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Deltares

Enabling Delta Life



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01 Launching Delft FEWS

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02 FEWS Explorer

Launching Delft FEWS

Depending on the local installation Delft-Fews can be started using the Application Launcher or by using an executable program located in the Delft-Fews binary directory (usually a link/shortcut will have been set up). On Linux systems Delft-Fews is started using a shell script. When using the Application Launcher a user must select a profile and enter the required password at startup.

Login to FEWS Application Lau 🗙					
Select a profile and enter the password:					
Forecaster 💌					
01/	L 0 [11.1.			
UK	Cancel	Help			

There are four profiles with each of them its own password:

- Viewer
- Forecaster
- Configuration Manager

• System Manager

The Viewer profile is the most restricted profile, a user with this profile can only launch the FEWS Webserver. The System Manager Profile, on the other hand, has all the rights to launch Stand Alone and Operator Clients, launch the Configuration Manager and use the Admin Interface. Depending on the configuration of FEWS all or some profiles may be present.

A screen dump of the FEWS Application Launcher for the National Flood Forecasting System for England & Wales is presented as an example below.



02 FEWS Explorer

01 Launching Delft FEWS

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03 Dropdown Menu

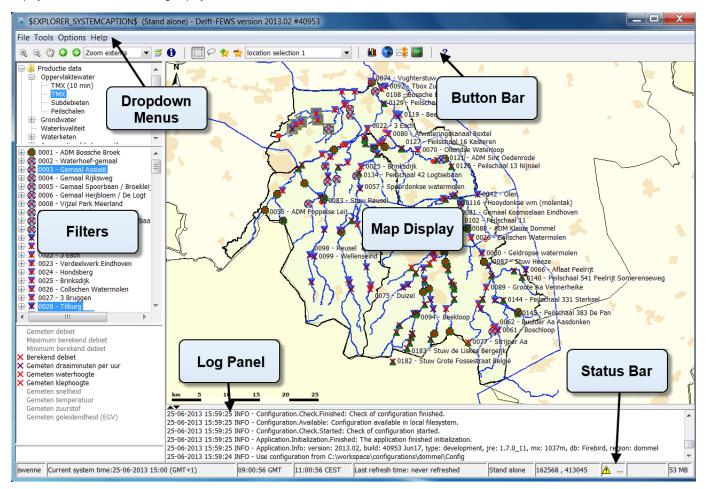
- FEWS Explorer
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FEWS Explorer

Overview

FEWS Explorer is the principal window of Delft FEWS. The main elements of FEWS Explorer are highlighted in the figure below. All windows can be re sized manually by dragging the mouse, or they can be undocked from the main screen, see 23 Interactive Forecasting Displays#23InteractiveForecastingDisplays-Dockablewindows



Map display

The map display serves a double purpose. The first is to give an overview of the available locations given a combination of filters applied and to allow the user to select or deselect locations by clicking the location icon. The second is to provide a geographical background to the locations involved in the flood forecast.

Filters

The list boxes- also called filters- are required to identify the data to be displayed in a graph or table, or the icons on the map. There are four list boxes, from top to bottom:

- Time series groups
- Locations
- Data types (parameters)
- Forecasts

Drop down menus

The drop down menu bar provides access to all displays configured for your configuration of FEWS.

File - Export timeseries

This menu option opens the Export timeseries dialog.

Time Serie	s Export		X
Export period	l of the timeseries		
Start Time	21-02-2010 00:00:00 💲	End Time	03-03-2010 00:00:00 📚
Module instar	nce		
Evaporation			
Status		Reliability	
ORIGINAL		RELIABLE	
COMPLETED		DOUBTFU	L .
CORRECTED		UNRELIAB	LE
	ОК	Cano	el Reset

This dialog can be used to filter the selected timeseries by view period, module instance, reliability and status. After the filter options are selected, the timeseries which match the given criteria are saved to a file.

When the user selects in the Export timeseries dialog the reliability "unreliable", then only export formats that write quality flags are available, i.e. PI xml files, CSV files with quality flags and Dutch CSV files with quality flags.

If "unreliable" is not selected in the export timeseries dialog, then all export formats are available. This is required, because if unreliable values would be exported without quality flags, then it would not be possible in the exported file to see which values are unreliable. In the case of csv format with quality flags, the complete text of the quality flags (including STATE and DETECTION flags, if they exist) are added to the timeseries.

All export formats available in the Export timeseries dialog are:

- PI xml
- GIN xml
- csv, Dutch csv
- · csv with quality flags
- Dutch csv with quality flags
- iBever csv
- Hymos transfer DB 4.50 mdb
- Hymos transfer DB 4.03 mdb
- Menyanthes csv
- UM Aquo 2009 xml

Since 2015.01 from the Reliability list, MISSING can be selected. Missing values will only be exported if MISSING has been selected.

Button bar

The Tool bar provides quick access to frequently used tools. Tools are plug-ins to FEWS Explorer. See FEWSExplorer-StatusBar for more information.

Log Panel

The Log Viewer relays high level messages generated by active system components. Additionally, detailed messages are available in the Log Browser.

Status Bar

The Status Bar provides information about the status of the forecasting system.

Map Display

Locations are displayed on top of the background map. The selected main filter determines which locations will be displayed. The background map may be configured to consist of stacked layering of various maps. For each map details about line types and fill colours may be set as well. Map layers can be disabled via the Layers button on the Button Bar..

File Tools Options Help	Layers 🛛
Image: Construction of the second	Coastine Plood_watch_areas Hood_watch_areas Hold_watch_areas Hold_watch_areas Hold_watch_odel Reaches (Eden) Hodraulic Model Reaches (Mersey) Hodraulic Model Reaches (Mersey) Hodraulic Model Reaches (Invel)

Tooltip

Information that is displayed when the user is moving the mouse cursor over a shape. To see this information turn on the 'I' button, in the button bar.

Map navigation

Map navigation options are set in the zoom toolbar item. After clicking the "button you can manually zoom in to a user defined map area. With the '-' button you can zoom out. Panning is possible after having clicked the *hand* button. From version 2008-01 the zoom in, zoom out and pan have been combined. After selecting the " button, drawing a box from top left to bottom right zooms in, while bottom right to top left zooms out. Holding down the right mouse button allows you to pan. The buttons for zoom out and pan remain for users with only one mouse button.

Returning and moving forward between previously selected zoom extents can be done after clicking the *arrow* buttons. The drop-down allows you to select pre-defined zoom ranges.

5	Tools	Options	Help	
٢	2, 🕎	00	North We	est Region 💙 🥑
	orih Area orth Area entral Area outh Area			X

Please note that in case you want to leave the zoom or pan mode, you have to click the buttons again.

Zooming with scroll wheel

Alternatively, zooming can be done with help of the scroll wheel on the mouse (when available). Zooming in and out is done by respectively turning the scroll wheel away and towards for the user. The position of the cursor determines the centre point of the zoom action.

Selecting locations and parameters

Locations in the Map Display can be selected by clicking on their icon. When selecting a location in this fashion, the locations selected in the Filters (to the left of the map display) will be adjusted to correspond with the map display. Conversely, if a location is selected in the Filters, the selection in the Map View will be adjusted as well. Multiple locations can be selected by holding down the [CTRL] key while selecting.

Parameters can be selected in the filter box bellow the locations filters. It's also possible to select multiple parameters by holding down the [CTRL] key while selecting.

In the Button Bar, there is a section further aiding location and parameter selection.

$\square P$	ದಿ ದಿ	location selection 1	•)

[]]	Rectangle selection : When selected allows you to press left mouse button and drag to create a rectangular box over the Map Display. When released it will select all locations contained in the rectangle.
P	Lasso selection : When selected allows you to create a freehand selection in the Map Display. Press and hold the left mouse button and drag around the locations you want selected. Release to make the selection.
ß	Select with map item selection: When selected allows you to select polygons on the Map Display. When hovering over a polygon, the polygon will be highlighted. If clicked, the locations related to the polygon will be selected.
	Add location parameter selection: Stores the current Map Display location and parameter selection. A Pop-up will allow you to enter a name for this selection. After entering the name and pressing OK, the selection can be found in the dropdown box to the right.
ت	Removes location parameter selection : Removes the current item in the location and parameter selection dropdown box to the right of this icon. If there is no current item, or it is empty, nothing will happen.
selection 1	Location parameter selection dropdown : When selecting an item from this dropdown, the locations and parameters contained in that item will be selected in the Map Display and the Filters. Selections can be added or removed with the Add / Remove location selection buttons.

The stored selections endure a restart of FEWS and will only be deleted by manually removing them or when overwritten.

Show map layer information

An icon on the toolbar can be pressed to activate the presentation of information for map layers as a tooltip. If a map layer has been configured such that it shows information from the dbf file, a user can show this information by clicking the information button.

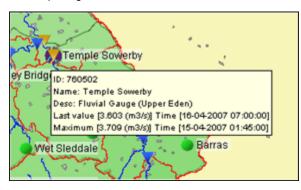
Note

In case the zoom mode has been activated, the desired location will not be selected, but the map will be panned instead. The zoom or pan mode must first be deactivated by clicking the magnifying glass again.

When moving the cursor to a location, a tool tip will be displayed with the following information:

- Location ID
- Location name
- Site description
- Information about time series...
- Last available value and date & time of last value
- · Maximum value (in view period) and date & time of maximum

An example is given below;



The tooltip shown above is the default tooltip. Within Delft-Fews it is possible that the tooltip has been configured differently to e.g. display a picture of the location. Consult the documentation of your local system or the Delft-Fews configuration guide (locations) for more information.

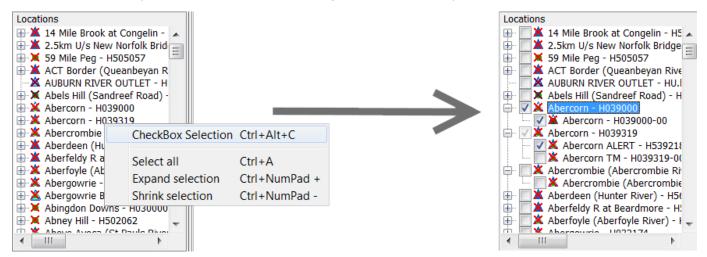
Filters

The filters are the 4 list boxes at the left hand side of the FEWS Explorer. The filters are used to select the data to be displayed in a graph or table. Your selection can be filtered by making one of more choices in the list boxes.

Using Check box selection

Locations, parameters and qualifiers have the ability to be selected with check boxes. To do so, right click on the windows for which you want the check box selection and select "Show check box selection".

With check box selection, selecting the label does not select the item. You will have to check the checkbox to select the item. A greyed out selected checkbox means that one, but not all locations associated with the local branch (the parent and its children) are selected. Like in the normal selection mode, it is possible in check box mode to select only the children without the parent.



Visibility of locations and parameters

The context menu of the listboxes includes the option Show only selected [CTRL ALT O]. This option restricts the visibility of locations and parameters in the listbox to the elements that are selected at the moment this option is chosen. In case of locations, the visibility in the map is also restricted. The visibility of all elements can be restored using the option Show All [CTRL ALT A]. It should be noted that these options require the listbox tree to be rebuilt; in check box selection mode, this leads to collapsing all children, except for the element with focus (dashed box).

Selection of location types

Time series sets can be selected in the upper filter. Time series sets are configured groups of locations with similar data types. The locations with the selected time series set(s) will be displayed on the map display and listed in the *locations* filter, the second list box. The data types associated with the locations are displayed in the *data types* filter, the third list box.

To select a list of multiple locations, hold down the [SHIFT] key between the first and second selection. Hold down the [CTRL] key to select multiple location types individually.

Using the right mouse button or a shortcut key, some context menu options become available:

- Select All [CTRL A] : Select all locations.
- Expand selection: [CTRL Numpad +]: A popup is shown where the selected locations can be expanded using a wildcard search. The
 wildcard characters are "*", matching zero or more characters, and "?", matching exactly one character. All matching locations will be
 selected.

For example, "Maas km 1?.00" will match "Maas km 10.00", "Maas km 11.00", etc., but not "Maas km 101.00".

As another example, "Maas km 1*" will match "Maas km 10.00", Maas km 11.00", etc., but also "Maas km 100.00", Maas km 101.00", etc. • Shrink selection: [CTRL Numpad -] : A popup is shown where the selected locations can be shrunk using a wildcard search (using * and ?). All matching locations will be deselected.

Locations list box

The locations associated with the selected main filter(s) are shown in the locations filter. Selected location will be highlighted on the map by means of a blue square. Locations can also be selected in the map display.

Location related icons are displayed on the map as well as in front of the location names.

Different icons are used to display locations and give information about the availability of data and about the hydrological status of the locations. More information about location related icons is given below in a separate section.

Data types list box

The data types associated with the selected main filter(s) are shown in the data types list box.

Selecting one or multiple data types causes the location list box to be updated regarding the potential availability of data, as shown by the icon displayed to the left of the location.

When depending on the selections made no data is available for a particular location or parameter its name is greyed out.

To select a list of multiple data types, hold down the [SHIFT] key between the first and second selection. Hold down the [CTRL] key to select multiple data types individually.

Using the right mouse button or a shortcut key, some context menu options become available:

- Sort by name: Sort all data types by name.
- Select All [CTRL A] : Select all data types.
- Expand selection: [CTRL Numpad +]: A popup is shown where the selected data types can be expanded using a wildcard search (using * and ?). All matching data types will be selected.
- Shrink selection: [CTRL Numpad -] : A popup is shown where the selected data types can be shrunk using a wildcard search (using * and ?). All matching data types will be deselected.

Forecast list box

The forecast list box displays forecasts that have been selected for viewing with help of the Forecast Manager. By highlighting one or more forecasts in this filter you can display them in graphs and tables.

Please note that- although not visible in the forecast list- the *current forecast* is always selected by the system. Icons related to the current forecast will be displayed on the map. The current forecast will also always be shown in the time series display. Selection of the current forecast is described in the section about the *Forecast Manager*.

The selection of forecasts in the Forecast list box can be removed by clicking the right mouse button with the cursor placed in the forecast list box. A pop-up menu appears with 'Remove all'. Pressing this menu item will remove the list of forecasts from the list box. Please note that this will just remove the selection but will not remove the actual forecasts from the database.

Location related icons

Locations related icons can refer to the following types of information:

- Location type icons
- Data availability icons (validation information)
- Hydrological status icons (threshold information)

Location type

For different types of locations different icons can be configured to allow for easier identification. Please note that only a single location type icon can be defined per location. In case for example various data types are available at a certain location that relate to different icons, the choice has to be made which icon will be displayed.

In Delft FEWS the following location icons have been chosen but in principle any icon could be chosen to represent a location type in FEWS.



Data availability and validation

Data availability icons show what kind of data is available for the timeSeries selected in a filter.

x no data stored in database (also when looking outside of the view period)

×	only missing values available in view period
×	only missing values available in view period for some time series (configurable since 2011_02; see someSeriesCompletelyMissingIconVisible in the Explorer file)
×	some missing values available in view period
	soft validation limit exceeded
∇	hard validation limit exceeded
0	data edited or interpolated

Although the icon descriptions are always true, there are some common assumptions that are not always correct. Following are some examples and an elaboration with details why it's not true.

-"If a timeSeries contains only missing values (also when looking outside of the view period), it will have a purple cross". This often results from the missing values not being stored in the database but are deduced (i.e, for an equidistant time steps). However, missing values that are the result of a manual adjustment *are* stored in the database.

-"If a timeSeries has a red cross, there are some values available, just not in this view period". The only reason a red cross is not a purple cross is because data are stored in the database (for the timeSeries). But besides values there are also other data stored for a timeSeries, like expired forecasts or the example shown above. These two "data" examples are not an exhaustive list and are not meant to be, but they show that this assumption is not correct.

-"A red cross means that one will see no data in the timeSeries display (or the other way around)". The selected filter determines the view period that is used to determine which data availability icon should be shown. This view period configured for a filter does not have to be the same as the view period for the timeSeries displayed in the timeSeries Dialog. If the relative view periods are the same, then the assumption *can* be used.

If both a data availability icon and validation icon are valid - both will be shown concurrently. By default only the red crosses are shown; add the tag to the Filters file to display the additional validation icons.

Hydrological and meteorological status

In case the high flow thresholds or rainfall thresholds are exceeded somewhere in the configured view period, the following icon is displayed.

a threshold exceeded in view period

The threshold status icons are only displayed for the current forecast or selected forecast and observed data.

Together with the threshold icons information is displayed on the map to inform the forecaster on:

- the timing of the threshold crossing (historic or forecast period),
- the severity of the threshold crossing.

There are 5 extra icons pre-configured for 5 threshold levels that are merged with the original threshold icon. These extra icons are:

	Level 1 threshold crossing in historic and forecast period
-	Level 2 threshold crossing in historic and forecast period
	Level 3 threshold crossing in historic and forecast period
	Level 4 threshold crossing in historic and forecast period
	Level 5 threshold crossing in historic and forecast period

For a level 3 threshold crossing in the historic period the combined threshold icon for a location will look as follows:

Since 2017.01 a button is available to turn of the threshold icons, it can be recognized by its icon:

. While this button is activated, the threshold icons are shown on the map (as normal). When the button is deactivated, the threshold icons will be deactivated, thus allowing the location type and data availability and validation icons to become visible.

Search in list boxes

It is possible to search elements in the list boxes. Select the appropriate list box and start typing the search criteria, see examples below. The cursor jumps to the next element *starting* with the letters you typed; in determining a match a closing asterisk "*" is implied. You may also use the asterisk "*" explicitly in the search criteria, for example if you do not want to start with the first character of the elements in the list box. When the search criteria turns red, the search criteria can not be found.

Search for: *Ha	~	Search for: *Halten	~
 TMX Armenmolen (027) TMX Baanbrug (041) TMX Bleyenbeek (013) TMX De Halte (Gre 6) (046) TMX De Halte (Pee 10) (046a) 		 TMX Armenmolen (027) TMX Baanbrug (041) TMX Bleyenbeek (013) TMX De Hatte (Gre 6) (046) TMX De Hatte (Pee 10) (046a) TMX De Hatte (Tussenschuif) (046k) 	^

By using the up and down arrow keys you can jump to the next element in the list boxes that match the search criteria.

Log Viewer

The Log Viewer provides information about the status of tasks run by the system. The messages that are displayed by the Log Viewer- called *Sys tem Messages*- are meant for both end users and system managers. Typical system logs are the successful start and finish of a module run.

The following type of system messages are identified:

Log level	Description
Fatal	Severe errors that cause premature termination
Error	Other runtime errors or unexpected conditions
Warn	Events that are undesirable or unexpected, but not necessarily wrong
Info	Runtime events (startup/shutdown) that allows tracking of the progress of the system

Per message, the Log Viewer provides the following information:

- Log level (see table above)
- Time of creation
- Event code
- Log message

Further sorting and assessment of the messages can be done with help of the system Monitor (see also System Monitor).

A System Manager can configure the system to also provide *Debug Messages*. These are used to log application internal events for system development and management. Typical debug events are the creation of a database connection or exceptions that occurred due to programming or configuration errors.

All messages listed in the Log Viewer can be removed from the display (not from the Local Data store) clicking the right mouse button with the cursor placed in the Log Viewer panel. Now two selections can be made:

- Clear Messages will remove all messages from the panel
- Save As will allow you to save the messages in the Log Panel to file

Status Bar

The Status Bar provides information about the status of the forecasting system. The information that is displayed can be defined by the user via the Options menu (see also *Options*). Some information is always visible.

The following information can be displayed:

Operator name (always displayed)

The name of the operator that has logged in is displayed.

Current system time

The current system time is the time in which the system 'lives'. The current system time moves forward in the so-called "Cardinal Time Step". In the live system the current system time will generally be the same as the current time. For analysis purposes, the system time can be set back in the standalone system to simulate a particular situation in the past.

When the system time is set back, only information- e.g. observed data and external forecasts- will be available to the system with a time stamp before the set system time. In case an hindcast for a particular flood is made with the *system time set back* to for example 13:00 on 21 January 2004, only data, that where imported into the database before this time will be used by the system. The system behaves as if the current time was 13:00 on 21 January 2004. When part of the required import data streams were missing at that moment but have been received later, they are *not* used in the analysis.

In case however, the same analysis is done *without setting back the system*, all data until the current time will be available for the analysis. This means that in this case also the above mentioned missing import data will be used in the analysis.

FEWS time

This is the time that is configured in FEWS to display information.

Local time

The actual computer time. This is the time the user configures in the regional settings of windows.

Time of last refresh (only relevant for OC)

The time of last refresh indicates the last time the local data store has been synchronised with the Central Database. Not relevant for Stand alone FEWS configurations.

System status

The system status indicates in what mode the system is currently operating: online, or stand-alone.

In the live system the following colour information indicates the state on synchronisation:

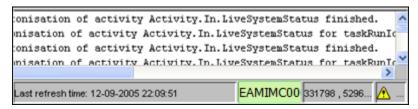
• In case the colour is red, the OC is logged off:

			_	
ally logged out from Master Controlles	r.		^	
om Master Controller started.				
conisation of activity Activity.In.LiveSystemStatus finished. misation of activity Activity.In.LiveSystemStatus for taskRunIc				
Last refresh time: 12-09-2005 22:06:26	Logged off	342353 , 4858 🥂		

• In case the colour is soft purple, the OC is synchronising with the MC displayed in system status box:

nisation	of	activity	Activity.	. In. Tasks	for	taski	RunId	null	and	1^
conisation	ı of	activity	Activity	y. In. Fews	Sess	ions	finis	ned.		-
onisation	of	activity	Activity.	In. Fews?	essi	ons f	or ta:	skRunI	d nu	1
chManager	has	heen cre	eated for	nrofile	Full					~
									>	
Last refresh	time	12-09-2005	22:09:17	E	AMIN	4C00	496642	, 5270.	📐	

• In case the colour is soft green, the OC is logged on and fully synchronised with the MC displayed in system status box:



• In case the colour is tomato, the OC is running the Rolling Barrel (system maintenance) in order to remove expired data from the local datastore.

onisation of activity Activity.I	n.LiveSystemStatus finished. 🔥
nisation of activity Activity.In	.LiveSystemStatus for taskRunIc
conisation of activity Activity.I misation of activity Activity.In	n.LiveSystemStatus for taskRunIc
Last refresh time: 12-09-2005 22:09:51	RollingBarrel 331798 , 5296 🥂

• In case the colour is orange, the MC which the OC is logged into is in failover mode, either manually or because the FSS's are down.

conisation of activity Activity.In	n.LiveSystemStatus finished.	^
misation of activity Activity.In	LiveSystemStatus for taskRunIo	-
conisation of activity Activity.In	-	-
misation of activity Activity. In	LiveSystemStatus for taskRunIc	Ť
		_
Last refresh time: 12-09-2005 22:09:51	Failover 331798 , 5296 🕂	

Mouse coordinates

Mouse coordinates displayed in the configured coordinate system

System status icon (always displayed)

The System status icon- in the lower right corner of the display- indicates whether the system operates normally or that severe errors are encountered. The icon has the following display modes:

lcon	Color	Description
	Green	System is running normally but warnings have been encountered.
⚠	Yellow	System encountered severe errors in the past 48 hours. This means that at least one system message has been generated with log level ERROR. After all messages with this log level have been acknowledged by the user via the System Monitor (see also System Monitor), the icon becomes green again.
×	Red	System encountered fatal errors in the past 48 hours. This means that at least one system message has been generated with log level FATAL. After all messages with this log level have been acknowledged by the user via the System Monitor (see also <i>System Monitor</i>), the icon becomes green again.

Notification (default disabled)

Since 2007.02, the Explorer can be configured to provide a popup type notification to show completion of manually dispatched tasks. The popup appears in the lower left screen corner, reporting the name of the job dispatched as well as its success or failure.



Database Viewer

Introduction

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	1	1	1	то]		an uitvoering][Vorkflow][Scenario		1	Omschrijving][Gebruiker	i	Filter met	gelectie
			10-12-2013 0			10-12-2013 08:15 10-12-2013 08:13			terkwantiteit_Proc								peter 1			Manufield	- Chur
	X		10-12-2013 0			10-12-2013 08:1			terkwantiteit_Bew porteer_Externe_D								peter 1 peter 1			Verwijde	a Teana
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Module Instantie	Parameter- groep	Parameter- id	Locatie- id	Locatie- naam	x	Y	Tijdserie- type	Waarde- type	Tijdstap	Externe Voorspel-	Start	End	Tijdspanne	Tijdstip Aantal	Eenheid	Ontbrekend	Niet Ontbreker Aantal	Kwaliteit	Waarde- resolutie	Waarde Bits	Schijfru
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figure 1: the GUI of the Database Viewer

The database viewer is a *configuration support* tool for inspecting the contents of the FEWS database (localdatastore). It provides an overview in tabular form of statistics and other metadata (columns) of the timeseries (rows) in the database. To aid the inspection of data, the user can add or remove columns, and select and filter rows. From the Database Viewer it is also possible to access the content (=values) of selected timeseries by opening the timeseries dialog. The database viewer is available in two different modes:

- Workflow based database viewer for each available workflow, all timeseries written to the database in that workflow can be inspected.
 From the Explorer, the Database Viewer can be accessed using <F12> + J.
- Timeseries lister for the selection made in the Data Viewer or Forecasts (Explorer Tabs) all available timeseries in the database are
 listed and can be inspected. To enable this mode, some configuration is required.

Configuration (mode: timeseries lister)

To enable the timeseries lister, it must be added as explorertask in Explorer.xml:

```
<explorerTask name="Timeseries Lister">
<iconFile>tableInfo.jpg</iconFile>
<taskClass>nl.wldelft.fews.gui.plugin.timeseriestableviewer.TimeSeriesTab
leViewer</taskClass>
<toolbarTask>true</toolbarTask>
<menubarTask>true</toolbarTask>
<allowMultipleInstances>false</allowMultipleInstances>
<accelerator>ctrl T</accelerator>
</explorerTask>
```

Usage

The database viewer enables the user to inspect the database. The database records are visualised as individual rows, which can be selected. When selected it can be browsed through (all columns) or its values can be inspected through a graph (scalar series) or the spatial display (grid data). In the top window, workflows are available. When selected, the lower part of the screen shows the records which have been written to the database in this selected workflow. In this lower part, individual rows can be selected as well.

All meta information and statistics are calculated on-the-fly and are not stored. Within selections or filters (e.g. on start/end time) the content of the (visible) columns are updated immediately.

There are many columns which can be viewed: general columns about module instance, location, parameter, disk space and all kind of relevant meta information about the selected record(s).

Besides the 'general' metadata, the basic statistics of that row can be inspected. These basic statistics are sum, average, maximum, minimum, etc.

The remaining columns describe the quality of the data. If the user e.g. wants to know how many values are 'unreliable' and how many 'periods' of unreliable data are available, this information can be retrieved. The same is true for all kinds of combinations of doubtful, completed and corrected data. This same functionality (number of records, periods) is available for primary and secondary validation results. This means that the user can inspect number of records and periods of e.g. hard maximums and flag comparison or series comparison.

When many records (rows) are available the user can filter the results. Double-clicking a cell will automatically filter for that value. If you want to filter on e.g. a location, select the location (name or Id) column and press F8 or double-click it. The background color of the cell will turn blue (meaning there's a filter on it).

This filter mechanism is applicable on all available columns, including the Start and End Time. When the users changes the start and/or end time, the visible columns will be updated accordingly.

Two types of filters - with or without data hierarchy

Note well that there are two modes for using the Database Viewer. When using the filters on the top of the screen of the database viewer, the timeseries can be viewed as they are available in the database. However, when using the other filters from for instance FEWS-Explorer (left below), the database viewer shows the timeseries as they are in the data hierarchy. In the first case this means that external data with a scenario can be made visible, and in the latter case, the external timeseries are viewed as they were imported, i.e. without the scenario applied. For more info read about the fews data hierarchy.

Context Menu Options

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-67	Remove all filters	F6	7:00 1.
-6	Sort column	F7) 7:00 1.
-66	Select columns	F8) 7:00 1.
-66) 7:00 1.
-66.	Show time series dialog	F10	7:00 1.
-66	Show spatial display	F11) GMT-4
-66	Conv TimeSeriesSet yml to clinhoard) GMT-4
-66.	Copy TimeSeriesSet xml to clipboard) GMT-4
-6	Export to CSV		7:00 1.
-66.14051	45.7683 external hist scalar		3:00 7:00 1.
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figure 2: context menu of the Database Viewer

The Graphical User Interface contains a number of context menu options for selection/filtering and inspection of data. Right-click the mouse on one of the cells to access the context menu.

Menu option	Shortcut	Functionality	Alternative	Remark	Visible effect
Filter for selection	<insert></insert>	Uses the cell content as a filter	Doubleclicking the cell	You can set different filters in different columns	Cell background turns blue
Remove filter for column	<f3></f3>	Show all timeseries (again) for this column	Doubleclicking the blue cell		Cell background turns white
Remove all filters	<f6></f6>	Show all timeseries (again)	Doubleclicking the blue cell		Cell background turns white
Sort column	<f7></f7>	Sort the content of the column	Clicking the header		

Select columns	<f8></f8>	Opens a dialog for selecting the columns (Met Data Elements/groups)		
Show Timeseries Dialog	<f10></f10>	Opens the TimeSeriesDialog and shows the content of the selected (scalar) timeserie(s)		
Show Spatial Display	<f11></f11>	Opens the Spatial Display and shows the content of the selected (gridded) timeserie(s)		
Copy TimeseriesSet.xml to clipboard		Copies the TimeSeriesSet in XML format		Shows the XML in popup
Export to CSV		Export selected timeserie(s) to a CSV file		File dialog opens for saving the CSV file
Show interval statistics		Allows the user to view statistics such as %available, %unreliable, %doubtful, Min, Max, Mean and also if values have exceeded a threshold		

Special Filter option: Start time / End time

Two columns have special features: The Start and End time columns can be used to increase or limit the view period. If you adjust these all statistical columns or columns showing information about quality flags and (secondary) validation will be adjusted automatically.

Doubleclicking in these time columns will provide the user with the following, see figure below.

	1																				
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figure 3: Special filter in the Start/End time columns

Meta Data Elements / Select Columns (F8)

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	Copy Selection	Paste Selection	ОК	Cancel

figure 4: Selecting different columns (elements) in the Database Viewer

The meta data elements are grouped as follows.

- General (e.g. moduleinstanceld, location, parameter, timestep, blobsize etc.)
- Basis Statistics (Sum, Mean, Median, Standard Deviation, Percentile-5, Percentile-95)

The below mentioned groups give an overview of number of values and periods based on quality flags, primary and secondary validation.

- Missing
- Original Reliable
- Corrected Reliable
- Completed Reliable
- Original Doubtful
- Corrected Doubtful
- Completed Doubtful
- Original Unreliable
- Corrected Unreliable
- Completed Unreliable
- Soft Min
- Soft Max
- Hard Min
- Hard Max
- Same Reading
- Rate of Change

- Temporary shift
- Series Comparison
- Flag Comparison
- Spatial Homogeneity

The list of available columns can be adjusted by (un)selecting the individual elements. Only the selected ones will be visible in Database Viewer after confirming by clicking <OK>.

Selections can be copied to the clipboard (<Copy Selection> button) and adjusted in a text editor (figure 5). These lists can be shared amongst users (e.g. e-mail). From a text editor you can adjust the list by removing rows, select the remaining rows and then copy it the clipboard (<CTRL+C>) again. After that use the <Paste Selection> button to update your selected columns (figure 6). See below:

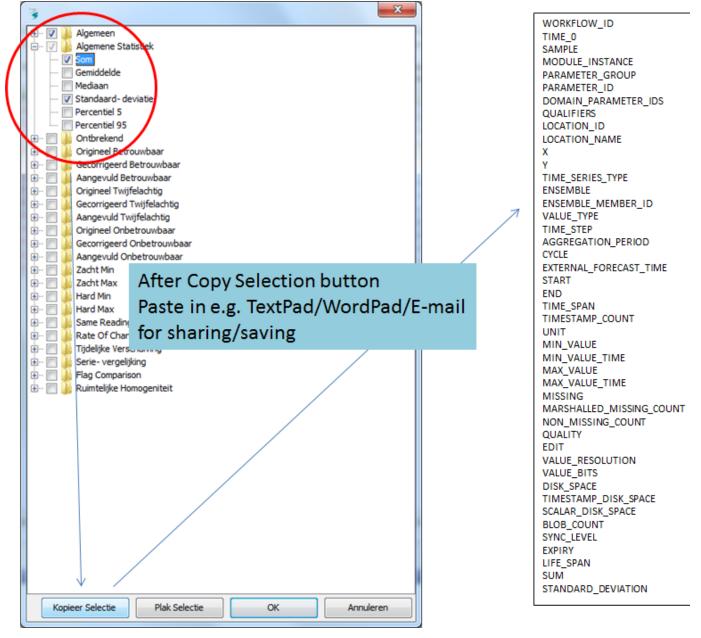


figure 5: Copying the selection of columns to clipboard

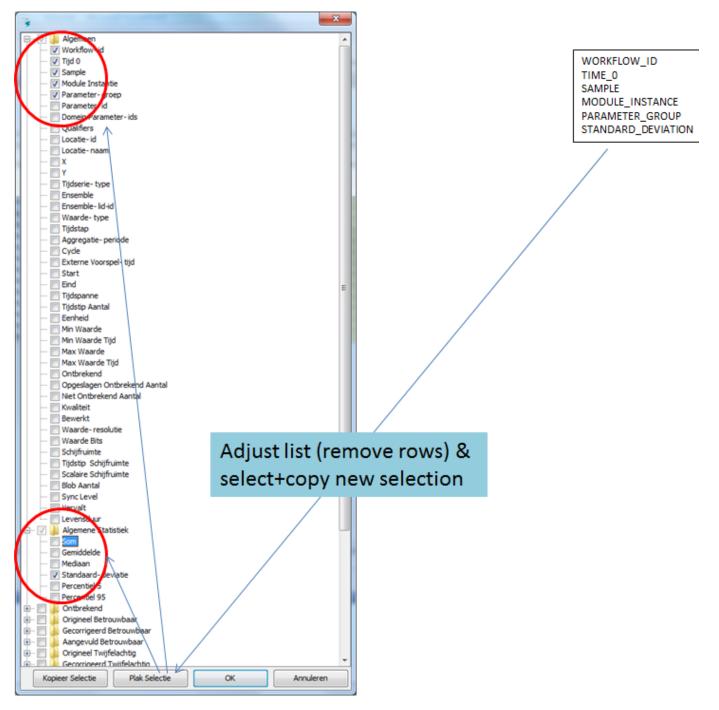


figure 6: Pasting the selection of columns from the clipboard

Delete module instance from Database Viewer

From build 2016.02 it is possible to remove module instances from Local Data Store via Database Viewer. This function only exists in FEWS stand alone mode. The procedure is as follows:

1. In Database Viewer, select one workflow, press F12, a menu will pop out (figure 7).

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figure 7: F12 menu in Database Viewer

2. Select '9 Delete module instance for selection', the module instances in this workflow will be displayed for selection. One can select the module instances that should be removed from the database.

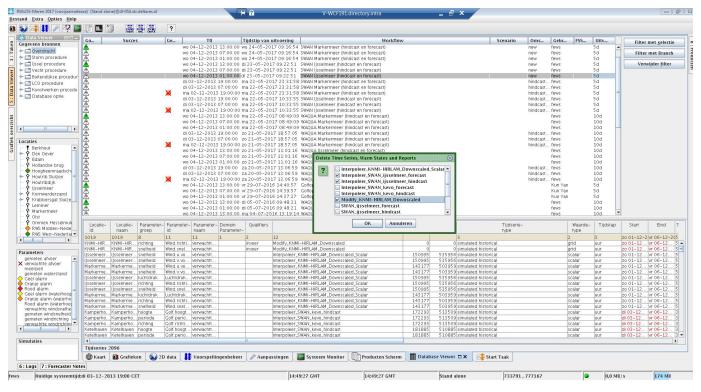


figure 8: select module instances to be removed from database

3. Press 'OK', the selected module instances will be removed. If all module instances in one workflow are all removed, the workflow will become empty, but the workflow still appears in the Database Viewer.

To completely remove this workflow from the list, go to FEWS F12 menu (in log panel, press F12), select 'P database', select 'validate, repair, and compact datastore indices and cache files', then restart FEWS, the workflow will be completely removed. To completely remove the data from the localDataStore (i.e. reduce file size), press F12, select 'P database,' and select 'repair and defrag localdatastore'.

۲۵٦				New Yorkshout Date	Carnel Colors	and Card								. 0 X
	1 open most recent current forecast and adjust system time													
	2 open most recent forecast and adjust system time													
	3 run last created task													
	4 open last forecast for selection	N		What-if scenario	Description	FDC		FSS ID	Runtime	Output Ti			Filter by S	election
	5 set system time to last available for selection		orecas precast Al			Nena Va	ndebr		5m 32s 1m 1s	7d 7d	26 /		Filter by	Decembra
	6 save temporary time series	carre	Jrecast Al			Nena Va			14s	7d	19		Filter by	branch
	7 ids visible	ean Fo	orecas			Nena Va			3m 30s	7d	16		Remove	Filter
-	✓ 8 names visible		log datab	base table spaces			debr debr		57s 15s	7d 7d	4			
	9 descriptions visible		-	central database			debr		15s 8m 26s	7d 7d	82			
	A verbose location tool tips			plicate action			debr		8m 49s	0s	5			
	B clear time series memory caches			e series disk space statistics			debr debr		7m 37s	0s	7			
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	E release plugin bin dirs		-	series blob id sequences			Time	Start	End	Tim	e .	Timestamp	Stored	Unit
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	H delete local data store			compact and repair datastor		che files	hours		17 21-1				57	57 ppt
	I acknowledge all			time series primary keys and	local int ids		hours		17 21-1				57	57 oC
	J open database viewer		show ses				hours	14-11-20	17 21-1	1-2017 7d			57	57knot
	K open workflow navigator			d defrag local datastore										
	L open tabular config files display		rolling ba	arrel local data store			er 🗆 🗙							
	M start embedded vjdbc server		delete all	local manual log entries			er 🗆 🗙							
	N terminate local runs Shift+F5		delete all	location attribute modifiers										E 🗆
	O rollback modifier changes		delete all	modifiers										
	P database		commit a	all temporary modifiers										
	Q screen recording													
	R convert			ting up. (11s;Unmarshall re	gion config 6s;1	Time Seri	es Viewe	r 1s)						
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	T export													
	U misc				15: 14: 52 CET	r .	Ctreet	alone	E4 625	, 23.663		0.01	AR /c	565 MB
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figure 9: Remove workflow and data using F12 - P - database menu

The F12 menu

Contents

- Contents
- F12 menu options
 - Database sub-menu options
 - Screen recording sub-menu options
 Convert sub-menu options

 - Clipboard sub-menu options
 - Export sub-menu options
 - Misc sub-menu options

F12 menu options

In the FEWS Explorer and the TimeSeries Display, a number of options are available under the <F12>. They are meant to be used during debugging or testing and useful functionality might end up in the GUI in a later version. Below are the options available in 2016.01, most of the options are self-explanatory but some additional descriptions of the functionality are included here.

F12 - Choice		What does it do?
1	open most recent current forecast and adjust system time	
2	open most recent forecast and adjust system time	
3	run last created task	Repeat last task run

4	open last forecast for selection	Opens forecast for selection in the data viewer
5	set system time to last available for selection	
6	save temporary time series	
7	ids visible	Shows ids next to location name (filters)
8	names visible	Shows names in location filter
9	descriptions visible	Shows description
А	verbose location tool tips	Extra info in tooltips
В	clear time series memory caches	
С	run workflow test	Allows selection of test workflow xml file
D	restart	
E	release plugin bin dirs	
F	set water coach wall clock time	Opens Water Coach wall clock time dialog
G	select by attributes	Opens the optional attributes panel in the data viewer
Н	delete local data store	
I	acknowledge all	Acknowledges all flagged messages in the system monitor
J	open database viewer	Optional display for visualising database records
к	open workflow navigator	Optional display for visualising workflow tree
L	open tabular config files display	Optional display for visualising metadata (use with filters)
М	start embedded vjdbc server	Connect to Delft-FEWS via JDBC
N	terminate local runs	
0	rollback modifier changes	
Р	database	database menu (see below)
Q	screen recording	screen recording menu (see below)
R	convert	convert menu (see below)
S	clipboard	clipboard menu (see below)
т	export	export menu (see below)
U	misc	misc menu (see below)
V	open most recent running forecast and adjust system time	
W	restart and disable UserSettings	

NB. If option <timeSeriesStatus>remotely updated snapshot</timeSeriesStatus> is enabled in the explorer.xml an additional F12 option appears 'time series status'. This option allows the user to 'load database snapshot' or 'update database snapshot'. These snapshot files are used where the calculation of the status icon is complex or has a long relative view period, thus improving the refresh performance of these icons.

Database sub-menu options

log database table spaces	Logs to table spaces to the Logs dialog and log.txt
replicate central database	
cancel replicate action	
show time series disk space statistics	

show connections	Shows current connections to the central database (live system)
log database info	
log time series blob id sequences	
set minimal execution time before logging sql statements	
test all time series blobs for corruptions	
compact datastore index files	
validate index files	
repair and defrag local datastore	Option available in stand alone and synchronising OCs
rolling barrel local data store	Option available in stand alone and synchronising OCs
delete all local manual log entries	Option available in stand alone and synchronising OCs

Screen recording sub-menu options

start/resume recording	Starts recording (full screen)
pause recording	
stop recording	

Convert sub-menu options

*.FI and *BIN to xml	Used for converting binary files created by Delft-FEWS into text based files
netcdf file curvilinear grid cell center coordinates to csv file	
netcdf file unstructured grid node coordinates to csv file	
netcdf file unstructured grid flowlink coordinates to csv file	
netcdf file unstructured grid cell contours to shape file	
netcdf file quadtree grid flowlink coordinates to csv file	
netcdf file quadtree grid cell contours to shape file	
netcdf file 3Di stations to csv file	
pack dbf files (remove white space)	
convert ascii grid file(s) (*.asc) to coverage tile archive (*.cta)	This creates an efficient 'pyramid of maps' for improved performance displaying large static grids in the explorer and grid displays
convert sll to shp	Converts Delft-FEWS specific .sll files into shp files
convert dbf/dbz to csv	

Clipboard sub-menu options

copy current map scale

copy current map extent	Useful feature for generating extents which can be used in the explorer.xml
copy selected time series sets	Used in conjunction with a selection in the data viewer
copy selected time series sets as display group	Used in conjunction with a selection in the data viewer
paste selected time series sets as filter	Used in conjunction with a selection in the data viewer
copy grib geometry from file	
encrypt password	Used to encrypt password for DDA root config file

Export sub-menu options

Options	Explanation	Details
default config	Exports current config to disk	
default config as zip	Exports current config to disk in a zip file	
default dbf/dbz as csv files	Exports current dbf/dbz files as comma separated value (csv) files	
location sets as csv files	Exports location sets as comma separated value (csv) files	
parameters as csv files	Exports parameters as comma separated value (csv) files	
qualifiers as csv file	Exports qualifiers as comma separated value (csv) files	
export all modifiers	Exports all modifiers	
current warm states	Exports all current warm states	
all warm states	Exports all warm states	A complete set of Warm States which can be used as Cold States can be exported. In the Explorer using F12+T, current warm states are exported for the current module runs. T0/system time is ignored. It exports for current module runs and for the current branches. This can give problems when the historical module instance id of the state is also used in another workflow that does not produce states. Code has been changed so it will search in the whole branch till the system time. A folder structure to the exported warm states for both export 'current' warm states and export 'all' warm states. The most recent state in the current branch per module instance is exported. This is the same method as used in the export state activity
irregular grids to esri shape files	Exports all irregular grids to ESRI shp file format	
rating curves	Exports all rating curves	
save current visible map as png file	Exports current visible map extent as png file	

Misc sub-menu options

last value visble on map Appends the last value from the selected timeseries to the name on the map

03 Dropdown Menu

02 FEWS Explorer

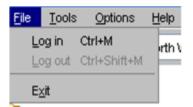
- Dropdown Menu
 - File
 - Log in
 - Log out
 - Reload Configuration
 - ExitTools
 - Map Display
 - Data Editor
 - Data Display
 - Spatial Display
 - Longitudinal Display
 - Manual Forecast
 - Forecast Management
 - Archiving
 - System Monitor
 - What-if Scenario
 - Skill Scores
 - LookUp Table
 - Correlation
 - Calibration
 - Threshold display
 - Other displays
- Options
 - Map
 - Status BarCurrent System Time
- Help
- Contents

Dropdown Menu

File

The File Menu in the Operator Client of Delft FEWS offers you the possibility to log into and out of the Master Controller:

Delft-FEWS User Guide



In the Standalone system the File Menu only allows you to reload you configuration:

Reload Configurati	on F5 📈
E⊻it	-

Log in

With Log in, an on-line session can be started. When logging in, the system may require some time for synchronising new data from the Central Database.

A range of synchronisation profiles can be selected:

Minimal

This profile synchronises a minimum amount of data required for a forecaster to perform the required tasks. As a default, data is

04 Data Display and Data Editor

synchronised over the past 2 days and no radar and grid data is transferred to the OC. This profile should be used, when logging in over a dial-in connection.

Login to Maste	er Controller	X
Select a Master	Controller:	
MC00 Online	Leeds	
O MC02 Online	Peterborough	
Select a synchro	onisaton profile:	
O Minimal		
💿 Full		
O Custom		
Set the synchron	nisation period	
week	×	1.0
Enable optional s	synchronisation act	ivities:
<u>o</u> k	Cancel	Help

• Full

This profile synchronises a larger amount of data required for a forecaster to perform the required tasks and have sufficient background data available. As a default, data is synchronised over the past 7 days.

Custom

With this profile a user can determine over which period data should be downloaded.

In addition, a user can select to download:

- Simulated Grid Data (e.g. flood maps)
- External Grid data (e.g. radar grids, surge forecast grids)
- · Complete configurations (all versions of the configuration files in the database including the module datasets)
- Radar forecasts and actuals (catchment average time series)
- Performance indicators
- Warm states

Login to Master Controller	
Select a Master Controller:	
EATHMC00 Delft AppServer01	
Select a synchronisaton profile:	
O Minimal	
⊖ Full	
⊙ Custom	
Set the synchronisation period:	
day 🖌 2 🗘	
Enable optional synchronisation activities:	
Simulated Grid Data (Including FloodMaps)	
External Grid Data (Met Office)	
Complete Configuration (including Module Datasets)	
Radar Forecasts and Actuals (CatAvg)	
Performance Indicators	
All Warm Model States	
OK Cancel Help	

The period over which data should be downloaded can be defined by the user.

Log out

With Log out, an on-line session can be closed without closing the FEWS menu. Work can be continued in an off-line mode. When logging out the following window appears:

•	Logging out system Waiting for synchronization to complete.

Before logging out, the system will complete a ongoing synchronisation action. Depending on the action this may take from seconds to several minutes.

Reload Configuration

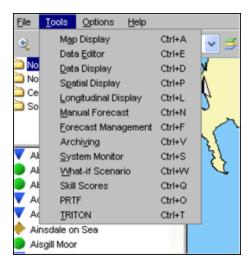
In the Standalone system you can reload your configuration from the file system without having to close your client. This may be practical when you have changed some configuration files and want to check the result of the changes.

Exit

With Exit a forecasting session can be closed.

Tools

Plug-ins to FEWS Explorer are activated primarily through the Tools menu. The following plug-ins may be configured (an example of some is shown in the picture below):



Map Display

The current map view will be opened in a new window when selecting this option.

Data Editor

By selecting Data Editor, time series can be displayed and edited in the form of tables. (see also Data Display and Editor).

Data Display

By selecting Data Display, time series can be displayed in graphs (see also Data Display and Editor).

Spatial Display

By selecting Spatial Display, meteorological forecast grids or hydrological flood maps and catchment average data can be displayed on a map (see also Spatial Display).

Longitudinal Display

The Longitudinal Display is for example used to display data for the axis of the river or along the coast (see also Longitudinal Display).

Manual Forecast

Via the Manual Forecast Display, the user can define forecasts that should be run in manual mode (see also Manual Forecasts).

Forecast Management

Via the Forecast Management Display, the user can download forecasts from the Central Database and make forecast active for viewing. The current forecast can be set and archived forecasts can be retrieved. (see also *Forecast Management*).

Archiving

Archiving allows you to archive and retrieve forecast runs with all associated data to/from an repository. Also threshold crossing events, time series and configuration can be archived. You can only retrieve to a standalone system.

System Monitor

The System Monitor allows the user to view selections of system messages and acknowledge severe and fatal errors (see also System Monitor).

What-if Scenario

Via the What-if Scenario Display, the user can define what-if scenarios, which can be run via the Manual Forecast Display. (see also What-if Scenarios).

Skill Scores

The Skill Scores display provides an overview of all threshold crossings in the observed and forecast time series. By matching observed and forecast thresholds crossings, the skill scores, which are shown at the bottom of the display, are obtained.

LookUp Table

The Lookup Table display allows for working with lookup tables interactively and run what-if scenarios on them (see also Lookup Table Display).

Correlation

The Correlation display allows for working with interactive regression functions and make alternative (off-line) forecasts

Calibration

The Calibration display allows a user to automatically optimize the model calibration parameters.

Threshold display

The Threshold displays allows for extended reviewing of all thresholds.

Other displays

Also displays specifically focussed on a particular forecast procedure or method- like PRTF, TRITON, K-Flows and Trends in NFFS for England and Wales- can be accessed from this menu.

Part of the functionality offered by the Tools menu is usually also (partly-) available via the Button Bar.

🔍 🔍 🗘 🔾 🗙 North West Region 🐱 🗃 🖓 🏙 Signifial Display Manual Forecast Eprecast Management System Monitor 🛛 PRTF 🏂 ?

Options

Through the Options Menu a number of settings can be defined.

Мар

The Map Tab allows the user to activate or de-activate the:

- scale bar
- north arrow
- labels

Explorer Options
Map Status Bar Oyrrent System Time
Show on the map
✓ Scale Bar
North Arrow
✓ Labets
<u>QK</u> <u>Cancel</u> <u>Apply</u>

Status Bar

The Status Bar Tab allows the user to activate the display on the Status Bar of:

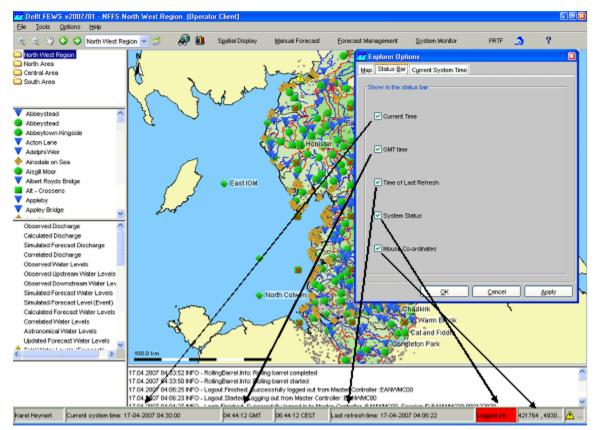
- GMT time
- Current time
- Time of last refresh___
- System status____

Mouse co-ordinates____

The time of last refresh indicates the last time the local data store has been synchronised with the Central Database.

The system status indicates in what mode the system is currently operating: online, offline and stand-alone.

Mouse co-ordinates displays the mouse pointer co-ordinates in a configurable format (e.g. OSGB 1936 format for NFFS).



Current System Time

The *Current System Time Tab* allows the user to set the current system time. This is the time, that should be simulated by the system. Under normal operational conditions, the current system time coincides with the actual time. For hindcasting, the current system time can be set at a user defined time.

🚟 Explorer	Options 🔲
Map Status	Bar Cyrrent System Time
-Date time 1	format : dd-MM-yyyy hHimm as
2	17-04-2007 04:45:00 0.
	QK Concel Apply

The current system time can only be changed in a Stand-alone system. In an Operator Client this item is disabled.

Help

The Help Menu provides:

- About
- Contents

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File Io	ols Options	telp	
0. 1	Thames Regi	Contents F1	la 🕼 🔇
Thames Region		About	N
Barrier Area Fluvial River Thames		Â	

Contents

Contents give access to the context sensitive Help information. The On-line HELP provides:

- Logical grouping of topics (Contents Tab)
- An Index (Index Tab)
- A search option (*Search* Tab)

Buttons are available at the top of the window to increase the size of the display window by closing the overview panel (*Hide*), navigate back and forward through the HTML pages opened before (*Back* and *Forward*) and print the information (*Print*). About

Via About background information regarding the Delft FEWS version can be displayed. The software version and build information is displayed. In addition, technical data is presented regarding the actual allocation of memory to the Delft FEWS application.

About	
	Program version: 2007.01 Build number: 15297 Build type: stable Built on: 14-04-2007 02:03:00 Datastore created on:#09-04-2007 21:07:43 used memory 36 MB Time series segments in database: 88818 Time series rows in database: 11730 Time series rows in memory: 513 Time series bytes in memory: 3 MB Shape files in memory: 3 MB

04 Data Display and Data Editor

03 Dropdown Menu

Delft-FEWS User Guide

05 Spatial Display

- Data Display and Data Editor
 - Table
 - Shortcuts
 - Graph
 - Descriptive statistics
 - Validation Rules (hidable panel)
 - Rotate Splitter
 - Rotate Legend
 - Toggle Graph
 - Scale to show unreliable Data
 - Show no Thresholds
 - Scale to show relevant Thresholds
 - Scale to show all Thresholds
 - Show data labels
 - Statistical Functions
 - Search and Select Forecast
 - Historical Events
 - Display time
 - Datum Toggle
- Navigating in Graphs
 - Save As
 - Print

- Zoom in / out
- Allow Vertical / Horizontal Axis Zoom
- Auto Range
- Data Editor
 - Editing data labels
- Historic Events
- Longitudinal profile
- Category plot
 - Configuration
 - Restrictions
- Editing Data
- Changing display properties
- Interactively modifying display colours
- The F12 debug menu (Timeseries Display)
- Statistical functions
- Filtering data

Data Display and Data Editor

The Data Display and Data Editor offer graphical displays for presenting and editing of data. Both have nearly the same functionality but only the Data Editor allows you to edit data. In addition, the data editor can only be opened once while multiple instances of the data display can be opened.

This display offers the following features:

- Display of time series in:
- graphs (scalar/longitudinal profiles)
- tables (scalar/longitudinal profiles)
- Tabular data editor
- Display of actual data with:
- Historical events
- Threshold levels

Data is displayed in a table and a graph simultaneously. The splitter between the table and the graph can be moved to modify the display. Select the data series, that should be displayed with help of the List Boxes and/or the Map Display (see also *Filters*).

Decimals for the reference values (ticks) in the chart autorange between 0 and 6, always using the lowest amount necessary to differentiate between ticks.

When the display is started through the FEWS Tools menu item *Data Editor*, data can be edited and the edited data can be stored in the FEWS data base. When the display is started through the FEWS Tools menu item *Data Display* or through the FEWS toolbar, the data can only be viewed.

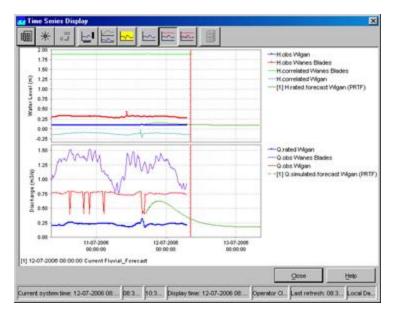
1.1 Data Display

Press the [Data Display] button

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on the toolbar to present graphs displaying the data. The splitter is normally positioned on the left of the display.

When data series of different data types have been selected, the data will be presented in different subplots with the data series of a single data type merged into one subplot.

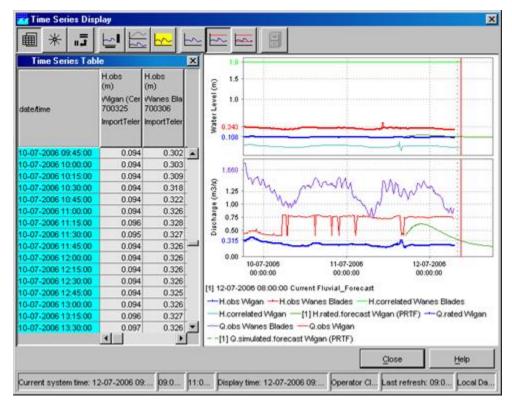


The data in the graph is *updated automatically* in case new data becomes available. Below the graph the workflows are listed that generated the forecast time series in the graph. Their numbers are used in the graph legend and table headers too.

The following buttons are used in the Time Series Display:

Table

By clicking this button the time series in the graph is also displayed in tabular format. Please note that in case you like to edit data, you have to select the Data Editor from the Tools menu (see section 4.3).



Selecting the small arrow at the right of the icon shows the next menu:

🛆 Valio	dation	Ctrl+Shift+J
💄 User	rs	Ctrl+Shift+K
✓ ○ Con	nments	Ctrl+Shift+L
V Unit	'S	
V Loca	ation Names	Ctrl+Alt+Shift+N
V Loca	ation Ids	Ctrl+Alt+Shift+L
✓ Mod	dules	Ctrl+Shift+M
V Colu	umn Statistics	Ctrl+Alt+Y
✓ Thre	eshold Crossing	Ctrl+Alt+T
V Nor	mal	Ctrl+Alt+N
Days	S	Ctrl+Alt+D
Wee	eks	Ctrl+Alt+W
Mor	nths	Ctrl+Alt+M
Year	rs	Ctrl+Alt+Y
 Show 	w empty RVP series	Alt+Shift+L
Show	w empty complete series	Alt+Shift+C
Tim	e order reversed	Alt+Shift+R

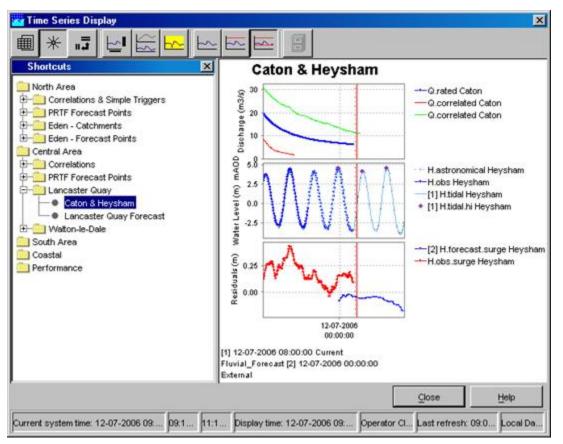
function	description
Validation	shows a separate column with the validation flags
Users	shows a separate column with the user names of editted values
Comments	shows a separate column with the comments
Units	shows in the header the unit of the parameter
Location Names	shows in the header the location name
Location Ids	shows in the header the location ID
Module	shows in the header the moduleInstanceId
Column statistics	shows between the header and the table statistics of the values in the current relativeViewPeriod, like mean, sum, min, max
Threshold crossing	shows in the cells (on the left side) a small bar with a color according to the threshold definition, that indicates a threshold crossing
Normal	shows the values in a normal table, so all times have a row
Days	shows the values in an aggregated way, so that each day gets its own column. Usefull to series with for example an hourly time step.
Weeks	shows the values in an aggregated way, so that each week gets its own column. Usefull to series with for example a daily time step.
Months	shows the values in an aggregated way, so that each month gets its own column. Usefull to series with for example daily time step.
Years	shows the values in an aggregated way, so that each year gets its own column. Usefull to series with for example monthly time step.
Show empty RVP series	shows/hides the series which are empty in the current viewperiod. Usefull while using shortcuts or thumbnails.

Show empty complete series	shows/hides the series which are completely empty. Usefull while using shortcuts or thumbnails.
Time order reversed	Shows the times in reversed order, so from new to old



Display templates are available for rapid assessment of data. The templates can be activated by clicking the above mentioned button. The left side of the display shows the available shortcuts in a pre-configured grouping.

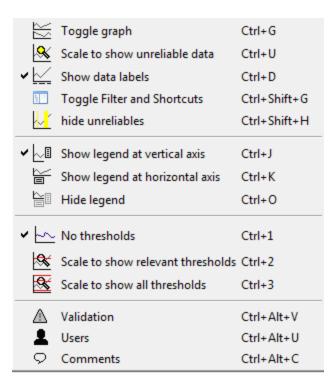
The data shown via the Shortcuts belong to the forecasts selected in the Forecasts panel of the FEWS Explorer. Please note that the current forecast is always displayed in the graphs.



Graph

This button can be used to hide or show the graph. If the table was not yet selected, it will show up.

Selecting the small arrow at the right of the icon shows the next menu:



Σ Descriptive statistics

This button will add a table to the display with descriptive statistical information. The statistics only appear if a column in the table is selected. Use the right mouse button to copy this table to the clipboard for pasting in Excel.

Statistical Functionality available (if configured):

- Mean
- Min (with date)
- Max (with date)
- Sum
- Standard deviation
- Percentiles (exceedance and non-exceedance)

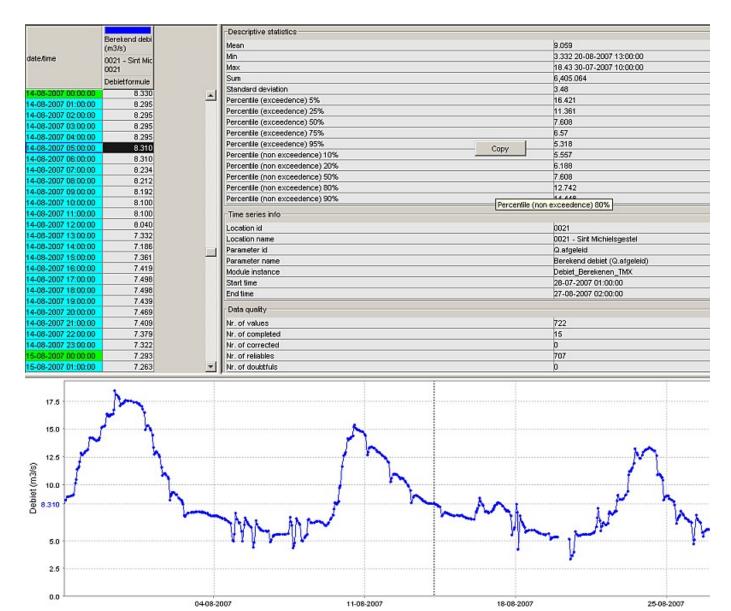
Time series information:

- Location id
- Location name
- Parameter id
- Parameter name
- Module instance
- Start time
- End time

Data quality information:

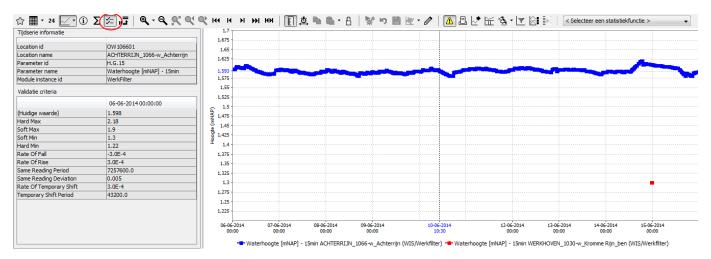
- Number of values
- Number of completed values
- Number of corrected values
- Number of doubtful values
- Number of missing values
- Number of reliable values
- Number of unreliable values

Time series info	
Location id	Please select a column header in the time series table to display descriptive information.
Location name	
Parameter id	
Parameter name	
Module instance	
Start time	
End time	



✓____ Validation Rules (hidable panel)

Since 2016.02 button is added to show (or hide) a panel that show the validation criteria for the selected time series on the selected time step



Opening this panel will automatically hide descriptive statistics panel when open



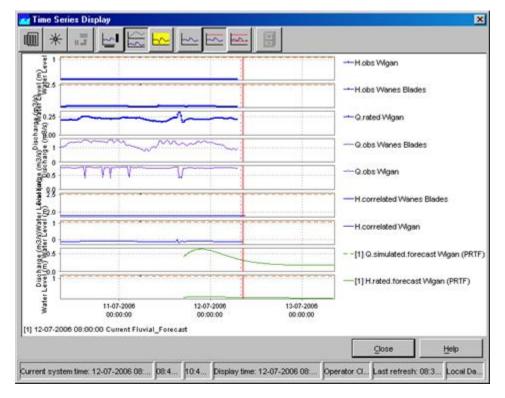
Rotate Splitter

With this button the splitter between table and graph can be placed in a horizontal position. Clicking the same button again returns the splitter to its default vertical position.



Rotate Legend

This button can be used to place the graph legend underneath the graph. Clicking the same button again returns the legend to its default position at the right hand side of the graph.





When multiple data series are selected for a single data type (parameter), the graphs will be placed in one subplot of the graph. This sometimes complicates the analysis of time series with different data ranges. By clicking the above mentioned button you can change the layout of the chart:

- Merged into a single graph
- Stacked in different subplots



Scale to show unreliable Data

This button can be used to focus on time intervals with unreliable data within the selected time series. Data is marked as unreliable, if values exceed hard limits.



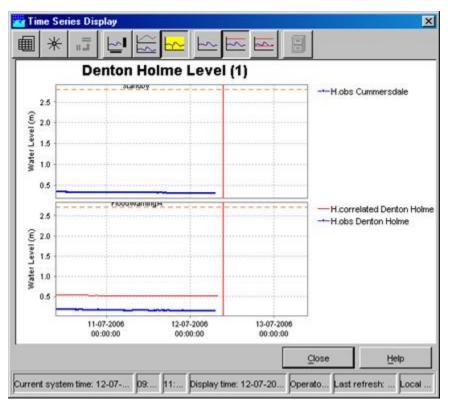
Show no Thresholds

By clicking this button all pre-configured thresholds which can also be shown in the graphs with the selected time series disappear.



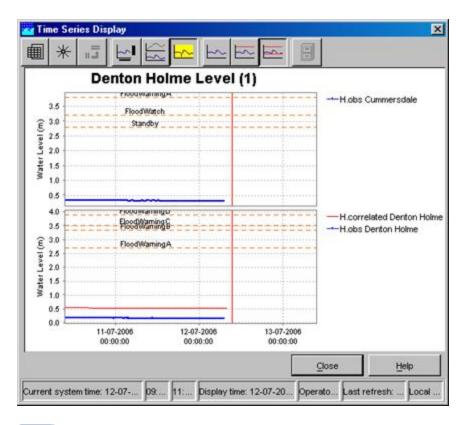
Scale to show relevant Thresholds

With this option the graph is scaled in such a way, that relevant thresholds (the closest threshold values) are displayed together with the selected time series in the graph.



Scale to show all Thresholds

This button can be used to show *all* pre-configured thresholds of a certain parameter at the selected location(s). This means that all thresholds levels (e.g. Standby, Flood Watch, Flood Warning and Severe Flood Warning) are displayed in the graph.





Show data labels

Clicking the 'Show data labels' will you to display quality flags for the data you are presenting. The information is shown at the bottom of the screen.

The following colour codes have been used:

- the upper line indicates the origin of the data
- · original data: no line is displayed
- automatically corrected data (original data flagged as unreliable and automatically interpolated): blue line
- automatically completed data (original data is missing and interpolated by system): magenta line
- manual corrected data (original data edited by a user): dark blue line
- manual completed data (filled up by a user): dark magenta line
- the middle line indicates the quality of the data
- reliable data: no line is displayed
- doubtful data: light yellow
- unreliable data: dark yellow
- · the lower line indicates where comments have been added to the data
- no comment: no line is displayed
- comment available: dark red

The lines are displayed under the data points. The colours correspond with the colouring used in the tables.

Functions < Select a statistical function > -

Statistical Functions

If switched on in the configuration. This functionality works independently from the descriptive statistics table.

The available statistical functions can be selected from the drop-down box in the button bar. The selected function will act on the timeseries that are currently selected by in the timeseries dialogue. The result of the statistical analysis will be shown in the timeseries dialogue window. Follow this link for a description of all available statistical functions.



Search and Select Forecast

Displays in FEWS by default only show current approved forecasts. Previous forecasts can be shown if you approve them in the Forecast Management Display, or by using this "search and select forecasts" option.

search period start time 09-25-20 Inr of recent forecasts 5 🚔	14, 12:00 🚔 🛅 end time	10-20-2014, 12:00 🚔 🛅	
include historical run persist selection			search
workflow	time	description	dispatch time
CJStrike Forecast Current	10-20-2014, 12:00	Preprocess MAP/MAT	01-12-2015, 16:26
CJStrike_Forecast Current	10-20-2014, 12:00		01-12-2015, 15:50
Bruneau_Forecast Current	10-20-2014, 12:00		01-12-2015, 15:49
Bruneau_Forecast	10-20-2014, 12:00		01-12-2015, 15:47
Bruneau_Forecast	10-20-2014, 12:00		01-12-2015, 15:46
BRON_Forecast Current	10-20-2014, 12:00	Bruneau at Rowland (BRON)	01-12-2015, 17:17
BRON_Forecast	10-20-2014, 12:00	Bruneau at Rowland (BRON)	01-12-2015, 17:10
BRON_Forecast	10-20-2014, 12:00	Bruneau at Rowland (BRON)	01-12-2015, 17:09
BRON_Forecast	10-20-2014, 12:00	Bruneau at Rowland (BRON)	01-12-2015, 15:53
BRON_Forecast	10-20-2014, 12:00	Bruneau at Rowland (BRON)	01-12-2015, 15:52
BRON_Forecast	10-20-2014, 12:00	Bruneau at Rowland (BRON)	01-12-2015, 15:53



Historical Events

With this button historical events can be activated (provided that they are pre-configured). They will be displayed in the same graph to enable a comparison with the actual timeseries. Further explanation is given below.

Display time

To change the view period in the graph, the field *Display time* in the Status Bar below the graph should be double clicked. The display time can now be changed with help of the menu. Press [**OK**] to accept the changed view period. The next time the chart is opened the original configured display time will be used again.

J _ J	Display Time Relative View Period	
	Relative Start Time -24 🗢	Hours 💌
19:43 Display time: 20-11-1992 14:00 Stand # BW = Validation Limit - Hard / Soft limit -	Display Time 14-04-2006 09:00:00 🗢	Reset
	Relative End Time 24 🗢	Hours 💌
	OK Cancel	Apply

Datum Toggle

The Datum Toggle at the lower right hand corner of the display allows levels to be displayed with reference to Local Datum or mAOD.

Close Help	Close Help]

Navigating in Graphs

Zooming in and out can be done with help of the scroll wheel of the mouse. Scrolling away from the user results in zooming in while scrolling towards the user results in zooming out.

Zooming is also possible by selecting a zoom range. Drag the mouse holding down the right button to form a rectangular area to zoom in to.

When clicking the right mouse button, the dropdown menu presented below appears. The menu gives you some additional options.

Save as	
Print	
Zoom In	
Zoom Out	
Auto Range	•
Allow Horizontal Axis Zo	om
Allow Vertical Axis Zoor	n
Copy to Clipboard	

Save As

You can save the graph to file with this option.

Print

This option allows you to print the graph.

Zoom in / out

You can select to zoom in and out along one or both axis with this option.

Allow Vertical / Horizontal Axis Zoom

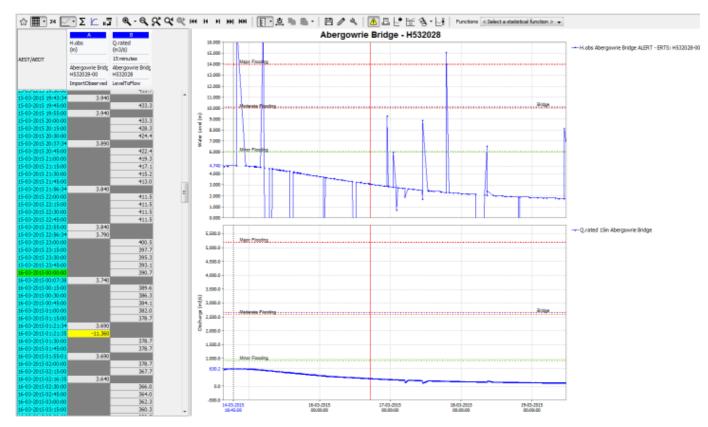
You can select to allow for zooming in and out along one of the axis with this option.

Auto Range

This feature allows you the set automatic scaling along one or both axis.

Data Editor

The Graph and Editor display has a table and an edit mode.



The most left column shows the date and time of the data. The period displayed spans the overall period defined in the filters for all time series.

The colours in the headings of the columns correspond with the line colour in the graph.

In the date/time column different colours are used to provide a logical meaning to certain important moments:

- Light blue: historical data, either observed or hindcast (data before T~0~)
- Dark blue: forecast data (data after T~0~)

For the data columns the background colour is used to indicate the quality of the data, identified by the data flags set of the Validation utility. Further, an indication of the editability of the data is given by the the background colour. The meaning of the background colours in the data fields is:

- White: reliable, editable
- Light yellow: doubtful
- Bright yellow: unreliable
- Gray: not editable

The font colour in the data fields indicates the data origin. Following colours are used:

- Black: original data
- Blue: corrected (original data flagged "Unreliable" and interpolated)
- Magenta: completed (original data missing and interpolated)

The edit mode can be enabled from the toolbar with the



Enable Edit mode button. Data (only those with a white background) can be edited by double clicking a field in the column. Editing may be done in the table directly. The result of an edit action is directly displayed in the corresponding graph. Manually corrected data will be saved to the database by disabling the Edit mode again from the toolbar. A pop-up will ask to save the edited data to the database. With [**OK**] the data is saved, [**NO**] the data is not saved and with [**Cancel**] changes will be undone.

Through manual editing of data, the source of the data changes from original to corrected. The font colour used for edited data is blue to indicate that it is completed data. The background colour remains white, as the data has not yet been validated. If however, after pressing [**Apply**] validation indicates that the value exceeds certain validation limits, the background colour will be set accordingly.

Editing data labels

Data labels can also be edited from the Table when the

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Enable Edit mode is active. Press the right mouse button when selecting one or multiple cells in the table and select the Mark option. It is now possible to change the data label of a value to reliable, doubtful, etc.. or remove the Manual Data Label Marks. A special data label is the Persistent Void or Persistent Unreliable data label, this label is used by the secondary validation module.

Fill Missing Data Shift Values in Time Apply Expression Apply Calibration Trend to value	Ctrl+T Ctrl+F Ctrl+M Ctrl+N	Reliable Suspect Void Persistent void Dried	Ctrl+R Ctrl+D Ctrl+U Ctrl+Shift+U Ctrl+Y
Add Comment Clear Comments Mark	Ctrl+Insert	Inundated Ice Remove Manual M	Ctrl+N Ctrl+I arks Shift+Delete
Show History	Ctrl+H		

Note: It is not possible to change the data label of a missing value.

Editing Data

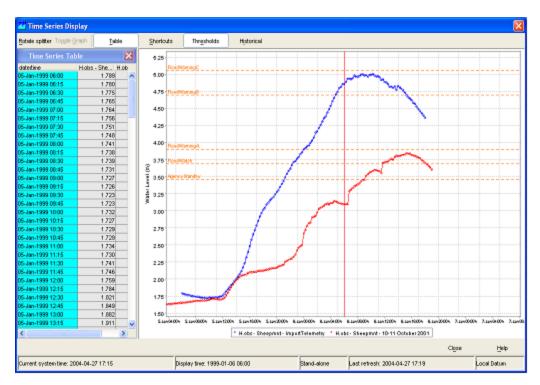
Historic Events

A special option in the Data Display is the option to add historic events to the chart window.

To show historic events for a specific location take following steps:

- · Select the location from the location list box in the FEWS explorer
- Select the parameter from the parameter list box
- Open the chart display by pressing the chart button
- Press the

button in the Chart Display and select one of the historical events from the list

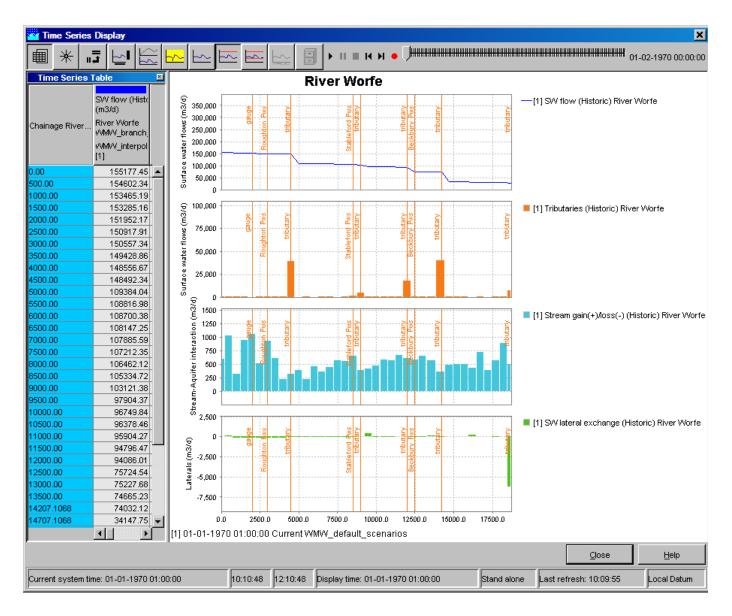


A new (red) line will be added to the chart. This event line can now be shifted forwards and backwards in time using the "+" and "-" keys on your keyboard. To activate this shift procedure press the [Historic Events] button in the Chart Display and select Shift Time.

A small pop-up window shows that you can now shift the historic event forwards and backwards by pressing the "+" or "-" keys on your keyboard. When the shift procedure is completed press [Done].

Longitudinal profile

Since release 2007.02, the display offers also the opportunity to show longitudinal profiles. In such graph, the parameter values (Y-axis) are plotted against the river chainage (X-axis). The graph can progress over time, eitehr step by step or animated, via the time control toolbar, described in the Spatial display. both the graph and table will change over time as they shown data along the profile.



Category plot

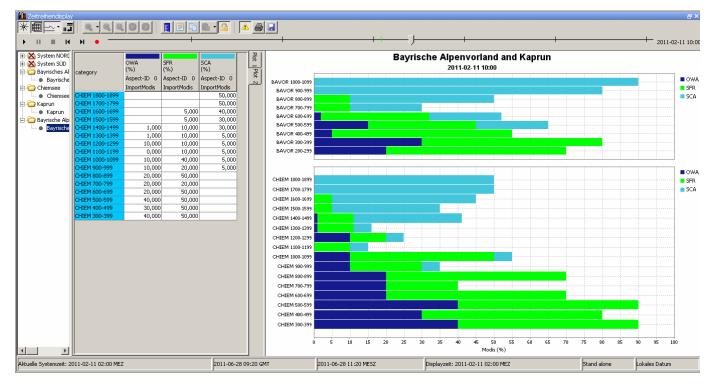
This graph type is available in DELFT-FEWS versions 2011.01 and higher.

In Category plot the parameter values (X-axis) are plotted against the locations (Y-axis).

The graph can progress over time, either step by step or animated, via the time control toolbar. Both the graph and table will change over time The detail description of the time toolbar can be found in the paragraph Spatial display.

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If there are more subplots in a plot, a separate table wil be created for each subplot.



Configuration

To show the data in the category plot, the 'category' plot viewer type should be specified in DisplayGroups.xml with element <plotViewerld>:

```
<plot id="MODISCategory1Plot">
    <subplot>
        <timeSeriesSet>
            <moduleInstanceId>ImportModis</moduleInstanceId>
            <valueType>scalar</valueType>
            <parameterId>OWA</parameterId>
            <qualifierId>Aspect-ID
                                     0</qualifierId>
            <locationSetId>ImportModis</locationSetId>
            <timeSeriesType>external historical</timeSeriesType>
            <timeStep unit="hour" multiplier="1"/>
            <relativeViewPeriod unit="hour" start="-24" end="4"/>
            <readWriteMode>read only</readWriteMode>
        </timeSeriesSet>
        <timeSeriesSet>
            <moduleInstanceId>ImportModis</moduleInstanceId>
            <valueType>scalar</valueType>
            <parameterId>SFR</parameterId>
            <qualifierId>Aspect-ID
                                     0</qualifierId>
            <locationSetId>ImportModis</locationSetId>
            <timeSeriesType>external historical</timeSeriesType>
            <timeStep unit="hour" multiplier="1"/>
            <relativeViewPeriod unit="hour" start="-24" end="4"/>
            <readWriteMode>read only</readWriteMode>
        </timeSeriesSet>
    </subplot>
    <plotViewerId>category</plotViewerId>
</plot>
```

Restrictions

The category plot can be customized in TimeSeriesDisplay.xml and in DisplayGroups.xml, similar to the other plot types. However not all configuration elements are applicable to the category plot. If these elements are still configured, they wil be ignored. The category plot is only applicable to scalar timeseries.

Editing Data

- Table edit functionality
 - Chart edit functionality
 - · Persistence of manual edited imported data

Table edit functionality

By pressing the right mouse button a list with edit actions appears on the screen. These includes the option to copy and fill in data. The display that pops up after clicking the right mouse button on an equidistant timeseries is shown below (figures 1, 1.1, 1.2):

Select All	Ctrl+A
Select Column	Ctrl+Space
Select Row	Shift+Space
Expand Selection	Ctrl+E
Filter by Tree	Ctrl+Alt+F
Filter by Expression	Ctrl+Alt+E
Save As	Ctrl+Shift+S
Edit Value	F2
X Cut	Ctrl+X
Copy	Ctrl+C
Copy Values Only	Ctrl+Shift+C
Copy Reliable Values Only	
Copy Reliable and Doubtful Values	Only
Copy Times Only	
Copy Headers Only	
🖺 Paste	Ctrl+V
Clear	Delete
Clear Doubtfuls	
Clear Unreliables	
Fill Missing Data	•
Shift Values in Time	Ctrl+T
Apply Expression	Ctrl+F
Apply Calibration	Ctrl+M
Trend to value	Ctrl+N
Add Comment	Ctrl+Insert
Clear Comments	
Mark	•
Show History	Ctrl+H

figure 1: Timeseries edit options

Block	Ctrl+B
Linear	Ctrl+L
Clipboard	Ctrl+Shift+V
Set Maximum Fill Gap	Ctrl+Shift+F

figure 1.1: Timeseries edit option - submenu Fill Missing Data

Reliable Ctrl+R	
Doubtful Ctrl+D	
Unreliable Ctrl+U	
Persistent unreliable Ctrl+Shift	t+U
Dried Ctrl+Y	
Inundated Ctrl+N	
Ice Ctrl+I	
Remove Manual Marks Shift+Del	ete

figure 1.2: Timeseries edit option - submenu Mark

The options have the following meaning...

[Select All]	Select all data displayed in the editor								
[Select Column]	Select all data in the column in which the cursor is placed								
[Select Row]	Select all data in the row in which the cursor is placed								
[Save As]	Save selected timeseries to file of format: PI xml, GIN xml, csv, Dutch csv, iBever csv, Hymos transfer DB 4.50 mdb or Hymos transfer DB 4.03 mdb								
[Save as special]	Filter selected timeseries by reliability and status and save to file of format: PI xml, GIN xml, csv, Dutch csv, iBever csv, Hymos transfer DB 4.50 mdb or Hymos transfer DB 4.03 mdb (see also Export Timeseries from FEWS Explorer). From 2015.01 [Save As Special] has been merged into [Save As].								
[Expand Selection]	Select all data in the row in which the cursor is placed								
Filter by Tree	Possibility to filter the rows in the table so that you only see the rows which meet the filter selection. You can select on comments, validation flags and user edits (if they are different)								
	PST/PDT A B FB_Sim MIDC []								
	12-02-2013 12:00 487.5 RT								
	12-02-2013 13:00 487.5 RT								
	12-02-2013 14:00 487.5 RT								
	12-02-2013 15:00 487.4RT								
	12-02- Filter Image: Constraint of the second								

Filter by Expression	Possibility to filter the rows in the table that you only see the times and values that meets an expression. With a pop-up message you can define the expression, where the time series are referred to as column A, B, C etc.						
	The expression can look like "A>0"where all times are are listed where the value is larger than 0. Or "A>B" where all times (rows) are listed where the value in column A is larger than the value in column B.						
	A B FB_Obs FB_Obs (FT) (FT)						
	PST/PDT Grand Coulee Chief Joseph CHJ						
	(Import) (Import) 06-04-2010 11:00 1274.4 0.0						
	Eilter hu Europeien						
	Filter by Expression						
	Apply Close Help						
[Edit Value]	The cell on which the cursor is place can be edited						
[Cut]	Move the selected data (including the date / time field) to the clipboard						
[Copy]	Copy the selected data (included the date / time field) to the clipboard						
[Copy Values Only]	Copy the data values in the selection to the clipboard						
[Copy Reliable Values Only]	Copy the data values in the selection classified as reliable to the clipboard						
[Copy Reliable and Doubtful Values Only]	Copy the data values in the selection classified as reliable and doubtful to the clipboard						
[Copy Times Only]	Copy the selected date / time in the selection to clipboard						
[Paste]	Paste the data from the clipboard into the selected fields						
[Clear]	Delete the data values in the selection						
[Clear Doubtfuls]	Delete the data values in the selection classified as doubtful						
[Clear Unreliables]	Delete the data values in the selection classified as unreliable						
[Block Fill Missing Data]	Fill the selected fields with the last value available value in the same column						
[Lineair Fill Missing Data]	Apply lineair interpolation when filling in the selected fields						
[Fill Missing Data from Clipboard]	Fill in the selected fields with data copied to the clipboard						
[Set maximum fill gap]	Set the maximum gap size to be interpolated						
[Shift Values in Time]	Moves the selected values in time						

[Apply Transformation]	Change the selected values using a regular expression
[Apply Calibration]	Undo trend deviance of the selected values using a calibration timeseries
[Trend to value]	Trends a value to a given target level

If the selected timeseries is non-equidistant extra options will be shown(figure 2):

Save as special	Ctrl+P
Edit Value	F2
Edit Time	Shift+F2
⊒⊷⊂ Insert Time	Insert
➡+ Remove Time	Ctrl+Backspace
👗 Cut	Ctrl+X

figure 2: Extra edit options for non-equidistant seriesThe extra options are:

[Edit Time]	Edit an existing date/time for which a value already has been entered	
[Insert Time]	Insert a date/time for which a value can be entered	
[Remove Time]	Remove a date/time. NOTE You can <i>only</i> remove a date/time if you have just inserted one using the Insert Time option and if you have not yet applied the change. Once stored in the database the time <i>cannot</i> be removed. If you need to remove values you can set it to missing using the clear option. The time will remain.	

Chart edit functionality

It is possible to edit timeseries directly in the chart (when in edit mode). To do this a user must first select the timeseries the user wants to edit. Selecting a timeseries can be done by:

- clicking the table column header
- clicking the chart legend item.

Once a timeseries is selected the font of its column header and legend will become **bold** (see figure 3). Now the user can click in the chart area using the left mouse button. To save the edits the user must again select the currently selected series to deselect it or must select an other series for editing.

Neerslaghoe Neerslaghoeve Neersla	aghoeve
(mm) (mm) (mm)	_
0306-AME-0 0306-AME-02 0306-A	AME-03
r0000518 r0000519 r00023	36
RH_RbgDisA RH_RbgDisAgc RH_Rb	igDisAgç

Neerslaghoeveelheid 0306-AME-01 Neerslaghoeveelheid 0306-AME-02 Neerslaghoeveelheid 0306-AME-03

figure 3: Selected table header and chart legend

Persistence of manual edited imported data

When existing imported data is edited a re-import of the data will not rollback the edit. This is not the case for completions and for data that is the result of transformation.

Apply Calibration

With this option a trend deviance can be undone using a calibration timeseries. The series to calibrate and the series to calibrate by can be choosen in the popup, see figure 1.1

date/time	(m) RGM Amerong RGM853	B Waterhoogte ((m) RGM 't Goy RGM823 (bron: HDSR/S	(m) RGM Amerong RGM853	D Waterstandsal (m) RGM 't Goy RGM823 WerkFilter			
28-12-2010 01:00:00							
29-12-2010 01:00:00							
30-12-2010 01:00:00							
31-12-2010 01:00:00							
01-01-2011 01:00:00	20,00						
02-01-2011 01:00:00	17,00						
03-01-2011 01:00:00	23,00						
04-01-2011 01:00:00	15,00		[😋 Calibrate m	easurements	×	
04-01-2011 01:10:00	10.00		15,				
05-01-2011 01:00:00	19,00		:	Series to calibrat	e	A 🔻	
06-01-2011 01:00:00	16,00						
07-01-2011 01:00:00	18,00		\$	Series to calibrat	e by	c 🚽	
08-01-2011 01:00:00	22,00						
09-01-2011 01:00:00	34,00		·	Apply to all times	;		
10-01-2011 01:00:00	28,00		r		-	l	
11-01-2011 01:00:00	31,00			OK	Cancel	Help	
12-01-2011 01:00:00	24,00		L		J		
13-01-2011 01:00:00	17,00						
13-01-2011 01:11:00			23,00				
14-01-2011 01:00:00	30,00						
15-01-2011 01:00:00	16,00						
16-01-2011 01:00:00	25,00						
17-01-2011 01:00:00	11,00						
18-01-2011 01:00:00	19,00						
19-01-2011 01:00:00	8,00						
19-01-2011 01:12:00			21,00				
20-01-2011 01:00:00	15,00						
21-01-2011 01:00:00	26,00						
22-01-2011 01:00:00	18,00						

Figure 1.1: Calibrate timeseries A by timeseries C

If the user didn't initially selected any timeseries in the table, all columns ID's are available in the dropdows boxes, otherwise only the selected column ID's are available.

Column ID's can be found in the coloured area of the column headers . Choose option "Apply to all times" if the modification should be done for the whole period visible in the table, without selecting all rows in the table. Note that there is always one time selected in the the table, it is the first time by default.

The timeseries to calibrate must be an equidistant timeseries. The timeseries to calibrate by can be equidistant or nonequidistant timeseries.

Figure 1.2 shows the results of the amending of the timeseries A using calibration timeseries C.

	A	В	с	D
	Waterhoogte [(m)	Waterhoogte [(m)	Waterstandsal (m)	
date/time	RGM Amerong RGM853	RGM 't Goy RGM823	RGM Amerong RGM853	RGM 't Goy RGM823
	(bron: HDSR/S	(bron: HDSR/S	WerkFilter	WerkFilter
28-12-2010 01:00:00				
29-12-2010 01:00:00				
30-12-2010 01:00:00				
31-12-2010 01:00:00				
01-01-2011 01:00:00	20,00			
02-01-2011 01:00:00	17,00			
03-01-2011 01:00:00	23,00			
04-01-2011 01:00:00	15,00			
04-01-2011 01:10:00			15,00	
05-01-2011 01:00:00	19,67			
06-01-2011 01:00:00	17,33			
07-01-2011 01:00:00	20,00			
08-01-2011 01:00:00	24,67			
09-01-2011 01:00:00	37,33			
10-01-2011 01:00:00	32,00			
11-01-2011 01:00:00	35,67			
12-01-2011 01:00:00	29,33			
13-01-2011 01:00:00	23,00			
13-01-2011 01:11:00			23,00	
14-01-2011 01:00:00	32,17			
15-01-2011 01:00:00	20,33			
16-01-2011 01:00:00	31,50			
17-01-2011 01:00:00	19,67			
18-01-2011 01:00:00	29,83			
19-01-2011 01:00:00	21,00			
19-01-2011 01:12:00			21,00	
20-01-2011 01:00:00	15,00			
21-01-2011 01:00:00	26,00			
22-01-2011 01:00:00	18,00			
23-01-2011 01:00:00	21.00			

Figure 1.2: Result of calibration of timeseries A by timeseries C

By selecting a certain period the calibration will only be performed for this period, see figures 2.1 and 2.2

31-12-2010 01:00:00							
01-01-2011 01:00:00	20,00						
02-01-2011 01:00:00	17,00						
03-01-2011 01:00:00	23,00						
04-01-2011 01:00:00	15,00						
04-01-2011 01:10:00		15,00					
05-01-2011 01:00:00	19,00						
06-01-2011 01:00:00	16,00						
07-01-2011 01:00:00	18,00						
08-01-2011 01:00:00	22,00		🚾 Calibrate mea	asurements		×	
09-01-2011 01:00:00	34,00						
10-01-2011 01:00:00	28,00		Coving to collingto				
11-01-2011 01:00:00	31,00		Series to calibrate		A		
12-01-2011 01:00:00	24,00		Series to calibrate	Бо	С	-	L
13-01-2011 01:00:00	17,00			0 %	10	<u> </u>	
13-01-2011 01:11:00		23,00	Apply to all times				
14-01-2011 01:00:00	30,00						
15-01-2011 01:00:00	16,00		ок	Cancel		Help	
16-01-2011 01:00:00	25,00					(1) sign	L
17-01-2011 01:00:00	11,00						
18-01-2011 01:00:00	19,00						
19-01-2011 01:00:00	8,00						
19-01-2011 01:12:00		21,00					
20-01-2011 01:00:00	15,00						
21-01-2011 01:00:00	26,00						
22-01-2011 01:00:00	18,00						
23-01-2011 01:00:00	21,00						
24.01.2011.01.00.00							

Figure 2.1: Calibrate values in selected period

31-12-2010 01:00:00		
01-01-2011 01:00:00	20,00	
02-01-2011 01:00:00	17,00	
03-01-2011 01:00:00	23,00	
04-01-2011 01:00:00	15,00	
04-01-2011 01:10:00		15,00
05-01-2011 01:00:00	19,00	
06-01-2011 01:00:00	16,00	
07-01-2011 01:00:00	18,00	
08-01-2011 01:00:00	22,00	
09-01-2011 01:00:00	34,00	
10-01-2011 01:00:00	28,00	
11-01-2011 01:00:00	31,00	
12-01-2011 01:00:00	24,00	
13-01-2011 01:00:00	17,00	
13-01-2011 01:11:00		23,00
14-01-2011 01:00:00	32,17	
15-01-2011 01:00:00	20,33	
16-01-2011 01:00:00	31,50	
17-01-2011 01:00:00	19,67	
18-01-2011 01:00:00	29,83	
19-01-2011 01:00:00	21,00	
19-01-2011 01:12:00		21,00
20-01-2011 01:00:00	15,00	
21-01-2011 01:00:00	26,00	
22-01-2011 01:00:00	18,00	
23-01-2011 01:00:00	21,00	
24.01.2011.01.00.00	İ	

Figure 2.2: Result of calibration in selected period

Apply Transformation

With this option s selection of values can be transformed using a regular expression (see figure 1).

02-02-2010 15:25:00	0.033	0.064	0.033		
02-02-2010 15:30:00	0.021	0.064	0.020		
02-02-2010 15:35:00	0.033	0.064	0.035		
02-02-2010 15:40:00	0.032	0.064	0.033		
02-02-2010 15:45:00	0.036	0.064	0.038		
02-02-2010 15:50:00	0.032	0.064	0.035		
02-02-2010 15:55:00	0.036	0.063	0.035		
02-02-2010 16:00:00	0.043	0.063	0.043		
02-02-2010 16:05:00 A	02-02-2010 16:05:00 Apply Transformation				
02-02-2010 16:10:00					
02-02-2010 16:15:00					
02-02-2010 16:20:00	— o-hh-h-				
02-02-2010 16:25:00	Only apply to r	nissing data			
02-02-2010 16:30:00	ОК	Cancel	Help		
02-02-2010 16:35:00					
02-02-2010 16:40:00	0.081	0.063	0.079		

figure 1: Apply Transformation window

By selecting the 'Only apply to missing data' checkbox, the transformation will only be performed for the selected fields that do not already contain a value.

A regular expression can be composed using the following elements:

VARIABLES

The variables that can be used to compose an expression are the alphabetical indexes of columns. These can be found in the coloured area of the column headers (see figure 2) and are case sensitive.

1	A	В	C
	Neerslaghoe	Neerslaghoeve	Neerslaghoeve
	(mm)	(mm)	(mm)
	0306-AME-0	0306-AME-02	0306-AME-03

figure 2: Alphabetical column indices

OPERATORS

operator	description	example
+	add	A+3
-	subtract	B-C
*	multiply	A*0.5
/	divide	B/A
۸	power	A^2

FUNCTIONS

function	description	example
sum	sum of values	sum(A,B,)
abs	absolute value	abs(A)
pow	power function	pow(A,2)
sqrt	square root	sqrt(B)
min	minimum of list	min(A,B,C)
max	maximum of list	max(A,B,C)

average	average of list	average(A,B,C)
ехр	exponential (e^x)	exp(A)
In	natural logarithm	In(A)
log	logarithm base 10	log(A)
atanh	inverse hyperbolic tangent	atanh(A)
acosh	inverse hyperbolic cosine	acosh(A)
asinh	inverse hyperbolic sine	asinh(A)
tanh	hyperbolic tangent	tanh(A)
cosh	hyperbolic cosine	cosh(A)
sinh	hyperbolic sine	sinh(A)
atan	arc tangent	atan(A)
acos	arc cosine	acos(A)
asin	arc sine	asine(A)
tan	tangent	tan(A)
cos	cosine	cos(A)
sin	sine	sin(A)
if	logical expression	if(evaluation,expression1,expression2)
isMissing	check for NaN	isMissing(A)

Shift Values in Time

With this option a selection of values can be moved by a given time period, both forward and backward (see figure 1).

01-02-2010 09:50:00	0.000	
01-02-2010 09:55:00	0.000	
01-02-2010 10:00:00	0.000	Shift Values in Time
01-02-2010 10:05:00	0.002	
01-02-2010 10:10:00	0.002	Time shift: minute 💌 🛛 -10 🚍
01-02-2010 10:15:00	0.002	
01-02-2010 10:20:00	0.002	OK Cancel Help
01-02-2010 10:25:00	0.002	OK Cancel Help
01-02-2010 10:30:00	0.002	
01-02-2010 10:35:00	0.002	

figure 1: Shift Values in Time window (back 10 mins)

This operation performs the following actions on the selected timeseries:

Equidistant timeseries

- copy the selected values to clipboard
- clear all values in the period that results from merging the selected period with the shift period
- move the selected values in time and paste them back in the table

Non-equidistant timeseries

- copy the selected values to clipboard
- delete all values in the period that results from merging the selected period with the shift period
- move the selected values in time and insert them back in the table

Trend to value

With this option a column selection can be filled by extending the first value of the selection using a trending function. A target level can be provided to indicate either a maximum or minimum for trending output. The coefficient value will define how fast the trending function will converge to the target value. Trending can be applied to multiple selected columns at the same time.

In order for trending function to succeed the first value of a selected column may not be empty.

• Select one or more columns and right mouse click for edit options to appear.

	A P.obs (mm)	B P.obs (mm)
GMT+10	Mongans Bri G402203A	Osbornes Fla G402204A
	ImportMeas	ImportMeas
Wed 17-04-2013 20:00:00		
Wed 17-04-2013 21:00:00		
Wed 17-04-2013 22:00:00	230.0	200.0
Wed 17-04-2013 23:00:00	230.0	200.0
Thu 18-04-2013 00:00:00		
Thu 18-04-2013 01:00:00		
Thu 18-04-2013 02:00:00		
Thu 18-04-2013 03:00:00		
Thu 18-04-2013 04:00:00		
Thu 18-04-2013 05:00:00		
Thu 18-04-2013 06:00:00		
Thu 18-04-2013 07:00:00		
Thu 18-04-2013 08:00:00		
Thu 18-04-2013 09:00:00		
Thu 18-04-2013 10:00:00		
Thu 18-04-2013 11:00:00		
Thu 18-04-2013 12:00:00		
Thu 18-04-2013 13:00:00		

• Select the option 'Trend to value' to make the trending dialog appear.

	GIOLEOIII	-		4
35	ImportMea		Select All	Ctrl+A
			Select Column	Ctrl+Space
.0	200.		Select Row	Shift+Space
.0	200.		Expand Selection	Ctrl+E
			Save As	Ctrl+Shift+S
			Save as special	Ctrl+P
			Edit Value	F2
		*	Cut	Ctrl+X
		Ē	Сору	Ctrl+C
			Copy Values Only	Ctrl+Shift+C
			Copy Reliable Values Only	
			Copy Reliable and Doubtful Values Only	,
_			Copy Times Only	
			Copy Headers Only	
		æ	Paste	Ctrl+V
_			Clear	Delete
1			Clear Doubtfuls	
_	🗾 Data Edit		Clear Unreliables	
ste	mStatus finish		Fill Missing Data	•
	mStatus start		Shift Values in Time	Ctrl+T
	essages finish∈ essages starte		Apply Transformation	Ctrl+F
rie	s finished.		Apply Calibration	Ctrl+M
	s started :mStatus finish		Trend to value	Ctrl+N
ste	mStatus start			

Enter the 'Coefficient' and optionally 'Target'. If the target is omitted it will default to 0 when trending down or infinity when trending up.

Trend to value 🛛 🗙		
Coefficient:	0.8	
Target:	100	
ок	Cancel	Help

• Press 'OK' for the calculations to start. This will fill the rest of the selection. Press 'Apply' to save changes.

Cancel Apply		
GMT+10	A P.obs (mm) Mongans Bridg	B P.obs (mm) Osbornes Fla
	G402203A	G402204A
	ImportMeasure	ImportMeas
Wed 17-04-2013 20:00:00		
Wed 17-04-2013 21:00:00		
Wed 17-04-2013 22:00:00	230.0	200.0
Wed 17-04-2013 23:00:00	230.0	200.0
Thu 18-04-2013 00:00:00	184.0	160.0
Thu 18-04-2013 01:00:00	147.2	128.0
Thu 18-04-2013 02:00:00	117.8	102.4
Thu 18-04-2013 03:00:00	100.0	100.0
Thu 18-04-2013 04:00:00	100.0	100.0
Thu 18-04-2013 05:00:00	100.0	100.0
Thu 18-04-2013 06:00:00	100.0	100.0
Thu 18-04-2013 07:00:00	100.0	100.0
Thu 18-04-2013 08:00:00	100.0	100.0
Thu 18-04-2013 09:00:00	100.0	100.0
Thu 18-04-2013 10:00:00	100.0	100.0
Thu 18-04-2013 11:00:00	100.0	100.0
Thu 18-04-2013 12:00:00	100.0	100.0
Thu 18-04-2013 13:00:00	100.0	100.0
Thu 18-04-2013 14:00:00	100.0	100.0
Thu 18-04-2013 15:00:00	100.0	100.0
Thu 18-04-2013 16:00:00	100.0	100.0
Thu 18-04-2013 17:00:00		

Changing display properties

In the Time series dialog window it is possible to change the look and feel of the displayed timeseries. By pressing the right mouse button, in the chart area of the display, a list will appear containing the option **Properties...** (see figure 1).

Properties
Save as
Print
Zoom In 🔶
Zoom Out
Auto Range 🔹 🕨
Allow Horizontal Axis Zoom
Allow Vertical Axis Zoom
Copy to Clipboard

figure 1: Right mouse pop up menu of the chart display

Selecting the Properties... menu item will make the Chart Properties editor appear (see figure 2).

Chart Properties	×
Series Title Plot Other	
Neerslaghoeveelheid 0306-ELS-02	-
Lines Areas	
Line	
T Visible	
Style:	-
Color: Select	
Size:	•
Marker	
Visible	
Style:	
Size:	
OK Cancel	

art Properties			
Series Title Plot	Other		
Series:			
Neerslaghoeveelheid	1 0306-ELS-02		-
Lines Areas			
Border			
Visible			
Style:	•		• •
Color:			Select
Size:	•		••
Area			
Visible			
		F	
Color:			Select
			,
	ОК	Cancel	

figure 2: Chart Properties editor; left - Lines tab, right - Areas tab

Using the **Series** tab is possible to alter the display properties of the timeseries arrays. To change the properties of an array select the series descriptor in the drop down box at the top of the panel. Then select either the **Lines** tab or the **Area** tab depending if the selected series is line or a bar.

Lines tab

The lines tab allows the user to change the properties of lines and line markers.

- Line visible: toggles visibility of line
- Line style: change the line style
- Line color: change the line color
- Line size: change the line width
- Marker visible: toggles visibility of line markers
- Marker style: change the marker shape
- Marker size: change size of marker

Areas tab

The areas tab allows the user to change the properties of areas such as bars and markers

- Border visible: toggles visibility of area border
- Border color: change the border color
- Border size: change the border width
- Area visible: toggle the visibility of the fill color
- Area color: change the area fill color

Note! These changes are not persistent and only remain in affect until the next update of the chart. This does give the user enough time to save the altered display as an image.

Interactively modifying display colours

Modifying display colours from within the client.

Users can interactively modify the colours used in their OC for a numbers of displays. This will not affect the configuration, but changes will persist between different sessions for that operator client (settings are saved in a user_settings file in the root directory).

Map display

Colours for map layers can be changed from the Layers pop-up, which holds the Map legend. Double clicking on an item there allows the user to modify the fill and line colour of the this layer. Color changes will impact the map as shown in the Grid display as well, as long as the layers in there have the same ID. The colour chooser will always open up with the default, configured colour to enable a reset.

Grid display

Colours for the classification of data in the grid display can be changed by double clicking on the colour-box in the legend. After modifications are made, the (right click) context menu will show an option 'Discard user-defined classification colours' to revert to the original, configured colour scheme.

Timeseries display

Timeseries: Colours for timeseries can be changed by double clicking on the legend for a timeseries. The colour chooser will always open up with the default, configured colour to enable a reset.

Thresholds/Time markers: These can be changed by double-clicking on these lines in the plot itself. The colour chooser will always open up with the default, configured colour to enable a reset.

The F12 debug menu (Timeseries Display)

In the FEWS Explorer and the TimeSeries Display, a number of debug options are available under the <F12>. Although useful for debugging and testing, support is not provided for these features. Currently, these are the options available in 2015.02.

9 descriptions visible 4 verbose location tool tips B clear time series memory caches C run workflow test D restart E release plugin bin dirs F compact local datastore G rolling barrel local data store H delete local data store I acknowledge all J open database viewer K open workflow navigator L open tabular config files display M start embedded vjdbc server N terminate local runs Shift+F5 O rollback modifier changes P set water coach wall clock time Q select locations by attributes R database S screen recording T convert V export W misc				-
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				encrypt password

Statistical functions

The F12 debug menu (Timeseries Display)

04 Data Display and Data Editor

Filtering data

Statistical functions

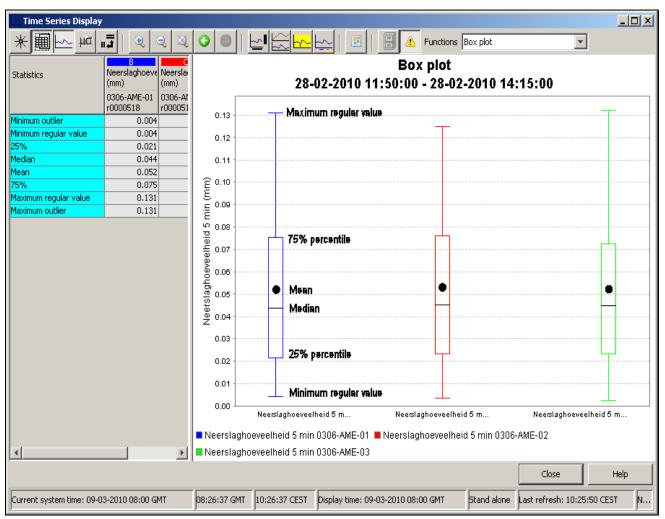
- Statistical functions

 - Box plotCalendar aggregation

- Moving average
- Central moving average
- Differences
- Display lows below value & Display peaks above value
- Display lows below value & Display peaks above value (per year and season)
 - Normalize duration
 - Split peaks
- Double Mass curve
- Duration curve
- Elevation
- Ensemble Percentile Exceedence
- Frequency distribution
- Gaussian curve
- Cumulative
- Accumulation Per Interval
- Historical Analysis
- Normalized Flow
- Principal Component Analysis
- Scatter Plot
- Historical Scatter Plot (per year and season)
- Show statistics for specific timeseries
- Hide original time series

Box plot

The box plot function will calculate a set of statistical values for each of the selected timeseries and displays these values in the chart as a Box and Whisker Plot.



In the table the following list of statical values is shown for each of the timeseries:

Statistical variables

Minimum outlier: minimum outlier value for selection.

Minimum regular value: minimum value for selection that is not defined as an outlier. Also known as the Whiskers 25%: 25th percentile

Median: 50th percentile

Mean: average value for selection

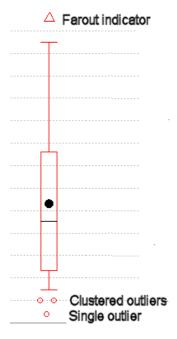
75%: 75th percentile *Maximum regular value*: maximum value for selection that is not defined as an outlier. Also known as the Whiskers *Maximum regular value*: maximum value for selection that is not defined as an outlier. Also known as the Whiskers *Maximum outlier*: maximum outlier value for selection.

The chart shows the same values as the table, hover the chart also can include some extra values that are not shown in the table. These are the outliers and the far-out indicators.

Far-out indicator. indicates that there are values that lie outside the plotted range of the axis. *Single outlier:* a single outlier value.

Clustered outlier. multiple outliers that are located too close together to be plotted separately.

Outliers: cases where the values are between 1.5 and 3 box-lengths from the 75th percentile or 25th percentile. **Farout values**: cases where the values are more than 3 box-lengths from the 75th percentile or 25th percentile.

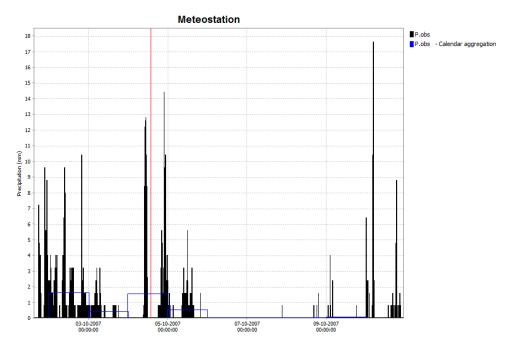


Config example:

```
<statisticalFunctions>
<statisticalFunction function="boxPlot">
<timeStep id="daily"/>
<timeStep id="weekly"/>
<timeStep id="monthly"/>
<timeStep id="seasons"/>
</statisticalFunction>
</statisticalFunction>
```

Calendar aggregation

Aggregation by calendar day (00.00h-24.00h)



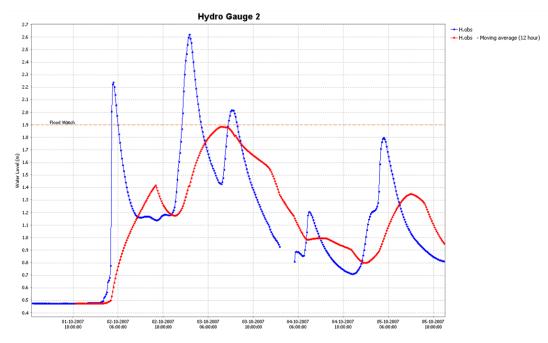
```
Config example:
```

```
<statisticalFunctions>
<statisticalFunction function="calendarAggregation">
        <movingAccumulationTimeSpan unit="week" multiplier="1"/>
        <movingAccumulationTimeSpan unit="week" multiplier="2"/>
        <movingAccumulationTimeSpan unit="week" multiplier="4"/>
        <movingAccumulationTimeSpan unit="week" multiplier="12"/>
        <movingAccumulationTimeSpan unit="week" multiplier="12"/>
        <movingAccumulationTimeSpan unit="day" multiplier="365"/>
        </statisticalFunction>
```

In addition to the calender aggregation, there is also the option for accumulationAggregation and relativeAggregation. There is also a very similar function called accumulationInterval where the accumulation is displayed at every timestep (for configuration see example above).

Moving average

Moving average where the value is stamped at the end of each averaging period.

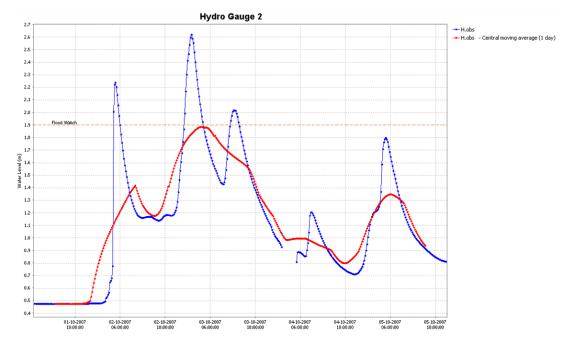


Config example:

<statisticalFunctions>
 <statisticalFunction function="movingAverage" ignoreMissings="true">
 <movingAccumulationTimeSpan unit="hour" multiplier="1"/>
 <movingAccumulationTimeSpan unit="hour" multiplier="3"/>
 <movingAccumulationTimeSpan unit="hour" multiplier="6"/>
 <movingAccumulationTimeSpan unit="hour" multiplier="12"/>
 <movingAccumulationTimeSpan unit="hour" multiplier="12"/></statisticalFunction>

Central moving average

Moving average where the value is stamped in the middle of each averaging period.



Config example:

```
<statisticalFunctions>
  <statisticalFunction function="centralMovingAverage"
ignoreMissings="true">
        <movingAccumulationTimeSpan unit="hour" multiplier="1"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="3"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="6"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="12"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="12"/>
    </statisticalFunction>
```

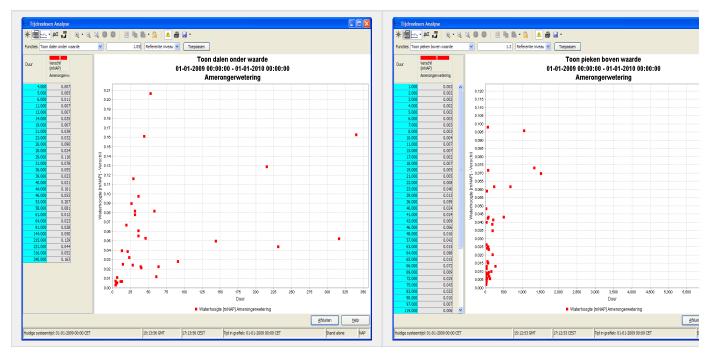
Differences

Displays the difference between two selected series

Config example:

<statisticalFunction function="differences"/>

Display lows below value & Display peaks above value



Shows all peak heights or dip depths and duration above or below a reference level. This level is set by default but can be altered in the toolbar. After adjusting, press the apply button to recalculate the peaks or dips. . From now on we will only mention the peaks and how values are above a level, but this functionality is symmetrical for the valleys and values being below a level. The default value for the reference level is set by determining the 'low' areas according to the maximum available value of the input time series array.

After setting the reference level, every continues series of values above that level is considered a peak and will be depicted as a dot in the XY plot. The X axis shows what the duration of this peak is, with this value corresponding to the amount of time entries that make up that peak. The Y axis shows the average height of the peak above the reference level. The parameter used on the Y axis is equal to that of the selected time series.

When hovering above a point in the XY plot, a tooltip will appear. Here is an overview of the tooptip format with some of the elements being optional:

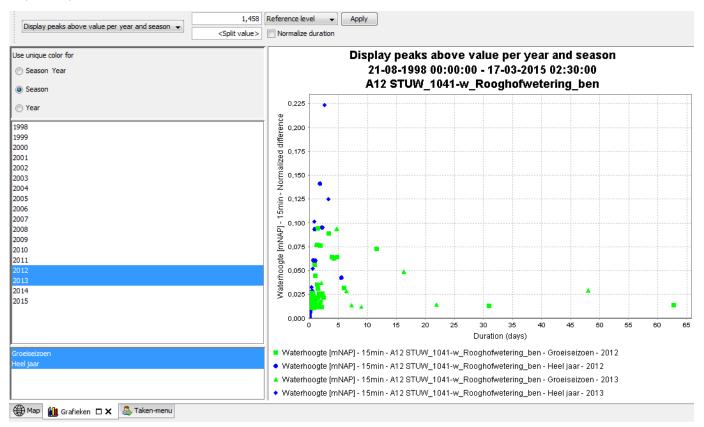
- |Parameter Id| |Location Id| (|Peak duration|, |Average peak height|), Max Difference = |Max peak height|, Percentile Difference = |Percentile peak height| at time |Peak time|
- Parameter Id: Paramter Id from selected timeseries
- Location Id: Location Id from selected timeserires
- Peak duration: Number of time entries in peak
- Average peak height: Average of all differences between reference level and the time entries value
- Max peak height (optional): Maximum of all differences between reference level and the time entries value
- Percentile peak height (optional): Relation between the average and max peak height
- Peak time: Time of the first time entry in the peak

Config example: <statisticalFunction function="showLowsBelow"/>
 <statisticalFunction function="showPeaksAbove"/>

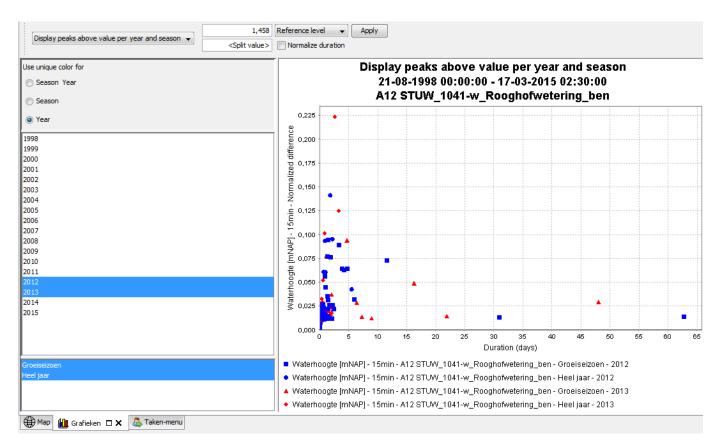
Display lows below value & Display peaks above value (per year and season)

(Since 2016.02) The same as the function above but then with the extension of selecting multiple different years and seasons, plus a choice of how the different seasons and years should be uniquely colored.

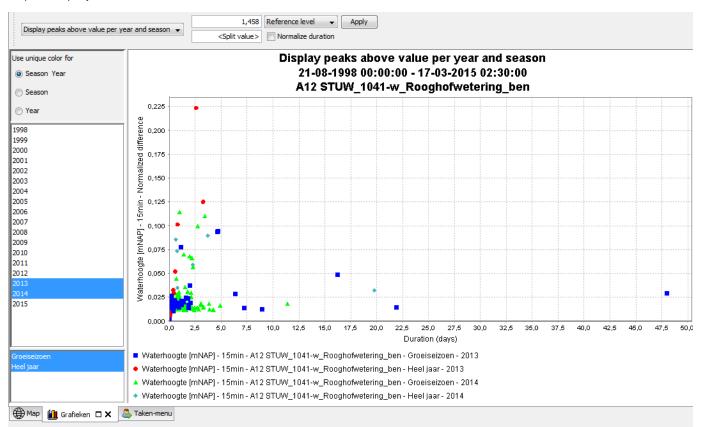
Unique color per season



Unique color per year:



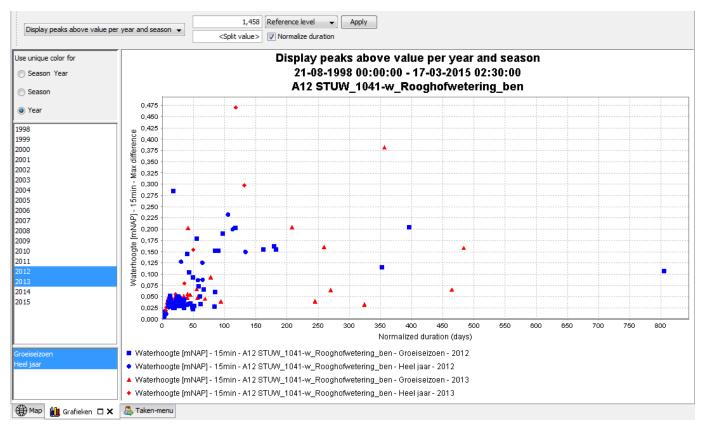
Unique color per year and season:



```
<statisticalFunction function="historicalShowLowsBelow"/>
<statisticalFunction function="historicalShowPeaksAbove"/>
```

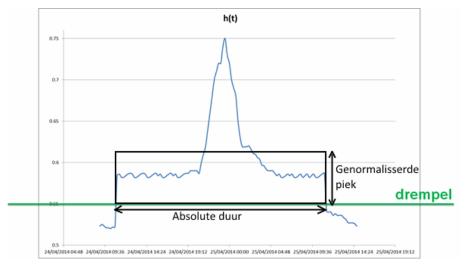
```
Normalize duration
```

(Since 2016.02) for the peaks above/below functions a checkbox is added to normalize over duration. This changes The y-axis from Normalized difference to Max difference and the X-axis from (total) duration the Normalized duration.

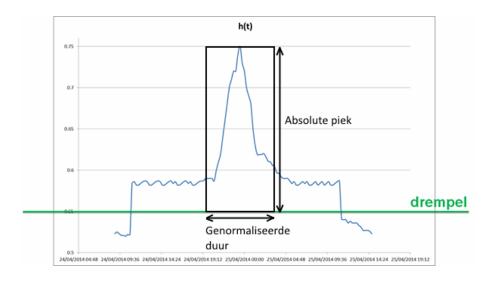


The differences between normalization can best be shown in a pictures

Normalized difference:



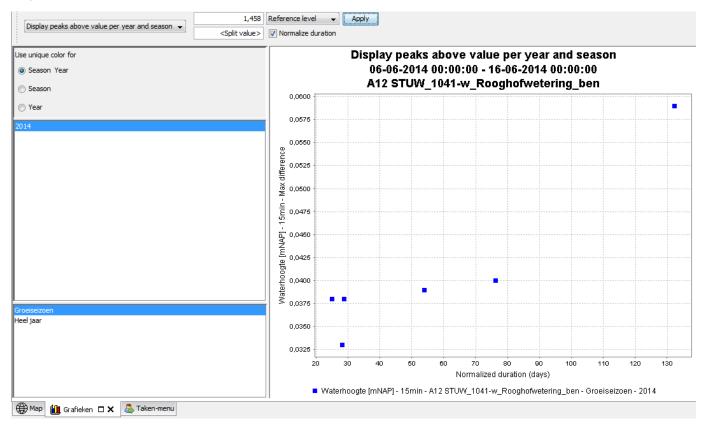
Normalized duration:



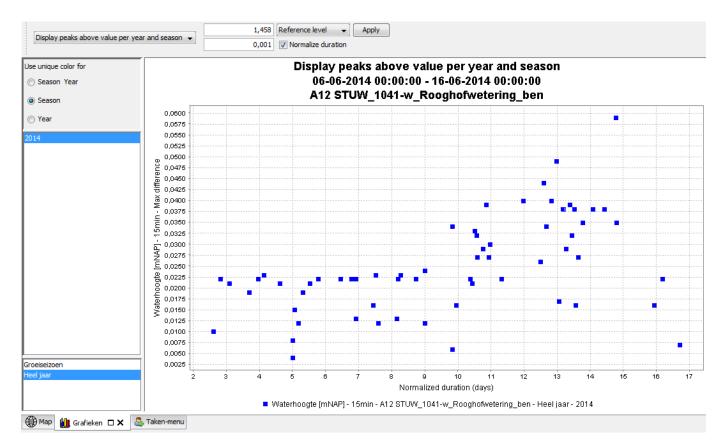
Split peaks

(Since 2016.02) for the peaks above/below functions a possibility is added to split the peaks when they have multiple local maxima.

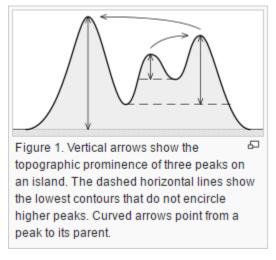
No split:



Split when local maxima have a low between them with a value difference of at least 0,001. As can be seen this results in a lot more separate peaks.



For the value difference the measure Prominence is used, which is an official measure for determining separate peaks.

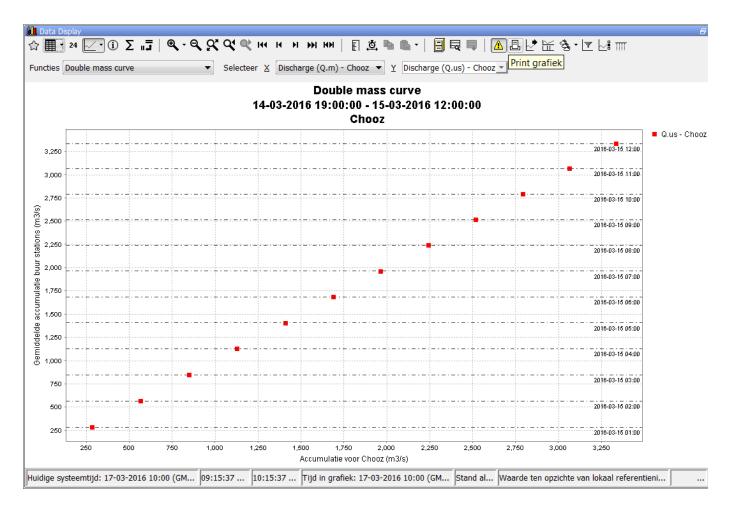


Source: https://en.wikipedia.org/wiki/Topographic_prominence

Double Mass curve

Isused in the study of the consistency and long-term trend test of hydrometeo--rological data. This method was first used to analyze the consistency of precipitation data in Susquehanna watershed United States by Merriam at 1937 (Merriam, 1937), and Searcy made a theoretical explanation

of it (Searcy, et al., 1960). The theory of the double-mass curve is based on the fact that a plot of the two cumulative quantities during the same period exhibits a straight line so long as the proportionality between the two remains unchanged, and the slope of the line represents the proportionality. This method can smooth a time series and suppress random elements in the series, and thus show the main trends of the time series. In recent 30 years, Chinese scholars analyzed the effect of soil and water conservation measures and land use/ cover changes on runoff and sediment using double mass curve method, and have achieved good results (Mu, et al., 2010). In this study, double-mass curves of precipitation vs streamflow and precipitation vs sediment are plotted for the two contrastive periods to estimate changes in regression slope (proportionality) to quantify the overall efficiency of soil conservation measures before and after transition years. An example of the doubleMassCurve plot is given here:



Config example:

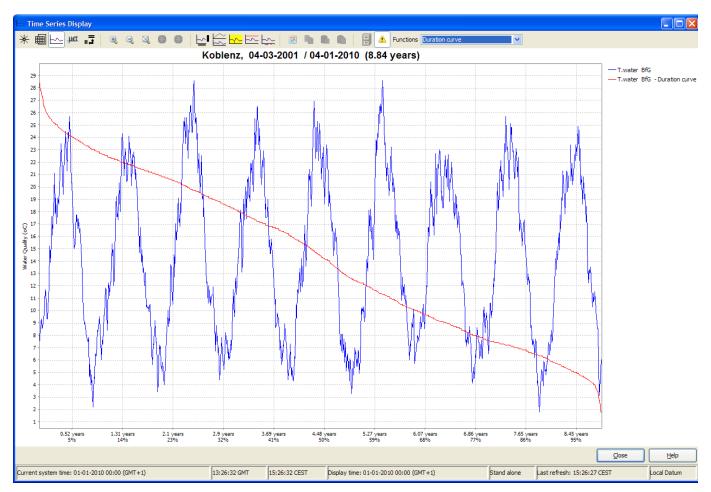
<statisticalFunction function="doubleMassCurve">
 <dateFormat>yyyy-MM-dd hh:mm</dateFormat>
 </statisticalFunction>

Duration curve

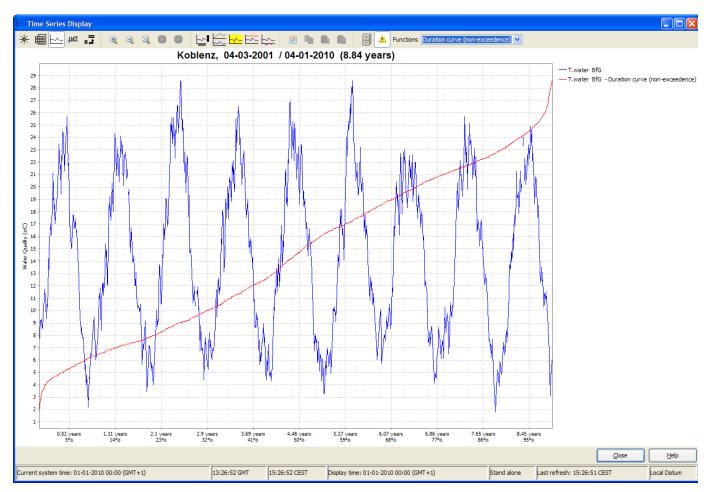
A convenient way to show the variation of hydrological quantities through time may be done by means of duration curves. For the selected time period the values of the selected quantity are sorted descending (durationExceedence) or ascending (durationNonExceedence). When the duration curve is plotted in the timeseries display, the x-axis will show the entire length in time of the selected view period. Percentages are shown as duration with respect to the entire chosen view period.

In the configuration of this statistical function there is the option to ommit missing values which may occur in the selected view period. If this option is set to true, all entries with missing values will be disregarded before the duration curve is calculated. If this option is not defined (default) or is set to false, missing values will be added to the the end of the array. In this case the plotted duration curve will never reach the 100%.

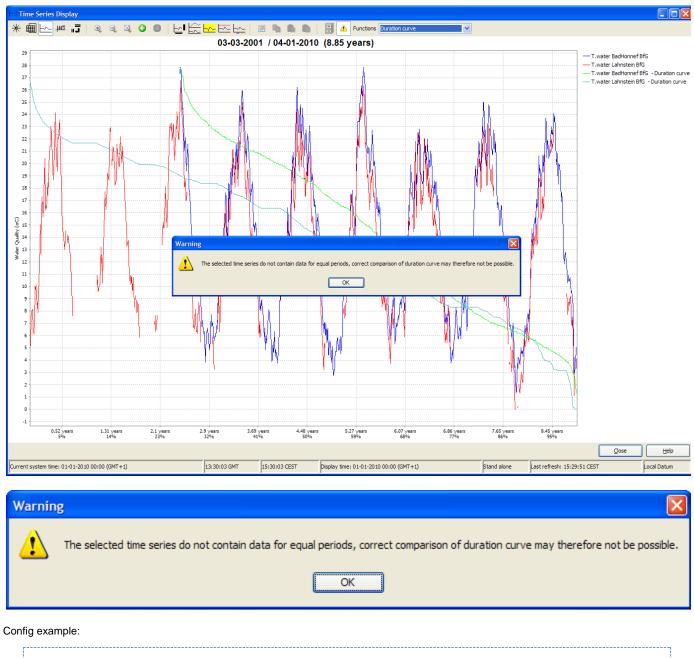
An example of the durationExceedence plot is given here:



An example of the durationNonExceedence plot is given here:



When selecting more than one location it could occur that the view periods of these selected timeseries do not cover the same period in time. In this case it is difficult to make a correct comparison of the calculated duration curves because they are analysed on different periods in time. A warning message will be given in order to ensure that the user is aware of this. The pop-up message will be shown each time the user zooms in or out until all view periods are an exact match.



<statisticalFunction function="durationExceedence" ignoreMissings="true"/> <statisticalFunction function="durationNonExceedence" ignoreMissings="true"/>

Elevation

The Elevation statistical function show parameter values against the elevation of the location on one particular time. The time for which the values are shown can be altered with a slider bar.

An example of the elevation plot is given here:

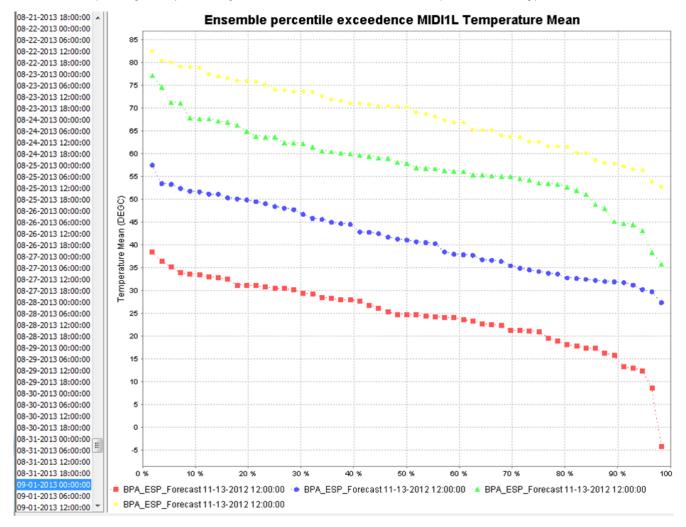
Configuration example:

<statisticalFunction function="elevation"/>

Ensemble Percentile Exceedence

Plots for the selected time stamp(s) each member of an ensemble along the horzontal axis, sorted by value. The result is exceedence diagrams for an ensemble forecast at a selected timestamp(s) within the timeseries.

The function allows multiple locations and/or multiple time stamps and/or multiple forecasts in one diagram. If multiple forecats include the same selected timestamp, the legend only can distinguish between these forecasts if a taskdescription is used during job submission.



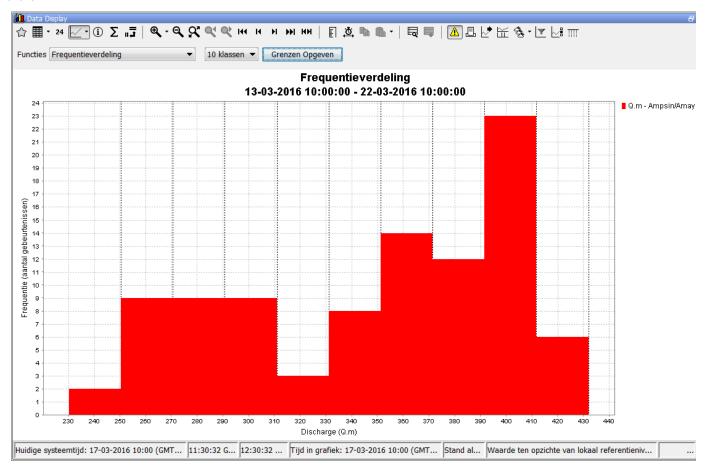
Configuration example:

<statisticalFunction function="ensemblePercentileExceedence"/>

Frequency distribution

The frequency distribution function divides the distance between the min and max value of the timeseries by the number of samples to create a classification. It then evaluate each value in the timeseries and assigns it to a class. The result is a frequency distribution diagram listing the number of occurrences per class. Number of classes (samples) can be selected in dropdown box. Also the class boundaries can be chosen in a

popup window.



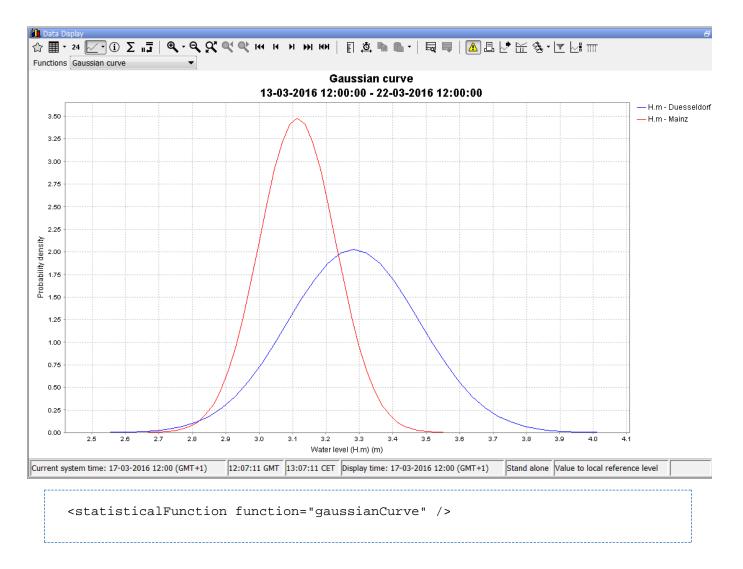
Popup window for selecting class boundaries.

Grenzen Opgeven		×
Laagste klasse	e grens:	\$30.27
Hoogste klasse	e grens:	431.96
ОК	Annuler	ren Automatisch

```
<statisticalFunction function="frequencyDistribution">
    <samples amount="5"/>
    <samples amount="10"/>
    <samples amount="20"/>
    </statisticalFunction>
```

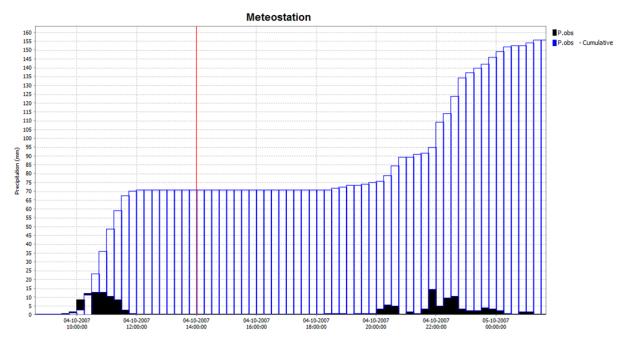
Gaussian curve

Gaussian or bell-shaped curve showes a particular distribution of probability over the values of a random variable.



Cumulative

Continuous accumulation over entire timeseries.

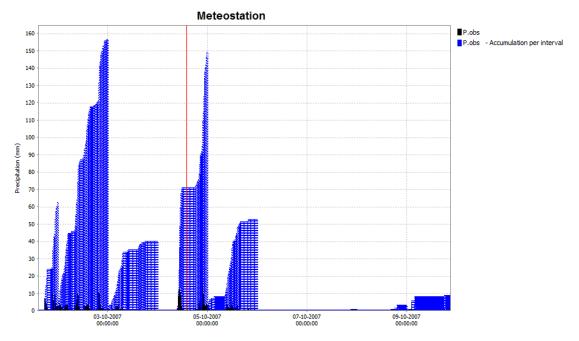


Config example:

```
<statisticalFunction function="cumulative"/>
```

Accumulation Per Interval

Accumulation per Interval, starting at zero at the beginning of the next interval. Interval can be selected in dropdown box.



Config example:

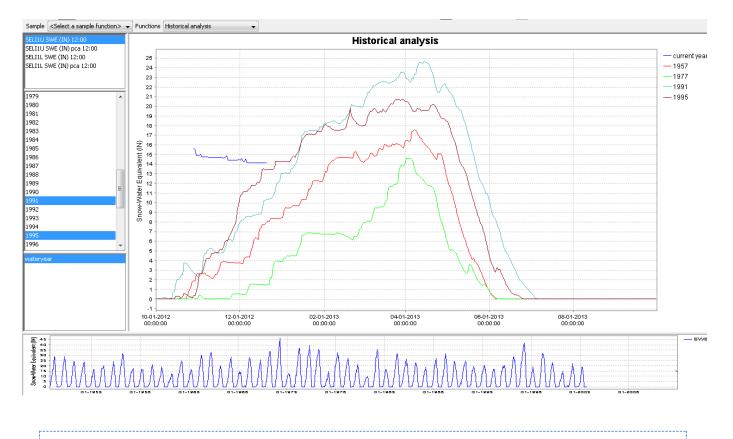
<statisticalFunction function="accumulationInterval">
 <movingAccumulationTimeSpan unit="hour" multiplier="1"/>
 <movingAccumulationTimeSpan unit="hour" multiplier="3"/>
 <movingAccumulationTimeSpan unit="hour" multiplier="6"/>
 </statisticalFunction>

Historical Analysis

Allows comparison of the current situation with selected previous years at the same moment within the year. CAn be used to compare seasonal behaviour, e.g. deficit accumulation, snow accummulation/melt, runoff.

The bottom of the window shows the full timeseries to assist in picking relevant historical years.

The function requires a multi-year historical series, where the view period on the x-axis streches over multiple years before the function is selected. You can use the |<>| button to stretch the x-axis from the current view period to the full available length. The display requires a fixed season definition for the x-axis, to be included in the configuration. The user needs to select the historical year of interest to plot this against the current year. Multiple years can be selected by holding the CTRL-key. Holding the SHIFT-key will select a range of years.



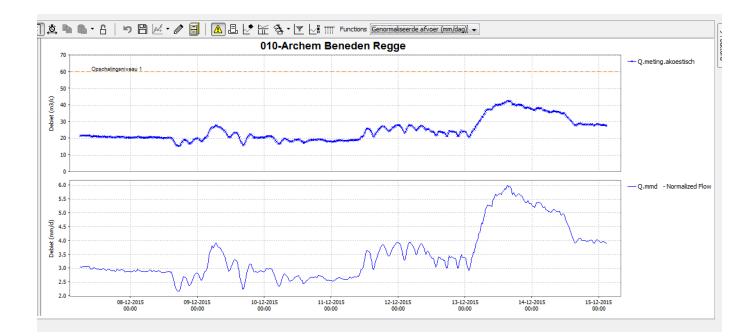
<statisticalFunction function="historicalAnalysis"> <historicalPeriods> <historicalPeriod> <startForwardLookingPeriod>--01-01</startForwardLookingPeriod> <season startMonthDay="--01-01" endMonthDay="--12-01" label="wateryear"/> </historicalPeriod> </historicalPeriods> </statisticalFunction>

Normalized Flow

Allows comparison of the current situation with selected previous years at the same moment within the year. CAn be used to compare seasonal behaviour, e.g. deficit accumulation, snow accumulation/melt, runoff.

The bottom of the window shows the full timeseries to assist in picking relevant historical years.

The function requires a multi-year historical series, where the view period on the x-axis streches over multiple years before the function is selected. You can use the |<>| button to stretch the x-axis from the current view period to the full available length. The display requires a fixed season definition for the x-axis, to be included in the configuration. The user needs to select the historical year of interest to plot this against the current year. Multiple years can be selected by holding the CTRL-key. Holding the SHIFT-key will select a range of years.



Principal Component Analysis

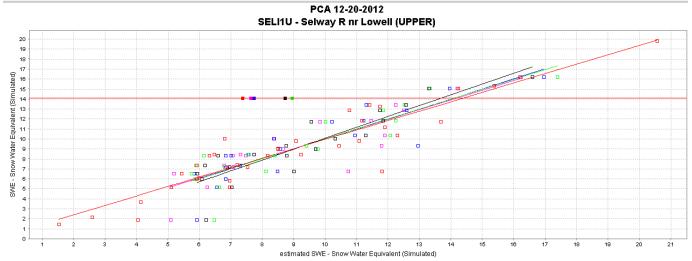
The Principal Component Analysis function uses independent historical data (observations) and dependent data (e.g. a simulated basin value) to compute a number of regression equations using the Principal Component Analysis technique. The resulting equation is applied with current observations to estimate the current basin value.

This functionality starts with the timeseries data available in the display. The independent and dependent parameters should correspond to the specification in the TimeSeriesDisplayConfig for the simulated (dependent) and observed (independent) parameter.

Typically, this functionality is intended to work in combination with the Topology and the Filters, such that you can have a default set of locations which you can modify from the map or via the Filters. You can also exclude locations from the analysis by making the timeseries invisible in the graph. By default the function shows the scatterplot of the best 5 equations (lowest root mean square error). By selecting one item in the legend, this item and its confidence interval is shown.

The PCA-estimate for the basin value can be utilized in a modifier if the ModifierTypes-configuration refers to the statistical function for the default value.

ample [DayMonthSample	• •	Functions Print	ncipal component analysis	• 0						
rank	simulated	pca	rmse	period of record	equation	ma×	min	mean	method	preprocessing	normalized
0	14.1	7.36	1.5	1967 - 2002	Y = 0.809*TWLM8 -2.106	19.81	1.45	8.94	PCA	NONE	no
1	14.1	8.72	1.5	1983 - 2002	Y = 0.152*HEMI1 + 1.694*NZCM8 -0.97	16.21	1.91	9.31	REGRESSION	SQUAREROOT	no
2	14.1	8.95	1.55	1984 - 2002	Y = 0.207*CRAI1 + 1.707*NZCM8 -1.84	16.21	1.91	9.27	REGRESSION	SQUAREROOT	no
3	14.1	7.74	1.6	1983 - 2002	Y = 0.913*LPSI1 + 0.528	16.21	1.91	9.31	REGRESSION	NONE	no
4	14.1	7.63	1.6	1983 - 2002	Y = 0.18*HEMI1 + 0.328*LPSI1 + 0.273*TWLM8 -0.411	16.21	1.91	9.31	PCA	NONE	no



pca=7.363; mse=1.5; 36 year, TWLM8=100%
 pca=8.721; mse=1.5; 20 year, HEMI1=19.57% NZCM8=80.43%
 pca=7.74; mse=1.6; 20 year, LPSI1=100%
 pca=7.63; mse=1.6; 20 year, HEMI1=28.05% LPSI1=32.2% TWLM8=39.74%

Scatter Plot

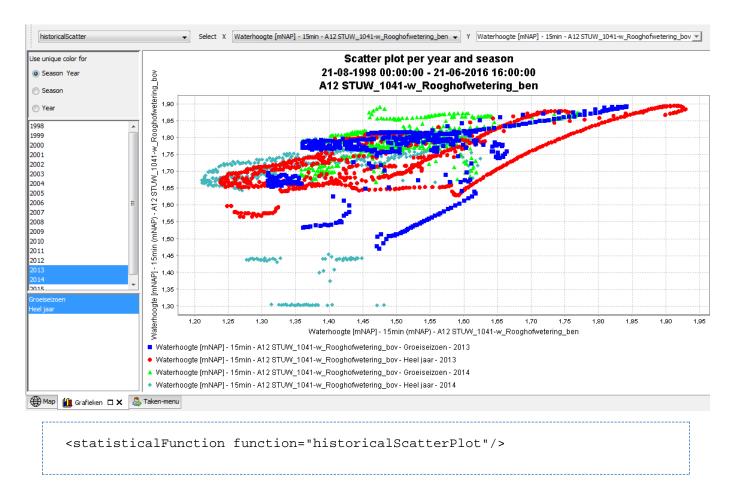
Creates a scatter plot of two selected series

Config example:

<statisticalFunction function="scatterPlot"/>

Historical Scatter Plot (per year and season)

(Since 2016.02) There is also a scatter plot available where you can select years and seasons separately and choose unique coloring



Show statistics for specific timeseries

By default the statistical results are displayed for all timeseries. To display the statistics for a specific timeseries, the relevant timeseries can be selected by clicking the legend or by selecting the timeseries in the graph. Using the CTRL button more than one timeseries can be selected this way.

Hide original time series

Since 2016.02 a checkbox has been added which offers the user the choice to hide the original time series. The status of this checkbox will be stored in the user settings so choice will be remembered between different statistical functions and when restarting FEWS:

Difference plot -	<enter value=""> Reference level</enter>	•	Apply Hide original series
Duration curve	✓ Hide original series		

The images show the checkbox for 2 functions but this checkbox is available for each statistical function which plotted the original time series together with the statistical time series.

Filtering data

The table context menu (available by right-clicking) gives access to two types of filtering: [Filter by Tree...] and [Filter by Expression...] (the latter since FEWS-2014.02). These options, which can be applied simultaneously, allow the user to apply a filter to data shown in the table, hiding all records that do not satisfy the filter criteria. With the filter(s) applied, data can be selectively copied to clipboard or edited. The display in the graph is not affected by the filters.

- Filter by Tree
- Filter by Expression

Filter by Tree

This option allows the user to filter records based on a number time series *properties*: user, comment, and flagSource (validation). The main branches of the filter tree are formed by the time series that are selected. The properties then appear as subbranches, and for each property the available options are listed as the tree leaves.

When selecting one of the leaves, the data shown in the table is shrunk to all records that have the specified property. When choosing multiple leaves from the *same* branch, the data selection is expanded to the union of the individual leaves. A filter based on leaves of *different* branches will shrink the data selection to the intersection of the individual branches. For example, suppose the user chooses the leaves HN and ROF in the validation branch of time series A, and leaf HN in the validation branch of time series B. In that case only those records are shown for which the flagSource of time series A equals HN *or* ROF, *and* the flagSource of time series B equals HN.

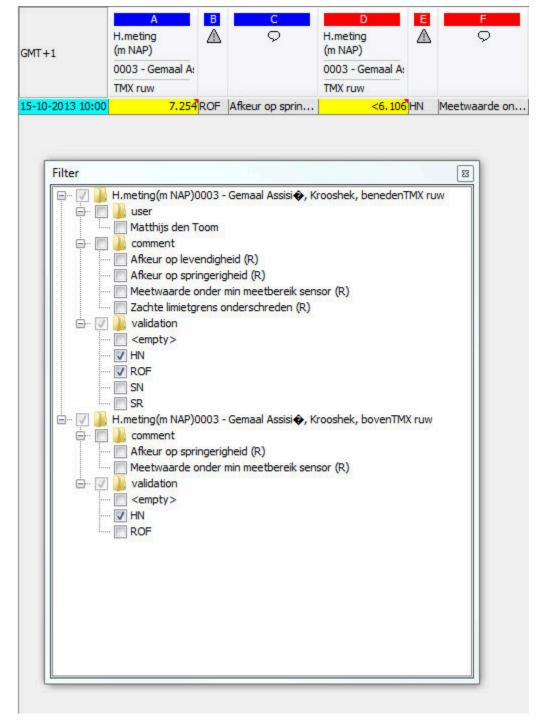


Figure 1: Filter by Tree.

Filter by Expression

This option (available sine FEWS-2014.02) allows the user to filter the records based on expressions, involving the active table columns. The

expressions are therefore not limited to the data column, but may also involve the user or comment column. A column is referenced by its alphabetical index (mind to use capitals). The following operators and functions are available for constructing expressions:

OPERATORS

operators	description	example
< > <= >=	relations	A>=10
== !=	equality	A!=10
+ -	add, subtract	A+3>10
*/	multiply, divide	A*0.5>10
^	power	A^2>10
&&	logical AND	A>10&&E>5
	logical OR	A>10 E>5

FUNCTIONS

function	description	example
sum	sum of values	sum(A,E,)>10
abs	absolute value	abs(A)>10
pow	power function	pow(A,2)>10
sqrt	square root	sqrt(A)>10
min	minimum of list	min(A,E)>10
max	maximum of list	max(A,E)>10
average	average of list	average(A,E)>10
exp	exponential (e^x)	exp(A)>10
In	natural logarithm	In(A)>10
log	logarithm base 10	log(A)>10
atanh	inverse hyperbolic tangent	atanh(A)>10
acosh	inverse hyperbolic cosine	acosh(A)>10
asinh	inverse hyperbolic sine	asinh(A)>10
tanh	hyperbolic tangent	tanh(A)>10
cosh	hyperbolic cosine	cosh(A)>10
sinh	hyperbolic sine	sinh(A)>10
atan	arc tangent	atan(A)>10
acos	arc cosine	acos(A)>10
asin	arc sine	asine(A)>10
tan	tangent	tan(A)>10
cos	cosine	cos(A)>10
sin	sine	sin(A)>10
isMissing	check for NaN	isMissing(A)

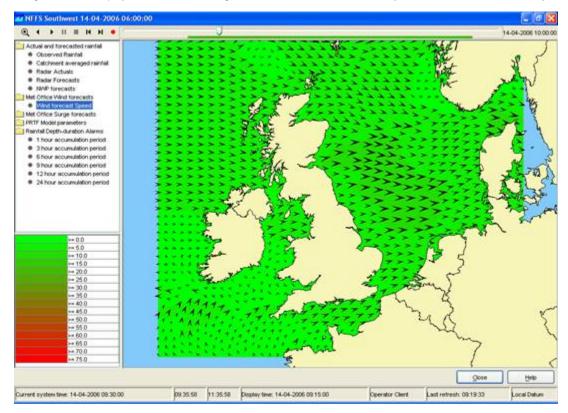
An example application is shown in Figure 2.

MT+1	A H.meting (m NAP)		D Q	E H.meting (m NAP)	F A	G	н Ф
	0003 - Gemaa			0003 - Gemaal A:			
	TMX ruw			TMX ruw			
6-10-2013 00:0		Matthijs den To		7.239		1	
6-10-2013 00:1		Matthijs den To		7.239	I I		
6-10-2013 00:2	2000-2000-2000-2000-2000-2000-2000-200	Matthijs den To		7.239	i i		
5-10-2013 00:3	2007-843765	Matthijs den To		7.239	I I		
5-10-2013 00:4	2007-2417-24	Matthijs den To		7.239	1		
5-10-2013 00:5	2	Matthijs den To		7.239	I I		
6-10-2013 01:0	2007-2017-0	Matthijs den To		7.239	i i		
6-10-2013 01:1	2	Matthijs den To		7.239	I I		
5-10-2013 01:2		Matthijs den To		7.239			
5-10-2013 01:3		Matthijs den To		7.239			
5-10-2013 01:4	2000-2000-2000-2000-2000-2000-2000-200	Matthijs den To		7.239			
5-10-2013 01:5	12 200 200 200 200 200 200 200 200 200 2	Matthijs den To		7.239			
5-10-2013 02:0	20022000	Matthijs den To		7.239			
5-10-2013 02:1	2017-2017-2017-2017-2017-2017-2017-2017-	Matthijs den To		7.239	-		
5-10-2013 02:2		Matthijs den To		7.239	-		
5-10-2013 02:3	2007-00-00-00-00-00-00-00-00-00-00-00-00-	Matthijs den To		7.239	-		
5-10-2013 02:4	12 200 AND 12	Matthijs den To		7.239			
5-10-2013 02:5	2002000	Matthijs den To		7.239			
5-10-2013 03:0		Matthijs den To		7.239			
5-10-2013 03:1	-	Matthijs den To		7.239			
5-10-2013 03:2		Matthijs den To		7.239	-		
5-10-2013 03:3	2 200 200 200 200 200 200 200 200 200 2	Matthijs den To		7.239			
5-10-2013 03:4	2000-2000-2000-2000-2000-2000-2000-200	Matthijs den To		7.239	-		
5-10-2013 03:5	-	Matthijs den To		7.239			
5-10-2013 03:0	2007-04-000	Matthijs den To		7.239			
5-10-2013 04:1		Matthijs den To		7.239			
5-10-2013 04:2		Matthijs den To		7.239			
5-10-2013 04:2	2000-2000-2000-2000-2000-2000-2000-200	Matthijs den To		7.239			
5-10-2013 04:4	-	Matthijs den To		7.239			
6-10-2013 04:5		Matthijs den To		7.239			-
6-10-2013 04:5		Matthijs den To		7.239			
6-10-2013 05:1	200326000	Matthijs den To		7.239			-
5-10-2013 05:2		Matthijs den To		7.239	-		
6-10-2013 05:3	-	Matthijs den To		7.239			
6-10-2013 05:4	2000-2000-2000-2000-2000-2000-2000-200	Matthijs den To		7.239			
6-10-2013 05:5	1	Matthijs den To		7.239			
5-10-2013 05:5 5-10-2013 06:0				7.239			
6-10-2013 06:0	2	Matthijs den To Matthijs den To		7.239	-		-
10 2010 00.1	7.250	Platanja deli Totti		Filter by Expressi	ion		
				A>7&&C=="Mattl	hijs de	en Toom"	
				Apply	1	Close	Help

Figure 2: Filter by Expression. 05 Spatial Display

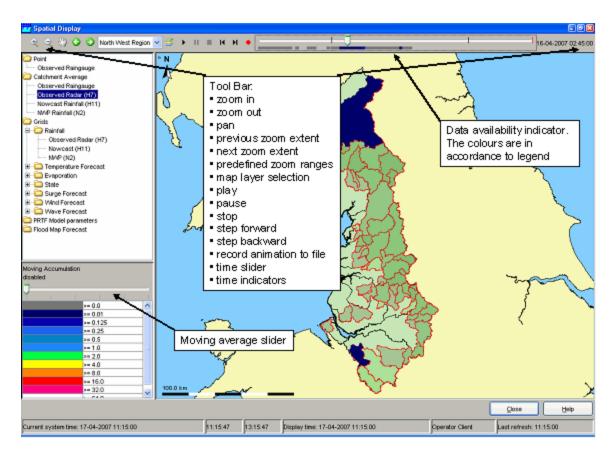
Spatial Display

The Spatial Display grid display can be used to display time series of any type: scalar, polygon or grid. The display will depict the data on a map background. The display time is then set using a ruler that can be moved manually or made to move automatically.



The spatial display consists of following components:

- Spatial Display selection filters
- Control Toolbar with following options:
- Manual zoom and zoom previous buttons
- Predefined zoom range selector
- · Play, pause, stop, step forward, step backward and record buttons
- Time slider with time slice indicator
- Data availability and maximum value indicator
- Moving average slider
- Legend
- Contours button
- Export time step data in ascii grid-file



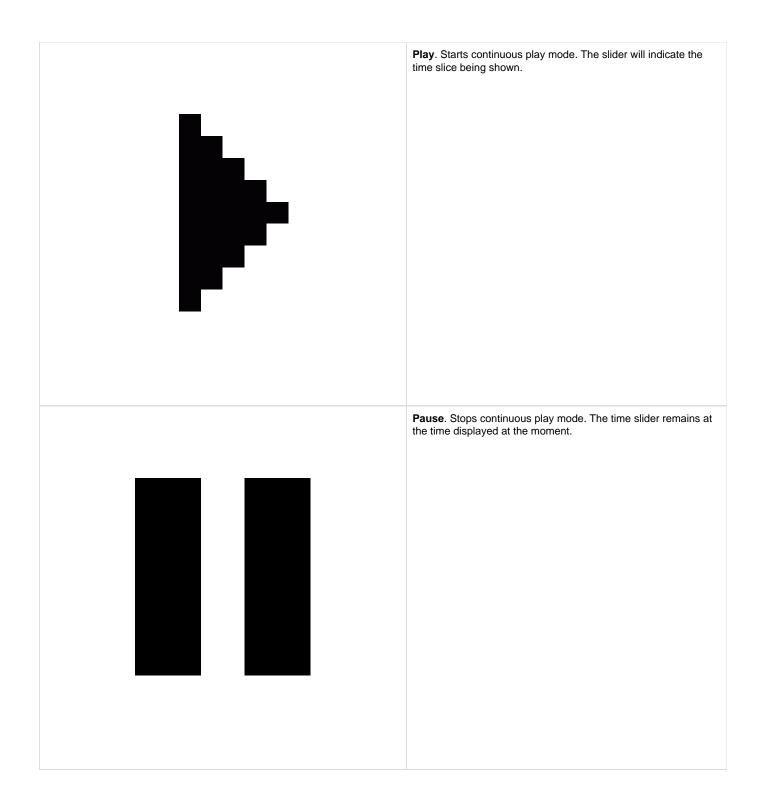
Grid display selection filters

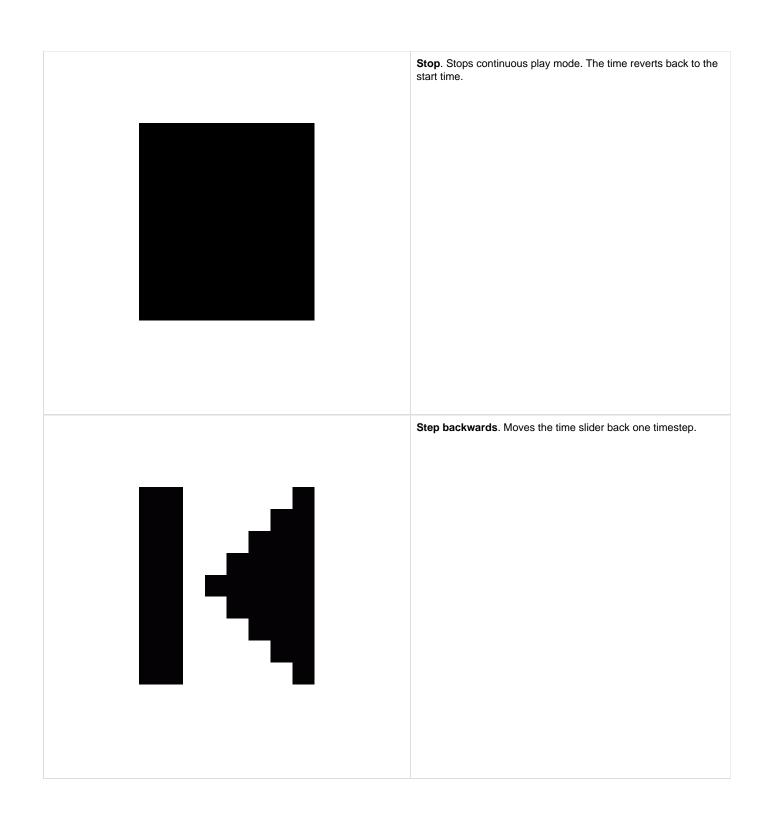
The selection filters show which displays have been configured. Select a filter to display the data. Note that each grid display may be configured differently, i.e. with a different period of data to be displayed, with a different background map, etc. The configuration allows filters to be highlighted in **bold**.

Control Toolbar

The toolbar provides the controls for displaying the spatial information via through the following buttons:

Button Description



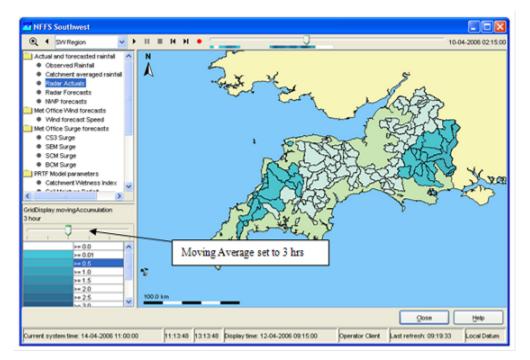


	Step forwards. Moves the time slider forwards one timestep.
	Record. Creates an AVI or animated gif movie file. The avi format is used by default unless the filename ends with '.gif'. After opening the file, the display will start playing from the current time position, until the stop button is clicked.
Time slider	The time slider can be dragged to specific time slice.
Data availability	The data availability indicator provides a visual clue as to where you can find data. For those times where data is available, the colour of the data availability indicator will be set to the maximum value found in the data for that time slice. Note: For grids that contain horizontal flow data in the form of u,v vectors the data availability indicator might over-estimate the maximum values. In other words, for u,v vector data the availability indicator colours might indicate values greater than the actual maximum

For the functionality of the zoom buttons is referred to the FEWS Explorer section (see 2.2).

Moving Average Slider

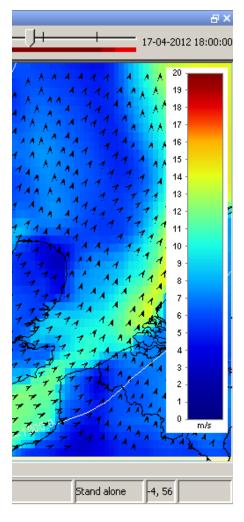
The moving average slider can be configured to allow the user to select a number of moving average settings. Each moving average window is then recalculated for the entire period.



Legend

The legend identifies the colour used for each range of values. The range of values used for each colour can be rescaled by right clicking on the display and selecting 'Rescale Classification' from the pop-up menu. The display colours will be updated to reflect the new classification. After rescaling, the lowest and highest values in the legend will correspond to the minimum and maximum values of the data in the current zoom extent of the display (for the selected time slice). When the display is zoomed in on an area where all data points or grid cells have similar colours, rescaling can be used to see more clearly the differences in the data values. To return to the default classification right click on the display and select 'Back To Default Classification' from the pop-up menu. When selecting a different plot, the classification always changes back to the default classification for that plot.

The legend can be shown as table legend or as bar legend. Bar legend displays fluent scale bar as shown in the picture below:



Contours button



To turn on/off contour lines (regular grids configured with contour lines only). Numbers appear when the animation has stopped or paused. The colors, which indicate the value remain visible.

Export time step data in ascii grid-file

By right clicking on the display, the grid data for a specific timestep can be exported in an ascii file. Select the desirable time step with the control toolbar.

Extracting scalar time series from grid

Scalar time series can be extracted from the grid by double clicking the point of interest. Depending on the type of data, which is displayed, the scalar time series will be relevant to either a point, polygon or grid cell. This can also be done in the following way. First select the point of interest either by right clicking and selecting 'Draw Point' from the pop-up menu or by left clicking. A coloured dot will be drawn to indicate the selected point. For grid data an additional green dot will be drawn to indicate the centre of the selected grid cell. Then extract the time series for the selected point either by right clicking and selecting 'Show Time Series' from the pop-up menu or by pressing the F3 key.

A series, that is extracted from a grid, is not related to a known location or polygon ID. The series will then be identified using the grid coordinates.

The graph will automatically pop up with the time series of the selected point, polygon or grid cell. When animating the grid display, a marker will move over the time series graph as well.

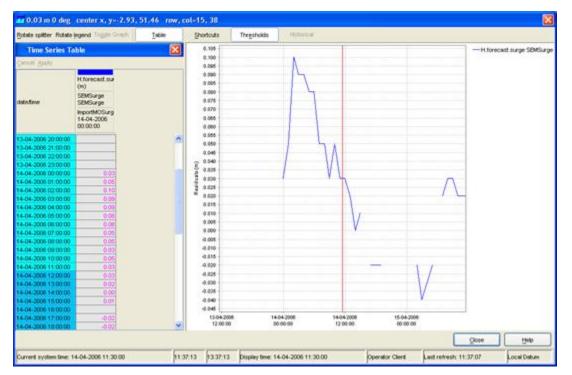
To extract a different scalar time series double-click on another point of interest. This will draw a new dot and extract a scalar time series for that point. Please be aware that when extracting a scalar time series from a data point in the display, then the dot drawn on top of the data point has a different colour from the point itself. This way it may look like the data point has a different colour because of the dot. The dot can be erased by right clicking and selecting 'Delete Point' from the pop-up menu.

Note:

Make sure that you stop the grid movie before you make a time series graph, this can cause the system to slow down because multiple processes have to be executed that take a lot of processing time.

Note:

Extraction of scalar time series is not available for rotated pole geodatum types. In some cases extraction of scalar time series can exhibit unexpected behaviour near the North Pole or South Pole.



Extracting longitudinal profiles (Xsections) from a grid time series

Longitudinal profiles time series can be extracted from grid data and shown in a separate graph as well. The profile (or cross section) is defined by drawing a profile sketch. Start drawing a profile sketch either by right clicking and selecting 'Start Drawing Profile' from the pop-up menu or by Ctrl+left clicking on the desired start point for the profile. A coloured dot will be drawn to indicate the selected start point. Add additional line segments to the profile by left clicking in the display. Finish drawing by double-clicking on the desired end point for the profile. Green dots along the profile indicate which grid cells are used for the profile.

Once a profile sketch has been drawn, extract the profile either by right clicking and selecting 'Show Profile' from the pop-up menu or by pressing the F2 key. The graph of the profile will show automatically.

To extract a different profile just start drawing another profile. This will erase the previous sketch. The profile sketch can also be erased by right clicking and selecting 'Delete Sketch' from the pop-up menu.

When animating the grid, the profile follows the same animation. When animating the profile only, the grid animation remains fixed. Note that the same cross section can be reused when switching to another plot (F2 will open a new window).

Note:

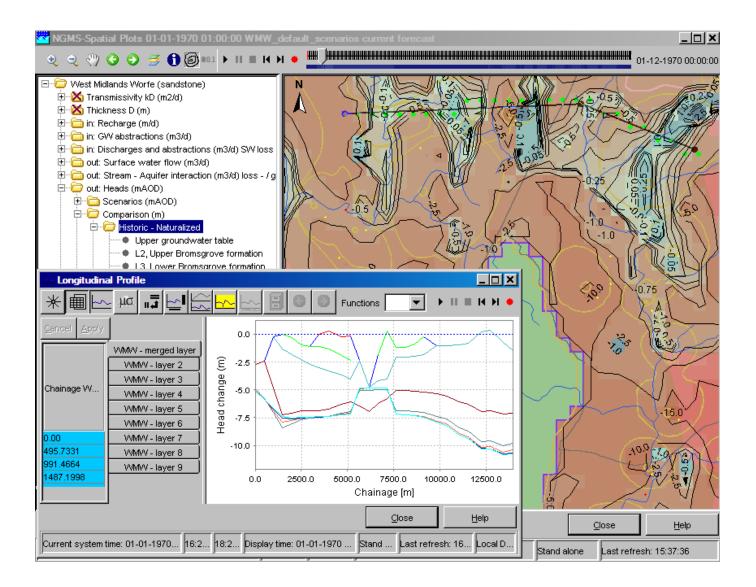
Even more essential then for scalars, it is wise to pause the grid animation when dragging a cross section to be shown.

Note:

Extraction of longitudinal profiles is not available for irregular grids, points and polygons. The profile sketch will be erased when switching to a plot that contains data of one of these types. Extraction of longitudinal profiles is also not available for rotated pole geodatum types. In some cases extraction of longitudinal profiles can exhibit unexpected behaviour for profiles crossing the dateline or located near the North Pole or South Pole.

Note:

If longitudinal profile data is displayed in the spatial display, then there is no need to draw a profile sketch. Just press the F2 key or right click and select 'Show Profile' from the pop-up menu to show the graph of the profile.



Extracting data for an area from a grid time series (available since build 18645)

For certain types of data it is possible to extract time series data for a specific part of a grid and show this in a separate graph. This is only possible for scalar data with dimension L3/T, L3, L/T, L or 'amount of substance' and for horizontal flow data with dimension L3/T or L/T. The specific part of the grid is defined by drawing an area sketch (a closed polygon surrounding the desired area). Start drawing an area sketch either by right clicking and selecting 'Start Drawing Area' from the pop-up menu or by Shift+left clicking on an edge for the desired area. A coloured dot will be drawn to indicate the selected point. Add additional line segments along the edge of the desired area by left clicking in the display. Finish drawing by double-clicking. The last point in the sketch will be connected to the first point automatically to create a closed polygon that surrounds the desired area. Each grid cell inside the area is marked with a green dot.

Once an area sketch has been drawn, extract the desired data by right clicking and selecting 'Calculate Budget' from the pop-up menu. The corresponding graph will show automatically. The 'Calculate Budget' option will perform one of the following calculations, depending on the type and the dimension of the selected data (The dimension can be defined in a parameterGroup in the region configuration).

Grids that contain scalar data (e.g. water levels or rainfall data):

- For dimensions L3/T (e.g. flow in m3/s), L3 (e.g. volume in m3) and 'amount of substance' the calculation will be 'volume summation'. This calculates the sum of the values inside the area. This uses all grid cells that are (partially) inside the area. The value of each grid cell is weighted using the fraction of the grid cell that is inside the area.
- For dimensions L/T (e.g. velocity in m/s) and L (e.g. water level in m) the calculation will be 'area times average level'. This calculates the
 average level inside the area multiplied by the size of the area. This uses all grid cells that are (partially) inside the area. The value of
 each grid cell is weighted using the fraction of the grid cell that is inside the area.
- If another dimension, or no dimension, is configured for the selected data, then the options 'Start Drawing Area' and 'Calculate Budget' are not available.

Grids that contain horizontal flow data in the form of u,v vectors:

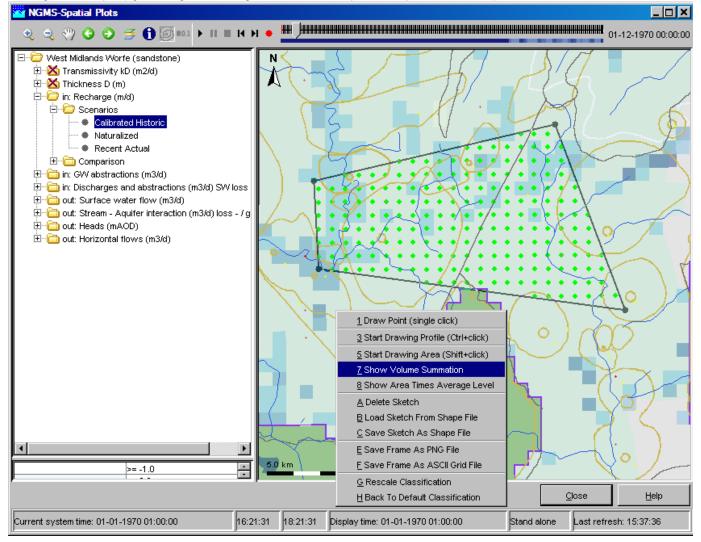
• For dimension L3/T (e.g. flow in m3/s) the calculation will be 'mass balance horizontal flux'. This calculates the net horizontal flow into/out

of the area. This uses all grid cells that are for at least 50% inside the area.

- For dimension L/T (e.g. velocity in m/s) the calculation will be 'mass balance horizontal velocity'. First for each grid cell the value of u, respectively v, is multiplied by the height of the gridcell, respectively the width of the grid cell, to get flow values (The height of the flowing water mass is taken to be 1). Then the net horizontal flow into/out of the area is calculated. This uses all grid cells that are for at least 50% inside the area.
- If another dimension, or no dimension, is configured for the selected data, then the options 'Start Drawing Area' and 'Calculate Budget' are not available.

To extract data for a different area just start drawing another area. This will erase the previous sketch. The area sketch can also be erased by right clicking and selecting 'Delete Sketch' from the pop-up menu.

When animating the grid display, a marker will move over the time series graph as well. Note that the same area sketch can be reused when switching to another plot (right clicking and selecting one of the relevant options will open a new window).



Note:

Even more essential then for scalars, it is wise to pause the grid animation when dragging an area for extracting data.

Note:

Extraction of data for an area is not available for quadrilateral grids, irregular grids, points and polygons. The area sketch will be erased when switching to a plot that contains data of one of these types. Extraction of data for an area is also not available for rotated pole geodatum types. In some cases extraction of data for an area can exhibit unexpected behaviour for areas crossing the dateline or located near the North Pole or South Pole.

Note:

The green dots only mark grid cells of which the cell centre is inside the area. The actual calculations also use grid cells that are partially inside the area.

Extracting data for multiple plots at once (available since build 18645)

It is possible to extract data for multiple plots at once. In the selection filters select a folder that contains more than one plot (as direct children). The first plot in the folder will be displayed. Then extract scalar time series, longitudinal profiles or data for an area in the usual way. The extracted data for all the plots in the selected folder will be shown in a combined diagram, where each plot has a separate graph.

Saving and loading sketches from shape files (available since build 18645)

Once a profile sketch or an area sketch has been drawn, the sketch can be saved as a shape file (*.shp file) by right clicking and selecting 'Save Sketch As Shape File'. A saved sketch or any other shape file that represents a profile or an area (a closed polygon) can be loaded into the display by right clicking and selecting 'Load Sketch From Shape File'. The loaded sketch can then be used for extracting data. When loading a sketch, the previous sketch will be erased.

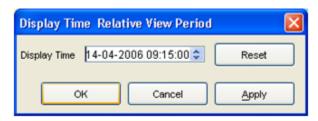
Note:

A shape loaded from file will only be used as an area sketch (a closed polygon) if the first and last points of the shape have exactly the same coordinates. Otherwise the shape will be used as a profile sketch.

Setting the display time

The display time in the spatial display can be changed in the *standalone system only*. The use is similar to the setting the display time in the data display, but with less modification possibilities.

When the display time is modified, the relative start and end times of the data to be shown are reset and the time slider is adjusted accordingly.



06 Manual Forecast Display

05 Spatial Display

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07 Forecast Manager

- Manual Forecast Display
 Workflow
 - Notification after completion workflow
 - What-if Scenario
 - Forecast description
 - Batch Forecast options (only in standalone)
 - Automatically approving forecasts
 - Run for selected locations
 - State Selection
 - Priority
 - Forecast length

Manual Forecast Display

The Manual Forecast display (see below) in the Operator Client allows for the running of single or a manually scheduled forecast.

rkflow art Wagua DCSM-v6	astro					 Info
hat-if scenario						
one						Combine
recast description						_
Scheduler options				State selection		
 Single forecast (dd-MM-yyyy HH:mm:ss	GMT)		Select initial state		
то	24-06-2016 10:0	00:00	(A) (V)	Cold state		
				Type	Cold states(Default)	~ ?
Scheduled forec	ast			Run start time	23-06-2016 10:00:00	*
Start time	24-06-2016 10:	00:00	-			
End time	24-06-2016 10:	00:00	*	Warm state		
Interval	day	~		Search interval		
Shift T0	day	•		Start time	22-06-2016 10:00:00	÷
ETEL Amount				End time	23-06-2016 10:00:00	÷
Run for selected	locations					
Priority		Forecasting shells		Forecast length		
🗇 High		③ Single		Oefault		
Normal		Parallel	1	O User defined	day	v 1 ×

The Manual Forecast display (see below) in a *Standalone* system is slightly different from the one in the Operator Client and allows for running of a single forecast or a batch of forecasts.

orkflow tart Wagua DCSM-vi	6 astro					Info	1
nat-if scenario							
one						Combine]
recast description							
Scheduler options				State selection (times re	elated to the first T0)		
	(dd-MM-yyyy HH:mm:ss GMT)			Select initial state	,		
то	24-06-2016 10:00:00		A	Cold state			
				Туре	Cold states(Default)	•]	?
 Batch forecast 	(dd-MM-yyyy HH:mm:ss GMT)			Run start time	23-06-2016 09:00:00	÷	_
Start T0	24-06-2016 10:10:00		\$				
End T0	24-06-2016 10:00:00		-	Warm state Search interval			
Interval	day	•	1 🜩	Start time	22-06-2016 09:00:00	- A- - V	
				End time	23-06-2016 09:00:00	* *	
Run for selecte	d locations						
Priority	Forecastin	g shells		Forecast length			
🗇 High	(i) Single			Default			
Normal	Paral	el	1 ÷	User defined	day	v 1 📩	1

A single or a series of forecasts can be submitted to the system by pressing [Run]. With [Close], a user can leave the Manual Forecast display.

The various items in the Manual Forecast display are described below.

Workflow

A workflow can be selected from a drop-down list with pre-configured workflows. By pressing [INFO], a description of the selected workflow can be displayed.

Notification after completion workflow

An automatic notification pops up after the completion of the workflow.

What-if Scenario

A What-if Scenario can be selected from a drop-down list with predefined What-if Scenarios. By pressing [INFO] a description of the selected What-if Scenario can be displayed. What-if Scenarios are defined via the What-if Scenario display.

Forecast description

A forecast description can be entered in this field. Entering of a description is not obligatory.

Please note that the *forecast name* is generated automatically by the system and consists of the **1** start time of a forecast, (ii) the selected workflow and (iii) the selected What-if Scenario. Scheduler options (only in Operator Client)

Two types of manual forecasts can be defined:

- single forecast
- scheduled forecast

A single forecast will only run once. For single forecast only the T0 of the forecast has to be entered in the date & time field (yyyy-MM-dd HH:mm).

A scheduled manual forecast will run for a period of time and with a time interval both defined by the user. In case a manual forecast is scheduled, the following information should be entered by the user:

- Period of time for which a scheduled manual forecast should run is defined by entering the *Start time* and *End time* (yyyy-MM-dd HH:mm). The first forecast run is done at the Start time.
- Via menu item Interval, the time interval at which the scheduled manual should run can be defined.
- Entering *Shift T0* allows the user to define a period of time over which the T0 of the forecast itself should be set back in relation to the Start time of the forecast run.

In case for example scheduled manual forecasts should always be made at 8:00 AM but the forecast itself should start at 12:00 PM the previous day, the *Shift T0* should be set at 8 hours while the *Start time* is set at 08:00.

Batch Forecast options (only in standalone)

Two types of manual forecasts can be defined:

- single forecast
- batch forecast

A single forecast will only run once. For single forecast only the T0 of the forecast has to be entered in the date & time field (yyyy-MM-dd HH:mm).

In batch mode, a scheduled manual forecast will run for a period of time and with a time interval both defined by the user. In case a manual forecast is run in batch mode, the following information should be entered by the user:

- Period of time for which a scheduled manual forecast should run is defined by entering the *Start T0* and *End T0* (yyyy-MM-dd HH:mm). The first forecast run will be made with the Start T0.
- Via menu item Interval, the time interval at with which the T0 of consecutive forecasts should be increased when submitted.

All runs will be submitted at the same time but will be run with different T0's as defined by the user.

Automatically approving forecasts

Ticking the approve box will set the status of the forecast automatically to *current* after it has been completed. In case you want to cancel this action or suspend it, please use the Scheduled Forecast tab in the System Monitor. When using the default synchroprises.xml, non-approved runs will not be automatically downloaded by the synchronising OC and need to be downloaded manually before they can be opened.

Run for selected locations

The check box is enabled when the selected workflow has an option allowSelection=true in WorkflowDescriptors.xml. The workflow will be then run only for locations selected in the Explorer Filters. It is not allowed to configure a forecast workflow with the allowSelection option set to true

State Selection

Leaving Select initial state unchecked, the default state- as has been configured by the system manager- will be used to start the historic run preceding a forecast simulation (see also *Running Modules*). For statefull simulation models- like hydrodynamic models- this means that the state selection for a model will follow the state selection rules as configured in the General Adapter Module Instances.

Checking Select initial state allows the user to select a particular state to start the historic run. A selection can be made between a cold and a warm state. A *Cold state* is a fixed module state defined in the system configuration. Normally various cold states will be available representing characteristic catchment conditions (e.g. dry, normal and wet). When a cold state should be used at the start of the historic run, the following information is required:

- Type: Via a drop-down list a typical cold state type can be selected.
- *Relative start time:* The relative start time defines the length of the historic run.

A *Warm state* is a module state that has been generated in a previous forecasting run and stored in the Central Database. In order to find a suitable warm state to start the historic run, a time interval needs to be defined within which the system will look for a warm state. The time interval is defined relative to the T0 of the forecast by the using the following entry fields:

• Time unit:

The time unit that will be applied to defined the Search interval.

• Start & end time:

The start and end time of the search interval are defined by multiplying the above mentioned *Time interval* with the values respectively entered in the first and second field. The system will look for the warm state with the date/time stamp closest to T0, which means that the multiplier for the Start time should always be set at a lower value than for the End time.

Please note that in case a *Warm state* is selected as the initial state, the date/time stamp of the warm state found within the defined *Search interval* will determine the actual start and therefore length of the historic run.

In case no *Warm state* can be found within the defined *Search interval*, the system will automatically run as if *Select initial state* was unchecked. This means that in that case the default state will be used for starting the historic run.

Priority

The user can give a forecast run either a *High* or a *Normal* priority. The Master Controller will give precedence to high priority tasks above normal priority tasks.

Please note that setting the priority to 'high' does not mean that the task will be directly carried out. In case other high priority tasks are waiting for execution, the new task will be added to the queue. When another task with normal priority is already being executed, it will not be cancelled when a new high priority task is submitted, but will be completed first.

Forecast length

A default forecast length is configured when setting up the forecasting system. Please note that within an area different forecasts lengths may have been configured depending on for example the hydrological (sub-) system and/or the forecasting models used.

07 Forecast Manager

06 Manual Forecast Display

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08 System Monitor

• Forecast Manager

• Filter visible forecasts (available since build 18784)

- Forecast Overview tab
 - Adding workflows to forecast list box of FEWS Explorer
 - Rerun a forecast
 - Download a forecast from Central Database (only in OC)
 - Redownload a forecast from Central Database (only in OC)
- Current Forecast tab
- Forecast Expiry Time tab (available since build 19708)
 - Deleting a forecast from the Central Database (only in OC)
 - Changing the expiry time of a forecast in the Central Database (only in OC)
- Display configuration

Forecast Manager

The Forecast Management display offers following functionality:

- management of forecasts
 - setting current forecast
- change expiry time of forecasts

These three basic functions are available via individual tabs in the display.

The meaning of the icons in the table is as follows:

· the current forecast is marked with

◬

- an approved forecast is marked with
- a partly failed forecast is marked with

×

The coloured circle icons indicate which state the system has used for each run:

In fact there are 6 different options (A to F) which can occur. The below mentioned table explains them.

Option	Manual Forecast (Dialog)	Scheduled Forecast Task	Result	lcon	Remarks
A	User selects cold state	-	cold state used		as expected: cold state selected and cold state used

В	User selects warm state	-	cold state used		not as expected: warm state could not be found in selected search period
С	User selects warm state	-	warm state used	٢	as expected: warm state selected and warm state used
D	User selects no specific start state	Forecast runs with configured properties	cold state used	no icon	as expected: cold state configured and cold state used
E	User selects no specific start state	Forecast runs with configured properties	cold state used		not as expected: warm state configured and cold state used
F	User selects no specific start state	Forecast runs with configured properties	warm state used	no icon	as expected: warm state configured and warm state used

The icons with more details:

- cold state start as selected by user. In this case the cold state id and state start time are shown in the tooltip.
- warm state start as selected by user. In this case the state search period is shown in the tooltip.
- cold state start as a warm state in the selected search period could not be found. In this case the module instance id and the state search period are shown in the tooltip.
- no state icon: default state start. No specific state start selected by user.

The tables in the display tabs can be sorted by clicking the headers of the columns.

Filter visible forecasts (available since build 18784)

For each table in the display tabs the list of visible forecasts can be filtered using the buttons next to the table. First select the text to use as a filter. Either click on a table cell to select all text in that cell (the selected cell will be recognisable since it has no gray background, as opposed to the other cells in the selected table row). Or click and drag inside a table cell to select part of the text in that cell (the selected text will be highlighted). Then click the 'Filter By Selection' button to filter the list of visible forecasts on the selected text. After filtering only forecasts that contain the filter text in the corresponding column will be visible. Repeat this process to use multiple filters.

For example, after filtering on the selected text 'Thames' in the 'Workflow' column, only forecasts that have a workflow name that contains 'Thames' will be visible (like e.g. 'Thames_Forecast' and 'Thames_Update').

It is also possible to use a displayed icon as a filter. First click on a table cell that contains an icon. Then click the 'Filter By Selection' button to filter the list of visible forecasts on the selected icon. After filtering only forecasts that have the same icon in the corresponding column will be visible. This can be used for instance to filter only approved forecasts.

To remove the filters, click the 'Remove Filter' button. All forecasts in the table will be visible again.

Forecast Overview tab

The Forecast Overview tab allows for:

- Downloading individual forecasts from the Central Database
- · Redownloading individual forecasts from the Central Database under another synchronisation profile
- Selecting a forecast and adding it to the forecast filter in FEWS Explorer
- Rerunning a forecast

	TO	Dispatch time	Workflow	What-if scenario	Descripti	FDO	
	28-04-2008 02:00:00	28-04-2008 02:30:00 I			Fluvial Forec		Download
	28-04-2008 00:00:00	28-04-2008 00:30:02 F	Fluvial_Forecast		Fluvial Forec		Filter By Selection
	27-04-2008 22:00:00	27-04-2008 22:30:00 F	Fluvial_Forecast		Fluvial Forec		Filter by Selection
	27-04-2008 20:00:00	27-04-2008 20:30:01 F	Fluvial_Forecast		Fluvial Forec		Remove Filter
X)	27-04-2008 18:00:00	27-04-2008 19:00:04	Coastal_Forecast		Coastal fore		
	27-04-2008 18:00:00	27-04-2008 18:30:04 F	Fluvial_Forecast		Fluvial Forec	-	
ecast	s in Local Datastore						
	то	Dispatch time	Workflow	What-if scenario	Description	FDO	1
		28-04-2008 06:30:05		r mat in ocontaino	Fluvial Forecast		Open
		28-04-2008 06:03:08	-		test_GB_prea		Run
		28-04-2008 04:30:04	-		Fluvial Forecast		
1		28-04-2008 02:00:02	-		Fluvial Historica	-	Redownload
- 8		28-04-2008 01:00:01	-		Coastal forec		
		ent fully succesfull Fluy					Filter By Selection
	25-04-2008 14:0 Cold	state start as a warm	state in the default search pe	riod could not be found for	GA_ISIS_tsev_State	eRun (and 1 mo	ore)
	25-04-2008 12:00:00	25-04-2008 13:00:04	Coastal_Forecast		Coastal forec		Remove Filter
	25-04-2008 12:00:00	25-04-2008 12:30:03	Fluvial_Forecast		Fluvial Forecast	t	
	24-04-2008 16:00:00	25-04-2008 02:00:01	Fluvial_Historical		Fluvial Historica	ıl	
	22-04-2008 10:00:00	22-04-2008 10:30:00	Fluvial_Forecast		Fluvial Forecast	t	
	22-04-2008 08:00:00	22-04-2008 08:38:06	Fluvial_Forecast		Fluvial Forecast	t	
~ 8	22-04-2008 06:00:00	22-04-2008 07:00:02			Coastal forec		
\sim x	21-04-2008 16:00:00						

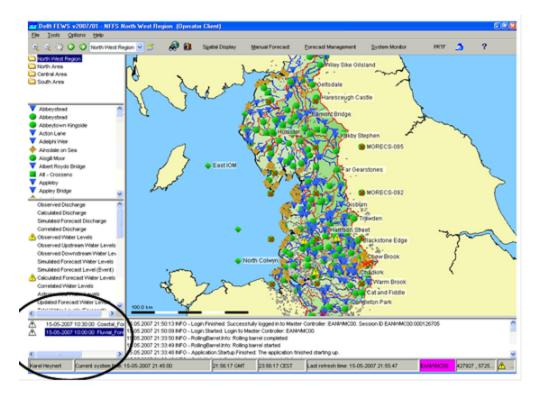
When moving the mouse over the forecast list a tool tip indicates whether the forecast has been fully successful or not.

Adding workflows to forecast list box of FEWS Explorer

When the tab is opened, the forecasts that are available in the Local Data store are displayed in the lower listing. Forecasts can be selected with the mouse and made available in the *Forecast List Box* of FEWS Explorer for review and analysis by pressing [**Open**].

Please note that only forecasts that are visible in the forecast filter box of the FEWS Explorer can be viewed and edited with the Data Display and Editor. The current forecast is an exception, because it's always shown in the Data Display and -Editor, but not displayed in the forecast filter box.

All forecasts listed in the forecast filter box can be removed from the display (not from the local data store) by clicking the right mouse button with the cursor placed in the list box. A button appears with 'Remove all'. Pressing this button will remove the list of forecasts from the filter box.



Rerun a forecast

A forecast can be rerun by pressing the [**Run**] button after selecting the forecast form the forecast list. The selected forecast will be completely rerun and saved as a new forecast in the data base. This option can be useful when rerunning an Archived Forecast.

Download a forecast from Central Database (only in OC)

Forecasts that are available in the Central Database, but not in the Local Data store are listed in the *top* panel. Forecasts can be selected with the mouse and downloaded to an OC by pressing [**Download**].

Please note that the download may require some time. When downloaded the forecast will be visible in the lower listing.

Redownload a forecast from Central Database (only in OC)

When logged in, the Operator Client (OC) allows for different synchronisation profiles to be used. If an individual forecast has been downloaded in the past under a minimal synchronisation profile, then only part of the data may have been downloaded. To download all data for such a forecast, log in under a full synchronisation profile, select the forecast in the lower listing with the mouse and redownload all data for the forecast to the OC by pressing [**Redownload**].

Please note that redownloading may require some time. After redownloading the forecast will still be visible in the lower listing.

Current Forecast tab

A few definitions are required at the start of this section:

Current Forecast

The Current Forecast is a combination of forecasts made for the whole region, which together form the current forecast. The current forecast is automatically downloaded to OCs. Location related icons are refreshed on the basis on the current forecast. The current forecast is always displayed in the Data Editor and -Display.

Approved Forecast

Approved Forecasts have been approved by the system or manually by an FDO to become the Current Forecast. The latest Approved Forecast is the Current Forecast.

Other Forecasts

Besides Approved Forecasts, the system may be populated with other forecasts that are the result of manual or scheduled forecasts with or without application of what-if scenarios.

Under normal conditions the Current Forecast will be updated automatically by the system on the basis of the results of a successfully completed scheduled forecasting run. There is always a Current Forecast that covers the whole region: all fluvial and coastal forecasting locations. The forecasts that together form the Current Forecast are listed in the *upper* table of the tab. These forecast are marked with the icon

A forecaster can amend the Current Forecast by replacing it partly or fully with the results individual forecast runs. These 'other' forecasts can for example be the result of running what-if scenarios. The Current Forecast tab allows for selection of individual forecasts that should become part of the Current Forecast.

To change the Current Forecast, select a forecast run that should become part of the Current Forecast in the *lower* column of the tab. Upon pressing [Approve] the selected forecast will become part of the Current Forecast.

	t Forecasts					
nt Forecasts						
TO	Dispatch time	Workflow	What-if scenario	Description FDC	Filter B	y Selection
A	:00 28-04-2008 06:30:05	-		Fluvial Forec		
	:00 28-04-2008 02:00:02	-		Fluvial Histori	Remo	ove Filter
💥 28-04-2008 00:00	00 28-04-2008 01:00:01	Coastal_Forecast		Coastal forec		
asts in Local Datastore	[1	1			
TO	Dispatch time	Workflow	What-if scenario	Description FDC	<u> </u>	prove
	:00 28-04-2008 06:30:05	-		Fluvial Forec		
	00 28-04-2008 06:03:08			test_GB_pre Gerben	Boot Filter B	y Selection
	:00 28-04-2008 04:30:04			Fluvial Forec	Barris	ove Filter
27-04-200 approved fully succesfull test_GB_preapprove_true, Fluvial Histori					Rem	ove Hitter
28-04-200 Default state start (No specific state start selected by user) 25-04-2008 14:00:00 25-04-2008 14:55:13 Fluvial Forecast				Coastal forec	De et	
		-		test gb no pr Gerben		
A COMPANY AND A CO	00 25-04-2008 14:34:58 00 25-04-2008 13:00:04	-		fluvial_test_gb_Gerben Coastal forec	DUUL	
	1:00 25-04-2008 13:00:04 1:00 25-04-2008 12:30:03	-		Fluvial Forec		
	00 25-04-2008 02:00:01	-		Fluvial Histori		
	00 22-04-2008 10:30:00	-		Fluvial Forec		
	00 22-04-2008 08:38:06	-		Fluvial Forec		
	00 22-04-2008 07:00:02	-		Coastal forec		
🕻 🔀 22-04-2008 OB:OD	:00 22-04-2008 02:00:01			Fluvial Histori		
		The first in the formed and				

In the list of forecasts that together form the Current Forecast, 'overlapping' forecasts may be displayed. A forecaster may for example run a what-if scenario for *part* of a catchment for which already an automatic forecast has been made that is part of the Current Forecast. When the forecast with the what-if scenario should now become part of the Current Forecast it can be selected in the *lower* table of the Current Forecast tab and with [Approve] moved to the *upper* table. The *upper* table now displays both forecast runs: the original forecast whole catchment and the forecast with the what-if scenario for part of the catchment. The system will override the data of the original workflow for the part of the catchment that has been rerun when presenting the Current Forecast.

Forecast Expiry Time tab (available since build 19708)

The Forecast Expiry Time tab allows for:

- Deleting individual forecasts from the Central Database
- Changing the expiry time of individual forecasts in the Central Database

Deleting a forecast from the Central Database (only in OC)

When logged in, forecasts that are available in the Central Database are listed in the table. Please note that only forecasts for which the user has delete permission are visible in the table. Forecasts can be selected with the mouse and marked for deletion by pressing [**Delete**]. Forecasts marked for deletion will be deleted in the next rolling barrel run. Only forecasts for which the user has delete permission can be deleted.

Changing the expiry time of a forecast in the Central Database (only in OC)

When logged in, forecasts that are available in the Central Database are listed in the table. Please note that only forecasts for which the user has delete permission are visible in the table. The expiry time of each forecast is visible in the Expiry Time column. When the expiry time of a forecast has passed, the forecast will be deleted from the Central Database. Forecasts that will expire within 10 days are displayed in strikethrough text in the table.

To change the expiry time of individual forecasts, select the forecasts in the table with the mouse and press [Change Expiry Time]. In the dialog that appears, select a new expiry time and press [Apply] to change the expiry time of the selected forecasts. The expiry time can only be changed for forecasts for which the user has delete permission.

	s in Central Database	4					1	-	
	то	Dispatch time	Workflow	What-if scenario	Desc	FDO	Expiry Time	Change B	xpiry Time
	× · · · · · · · · · · · · · · · · · · ·	07 00 2007 14:40:03	WMW_default_seenari				06 12 2007 14:40:03		
	T	44 12 2007 10:48:03	WMW_default_seenari				43 03 2008 10:48:03	De	lete
	• • • • • • • • • • • • • • • • • • • •		WMW_default_soenari				42 06 2008 13:07:12		
	06-06-2008 12:00:00		WMW_default_scenari				04-09-2008 12:55:55	Filter By	Selection
X	-		WMW_default_scenari				09-09-2008 08:37:41	Ramo	/e Fitter
	T		WMW_default_scenari				09-09-2008 09:48:22	NBMO	/e-miller
	-		WMW_default_scenari				09-09-2008 11:03:12		
			WMW_default_scenari		test simone :	tevils user	03-02-2009 12:39:47		
	01-08-1970 00:00:00	07-08-2008 133 Char	ige Expiry Time				13:08:29		
	01-01-1970 01:00:00	07.09.2009.43					- 1 12:44:40		
	01-08-1970 00:00:00	Cha	nge expiry time from 0	9-09-2008 08:37:41	to \$9-09-200	8 09:00:00	12:49:11		
	01-08-1970 00:00:00						13:32:51		
	01-01-1970 00:00:00				Appl	. [] .	ancel 13:31:37		
	01-08-1970 01:00:00				Appr	y _ u	16:18:58		
	-		WMW modified Rece	test MV Beokbury × 2	test MV char	feves user	16-02-2009 16:35:50		
	•		WMW_modified_Rece				16-02-2009 16:47:19		
	-		WMW_modified_Rece		test MV sime		16-02-2009 17:08:55		
	•								

Display configuration

It is possible to add display configuration for forecast management, for more information click here.

08 System Monitor

- 07 Forecast Manager
 - System Monitor
 - Log Browser
 - Query definition
 - Acknowledging messages
 - Debug messages
 - Live System Status
 - Scheduled Forecasts
 - Running Forecasts
 - Batch Forecasts
 - Synchronisation Status
 - Synchronisation Monitor
 - Import Status

System Monitor

The System Monitor display allows for viewing the status of the system. The behaviour of the System Monitor is different depending on the use of the system, i.e. whether you are using the system in Stand Alone mode or as an Operator Client.

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In the *Standalone* mode the System Monitor will display the Log Browser and Batch Forecast tab. On overview of the tabs available in the System Monitor of a Standalone system is illustrated below.

09 What-if Scenario Display

cog growser	Batch Eorecasts Impor	t Status					
Log level	Log creation time	Even	Code)(Log Message	baskRu	unid
WARN	15-05-2007 22:15:41	GA Execution Mo	del.Warn	Warn in adapter model:	Not enough SMD MORECS data	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	delWarn	Warn in adapter model:	Not enough SMD MORECS data	7_11	
VKARN	15-05-2007 22:15:41	GA Execution Mo	del.Warn	Warn in adapter model:	***Low Briery- Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	delWarn	Warn in adapter model:	Not enough SMD MORECS data	7_11	
VKARN	15-05-2007 22:15:41	GA Execution Mo	del.Warn	Warn in adapter model:	Southwaite Bridge- Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	delWarn	Warn in adapter model:	Harraby Green- Error Generating SMD	7_11	
VKARN	15-05-2007 22:15:41	GA Execution Mo	delWarn	Warn in adapter model:	Sheepmount- Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	del/Warn	Warn in adapter model:	Not enough SMD MORECS data	7_11	
VKARN	15-05-2007 22:15:41	GA Execution Ma	delWarn	Warn in adapter model:	Kirby Stephen- Error Generating SMD	7_11	
ERROR	15-05-2007 22:15:41	TaskRun Failed		Task Fluvial_FastRespo	nse_Forecast with D 7_11 failed : null	7_11	
WARN	15-05-2007 22:15:41	GA Execution Ma	del.Warn	Warn in adapter model:	Appleby- Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	del.V4am	Warn in adapter model:	Not enough SMD MORECS data	7_11	
WARN	15-05-2007 22:16:41	GA Execution Ma	del.Warn	Warn in adapter model:	.Temple Sowerby- Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	del.V4am	Warn in adapter model:	Not enough SMD MORECS data	7_11	
WARN	15-05-2007 22:16:41	GA Execution Ma	del.Warn	Warn in adapter model:	Udiford- Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	del.Wiern	Warn in adapter model:	Not enough SMD MORECS data	7_11	
WARN	15-05-2007 22:16:41	GA Execution Ma	del.Warn	Warn in adapter model:	Great Carby-Error Generating SMD	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	del.Wiern	Warn in adapter model:	Not enough SMD MORECS data	7_11	
WARN	15-05-2007 22:15:41	GA Execution Ma	del.Warn	Warn in adapter model:	Greenholme- Error Generating SMD	7_11	
VKARN	15-05-2007 22:15:41	GA Execution Mo	del.Warn	Warn in adapter model:	Not enough SMD MORECS data	7_11	
WARN	15-05-2007 22:15:41	GA Execution Mo	del.Warn	Warn in adapter model:	Not enough SMD MORECS data	7_11	
VKARN	15-05-2007 22:15:41	GA Execution Mo	delWarn	Warn in adapter model:	Not enough SMD MORECS data	7.11	
Log creation	time						Refresh
End time	15-05-2007 22:21:3	30 🔅	Log level		VWARN	_	
View period	day	2 🗘	Egternal event	code		- Al	cknowledge
Refresh geri	odically		Max number of	messages displayed	250 🗘		Save

In an Operator Client the System Monitor will show a number of tabs for monitoring various aspects of the live system. On overview of the tabs available in an Operator Client when logged into a live system is illustrated below.

🖌 System M	onitor				
.og Browser	Live System Status	Scheduled Forecasts Runnin	g Forecasts Synchronisatio	n Status Synchronisation Monitor Import S	tatus
Log level	Log creation time	Event Code)[Log Message	taskRunid
NF0	15-05-2007 22:03:52	RollingBarreUnto	Rolling barrel co	ompleted	EANAMIC00.000126
INF0	15-05-2007 22:03:51	RollingBarrel.into	Rolling barrel st	tarted	EAN/M/C00.000126
NF0	15-05-2007 21:50:13	Login Finished	Successfully lo	gged in to Master Controller : EANVMC00. Set	ssion ID EAN EANAMICOD.000126
INF0	15-05-2007 21:50:10	Login.Started	Login to Master	Controller: EAN/MICOD	EAN/M/C00.000126
NF0	15-05-2007 21:48:48	ForecastingShell.Comple	eted Forecasting sh	ell completed successfully.	EAM/M/C00.000126
NF0	15-05-2007 21:48:48	TaskRun Completed	Task ImportExte	ernal with ID EANWMC00:000126704 complete	d in 0 minute EAN/M/CO0.000126
N*0	15-05-2007 21:48:48	Workflow ActivityCompl	leted Workflow Impo	artExternal completed in 0 minutes and 13 sec	ands EANMACOD.000126
NF0	15-05-2007 21:48:48	EventCrossingModule.C	ompleted event crossing	module completed	EAN/MC00.000126
NF0	15-05-2007 21:48:48	ForecastingShell.Synch/	Started Outgoing synch	monization started.	EAN/M/COD/000126
NF0	15-05-2007 21:48:48	EventCrossingModule.St	tarted event crossing	module started	EAN/MICO0.000126
NFO .	15-05-2007 21:33:50	RollingBarreUnto	Rolling barrel or	angleted	EAN/W/C00.000126
NF0	15-05-2007 21:33:49	RollingBarrel.info	Rolling barrel st	tarted	EAN/MICO0.000126
NF0	15-05-2007 21:33:49	Application.Startup Finis	thed The application	finished starting up.	EAN/W/C00.000126
NF0	15-05-2007 21:33:49	Gui Initialized	Graphical user	interface initialized.	EANAMIC00.000126
ERROR	15-05-2007 21:33:47	DataStore.Error	Can not find de	fault config file DefaultModuleInstanceDatase	ts Northwest EAN/M/C00.000126
ERROR	15-05-2007 21:33:47	DataStore Error	Can not find de	fault config file DetautModuleInstanceDataset	Is Northwest EANAMC00.000126
ERROR	15-05-2007 21:33:47	DataStore.Error	Can not find de	fault config file DefaultModuleInstanceDatase	Is Report_Ex EAN/M/C00.000126
ERROR	15-05-2007 21:33:47	DataStore Error	Can not find de	fault config file DefaultModuleInstanceDataset	Is Report_Ex EANAMC00.000126
ERROR	15-05-2007 21:33:47	DataStore Error	Can not find de	fault config file DefaultModuleInstanceDataset	Is Report_Ex EAN/MICOD000126
NF0	15-05-2007 21:33:46	Session Created	Operator Client		none
INFO	15-05-2007 21:33:46	Configuration.Check.Fini	ished Check of config	juration finished.	EAN/MC00.000126
NF0	15-05-2007 21:33:44	LocalDataStore.Info	22 MB expired t	time series data	none
Log creation (time				Befresh
End time	15-05-2007 22:1	7:45 🗘 L <u>og</u>	level	INFO 2	v
View period	day	🖌 2 🗘 Egte	rnal event code		Acknowledge
Refresh geric	dically	Max Max	number of messages display	ed 250	Save
					Gose Help

Each of the System Monitor tabs is detailed in the following paragraphs.

Log Browser

The Log Browser contains a spreadsheet like form with a list of system messages. Messages can be sorted based on user defined criteria. Fatal and severe system errors can be acknowledged as being reviewed by the forecaster. If all errors within the past 48 hours are acknowledged the system status icon at the lower right of the FEWS explorer will become green again.

With [Refresh] the browser is updated with new messages in the system. Please note that the query settings (see below) define what messages will be displayed. With [Close], a user can leave the Log Browser.

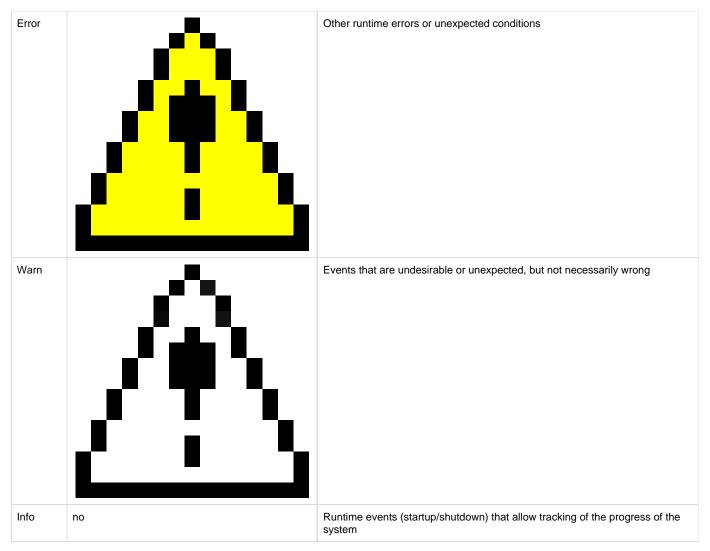
og Browser	Live System Status	Schedules	Forecasts	Running Forecasts	Synchronisation Stat	us Synchronisation	Monitor Import Status		
Log level	Log creation time		Even	t Codie	Construction of the second	Log Messag	e	taskR	Runid W
WARN	13-04-2006 14:12:33	Val	dation HardL	int	: Hard limit violated to	or Observed Water Li	evels at Watton	EATHMOD	0.000036
VICARIN	13-04-2006 14:12:33	Val	dation.SoftLi	mt	: Soft limit violated for	Observed Downstr	eam Water Levels at Deniham	M. EATHMCO	0.000036
WARN	13-04-2006 14:12:32	Val	dation SoftLi	mt	: Soft limit violated for	r Observed Downstr	eam Water Levels at Denham	M. EATHMCO	0.000036
WARN	13-04-2006 14:42:32	Vali	dation SoftLi	mit	: Soft limit violated for	r Observed Downstr	eam Water Levels at Denham	M. EATHMOD	00.000036
WARN	13-04-2006 14:42:31	Val	dation Hardl,	int	Hard limit violated to	or Observed Tail Wat	er Levels at Sonning Lock Ta	EATHMC0	0.000036
WARN	13-04-2006 14:42:31	Val	dation HardL	int	: Hard limit violated to	or Observed Tail Wat	er Levels at Sonning Lock Ta	EATHMC0	0.000036
WARN	13-04-2006 14:42:31	Val	dation.SoftLi	mt	: Soft limit violated for	Closerved Downstr	eam Water Levels at Deniham	M. EATHMCO	0.000036
WARN	13-04-2006 14:42:31	Val	dation HardL	int	: Hard limit violated for	r Observed Tail Wat	er Levels at Sonning Lock Ta	EATHMC0	00.000036
WARN	13-04-2006 15:13:10	The	eshold.UpCro	ssing	Threshold event cros	sing at 1501TH_T: St	tandby for Correlated Water L	ev. EATHMCO	0.000036
WARN	13-04-2006 15:12:46	Val	dation SoftLi	mt	: Soft limit violated for	r Observed Downstr	eam Water Levels at Deniham	M EATHMCO	0.000036
VKARN	13-04-2006 15:12:45	Val	dation.SoftLi	mt	: Soft limit violated for	r Observed Downstr	eam Water Levels at Denham	M. EATHMCO	0.000036
WARN	13-04-2006 15:12:45	Val	dation Hardi,	init	: Hard limit violated to	or Observed Tail Wat	er Levels at Godistow Lock T	al EATHMCC	00.000036
VICARIN	13-04-2006 15:12:45	Val	dation Hard,	init	: Hard limit violated to	or Observed Head W	ater Levels at Godstow Lock	EATHMCO	00.000036
WARN	13-04-2006 15:12:44	Val	dation Hard,	Init	: Hard limit violated for	or Observed Tail Wist	er Levels at Shifford Lock Ta	EATHMC0	0.000036
WARN	13-04-2006 15:12:44	Val	dation Hand,	init.	Hard limit violated for Observed Tail Water Levels at Sonning Lock Tail				00.000036
WARN	13-04-2006 15:12:44	Val	dation Hard,	init	: Hard limit violated to	or Observed Head W	ater Levels at Shifford Lock	EATHMCO	0.000036
WARN	13-04-2006 15:43:01	Three	eshold UpCro	asing	Threshold event cros	sing at 2497TH_T: St	tandby for Correlated Water L	.ev. EATHMCO	00:000036
WARN			: Soft limit violated for Observed Downstream Water Levels at Denham M.				00.000036		
WARN	13-04-2006 16:12:36	Val	dation HardL	int	: Hard limit violated for Observed Water Levels at Waton				00.000036
WARN	13-04-2006 16:12:36	Val	dation Hard,	init	: Hard limit violated for Observed Discharge at Waton				00 000036
WARN	13-04-2006 16:12:36	Val	dation SoftLi	mit	: Soft limit violated for Observed Downstream Water Levels at Denham Mi.				00.000036
WARN	13-04-2006 16:12:35	Val	dation.SoftLi	mđ	: Soft limit violated fo	r Observed Downstr	eam Water Levels at Denham	M EATHMCO	0.000036
og creation t	lime		1.4.4	1					Retresh
Ind time	14-04-2006 1	2:13:45	0	Log level		VAARN	~		sknowledge
View period	day	*	10	Esternal event co	de				Contraction of the
Refresh perk	odically			Max number of m	essages displayed		250 🗘		: Sava

Upon opening, the same information is displayed as in the Log Viewer. Per message, the Log Browser provides the following information:

- Log level (see table above)
 Log creation time
 Event code (see Appendix A for listing)
- Log message (description)
 taskRunId

The following type of system messages are identified in the table below.

Log level	Icon	Description
Fatal		Severe errors that cause premature termination



The Log Messages can be sorted by clicking on the header of a column.

Double click a message to view the message details (see example below). The message can then be saved to file or printed.

🖥 NFFS NorthEast Region. Version 07.00, July 2005:Logging - Message Details 🛛 🛛 🗃
evet WARN Creation time: 13-09-2005 07:27:35 Event type Validation HardLinit
KARN
13-09-2005 07:27:35
NE_MC00.000048474 Validation HardLinit
Hard limit violated for Observed Wind Speed at High Mowthorpe
a na a na manana na sanan na manan aga an aga mananan fili
Country Date Class
Save Aa Print Close

Query definition

A query can be defined to select a subset of the messages to be displayed in the Log Browser. The following options are available:

Loglevel
 A log level from the dropdown list and all messages with a higher alert level will be displayed This means that for example selection of

INFO shows all messages and selection of FATAL shows only messages with log level FATAL.

• Log creation time

Messages can be displayed that have been created within a given period of time. The period is defined by entering an *end time* and the length of a *view period* in hours preceding the *end time*.

- Event code
- By entering symbols in this field, only messages will be displayed starting with the symbols entered by the user.
- Token in Message
- By entering symbols in this field, only messages will be displayed that include the symbols entered by the user.

The display will be updated on the basis of the user defined query upon pressing [Refresh].

Acknowledging messages

🗳 System M	onitor			
Log Browser	Live System Status	Scheduled Ecrecasts Running Forecasts	s Synchronisation Status Synchronisation Monitor Import Status	
Log level	Log creation time	Event Code	Log Message	taskRunid
NF0	15-05-2007 22:03:52	RolingBarreUnto	Rolling barrel completed	EANAMICO0.000126
INFO .	15-05-2007 22:03:51	RollingBarrel.into	Rolling barrel started	EANMMC00:000126
NFO	15-05-2007 21:50:13	Login Finished	Successfully logged in to Master Controller : EANWAMC00. Session ID EAN	EANMMC00.000126
NFO	15-05-2007 21:50:10	Login.Started	Login to Master Controller: EAN/MMC00	EAN/MICOD/000126
NF0	15-05-2007 21:48:48	ForecastingShell.Completed	Forecasting shell completed successfully.	EANAMICOD.000126
NF0	15-05-2007 21:48:48	TaskRun Completed	Task ImportExternal with ID EAN/VMC00:000128704 completed in 0 minute	EAN/MC00.000126
N*0	15-05-2007 21:48:48	Workflow ActivityCompleted	Workflow ImportEdernal completed in 0 minutes and 13 seconds	EAN/M/COD/000126
NF0	15-05-2007 21:48:48	EventCrossingModule.Completed	event crossing module completed	EAN/MICOD/000126
NF0	15-05-2007 21:48:48	ForecastingShell.SynchStarted	Outgoing synchronization started.	EAN/M/COD/000126
NF0	15-05-2007 21:48:48	EventCrossingModule Started	event crossing module started	EANAMICO0.000126
NF0	15-05-2007 21:33:50	RolingBarreLinto	Roling barrel completed	EAN/M/COD/000126
NF0	15-05-2007 21:33:49	RollingBarrel.info	Rolling barrel started	EANAMICO0.000126
NFO .	16-05-2007 21:33:49	Application.Startup Finished	The application finished starting up.	EAN/M/COD/000126
NF0	15-05-2007 21:33:49	Gui Initialized	Graphical user interface initialized.	EANAMICO0.000126
ERROR	15-05-2007 21:33:47	DataStore.Error	Can not find default config file DefaultModuleInstanceDatasets Northwest	EAN/M/COD/000126
ERROR	15-05-2007 21:33:47	DataStore Error	Can not find default config file DefaultModuleInstanceDatasets Northwest	EANAMICOD.000126
ERROR	15-05-2007 21:33:47	DataStore.Error	Can not find default config file DefaultModuleInstanceDatasets Report_Ex	EAN/M/COD/000126
ERROR	15-05-2007 21:33:47	DataStore Error	Can not find default config file DefaultModuleInstanceDatasets Report_Ex	EANAMICOD.000126
ERROR	15-05-2007 21:33:47	DataStore.Error	Can not find default config file DefaultModuleInstanceDatasets Report_Ex	EAN/M/COD/000126
NF0	15-05-2007 21:33:46	Session Created	Operator Client	none
NF0	15-05-2007 21:33:46	Configuration Check Finished	Check of configuration finished.	EAN/M/COD/000126
NF0	15-05-2007 21:33:44	LocalDataStore.Info	22 MB expired time series data	none
Log creation 1	time			Befresh
End time	15-05-2007 22	17:45 Cog level	NFO 💌	
View period	døy	2 C Eglernal event o	code	Acknowledge
Refresh geric	odically	Max number of	messages displayed 250 🗘	Save
			0	ose Help

All messages having a level ERROR or FATAL should be acknowledged to identify that the message has been seen and appropriate action taken.

A message having a level WARN can be acknowledged as well but is only needed to remove the opaque warning icon in the status bar if in the explorer.xml <showlconForUnacknowledgedWarnings>true</showlconForUnacknowledgedWarnings> is configured which is false by default. See showlconForUnacknowledgedWarnings.

Double click the icon to acknowledge a message or click the Acknowledge button. Multiple messages may also be selected and acknowledged in a single action.

To select all messages that have not been acknowledged select the 'not acknowledged' item in the Log Level selection box,, then refresh the log messages.

Tip: to quickly select all messages, click on a single message and hit [ctrl-A]

When all ERROR messages are acknowledged, the status icon in explorer will change to green (or opaque when showlconForUnacknowledgedWarnings is true).

	1100	1	1	1	1		1
Logging Bri	INCO						×
[off-evel	logCreationTime	eventCode		ine in the second se	Message		
A ERROR	2004-05-09 19:41	Workflow ActivityFalled	Activity (STF_Stillebri		processingle		
og A spece	2004-05-09 19:41	GA.Execution Failed	Execution of souther				- 21
ERROR	2004-05-09 19:41	Workflow ActivityFailed	Activity (STF_Roman				
A ERROR	2004-05-09 19:41	GA Execution Failed	Execution of souther				
ERROR	2004-05-09 19:41	Workflow ActivityFailed	Activity (STF_Cross)	andsDrive) failed			
A ERROR	2004-05-09 19:41	GA.Execution Failed	Execution of souther	mTF.exe tailect {1}.			
Y A ERROR	2004-05-09 19:41	GA.Execution Failed	Execution of souther	mTF.exe tailect {1}.			
00 A ERROR	2004-05-09 19:41	Workflow ActivityFailed	Activity (STF_Milloro	ok) failed			
AC RRROW	2004-05-09 19:41	Workflow ActivityFailed	Activity (STF_Isrield)	tailed			
NORRE A	2004-05-09 19:41	GA.Execution Failed	Execution of souther	nTF.exe tailect {1}.			
VWW/8N	2004-05-09 19:41	Validation Limit	: Hard / Soft limit viol	lated for parameter Obse	rved Downstream Wat	er Levels at Uckfield Mill	
🕫 🙆 ERROR	0004-05-09 19:40	Workflow ActivityFailed	Activity (Report_Stat	tusfforecastMap) failed			
VNARN	2004-05-09 13:40	TE.102	Threshold event cros	ssing H1 for Observed W	later Levels at Porters.	Time 05.05.2004 09:00:00	
DNADN ON	2004-05-06 (2:40	TE.101	Threshold event cros	ssing H1 for Observed W	later Levels at Porters.	Time 06.05.2004 00:45:00	
in WARN	2004-05-09 19:40	TE.102	Threshold event cros	ssing H1 for Observed V/	later Levels at East Far	rleigh d/s. Time 05.05.2004 04	:3
WARN	2004-05-09 19:40	TE.102	Threshold event cros	ssing H1 for Observed Vi	ater Levels at Denton R	PS. Time 05:05:2004 01:45:00	()
OP WARN	2004-05-09 19:40	16.402	Threshold event cros	ssing H1 for Observed Vi	ater Levels at Denton R	PS. Time 05:05:2004 17:00:00	
UC WARN	2004-05-09 19:40	TE.101				PS. Time 05.05.2004 18:45:00	
Y WARN	2004-05-09 19:40	TE.102				PS. Time 05.05.2004 19:19:00	
ed WARN	2004-05-09 19:40	TE.101				PS. Time 05.05.2004 21:00:00	
TO WARN	2004-05-09 19:40	TE.102				PS. Time 05.05.2004 21:16:00	
WARN	2004-05-09 19:40	TE.101				PS. Time 05.05.2004 23:00:00	
WARN	2004-05-09 19:40	TE.101				PS. Time 06.05.2004 01:30:00	
WARN	2004-05-09 19:40	TE.101				PS. Time 05:05:2004 12:30:00	
VWARN VE NUMBER	2004-05-09 19:40	TE.101	Threshold event cros			PS. Time 06:05:2004 03:15:00	
at		ation time					_
d٦						a	
trv	End tim	e 2004-05-09 20:2		Log level	WA	RN	-
YR	View p	eriod day	N 1-2	External event code			
πv				Max number of message:	a disclosed	51	ल्ल
				Hat manager of meaninger	a desheallen	L .	-
_					Refresh	Gose Help	
20:25:22	22:25:22	Stand alone	Last refres	h: 2004-05-09 20:22			
9		,	,			-	\sim
							1

Debug messages

Please note that a System Manager can configure the system to also provide *Debug Messages*. These are used to log application internal events for system development and management. Typical debug events are the creation of a database connection or exceptions that occurred due to programming or configuration errors. Debug messages are not displayed in the Log Viewer but only written to a log file called *log.txt* in the regional configuration folder.

Live System Status

The Live System Status tab is used to show the status of the live system. Three lists show the status of the:

- Currently dispatched forecasts (taskruns)
- Currently executing forecasts (taskruns)
- Status of the Master Controllers
- Status of the Forecasting Shells

The status lists show the currently configured master controllers and forecasting shells. From this list a user can see if the systems are Alive or if they are down.

💒 System Monitor					2
	Scheduled Forecasts Ro	rning Forecasts Synchro	nisation Status	Synchronisation Monitor Import Status	
Current TaskRuns					
	Status)[Count	
Currently Dispatched TaskRuns:			1		
Currently Executing TaskRuns:			1		
Status Master Controllers MCID EATHMC00		tetus		is Falover falce	
	S	tatus		Queue Length	
FSS ID		tatus own		Gueue Length 0	
Status Forecasting Shells FSS ID FSS00 FSS01 FSS02	Di A				

Scheduled Forecasts

The Scheduled Forecasts tab includes a list with all scheduled forecasts together with some information of these forecasts. The following information is included:

- Task ID: The Task ID is a unique ID generated by the Master Controller
- Description The description is given by the user that scheduled the forecast
- Workflow ID The Workflow ID is the id of the workflow that is scheduled. The workflow id's can include Forecasting Shell workflows and Master controller workflows.
- MC ID ID of the Master Controller where the task is scheduled on
- Priority This can be a high or normal priority
- Repeat Time The repeat time of the task in minutes
- Next Due Time The next time when the task is scheduled to run
- Task Status The status can be suspended or pending. Suspended tasks normally depend on an action to trigger them, such an action can be a threshold crossing.

EANVMC00:000 Daily Archive Run. Archive_Schedul. EANVMC00 Normal 1440 minutes 14.07.2006 00.15 Pending EANVMC00:000 Scheduled CURR Coastal_Forecast EANVMC00 Normal 360 minutes 13.07.2006 16:30 Pending EANVMC00:000 Daily database m Database_Mainte EANVMC00 Normal 1440 minutes 13.07.2006 15:45 Pending EANVMC00:000 Export current to Export_Current EANVMC00 Normal 1 minutes 19.03.2006 08:40 Suspender EANVMC00:000 Enhance Foreca Fluxial_FastResp EANVMC00 Normal 30 minutes 02.08.2006 16:00 Suspender EANVMC00:000 Enhance Foreca Fluxial_FastResp EANVMC00 Normal 30 minutes 02.08.2006 16:00 Suspender EANVMC00:000 Enhance Foreca Fluxial_FastResp EANVMC00 Normal 120 minutes 13.07.2006 18:00 Suspender EANVMC00:000 Schedule CURRE. Fluxial_FastResp EANVMC00 Normal 120 minutes <th>EANVMC00.000 Dail EANVMC00.000 Sch EANVMC00.000 Exp EANVMC00.000 Exp EANVMC00.000 Erh EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch</th> <th>y Archive Run eduled CURR y database m ort current fo ance Foreca ance Foreca edule CURRE y State Run</th> <th>Archive_Schedul Coastal_Forecast Database_Mainte Export_Current Fluvial_FastResp. Fluvial_FastResp. Fluvial_Forecast</th> <th>EANVMC00 EANVMC00 EANVMC00 EANVMC00 EANVMC00 EANVMC00</th> <th>Normal Normal Normal Normal Normal</th> <th>1440 minutes 360 minutes 1440 minutes 1 minutes</th> <th>14.07.2006 00.15. 13.07.2006 16:30. 13.07.2006 15:45. 19.03.2006 08:40.</th> <th>Pending Pending</th>	EANVMC00.000 Dail EANVMC00.000 Sch EANVMC00.000 Exp EANVMC00.000 Exp EANVMC00.000 Erh EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch	y Archive Run eduled CURR y database m ort current fo ance Foreca ance Foreca edule CURRE y State Run	Archive_Schedul Coastal_Forecast Database_Mainte Export_Current Fluvial_FastResp. Fluvial_FastResp. Fluvial_Forecast	EANVMC00 EANVMC00 EANVMC00 EANVMC00 EANVMC00 EANVMC00	Normal Normal Normal Normal Normal	1440 minutes 360 minutes 1440 minutes 1 minutes	14.07.2006 00.15. 13.07.2006 16:30. 13.07.2006 15:45. 19.03.2006 08:40.	Pending Pending
EANVMC00:000 Scheduled CURR Coastal Forecast EANVMC00 Normal 360 minutes 13.07 2006 16:30 Pending EANVMC00:000 Daily database m Database_Mainte EANVMC00 Normal 1440 minutes 13.07 2006 15:45 Pending EANVMC00:000 Export current to Export_Current EANVMC00 Normal 1 minutes 19.03 2006 08:40 Suspender EANVMC00:000 Enhance Foreca Fluvial_FastResp EANVMC00 Normal 30 minutes 04.02 2006 12:45 Suspender EANVMC00:000 Enhance Foreca Fluvial_FastResp EANVMC00 Normal 30 minutes 02.06 2006 16:00 Suspender EANVMC00:000 Enhance Foreca Fluvial_FastResp EANVMC00 Normal 30 minutes 13.07 2006 16:00 Suspender EANVMC00:000 Schedule CURRE Fluvial_FastResp EANVMC00 Normal 14.07 2006 08:00 Pending EANVMC00:000 Schedule Import ImportExternal EANVMC00 Normal 30 minutes 13.07 2006 12:48	EANVMC00.000 Sch EANVMC00.000 Dail EANVMC00.000 Exp EANVMC00.000 Erin EANVMC00.000 Erin EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Sch EANVMC00.000 Mar	eduled CURR y database m ort current fo ance Foreca ance Foreca edule CURRE y State Run	Coastal_Forecast Database_Mainte Export_Current Fluvial_FastResp. Fluvial_Forecast	EANVMC00 EANVMC00 EANVMC00 EANVMC00 EANVMC00	Normal Normal Normal Normal Normal	360 minutes 1440 minutes 1 minutes	13.07.2006 16:30. 13.07.2006 15:45 19.03.2006 08:40	Pending Pending
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EANVMC00:000 Export_current_to Export_curre	EANVMC00.000 Exp EANVMC00.000 Exh EANVMC00.000 Exh EANVMC00.000 Sch EANVMC00.000 Dail EANVMC00.000 Sch EANVMC00.000 Mar	ort current fo ance Foreca ance Foreca edule CURRE y State Run	Export_Current Fluvial_FastResp Fluvial_FastResp Fluvial_Forecast	EAN/MC00 EAN/MC00 EAN/MC00	Normal Normal Normal	1 minutes	19.03.2006 08:40.	and the second second second second
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EANVMC00:000 Marked Record M MarkedRecordMa EANVMC00 Normal 60 minutes 03.10.2005 09.38 Suspender EANVMC00:000 Marked Record M MC:MarkedRecor EANVMC00 Normal 40 minutes 29.09.2005 12:36 Suspender EANVMC00:000 Rolling Barrel MC MC:RollingBarrel EANVMC00 Normal 40 minutes 13.07.2006 13:15 Pending EANVMC00:000 Scheduled Perfor PerformanceMoni EANVMC00 Normal 1440 minutes 14.07.2006 12:20 Pending EANVMC00:000 Scheduled Perfor PerformanceMoni EANVMC00 Normal 1440 minutes 13.07.2006 16:45 Pending EANVMC00:000 Rolling Barrel on			ImportExternal	EAN/VMC00	Normal	30 minutes	13.07.2006 12:48.	Pending
EANVMC00:000 Marked Record M MC:MarkedRecor EANVMC00 Normal 40 minutes 29.09.2005 12:36 Suspender EANVMC00:000 Rolling Barrel MC MC:RollingBarrel EANVMC00 Normal 40 minutes 13.07.2006 13:15 Pending EANVMC00:000 Scheduled Perfor PerformanceMoni EANVMC00 Normal 1440 minutes 14.07.2006 12:20 Pending EANVMC00:000 Rolling barrel on RollingBarrel_FS EANVMC00 Normal 1440 minutes 13.07.2006 16:45 Pending	EANVMC00:000 Mar	ked Record M	MarkedRecordMa.	EAN/MC00	Normal	60 minutes	03.10.2005 10:59.	Suspended
EAM/MC00:000 Rolling Barrel MC. MC:RollingBarrel EAM/MC00 Normal 40 minutes 13.07.2006 13:15 Pending EAM/MC00:000 Scheduled Perfor PerformanceMont EAM/MC00 Normal 1440 minutes 14.07.2006 12:00Pending EAM/MC00:000 Rolling barrel on RollingBarrel_FS EAM/MC00 Normal 1440 minutes 13.07.2006 16:45 Pending		ked Record M	MarkedRecordMa.	EAN/MC00	Normal	60 minutes	03.10.2005 09:38.	Suspended
EAN/MC00.000 Scheduled Perfor PerformanceMorilEAN/MC00 Normal 1440 minutes 14.07.2006 12:00	EAN/VMC00:000 Mar	ked Record M	MC:MarkedRecor	EAN/VMC00	Normal	40 minutes	29.09.2005 12:36.	Suspended
EAM/MC00:000 Rolling barrel on RollingBarrel_FS EAM/MC00 Normal 1440 minutes 13.07.2006 16:45 Pending	EAN/VMC00:000 Roll	ing Barrel MC	MC:RollingBarrel	EAN/VMC00	Normal	40 minutes	13.07.2006 13:15.	Pending
	EANVMC00:000 Sch	eduled Perfor.	PerformanceMoni.	EAN/MC00	Normal	1440 minutes	14.07.2006 12:00.	Pending
EAN/MC00:000 Rolling barrel on RollingBarrel_FS EAN/MC00 Normal 1440 minutes 14.07.2006 04:10 Pending	EANAMCOD:000 Roll	ing barrel on	RollingBarrel_FS	EAN/MC00	Normal	1440 minutes	13.07.2006 16:45.	Pending
	EANVMC00:000 Roll	ing barrel on	RollingBarrel_FS	EAN/MC00	Normal	1440 minutes	14.07.2006.04.10.	Pending
	EANVMC00:000 Roll	ing barrel on	RollingBarrel_FS	EAN/VMC00	Normal	1440 minutes	14.07.2006.04:10.	Pending

In the Scheduled Forecast tab a user can...

- Cancel a scheduled task by clicking [Cancel]
- Suspend a scheduled task by clicking [Suspend]
- Resume a suspended task by clicking [Resume]
- Pause a scheduled task for up to 5 of runs by clicking [Pause] and filling in the display that pops up (see below). You can undo the pausing by resetting the number of runs for which a task has been paused to '0'.

Pause Task	8
Pause task for 🧕	🔽 runs.
ок	Cancel

Please note that not all options are available for all workflows. A user can for example normally not cancel the current forecast and import runs runs scheduled by the super user. Also the status of system management workflows can normally not be changed by a user.

Running Forecasts

The Running Forecasts Tab includes a list with all tasks that are currently running on a Forecasting Shell. The list includes information on the task that is running and the Forecasting Shell it is running on.

From the example below can be seen that the first task is a Rolling Barrel task, running on the Master Controller. The second task is a Riverflow Forecast running on forecasting Shell FSS00.

System Monitor							×
Log Browser Live Sys	stem Status Scheduled Fore	casts Running Foreca	tts Synchronisation St	atus Synchronisation Monitor	Import Status		
TaskRun ID	Task ID	Description	Workflow ID	Dispatch Time	FSS ID	Stetus	
EATHMC00 000036781	EATHMC00:000036778_0		Fluvial_Forecast	14.04.2006 12:15:23 F	5502	Running	
EATHMC00.000036782	EATHMC00.000036778_1		Coastal_Forecast	14.04.2006 12:15:28	\$\$502	Running	
EATHMC00.000036783	EATHMC00:000036778_2		Motrix	14.04.2006 12:15:34 F	SS01	Running	
					2	ose Help	

This display is refreshed after each synchronisation of the Operator Client with the Master Controller.

A manually dispatched task can be killed by pressing on the 'Kill Running Task' button. Note that this is a hard process kill which may lead to corruption of the local datastore.

Batch Forecasts

The Batch Forecast tab will list the forecasts that have been submitted in the Manual Forecast display of a standalone system. You stop all submitted forecast runs by clicking [Stop].

System Monitor				
Log Browser Batch Eoreca	sts Import Status			
TO	Dispatch Time	Workflow	What-if scenario	Description
15-05-2007 16:45:00	15-05-2007 22:11:49	Fluvial_FastResponse_Forecast		
15-05-2007 17:45:00	15-05-2007 22:11:50	Fluvial_FastResponse_Forecast		
15-05-2007 18:45:00	15-05-2007 22:11:50	Fluvial_FastResponse_Forecast		
15-05-2007 19:45:00	15-05-2007 22:11:50	Fluvial_FastResponse_Forecast		
15-05-2007 20:45:00	15-05-2007 22:11:50	Fluvial_FastResponse_Forecast		
<u> </u>				
				Stop
				(Tob
			1	gose Help
			1	Tone Deb

Synchronisation Status

The Synchronisation Status tab provides the status of all synchronisation activities. For each synchronisation activity the following information is provided:

- · Activity: identifies the synchronisation activity
- Type: single or continuous. A single type activity is only started after certain manual actions
- Frequency: only applicable for continuous synchronisation activities. The frequency is given in minutes.
- Last Synch Time: the date and time the synchronisation activity has last taken place.
- Status: is either empty or shows 'synchronising', meaning that this activity is now synchronising.
- Progress: shows the number of records of the maximum number of records to synchronise. This field is only used for the activity being synchronised.

Activity ID Type Prequency LastSynchTime Status Prov Activity ID Generation single 0 14.04.2006 11:55.13 Activity ID Activity ID Status Prov Activity In Tasks continuous 60 14.04.2006 11:55.13 Activity ID			for import Status	asation Mon	Isabon Status Synchron	unning Forecasts Synch	tatus Scheduled Forecasts	Log Browser Live System 5
Activity In Tesks continuous 60 14.04.2006 12.15.38 Activity In FloodMaps single 0 14.04.2006 12.15.38 Activity In FloodMaps single 0 14.04.2006 11.55.13 Activity Out TimeStries single 0 14.04.2006 11.55.13 Activity Out TimeStries single 0 14.04.2006 12.15.41 Activity In TimesholdEvents continuous 180 14.04.2006 12.15.41 Activity In ManuaData continuous 180 14.04.2006 12.15.42 Activity In ManuaData continuous 180 14.04.2006 12.15.42 Activity In ManuaData continuous 60 14.04.2006 12.15.42 Activity In InportOridis continuous 180 14.04.2006 12.15.42 Activity In ImportOridis continuous 180 14.04.2006 11.54.51 Activity In ImportOridis continuous 180 14.04.2006 11.54.22 Activity In ImportOridis continuous 180 14.04.2006 11.54.21 Activity In Configuration continuous 300 14.04.2006 11.54.51 Activity In	gress	Prog	Status		LastSynchTime	Frequency	Type.	Activity ID
Activity in FloodMaps single 0 14.04 2006 11:55:06 Activity Out TimeSeries single 0 14.04 2006 11:55:06 Activity Out TimeSeries single 0 14.04 2006 11:55:13 Activity Out Whath/Scenarios single 0 14.04 2006 12:15:41 Activity In ManusDate continuous 180 14.04 2006 12:15:42 Activity In ManusDate continuous 180 14.04 2006 12:15:42 Activity In Forecasts single 0 14.04 2006 12:15:42 Activity In InportCirids continuous 60 14.04 2006 12:15:42 Activity In ForecastData single 0 14.04 2006 12:15:42 Activity In ForecastData single 0 14.04 2006 12:15:42 Activity In ForecastData single 0 14.04 2006 12:15:42 Activity In Configuration continuous 180 14.04 2006 12:15:42 Activity In Configuration continuous 3000 14.04 2006 12:15:42 Activity In Configuration continuous 3000 14.04 2006 12:15:43 Activity In ForeSes			1.000		14.04.2006 11:55:13		single	Activity Out OurrentForecast
Activity Out. TimeSeries single 0 14.04.2006 11:55:13 Activity Out. Whatt/Scenarios single 0					14.04.2006 12:15:38)	continuous	Activity In Tasks
Activity Out WhathScenarios single 0 Activity In ThresholdEvents continuous 180 14.04.2006 12.15.41 Activity In ThresholdEvents continuous 180 14.04.2006 12.15.42 Activity In AmnuBosta continuous 180 14.04.2006 12.15.40 Activity In AmnuBosta continuous 60 14.04.2006 12.15.40 Activity In Applications continuous 60 14.04.2006 12.15.43 Activity In IngortStratus continuous 180 14.04.2006 12.15.42 Activity In IngortStatus continuous 180 14.04.2006 12.15.42 Activity In Configuration continuous 180 14.04.2006 12.15.42 Activity In Configuration continuous 3600 14.04.2006 12.15.42 Activity In Configuration continuous 3600 14.04.2006 12.15.42 Activity In Configuration continuous 180 14.04.2006 12.15.42 Activity In Configuration continuous 180 14.04.2006 12.15.42 Activity In FlowsSessions single 0 14.04.2006 12.15.44 Activity In FlowsSest					14.04.2006 11:55:06		single	Activity In FloodMaps
Activity in ThresholdEvents continuous 180 14.04.2006 12.15.41 Activity in ManualData continuous 180 14.04.2006 12.15.41 Activity in Forecasts single 0 14.04.2006 12.15.42 Activity in Logistrines continuous 60 14.04.2006 12.15.42 Activity in ImportOridis continuous 60 14.04.2006 12.15.42 Activity in ImportOridis continuous 180 14.04.2006 12.15.42 Activity in ImportOridis continuous 3000 14.04.2006 12.15.42 Activity in ImportOridis continuous 3000 14.04.2006 12.15.52 Activity in EverySection continuous 180 14.04.2006 12.15.43 Activity in FerveSections single 0 14.04.2006 12.15.43 Activity in FerveSections single 0 14.04.2006 12.15.43 <					14.04.2006 11:55:13		single	Activity Out TimeSeries
Intervention Intervention Intervention Intervention Intervention Intervention Intervention							single	Activity Out What it Scenarios
Interview single 0 14.04 2006 12:15:40 Activity In LogGritries continuous 60 14.04 2006 12:15:40 Activity In LogGritries continuous 180 14.04 2006 12:15:42 Activity In InportSitus continuous 180 14.04 2006 12:15:42 Activity In InportSitus continuous 180 14.04 2006 12:15:42 Activity In Configuration continuous 180 14.04 2006 12:15:42 Activity In Configuration continuous 3000 14.04 2006 12:15:42 Activity In Configuration continuous 3000 14.04 2006 11:55:27 Activity In CadAvg continuous 180 14.04 2006 12:15:33 Activity In FerveSestions single 0 14.04 2006 12:15:44 Activity In FerveSestions single 0 14.04 2006 12:15:44 Activity In FerveSestions single 0 14.04 2006 12:16:48 Activity In FerveSestions single 0 14.04 2006 12:16:08 Synchronizing Activity In HyperDista continuous 180 14.04 2006 12:16:04 Sy					14.04.2006 12:15:41	90	continuous	Activity In ThresholdEvents
Activity In LogEntries continuous 60 14.04.2006 12.15.43 Activity In ImportOrids continuous 180 14.04.2006 12.15.42 Activity In ForecastData single 0 14.04.2006 12.15.42 Activity In ImportStatus continuous 180 14.04.2006 12.15.42 Activity In ImportStatus continuous 180 14.04.2006 12.15.42 Activity In ImportStatus continuous 3600 14.04.2006 12.15.42 Activity Out Tasks single 0 14.04.2006 12.15.42 Activity In CedAvg continuous 3600 14.04.2006 12.15.43 Activity In CedAvg continuous 180 14.04.2006 12.15.44 Activity In FerwSestenis single 0 14.04.2006 12.15.43 Activity In FerwSestenis single 0 14.04.2006 12.15.43 Activity In ImportData continuous 30 14.04.2006 12.15.41					14.04.2006 12:15:42	90	continuous	Activity In ManualData
Intervention 180 14.04.2006 12.15.42 Activity In Processition single 0 14.04.2006 12.15.42 Activity In ImportStatus continuous 180 14.04.2006 12.15.42 Activity In Configuration continuous 3900 14.04.2006 12.15.42 Activity In Configuration continuous 3900 14.04.2006 12.15.33 Activity In Configuration continuous 180 14.04.2006 12.15.33 Activity In Configuration continuous 180 14.04.2006 12.15.44 Activity In FervisSessioni single 0 14.04.2006 11.54.37 Activity In FervisSessioni single 0 14.04.2006 12.15.43 Activity In ImportData continuous 30 14.04.2006 12.15.40 Activity In ImportData continuous 30 14.04.2006 12.15.41					14.04.2006 12:15:40	2	single	ctivity In Forecasts
chtvity in ForecastData single 0 14.04.2006 11:54.51 uchtvity in ImportStatus continuous 180 14.04.2006 11:55.27 uchtvity in Configuration continuous 3600 14.04.2006 11:55.27 uchtvity in CatAvg continuous 180 14.04.2006 12:15:33 uchtvity in CatAvg continuous 180 14.04.2006 12:15:44 uchtvity in CatAvg continuous 180 14.04.2006 12:15:44 uchtvity in FerveSessionis single 0 14.04.2006 12:15:44 uchtvity in ImportData continuous 30 14.04.2006 12:15:41					14.04.2006 12:15:43)	continuous	ctivity in LogEntries
Interview Interview <thinterview< th=""> Interview <thinterview< th=""> Interview Interview</thinterview<></thinterview<>					14.04.2006 12:15:42	30	continuous	Activity In ImportGrids
Activity In Configuration continuous 3600 14.04.2006 11.55.27 Activity Out Tasks single 0 14.04.2006 12.15.33 Activity In CetAvg continuous 180 14.04.2006 12.15.44 Activity In FewsSessions single 0 14.04.2006 12.15.43 Activity In LiveSystem/Status ontinuous 100 14.04.2006 12.15.44 Activity In LiveSystem/Status ontinuous 30 14.04.2006 12.15.43 Activity In ImportData continuous 180 14.04.2006 12.15.41					14.04.2006 11:54:51		single	Activity In ForecastData
cb/bly_Out_Tasks single 0 14.04.2006 12:15:33 cb/bly_In_Cx6Avg continuous 180 14.04.2006 12:15:44 cb/bly_In_EversSession single 0 14.04.2006 11:54:37 cb/bly_In_EversSession single 0 14.04.2006 11:54:37 cb/bly_In_EversSessions 30 14.04.2006 12:15:68 Synchronizing cb/bly_In_EversSession single 0 14.04.2006 12:15:41					14.04.2006 12:15:42	30	continuous	ctivity in importStatus
Including Continuous 180 14.04.2006 12.15.44 Activity In FerwiSessions single 0 14.04.2006 11.54.37 Activity In LiveSystemStatus continuous 30 14.04.2006 12.15.48 Activity In LiveSystemStatus continuous 30 14.04.2006 12.15.41					14.04.2006 11:55:27	500	continuous	Activity In Configuration
Interview Sessions single 0 14.04.2006 11.54:37 Incluidy in LiveSystem/Status continuous 30 14.04.2006 12.16:08 Synchronizing Incluidy in ImportData continuous 180 14.04.2006 12.15:41 Incluid					14.04.2006 12:15:33	X	single	Activity Out Tasks
Activity In LiveSystemStatus continuous 30 14.04.2006 12.16.08 Synchronizing Activity In ImportData continuous 180 14.04.2006 12.15.41					14.04.2006 12:15:44	90	continuous	Activity In CatAvg
kdtvitty in ImportData continuous 180 14.04.2006 12:15:41					14.04.2006 11:54:37		single	Activity In FewsSessions
			ronizing	Sync	14.04.2006 12:16:08)	continuous	Activity In LiveSystemStatus
uctivity In Astronomica/Data continuous 86400 14.04.2006 11:55:32					14.04.2006 12:15:41	30	continuous	ctivity in importData
					14.04.2006 11:55:32	5400	continuous	Activity In AstronomicalData

Synchronisation Monitor

In the Synchronisation Monitor tab the log messages are shown that are generated by the synchronisation module. These messages will inform the user of synchronisation problems.

Log Browser	Live System Status	Scheduled Forecasts Running Forecasts Synchronisation Status Synchronisation Monitor Import Status
14.04.2006	12:16:16 INFO	- Synchronisation of activity Activity.In.LiveSystemStatus finished.
14.04.2006	12:16:15 DEBUG	- Storing last synch time for activity Activity.In.LiveSystemStatus
14.04.2006	12:16:15 DEBUG	- Incoming synchronisation event completed at Fri Apr 14 12:16:15 GMT 2006
14.04.2006	12:16:15 DEBUG	- Completed synchronisation of table: LiveStatus
14.04.2005	12:16:15 DEBUG	- Inserted 4 of 4 records.
14.04.2006	12:16:15 DEBUG	- Started synchronisation of table: LiveStatus
14.04.2006	12:16:15 DEBUG	- Incoming synchronisation event started. Synch time is: Fri Apr 14 12:16:08 GMT 2006. Synchronisin
14.04.2006	12:16:15 INF0	- Synchronisation of activity Activity. In. LiveSystemStatus for taskRumId null and last synch date 14
14.04.2006	12:16:03 INFO	- Synchronisation of activity Activity. In. Catkvg finished.
14.04.2006	12:16:02 DEBUG	- Storing last synch time for activity Activity. In. CatAvg
14.04.2006	12:16:02 DEBUG	- Incoming synchronisation event completed at Fri Apr 14 12:16:02 GMT 2006
14.04.2006	12:16:02 DEBUG	- Completed synchronisation of table: TimeSeries
14.04.2006	12:16:02 DEBUG	- Inserted 124 of 124 records.
14.04.2006	12:15:51 DEBUG	- Started synchronisation of table: TimeSeries
14.04.2005	12:15:51 DEBUG	- Incoming synchronisation event started. Synch time is: Fri Apr 14 12:15:43 GHT 2006. Synchronisir
14.04.2006	12:15:51 INFO	- Synchronisation of activity Activity.In.Catkvg for taskRumId null and last synch date 14.04.2006 1
14.04.2006	12:15:51 INFO	 Synchronisation of activity Activity. In. LogEntries finished.
14.04.2006	12:15:51 DEBUG	- Storing last synch time for activity Activity. In. LogEntries
14.04.2006	12:15:51 DEBUG	- Incoming synchronisation event completed at Fri Apr 14 12:15:51 GMT 2006
14.04.2005	12:15:51 DEBUG	- Completed synchronisation of table: LogEntries
14.04.2006	12:15:51 DEBUG	- Started synchronisation of table: LogEntries
14.04.2006	12:15:51 DEBUG	- Incoming synchronisation event started. Synch time is: Fri Apr 14 12:15:43 GMT 2006. Synchronisir
14.04.2006	12:15:51 INFO	- Synchronisation of activity Activity.In.logEntries for taskRumId null and last synch date 14.04.20
14.04.2006	12:15:51 INFO	 Synchronisation of activity Activity. In. LiveSystemStatus finished.
14.04,2006	12:15:51 DEBUG	- Storing last synch time for activity Activity.In.LiveSystemStatus
14.04.2006	12:15:51 DEBUG	- Incoming synchronisation event completed at Fri Apr 14 12:15:51 GMT 2006
14.04.2006	12+15+51 DERING	- Commissed sumchronisation of table: LiueGranis
S.		2

Import Status

The Import Status tab provides information on the files that were last imported. For each import task the file name of the last imported file is shown including the date and time of the import. Also the number of files that were imported in that task are shown, with the number of failed imports.

Data Feed	Directory	Last Import Time	Last Import File	Files Imported	Files Faled
40SurgeCS3	Wewsfilesvr01\Thames\fss\toWindows\importWOSurgeCS3	14 04 2006 09 12 38	MOEAEUSURGE20060	A Real Property and a real of the real of	0
AOMIndiActual	Wewsfilesvr01\Thames\fss\fo\Windows\ImportWOWindActuals	14 04 2008 09 12 31	MOEAMINDASSIM200		0
OWIndForecast	Wewsfilesvr01\Thames\fsstoWindows\importWOWindForecasts	14.04.2006.09.12.35	MCEAWIND20060414		0
love.#81	Wewsfilesvr011ThamesVss%oWindowsWinportWovjuk81	14.04.2006.09.12.30	SURGERES2 DAT	1	0
APForecast	Wewsfilesvr01\ThamesVssiteWindowsWinport/CatAvgWMP_Rain	14.04.2006 10 42 38	EAHYTHFS20060414_	1	0
rs	V/rewsfilesvr01\Thames\fss\toWindows\import\RTS	14.04.2006 12:13:05	THTSTHFS200604141	12	0
ider Actual	Wewsfilesvt01\ThamesVss\toWindows\Import\CatAvg\Actuals	14 04 2006 12 13:08	EAHYTHFS20060414	2	0
darForecast	Vifewsfilesvr01\Thames\fss\toMindows\timport\CatAvg\Forecasts	14.04 2006 12 13:07	EAHYTHFS20060414_	1	0
rge	Wewsfilesvr01\ThamesVssVoWindowsVmport/Surge	14.04.2006.03.13.13	WCSURG2006041402	3	0
daMontoring	Vfewsfilesvr01\Thanes\fss\toWindows\import\TidalMonitoring	14.04.2006 12:13:09	COMBINEDBODD1404	2	0
IndNave	Wewsfilesvr01\Thames\fsstoWindows\import\WindWave	14.04 2006 04:13:48	SOMND20060414032	2	0

Last import time is updated only if at least one file has been successfully imported. The cell in the column 'Fails Failed' gets red color if there is one or more files failed.

An example (see two pictures below) :

First picture shows fully successful imports at 08:03:28. Second picture shows partly successful import (Level measured) and failed import (Discharge measured). The files has been imported at 08:11:24. Last import time of the partly successful import has been updated. Last import time of the failed import is not updated, since no file has been successful imported.

🚇 System Monitor					ad×
Log Browser Eorecas	ter Notes Batch Forecasts Import Status				
Data Feed) Directory	Last Import Time	Last Import File	Files Imported	Files Failed
Discharge measured	D:\Fews\ConfigExample\Import\external\discharge	09-06-2016 08:03:28	Q_m.xml	1	0
Level measured	D:\Fews\ConfigExample\Import\external\evel	09-06-2016 08:03:28	H_m.xml	1	0
L					
				Close	<u>H</u> elp

🚇 System Monitor					ad×
Log Browser Forecas	ster Notes Batch Forecasts Import Status				
Data Feed] Directory	Last Import Time	Last Import File	Files Imported	Files Failed
Discharge measured	D: \Fews \ConfigExample \Import \external \discharge	09-06-2016 08:03:28	Q_m_02.xml	0	2
Level measured	D:\Fews\ConfigExample\Import\external\evel	09-06-2016 08:11:24	H_m_02.xml	1	1
L				Close	Help

Last import time stays red if the time series has been never imported for that data feed. The picture below illustrates this. There is no time series imported from Q_m.xml, because the wanted time series were not available in the file. There is also no time series imported for Level measured, since the import folder was empty.

🚇 System Monitor					8ď×
Log Browser bulletinBoard	Batch Forecasts Import Status				
Data Feed	Directory	Last Import Time	Last Import File	Files Impor	Files Failed
Discharge measured	D:\Fews\ConfigExample\Import\external\discharge	08-03-2017 12:22	Q_m.xml	0	0
Level measured	D:\Fews\ConfigExample\Import\external\evel	08-03-2017 12:22	none	0	0
				Close	Help
			_	Giose	Паф

09 What-if Scenario Display

08 System Monitor

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10 Archiving Display

- What-if Scenario Display
 - Transformation
 - User Defined Profile
 - Module Data Sets and Module Parameters
 - Buttons
 - Edit Visibility button
 - Import All
 - Export All

What-if Scenario Display

The What-if Scenario display allows for the definition of What-if Scenarios. The What-if Scenarios can be used, when running forecasts via the Manual Forecast display. The latter allows for selection of What-if Scenarios defined in the What-if Scenario display.

In order to define a What-if Scenario, the button [Add New Scenario] should be pressed. Next a name or ID for the new what-if scenario must be entered in the "Scenario Name" field; it is advised to use a short name. When running a What-if Scenario, the name of this scenario will be added to the forecast name. The scenario can also have a description, this can be used to enter more information on the newly added scenario.

Four types of What-if Scenarios can be defined:

- a transformation of an input time series
- the use of a user defined typical profile
- the use of a complete alternative module dataset
- the use of an alternative subset of module parameters

🚾 What-if-Scena	rio Editor										×
Scenario Name :	Scena	rio 2A							v	Add Nev	v Scenario
Scenario description	n : Rainfa	I Input Scer	harios	(2A): No furthe	er rain					Copy Selecte	ed Scenario As
										Save Selec	te <u>d</u> Scenario
1: Transformation	2:User Defin	ed Profile	<u>3</u> Mod	lule Data Set Fi	le/Version	4:Module Parame	eter i	File/Version			
Select Input Variable		Select Loca	tion		Choose 0	perator		Enter Chang	je		
Radar_Actuals	*	All Locatio	ns	*	add		~	0.0			Add to List
List of Transformat	tions										
Input/Variable				Location		Operator	0	hange		nclude in What	ifScenario
N/VP_Forecast (Pre	ecipitation Fo	recast (NA	/P))	All Locations		equal to Missing	-99	0.00	V	included	
Radar_Forecast (P	recipitation F	forecast (R	adar))	All Locations		equal to Missing	-99	99.0	•	included	
	(Edît <u>V</u> isibi	ity	Import Al		Export Al	S	ve Al	C	Qlose	Help

Transformation

In the field Select Input Variable, an input time series can be selected from a drop-down list for transformation.

In the next step, the user has to choose whether to apply the transformation to a single location or all locations for which the selected transformation variable is available.

Finally, the transformation itself is defined by selecting a mathematical operator and a value in the *Choose Operator* and *Enter Change* fields. The following operators can be entered: add, subtract, divide, multiply. Also a constant value can be entered and a time shift.

By pressing [Add to list], the transformation is added to the What-if Scenario and appears in the table at the bottom of the tab. A number of transformations can be defined within a single What-if Scenario by repeating the sequence described above.

With [Save All], What-if Scenarios are stored in the database. In the Live System, What-if Scenarios are stored in the Central Database and may be used by others. After saving therefore, a What-if Scenario can not be edited or deleted by a regular user.

The buttons [Import All] and [Export All] allow saving and retrieving of sets of what-if scenarios when the local data store is renewed. The display can be left with [Close].

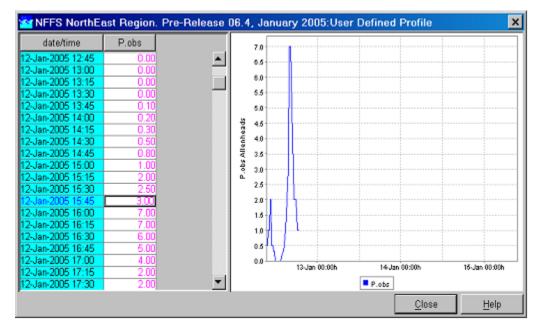
What-if Scenarios can be run via the Manual Forecast Display.

User Defined Profile

In the User Defined Profile Tab, the user can define a user defined profile that may be used that as an input time series for a workflow. To add a user defined profile the data should be entered in a table. First press the [Add New Scenario] button to start a new What-if scenario.

🕍 NFFS NorthEast Region. Pre-Relea	use 06.4, January 201	05:What-if-Sc	enario Editor	×				
Scenario Id : Typical Profile Allenhe	ads	•	Add <u>N</u> ew S	cenario				
Scenario description : Typical Profile Allenhe	ads		Copy Selected	Scenario As				
		ĺ	Save Selecte	d Scenario				
Transformation User Defined Profile Module	Transformation User Defined Profile Module Data Set File/Version Module Parameter File/Version							
Select Input Variable	Select Location							
Precipitation_gauges	 Allenheads 	 Edit Table 		Add to List				
List of Transformations				1				
Input/Variable	Location	Profile	Include in	WhatifSce				
Precipitation gauges at Allenheads (Observe	Allenheads	View	include	d				
<u> </u>	mport All <u>E</u> xport All	Save All	Close	Help				

Select the "User Defined Profile" and select the input variable and location where the typical profile will be defined for. Now the values of the user defined profile must be entered in the data store through the special table editor, press the [Edit Table] button.



The table includes a spreadsheet and a graph showing the entered values. Values can also be copied from other programs like Microsoft Excel by using the [CTRL+C] keys. When all data is entered, press the [Close] button.

By pressing [Add to list], the user defined profile is added to the What-if Scenario and appears in the table at the bottom of the tab. A number of profiles can be defined within a single What-if Scenario by repeating the sequence described above.

The buttons [Import All], [Export All], [Save All] and [Close] function similar as described in the section above. The import button is only enabled when all new scenarios have been saved. In case during the import a conflicting whatif scenario is encountered that has different settings a confirmation screen may be prompted to deal with this situation.



Module Data Sets and Module Parameters

This tab allows the user to select alternative module datasets. The general usage of this type of What-if scenario is similar to the previous types.

Via the fields Select Module Data Set File and Select Module Data Set File Version, an alternative module data set can be selected. When an Operator Client is used an alternative module data set should first be loaded in the FEWS data base through the Configuration Management. When a Stand Alone system is used an alternative module data set can also be located in the "\config\ModuleDataSetFiles" directory. The selected alternative module Data Set is actually added to the What-if Scenario by pressing [Add to List...]. This action can be repeated when required to add an additional alternative Module Data sets to the list.

Scenario Id :	Use Corrected Su	rge Forest Sheerness	~	Add New Scenario	
Scenario description :	Use Corrected St	ĺ	Copy Selected Scenario As		
					Save Selected Scenario
1:Transformation 2:U:	ser Defined Profile	3:Module Data Set File/Version	4:Module Parameter File/Ver	sion	
Select Module Data Set F	ile -	Select Module Data Set File Ver	rsion		
No ModuleDataSetFile	~	,	×.		Add to List
List of Module Data Se	t File(s)		1005		
File		Version	Include in Wha	tifScenari	0
File		Version	Include in Wha	tifScenari	0

Similarly, alternative Module Parameters can be selected via the Module Parameter tab. In this case the fields Select Module Parameter File and Select Module Parameter File Version must be used.

Buttons

The buttons [Import All], [Export All], [Save All] and [Close] apply in the same way as described above.

Edit Visibility button

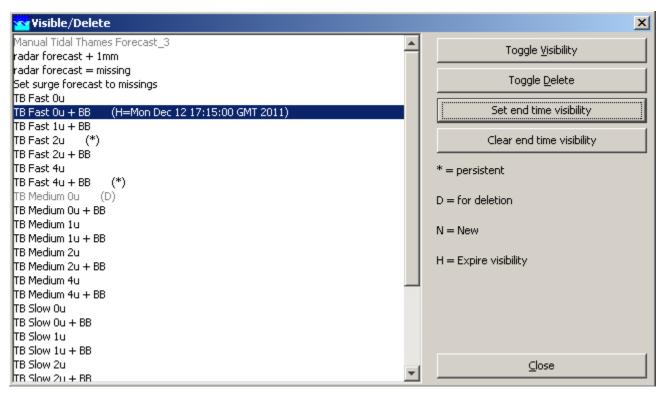
The number of What-if Scenarios in the system can become quite large. To limit the number of visible What-if Scenarios each scenario may either be deleted or made invisible to all users.

Click the [Edit Visibility] button to edit the visibility of the What-if Scenarios in the system or delete them.

• [Toggle Visible] make the selected what-if scenario invisible to users and as it can not be used when running forecasts. Note that a what-if scenario, which has been made invisible, is invisible to *all* users. When made invisible, the what-if scenario name is greyed out.

• [Toggle Delete] permanent deletes what-if scenarios from the system. These scenario are marked with (D) when the display is still open.

What-if Scenarios marked with an asterix (*) are persistent, indicating that they both can not be deleted or made invisible. The visibility can be set to expiry by selecting a number of items and then selecting an expiry time.



Import All

With [Import All] you can import what-if scenarios from file.

Export All

With [Export All] you can export what-if scenarios to file.

10 Archiving Display

09 What-if Scenario Display

- Archiving Display
 - Manual Archiving
 - Importing Archives into the Standalone
 - a) Importing Forecast Run Archives
 - b) Importing Threshold Event Archives
 - c) Importing Time Series Archives
 - Configuring RegionId

Archiving Display

The archiving display is used to archive forecasts and to retrieve previously archived forecasts from a central server. The concept is that all the individual pieces of data used to create the forecast (only from the forecast workflow) are saved so that the forecast can be rerun at any point in the future with exactly the same result. This is useful for post event analysis of forcasting and model performance.

Manual Archiving

To manually archive a single forecast, open the Operator Client where the forecast was run. Select Archiving from the Tools Menu, Select Forecast Runs filter under Upload to Archive. Select the forecast that you want to archive and click on Upload.

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11 Skill Scores Display

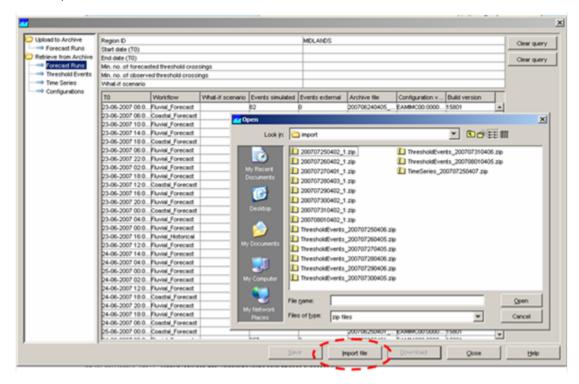
Forecast Runs	Expetitivestory	Vidfsmcof.ea.gov/Mid_F	sstrom/Windows/Arch	velexport			
rieve from Archive Forecast Runs	TO	Dispatch time	Workflow	What-If scenario	Description	Forecaster	Export single
Threshold Events	10-06-2007 16.	11-06-2007 02:00:03	Fluvial_Historical		Midlands Daily staterun		
Time Series	10-06-2007 16.	10-06-2007 16 20:02	Fluvial Forecast		Midlands standard for		
Configurations	10-06-2007 18	10-06-2007 18 20:04	Fluvial_Forecast		Midlandis standard for		
	10-06-2007 18 10-06-2007 18 10-06-2007 20 10-06-2007 22	10-06-2007 18:50:03	Coastal Forecast		Midlands standard coa.		
	10-06-2007 20.	10-06-2007 20:20:02	Fluvial_Forecast		Midlands standard for		
	10-06-2007 22.	10-06-2007 22 20:01	Flavial Forecast		Midlands standard for		
		11-06-2007 00:20:01	Fluvial_Forecast		Midlandis standard for		
	11-06-2007 00.	11-06-2007 00:50:01	Coastal Forecast		Midlands standard coa.		
	11-06-2007 02	11-06-2007 02:20:04	Fluvial_Forecast		Midlandis standard for		
		11-06-2007 04:20:04	Fluvial Forecast		Midlands standard for		
	11-06-2007 06.	11-06-2007 06:20:05	Fluvial_Forecast		Midlandis standard for		
	11-06-2007 06.	11-06-2007 06:50:02	Coastal Forecast		Midlands standard coa		
		11-06-2007 08:20:03	Fluvial_Forecast		Molands standard for		
	11-06-2007 10.	11-06-2007 10:20:03	Fluvial Forecast		Midlands standard for		
	11-06-2007 12	11-06-2007 12 20:03	Flavial_Forecast		Molands standard for		
		11-06-2007 12:50:04	Coastal Forecast		Midlands standard coa.		
		11-06-2007 14:20:01	Flavial_Forecast		Midlands standard for		
	11-06-2007 16.	11-06-2007 16:20:01	Fluvial Forecast		Midlands standard for		
	11-06-2007 16.	12-06-2007 02:00:02	Fluvial Historical		Midlands Daily staterun		
	11-06-2007 18.	11-06-2007 18:20:02	Fluvial_Forecast		Midlands standard for		
		11-06-2007 18:50:04	Coastal Forecast		Midlands standard coa.		
	11-06-2007 20.	11-06-2007 20:20:03	Fluvial_Forecast		Midlandis standard for		
	11-06-2007 22	11-06-2007 22 20:01	Flavial Forecast		Midlands standard for		
	12-06-2007 00.	12-06-2007 00:20:04	Fluvial_Forecast		Midlandis standard for		
	12-06-2007 00.	12-06-2007 00:50:02	Coastal Forecast		Midlands standard coa		
	A 12-06-2007 02.	12-06-2007 02:20:02	Fluvial_Forecast		Midlandis standard for		
	12-06-2007 04	12-06-2007 04:20:00	Fluvial Forecast		Midlands standard for		
	12-06-2007 06.	12-06-2007 06:20:03	Fluvial_Forecast		Midlandis standard for		
	12-06-2007 06.	12-06-2007 06:50:03	Coastal Forecast		Midlands standard coa.		
	A 12-06-2007 06 12-06-2007 06 A 12-06-2007 08 12-06-2007 10	12-06-2007 08:20:05	Flavial Forecast		Midlandis standard for		
	12-06-2007 10	12-06-2007 10:20:02	Fluvial Forecast		Midlands standard for		*
	, <u> </u>				-	•	

This forecast is then written to a zip file and stored in the file shares. If configured (deployed) an archiver process can pick up these zip files and process them.

Users can also archive several forecasts to one archive file by checking the Export Single File box in the top right hand corner of the archive window.

Importing Archives into the Standalone

The Standalone System is the only system that archives can be imported to. In order to import archives, you should use a Standalone that only contains the latest configuration. You can do this by copying the config folder of an Operator Client to the Standalone or by deleting the local datastore of an Operator Client and downloading the configuration using the Configuration Management Tool, then copying the local datastore from the Operator Client to the Standalone.



a) Importing Forecast Run Archives

In the Standalone System, select Archiving from the Tools Menu. Select the Forecast Runs filter under Retrieve from Archive. Then press the

Import file button. This enables you to select zip files of any type. Navigate to the correct location (anywhere on your network or local pc) and select one or more Forecast Run Archives.

You can then view these forecasts by opening the Forecast Management Display and they will be listed under forecasts in local datastore. To view the results of the required forecast- select it in the list and then click Open and it will appear in the bottom left hand corner of the screen. Double click on this to set the system time to the T0 of the open forecast. You can then view the results in the pre-configured displays.

b) Importing Threshold Event Archives

As in a) except you need to select Threshold Events under Retrieve from Archive. To view Threshold Events you need to open the Skill Scores Display.

c) Importing Time Series Archives

As in a) except you need to select Time Series under Retrieve from Archive. To view Time Series you need to open the pre-configured displays for Performance.

Please note: You cannot import archived configurations directly into your standalone system.

Configuring RegionId

In the case that the REGION_HOME variable of the FSS or OC creating the archives does not match the requested regionId for the archive, it is possible to explicitly configure a regionId in the **explorer.xmI** configuration file:

<systemInformation> <systemCaption>KRW-VSS Analyse Tool (versie Release 1)</systemCaption> <systemHelpFile>%REGION_HOME%\help.pdf</systemHelpFile> <regionId>KRW_VSS</regionId> </systemInformation>

11 Skill Scores Display

10 Archiving Display

Delft-FEWS User Guide

12 Thresholds Display and TRITON Display

- Skill Scores Display
 - Background
 - Setting Criteria for Analyses
 - Matching Events
 - Forecast Available for Events
 - Thresholds List
 - Archiving Events
 - Excluding Events and TaskRuns

Skill Scores Display

This display provides an overview of all threshold crossings in the observed and forecast time series. By matching observed and forecast thresholds, various skill scores can be computed.

Background

The first step is to set up a contingency table. Given criteria on time intervals to consider when matching threshold crossing events, the values of **a**, **b**, **c** and **d** in the table below can be filled in (where e.g. **a** is the number of matched observed and forecast threshold crossing events).

	Threshold Obser	ved
Threshold Forecast	Yes	No
Yes	a	b
No	с	d
Forecast Available	Yes	No
Yes	e	
No	f	

Once the contingency table has been filled, different skill scores can be established:

$$FAR = \frac{b}{a+b}$$

False Alarm Rate

$$POD = \frac{a}{a+c}$$

Probability of Detection

$$CSI = \frac{a}{a+b+c}$$

Critical Success Index

$$CR = \frac{e}{e+f}$$

Critical Reliability (checks if a forecast is available at least some time (but not too late) before the observed threshold crossing)

The First Forecast of Threshold (FFOT) is determined as the average time between the $T\sim0\sim$ of the forecast run in which a threshold crossing was detected and the time of the observed threshold crossing (i.e. the average lead time of the category **a** threshold crossing events in the contingency table).

The Bias of paired threshold crossings is the average time between paired observed and forecast events.

Setting Criteria for Analyses

To specify when two threshold crossing events are considered as matching or not, a number of event matching criteria can be used. In the configuration file for the skill scores display it is possible to define default event matching criteria, which can be different for different locations and/or groups of locations. When the skill score display is opened, then the global criteria and the criteria settings for each location and group of locations are read from the configuration file. If for a given location/group individual criteria have been defined, then these are used and the location/group gets a green tickmark in the filterbox at the left hand side of the skill scores display. If for a given location/group no criteria have been defined, then the global criteria are used for that location/group. See the image below of the skill scores display with different criteria set for different locations.

📷 Threshold Skill Score									
PR.TF Ponecasts	Natching Events Ponecast A	valable For Events Eve	nte Liet						
North Area	Location Name	Threshold	Obs Paraneter	Obs Event Time	For Parameter	For Event Time	Difference	Forecast T0	
Cummeradale	Greenholme Greenholme	Flood Watch Standby	H obs H obs	24-10-2005 15:00:00		24-10-2005 11(45)	0 0.15	24-10-2005 08:00:00	
- of Decre Beck	C CONTRACTOR	and they	11000	11000000	- The contractory		w 10	11000000000	
Great Corby									
Ariday Stephen									
 									
- of Sheepmount - o Southwate Bridge									
- Sprint Mil									
- Udford									
- O Victoria Bridge									
E-Costa rea									
C 1515 Forecasts									
Standby									
Flood Watch									
Flood Warning A Flood Warning 8									
Flood Warning C									
Flood Warning D									
Severe Flood Warning									
Ponecast Available Name									
	Indicators				Oritoria				
	Probability of Detection :	50,0			Min T0 diffe		hour		
	False Alam Rate :	0,0			Max T0 diff		hour		Change Optenia
	Critical Success Indeo:	50,0				dh time difference: 6			
	Orlical Reliability	0,0					hour		
	Fint Porecast of Threshold:	Shours 45 min					hour		
	Bies of paired thresholds:	0.15			Up crossing		7		
					op o dran,				
· · · · · · · · · · · · · · · · · · ·	1			The	Seve Criteria	Seve	Export	(Inport gla	e Belo

To change the matching criteria of certain location(s) and/or group(s), first select the location(s) and/or group(s) in the filterbox at the left hand side of the display. Then click the [Change Criteria] button. When clicking the [Change Criteria] button the following display appears.

Select periods		×
Criteria		
Min T0 difference	2 📩	hour 💌
Max T0 difference	6	hour 💌
Max dispatch time difference	6	hour 💌
Max time threshold beeing too early	1 =	hour 💌
Max time threshold beeing too late	2 🗧	hour 💌
Apply to		
 Apply global 		
C Apply to selected		
OK Cancel	Apply	<u>R</u> eset

The criteria in the display have the following meaning.

• *Min/Max T~0~ difference*. These criteria define in what time interval the T0 of a forecast should fall that has predicted a threshold crossing in order for this threshold crossing event to be included in the analysis.

- Max dispatch time difference. This criterion is used to compute the Critical Reliability (CR) which determines whether a forecast was available at the time of an observed crossing irrespective of its quality. By setting this criterion the maximum time difference can be defined between the dispatch time of a forecast and the time of an observed crossing.
- Max time threshold being too early/late. These criteria define what the maximum difference between a forecasted threshold crossing and an observed threshold crossing are allowed to be in order to consider them as matching.

In the lower section of the display it is possible to choose between two options:

- Apply global: if this is selected, then the changes will be applied to all locations and all groups.
- Apply to selected: if this is selected, then all changes only apply to the groups and/or locations that have been selected in the skill scores display.

In this display it is also possible to set the criteria in the display to the default global criteria from configuration by pressing the [Reset] button.

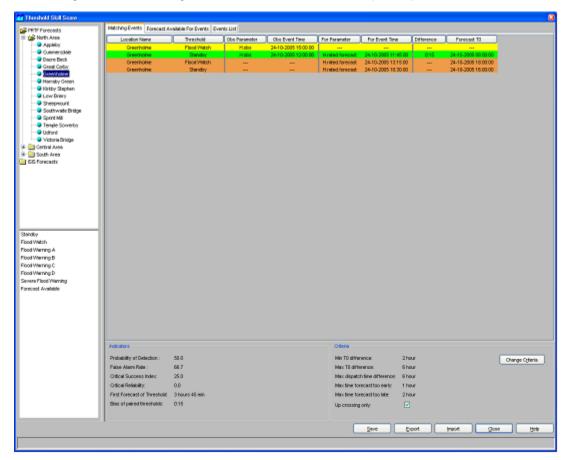
This way it is possible to change the criteria settings for individual locations/groups. If a location/group has no individual criteria settings, then the global criteria are used for that location/group. If multiple locations/groups with different criteria are selected, then the global criteria are used.

To store the current criteria settings of individual locations and groups, click the [Save Criteria] button. This will create a txt file with the current settings, which can be used for future reference.

Matching Events

In the Matching Events tab different background colours are used to indicate in which sector of the Contingency Table events fall.

- green: observed and forecast threshold crossing event match (sector a of contingency table)
- yellow: a threshold crossing has been observed but not forecasted (sector c)
- orange: a threshold crossing has been forecasted but not observed (sector b)



In general, skill scores are determined for all forecast locations being at a gauging station and having level thresholds. Typically these are determined separately, but the structure of the display allows skill scores to be established for different models. This way the skill scores of the different models can be compared.

The performance indicators that are computed on the basis of the selection in this tab are:

- · probability of detection
- false alarm rate
- critical success factor

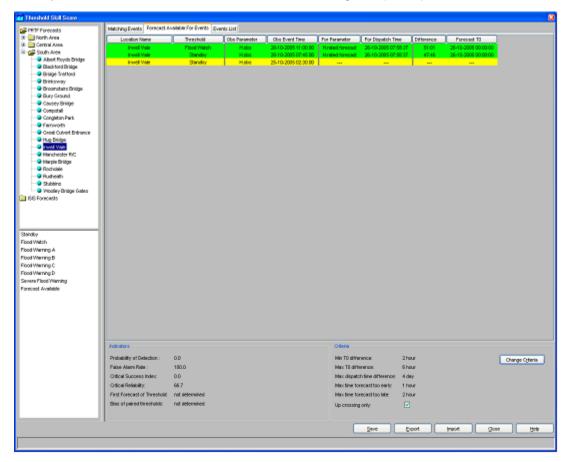
- first forecast of threshold
- bias of paired thresholds

The filter boxes at the left hand side of the skill scores display enable the selection of certain locations or certain thresholds levels to be shown alone. By activating the check box below the criteria, it's possible to display Up crossings of thresholds only.

Forecast Available for Events

In the Forecast Available for Events tab different background colours are used to indicate in which sector of the Contingency Table events fall.

- green: a forecast is available for an observed threshold crossing event (sector e of contingency table)
- yellow: no forecast available for an observed threshold crossing event (sector f)



The performance indicator that is computed on the basis of the selection in this tab is critical reliability .

Thresholds List

The Threshold List provides an overview of all threshold crossing events available for the selected locations. In the analyses subsets can be made by setting the criteria discussed in the earlier part of this section.

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	intenholme	Hinded forecast	Sanity	i	simulated forecasting		24/10/2005 22:00:00			
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	Heenholme	Hirsted forecast	FloodWatch	3	simulated forecasting		25-13-2005 08 00:00			
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Archiving Events

As the threshold crossing events are stored in the operational database for only some days (according to the length of the Rolling Barrel), it's possible to manually export the list of threshold crossing events by pressing the [**Export**] button in the skill scores display. This list can later be imported in a Stand Alone system by pressing the [**Import**] button. In this way, longer records can be established for analysis in an off-line modus.

Instead of exporting the whole list of threshold crossing events, as described above, it's also possible to select some of them and export only the selected ones by using the [Save] button.

All threshold crossing events can also be archived automatically by the system. See also Archive Display.

Excluding Events and TaskRuns

To exclude individual events from the event matching analysis, click the [Filter] button in the skill scores display. Then the following display appears.

<mark>४४</mark> Filter t	hreshold crossing even	its						×
Include	Task Run Id 🛛 🔺	TO	Workflow	What-if	scenario De	escription	FDO	
	1_0	20-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	1_1	21-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	1_2	22-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	1_3	23-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	1_4	24-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	1_5	25-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	1_6	26-10-2005 00:00:00	ImportExternal				Marc van Dijk	
	3_0	24-10-2005 00:00:00	Fluvial_Forecast		Perfo	rmance test	Marc van Dijk	
	3_1	24-10-2005 02:00:00	Fluvial_Forecast		Perfo	rmance test	Marc van Dijk	
	3_10	24-10-2005 20:00:00	Fluvial_Forecast			rmance test	Marc van Dijk	
	3_11	24-10-2005 22:00:00	Fluvial_Forecast		Perfo	rmance test	Marc van Dijk	-
Include	Location	Parameter	Threshold	UpDown	Туре	Event Time	TO	
	Kirkby Stephen	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 08:30:00	24-10-2005 02:00:0	10 🔺
	Kirkby Stephen	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 09:15:00	24-10-2005 02:00:0	JO 🔲
	Greenholme	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 10:45:00	24-10-2005 02:00:0	0
	Greenholme	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 17:00:00	24-10-2005 02:00:0	10
	Brock A6	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 06:45:00	24-10-2005 02:00:0	ю 🗌
	Brock A6	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 10:00:00) 24-10-2005 02:00:0	ю 🔰
	Garstang FCS	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 08:30:00	24-10-2005 02:00:0	0
	Garstang FCS	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 10:45:00	24-10-2005 02:00:0	0
	Kirkby	H.rated.forecast	Standby	1	simulated forecasting	23-10-2005 04:30:00	24-10-2005 02:00:0	10
	Kirkby	H.rated.forecast	Standby	2	simulated forecasting	23-10-2005 13:15:00	24-10-2005 02:00:0	ю 📕
	Kirkby	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 03:30:00	24-10-2005 02:00:0	JO 📃
	Kirkby	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 13:15:00	24-10-2005 02:00:0	JO 📃
	Croston	H.rated.forecast	Standby	1	simulated forecasting	23-10-2005 14:30:00		10
	Croston	H.rated.forecast	Standby	2	simulated forecasting	23-10-2005 21:15:00	24-10-2005 02:00:0	10
	Croston	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 05:45:00	24-10-2005 02:00:0	10
	Croston	H.rated.forecast	FloodWatch	3	simulated forecasting	24-10-2005 11:45:00) 24-10-2005 02:00:0	JO 📃
	Croston	H.rated.forecast	FloodWatch	4	simulated forecasting	24-10-2005 13:00:00	24-10-2005 02:00:0	JO 📃
	Croston	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 21:45:00	24-10-2005 02:00:0	10
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			ОК	Car	ncel <u>A</u> pply	Exclude All Sa	ve Filters Load Fil	ters

When one or more taskruns in the upper table are selected, then the lower table displays all events that correspond to the selected taskruns. To exclude an event/taskrun from the analysis, deselect the checkbox for that event/taskrun. To apply all changes click the [**OK**] or the [**Apply**] button. When a taskrun is excluded, then all events corresponding to that taskrun are also automatically excluded. If a taskrun is excluded, then it is not possible to include the events within that taskrun, because the taskrun setting overrules when a taskrun is excluded.

Click the [Save Filters] button to save the current filter settings to a csv file. It is also possible to use previously saved filter settings by clicking the [Load Filters] button and selecting a csv file to load. When filter settings are loaded, then all events and taskruns that are present in the loaded file will be excluded. If an event or taskrun is not present in the file, then it will be included by default.

12 Thresholds Display and TRITON Display

11 Skill Scores Display

Delft-FEWS User Guide

13 PRTF Display

- Thresholds Display & TRITON Display
 - Selecting a Workflow for Display
 - Threshold Status View
 - Alarm Summary View
 - Site Data View

Thresholds Display & TRITON Display

Information about thresholds crossings is of prime importance in a forecasting system. If and when a threshold crossing occurs, a log message is generated and the location icon is updated in the FEWS Explorer. The log message can be viewed in the system monitor and in reports.

The Thresholds display provides an additional means to view and analyse threshold crossings. The module provides a number of different ways to obtain an overview of all threshold crossings. The TRITON display is a specific version of the Threshold display.

For a selected forecast, the Thresholds display presents information in three different views:

- Threshold status view A general overview of thresholds, for a group of location and individual locations. Multiple threshold status views may be configured, for example to view the threshold status over a certain length of time, at precise times or per hour.
- Alarm summary view The Alarm summary view presents a table of all threshold crossings.
- Site data view

For a selected time series the Site data view will present any number of time series that may be of importance

Selecting a Workflow for Display

The workflow for which data should be displayed in the Threshold display can be selected at the top of the screen. Place your cursor on the workflow you would like to display and click [Open]. The selected workflow is shown in bold above the tabs.

TO	Citypetch time		Norkflow	What if oceasio	Description ForecastList	ax/FD0 Qeen
16-05-2007 00:00:00	16-05-2007 00:20:01	Fluvial_Forecast				2000
11.05/2007 14:00:00	11.05/2007 14/20:05	Fluxial Forecast				
09-05-2007 04:00:00	09-05-2007 84:28:04	Fluvial_Forecast				
15-2007 1 6 00.00 11-05-2007 14		***				
oplay per 4 hours Display per h	our Alem summary Porecast data Fri 10:00 - 1	400	Pri 14:00 - 18:00	PH 18 00 - 22:00	5et 22:00 - 02:00	5# 02:00 - 05:00
Cornwall						
Devon						
 Sdury 						
Ferry Bridges						
Bonehayte						
Chard Junction						
Cowley Bridge						
Thorvertan						
Vibodnil						
 Spolleigh 						
Brushford						
Pittan						
Grece Lowman						
Collard Bridge						
Doton						
Autórs Bridge				Early Warn75%	Early Warn25%	
· Bolever			Early Warn/5%	Early Wein/19%		
Polster Bridge						
 Elicitington 						
Natimestex						
Sou@Wilcosex						

Threshold Status View

The threshold status view can be configured to display the threshold status of any number of time series over a period of time. Examples of frequently used settings are:

- For coastal forecasting the threshold status at high tide. The input data is non-equidistant and all values are shown. See the example below, where Triton results are shown at high tide.
- For coastal forecasting the threshold status per hour. This shows how the threshold status develops in a 24 hour period over successive high tides.
- For fluvial forecasting over any duration. The example given provides an overview over 4 hour durations.

19-03-2004 18:00:00 (5-02- 03-2004 18:00:00 05-02- isplay per high lide (Display per ho te		Coastal_Forecast			Micha Werner	Open
isplay per high tide Display per ho		Coastal_Forecast Micha We				
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Duddon estuary				Flood Warning	Flood Warnin	
Barrow in Fumess				ng Severe Flood W.		
North Morecambe Bay						
Morecambe			Flood	Watch		
Heysham to Cockerham			Severe Flood Warri	ing Severe Flood W.	Severe Flood Warning, Sev	rene Floor
Lune Estuary			Flood Warning	Flood Warning		
Cockerham to the Wyre						
Wyre Estuary						
Binckpool & Fleetwood			Severe Flood Warri	ing B,Severe Flood		
Lytham St Annes						
Ribble Estuary						
Southport						
Formby to the Mouth of the Merse			Flood Water	Flood Watch	Flood Watch	
Mouth of Mersey to Widnes/Runor Mersey u/s to Warrington	om enage		Deed	Watch		
Widnes/Runcom Bridge to Wirral			Picod	wateri		
Head of the Wirral						

Coastal forecasting example: thresholds at high tides

TO Dispeto				rkflow				What	if scer	nario		De	scripti			00			Oper	1	1
19-03-2004 18:00.00 05-02-2006	00:15:15	Constal	Forec	ast											Micha	Werne	r i	_	_	_	٢.
-03-2004 18:00:00 05-02-2006 (isplay per high tide Display per hour Alle				cast	Mic	ha W	erner														
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Gretna to Silloth																					
Siloth to St Bees Head																					
St Dees to Millon																					
Duddon estuary																					
Barrow in Furness																					
North Morecambe Bay																					
Morecambe																					
Heysham to Cockerham																					
Lune Estuary																					
Cockerham to the Wyre																					
Wyre Estuary																					
Biackpool & Fleetwood																			_		
Lythan St Annes																					
Ribble Estuary																					
Southport																				_	
Formity to the Mouth of the Mersey																				_	
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Mersey wis to Warrington																					4
Widnes/Runcom Bridge to Wirral																					
Head of the Wirral																					
1																					ß
															Γ	0	:08		н	elp	

Coastal forecasting example: thresholds per hour. High tide as in the previous example is at 10:45.

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Fluvial forecasting example: threshold status over a 4 hour period

Alarm Summary View

The alarm summary view will present a table of all alarms for the selection of location(s) made in the Threshold Status View.

TO	Dispe	tohtime	Workflow	What-it scenario	Description	FDO	Open
19-03-2004 18:	00:00 05-02-200	6 00:15:15 Cose	tal Forecast	1		Micha Werner	Shen
-03-2004 18:00	:00 05-02-20 <mark>06</mark>	00:15:15 Coast	al_Forecast Nicha V	/erner White	aven		
	Display per hour A						
Location Id	Location name	Nearshore Site T		Value	Threshold value	Threshold	Action
NW_SI_N2_3	Whitehoven		15:00 Peak Overtopping Ra.	0.293	0.200	Flood Warning	
NW_SI_N2_3	Whitehoven		0:00 Mean Overtopping R	0.000	0.000	Flood Warning	
NW_SI_N2_3	Whitehoven		30:00 Peak Overtopping Ra.	0.900	0.200	Flood Warning	
NAV_SI_N2_3	Whitehaven		5:00 Peak Overtopping Ra.	1.263	0.200	Flood Warning	
NW_SI_N2_3	Whitehaven		5:00 Mean Overtopping R.,	0.000	0.000	Flood Warning	
NW_SI_N2_3	Whitehaven		0:00 Peak Overtopping Ra.	1.247	0.200	Flood Warning	
NW_SI_N2_3	Whitehaven		0:00 Mean Overtopping R.	0.000	0.000	Flood Warning	
NW_SI_N2_3	Whitehaven		\$100 Peak Overtopping Ra.	0.729	0.200	Flood Warning	
NW_SLN2_3	Whitehoven		IS:00 Mean Overtopping R.		0.000	Flood Watch	
NW_SI_N2_3	Whitehoven	20-03-2004 10:3	80:00 Peak Overtopping Ra.	0.076	0.050	Flood Watch	
						Ciose	Help

Site Data View

The site data view will present a table of data for the selected location.

TO	Dispato	htime	Workfie	w	What-i	f scenario	Descriptio	n FD	• I I	Open
19-03-2004 18:00:00	05-02-2006	00:15:15 c	osstal_Forecast					Micha V	Verner	201011
9-03-2004 18:00:00 Display per high tide Displa		_		t Micha	Werner	Whitehaven	I			
Nearshore Site Time	Calculated	Overtop	Overtop	Overtop	Nearshore	Nearshore	Nearshore	Offshore	Offshore	Offshore
	Tide Level	Mean	Peak Forec	Volume	Vieve	Viave	Viave	Site Used	Wind Speed	Wind Direct
	(m)	Forecast	(n2/s)	Forecast	Height	Period	Direction	(.)	(m/s)	(degrees)
		(m2/s)		(m3)	(n)	(8)	(degrees)			
20-03-2004 09:45:00	3.681	0.000	0.000	0.000	1.691	4.764	240.836	BOM	35.269	241.000
20-03-2004 10:00:00	4.026	0.000	0.000	0.000	1.697	4.772	240.682	BOM	35.269	241.000
0-03-2004 10:15:00	4.305	0.000	0.000	0.000	1.702	4.778	240.559	BOM	35.269	241.000
0-03-2004 10:15:00	4.305	0.000	0.000	0.000	2.508	5.509	245.855	BOM	37.974	238.000
20-03-2004 10:30:00	4.526	0.000	0.076	0.000	2.516	5.512	245.751	BOM	37.974	238.000
0-03-2004 10:45:00	4.681	0.000	0.729	0.000	2.521	5.514	245.678	BOM	37.974	238.000
0-03-2004 11:00:00	4.769	0.000	1.247	0.000	2.525	5.515	245.623	BOM	37.974	238.000
20-03-2004 11:15:00	4,775	0.000	1.283	0.000	2.525	5.515	245,618	BOM	37.974	238.000
0-03-2004 11:30:00	4,713	0.000	0.900	0.000	2.522	5.515	245.663	BOM	37.974	238.000
0-03-2004 11:45:00	4.506	0.000	0.293	0.000	2.518	5.513	245.722	BOM	37.974	238.000
0-03-2004 12:00:00	4,402	0.000	0.000	0.000	2.512	5.510	245.009	BOM	37.974	238.000
0-03-2004 12 15:00	4.204	0.000	0.000	0.000	2.505	5.507	245.903	BOM	37.974	238.000
0-03-2004 12:30:00	3.961	0.000	0.000	0.000	2.495	5.504	246.017	BIOM	37.974	238.000
0-03-2004 12:45:00	3.682	0.000	0.000	0.000	2.486	5.500	246.154	BIOM	37.974	238.000
20-03-2004 13:00:00	3.374	0.000	0.000	0.000	2.475	5.493	246.323	BIOM	37.974	238.000
20-03-2004 13:15:00	3.037	0.000	0.000	0.000	2.110	5.422	243.822	BIOM	37.273	246.000
20-03-2004 13:30:00	2.684	0.000	0.000	0.000	2.099	5.416	244.020	BIOM	37.273	246.000
0-03-2004 13:45:00	2.318	0.000	0.000	0.000	2.083	5.421	244.240	BIOM	37.273	246.000
C 02 2004 54 00:00	1 0.44	0.000	0.000	0.000	2,068	5 417	244,485	RIGH	97 379	246.000
									Close	Help

13 PRTF Display

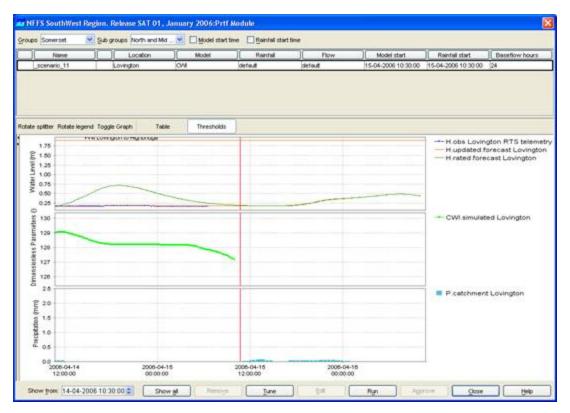
- 12 Thresholds Display and TRITON Display
- PRTF Display
 - Create Scenarios
 - Change settings
 - Change Model type or Tune Models
 - Create or select a Rainfall Profile
 - Edit Flow Profile
 - Change Model Start Time
 - Change Rainfall Start Time
 - Change Base flow search Hours
 - Approve a scenario

PRTF Display

The PRTF display is the front end (user interface) for the PRTF module. PRTF takes a transfer function approach (using the Physically Realisable Transfer Function model algorithm, available also in the WRIP forecasting system). The PRTF forecasting module is an external module. The PRTF module (provided by PlanB, UK) is linked to NFFS using the same method as any external forecasting module.

Delft-FEWS User Guide

14 Correlation Display

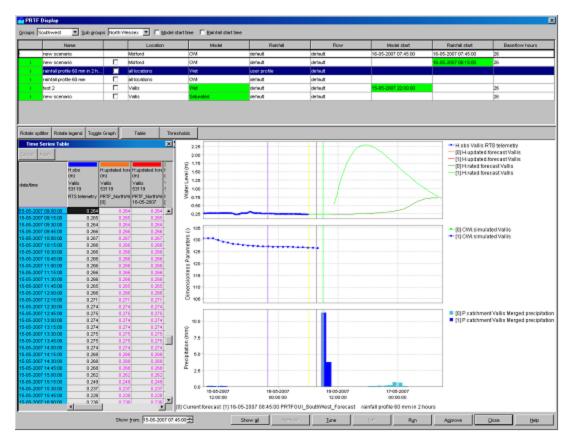


The PRTF display provides an interface to the configurable settings of the PRTF module. The settings entered by the user are stored in the form of a what-if scenario, that can then be run. Scenarios created with the PRTF display run locally on your own PC. The forecast result of each scenario can then be viewed in the same display. A scenario created in the PRTF Display is at first not visible to any other user than the user on the computer it's running on.

Within the PRTF Display it is possible to approve a scenario or a selection of scenarios to create a new forecast, which is then sent of to the Master Controller to run on one of the Forecasting Shells. When this forecast is ready it is automatically visible to all other users, because it has been approved.

Create Scenarios

The PRTF Display makes it possible to interactively change module settings and view the results of these changes. Changes in model settings, rainfall profiles and changing initial conditions will be stored in a scenario. Each scenario consists of a row in the top part of the Display (see example below). If you select a scenario (and one site) then the results of this scenario will be shown in the graphs in the lower part of the display.

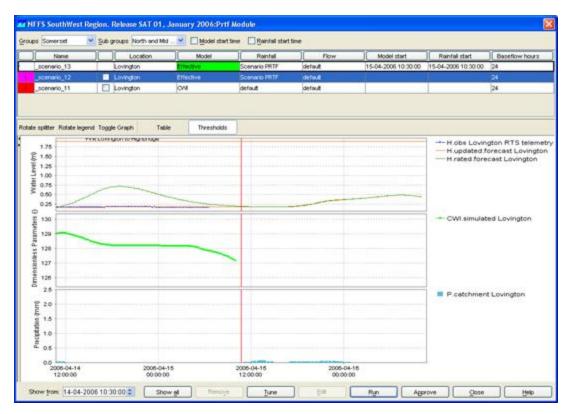


To create a new scenario you have to select a group of sites in the top part of the display and optionally you also have to select a subgroup (Southwest only). Then you select a site or the option 'all locations' in the top row of the scenarios list and change the settings you want. If you change one the settings in a scenario, the cell will become green (apart from the cells in the columns 'Name', 'Location' and 'Baseflow hours'). You can make the name of a scenario editable by clicking in the cell with 'new scenario'. After changing the settings and the name of the scenario you need to click on 'Run' to run this scenario. A new row will be added to the top of the list. The scenario you have just created will move on record down and the top row will be the new scenario to edit.

The colour of the first cell in each row gives an indication of the status of that scenario (see picture below this paragraph). The following table explains the colours and their meaning.

colour	status
green	scenario ran successfully
purple	scenario is running
red	scenario failed

The first cell also contains an 'I' indicating that more background information (log messages) on this run is available. Double clicking will reveal this information.



The buttons 'Show All' and 'Remove' in the button bar in the lower part of the display, will respectively show all previously created scenarios for the selected group or subgroup of locations and remove the scenario which is currently selected.

Change settings

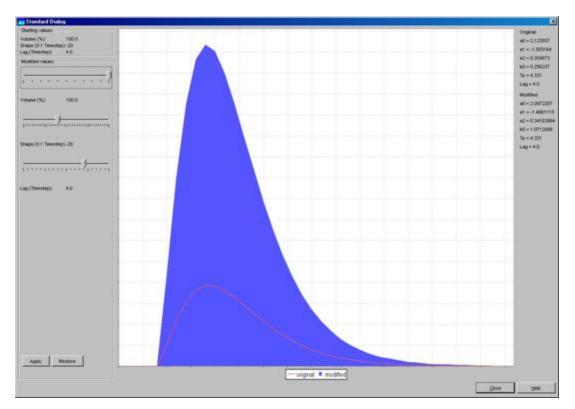
Within the PRTF Display it is possible to change the following settings:

- 1. change model type or tune an existing model
- 2. create or select a rainfall profile
- 3. edit the flow profile
- 4. change model start time
- 5. change rainfall start time
- 6. change base flow search hours

Each of these options will be discussed briefly in the next section.

Change Model type or Tune Models

By clicking on the cell in the column 'Model' you get a dropdown box with additional model types to chose from. By default the default model type is displayed. You can select one of the available model types and run a scenario. It is also possible to tune the model you have selected by clicking on the 'Tune' button in the button bar in the lower part of the display. A new window will appear showing the current settings of the selected model (see example below). The graph reflects the response of a catchment to a rainfall event.



The red line shows the original settings and the blue graph shows the changed settings. The values for Volume, Shape and Lag can be modified by moving the slider bars. This results in a change in shape of the blue graph. After changing the Model parameters you should click on 'Apply' to add the modified settings to your new scenario. With the 'Restore' button you can go back to the settings that were applicable when you opened the Model Tune window.

The starting values for Volume, Shape and Lag are given in the upper left part of the display and the original and modified parameters for the Transfer Function are given in the upper right part of the Display.

Create or select a Rainfall Profile

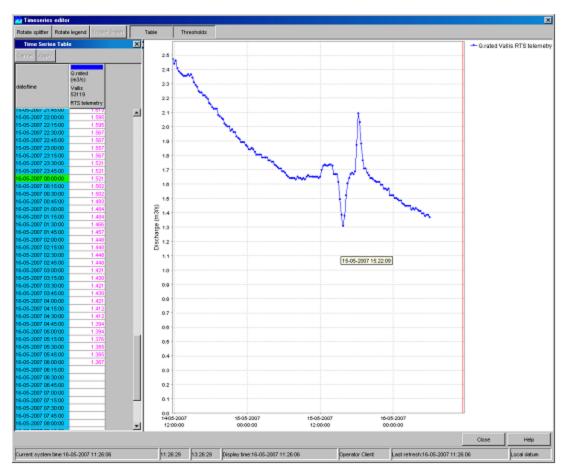
To create or select a rainfall profile you need to click on the cell in the column Rainfall. A dropdown box will appear with some predefined rainfall scenarios. You can select one of those predefined scenarios or you can select the option 'user profile' to create a new profile. When the option user profile is selected you need to click on the 'Edit' button in the button bar in the lower part of the display. This button opens a window with a Time series Editor (see picture below).

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	6-05-2007 18:00:00	0.00	-	12:0	0.00	00:00:00	12:00:00	00:00:00		
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You can type in or copy in the rainfall profile you want. The values inserted are interpreted as mm per time step (15 min). Before closing this window you should click on 'Apply'.

Edit Flow Profile

To edit a flow profile you need to click on the cell in the column Flow. A dropdown box will appear with two options, 'default' and 'user profile'. The default option will leave the flow time series as it is. You can select the option 'user profile' to create a new profile. When the option user profile is selected you need to click on the 'Edit' button in the button bar in the lower part of the display. This button opens a window with a Time series Editor (see picture below).



You can type in or copy in the flow profile you want. Before closing this window you should click on 'Apply'.

Change Model Start Time

You can specify a model start which overrules the model start time PRTF derives itself. There are two ways to edit the model start time:

1. Edit the date in the column 'Model start' by clicking in the cell.

2. Click with the left mouse button some where in the graph (a black dashed line appears) and then use the right mouse button to select 'Set model start time'. The new model start time will appear in the 'Model start' column of this new scenario and the dashed black line will become blue.

Change Rainfall Start Time

You can specify a rainfall start which determines the start of the rainfall event. There are two ways to edit the rainfall start time:

1. Edit the date in the column 'Rainfall start' by clicking in the cell.

2. Click with the left mouse button some where in the graph (a black dashed line appears) and then use the right mouse button to select 'Set Rainfall start time'. The new rainfall start time will appear in the 'Rainfall start' column of this new scenario and the dashed black line will become yellow.

Change Base flow search Hours

Another option in the PRTF display is to edit the Base flow search hours. This parameter automatically determines the start time of a PRTF model run by selecting the lowest level in the base flow search period (a tolerance around this level is used to make it less sensitive). To edit this value you need to type in a new value in this cell and press enter.

Approve a scenario

If you want to approve a forecast you need to select the scenarios you want to approve by checking the checkbox in each row you want approve. Then you need to click on 'Approve' in the button bar in the lower part of the display. A window will pop up with the options to run a single forecast based on your selected scenarios or a scheduled forecast over a period of time and with a certain time interval.

14 Correlation Display

13 PRTF Display

- Correlation Display
 - Input
 - Scatter Plot
 - Forecast
 - Events
 - Show Report and Close

Correlation Display

The Correlation display allows application of the Correlation Utility in an interactive manner. Correlations can be evaluated and derived between datasets using various criteria. The derived correlation can for example be applied to monitored time series data or manually entered data points.

Input

At first, a *correlation group* should be selected from which a dataset will be used for making a correlation. Next, a *forecast location* needs to be selected and a *support location* or a number of support locations. With these steps a dataset is selected from a configuration file with pre-defined correlation input values for making a correlation.

Correlation Disp	lay		×	
Correlation module				
Input Scatter plot Forecast Events				
Correlation Group	s			
CorrelationDispla	y_Trent		T	
Forecast locations				
Colwick (4009)				
Support locations				
Drakelow (4019)				
Selection criteria				
E Period:	Start date	End date	© Select inside period	
	2005-01-14 10:00	2005-01-14 10:00	00 🔄 C Select outside period	
Thresholds:	Threshold limit		C Select aboye threshold	
			${f C}$ Select below threshold	
Tags:	dummy time	•	C include selected tags	
	invalid month in Tpot.ir	uf T	$oldsymbol{c}$ Exclude selected tags	
Regression equations Polynomial order				
Linear Regression: f(x) = A + B * x				
			Show Report Close Help	

When required, the above mentioned dataset can be restricted on the basis of a number criteria...

• Period

A period can be defined inside or outside which data points should be included in the analysis.

• Thresholds

A threshold can be defined below or above which data points should be included in the analysis.

• Tags

One or more tags of data points can be selected. Data points that have a corresponding tag are or are not included in the analysis. Please note that these tags should be available in the datasets. Typical tags could be winter or summer event.

After having selected a dataset for which a function should be fitted, a regression equation can be selected. The available equations are shown below. For the polynomial regression, an order can be entered.

Regression equations	
Hyperbolic Regression: f(x) = A + B / x	•
Hyperbolic Regression: f(x) = A + B / x	
Exponential Regression: f(x) = A * exp(B / x)	
Linear Regression: f(x) = A + B * x	
Polynomial Regression: $f(x) = C0x^0 + C1^*x^1 + + Cn^*x^n$, (n<=9)	
Logarithmic Regression: f(x) = A + B* In(x)	
Power Regression: f(x) = A * x/B	
Exponential Regression: f(x) = A * exp(B * x)	

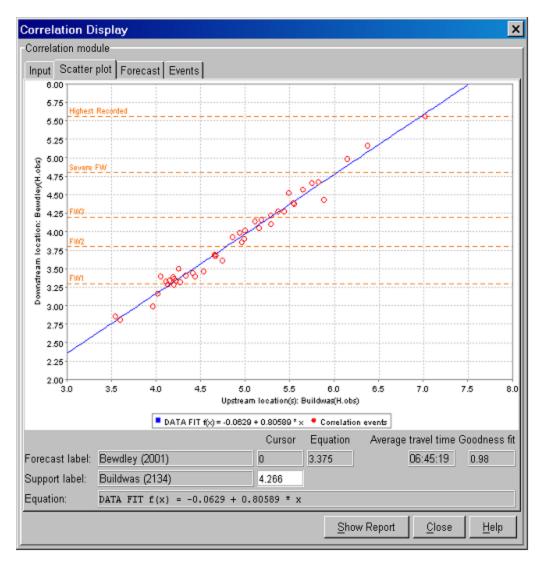
Scatter Plot

When selecting the *Scatter Plot* tab, a scatter plot is displayed. Defining the criteria for the restriction of the dataset- if any- and the best regression equation, requires probably a number of iterations where the scatter plot will prove to be helpful.

Moving the cursor in the scatter plot displays a cross hair that helps to look at data values. Tool tips with event information are displayed when the cursor is placed on an event.

Below the scatter plot, the discharge or water level at the support location (X) and at the forecast location are displayed (Y). The Cursor column indicates the values for the support location and the forecast location at the location of the cursor on the graph. The forecast computed with the regression relation is displayed in the equation column; this computed value assumes an X-value as indicated by the cursor. The regression formula used to compute the forecast value is also given.

In addition, the travel time computed from the selected events is presented in the field Travel time .



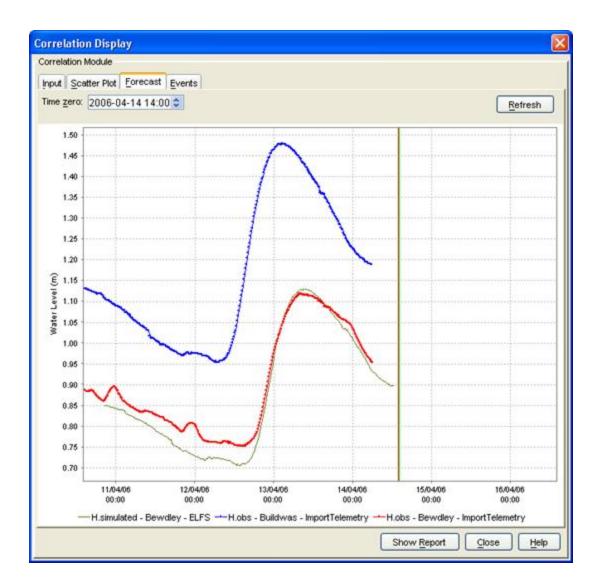
A forecaster can also enter a value in the cursor column for the support location. By pressing [ENTER] the correlation display computes the forecast with the equation and shows the result in the equation column.

Forecast

On the Forecast tab of the Correlation display, the derived regression equation can be applied to a monitored data series for the support location or a manually entered value.

By entering the *Time zero* (T0), the FDO can review the result of the application of the derived regression equation in time. After T0 is changed, pressing [Refresh] will update the graph.

In the displayed graph, the observed water levels at the support and forecasting locations are respectively given in blue and red. The thin line is the time series that results from applying the regression equation to the observed time series at the support location.



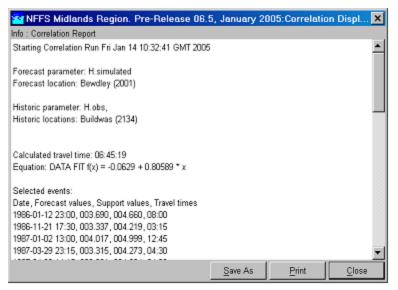
Events

The events tab shows a list of all events used in the correlation function. The list includes the dates, forecast level, support level, travel time of the selected events, comments and tags (user configured in CorrelationEventSets file). These can be sorted by clicking on the header of each column.

Show Report and Close

The forecasts generated by applying the regression relation can be presented in a report with [Show Report] when required. With [Close], a user can leave the Correlation display.

The generated report includes the selected events and the computed correlation function. This report can be printed or saved to a text file.



15 Lookup Table Display

14 Correlation Display

Delft-FEWS User Guide

16 KFlows Display

- Lookup Table Display
 - Lookup Scenario Id
 - Forecast Description
 - Start time
 - What-if Scenario
 - Report
 - Close

Lookup Table Display

The Lookup Table display allows for interactive use of lookup tables. In the present configurations lookup tables are only used for tidal forecasting. The display allows the user to view the input data for lookup tables and run what-if scenarios on them. Forecast results of these what-if scenarios can be shown in a report.

The results of running the interactive Lookup Table Display will only be available in the display and *not* be saved as a forecast in the Local Data store and Central Database. In case this is required, the what-if scenario should be defined with the What-if Scenario Display and run as a manual forecast.

Kert C1 to C10, C001 to C006 precast description : (ent Forecasting What-if Scenario tart time : (dd-MM-yyyy HH:mm:ss) : 6-05-2007 09:45:00 What-if scenario Parameter Location Tidal Surge Residuals (Simulated) Sheerness add 0.0 Tidal Surge Residuals (Simulated) Dover add 0.0 Wind Direction Forecast Thames Sea Area add 0.0 Wind Speed Forecast Thames Sea Area	ookup Scenario Id :			
cerecast description : (ent Forecasting What-if Scenario tart time : (dd-MM-yyyy HH:mm:ss) : 8-05-2007 09:45:00 What-if scenario Parameter Location Operation Change Tidal Surge Residuals (Simulated) Sheerness add 0.0.0 Tidal Surge Residuals (Simulated) Dover add 0.0.0 Tidal Surge Residuals (Simulated) Rye add 0.0.0 Wind Direction Forecast Thames Sea Area add 0.0.0				
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tart time : (dd-MM-yyyy HH:mm:ss): 6-05-2007 09:45:00 What-if scenario Parameter Location Operation Change Tidal Surge Residuals (Simulated) Sheerness add 0.00 Tidal Surge Residuals (Simulated) Dover add 0.00 Tidal Surge Residuals (Simulated) Rye add 0.00 Wind Direction Forecast Thames Sea Area add 0.00 Wind Speed Forecast Thames Sea Area add 0.00				
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Tidal Surge Residuals (Simulated) Sheerness add 0.0 Tidal Surge Residuals (Simulated) Dover add 0.0 Tidal Surge Residuals (Simulated) Rye add 0.0 Tidal Surge Residuals (Simulated) Rye add 0.0 Wind Direction Forecast Thames Sea Area add 0.0 Wind Speed Forecast Thames Sea Area add 0.0	What-if scenario			
Tidal Surge Residuals (Simulated) Dover add 0.0 Tidal Surge Residuals (Simulated) Rye add 0.0 Wind Direction Forecast Thames Sea Area add 0.0 Wind Speed Forecast Thames Sea Area add 0.0	Parameter	Location	Operation	Change
Tidal Surge Residuals (Simulated) Rye add 0.0 Wind Direction Forecast Thames Sea Area add 0.0 Wind Speed Forecast Thames Sea Area add 0.0	Tidal Surge Residuals (Simulated)	Sheerness	add	0.000
Wind Direction Forecast Thames Sea Area add 0.0 Wind Speed Forecast Thames Sea Area add 0.0		Dover	add	0.000
Wind Speed Forecast Thames Sea Area add 0.0	Tidal Surge Residuals (Simulated)	Rye	add	0.000
	Wind Direction Forecast	Thames Sea Area	add	0.000
Wind Direction Forecast Dover Sea Area add 0.0	Wind Speed Forecast	Thames Sea Area	adid	0.000
	Wind Direction Forecast	Dover Sea Area	add	0.000
Wind Speed Forecast Dover Sea Area add 0.0	Wind Speed Forecast	Dover Sea Area	adid	0.000

Lookup Scenario Id

A workflow can be selected from a drop-down list with pre-configured workflows. Only workflows are available that run lookup tables. The workflows that can be selected are described in the Regional Configuration Documentation.

Forecast Description

A description can be entered to identify the workflow run in the Lookup Table display.

Start time

A start time for the forecast can be entered in the date & time field (yyyy-MM-dd HH:mm). Please note that the length of the forecast is defined in the forecast workflow and can not be set here.

What-if Scenario

The what-if scenario frame displays the *input* series and corresponding locations for the selected workflow. A what-if scenario can be defined by selecting a mathematical operator and a value to be applied to the corresponding input time series for the selected lookup table. The mathematical operator can be selected via a drop-down list in the column *Operator*. The value can be entered in the table *Change*.

🚾 Lookup Table Display			8
Lookup Scenario Id :			
Sussex C11 to C12, C401 to C405			*
Ecrecast description :			
Sussex Region Forecasting What-if S	cenario		
Start time : (dd-MM-yyyy HH:mm:ss):			
16-05-2007 09:45:00			
What-if scenario			
Parameter	Location	Operation	Change
Tidal Surge Residuals (Simulated)	Newhaven	add 💌	0.000
Total Wave Direction Forecast	South Hastings	add	0.000
Total Wave Height Forecast	South Hastings	subtract	0.000
Total Wave Direction Forecast	South Selsey	multiply	0.000
Total Wave Height Forecast	South Selsey	divide	0.000
		equal	
		timeshift (minutes)	
		equal to Missing	
		<u>Report</u>	Qose Help

Report

By pressing [Report] the workflow is run and the result of a what-if scenario is displayed in an HTML report. The results of the above mentioned example is presented below.

NFFS S	outher	n Region		(Ch	ENVIRONMEN AGENCY	
Coastal St	atus Repo	ort				
Forecast area	: North	Kent Forecasting				
Forecast name	: North	Kent Forecasting W	Vhat-if Scenario			
Forecast time (T0)	: 06/05	2004 20:15 GMT				
Time of Report	: 09/05	5/2004 20:55 GMT				
Location	06/05/2004 01:00	06/05/2004 13:30	07.05.2004 01:45	87/05/2004 14:15	08/05/2004 02:30	08/05/2004 15:00
C1	Flood Willining	Flood Werning	Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C2	were Flood Willining	Severa Flood Wenting 5		No Warning Issued		
C3	Flood Witming	Flood Warning		No Warning Issued		Contraction of the Contraction o
C4	Flood Wiening	Flood Warning	the second s	No Warning Issued	and the second	And the second se
C5	Flood Willining	Flood Warning		No Warning Issued	the second s	and the second se
	nine Rood Warning	Seven Floor Vierning 5		No Warning Issued No Warning Issued		
C6 5	Flood Werning	Flood Warning				

Close

With [Close] the display is closed. Please be aware that no results of the analysis are stored in the database.

16 KFlows Display

15 Lookup Table Display

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17 Trends Display

- KFlows Display
 - KFlows Calculations
 - Current day mode
 - Historical mode

KFlows Display

KFlows is a very specific module that is applied to monitor target flows over a water day at a specified site. In NFFS the model is applied only for Thames region. The KFlows display is the front end (user interface) of the KFlows module. The KFlows module may be run without an active connection to the network or even a Master Controller.

In principle the KFlows module in NFFS replicates the behaviour of the KFlows module set up in CASCADE (Thames region) with the following minor differences:

- the running mean excluding tidal influence has not been implemented in the NFFS version.
- the NFSS version will perform the calculations if less than two hours worth of data is available. A warning message will be issued if this happens

KFlows can be used in two working modes:

- Current day mode This is the 'forecasting mode'
- Historical mode
 This mode allows the user to view flows and trends of previous water days

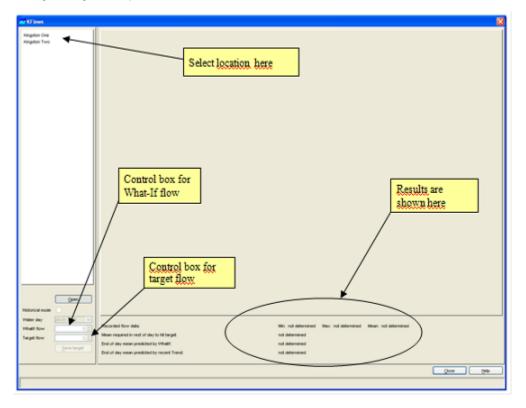
KFlows Calculations

The KFlows module performs the following calculations:

- First the average of the last 8 observed values (last 2 hours) is determined.
- This average (the current trend) is used to extrapolate the observed timeseries for the whole water day
- From this time series a running mean is determined that is displayed in the graph
- The end of day mean is determined and (in case of the workflow) stored in a daily timestep series
- The display can also use a what-if scenario for the rest of day flow. It then determines the amount of water needed to reach the target flow

Current day mode

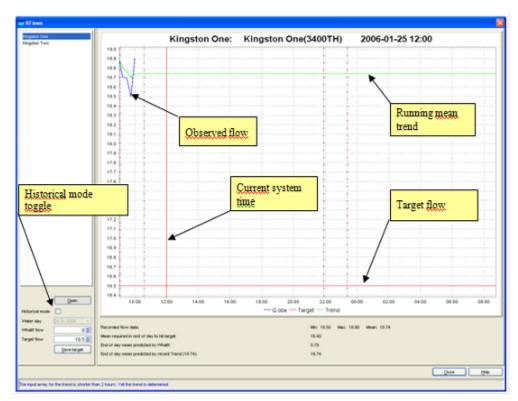
After opening the selected gauge the module will get the data and perform the calculations. If not enough data points (the number of points used is presently fixed at 8) are present between the current time and the configured start of the water day the calculation will use less points and a warning message will be printed in the status bar.



Using the controls on the bottom left part the target flow and the what-if flow for the rest of the day may be adjusted. After adjusting any of these, the calculations will be updated immediately.

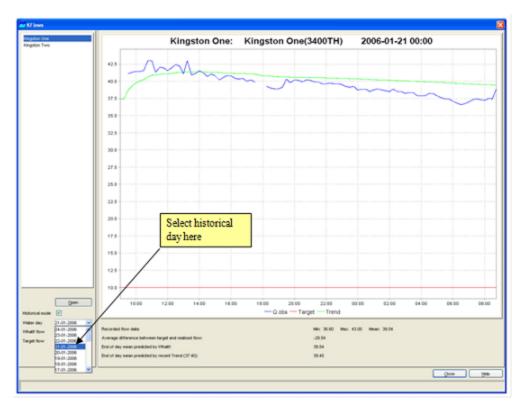
The periods with tidal influence (these are based on the Astronomical Highs and Lows) are shown as fine dashed vertical lines.

The save target button allows the user to save the target flow for that day. Saved target flows are used in the historical mode of the display.



Historical mode

The historical mode can be selected using the historical model toggle. After selecting this toggle the drop down box can be used to select a specific water day. The display will show recorded flow, target flow and the running mean trend for that day.



17 Trends Display

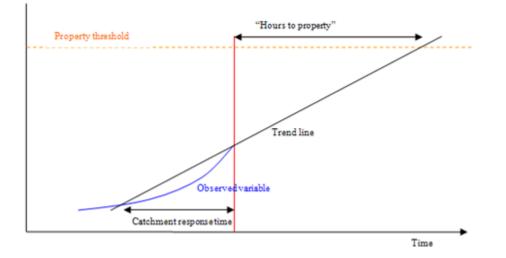
16 KFlows Display

Delft-FEWS User Guide

18 Longitudinal Profile Display

Trends Display

The Trends display is an interactive display that determines the difference between the last observation and a value some time ago, determined by the catchment response time. After that the average rate of change between these points is determined and extrapolated into the future. The display then indicates the remaining hours before the so-called "Property threshold" will be crossed (up to a maximum of 99 hours), as illustrated in the figure below.



Note that when no data is available for the last hour up to the current system time, for that location the trend will not be determined. The display shows the results for selectable groups of locations and may be printed to the <u>default</u> windows printer.

For each location in the display the following information is shown:

- Location ID and Name
- Parameter

- Latest Value / Time: the date and time of the latest value
- Value XX hours ago: where XX identifies the selected catchment response time
- Diff: the difference between the two values
- Rate of change: the difference per hour. This is the slope of the trend line.
- Hours to Prop: the amount of time from "Now" to the trend line crossing with the property threshold

0	Name	Parameter	Latest Value / Take	Value 24 hours ago	OFF	Rate of change	Presto Prop	
11007H	Farmoor	Observed Water		0.796 (13.15)	0.000	0.000	- Int	
ant Aven 1800TH	Sutton Courterveu	Otoerved Water		1.983 (13:36)	-0.008	-0.00033		
South East/1-2 (T) 2290TH	Residing	Otionrved Water		-	-	-		
South Exit/0.6 (T) 27007H	Windsor	Observed Vinter		6,219 (13:15)	0.026	0.00108	+90	
2900TH	States	Observed Weder .	2.781 (12.30)	2,771 (12:30)	0.010	0.00042	+99	
ND 5100TH	visitor	Observed Wilder	8.190 (12:30)	0.263(13:30)	-0.065	-0.00271		
3399TH	Hingston Two	Observed Water		4.509 (13.15)	-0.047	-0.00196	-	
3400TH	Hingition One	Observed Water		4.498 (12:30)	-0.061	-0.00213	_	
1000000								
00								
7								
(1715)								
West (WI)								
WestQ (TVQ)								
WestD and 4 (TVC								
Ver85 to 7 (TVI5-								
(Ovan) (CHE)								
110								
675)								
117)								
same (PAN)								
NA)								
CAVIN BUSIN								
write (howre)								
ente (howes)								
write (hower)								
anenti (hovet)							Pet	Quee

18 Longitudinal Profile Display

17 Trends Display

Delft-FEWS User Guide

19 Calibration Display

Longitudinal Profile Display

Since release 2015.02 the Longitudinal Profile Display is not supported anymore.

Since release 2007.02, the Data/TimeSeries Display can display longitudinal profiles in graph and table format. It therefore has become the preferred way to show longitudinal profiles and overtakes the functionality of the Display discussed below.

The FEWS Longitudinal display can be used to show time series, generated by hydraulic models for a longitudinal river profile,. stored in the FEWS data store. Another option is to generate a longitudinal profile in the time series display.

To show longitudinal profile data press the [Longitudinal Display] button from the FEWS toolbar. When the Longitudinal Display is active you can see the following components on the Display:

- A list box with time series that can be displayed
- A graph component
- A Toolbar with the following options:
- · Buttons to start a movie of the longitudinal time series, pause or stop the movie
- A slide bar that can be used to go forwards or backwards in time
- A time caption showing the exact time of the time step that is shown
- Two buttons to close the display or show the FEWS help file



When a longitudinal profile is selected from the list the graph component is loaded with data for the selected profile:

- Brown line with the elevation of the river bed
- Green line with the minimum water levels of the selected profile time series
- · Red line with the maximum water levels of the selected profile time series
- Blue line with the water levels of the time step shown in the slider.

When the play button is pressed the time series will be shown in the graph as a kind of movie.

When configured other information than the time series can be shown in the graph. From the above example can be seen that also information on the location of motorways or bridges is added as well as thresholds for a location located on the selected branch.

19 Calibration Display

18 Longitudinal Profile Display

Delft-FEWS User Guide

20 Configuration Manager

- Calibration Display
 - Model to Calibrate
 - Model Parameters
 - Run Options tab
 - Results
 - Working efficiently with calibration

Calibration Display

The calibration display forms a special part of the forecasting systems that allow automatic calibration of any model connected to FEWS through the General Adapter. The model to calibrate must have a correctly configured General Adapter module Instance and included in a workflow. The calibration display (or utility) will be available only in the stand alone system, as it is not considered a functional part of an on-line system.

The calibration display will provide simple automatic calibration methods using either a non-derivative based local optimisation method or a more global optimisation approach (SCE-UA). While it is accepted that many alternative calibration approaches and algorithms are available, the functional scope of the module within FEWS is to provide a general purpose utility only, not necessarily encompassing all different optimisation methods. The algorithms applied are subject to research and development and the functional availability of the calibration environment may be subject to future expansion.

It is noted that for forecasting module development, the calibration utility is not seen as the primary tool with which to calibrate modules. These should first be calibrated outside FEWS in the native environments. The module within FEWS can then assess how the module perform in the linked environment. Alternatively, for modules where no native calibration environment is available, this module can be used, but it is a generic tool and therefore contains no module specific optimisation strategies.

The calibration utility will make use of performance indicators provided by the performance indicator utility, allowing comparison of calculated and observed data series.

Because of its interactive nature, the module is provided solely though a user interface plug-in that allows:

- Selection of the workflow to run during calibration. This workflow should obviously contain modules that allow calibration, though the system will not explicitly check on this.
- Selection of parameter and/or parameter sets to be calibrated.
- Selection of how module performance is to be assessed. The performance indicator module will be used to establish the performance.
- Selection of various calibration criteria, including termination criteria.

odel to calibrate Model parameters Run options Results Workflow Select workflow:	
Severn_Trent_Hydrological_Historical	
Select module instance ID	
GA_Historical_MCRM_Sev-C103	
Tresseries Start time: 2005-02-20 21:00:00 C End time: 2005-02-27 21:00:00 C Tresstep: hour V 1 C Observed	Simulated
Module instance importTelemetry	Module instance: MCRM_Historical Cocation: Rhos-V-Pentref (2025)
Parameter Group & param Discharge	Parameter Group & param Discharge
Other Grace period	Cold State
Grace period day 💌 0 🗘	Type: Cold states(Default)

The Calibration display includes 4 tabs:

- Model to Calibrate
- Model Parameters
- Run Options
- Results

Model to Calibrate

In the first tab the user must enter all information concerning the model to calibrate. Not all models can be selected, the requirements for a calibration model run are:

- The model must allow module parameters to be exchanged through the Published Interface Exchange XML format.
- For each model the Parameter Files must be added to the ModuleParFiles configuration directory.

Currently only the Model Adapters for the MCRM & DODO models fulfil these requirements.

The required steps in the Model to Calibrate tab are:

1. Select the workflow that includes the model to calibrate from the list of available workflows.

2. When the workflow is selected the General Adapter Module Instance of the external module should be selected from the list. This General Adapter Module Instance must include configured elements that export model parameter files, adapted by the Calibration utility.

3. Select the time period to calibrate for by entering a start date and an end date

Select the observed time series; this is the time series that will be used to compare the model results with. It is important to select the correct module instance id that generated the observed time series (most often an import module instance) and the correct location id and parameter id.
 Select the simulated time series that should be compared with the observed time series. The module instance id of this time series will be the module instance of the module to calibrate.

6. Enter a period for the Grace period. The model results produced in the grace period will not be included in the calibration optimisation.

7. Select the cold state group that will be used in the workflow.

Once the selection has been entered in the Model Calibration tab it can be stored to a file by pressing the [Save] button. Next time the calibration utility is used the [Load] button can be used to load the selection.

Model Parameters

The Model Parameters tab includes a spreadsheet with all model parameters that can be adjusted by the calibration utility.

Model to calibrate Model parameter Module Instance	Run options Resu	£s .						1
Model parameter file versions:	1.00 Parameters for	catchname.dulas	s - rhos y pertref			*	Save A	ls:
Name	Value Origi	nal V	alue new	Min	Max	Stepsize	Adjust	
cetchname	dulas	- rhos y pentref	dulas - rhos y pentref	11994 - Castella	All Second Second			-
maxtempsnowfall		0.000	0.000	-1.000	3.000			
windenssnowfall		0.070	0.070	0.000	1.000			
mintempsnowmeit		0.100	0.100	-0.500	2.000			
snowmetcoeff		0.100	0.100	0.000	1.000			
snowmetexp		1.200	1.200	0.000	9.990			
snowpackripe		0.350	0.350	0.000	1.000			
intstorecap		1.000	1.000	0.000	9.900			_
ntstoreevapfac		1.000	1.000	0.000	9.990			
potranspfac		0.670	0.670	0.000	0.990			
maxsmdpotevap		20.000	20.000	0.000	500.000			
snidmintransp		150.000	150.000	0.000	500.000			
mintransplac		0.000	0.000	0.000	0.990			_
unottooett		0.400	0.400	0.000	0.990			
runoffexp		0.050	0.050	0.000	0.100			
maxrunoffperc		0.700	0.700	0.000	0.990			
sansurplus		10.000	10.000	0.000	99.900			_
stunccoeff		30.000	30.000	0.000	99.900			
sfuncexp		1.500	1.500	0.000	9.990			
waxpercolrvate		1.000	1.000	0.000	9.990			
baseflowcoeff		2.400	2.400	0.000	99,900			
aytime		0.100	0.100	0.000	9.900			
durationresp.		2.300	92.99584	0.000	99.900		25	
charroutcoeff		0.0717	0.03577	0.000	0.250		1	
chervoutexp		1.5103	8.88728	0.000	9.990			
proutfactor		0.0689	0.0689	0.000	0.099			
	Show Report	Run	Stop	Load	Save	Close	10	telp

The parameters shown in the spreadsheet are the model parameters of the parameter file that is selected in the upper drop down list. Once the spreadsheet has been filled with parameter values the model parameters can be selected that need to be optimised through the calibration utility. A model parameter can be selected by checking the "Adjust" column in the spreadsheet. Make sure that the original, minimum and maximum values for the selected parameter have realistic values.

Run Options tab

In the Run Options tab the final set of definitions must be set that allows the method and constraints of calibration to be defined. These include:

1. The calibration method to be used- thus may either be the Local gradient method "SuperDUD" or the global "SCE-UA" method. At the moment only the SuperDUD method is implemented.

2. The performance indicator to be used in calibration. The enumeration of this is "BIAS", "MAE", "MSE", "NS", "PEAK_MSE" and "PERCENT_VOLUME".

3. A number of termination criteria. All are available and may be selected for application or not considered:

a) Maximum number of runs.

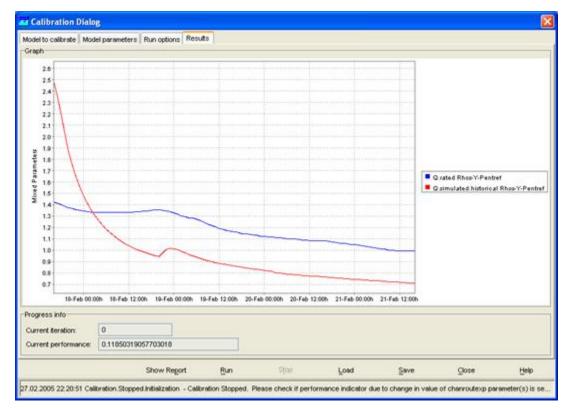
b) Threshold change in performance

c) Threshold change in parameter vector

Calibration Dialog							×
Model to calibrate Model param	eters Run optio	ns Results					
Calibration method							
Calibration method:	SuperD	UD		•			
Performance							
Performance indicator:	mea	nsquareerror			•		
Termination criteria							
Max.number of iterations:		4 100					
Threshold change in performance	:e:	4 <u>급</u> 1를	Í				
Threshold change in parameter	vector:	0.1					
1	Show Regart	Run	Stop	Load	Save	Close	Help
				·			

Results

The results tab shows the calibration results in a graph. To start the calibration utility the [Run] button must be pressed. The workflow will be started and the model parameters adjusted by the calibration utility. The user can follow the calibration progress by analysing the graph and the current iteration and current performance values located in the progress info frame.



After the calibration run is completed you can select to see a report by pressing the [Report] button. The report of the calibration run contains information on the model parameters that have been optimised in each iteration step.

By pressing [Close] the Calibration display can be closed.

Working efficiently with calibration

When working with the calibration utility a complete workflow must be run in order to optimise one of the modules in that workflow. In the calibration process this workflow will be run for multiple iterations. When the module is included in a fluvial workflow for the complete region each iteration will require a long time to complete. It is therefore recommended to create specific "calibration" workflows that only include one or several modules; the number of modules not contributing to the calibration module must be minimised. This will bring down the calculation time considerably. Especially for rainfall-runoff modules it will not take much time to create such calibration workflows.

When running the calibration utility a database must be used with a complete set of historical data. Such a database can be created using the on-line or off-line systems or by importing data from HARP.

20 Configuration Manager

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 - Steps for verifying the configuration in the master-controller database
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 - Occasional clean up of config files using the MCRecoveryTool
 - Known issue with patch mechanism

Configuration Manager - Introduction

From Delft-FEWS 2011_01 onwards the Configuration Revisions are stored more efficiently in the database. Please note that when the ConfigManager 2011_01 is started, it will not display Configuration Revisions from before 2011_01. Read Migration of Configuration Revisions (restricted access) for information on how to migrate the Configuration Revisions to the new 2011_01 format.

The Configuration Manager supports management of Delft-FEWS configurations. With help of the Config Manager files can be uploaded to and downloaded from the FEWS system. The tool also facilitates version management.

The display of the Config Manager is presented below.

- The tree view on the left hand side of the screen shows the various groups of configuration files.
- Configuration files of a selected type are displayed in the table in the centre of the screen. Files highlighted with yellow are part of the
 active configuration.
- Log messages generated during configuration management actions are displayed in the Log Panel.

nagement Version Management								
Group By Export	Im <u>p</u> ort	Set <u>A</u> ctive	Set Inactive	<u>D</u> elete <u>V</u> ali	date Do <u>w</u> nload	Upload	System Monitor	
		Version	Creation Time	User	Filename		Comment	Synch Level
CoefficientSetsFiles		TUAMC00:000000000	2016-08-16 08:36:4	. Min Xu	ManualForecastDisplay.xml	Î		Î
🗄 🛄 ColdStateFiles		CM:1479335862499_0	2016-11-16 17:37:4	. Edwin	ManualForecastDisplay.xml			
 CorrelationEventSetsFiles 								
TravelTimesFiles								
🚊 🛄 DisplayConfigFiles								
i DisplayConnightes								
ManualForecastDisplay	E							
	=							
ManualForecastDisplay ModifierDisplay Scada_MexRes	E							
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ManualForecastDisplay ModifierDisplay Scada_MexRes SpatialDisplay SystemMonitorDisplay FlagConversionsFiles	E	17 11 2016 10:05:00	2 INFO - Connection	to conver re-establish				
ManualForecastDisplay ModifierDisplay Scada_MexRes SpatialDisplay SystemMonitorDisplay FlagConversionsFiles IconFiles	E			to server re-establish		ra.astablishari		
ManualForecastDisplay ModifierDisplay Scada_MexRes SpatialDisplay SystemMonitorDisplay FlagConversionsFiles IdMapFiles	ш	17.11.2016 10:05:02	2 INFO - Connection	.ReEstablished: conr	ection to master controlle		d.	
ManualForecastDisplay ModifierDisplay Scada_MexRes SpatiaDisplay SystemMonitorDisplay FlagConversionsFiles IconFiles MapLayerFiles	ш	17.11.2016 10:05:02 17.11.2016 10:05:02	2 INFO - Connection 2 INFO - synchronisa	.ReEstablished: conn ation of activity Activity.	nection to master controlle In.LiveSystemStatus finish	hed.	d.	
ManualForecastDisplay ModiferDisplay StateMonitorDisplay SystemMonitorDisplay FlagConversionsFiles IconFiles IdMapFiles MapLayerFiles ModuleConfigFiles	EL.	17.11.2016 10:05:02 17.11.2016 10:05:02 17.11.2016 10:05:02	2 INFO - Connection 2 INFO - synchronisa 2 INFO - Finished sy	ReEstablished: conr ation of activity Activity. nchronization activity:	ection to master controlle	hed.		
ManualForecastDisplay ModifierDisplay Scada_MexRes SpatiaDisplay SystemMonitorDisplay FlagConversionsFiles IconFiles MapLayerFiles	ш	17.11.2016 10:05:02 17.11.2016 10:05:02 17.11.2016 10:05:02 17.11.2016 10:05:02 17.11.2016 10:04:53	2 INFO - Connection 2 INFO - synchronisa 2 INFO - Finished sy 3 INFO - Synchronizii	ReEstablished: conr ation of activity Activity. nchronization activity: ng table: LiveStatus	nection to master controlle In.LiveSystemStatus finish	hed. JS	d.	

The features offered by the Config Manager are available via the dropdown menus. A frequently used subset of the features is also available via Button Bar.

All options are described in the next sections.

Typical workflow for adding new Configuration

A typical workflow for adding new configuration via the ConfigManager consists of the following steps.

- 1. Remove the ConfigManager localDataStore.
- 2. Start the ConfigManager.
- 3. Login to the Master-Controller using the File->Login option.
- 4. Press Download and wait until all configuration is downloaded.
- 5. Press Import and import the new Configuration in the localDataStore.
- 6. Select the top root node in the config tree and press Validate the new Configuration.
- 7. When no errors are present, upload the changes and type a comment describing the changes.

Steps for verifying the configuration in the master-controller database

- 1. Remove the ConfigManager localDataStore.
- 2. Start the ConfigManager.
- 3. Login to the Master-Controller using the File->Login option.
- 4. Press Download and wait until all configuration is downloaded.
- 5. Use the Management -> Export All button to export all the configuration.
- 6. Inspect configuration the *export_config* directory.

The Configuration Manager MenuBar

The following dropdown menus are available...

- File menu
- Management menu
- Help menu

File menu

Login

In order to upload configurations to or download configurations from the server, you have to have to be logged in. By selecting Login you can choose to which of the servers running the Delft FEWS you want to connect.

When being logged in the [Upload] and [Download] button become active.

🙆 Configurati	on Management - w	grfc_oc		-				
File Managen	nent Help							
Login	ersion Management							
Logout	Export	Import		Set	Active			
Exit	c	^ Version	Cr	eati	User			
€ <mark>)</mark> Col ● Cor ● Tra € <u>)</u> Dis	efficientSetsFiles dStateFiles rrelationEventSetsFile ivelTimesFiles playConfigFiles gConversionsFiles -	=						

After selecting Login the following window is shown. In case multiple master controllers are available, these will be shown in the display.

Login to Master	Controller	×
Select a Maste	er Controller: TUAMC00 server	
Select a synch	nronisation profile:	
Set the synch	ronisation period:	1
ОК	Cancel	Help

Logout

Logs out again after logging in at a MasterController.

Exit

Exits the Configuration Manager.

Management menu

The management menu offers you the following options...

🖄 C	onfig	uration Managem	ent - w	grfo
File	Man	agement) Help		
Man		Export Export All Import	nent	
		Delete Delete Inactive	tsFiles	Î
		Set Active Set Inactive Validate	:Displa	=
		Download Upload	Display	
	Ŧ 📕	System Monitor	:S	

Please that most options are also available from the Button Bar.

The various option available for managing configuration files are discussed below.

Export

Allows you to export a selected configuration file to your file system. The exported files can be found in the \export_config folder in your Delft FEWS configuration folder.

See Export All, starting from 2015.01 two confirmation panels may be displayed that allow selecting the export directory. This directory is remembered via the user_settings.ini.

Export All

Allows you to export the complete configuration to your file system. The exported files can be found in the \export_config folder in your Delft FEWS configuration folder.

Starting from 2015.01, two confirmation panels may be displayed that allow selecting the export directory. This directory is remembered via the user_settings.ini.



If the directory already exists, or no is selected, the user is allowed to enter a custom directory.

猗 Save		×
Save in:] nl_regge_cm 💌 🦻 📴 🖬 🗸	
Recent Items	Config localDataStore lemp	
Desktop		
My Documents		
Computer		
	Folder name: D:\configurations\Fews_net\nl_regge_cm	
Network	Files of type: All Files Cancel	

Import

Allows you to import configuration files from a user defined folder into the datastore of the Client. In case you select the root of the folder tree, you can import a complete configuration in one go. Make sure in that case you select the folder that holds the Config directory. Since 2015.01, the default import directory is preserved via the user_settings.ini.

Configuration	Management - w	grfc_oc	~		_	- 24	-		
File Managemen	nt Help								
Management Ver	sion Management								
Group By	Export	Impo	ort	Set Act	ive	Set Inactive	Delete	Validate	Download
⊡ 🍡 wgrfc_oc		<u> </u>	ersion	Creatio	on	User	Filename		Comment
ColdSt ColdSt Correl Travel Displa Mt Correl Sc S	cientSetsFiles tateFiles ationEventSetsFiles TimesFiles yConfigFiles anualForecastDispla difierDisplay cada_MexRes vatialDisplay vstemMonitorDisplay onversionsFiles	E	Sele ©) Default	C:\FE\	Not Directory for I NS\wgrfc_oc and new files	mport	Bro	wse
⊕…]] IconFi ⊕…]] IdMap	les	17.1 17.1 re-e				ОК	Cancel		
	eConfigFiles	17.1	11.2016	10:05:02			n of activity Activity		

Before an actual import takes place the following screen pops up and you will be able to perform the following actions...

• Ticking Active imported files allows you to automatically set all files to active upon import. In the table you can select and deselect individual files to be imported.

Configuration N	lanagement - wgrfc_oc								×
Import Options									
Activate import	ted files	Deactiva	te missing configuration f	les					
Use single desc	ription for all imported files								
Import Candidates	Missing Configuration Files								
							Select /	All Selec	ct None
Filename	Date Modified		Config Table	Config Type	Status	Descri	Synch L	Select	Diff
Locations.xml	Thu Nov 17 12:05:06 E	ST 2016	RegionConfigurations	Locations	Ready		0	V	Diff
Parameters.xml	Thu Nov 17 12:06:02 E	ST 2016	RegionConfigurations	Parameters	Ready		0		Diff
Total amount of impo	rt candidates:		2						
Selected amount of in			2						
Unselected amount o	•		0						
	ndidates with newer version:		0						
			OK Can	cel					

• Ticking Use single description for all imported files allows you to add the same description for all imported files. The description is shown in the Management tab. You can add description to individual files by placing your cursor in the relevant field in the table.

Delete

Allows you to delete selected configuration files.

Deleting configuration files is possible only in limited situations. A configuration file could at some stage be used in a forecast and must therefore remain available for at least the length of the rolling barrel.

Configuration files may only be deleted in the following situation:

- The configuration file ID is a local ID, ie it starts with the prefix "CM: ".
- The configuration file is not the active configuration file, i.e. it is not referenced in the default table

Set Active

Allows you to set files to active. This means that when synchronised to the server, they will be used throughout the system.

Validate

Allows you to validate the active configuration. It is checked whether all files that form part of the active configuration are valid XML files and comply to the XML schema they relate to. This should in principle always be done before uploading a configuration but is not mandatory. Following a *successful* validation the bullets in front of the groups of files turn green.

The Configuration Manager will not import or upload any configuration which violates the validation rules that have been set in the Configuration

Manager configuration file.

Any other configuration files that are not XML, ie HTML and binary files, cannot be validated.

Configuration Management - wgrf	c_oc	Property and in case of the	the last little	a (0.00 m)	
<u>File</u> <u>Management</u> <u>H</u> elp					
Management Version Management					
Group By Export	Import Set <u>A</u> ctive	Set <u>I</u> nactive	<u>D</u> elete	alidate Do <u>w</u> nload	Upload
	Version Creation T	ime User	Filename	Comment	Sy
CoefficientSetsFiles ColdStateFiles CorrelationEventSetsFiles TraveITimesFiles DisplayConfigFiles ManualForecastDisplay					
ModifierDisplay Scada_MexRes SpatialDisplay SystemMonitorDisplay FlagConversionsFiles) - Validation started.) - Import.Finished: Ir	nport of configuration	n finished. jionConfigurations/Param	eters.xml
IconFiles IconFiles MapLayerFiles ModuleConfigFiles ModuleDataSetFiles ModuleParameterFiles III	CM:1479402944779_1 17.11.2016 12:15:45 INF(17.11.2016 12:15:45 INF(17.11.2016 12:15:45 INF(17.11.2016 12:15:44 INF(17.11.2016 12:13:07 INF(- D - Import of Paramet D - Import of Location: D - Import.Started: Imp D - Connection to serv	ers.xml completed s s.xml completed suc port of configuration s ver re-established	cessfully.	-
Edwin 2016-11-17 12:22:02 EST	г	TUAM	C00		<u>A</u>

Download

Allows you to download a complete set of configuration files- active and non-active- from the server.

Upload

Allows you to upload the active configuration to the server. Please validate your configuration before you upload.

During the upload process you will be requested to add a comment to the upload action in order to be able to identy why this particular upload has been made. See screen below. This comment will be shown in the Version Management tab.

Revision	comment X
?	Your active configuration has changed since last synchronization. Please provide a comment for the new active configuration revision that will be created.
	OK Cancel

Uploading a configuration (file) involves that all modified and added configuration files are synchronized with the master controller database. An essential aspect of uploading is that the configuration files are provided with a unique Master Controller ID. The local ID that has been set for the configuration file cannot be guaranteed to be unique for the master controller as multiple users may be changing a configuration.

During the period between downloading a configuration and the ensuing uploading of a modified configuration, in theory some one else could have made a change to the same configuration. The configuration manager will not deal with this theoretical possibility. The procedure that is used is that of optimistic locking, where the last changes that are made to a regional configuration are the changes that are stored.

System Monitor

Opens the System Monitor to display log messages and status information. This display has been described elsewhere.

og level	Log creation time	Workflow	Event Co	de	Lo	g Message	taskRunId
ERROR	2016-11-17 12:12:55 EST		RemoteSession.Erro	r	OC time out of synch with MC ti	me by approx. 69 secs. This may result	TUAMC00:00013504
WARN	2016-11-17 12:12:55 EST		Connection.Reconne	ecting	trying to reconnect		TUAMC00:00013504
WARN	2016-11-17 12:12:45 EST		Connection.Reconne	ecting	trying to re-login		TUAMC00:00013504
WARN	2016-11-17 12:12:44 EST		Connection.Lost		synchronisation problem reporte	ed: JMS connection lost	TUAMC00:00013504
WARN	2016-11-17 10:04:29 EST		Connection.Reconne	ecting	trying to reconnect		TUAMC00:00013431
ERROR	2016-11-17 10:04:22 EST		RemoteSession.Erro	r	OC time out of synch with MC ti	me by approx. 69 secs. This may result	TUAMC00:00013431
WARN	2016-11-17 10:04:09 EST		Connection.Reconne	ecting	trying to re-login		TUAMC00:00013431
WARN	2016-11-17 10:04:05 EST		Connection.Reconne	ectFailed	reconnection (7) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-17 10:04:01 EST		Connection.Reconne	ectFailed	reconnection (6) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-16 18:53:46 EST		Connection.Reconne	ectFailed	reconnection (5) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-16 18:53:41 EST		Connection.Reconne	ectFailed	reconnection (4) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-16 18:53:36 EST		Connection.Reconne	ectFailed	reconnection (3) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-16 18:53:31 EST		Connection.Reconne	ectFailed	reconnection (2) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-16 18:53:26 EST		Connection.Reconne	ectFailed	reconnection (1) to master cont	roller failed.	TUAMC00:00013431
WARN	2016-11-16 18:53:25 EST		Logout.Warn		Exception closing process conte	xt: Couldn't close JMS queue connection	TUAMC00:00013431
WARN	2016-11-16 18:53:25 EST		Connection.Lost		synchronisation problem reporte	ed: Failed to perform GET on: https://tl	TUAMC00:00013431
ERROR	2016-11-16 18:08:07 EST		RemoteSession.Erro	r	OC time out of synch with MC ti	me by approx. 65 secs. This may result	none
ERROR	2016-11-16 17:10:29 EST		Datastore.Error			tivity rows are missing in the index file (TUAMC00:00013427
g creation	time		_ · · ·		L	1 1.8	Refresh
nd time	2016-	11-17 12:32:15 ES	ST 🚖	Log level		WARN	_
	day	_	2 🖨	Eutomal aus			Acknowledg
ew period	uay	•	2 v	E <u>x</u> ternal ever	nt code		
efresh <u>p</u> eri	odically 🗸			Search in me	ssage		Save
				Max number	of messages displayed	250 ≑	

Version Management

Configurations changes are registered in the Version Management tab. Here is shown when configuration changes have been made and by whom. Comments entered during the upload are displayed to be able to identify the reasons for a particular configuration change. By default the system will show all the files belonging to the selected version. By selecting the "filter new or modified items" tick-box the list will only show the changed files compared to a version select in the drop down box next to it.

Nanagement Version Management Revisions Comment Changes Revision Date User Comment Changes TUAMC00:0000008 Thu Nov 17 12:23:30 EST 2016 Edwin None TUAMC00:00000006 Wed Oct 26 19:50:10 EDT 2016 Min Xu None TUAMC00:00000005 Wed Oct 26 09:50:10 EDT 2016 Min Xu None TUAMC00:00000004 Fill Oct 21 09:30:50 EDT 2016 Min Xu None TUAMC00:00000004 Fill Oct 21 09:30:50 EDT 2016 Min Xu None TUAMC00:00000001 TUAMC00:00000001 TUAMC00:00000001 Tru Oct 13 06:02:57 EDT 2016 Min Xu None TUAMC00:00000001 TuAMC00:00000001 TuAMC00:00000001 TuAMC00:00000001 TuAMC00:000000001 None TUAMC00:000000001 Full Reset Export Export Full Reset Export Full Reset Export						ile <u>M</u> anagement <u>H</u> elp
Revision Date User Comment Changes TUAMC00:00000008 Thu Nov 17 12:23:30 EST 2016 Edwin None Image: Comment Image: Comment <t< th=""><th></th><th></th><th></th><th></th><th>nent</th><th>Management Version Manage</th></t<>					nent	Management Version Manage
TUAMC00:00000008 Thu Nov 17 12:23:30 EST 2016 Edwin None TUAMC00:00000007 Wed Oct 26 11:02:30 EDT 2016 Min Xu None TUAMC00:00000005 Wed Oct 26 09:50:10 EDT 2016 Min Xu None TUAMC00:00000005 Wed Oct 28 09:50:10 EDT 2016 Min Xu None TUAMC00:00000005 Wed Oct 28 09:50:10 EDT 2016 Min Xu None TUAMC00:00000003 Fri Oct 11 05:06:49 EDT 2016 Evert de Vos fews-development-201602-63543-patch TUAMC00:00000001 Wed Oct 25 09:57 EDT 2016 Min Xu None None TUAMC00:00000002 Thu Oct 13 06:02:57 EDT 2016 Min Xu None None TUAMC00:00000001 Wed Oct 65 09:52:00 EDT 2016 Min Xu None None TUAMC00:00000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None None TUAMC00:000000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None None None Modification Table name Config type Version Version None New IdMaps IdImportMOS TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 Ne						Revisions
TUAMC00:0000007 Wed Oct 26 11:02:30 EDT 2016 Min Xu None TUAMC00:0000006 Wed Oct 26 09:90:10 EDT 2016 Min Xu None Image: Control of Contr		Changes	Comment	User	Date	Revision
TUAMC00:00000006 Wed Oct 26 09:50:10 EDT 2016 Min Xu None TUAMC00:00000005 Wed Oct 26 09:46:13 EDT 2016 Min Xu None Image: Comparison of the comparison of th	2586		None	Edwin	Thu Nov 17 12:23:30 EST 2016	TUAMC00:00000008
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TUAMC00:00000004 Fri Oct 21 08:30:50 EDT 2016 Min Xu None TUAMC00:00000003 Fri Oct 14 05:06:49 EDT 2016 Evert de Vos fews-development-20 1602-63543-patch TUAMC00:00000002 Thu Oct 13 06:02:57 EDT 2016 Min Xu None Image: Comparison of the Comparison of	2586		None	Min Xu	Wed Oct 26 09:50:10 EDT 2016	TUAMC00:00000006
TUAMC00:0000003 Fri Oct 14 05:06:49 EDT 2016 Evert de Vos fews-development-201602-63543-patch TUAMC00:00000002 Thu Oct 13 06:02:57 EDT 2016 Min Xu None TUAMC00:00000001 Wed Oct 05 09:52:00 EDT 2016 Min Xu None TUAMC00:00000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None Full Reset Export Full Reset Export Active configuration for revision TUAMC00:00000001 Compare with revision Revision: TUAMC00:00000000, created at Tue Aug 16 08:47:22 EDT 2016 by Min Xu ✓ ✓ Filter new or modified items Modification Table name Config type Version Version New IdMaps IdImportMOSQTF TUAMC00:0000000 TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New New IdMaps IdImportMOS TUAMC00:00000000 New New KediuleInstanceConfigs ImportMOS TUAMC00:00000000 New New RegionConfigurations RatingCurves TUAMC00:00000000 New New WorkflowFiles ImportPI	2586		None	Min Xu	Wed Oct 26 09:46:13 EDT 2016	TUAMC00:00000005
TUAMC00:0000002 Thu Oct 13 06:02:57 EDT 2016 Min Xu None TUAMC00:00000001 Wed Oct 05 09:52:00 EDT 2016 Min Xu None TUAMC00:00000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None TUAMC00:00000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None Full Reset Export Full Reset Export Active configuration for revision TUAMC00:00000001 Compare with revision Revision: TUAMC00:00000000, created at Tue Aug 16 08:47:22 EDT 2016 by Min Xu ✓ filter new or modified items Modification Table name Config type Version New IdMaps IdImportMOSQTF TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New ModuleInstanceConfigs ImportMOS TUAMC00:00000000 New ModuleInstanceConfigs ImportPIXML TUAMC00:00000000 New WorkflowFiles ImportPIXML TUAMC00:00000000	2586		None	Min Xu	Fri Oct 21 08:30:50 EDT 2016	TUAMC00:00000004
TUAMC00:00000001 Wed Oct 05 09:52:00 EDT 2016 Min Xu None TUAMC00:00000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None Full Reset Export Export Active configuration for revision TUAMC00:00000001 Export Import Provision TUAMC00:0000000000000000000000000000000000	2586	nent-201602-63543-patch	fews-develop	Evert de Vos	Fri Oct 14 05:06:49 EDT 2016	TUAMC00:00000003
TUAMC00:0000000 Tue Aug 16 08:47:22 EDT 2016 Min Xu None Full Reset Full Reset Export Active configuration for revision TUAMC00:00000001 Export Export Compare with revision Revision: TUAMC00:00000000, created at Tue Aug 16 08:47:22 EDT 2016 by Min Xu ✓ filter new or modified items Modification Table name Config type Version New IdMaps IdImportMOSQTF TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New ModuleInstanceConfigs ImportRTMA TUAMC00:00000000 New ModuleInstanceConfigs ImportRTMA TUAMC00:00000000 New WorkflowFiles ImportPIXML TUAMC00:00000000	25864		None	Min Xu	Thu Oct 13 06:02:57 EDT 2016	TUAMC00:00000002
Full Reset Export Active configuration for revision TUAMC00:00000001 Export Compare with revision Revision: TUAMC00:00000000, created at Tue Aug 16 08:47:22 EDT 2016 by Min Xu Items Modification Table name Config type Version New IdMaps IdImportMOSQTF TUAMC00:00000000 New IdMaps IdImportMOSQTF TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New IdMaps IdImportMOS TUAMC00:00000000 New ModuleInstanceConfigs ImportRTMA TUAMC00:00000000 New ModuleInstanceConfigs ImportRTMA TUAMC00:00000000 New WorkflowFiles ImportPIXML TUAMC00:00000000	2586-		None	Min Xu	Wed Oct 05 09:52:00 EDT 2016	TUAMC00:00000001
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New WorkflowFiles ImportPIXML TUAMC00:00000000	Restore	Version TUAMC00:00000000 TUAMC00:000000000	,	Config type IdImportMOSQ1 IdImportRTMA	on: TUAMC00:00000000, created at Tue Au Table name IdMaps IdMaps	Compare with revision Revision Modification New New
	Restore	woodified items Version TUAMC00:00000000 TUAMC00:00000000 TUAMC00:00000000	,	Config type IdImportMOSQ1 IdImportRTMA IdImportMOS	TUAMC00:00000000, created at Tue Au Table name IdMaps IdMaps IdMaps IdMaps	Compare with revision Revision Modification New New New
New ModuleInstanceConfigs ImportQTF_MOS TUAMC00:00000000	Restore	Version TUAMC00:000000000 TUAMC00:000000000 TUAMC00:000000000 TUAMC00:000000000 TUAMC00:000000000	,	Config type IdImportMOSQI IdImportRTMA IdImportMOS ImportRTMA	Table name Table name IdMaps IdMaps IdMaps ModuleInstanceConfigs	Compare with revision Revision Modification New New New New
	Restore	Version TUAMC00:00000000 TUAMC00:00000000 TUAMC00:00000000 TUAMC00:00000000 TUAMC00:00000000 TUAMC00:00000000 TUAMC00:00000000	,	Config type IdImportMOSQI IdImportRTMA IdImportMOS ImportRTMA RatingCurves	n: TUAMC00:00000000, created at Tue Au Table name IdMaps IdMaps IdMaps ModuleInstanceConfigs RegionConfigurations	Compare with revision Revision Modification New New New New New New
	Restore	Version TUAMC00:00000000 TUAMC00:00000000	F	Config type IdImportMOSQI IdImportRTMA IdImportMOS ImportRTMA RatingCurves ImportPIXML	n: TUAMC00:00000000, created at Tue Au Table name IdMaps IdMaps IdMaps ModuleInstanceConfigs RegionConfigurations WorkflowFiles	Compare with revision Revision Modification New New New New New New New

With [Export] you can export a complete configuration to your file system. [Restore] allows you to revert back to a previously active configuration.

Command-line options for the Configuration Manager

For users of the ConfigManager who want to add command-line options, these must be added in the jpif file under Windows or in the fews.sh script under linux. See the next section on howto add these for use with Windows/Linux/Launcher.

Automatic configuration download (-auto_download_configuration)

For users of the ConfigManager who want to automatically download the latest config, the option -auto_download_configuration is available (since 2011_02).

Note: The auto download option simply logs on and starts the configmanagers download like it is configured, which is <single> and not <continuous> by default. Therefore with multiple configmanagers the autodownload will not receive automatically updates when opened longer except on startup. There is a way to use autodownload with multiple configmanagers in this manner, but this requires a small edit of SynchProfiles.xml.

See the section <profile id="ConfigManager">

```
<activity id="Activity.In.Configuration">
<channelId>Channel.In.Configuration</channelId>
<schedule>
<single>
<priority>normal</priority>
</single>
</schedule>
<timeOut>10000</timeOut>
</activity>
```

replace it with

```
<activity id="Activity.In.Configuration">
<channelId>Channel.In.Configuration</channelId>
<schedule>
<continuous>
<period unit="minute" multiplier="1" divider="1"/>
<priority>normal</priority>
</continuous>
</schedule>
<timeOut>10000</timeOut>
</activity>
```

Prevention of deletion (-prevent_deletion)

By design, the deletion of configuration files means that some existing config revisions may become incomplete (or corrupted). In order to prevent deletion of config files using the ConfigManagementApplication, the option *-prevent_deletion* has been added. This option will hide the buttons / menuitems and popup menu items that allow this to happen. The following screen shot illustrates that there is no delete button visible.

tensorement Version Management Group By Export Import Set Active Set Inactive Validate Download Upload System Monitor P Export Import Creation Time User Filename Comment Syn DisplayConfigFiles DisplayConfigFiles Files Files	e Management Help							
Provide Support Export User Filename Comment Syn Provide Support Download Files Creation Time User Filename Comment Syn Provide Support Download Files Files Comment Syn Provide Support Files Files Files Comment Syn Provide Support Files Files Files Files Files Files Provide Support Module ConfigFiles Files	nagement Version Managemen	t						
Export Import DisplayConfigFiles Download Files Files DisplayConfigFiles Files Files Files	Group By Export	Import	Set Active	Set Inactive	Validate	Download	Upload	System Monitor
17-11-2016-12:40:22 INEC _ Superiorizing table: DefaultModuleParameters	Export Import Download DisplayConfigFiles FlagConversionsFiles Generation IdMapFiles ModuleConfigFiles ModuleDataSetFiles ModuleDataSetFiles PiClientConfigFiles PiServiceConfigFiles ReportImageFiles ReportImageFiles SystemConfigFiles SystemConfigFiles UnitConversionsFiles UnitConversionsFiles UnitConversionsFiles	es 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016 17.11.2016	12:48:55 INFO - Syr 12:48:53 INFO - Syr 12:48:51 INFO - Syr 12:48:49 INFO - Syr 12:48:48 INFO - Syr 12:48:34 INFO - Syr 12:48:34 INFO - Syr 12:48:34 INFO - Syr 12:48:33 INFO - Syr 12:48:33 INFO - Syr 12:48:33 INFO - Syr	nchronizing table: nchronizing table: nchronizing table: nchronizing table: nchronizing table: nchronizing table: nchronizing table: nchronizing table: nchronizing table: nchronizing table:	DefaultSystemC SystemConfigu DefaultReportT ReportTemplate DefaultRegionC RegionConfigu DefaultModuleF DefaultModuleF DefaultModuleF DefaultModuleF	Configurations rations emplates es configurations rations Parameters Parameters Parameters Parameters Parameters] <u>Com</u>	nent Syr

Prevention of upload (-no-upload)

For novice users, there is the option -no-upload that will allow only download and disable the upload button.

Extra confirmation of upload (-upload_confirmation)

In order to have the ConfigManager display an additional confirmation screen containing the newly imported configuration files, the ConfigManager can be started using the *-upload_confirmation* command-line option. This will allow the user to confirm before the upload is executed.

d the following new MC: Queue: Server: Amount imported:	ly imported files		Queues/NWS/ABRFC/MC0)1/ 43?jms.prefetchPolicy.queuePrefetch
Filename	Subdirectory	Config Type	File Type	Date Imported
Parameters	RegionConfigFiles	parameterGroups	XML	Thu Nov 17 12:52:44 EST
		OK Cancel		

Enable full reset of config revisions (-enable-revision-full-reset)

The commandline option *-enable-revision-full-reset* enables the button in the revision management screen (and only when logged in). Since 2014.01 this button is disabled by default.

👜 Configurat	tion Manager	nent - wgrfc_oc						x
<u>File Manager</u>	ment <u>H</u> elp							
Management	Version Manag	gement						
Revisions								
Revision		Date	User		Comment		Changes	
TUAMC00:000	000009	Thu Nov 17 12:54:04 EST 2	Edwin		None		25865	
TUAMC00:000	800000	Thu Nov 17 12:23:30 EST 2	Edwin		None		25865	
TUAMC00:000	000007	Wed Oct 26 11:02:30 EDT	Min Xu		None		25865	Ξ
TUAMC00:000	000006	Wed Oct 26 09:50:10 EDT	Min Xu		None		25865	
TUAMC00:000	000005	Wed Oct 26 09:46:13 EDT	Min Xu	l	None		25865	1
TUAMC00:000	000004	Fri Oct 21 08:30:50 EDT 2016	Min Xu	1	None		25865	Ŧ
					Full Reset	Export	Restore	
Configuration	n revision Sele	ect Revision				Ŧ		
Modification		Table name		Config type		Version		
Edwin	2016-11-17 13	:07:37 EST		TUAMC00			4	۸

Howto add command-line options

The following examples demonstrate how the **auto_download_configuration** is added to the command-line for several startup modes. Other command-line options can be added in a similar fashion.

Adding command-line options the jpif file under Windows

Before 2014.02 in the jpif file

```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
[FEWS_APPLICATION_DIRECTORY]
-prevent_deletion
-upload_confirmation
-auto_download_configuration
-enable-revision-full-reset
```

Note that the last line should be a linefeed.

Since 2014.02 in the .ini file

```
#Delft-FEWS ini file
main.class=nl.wldelft.fews.configmanagement.ConfigManagementApplication
classpath.1=*.jar
#Java Runtime jvm.dll location
vm.location=../jre/bin/client/jvm.dll
vmarg.1=-Xms512m
vmarg.2=-Xmx1024m
#location of the bin dir
working.directory=.
#region_home directory - <region_home> to be replaced with actual region
home directory
arg.1=../midlands_OC_activeMQ
arg.2=-prevent_deletion
arg.3=-upload_confirmation
arg.4=-auto_download_configuration
arg.5=-enable-revision-full-reset
```

Adding command-line options in the fews.sh script under linux.

```
if [ "$configmanager" = "true" ]; then
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx512M $JVM_OPTS
\-Djava.library.path=$BINDIR \
\classpath "$classes" \
nl.wldelft.fews.configmanagement.ConfigManagementApplication $REGIONHOME
$BINDIR -auto_download_configuration
elif \[ "$launcher" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx128M $JVM_OPTS
\-Djava.library.path=$BINDIR \
\classpath "$classes" \
nl.wldelft.fews.launcher.Launcher $REGIONHOME
else
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx512M $JVM_OPTS
\-Djava.library.path=$BINDIR \
\-classpath "$classes" \
nl.wldelft.fews.gui.explorer.Application $REGIONHOME $BINDIR
fi
```

Adding command-line options using the launcher

When the Configuration Manager is started using the Launcher, please refer to the Launcher documentation for adding command-line options.

```
...
<javaApp region="FEWS Scotland" operationMode="OnLine"
javaClass="nl.wldelft.fews.configmanagement.ConfigManagementApplication"
jvmOption="-Xmx512m" argument="FewsSC_OC -auto_download_configuration"/>
...
```

How to deal with big ModuleInstanceDataSets files

The ConfigManager uses synchronisation, and as such is limited by what the synchronisation is capable of downloading and uploading. Some module instance datasets / cold state files can be large enough to cause trouble to the synchronisation. If the configmanager does not upload or download all the config files without problems, the synchChannels.xml file can be edited to skip for instance the moduleinstancedatasets as shown in the sample. Sometimes the solution can be that the big files are splitted up in smaller ones, or alternatively they should be distributed via a different mechanism to their destination (e.g. Forecasting Shells).

	Sample synchChannels.xml excluding the ModuleInstanceDataSets and
	DefaultModuleInstanceDataSets
<channel< td=""><td>id="Channel.In.Configuration"></td></channel<>	id="Channel.In.Configuration">
<	<pre>incoming></pre>
	CorrelationEventSets
	DefaultCorrelationEventSets
	CorrelationTravelTimes
	DefaultCorrelationTravelTimes
	DisplayConfigurations
	DefaultDisplayConfigurations
	FlagConversions
	DefaultFlagConversions
	IdMaps
	DefaultIdMaps
	ModuleInstanceConfigs
	DefaultModuleInstanceConfigs
	optional
	<table ModuleInstanceDatasets>
	<table DefaultModuleInstanceDatasets>
	end optional

Occasional clean up of config files using the MCRecoveryTool

The design of the ConfigManager tool and master-controller database is intended for distributing the Delft-FEWS configuration, but is not suitable as an archive software for the configuration. We recommend that this is done by a dedicated backup system or versioning tool. Whenever the ConfigManager fails to upload / download config files, then it's probably time to clean up some inactive config files. The MCRecoveryTool (to be found in the MC build directory) includes several options for cleaning the config files. One can either clean all the config or remove the inactive config files only. The active workflow files are never removed by the MCRecoveryTool, since tasks for these active workflow files may be scheduled in the Admin Interface.

Known issue with patch mechanism

There is a known issue in 2014.01 with the Config Manager patch mechanism, where the first command-line argument of the Config Manager is ignored by the Config Manager. This is fixed in 2014.02. The workaround is to include the <binDir> just after the <regionHome>. See the following example.

```
..\jre
-Xmx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
<regionHome>
<binDir>
-prevent_deletion
-enable-revision-full-reset
```

Configuration Editor

Getting started

Stand-alone using the file system

Before 2014.02 using a jpif file:

```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configeditor.main.ConfigEditorController
<REGION FOLDER>
```

Since2014.02 in an ini file:

```
main.class=nl.wldelft.fews.configeditor.main.ConfigEditorController
```

Before 2014.02 Use within the Config Manager

Add the option "-edit-menu" to the JPIF to get the Editor available in the Config Manager. The Editor can be started through the menu option <Edit>.

```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
<REGION FOLDER>
-edit-menu
```

Since 2014.02 in an ini file:

```
#Delft-FEWS ini file
main.class=nl.wldelft.fews.configmanagement.ConfigManagementApplication
classpath.l=*.jar
#Java Runtime jvm.dll location
vm.location=../jre/bin/client/jvm.dll
vmarg.l=-Xms512m
vmarg.2=-Xmx1024m
#location of the bin dir
working.directory=.
#region_home directory - <region_home> to be replaced with actual region
home directory
arg.l=../<region_home>
arg.2=-edit-menu
```

21 Background Information

Background Information

Use of Time in FEWS

Within Delft FEWS, different concepts of time are used. In this section an overview is given of the various time concepts and their role in the system.

Internal time

The internal time is always Greenwich Mean Time (GMT). All time related information is stored in the FEWS database in GMT.

Current time

The current time is taken from the computer clock. For internal use GMT is derived from the computer clock and the time zone. The current time is by default displayed in GMT, but can also be displayed in local time.

Current system time

The current system time is the time in which the system 'lives'. The current system time moves forward in the so-called "Cardinal Time Step". In the live system the current system time will generally be the same as the current time. For analysis purposes, the system time can be set back to simulate a particular situation in the past.

When the system time is set back, only information- e.g. observed data and external forecasts- will be available to the system with a time stamp before the set system time. In case an hindcast for a particular flood is made with the *system time set back* to for example 13:00 on 21 January 2004, only data, that where imported into the database before this time will be used by the system. The system behaves as if the current time was 13:00 on 21 January 2004. When part of the required import data streams were missing at that moment but have been received later, they are *not* used in the analysis.

In case however, the same analysis is done *without setting back the system*, all data until the current time will be available for the analysis. This means that in this case also the above mentioned missing import data will be used in the analysis.

Display time

The display time is used in the time series display and allows the operator to define view windows on the selected time series. Setting the display time has no effect on data stored in the database.

22 Interactively modifying display colors

Users can interactively modify the colours used in their OC for a numbers of displays. This will not affect the configuration, but changes will persist between different sessions for that operator client (settings are saved in a user_settings file in the root directory).

Map display

Colours for map layers can be changed from the Layers pop-up, which holds the Map legend. Double clicking on an item there allows the user to modify the fill and line colour of the this layer. Color changes will impact the map as shown in the Grid display as well, as long as the layers in there have the same ID. The colour chooser will always open up with the default, configured colour to enable a reset.

Grid display

Colours for the classification of data in the grid display can be changed by double clicking on the colour-box in the legend. After modifications are made, the (right click) context menu will show an option 'Discard user-defined classification colours' to revert to the original, configured colour scheme.

Timeseries display

Timeseries: Colours for timeseries can be changed by double clicking on the legend for a timeseries. The colour chooser will always open up with the default, configured colour to enable a reset.

Thresholds/Time markers: These can be changed by double-clicking on these lines in the plot itself. The colour chooser will always open up with the default, configured colour to enable a reset.

23 Interactive Forecasting Displays

iWhat is the IFD?

The IFD is short for Interactive Forecast Displays.

The IFD is a set of displays which enable the forecaster to create a forecast manually in comparison to a batch run which creates a forecast in a background process triggered either by a schedule or manually.

When a forecaster creates a forecast in the IFD, the forecast created in the background process is usually used as the starting point for the forecaster.

The forecaster validates the results from the server run and adjusts the forecast by using modifiers where needed.

When the forecaster is satisfied with the adjusted forecast the forecast is finalized and published to other forecasters.

Usually when creating a forecast by using the IFD, FEWS runs in a mode where all the windows are dockable.

This is an important aspect of the IFD because this feature enables the forecaster to keep an overview of the system.

Contents

- Contents
 - Which displays are used in the IFD?
 - Forecast panel
 - Modifiers panel
 - Topology panel
 - Plot
 - Plot overview
 - Forecaster help
 - Run info
 - Forecaster notes
- How to create a forecast with the IFD
 - Steps in creating a forecast
 Starting EFING
 - Starting FEWS
 - Selecting the forecast panel
 - Review the list of available state date/times
 Adjust state and/or forecast length
 - Adjust state and/or forecast le
 Starting the forecast process
 - Starting the forecast process
 - Reviewing run status workflow
 - Review graphs (graph display listens to segment selection)
 - Creating a mod in the time series display
 - Creating a mod in the mods display
 - Continue with the forecast process downstreamEnding the forecast process
- Dockable windows
 - Dockable windows
 Docking and undocking main displays
 - Save display layout and reload on opening with same user

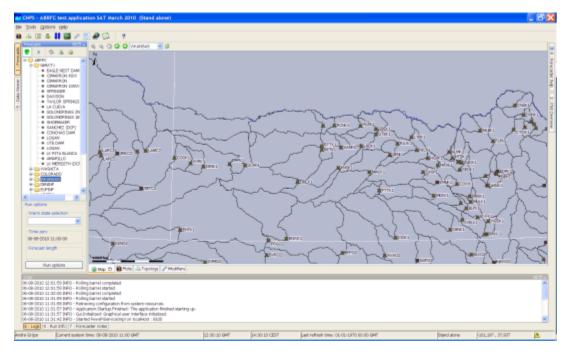
Save display layout and reload default layout

Which displays are used in the IFD?

The IFD consists of several panels.

Each of these panels has a specific role in the process of creating a forecast with the IFD. In this chapter the functionality of each panel in the IFD will be explained. In the next chapter will be explained with a use case how a forecast can be created with the IFD by using the combined functionality of the separate panels.

Forecast panel



The forecast panel plays a central role in creating a forecast in the IFD.

The forecast panel shows a tree with all the forecast points for a region and the grouping of these forecast points.

Each node in the tree can be linked to a workflow. For example node EAGLE NEST DAM has its own workflow.

Each node also shows the current status of the last run of the workflow to which the node refers.

Workflows of parent nodes are always run on the server. By default leaf nodes are locally run, however it is also possible that these workflows are run on the server.

This can be done by setting the optional tag localRun to false for a node.

The leaf nodes are indicated by the small black balls in the display, parent nodes (node containing other parent nodes or leafs) are indicated as a folder in the forecast display.

When a leaf node is selected the ifd will automaticly run the workflow of that node.

This behaviour can however be disabled in the configuration by setting the enableAutoRun-tag to false in the topolog.xml.

Forecasts	<i>H</i> =
👼 🕨 🕾 🚳 🚱	
B-CO ABREC	~
III 🗀 NMWTX	
III WASHITA	
😑 😂 COLORADO	
- COVERSIONS-CO	
- 9 LEADVILLE	
MALTA SSE (ARK R)	
- MALTA SSE (ARK R) - ULAKE CR. ABV RES	
TWIN LAKES RSVR	
- GRANITE (ARK R)	
 CLEAR CRK ABV RSVR 	
 CLEAR CRK RESERVOR 	
BUENA VISTA	
—	
COTTOM/VOOD CR NR BV	
CHAUCCRIAT NATHROP	
 NATHROP 	
- SALIDA WELLSVILLE (DCP)	
WELLSVILLE (DOP) BADGER OR AT HOWARD	
PARIDALE	
GRAPE CR NR DEWEESE	
OF WEESE RSVR	~
Run options	_
Warm state selection	
	~
Time zero	
06-08-2010 11:00:00	
Forecast length	
06-13-2010 11:00:00 estimated	
Run options	
	_

If the node shows a green checkbox (as is seen in the image above at the node DIVERSIONS-CO) item it means that the workflow has run successfully.

A red exclamation (as is seen in the image above at the LEADVILLE node) mark indicates that the workflow is failed.

A yellow ball indicates that the workflow was successful in a prior run, but the results have since been invalidated by some upstream change. For example, when the forecaster has created a modifier but did not rerun the workflow yet.

Or when an upstream node was run later than one off its downstream nodes then the results of the downstream nodes are set to invalid.

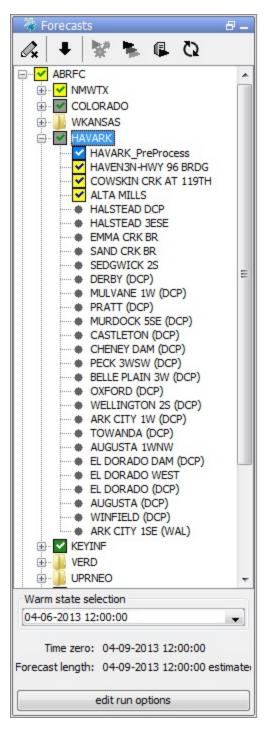
When a folder is shown for a parent node (as is seen for the COLORADO node in the image below) or a black ball for a leaf node (as is seen in the MALTA 5SE node) then the workflow has not run yet for the current time zero.

Forecasts	9 -
🔻 🕨 🕾 🕒	
III CO ABREC	~
IB 🛄 NMWTX	
B-COLORADO	
- U LEADVILLE	
- D TURQUOISE LAKE	
-Z HALFMOON	
MALTA SSE (ARK R) KAKE OR ABV RES	
- GRANITE (ARK R)	
-Z CLEAR CRK ABV RSVR	
CLEAR CRK RESERVOIR	
COTTON/VOOD CR NR BV	
-Z CHALK CR AT NATHROP	
- NATHROP	
- SALIDA WELLSVILLE (DCP)	
-3 BADGER CR AT HOWARD	
PARKDALE	
-Z GRAPE CR NR DEWEESE	
DE WEESE RSVR	~
- Run options	
Warm state selection	
Time zero	
06-08-2010 11:00:00	
Forecast length	
Run options	ור
	-

A green arrow (as is seen in the node TURQUOISE LAKE) indicates that the workflow is currently running (locally or at server).

An hour glass (see node HALFMOON above) indicates the workflow is scheduled to run.

As part of 2014.02, the color of the forecast icons has changed (see figure below).

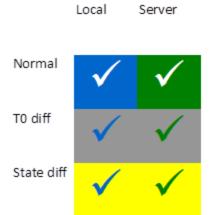


We still have the green and blue boxes with the white check marks. They represent a server (green) or local (blue) run, with the same T0 and state settings as shown in the IFD.

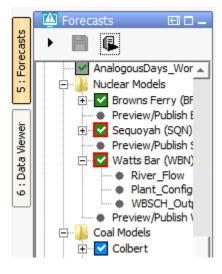
Prior to 2014.02 you would not see an icon at all if the T0 in the IFD was different than the T0 of the approved run in the database, or if the state settings in the IFD were different than the state settings of the approved run in the database. For releases starting with 2014.02, you will see multiple icons for the various situation:

A grey box with either a green or blue check mark. A grey box means the T0 of the approved run in the database is different than the one in the IFD. The check mark indicates whether the approved run is a local or a server run.

A yellow box with either a green or blue check mark. A yellow box means the state settings of the approved run in the database are different than the settings in the IFD. For example you might have a different warm state, warm state search interval, or forecast length. The check mark indicates whether the approved run is a local or a server run."

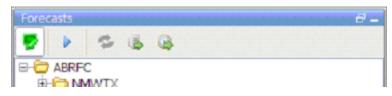


As of 2016.01, The IFD status icon can be surrounded by a red outline. See figure below. This red outline surrounding the IFD status icon indicates that the workflow task completed but not all of the data has been synchronised back to the operator client. This red outline feature is disabled for DDA clients as it pertains only to synchronisation in LDS clients.



Go to next segmentAdjust T0

Run on ServerForecast/View-button



Re-Run button

At the top of the forecast panel several buttons are shown.

The first button is a Forecast/View toggle button (Put image of the button here) which can be used to switch from View mode to Forecast mode.

In the *Forecast* mode the forecaster can create modifiers and when a leaf node is selected the workflow is run automatically. In *View* mode the forecaster can view the results of other forecasts.

However, it is not allowed to create modifiers and workflows will not be run automatically when a node is selected. A workflow can be forced to run by pressing the **Re-Run** button.

The second button is the **Go to Next Segment**-button (image of button here). By pressing this button automatically the next leaf-node in the forecast panel will be selected.

The third button is the **Re-Run**-button (need button image). This button is only enabled when a node is selected which has a workflow which runs locally.

The fourth button is the 'Run on Server'-button (need button image here). This button is only enabled when a node is selected with a workflow

which should run on the server.

The last button is the **Adjust T0** (need image of button) button which allows the forecaster to adjust the current system time to the nearest cardinal time step prior to the current time.

Run options
Warm state selection
Time zero
06-08-2010 11:00:00
Forecast length
06-13-2010 11:00:00 estimated
Run options

At the bottom of the forecast panel there is a Run options section. In this section the forecaster can set the properties of the run. The warm state can be selected and the current Time zero is also displayed. More advanced options are available with the button **Run options**.

Modifiers panel

The modifiers panel is an important display in the IFD.

It shows the modifiers which are created for a certain node. Modifiers can be created, modified or deleted in this panel.

The upper part of the display gives an overview of the modifiers created for the currently selected node in the forecaster panel. It lists the Start Date, the End Date, the Valid Date and the Creation time of the mod. It also allows the user to make mods active and inactive with the checkbox in the column Active.

A mod can be deleted by pressing the red cross icon and a copy can be made pressing the copy-icon.

Modifiers									# *
Mod type	Name	Summary	Start	End	Valid	User	Creation time	Active Delete	
UNITHG	UNTHG JEDC2 JEDC3.VE	8_U	06-07-2010 11:00:00	06-13-2010 11:0		11:00:00 Andre Gripe	06-08-2010 15:36:18		
MEC	MFC_LEDC2LVR_LEDC2LF	R 1.0	06-07-2010 17:00:00	06-13-2010 11:0	0:00	Andre Gripe	06-09-2010 15:36:09		100
Create Mod	1								Stenn
AT)								(arrenar)
Modifier Propert	ties.								
Type	unitig								
Name	UNITHG JEDC2 JEDC2.VR Up	date/States							
Start time	06-07-2010 11:00:00 2 00		Enditime	06-13-2010 11:00	00 C C	Valid fire	06-09-2010 11:00:00 2 20		
								Apply	Apply to
Parameter files	6	b. 5							
	EDC2_UpdateStates					Unit the dee	arash IEADAMIE		
CHARLES BOLLES		tine	MODIFED			Unit Hydro	graph - LEADVILLE		
			Discharge Discharge LEADVILLE LEADVILLI		1.800		~		
		01-1970-00-00-00	910,00 956,90		1.290				
		01-1970 12:00:00	1516.00 988,90 607,00 930,68		£ 1.000				
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With the create mod-button the forecaster can create new modifiers. When the button is pressed a dropdown-list with the available modifier types for the currently selected node is shown.

The modifiers which are shown are depended on the models, transformations and module parameterfiles available in the workflow of the selected node and the plots which are associated with the node.

In the modifierTypes.xml is defined which modifiers are available for the forecaster. The combination of the configuration of the modifierTypes.xml and the workflow and the time series in the plots

When a modifier type is selected, the details of the new modifier is shown is in the lower part of the display. In some cases it is also necessary to specify to which models the modifier should be applied.

For example when the forecaster selects the modifier type MFC and there are two SNOW17-models available in the segment, the forecaster should also specify to which models the modifier should be applied.

A Modifiers								# *
Mod type	Name	Summary Sta		Ond	Valid	User	Creation time	Active Delete Copy
UNITHG	UNITHG JEDC2 JEDC2.WR JU. MFC JEDC2LWR JEDC2UPR	1.0 06-0	7-2010 11:00:00 7-2010 17:00:00	06-13-2010 11:00:00 06-13-2010 11:00:00	05-09-2010 11:00:00	Andre Gripe Andre Gripe	06-09-2010 15:36:18 06-09-2010 15:36:09	
	and particular particular			par-12-2010 11 00 00		pend a gre		
Create Mod								Stern
Modifier Propert	ies .							
TIDE	rk.							
	MPC_LEDC2LIVA_LEDC2UPA							
Start time	06-07-2010 17:00:00 2 20		End time	06-13-2010 11:00:00 🛟		Valid time	01-01-0000 00-00-00 1	
								Apply Apply to
Locations								
LEDC2LWR LEDC2UPR	Constant value 1 2	0 1 2 3 4 5 6 7	(-)					

When the modifier can be applied to more than one model in a basin a 'location'-panel shows up at the left part of the details display. In this panel the forecaster can select to which locations the modifier should be applied.

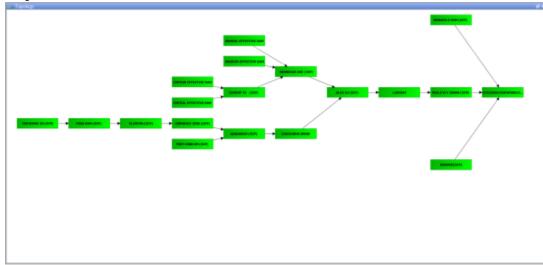
The Re-run button runs the workflow from the selected node and the workflows from the upstream nodes.

The lower part of the display shows the details of the selected modifier or when the forecaster is creating a new modifier the details of the new modifier.

Topology panel

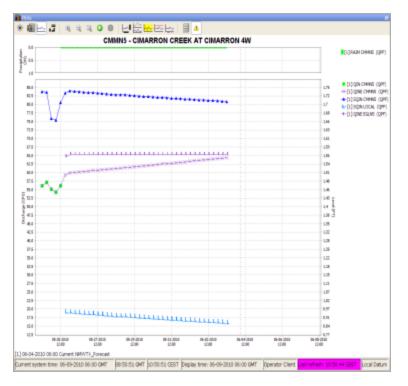
The topology panel shows the topology of the selected node. When a leaf node is selected the topology of the parent node is shown. When a parent node is selected the topology of its children is shown.

The colors of the boxes in the topology change when a threshold is passed. The color of the box and the thresholds which are monitored can be configured.



Plot

The plot display is used to show scalar time series. Each node has its own set of predefined displays configured. When a node is selected the plots display automatically updates the plots which are already displayed to show data for the new node. The first plot configured for the selected node is automatically shown in this display.



When the IFD is started, there is always at least one plot display available. This plot is called the primary plot display. The primary plot doesn't have lock icon at the left of the toolbar. When a new plot display is started this plot will have a lock icon at the left on the toolbar. When a new plot displayed is started, by default the plot will be locked.

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When a plot is locked, the display is locked to that set of time series. When the forecaster moves from basin to basin, the plot will continue to display the original timeseries. The plot is not updated. However, as new data is brought in, the plot is updated with new data. When the toggle-button is switched off (icon changes to unlock) the plot window is updated automatically when a new node is selected.

Plot overview

The plot overview is a panel which shows a thumbnail of each plot which is configured for the selected node. This panel gives an overview of the selected node. This overview is enabled by configuring the following task in the explorer tasks; nl.wldelft.fews.gui.plugin.displaythumbnails.ShortcutsThumbnailsDialog

When a plot is selected the primary plot is automatically updated, also other plots display which are not locked (see previous chapter) are updated. Primary plot is defined by including the following task in the explorer tasks: nl.wldelft.fews.gui.plugin.timeseries.PlotsTimeSeriesDialog. Is such task is not defined the Plot Overview works only if a time series dialog window is open.

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At the top of the panel there are four buttons. The first button selects the first plot, the second button selects the previous plot, the third button selects the next plot and the last button selects the last plot.

Plot Overview) N
CMMN5 - CIMARRON CRI CIMARRON 4W	EEK AT
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Forecaster help

The forecaster help panel shows user provided documentation which is available for a node. Currently the following formats are supported: textfiles, images and pdf-files. Users can place documents in a directory within predefined directories. These directories can be configured in the topology.xml configuration file by adding a forecasterHelperDirectories element that contains a directory element for all directories.

For instance:

```
<forecasterHelperDirectories>
<directory>d:\Data\ForecasterHelperData\</directory>
<directory>d:\Data\FHD3\</directory>
</forecasterHelperDirectories>
```

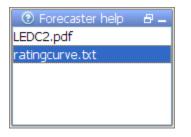
If this is not present in the topology.xml the directory in the global.properties defined by the INFORMATION_PANEL_FOLDER property will be used.

Within these directories each node has its own directory. The directory should have the same name as the node id. Within that directory the documentation for that node can be placed.

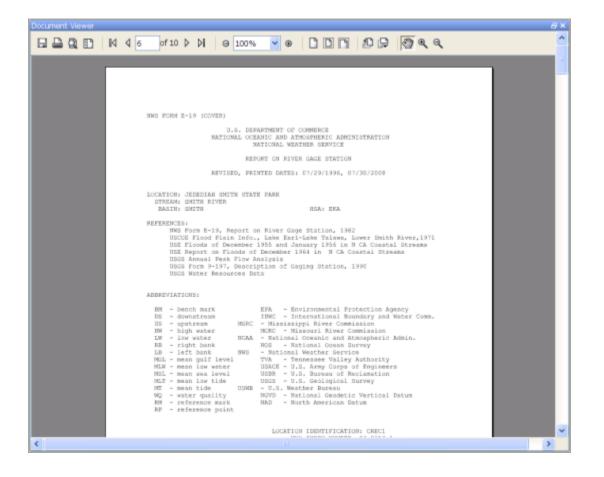
If you make use sub-folders, make sure to also include the main folder as a directory when you list the <forecasterHelperDirectories>. Documents in the folder configured as <allNodesDirectory> will be visible at all nodes.

<forecasterhelperdirectories></forecasterhelperdirectories>
<pre><directory>\$DOCUMENTS_ROOT_FOLDER\$</directory></pre>
<pre><directory>\$DOCUMENTS_ROOT_FOLDER\$/subfolder_1/</directory></pre>
<pre><directory>\$DOCUMENTS_ROOT_FOLDER\$/subfolder_2</directory></pre>
<allnodesdirectory>\$DOCUMENTS_ALWAYSVISIBLE_FOLDER\$</allnodesdirectory> >

Below an example of the tool window forecaster help. In this example the forecaster has two documents available for information. If multiple directories are configured this window will show all available files for the node from the different predefined directories together.



When one of the files is selected in this panel the content of the selected file is shown in the document viewer. The document viewer is a dockable window in the centre of FEWS.



When a text file is selected it can also be edited. To facilitate this an edit and save button are displayed above the document when selecting a text file.

0 巴 This text can be edited by pressing the pencil button. Pressing the floppy icon will save changes.

The content of the forecast help dialog is depended of which node is selected in the forecaster panel. When a new node is selected the content of the forecaster help dialog is automatically updated.

To add the Forecaster help panel and document viewer to the Delft-FEWS explorer, please add the following tasks to Explorer.xml:

```
<explorerTask name="Forecaster help">
  <taskClass>nl.wldelft.fews.gui.plugin.information.ForecasterAidSelectionP
  anel</taskClass>
  </explorerTask>
  <explorerTask name="Documents viewer">
    <taskClass>nl.wldelft.fews.gui.plugin.information.ForecasterAidDocumentPa
  nel</taskClass>
  </explorerTask>
```

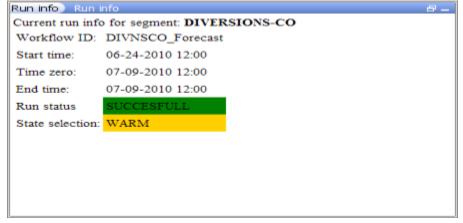
Run info

The run info panel shows detail information of the latest run of the workflow of the selected node. If the workflow of the node has not run yet for the current T0 then the panel will show that there is no current run info available

Run info	Run info	8 -
No curre	nt run info available for segment: GOLONDRINAS 1E	
	-	

When the workflow has run. The status can either be succesfull, failed or partly successful.

Only when the workflow was succesfull than the icon of that node will be set to green. The run status will be shown green in the run info box.



When the run is partly successful the icon of that node will be set to the red exclamation mark, the run status box in the run info panel will be set to yellow. When the run is failed the icon of the node will be set to the red exclamation mark, the run status box will be set to red.

Run Into		8 -
Current run info	o for segment: LEADVILLE	
Workflow ID:	LEDC2_Forecast	
Start time:	-	
Time zero:	06-08-2010 11:00:00	
End time:	-	
Run status	PARTLY SUCCESFULL	
State selection:	-	

Forecaster notes

The forecaster notes panel shows the notes other forecaster have created regarding their previous forecasts for the forecast point. Forecasters can also created their own note and publish them.

Forecaster notes					
Log level Log cr User Segm	L	.og Message			
INFO 06-09-20 Andre Gri DIVNSCO FEWS is a really nice application!					
1					
Log creation time] .		Refresh		
End time 06-09-2010 11:37:15	Log level	INFO 💌			
View period day 💙 1 🗘	Search in message		Add message		
Refresh geriodi			Save		
	Max.number of messages displayed	250 🗘			
]				

How to create a forecast with the IFD

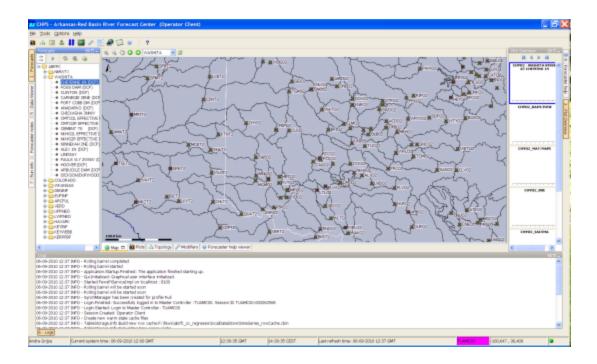
Steps in creating a forecast

Below is a list of all possible steps in creating a forecast with the IFD. Please note that not all of the listed steps are obligated. For each step will be explained how this step can be carried out using the IFD in FEWS.

- 1. Start FEWS
- 2. Selecting the forecast panel
- 3. Reviewing the topology
- 4. Review the list of available state date/times
- 5. Adjust state and/or forecast length
- 6. Starting the forecast process and selecting the workflow for which the forecast should be made
- 7. Reviewing workflow status
- 8. Reviewing graphs (graph display listens to segment selection)
- 9. Reviewing graphs (graph display is independed from segment selection)
- 10. Continue with the forecast process downstream
- 11. Ending the forecast process

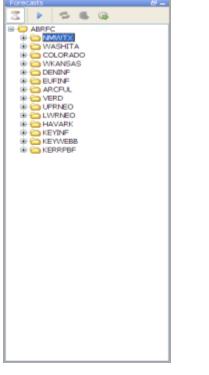
Starting FEWS

After starting FEWS, the map-display will be displayed in the centre and the Forecast Panel-tab at the left will be selected. This the default layout. The layout after starting FEWS is however configurable by creating and saving a custom layout by using the option in the File menu at the top left of the display.



First the IFD will try to synchronize the local datastore with the central database. Until that process is finished it is not possible to create a forecast with the IFD.

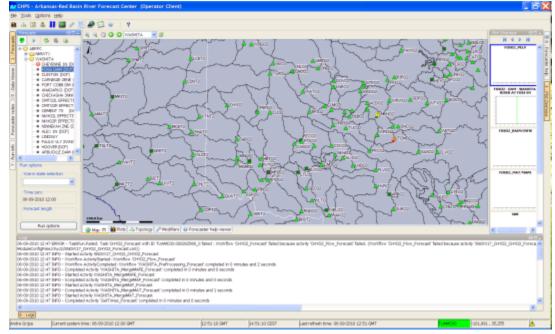
To indicate that the IFD is doing its initial synchronization after startup the forecast-button shows a hour glass icon. While the Operator Client if synchronizing, it is possible to view scalar and spatial data.



When the initial synchronization is finished. The following message is shown.

Modifi	iersDisplay 🔀
⚠	Initial synchronization completed. You can now make modifications.
	OK

Selecting the forecast panel



The whole process of creating of forecast by using the IFD is managed by the forecast dialog, therefore the first step is selecting the Forecast tab at the left of the display. The Forecast tab will give an list, in computational order of the basins of the region.

Review the list of available state date/times

The forecast panel also shows at the bottom the currently selected (default) warm state. By clicking on the drop-down box all the available warm states are shown. If the forecaster needs to use a different warm state than the default, a new warm state date may be selected from drop down menu titled Warm State Selection. If the default warm state is not correct another warm state can be selected from the drop-down box.

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6 Loggerg 10 : Forecast Management (3 : System Montor	29.05.2009 07-4	7:25 BPG - Configuration Available: Configuration 7:25 BPG - Configuration Check Startest: Dreck of	n available in local Resystem. of configuration started.						-
kesha Gripa 🛛 🗇 art sestam tense: 05-23-2000 18:00 0HT 🛛 07:52:25 GMT 🛛 18:52:25 GST 🖉 art refreshed 🖉 Bard alone 120:200 . 46:380 📐									_
	Andre Grijpe	Current system time: 05-29-2809 86:00 GHT		07:52:25 GMT	19-52-25 0057	Last refresh time: never refreshed	Stand alone	119,230 , 48,369	٨

Adjust state and/or forecast length

By pressing the Run Options button at the bottom of the forecast dialog the user will have access to alternative ways of selecting states. After pressing the advanced button a dialog will be shown in which the user can select the state, forecast length and a what-if scenario.

State Sales	000		
Delect rate			
 Warm state 			
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Warm states a	and desired		
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		DK:	Carnel

After selecting the OK-button the selected state or forecast length will be applied and used in the runs.

Starting the forecast process

To start the interactive forecast process, the user should select a leaf node. If the IFD is in forecast mode (which it is by default) the workflow of the selected node will also be automatically run. Models can be run by selecting a node, or pressing the rerun button. In view mode the forecaster can view data but it is not possible to create a forecast.

Reviewing run status workflow

When a run is finished the segment-dialog will show the status of the run.

If a run is in progress a refresh-icon will be shown. A green box will indicate a successful run.

A red exclamation mark will indicate that run workflow has failed.

A yellow dot will indicate the workflow has run succesfully but that the results are invalid.

For example when an upstream segment has run later than the workflow for a downstream segment the results of the downstream segment workflow are invalid.

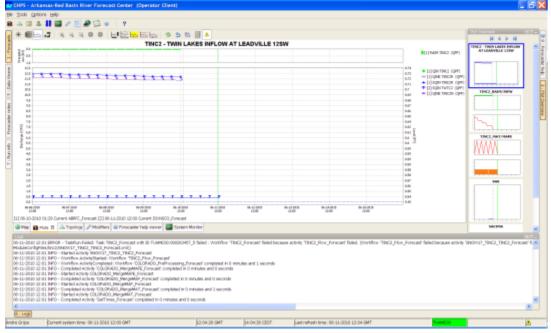
The icons displayed on the leaf node (for individual basins) indicate the status of local runs. If the icon is blank then the server run is the most recent run. Icons on the parent nodes indicate the status of server runs.

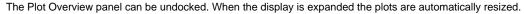


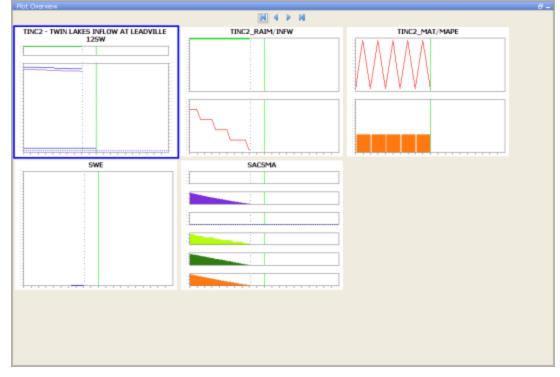
Review graphs (graph display listens to segment selection)

When a basin run has finished the results of the run should be reviewed. By selecting the plot overview at the right a list of thumbnails will be displayed. For each graph available for the current node a thumbnail will be shown. To display a graph, the forecaster selects a thumbnail and

then this graph is displayed in the main plot window. The plot display will show the selected graph. Navigation between the graphs can be done by selecting a graph by clicking on a thumbnail with the mouse or by pressing alt+g (go to next graph) or by pressing shift+alt+g(go to previous graph). When the Thumbnail Panel is selected it is also possible to navigate by using the arrow keys up and down on that panel. When a new node is selected in the Forecast Tab the list of thumbnails is automatically updated to show the graphs available for the newly selected node.

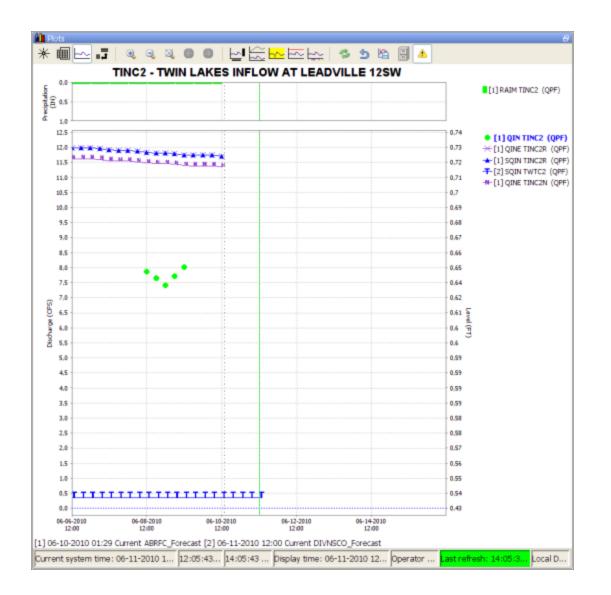






Creating a mod in the time series display

Mods can be created in the mods display or directly in the plot display. To modify a time series directly in a plot, a time series has to be selected. This can be done by selecting a time series in the legend of the plot. To indicate that a time series is selected the legend and the time series will be plotted bold.



Creating a mod in the mods display

The modifier display can be started by clicking on the wrench-icon at the toolbar or by using the shortcut ctrl+m. The modifier display will show all the mods which are applied in the currently selected segment. By clicking on the create mod-button a new mod can be created. After pressing the create mod-button a list of available mods will be shown. When the mod is created it can be applied by pressing the apply-button. With the run-buttons (rerun, rerun to selected and rerun all to selected) it is possible to rerun the workflows. Pressing the run-buttons will also automatically apply the mod.

Continue with the forecast process downstream

After reviewing the graphs and if needed applying mods the forecaster can proceed to the next segment. Going to the next segment can be done easily by pressing alt+s (go to next segment) or by pressing the next segment-button in the forecast panel or by selecting the next node. After selecting the segment the workflow will be run automatically and after finishing the run the status of the run will be shown by color of the dot of the segment.

Ending the forecast process

When the forecaster thinks that the current forecast is sufficient. The forecast can select the parent node of the leaf nodes and press the 'run on server'-button. When this button is pressed, first all the new modifiers and changes to the existing modifiers of the child nodes of the selected node will be uploaded to the server. When the upload is successful the workflow will be run at the server. The locally created runs will be deleted when the server run was successful and the results are downloaded successfully back to the Operator Client.

Dockable windows

Docking and undocking main displays

All windows in the centre section of FEWS can be undocked. This can easily be done by clicking on the square-box icon beside the x-icon at the tab of each display. Undocking the windows allows the forecaster to arrange the windows as they like.

After clicking on the icon the display will automatically be undocked. Putting the display back in docking mode can be done by clicking on the double square icon at the top of the display. By clicking on the x-icon the display can be closed.

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Topology)										
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	Little North Sectore									
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29.05.2009 00:12	2:19 INFO - Gui Initialized: Graphical user interf	face initialized.								
	I: 14 INFO - Started FeweRGerviceImpl on local II: 13 INFO - Season (meabed) Stand-alone system									
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Save display layout and reload on opening with same user

By default FEWS will start with the map display opened in the centre section of the display and with the map display, data display and the topology display docked in the center section of FEWS. It is possible to customize the display layout. First step in customizing the display layout is to manually place the display in the desired display layout. In the example below three displays are undocked and the graph-tab and the display are moved to the left section of the display. In the File-menu the user can store this layout by selecting the option store layout. The next time FEWS is started it will start with the stored layout.

Keep in mind that the layout manager is only responsible for laying out open windows. It will not open a window by itself. Only once the user opens the window, will the stored layout be applied!

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Save display layout and reload default layout

The file-menu also provides an option default layout. By selecting this option the default layout can be reloaded.

24 Archiving and extended filtering of log messages

Archiving and extended filtering of log messages

For Water Coach purposes archiving and extended filtering of log messages is available. This functionality includes:

- inserting (retrospectively) extended manual messages,
- archiving selected log messages the users are interested in, and
- downloading archived messages and filtering them from the other messages.

The collected and filtered log messages can be used to build Water Coach game.

Archiving log messages

Create ArchiveRun module with export task LogEntriesArchive and include it in an archiving workflow. Log messages are archived by (periodically) running this archiving workflow. Use constraints to select log messages that should be archived. A log message will be archived when its event code is configured as logEventContstraint option and/or the log message text contains the specified messageText configured as logEventConstraint option.

Configuration example:

```
<exportArchiveRun>
<archivePeriod start="-2" end="0" unit="day"/>
<archiveType>LogEntriesArchive</archiveType>
</ogEventConstraint eventCode="Manual."/>
<logEventConstraint eventCode="Validation.HardLimit"/>
<logEventConstraint eventCode="Validation.SoftLimit" messageText="at
Lobith"/>
<logEventConstraint eventCode="Workflow.ActivityStarted"
messageText="Workflow 'Rijntakken_Forecast'"/>
<logEventConstraint eventCode="Workflow.ActivityCompleted"
messageText="Workflow 'Rijntakken_Forecast'"/>
</exportArchiveRun>
```

In this example the following messages will be archived:

- all manual messages,
- all Validation.HardLimit messages
- Validation.SoftLimit messages only for Lobith
- Workflow.ActivityStarted/Finished messages only for workflow Rijntakken_Forecast

Retrieving archived log messages from archive

Log messages can be retrieved using ArchivedDialog. The user selects and downloads the log messages archive in the same way as for example thresholds.

ArchiveDialog configuration

Configure in this dialog an archive type LogEntriesArchive. An example:

```
<archiveTask name="Log Entries" workflowId="Import_Archive_LogEntries"
iconName="icons/LookUpTable.gif" queryServiceUrl="$ARCHIVE_SERVER_URL$">
<archiveRun>
<importDirectory>$ARCHIVE_IMPORT_PATH$</importDirectory>
<importArchiveRun>
<archiveType>LogEntriesArchive</archiveType>
</importArchiveRun>
</archiveRun>
</archiveRun>
```

ArchiveRun configuration

Create ArchiveRun module with import task LogEntriesArchive and include this module in the workflow specified in ArchiveDialog. An example:

```
<importArchiveRun>
  <archiveType>LogEntriesArchive</archiveType>
</importArchiveRun>
```

Displaying and filtering archived log messages in SystemMonitor

By default, all non-manual messages are displayed in LogBrowser tab, and all manual messages are displayed in BulletinBoard. For Water Coach purposes we need to display both manual and selected non-manual messages in one tab. For this purpose a new tab has been added – BulletinBoardPlus. In this new tab we also have some more choices to create manual messages quickly.

To show this tab, configure in SystemMonitorDisplay:

```
<bulletinBoardPlus>
<tabName>Interesting events</tabName>
</bulletinBoardPlus>
```

We can also add several optional 'messageTemplates' to create quickly messages with a specific mark. Similarly we can add several optional 'users' to quickly create messages from a specific user.

```
An example:
```

```
<bulletinBoardPlus>
<tabName>Interesting events</tabName>
<messageTemplate>Analysed by operator</messageTemplate>
<messageTemplate>Phone line went dead</messageTemplate>
<messageTemplate>Emergency advice requested</messageTemplate>
<userTemplate>Simone De Kleermaeker</userTemplate>
<userTemplate>gast gebruiker</userTemplate>
</bulletinBoardPlus>
```

An example of BulletinBoardPlus tab of SystemMonitor:

og Browser	Interesting events Batch	Forecasts				
Log level	Creation time	Event Code	Event time 🔺	User	Template	Log Message
ARN	29-11-2011 19:06:21	Validation.SoftLimit	29-11-2011 19:06:21			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 19:06:21	Validation.HardLimit	29-11-2011 19:06:21			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 below limit value 0.4 at 2011-
ARN	29-11-2011 19:06:21	Validation.HardLimit	29-11-2011 19:06:21			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
ARN	29-11-2011 19:06:07	Validation.SoftLimit	29-11-2011 19:06:07			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 19:06:07	Validation.HardLimit	29-11-2011 19:06:07			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
ARN	29-11-2011 19:06:07	Validation.HardLimit	29-11-2011 19:06:07			HardLimit min violated for Water level (H.m) at Speyer, value -176.64 below limit value 1.0 at 201
ROR	18-09-2012 13:38:42	Manual.Error	29-11-2011 18:55:00	Simone De Kleermaeker	Phone line went dead	still dead !!
ROR	18-09-2012 13:38:15	Manual.Error	29-11-2011 18:45:00	Simone De Kleermaeker	Phone line went dead	
ARN	18-09-2012 13:37:46	Manual.Warning	29-11-2011 18:40:00	Simone De Kleermaeker	Analysed by operator	
ARN	29-11-2011 18:35:50	Validation.HardLimit	29-11-2011 18:35:50			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 below limit value 0.4 at 2011-
ARN	29-11-2011 18:35:50	Validation.HardLimit	29-11-2011 18:35:50			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261.321 above limit value 7.0 .
ARN	29-11-2011 18:35:50	Validation.HardLimit	29-11-2011 18:35:50			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
ARN	29-11-2011 18:35:50	Validation.SoftLimit	29-11-2011 18:35:50			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 18:35:35	Validation.HardLimit	29-11-2011 18:35:35			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
ARN	29-11-2011 18:35:35	Validation.SoftLimit	29-11-2011 18:35:35			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 18:35:34	Validation.HardLimit	29-11-2011 18:35:34			HardLimit min violated for Water level (H.m) at Speyer, value -176.64 below limit value 1.0 at 201.
ARN	29-11-2011 18:05:59	Validation.SoftLimit	29-11-2011 18:05:59			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 18:05:58	Validation.HardLimit	29-11-2011 18:05:58			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 below limit value 0.4 at 2011-
ARN	29-11-2011 18:05:58	Validation.HardLimit	29-11-2011 18:05:58			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261.321 above limit value 7.0 .
ARN	29-11-2011 18:05:58	Validation.HardLimit	29-11-2011 18:05:58			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
'ARN	29-11-2011 18:05:46	Validation.SoftLimit	29-11-2011 18:05:46			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 18:05:46	Validation.HardLimit	29-11-2011 18:05:46			HardLimit min violated for Water level (H.m) at Speyer, value -176.64 below limit value 1.0 at 201
ARN	29-11-2011 18:05:46	Validation.HardLimit	29-11-2011 18:05:46			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
IFO	29-11-2011 18:01:00	Workflow.ActivityCor	np 29-11-2011 18:01:00			Workflow 'Rijntakken_Forecast' completed in 0 minutes and 35 seconds
IFO	29-11-2011 18:00:24	Workflow.ActivitySta	rted 29-11-2011 18:00:24			Workflow 'Rijntakken_Forecast'
IFO	18-09-2012 13:39:07	Manual.Info	29-11-2011 17:50:00	Simone De Kleermaeker	Emergency advice requested	
ARN	29-11-2011 17:35:56	Validation.HardLimit	29-11-2011 17:35:56			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261.321 above limit value 7.0 .
ARN	29-11-2011 17:35:56	Validation.SoftLimit	29-11-2011 17:35:56			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
ARN	29-11-2011 17:35:56	Validation.HardLimit	29-11-2011 17:35:56			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 below limit value 1.0 at 201
ARN	29-11-2011 17:35:56	Validation.HardLimit	29-11-2011 17:35:56			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 below limit value 0.4 at 2011-
'ARN	29-11-2011 17:35:44	Validation.SoftLimit	29-11-2011 17:35:44			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 below limit value 865.0 at 2.
View period						
						<u>R</u> efresh
Choose from	Event time		og level	INFO	~	Add messa
End time	18-09-2012 13:49:0	ο 🚊 ι	Jser		-	- Edd messa
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		C	<u>1</u> ax.number of messages display	ed	250 😴	

Button Add message

Using this button we add a manual message 'plus'.

Messages Creation	
Log time	
21-12-2011 12:07:00 🛨 🗔	
Log level	
WARN	•
User	
Simone De Kleermaeker	-
Log template	
Emergency advice requested	
Text	
•	
<u>A</u> dd <u>C</u> lose	Help

Manual message 'plus' is actually a standard manual message. The information entered in the additional fields, is stored in the messages text (message body) in LogEntries table field 'logMessage'. Compared to standard manual message , the additional fields are Event Time (default value is Current System Time) and messageTemplate.

The message text (body) entered in the example above is stored as follows: Simone De Kleermaeker@05-12-2011 13:47:00@Phone line went dead@

If we enter also some additional text, the messages body looks like: Simone De Kleermaeker@05-12-2011 13:47:00@Phone line went dead@my comment

View period

In view period fields we specify the time filter. This time filter is applicable to the message Event Time or to the message Creation Time. For example, if the filter is Event Time and we choose one month, the log messages with Event Time inside this period are displayed.

User

The drop down box 'User' is filled with the current system user name and optionally with the userTemplates as defined in the configuration. It is also possible to enter any name in this editable drop down box.

The user names can be entered while creating manual messages. Configure the userTemplates if you want to enter usernames that are different from the system user.

Template

The drop down box 'Template' is filled with messageTemplates configured in SystemMonitorDisplay <bulletinBoardPlus> tab. It is also possible to enter any text in this editable drop down box.

Other fields in the tab BulletinBoardPlus

Buttons Refresh, Save and fields log Level, Search in Message, Max number of events have the same meaning and behaviour as in standard BulletinBoard.

25. Using the Deltares Open Archive

Introduction

Currently, the only graphical user interface to access the Deltares Open Archive is via the Delft-FEWS GUI. In addition, data can be approached via the Geonetwork web client of via THREDDS web server.

The Deltares archive is located on a separate server and can be used for post-event analysis like (re-) calibration of models, reviews and performance analysis. Most of the data in the Deltares archive is archived through automated processes that are scheduled on the Delft-FEWS MC server. The archived data can be accessed and downloaded to the local computer through the Delft-FEWS Archive catalogue display.

The Deltares Archive is storing data (sets), these are the actual forecast time series, observation time series, configuration, rating curves, forecaster notes, model states, FEWS modifiers etc. Most of the data sets can be organized in events; this is a special type of metadata overarching multiple data sets. The area and period covered by the event determine, in combination with the type of event and associated data types, which data sets belong to an event.

A separate Deltares archive document is available that contains all technical details of the Deltares archive. An Installation of the Deltares Archive is available on the Deltares Delft-FEWS Wiki pages.

This user guide is derived from the HyFS application as used at the Bureau of Meteorology.

Archived data

In the Delft-FEWS application, scheduled and manual archive workflows can take care of archiving the data (sets) from the database. The scheduled archive workflow is generally run once a day and will generally archive the following type of data:

Archived data set	Data set	Data types
Astronomical data	Observed time series	NetCDF-CF timeseries
Observed series	Observed time series	NetCDF-CF timeseries
Surge forecasts	External Forecast time series	NetCDF-CF timeseries
Forecaster Notes on various level	Messages	text
Delft-FEWS configuration changes	Configuration	zip (FEWS-configuration)
Rating Curves	Rating Curves	xml (FEWS PI-rating)
NWP forecasts	External Forecast time series	NetCDF-CF timeseries

Simulations (forecast)	Simulated timeseries	NetCDF-CF timeseries
		Model States
		Modifiers
		Reports
Products as handed over to downstream users	Products	Products in original format
Local datastore	Snapshot	Local datastore

Note: External data which is archived elsewhere should in general not be archived within the context of the Delft-FEWS application.

Events

Within Forecasting organisations, events are situations that can be distinguished from business as usual as something special or interesting is happening, e.g. a flood, drought or calamity. Generally the operations during an event is hectic and no one wants to spent time on data archiving. however, after the event the archived data may be crucial for legal inquiries, performance assessment, or model calibration or to use as input for training. Therefore, the concept of Event has been introduced to label a period of interest for a certain area, such that one easily can find this data back.

Many of the important data sets stored in a Deltares Archive associated with a real time system can be organized in events, this is a special type of metadata overarching one or multiple data sets. The event type, area and period covered by the event determine which data sets belong to an event. Each event type will include one or multiple data sets. Typical event types within a real time application are:

- Historic Event: This event type contains observed time series that are stored in the archive. When a new historic event is made the data
 include in the historic event period will become available as historic event in the Delft-FEWS operator client and can be viewed together
 with the current observed or simulated data.
- Review Event: This event type may contain observed time series, external forecast time series, simulated time series, modifiers and mes sages. When a new review event type is made the data sets covered will be tagged and can be downloaded to a Delft-FEWS Stand Alone for post event review purposes.
- Flood Watch Event. This event type contains observed time series and external forecast time series. When a new flood watch event type is made the data sets covered will be tagged and can be downloaded to a Delft-FEWS Stand Alone for skill perfomance analysis
- Watercoach/Training Event: This event type contains observed time series, external forecast time series, simulated time series, modifiers, model states and messages. When a new water coach event type is made the data sets covered will be tagged and can be downloaded to a Delft-FEWS Stand Alone. The data downloaded can then be used for making a new Delft-FEWS Water Coach script for training purposes.

Event types can be defined as appropriate, but need to be registered on the archiver server side.

Additional to tagging an event in the Deltares archive it is also possible to have attachments uploaded and linked to an event in the archive. Creating an event, downloading events and data sets, and attaching attachments to events can be done with the Delft-FEWS Archive display.

Finally, events can play a crucial role in the data management of the archive. Data labelled for a specific type of event may be help longer in the archive compared to data not labelled for an event. E.g. Numerical Weather Predictions may be removed quickly, except for those external forecast that are part of a Flood Watch or training event.

Archive display

All data that is archived can be accessed and downloaded through the Delft-FEWS archive display. The archive display can be started from the Delft-FEWS Explorer from the Tools menu.

When the display is initialized it will try to contact the archive file server to download information about the archive content (the archive configuration).

Note: When the Delft-FEWS archive display cannot connect to the archive file server, there will be a error message shown when starting the display. If this is the case, make sure the computer has a network connection, access to the archive file server, and that the path to the archive file server is correctly configured in the global.properties file.

The Delft-FEWS Archive display contains three tabs:

- Create a new event: This tab can be used to create a new event file to tag data in the Deltares archive. It also contains functionality to update an event and/or upload an attachment to an existing event.
- Search for events: This tab can be used to search in existing Deltares archive for events and download the associated data and the attachment(s) that have been tagged to the event.

• Search in archive: This tab can be used to download data from the archive, without using the events functionality.

In the following paragraphs the functionality of the different tabs is explained.

Create an archive event

Events are created for Areas and are valid for a period; specified by the start and end time.

To create a new event; take the following steps:

1 Select the area for the event (an area is a basin or national). The list with events will be updated with all events found in the Deltares Archive.

2 Press the *create event* button to create a new event for the selected area.

3 Select the event type to add and enter the start and end time of the event. Complete the name and description textboxes for the event to make the new event understandable for other forecasters.

- 4 Press the search button on the right part of the display to check if there is any data in the archive for the selected area and period.
- 5 Press the save event button to save the event file on the local computer. The event will be added as a new line in the event list table in red.
- 6 Press the upload event button to upload the event file from the local computer to the archive server.

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File	Tools Options Help									
				≜ * ‼ ‼	?					
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	event properties area NSW Belling	ger and Nambucca	start time 25-03-2015 15:44 end time 30-03-2015 15:44 event type Flood Event		inter conge nova		simulated d	ata: 1.19 Mb ata: 7 available, 7 sele ata: 93 available, 93 se ata: 0.06 Mb les: 0 les: 0		Reports Archive 4 : Plot Over
							report f			rview
	name	description		creation time	start time	end time	area		event type	
	minor Surge flood	minor event		30-03-2015 16:25:37	25-03-2015 15:45:			r and Nambucca	flood event	88
	Test Water Coach	Test Water Coach		24-03-2015 10:03:12				r and Nambucca	watercoach event	<u></u>
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вмт	C Generic Account 10	Current system time	e:30-03-2015 16:15 AEDT		05:25:42 GMT	16:25:42 EST	HYFSDEVMC00		0.0 MB/s	s 587 MB

Figure Delft-FEWS Archive display; create new event

When an event is created it is possible to attach a file (pdf file, or zip file, max. 100Mb) to the event. Take the following steps to attach an attachment to an existing event.

- 1 Select the event from the list of events.
- 2 Press the attach file button to select a file and attach it to the selected event.

3 Press the *upload event* button to upload the event file from the local computer to the archive server.

Search and Download archive events

The Deltares archive will contain many events for all catchments. The events can be searched and downloaded in the Search for Events tab.

To search for events; take the following steps:

1 Select the area and set the search start and end times. The list with events will be updated with all events found in the Deltares Archive that match the selected criteria.

- 2 Press the search button on the right part of the display to check if there is any data in the archive for the selected area and period.
- 3 Select one or multiple events from the list with events.

Press the *download attachment* button to download the attachments for the selected events from the archive server to the local computer. The attachments will be stored in the ArchiveDownload folder (configured); check the log file in the system logs to find the names of the correct folders.

5 Press the download event with data button to download the data for the selected events from the archive server to the local computer.

Note: By double clicking one of the cells in the event list, the event list will be filtered and show only those events that have the same content of the selected cell. To filter for example on historic events, double click in the event type cell where the content is historic event. All cells in that event table column will now have a blue background color indicating there is a filter active. To remove the filter, double click again on one of the event type cells.

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Tree			e a new event 🔍 search for events 🛛 🏹 search in archive						
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			end time 30-03-2015 15: thresholds No thresholds						thive
ewer			ING UNCERTOOD SE	Jected, •					
2 : Data Viewer									4 : Plot Overview
2									erview
	ŀ-	name	description	creation time	start time	end time	area	e	event type
	r	minor Su	urge flood minor event	30-03-2015 16:25:37	25-03-2015 15:4	5:00 30-03-2015 1	5:45:00 NSW	Bellinger and Nambucca flo	ood event
		test	test	23-03-2015 16:43:32	01-03-2015 13:0	0:00 23-03-2015 1	3:00:00 NSW	Bellinger and Nambucca flo	ood event
		€ Мар	1 Piots Spatial J Modeling Peak Heights	🕉 Archive Catalogue 🗖 🗙					
			6 : Forecaster Notes 7 : Run Info						
вм	TC Ge	eneric Ad	ccount 10 Current system time:30-03-2015 16:30 AEDT	05:3	30:19 GMT	16:30:19 EST	IYFSDEVMC00		0.0 MB/s 508 MB

Figure Delft-FEWS Archive display; search for events (filtered by flood event using double click)

Search and Download archive data

The Deltares archive will contain data that is not always included in an archive event file. If the data is not included in an event file it can be downloaded in the Search in archive tab.

To search for data in the archive; take the following steps:

1. Select the area

- 2. Set the search start and end times.
- 3. Select the type of dataset
- 4. Select the source of the data (if available, from 2015.01 onwards only)
- 5. Press the search button
- 6. Select one or multiple data sets from the list for download
- 7. Press the *download and import data* button to download the data from the archive server and import into the local datastore. If do not want the data imported, you can also press the *download* (only) button.

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Figure Delft-FEWS Archive display; search in archive and download data

Note: After selecting an area and period make sure to press the search in archive data before downloading the files from the archive server. Especially the National area can contain many external forecast data files and the size of the files can be considerable.

Importing archived data into Delft-FEWS stand alone application

If you did not import the data directly as part of the download, you can import the data in the Delft-FEWS Stand Alone system with use of the Manual Forecast display. To import downloaded data; take the following steps:

- Open the Manual Forecast display from the Delft-FEWS Explorer Menu or Toolbar.
- Select the Import data from Archive workflow.
- Press the Run button.

All data that is downloaded and available in the ArchiveDownload folder will be imported in the localdatastore of the Stand Alone system. As the imported data will be imported in the localDatastore of the Deft-FEWS Stand Alone it is advised to delete or rename the existing localdatastore folder and all data in the ArchiveDownload folder before starting a new Archive download and import session. Note that this import activity will bring back the data using the original data administration.

If you want to use the data within a different context, you may also copy the data to the normal Import folders, and setup a normal timeSeriesImport run module with idmapping to bring the data into the Delft-FEWS stand alone application registered under your timeSeriesImport run module.

26. Validation Status

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Overview

Besides seeing the result of a series of validation steps, the user will be able to determine the results of individual validation steps. The progress in the validation process is called Validation Status.

This functionality is available from Delft-FEWS version 2015.02 onwards.

Use Cases

Validation Status should support the users in their specific validation practices and allow the users to confirm that the data has been adequately validated. The following use cases will be supported:

- · For a time series, it will be registered per timestep, which validation steps have been performed
- The progress in the validation process can be used to make time series data (un)available for transformations / display
- The user gets a visual indication (tooltip, validation step columns in table view, background color and color bar) which validation steps have been performed
- · The user gets extended possibilities to validate timeseries manually

Summary of Validation Status implementation

The validation procedure of an organisation can consist of various (serial) validation tasks: Primary/Secondary validation, transformation interpolation of data, visual inspection, ... In the end, a validated timeseries will possibly have a quality flag (Reliable/Doubtful/Unreliable/Missing) as a result from the validation process. Since version 2012.01 FEWS stores not only the quality flags, but also the source of the flag, the so-called flagSource. So the user is able to see why a certain value is validated as unreliable, eg. due to exceeding of the hard max. The regular flagSource (which is visible in the Delft-FEWS interface as the 'Validation' item), in combination with the quality flag is therefor a summary of the validation process.

Since version 2015.02 FEWS makes it possible to configure so-called 'flagSource columns' for each individual validation step, in which the flagSource of the specific validation step will be recorded. From these flagSource columns the user can deduct which individual validation steps

have been performed and to what result. Even when a defined validation step has been executed successfully and no quality flag has been changed, a default flagSource "OK" will be set for the respective flagSource column. The flagSource columns therefor provide details on all the validation steps.

Since version 2016.01 the concept 'Time of Validity' (Tv) has been introduced. This is defined the last timestep for which a timeseries has been validated (i.e. for which a specific flagSourceColumn has been set). Specific functionality related to the Time of Validity (Tv) becomes available for the timeseries display whenever a 'Time of Validity mode' is activated by activating a Tv button in the toolbar. The Tv is also available in de database lister.

Functionality

FlagSource columns can be defined in a dedicated flagSourceColumns regional configuration file, see FlagSourceColumns in the Configuration guide. These flagSource Columns are stored for each timestep for all timeseries that have been validated in the FEWS database. Various configuration options allow the user to harness the Validation Status in the operational process, either by visualisation, export, conditional filtering in transformations, etc.

The following principles apply and options are available:

FlagSourceColumns are optional

All Validation Status related configuration options are optional. When flagSourceColumns are not defined in the configuration, they will not be used by Delft-FEWS. When timeseries in a database contain flagSource Columns which are not configured, they will be ignored by FEWS.

Specific flagSource related functionality will not be available to users when the flagSourceColumns file is not configured.

On startup, Delft-FEWS performs a check whether all flagSource ColumnId's referenced in the configuration are defined in the flagSourceColumn configuration file. When there are configuration inconsistencies, FEWS will throw an error/warning.

Writing of flagSources

A validation step where a flagSourceColumn has been defined will write the appropriate flagSource in case of a flag change, both to the flagSource column and the regular flagSource element.

In case the flag is not changed, the default flagSource "OK" which indicates that the validation step has been performed, will be written to the flagSource column. In this case, the flagSource will only be written to the regular flagSource element when this is empty.

This ensures that the regular FlagSource element (visible to the user in the FEWS interface with the 'Validation' option) remains a summary of the validation status.

FlagSource columns are configured using an columnId and a storageKey

The ld of the column is only used to reference this column from the rest of the configuration. This id is not stored in the database. This id can be changed at any time without the requirement of deleting the datastore.

The storageKey is an integer between 0 to 127 that is used in the datastore to reference a columnId. After changing this key you have to delete the local datastore and MC database.

flagSources contained in the flagSource Columns

The flagSourceColumns can only contain the existing flagSources. Also see D Time Series Flags. These flagSources will automatically be set to the flagSource Column when a flag is changed in the respective validation step

Primary Validation	FlagSource
soft min.	SN
hard min.	HN
soft max.	SX
hard max.	НХ
rate of rise	RO

rate of fall	RO
same reading	SR
temporary shift	TS

Secondary Validation	FlagSource
spatialHomogeneityCheck	SH
seriesComparisonCheck	SC
minReliableValuesCheck	RV
minReliableOrDoubtfulValuesCheck	RDV
minNumberOfValuesCheck	NV
minNonMissingValuesCheck	NM
mannKendallCheck	КТ
flagsComparisonCheck	FC
flagPersistencyCheck	FP

To support transformation and visual validation steps, custom flagSources can be configured in the customFlagSources configuration file, see 27 CustomFlagSources.

Tranformation/Manual	Custom FlagSource
default validation (success)	ОК
Interpolation small gap	SG
Interpolation large gap	LG

Validation Status as a condition

By defining a 'visibilityControllingFlagSourceColumnId' element in the timeSeriesSet, the existence of a flagSourceColumn for a particular timeseries (step) can be used as a condition for for example a transformation. When the configured flagSourceColumn is not existing for a particular timeseries step, the value will be perceived as 'Missing' for the transformation. All values that did not pass this validation step are removed on read. They are set to missing for equidistant timeseries and removed for non-equidistant timeseries.

() timeSeriesType timeStep unit=hour	simulated forecasting
	_
() location SetId	ALL_KOT
() parameterId	FB_Seed
() valueType	scalar
() moduleInstanceId	\$MODELCODE\$_\$MODELNAME\$_Prep_FB_\$RUNTYPE\$

This element can also be used to prevent non-validated data to be exportable through a PI-Webservice. If the timeseriesSets in the filterId that is used for the Webservice are configured with a visibilityControllingFlagSourceColumnId, timesteps that do not have the correct validation status will not be exported.

Assign a FlagSource Column per module run

It is possible to add an element defaultFlagSource and a FlagSourceColumnId in a **workflow**, at the module activity level of the validation step. This will dictate which flagSourceColumn (FlagSourceColumnId) will be used to write the flagSources to and what flagSource will be written in case no flag is changed (defaultFlagSource).

The interpolation serial transformation also has the possibility to assign a custom flagSource to a flagSourceColumn for interpolated values.

Example

<transformation id="interpolation serial linear"></transformation>
<interpolationserial></interpolationserial>
linear>
<inputvariable></inputvariable>
<variableid>input</variableid>
<maxgaplength>5</maxgaplength>
<outputvariable></outputvariable>
<variableid>output</variableid>
<pre><outputcomment>outputCommentTest</outputcomment></pre>
<pre><outputcustomflagsourceid>INTP</outputcustomflagsourceid></pre>

Validation Status in the GUI (Time series diplay)

An option 'Validation Steps' is available in the table view options (when flagSource Columns are configured). When this option is activated, all flagSource Columns that are either filled (the validation step has been performed) or are configured 'editable' will be shown next to the value column. The header of the flagSource Columns is equal to the configured 'shortName' and when the user hoovers above the header, a configured tooltip for the flagSource Column is shown.

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	Validatie	Ctrl+Shift+J	
4	Validatie Stappen		
-	Gebruikers	Ctrl+Shift+K	

The order in which the flagSourceColumns are configured should reflect the sequence of the respective validation steps in the validation process. This order is also used in the timeseriesDisplay - tableview, when the 'Validation Steps' are visualized. Note that the order in the configuration file is from top (first validation step) to bottom (last validation step), in the interface the order is from right (first) to left (last).

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ML gSourceColumns = xmins = xmins:xsi = xsi:schemaLoca	ation	http://w http://w http://w http://w V1 F V2 V3 V4	ww.widel www.widel www.widel	ft.nVfe rg/200 ft.nVfe	₩S //XMLS ws http 0 5 1	ochema-i	instar wide	Ift.nl/so Alidatio Second	chema: criptic onstep valida on step	s/vers on A is th tion st o C	sion1.0/	/flagSourceCo	Imms xsd O shortName V1 V2 V3 V4	↓ toolTip A ToolTip B ToolTip C ToolTip D ToolTip	editable true false true	alwaysVisible true true true true true	lawn green alice blue cyan	ndColor
ML gSourceColumns = xmins = xmins:xsi = xsi:schemaLoca	ation	http://w http://w http://w http://w V1 F V2 V3 V4 V5 F	www.widel	ft.nVfe rg/200 ft.nVfe	WS //XMLS ws http 0 5 1 2	ochema-i	instar wide V S V V	Alidatic /alidatic /alidatic /alidatic	chema: criptic onstep valida on step	s/vers on A is th tion st o C	sion1.0/	/flagSourceCo	lumns.xsd () shortName V1 V2 V3 V4 V5	↓ toolTip A ToolTip B ToolTip C ToolTip D ToolTip	() editable true false true true false	alwaysVisible true true true true false	lawn green alice blue cyan purple	ndColor

Mark and edit Validation Status

The regular 'Validation' column cell for each individual timeseries will get background color that is equal to the configured color of the last validation step that has been performed for that timestep. When a distinctive color is used for a specific validation step that is of interest to the user, it is easy to gauge the progress of validation from the color. This color is also visible as a bar chart under the timeseries graph, and represents the last validation step that has been executed for all timeseries.

It is possible to include an explicit manual validation step in the validation procedure using the 'Mark' option that is available in the toolbar when the timeseries display is in edit mode and flagSources have been configured. This allows the user to set a flag (or not) for selected timeseries and timesteps and at the same time indicate for what flagSource Column (e.g. 'Visual_Inspection') which flagSource (e.g. 'OK') should be written.

Validatie status	<u> </u>
Vlag	
<geen wijzigingen=""></geen>	*
<verwijder alle="" vlaggen=""></verwijder>	
Betrouwbaar	=
twijfelachtig	_
Onbetrouwbaar	
Persistent unreliable	-
Validatie stap	
<geen selectie=""></geen>	*
V1	
V2	=
V3	
V4	-
V5	-
Validatie bron	
<geen selectie=""></geen>	*
d0u0	=
d1u0	_
d2u0	
d3u0	
d4u0	-
OK Annuleren	

Validation History

When a data value is deleted (either by the user or by a different action), the flagSources for that timestep will remain. For an individual value in the time series table, the history of that value can be shown using the right-mouse menu - Show history (CTRL+H). This menu also shows the 'state' of the flagSourceColumns for each time the value was changed in the datastore.

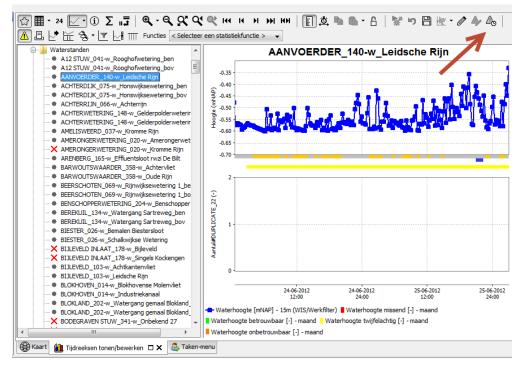
	Workflow/Gebruiker	Waarde	Vlag	Validatie	V6	V5	Commentaar
1-12-2015 16:11:44	SecondaryValidation_Test	0.586	corrected reliable	INTP	OK	INTP	
1-12-2015 16:10:59 I	InterpolateTest	0.586	corrected reliable	INTP		INTP	
1-12-2015 16:10:08 I	Ivo Miltenburg	missing	corrected unreliable				
0-10-2013 03:56:38	?	0.587	original reliable				

Time of Validity

Since 2016.01 it is possible to open up 'Time of Validity' (Tv) related functionality in the timeSeries display, by configuring a timeOfValidity element in the flagSourceColumns.xml configuration file.

Activating Time of Validity 'mode'

A Tv button becomes available in the time series button panel, which activates all 'Time of Validity' related functionality. The button is only be visible in the button panel, when the timeOfValidity element has been defined in the flagSourceColumns.xml file. Note that none of the Tv functionality is available when the Tv button is not activated.



Besides the functionality as described below, when the Tv button from the toolbar is activated, the time series display will be set to 'edit mode' automatically.

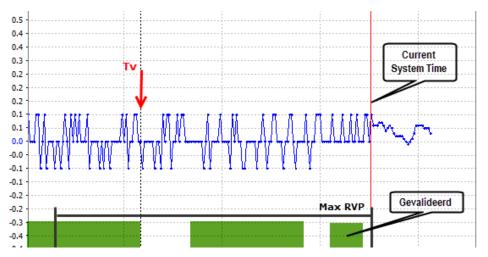
Definition Time of Validity

The time of Validity is defined as the last timestep for which a timeseries has been validated with a particular validation step (in other words: for

which a specific flagSourceColumn contains a flagSource). The Time of Validity of a single timeseries in a display is calculated according to the following logic:

- the TimeOfValidity flagSourceColumn, as defined in flagSourceColumns.xml, will be used
- The timeseries is read for the maximum relative view period timeOfValiditySearchPeriod, as defined globally in the timeseriesDisplayConfig.xml configuration file
- The timestep before the first timestep where the Tv flagSource is not available is considered as the Tv for that time series
- When no single timestep within the timeOfValiditySearchPeriod has the Tv flagSourceColumn filled, the timeseries will have no Tv
- When the first timestep within the timeOfValiditySearchPeriod does not have the flagSourceColumn filled but later timesteps do have the Tv flagSource, the Time of Validity will be equal to this first timestep within the timeOfValiditySearchPeriod

An example for a single timeseries is given in the image below



The Tv (Time of Validity) for a display node needs to be calculated by aggregating the Tv's for all the timeseries displayed under that node. Display nodes are configured in the displayGroups.xml configuration file.

- The Tv furthest in the past of all the time series under the display node will be considered as the display Time of Validity.
- The Tv also needs to be calaculated for the (sub)directories in which the displaynodes are contained.
- · Read Only time series should be ignored when calculating Time of Validity
- Recalculating (and displaying the (updated)) Tv should take place after every save action.

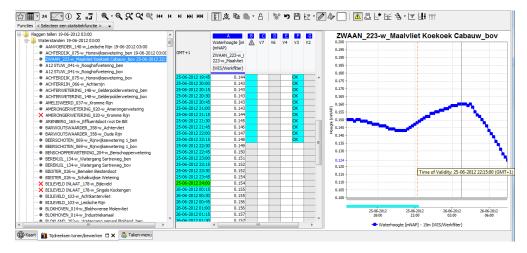
Time of Validity in Database Viewer

When the timeOfValidity element has been defined in the flagSourceColumns.xml file, the Time of Validity will be calculated for each timeseries in the database lister. Note that - different from the time series in the time series display - the Tv is calculated based on the complete time series.

			26-06-20 02-03-20	12 0 11-12-2 11 2 02-02-2	015 1 Secu 015 1 Inter 015 1 Peilb	Workflow Indaire Validati Ipolatie flagSo esluitevaluatie ewerking Neer		Oms	ю	Gebr Ivo Milte Ivo Milte Andre G Verkaik,		•		lter met selectie Verwijder filter	2
						orteer neerslag				Verkaik,		-			
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~	1714		443508	external hist	scalar	15 minuten	25-06-2012	26-06-201	2.			10		9	·
n 🗐 🛛	1714			external hist		15 minuten	25-06-2012					10		9	
v 👘	623		454951	external hist	scalar	15 minuten	24-06-2012	26-06-201	2.	24-06-2012 03	3:00:00	2		193	3
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Time of Validity marker

When Time of Validity has been configured, a Tv marker for the time series display will be displayed in the timeSeries display (when configured).



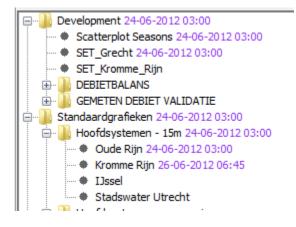
Tv in displayNode text

The Tv that is calaculated for all timeseries in a display node will be shown in the display node text.

Format: </br><displayGroupName> <time></time></time></time></time></time></time></time></time></time></time></time></time></time></time>

The position of the Tv time will be either before or after the displayGroupName and can be toggled through the right mouse menu ('Time of Validity position'). The dateTimeFormat as defined in the Explorer.xml configuration file is used, where the :ss (seconds) is removed. The color of the time will be the same as the Tv marker (and black by default, when the Tv marker is not configured).

Recalculation and displaying the (updated) Tv takes place after every save action.



Ordering of display nodes based on Tv

When the Tv mode is activated, the displaygroups nodes are dynamically ordered based on the Tv of that display node

- The node with the Tv furthest in the past will be displayed on top within the (sub)directory.
- When Tv's are equal, the order will be as configured in the displayGroup.xml file
- (Sub)directory display nodes will show the Tv as an aggregation of the nodes/directories in that (sub)directory



It is noted that the this automatic ordering of the display nodes within a (sub)directory will only be executed at the moment the Tv button is selected. When a validator wants to update the sorting, the Tv button can be de-activated and activated again.

View period and cursor behaviour

A required default view period for the time of Validity (Tv) has be configured to define the time span of data displayed in the time series display whenever the Tv button is selected. The view period is relative to the Tv of the time series in the display and not to T0. This view period is enforced every time the user switches to another display node.

Also, when Tv button is selected, the cursor will default to the last timestep of the view period, whenever:

- · the user selects switches from display node
- the user changes the view period (use case is CTRL+ALT+Right quickkey to change viewperiod, but this also works for manual zooming)

Note: the cursor will update to the last time step for which data is available

Update Tv flagSource column

When the Tv button is selected, the user is able to update the flagSource column related to Tv for all timesteps up to the current position of the cursor (current selected timestep) with the defaultFlagSource as defined in the flagSourceColumn configuration file.

- using an option through the rightmouse menu
- using a simple keyboard shortcut: CTRL+SHIFT+T

Ē	Plakken Wissen Wissen twijfelachtige waarde	Ctrl+V Delete	26-06-2012 04:00	
	Wissen onbetrouwbare waarde		Betrouwbaar	Ctrl+R
	Opvullen ontbrekende data	•	twijfelachtig	Ctrl+D
	Verplaats waarden in tijd	Ctrl+T	Onbetrouwbaar	Ctrl+U
	Expressie toepassen	Ctrl+F	Persistent unreliable	Ctrl+Shift+U
	Kalibreer waarden	Ctrl+M	Droogval	Ctrl+Y
	Trend naar waarde	Ctrl+N	Inundatie	Ctrl+N
	Commentaar toevoegen	Ctrl+Insert	Us	Ctrl+I
	Commentaar verwijderen		Verwijder handmatige markeringen	Shift+Delete
	Markeer		Update time of validity up to the cursor	Ctrl+Shift+T

The update will only take place for the view period of the display. When this update function is used when Tv is outside the view period of the display, a pop up will be displayed warning the user that a validation gap would be created. The update action will not be performed in this case. This might for example happen when the validator updates the flagSourceColumns using the functionality described above - without saving. Delft FEWS does not know in that case that the Tv should be updated, as the Time of Validity is only recalculated after the timeSeries have been saved.

rongerwetering	26-06-2012 00:15	0.155	0.175					
nme Rijn	26-06-2012 00:30	0.155						
De Bilt	26-06-2012 00:45	0.156	0.170 -					
rvliet	26-06-2012 01:00	0.156	0.165					
Rijn	26-06-2012 01:15	0.157	0.105					
tering 1 ben	26-06-2012 01:30	0.157	0,160				 <u>.</u>	
tering 1 bov	26-06-2012 01:45	0.158			- -			
inschopperweterin	26-06-2012 02:00	0.159	G 0.155 ····				<u>.</u>	
weg_ben	dation and warning							
weg_ben weg_bov	dation gap warning							
	dation gap warning	1.00	1					
		: be performed, as a va	lidation gap would	be created for va	lidation step	25-06-20		
veg_bov t		: be performed, as a va	lidation gap would	l be created for va	lidation step	25-06-20		
veg_bov t		: be performed, as a va		be created for va	lidation step	25-06-20		
veg_bov t ng		: be performed, as a va	5.	l be created for va	ilidation step	25-06-20		
veg_bov t ng	j Action cannot		ОК	l be created for va	ilidation step	25-06-20		
veg_bov t ng	Action cannot	: be performed, as a va 0.158	ОК	l be created for va	ilidation step	25-06-20		
veg_bov t ng ickengen	j Action cannot		ОК	l be created for va	ilidation step	25-06-20		
veg_bov t ng ickengen	Action cannot	0.158	ОК	l be created for va	lidation step	25-06-20		
veg_bov t ng ckengen lenvliet	Action cannot	0.158	OK	l be created for va	lidation step	25-06-20		

Export of flagSourceColumns

In the FEWS client, it is possible to use the validation status as a condition for the interactive export. A specific flagSource Column can be selected which is used as a filter for the export. The flagSource Columns are included for the PI-XML data type and will always be exported when available. The GeneralCSV datatype can be configured as an interactive export type as well. The flagSource columns that should be exported can be configured in the explorer.xml configuration file.

Tijdreeksen Export			x
Exportperiode voor de tijdreeksen			
Starttijd 16-06-2012 03:00:00 🚔	Eindtijd	26-06-2012 03:00:00	-
Module			
WerkFilter			
Status.	Patro bash	J	
Status	Betrouwbaarhei	d	
ORIGINAL	RELIABLE		
COMPLETED	DOUBTFUL		
CORRECTED	UNRELIABLE		
	MISSING		
Validatie stap			
V1 - V1 - Validatiestap A is de eerste stap die moet	worden doorlope	'n	
V2 - V2 - Validatiestap B is een hele lang stap			
V3 - V3 - Validatiestap C			
V4 - V4 - Validatiestap D			
V5 - V5 - My E			
	ОК	Annuleren Her	stel

In the regular timeseries exports, the export of flagSourceColumns is supported for the PI-XML format and the GeneralCSV format. In PI-XML, the flagSource columns will always be exported. When exporting using the generalCsv export format, inclusion of flagSourceColumns can be defined in the configuration with the use of Table Layout.

Import of flagSourceColumns

The flagSource Columns are included for the PI-XML data type and will be imported.

The GeneralCSV datatype can be configured as an import type as well. The flagSource columns that should be imported can be configured in the explorer.xml configuration file.

Below is given an example on how to configure a generalCSV import with flagSource columns.

```
<?xml version="1.0" encoding="UTF-8"?>
<timeSeriesImportRun xmlns="http://www.wldelft.nl/fews"</pre>
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.wldelft.nl/fews
http://fews.wldelft.nl/schemas/version1.0/timeSeriesImportRun.xsd">
<import>
  <general>
   <importType>generalCSV</importType>
<folder>../junit_test_output/nl/wldelft/fews/system/plugin/dataImport/Time
SeriesImportTestData/import/generalcsv</folder>
   <dateTimeColumn name="DATE" pattern="dd-MM-yy HH:mm"/>
    <locationColumn name="LOC"/>
    <unitColumn name="UNIT"/>
    <parameterColumn name="PARAM"/>
    <flagSourceColumn id="A" name="FS_A"/>
    <!-- column with name fs a will be mapped to the flag source column
with identifier A -->
    <flagSourceColumn id="B" name="FS_B"/>
    <flagSourceColumn id="C" name="FS_C"/>
    <flagSourceColumn id="D" name="FS_D"/>
    <flagSourceColumn id="E" name="FS E"/>
    <valueColumn name="VALUE"/>
   <logWarningsForUnmappableLocations>true</logWarningsForUnmappableLocations>
<logWarningsForUnmappableParameters>true</logWarningsForUnmappableParamete
rs>
<logWarningsForUnmappableQualifiers>true</logWarningsForUnmappableQualifie
rs>
   <maxLogWarnings>1000</maxLogWarnings>
   <missingValue>-999</missingValue>
   <importTimeZone>
    <timeZoneOffset>+01:00</timeZoneOffset>
   </importTimeZone>
   <dataFeedId>generalCSV</dataFeedId>
  </general>
 </import>
</timeSeriesImportRun>
```

The CSV file for this example could look like this:

DATE,LOC,VALUE,UNIT,PARAM,FS_A,FS_B,FS_C,FS_D,FS_E 01-01-81 00:00,H-2001,2.3,m,P.m,OK,OK,OK,OK,OK

Note that during import, the mapping goes from 'name' to 'id'. When importing the data, the flagSourceColumnId's should be configured in the flag SourceColumns configuration file.

Copying of flagSource columns to other timeseries

It is possible to manually copy and paste the flagSources in the flagSource Columns to other flagSource Columns (from the same, or from other timeseries), when in edit mode.

It is not possible to copy flagSource columns in a transformation to another timeseries.

27 Resampling Dialog

Contents

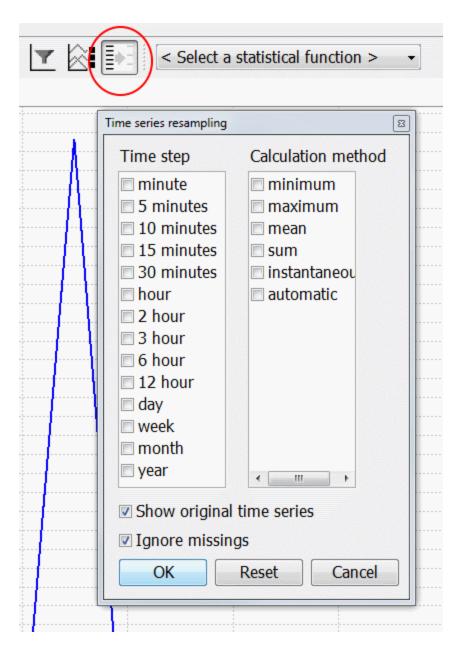
- Contents
- Overview
 - Button on toolbar
 - Adding a time serie with new interval
 - Adding time series for each original time serie
 - Selecting multiple intervals and calculation methods
 - Ignore missings values checkbox
 - Buttons
 - Calculation Methods
 - Minimum
 - Maximum
 - Mean
 - Sum
 - Instantanious
 - Automatic

Overview

The time series resampling dialog lets the user select different intervals and calculation methods for the time series available in the Time Series Dialog. The different intervals and calculation methods will result in newly on the fly calculated time series which will be added to the Time Series Display. These newly added time series are just for displaying in the graph and table and will not be stored in the data store so will not be available for functionality outside of the Time Series Dialog.

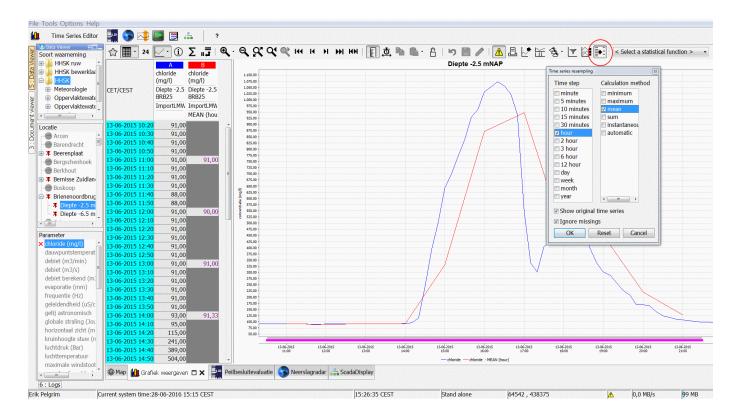
Button on toolbar

The resampling dialog will appear after clicking the button in the toolbar of the Time Series Dialog.



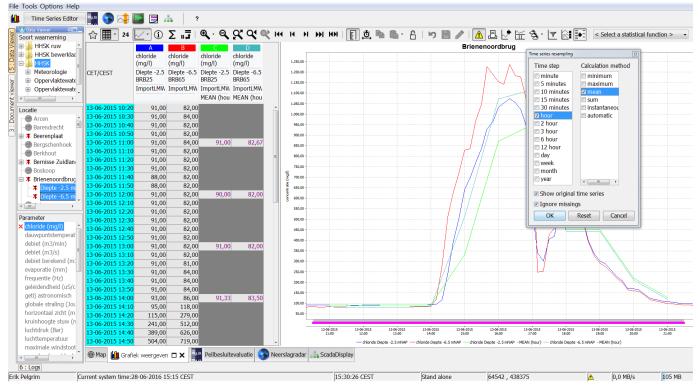
Adding a time serie with new interval

When selecting the time step "hour" and calculation method "mean", the time series "chloride -MEAN (uur)" will appear after clicking the "ok" button. When time series are added in this way, the icon of the button will have a black arrow and black stripes instead of grey to show it is active.



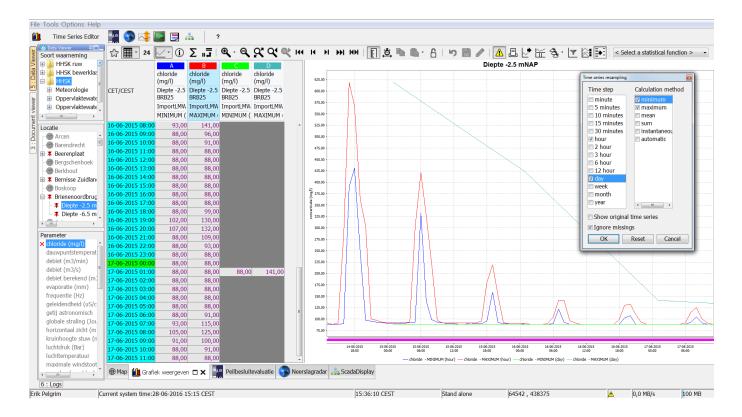
Adding time series for each original time serie

Each combination of selected intervals and calculation methods will result in a new time series for each original time serie. Below an example is shown where for both locations "Diepte -2.5 mNAP" and "Diepte -6.5 mNAP" a time serie is added with interval hour and calculation method mean:



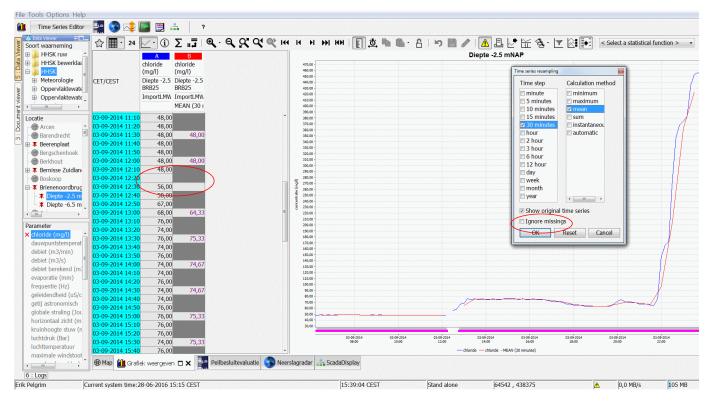
Selecting multiple intervals and calculation methods

Selecting multiple intervals and multiple calculation methods will result in adding new time series for each combination. In the example below the intervals hour and day are selected and calculation methods minimum and maximum, this way 4 time series are added. Also the checkbox "show original time step" is not selected anymore, this way the original time serie is not shown anymore.

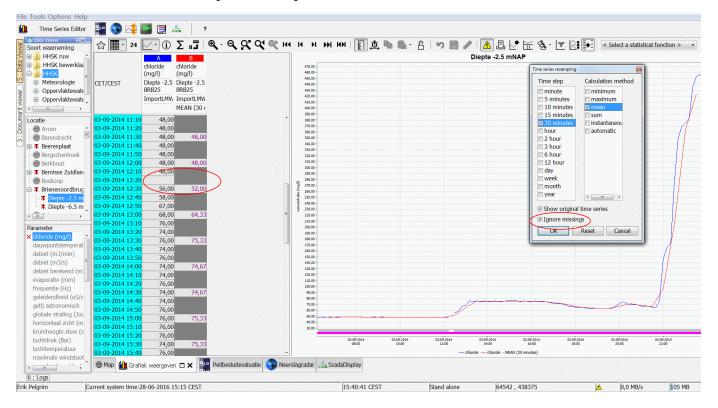


Ignore missings values checkbox

If the checkbox "ignore missing values" is not selected a new value will not be calculated for a new interval time step when a missing value is present in the original interval:



When this checkbox is selected, the missing values will be ignored:



Buttons

The reset button will deselect all intervals and calculation methods and select both checkboxes, this is the default setting in which the dialog is also originally opened for the first time.

The cancel button will close the dialog and not apply the changes made while it was open.

The changes made to this dialog will only be applied to the time series after clicking the ok button.

Calculation Methods

There are multiple calculation methods:

Minimum

Minumum value that is present in the original time serie within each interval.

Maximum

Maximum value that is present in the original time serie within each interval.

Mean

This is calculated by first adding the values from the original time serie within each interval together, and then dividing it by the amount of values.

Sum

This is calculated by adding the values from the original time serie within each interval together.

Instantanious

This takes the last value from the original time series within each interval.

Automatic

This picks the calculation method according to the parametertype:

- Parameter type "instantanious" => Calculation method "instantanious"
- Parameter type "accumulative" => Calculation method "sum"
- Parameter type "mean" => Calculation method "mean"

This option is introduced to help users to pick a valid calculation method. Because for some parameters certain calculation methods do not make sense.

For instance for a parameter "Precipitation Intensity" with type "mean" and unit "mm/h" it does not make sense to chose calculation method sum because intensity is not meant to be summed. If in 1 hour every 15 minutes the intensity was measured at 5, 10, 0 and 5 and you calculate the sum over that hour you get an intensity of 20 mm/h, which is wrong. But for a parameter "Precipitation" with type "accumulative" and unit "mm" this does make sense. If in 1 hour every 15 minutes the precipitation was measured at 5, 10, 0 and 5 and you calculate the sum over that hour you get a total precipitation of 20 mm, which is perfectly fine.

For a parameter "Gate position" with type "instantanious" it could be that the only valid values are 0 or 1, meaning closed and open. Calculating a sum or a mean will not make sense because it can result in invalid data above 1 or between 0 and 1.

28 Interval Statistics Dialog

Contents

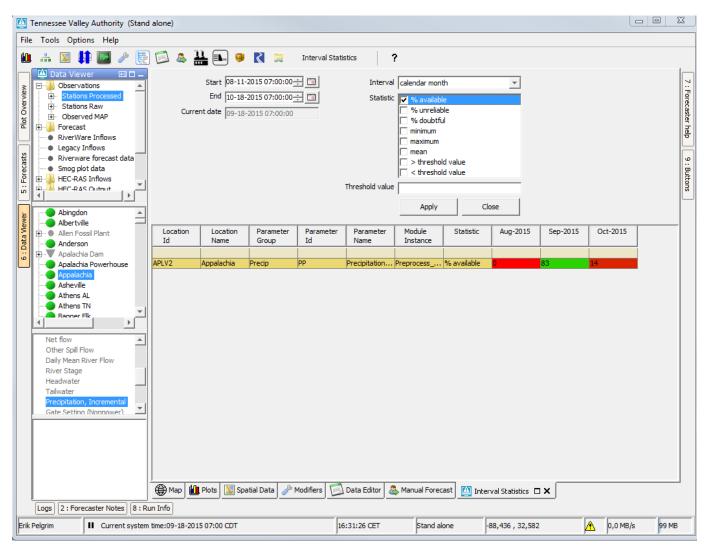
- Contents
- Overview

Overview

The interval statistics dialog is a predefined display that needs to be configured as an ExplorerTask in Explorer.xml:

```
<explorerTask name="Interval Statistics">
<predefinedDisplay>interval statistics</predefinedDisplay>
<toolbarTask>true</toolbarTask>
<menubarTask>true</menubarTask>
<loadAtStartup>true</loadAtStartup>
</explorerTask>
```

This dialog will enable the user to divide the selected time series from the data viewer into intervals between a specific start and end date and calculates statistical values for those intervals. The example below shows the percentage of non missing values for each calendar month between start and end date:



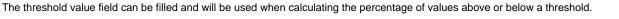
A different interval can be chosen from a dropdown list, like year

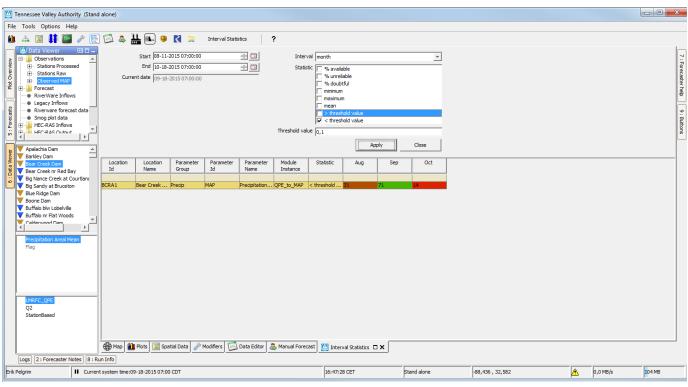
Tennessee Valley Authority (Stand	nd alone)	x
File Tools Options Help		
🛍 🚓 🔟 🗱 💹 🤌 🔄	🖹 🖾 🌲 🏊 🧐 【 📜 Interval Statistics 🛛 ?	
Abingdon	Start 08-11-2015 07:00:00 - 13 Interval year End 10-18-2015 07:00:00 - 13 Statistic % % available Current date 09-18-2015 07:00:00 Statistic % unreliable % unreliable % doubtful ininimum maximum mean > threshold value Threshold value Apply Close	7 : Forecaster help 9 : Buttons
Albertville Aldertville Aldertville Aldertson Apalachia Dam Apalachia Powerhouse Apalachia Asheville Athens AL Athens TN Athens TN Athens TN	Location Location Parameter Parameter Parameter Module Statistic 2015 Id Name Id Name Instance Statistic 2015 APLV2 Appalachia Precip PP Precipitation Preprocess % available 8	
Net flow Other Spill Flow Daily Mean River Flow River Stage Headwater Tailwater Precipitation, Incremental Gate Setting (Nonnower)	There are a constructed by the second	
Logs 2 : Forecaster Notes 8 : Ru		
Erik Pelgrim II Current system	m time:09-18-2015 07:00 CDT 16:34:41 CET Stand alone -88,436 , 32,582 0,0 MB/s 99 MB	

By selecting the interval month, the intervals will be divided over the 12 months within a year. This means for example that the data from September 2014 and September 2015 is taken together in the column Sep.

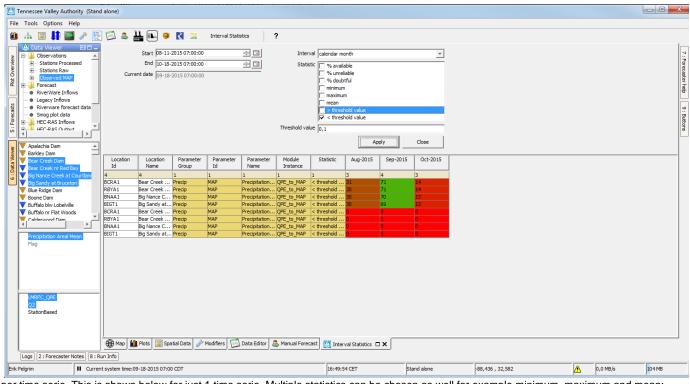
:

ennessee Valley Authority (Sta	nd alone)																			
Tools Options Help																				
🚠 🔟 😫 🔤 🥕 🎚	- 	ш 🖬 🧕	R 🚞	Interval Stat	istics	?														
Data Viewer Color Data Viewer Color Stations Processed Stations Raw Coserved MAP Forecast RiverWare Inflows Legacy Inflows		Start 08-11	-2014 07:00:00)				Interval Statistic	V % available % unreliable % doubtful minimum maximum	e				*						
- Riverware forecast data	-								□ mean □ > threshold	d value										
Smog plot data HEC-RAS Inflows									C < threshold											
HEC-RAS Output	<u>-</u>							Threshold value												
<u> </u>	_											Apply	Close							
V Apalachia Dam A Barkley Dam -																				
Bear Creek Dam Bear Creek nr Red Bay	Location Id	Location Name	Parameter Group	Parameter Id	Parameter Name	Module Instance	Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Big Nance Creek at Courtland																				
Big Sandy at Bruceton	BCRA1	Bear Creek	. Precip	MAP	Precipitation	. QPE_to_MAP	% available	0	0	0	0	1	2	34	16	36	7	0	0	
Blue Ridge Dam Boone Dam																				
Buffalo blw Lobelville																				
V Buffalo nr Flat Woods																				
Calderwood Dam	-11																			
Description Associations																				
Precipitation Areal Mean Flag																				
Titog																				
LMRFC OPE	-																			
Q2																				
StationBased																				
	(Map	🚺 Plots 🛛 🔊 Sp	atial Data 🥜	Modifiers [Data Editor	S. Manual Fore	cast 🔟 Inte	rval Statistics	x											
Logs 2 : Forecaster Notes 8 :						-														
		time:09-18-2015	5.07:00 CDT						16:41:35 CET	г	s	tand alone		-88,436,3	2.582		<u>^</u>	0,0 MB/s		102 MB
elgrim II																				

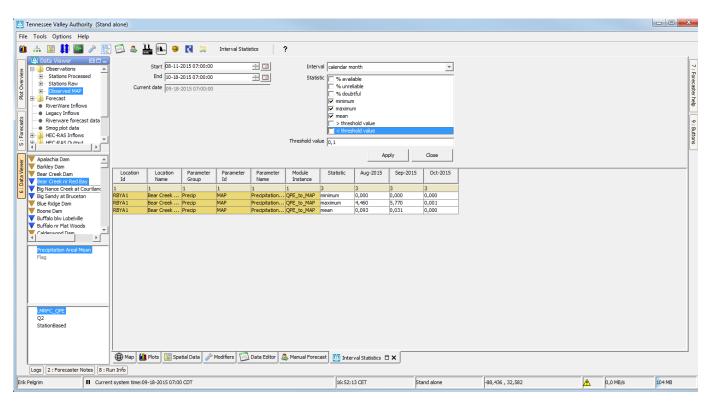




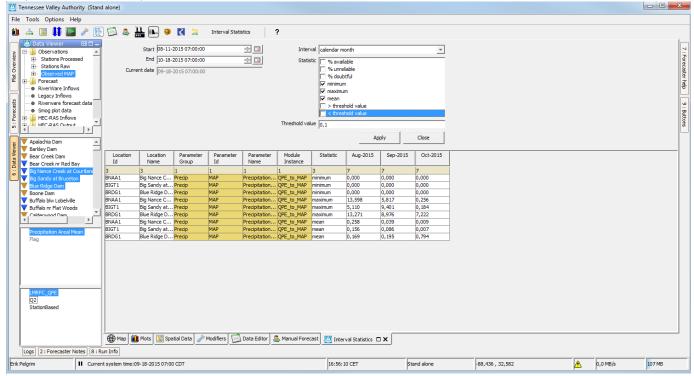
Multiple time series can be selected at once, this will result in multiple rows:



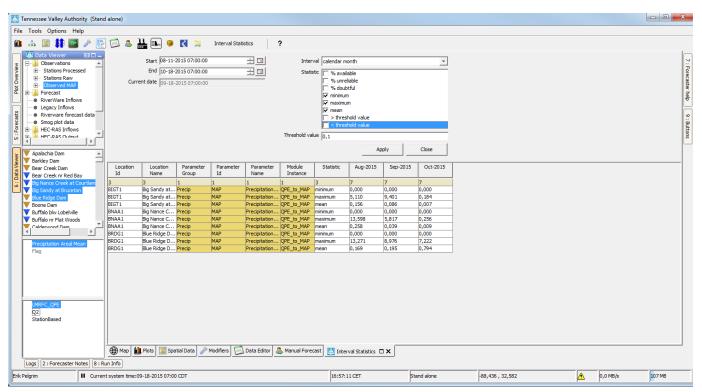
per time serie. This is shown below for just 1 time serie, Multiple statistics can be chosen as well for example minimum, maximum and mean:



Multiple time series and multiple statistics can be chosen, this will result in a new row for each time series for each each statistic:



The rows can be oredered by clicking on the table header, for example Location Id:



29 System Wide Thresholds Display

- System Wide Thresholds Display
 - Activate Display
 - Configure Display
 - ThresholdValueSets EventTimeViewPeriod
 - ThresholdValueSets Visible
 - TimeSeriesDisplayConfig ThresholdDisplayConfig
 - Filtering
 - Event Time
 - Event Value
 - Acknowledging Events

System Wide Thresholds Display

This display provides users with a system wide overview of all threshold crossing events. This display does not require any additional configuration files. It makes use of the already existing threshold configuration in the 'thresholdValueSets.xsd' and the 'thresholdDisplayConfig' that is available in the 'timeSeriesDisplayConfig.xsd'.

🚇 Events													6
Threshold	Module	Location	Location	Parameter	Parameter	Unit	Time	Event	Event	Time till	Warning	Acknowledg	Acknowle
Id	Instance	Id	Name	Id	Name		Step	Time	Value	Crossing	Action	By	Time
AlarmFase1	ARMA Regge Forecast	WST 2102	074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A	m	hour	19-10-2016 07:30:00	-999,000	17d 16h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast	WST_2102	074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A	m	hour	20-10-2016 12:00:00	14,400	18d 21h	H 074:		-
AlarmFase1	ARMA_Regge_Forecast	WST_2102	074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A	m	hour	22-10-2016 19:00:00	14,400	21d 4h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	10-11-2016 18:30:00		40d 4h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	12-11-2016 04:00:00		41d 14h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	12-11-2016 14:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	13-11-2016 12:30:00		42d 22h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	13-11-2016 18:30:00		43d 4h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	14-11-2016 06:30:00		43d 16h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	14-11-2016 12:30:00		43d 22h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	14-11-2016 18:30:00		44d 4h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	15-11-2016 00:30:00		44d 10h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	15-11-2016 05:00:00		44d 15h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	15-11-2016 06:30:00		44d 16h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	15-11-2016 09:00:00		44d 19h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	15-11-2016 18:30:00		45d 4h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	15-11-2016 19:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 01:00:00		45d 11h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 02:00:00		45d 12h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 03:00:00		45d 13h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 06:30:00		45d 16h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 11:00:00		45d 21h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 13:00:00		45d 23h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 15:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 16:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 18:30:00		46d 4h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 19:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 19:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	16-11-2016 21:00:00	14,400		H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 00:00:00		46d 10h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 00:30:00		46d 10h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 02:00:00		46d 12h	H 074: H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 04:00:00		46d 14h			
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 06:00:00		46d 16h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 06:00:00		46d 16h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 06:30:00		46d 16h 30m	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 07:00:00		46d 17h	H 074:		
AlarmFase1	ARMA_Regge_Forecast		074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A		hour	17-11-2016 10:00:00		46d 20h	H 074:		
AlarmFase1	ARMA_Regge_Forecast	WST_2102	074-Middensloot Weerselo	H.updated.voorsp	Gesimuleerde voorspelde waterstand (A	m	hour	17-11-2016 12:00:00	14,400	46d 22h	H 074:		- → [
Threshold Cross	sings 814												

Activate Display

The thresholds display can be activated by adding the following explorer task in the Explorer.xml file:

Configure Display

The thresholds display does not require a display configurations file. It obtains all information for thresholds configuration that is already available in the ThresholdsValueSets.xml file and also in the TimeSeriesDisplayConfig.xml file.

Firstly the most information is retrieved from the ThresholdValueSets file. Here is where all threshold levels are configured and how they relate to timeseries sets. For the purpose of the Thresholds Display some configuration options have been added to this file to control the view period and visibility of the threshold events.

ThresholdValueSets - EventTimeViewPeriod

This configuration option consists of a relative view period that controls which threshold events are shown in the display by default. The relative period is converted to an absolute period based on the current system time. Only threshold events will be shown if their Event Time lies within the configured period. Changing the System Time is one way to change the view period the events. The other way to change the view period is described in the section on filtering.

Each thresholdValueSet file can contain a single EventTimeViewPeriod element. When multiple thresholdValueSet files are configured and they each have their own relative period then the overal view period is an extension of all the individual view periods.

ThresholdValueSets - Visible

This configuration options allows you to control the visibility of threshold values. The 'visible' field can be set for each threshold value separately. By default all threshold values are visible. To hide none interesting threshold values from being shown in the display, they must have their visible value set to 'false'.

```
<thresholdValueSet id="013H" name="H 013">
<levelThresholdValue>
<levelThresholdId>Alarm</levelThresholdId>
<value>8.10</value>
<visible>false</visible>
</levelThresholdValue>
...
```

TimeSeriesDisplayConfig - ThresholdDisplayConfig

The second place the thresholds displays retrieves configuration information is in the TimSeriesDisplayConfig file. This file already contains an element that allows you to control the colors of the threshold values shown in the TimeSeries dialog. This section is also used by the thresholds display to color the text in the Threshold Id column.

```
<thresholdDisplayConfig>
<thresholdDisplayOptions id="Alarm">
<color>orange</color>
</thresholdDisplayOptions>
<thresholdDisplayOptions id="AlarmFasel">
<color>orange red</color>
</thresholdDisplayOptions>
<thresholdDisplayOptions id="AlarmFase2">
<color>red</color>
</thresholdDisplayOptions id="AlarmFase3">
<color>red</color>
</thresholdDisplayOptions id="AlarmFase3">
<color>indian red</color>
</thresholdDisplayOptions id="AlarmFase3">
<color>indian red</color>
</thresholdDisplayOptions>
</thresholdDisplayOptions>
```

Filtering

The functionality of the Thresholds Display closely resembles that of the 'Database Viewer'. By clicking on a value in one of the columns the table will be filtered for that value. By clicking again on the same column the filter is removed. The Thresholds Display offers two special filter options; Event Time and Event Value

Event Time

When filtering the Event Time column a pop-up display appears allowing the user the overrule and extend the default view period that is controlled by the EventTimeViewPeriod. In the pop-up the user can explicitly select a start and end time for displaying event times.

Event Time Filter			×
Select Period			
Start Time 01-10-2016	15:00:00 🗧 En	d Time 08-10-2	016 15:00:00 🗧
	ОК	Cancel	Apply

Event Value

When filtering the Event Value column a pop-up display appears allowing the user to choose how to filter the value column. Options are equal to ('='), greater than ('>') or less than ('<') the entered value.

Event Value Fil	lter	×
Select Value		
Value		14,4 📩
ОК	Cancel	Apply

Acknowledging Events

The Thresholds Display offers the user the ability to 'acknowledge' events. By acknowledging an event a user indicates that a Threshold Event has been seen and the required actions have been taken. On acknowledgement of events the time of acknowledgement and the user that acknowledged the event are registered. This information is stored together with the event data in the ThresholdEvents table.

Events can either be acknowledged by selection or all none-acknowledged events can be acknowledged in one single action. Acknowledging of events can be done by clicking the right-mouse button and selecting the Acknowledge options in the pop-up menu.

Filter for Selection	Insert
Remove Filter for Column	F3
Remove all Filters	F6
Sort Column	F7
Acknowledge Selection	F8
Acknowledge All	F9
Show Time Series Dialog	F10
Export to CSV	