

# Time Series Lister

## Introduction

The Time Series Lister is a display to verify and inspect time series which are written to the database in any workflow.

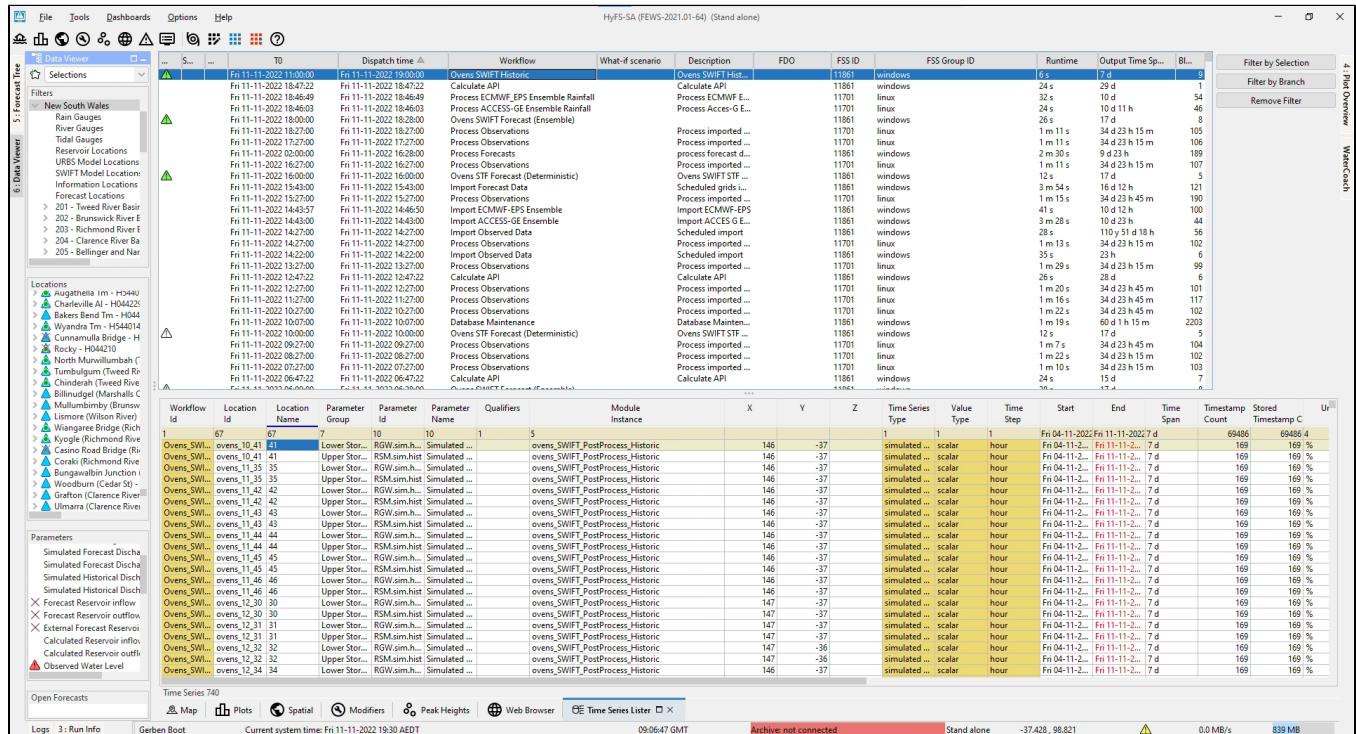


figure 1a: the GUI of the Time Series Lister (with a workflow selected)

When a *filter* - *location* - *parameter* selection is made via the Data Viewer, the Time Series Lister results will be filtered accordingly.

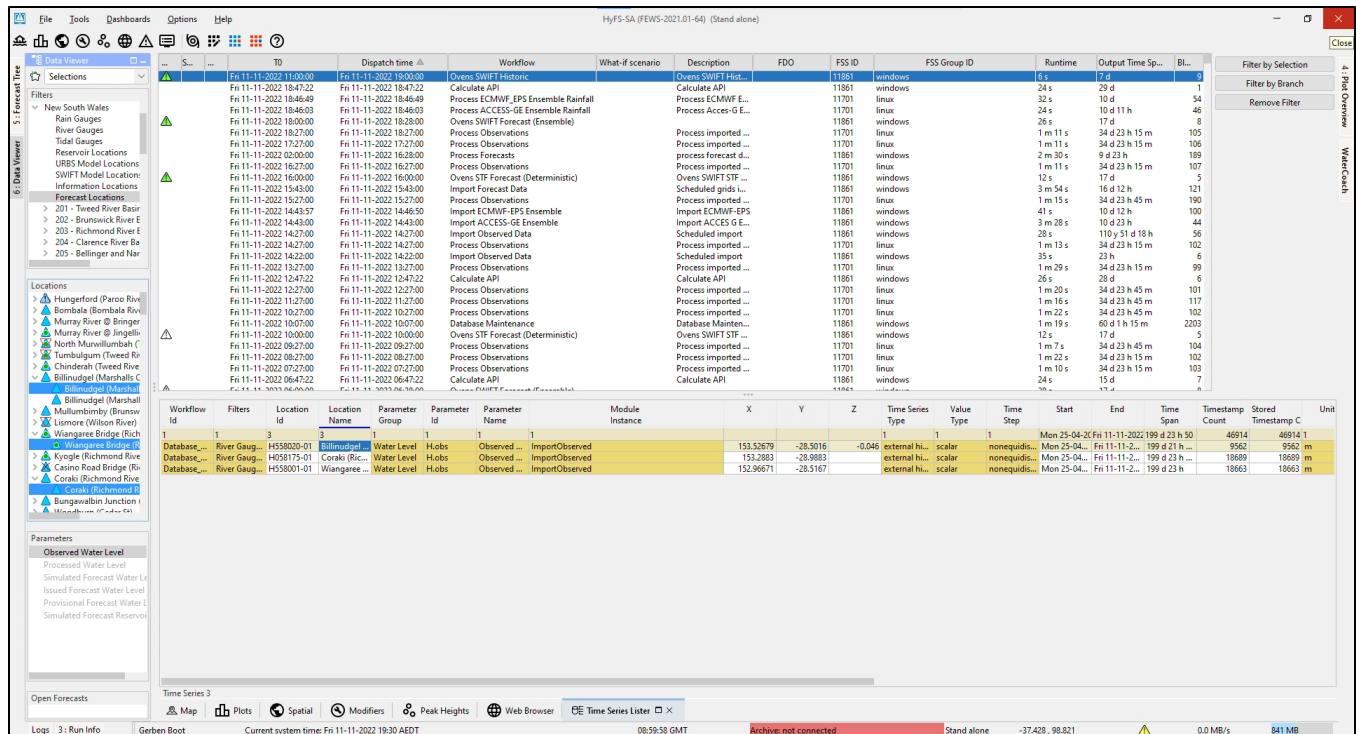


figure 1b: the GUI of the Time Series Lister (with a workflow selected AND a Data Viewer selection)

The Time Series Lister is a pre configured display and a very handy 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 Time Series Lister it is also possible to access the content (=values) of selected timeseries by opening the timeseries display or the spatial (grid) display.

## Configuration

To enable the Time Series Lister, it must be added as `exploretask` in `Explorer.xml`:

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

## Usage

The Time Series Lister 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.

## Context Menu Options (lower table)

Workflow Id	Filters	Location Id	Location Name
1	2	423	422
Horizontalization	Automatic	QW214502	WEERDSEU...
<div> <div>Filter for Selection</div> <div>Remove Filter for Column</div> <div>Remove all Filters</div> <div>Sort Column</div> <div>Select Columns</div> <div>Show Time Series Dialog</div> <div>Show Spatial Display</div> <div>Show Rating Curve</div> <div>Copy TimeSeriesSet xml to Clipboard</div> <div>Highlight in workflow navigator</div> <div>Export table contents to CSV</div> </div> <div> <div>Insert</div> <div>F3</div> <div>F6</div> <div>F7</div> <div>F8</div> <div>F10</div> <div>F11</div> <div>Shift+F12</div> <div></div> <div></div> <div></div> </div>			

**figure 2: context menu of the Time Series Lister**

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>	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>	Show all timeseries (again) for this column	Doubleclicking the blue cell		Cell background turns white
Remove all filters	<F6>	Show all timeseries (again)	Doubleclicking the blue cell		Cell background turns white
Sort column	<F7>	Sort the content of the column	Clicking the header		
Select columns	<F8>	Opens a dialog for selecting the columns (Met Data Elements/groups)			
Show Timeseries Dialog	<F10>	Opens the TimeSeriesDialog and shows the content of the selected (scalar) timeserie(s)			
Show Spatial Display	<F11>	Opens the Spatial Display and shows the content of the selected (gridded) timeserie(s)			
Show Rating Curve	SHIFT + <F12>	Opens the TimeSeriesDialog and shows the details of the selected rating curve			
Copy TimeseriesSet. xml to clipboard		Copies the TimeSeriesSet in XML format			Shows the XML in popup
Highlight in workflow navigator		Highlights selected time series in workflow navigator			Workflow navigator will be shown
Export to CSV		Exports the tabular overview of (filtered) timeserie(s) to a CSV file		For exporting the data to a CSV file, use the Timeseries Dialog  (select the data in the table and use context menu / save as...)	File dialog opens for saving the CSV file

### 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.

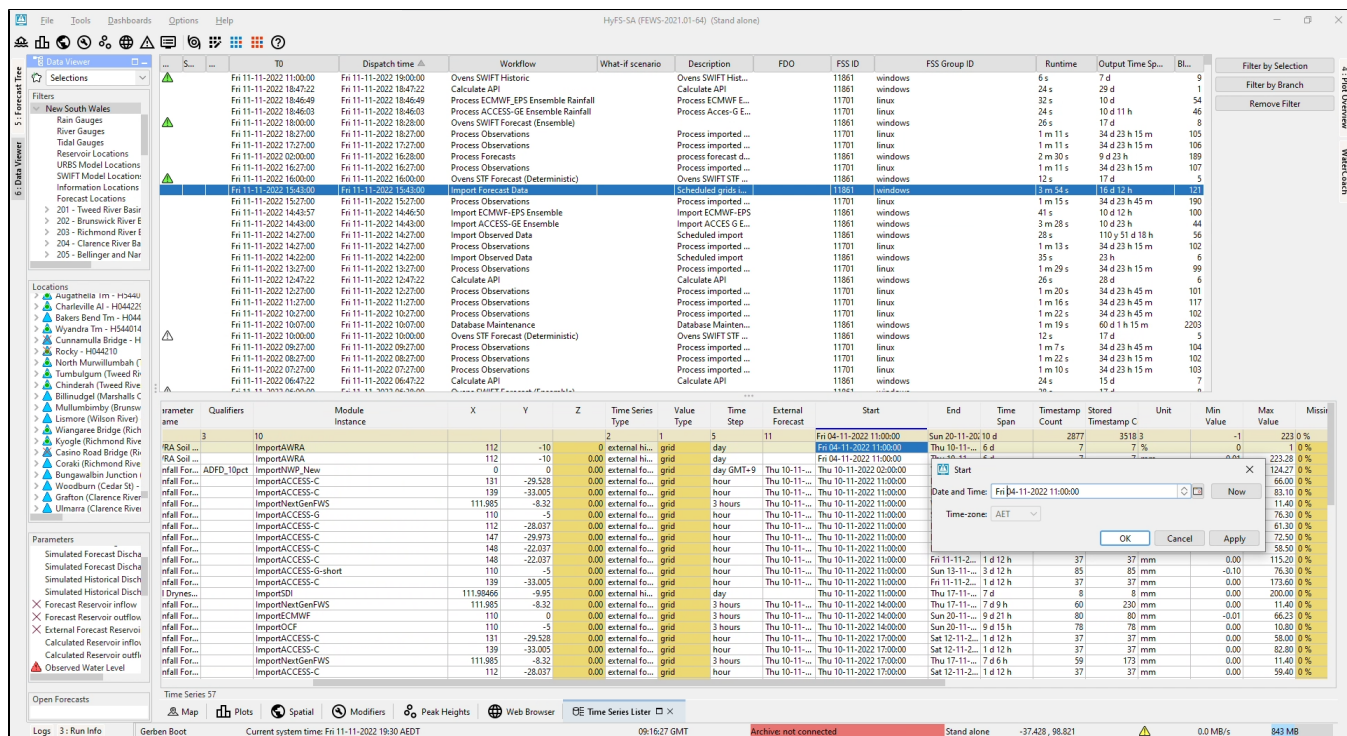
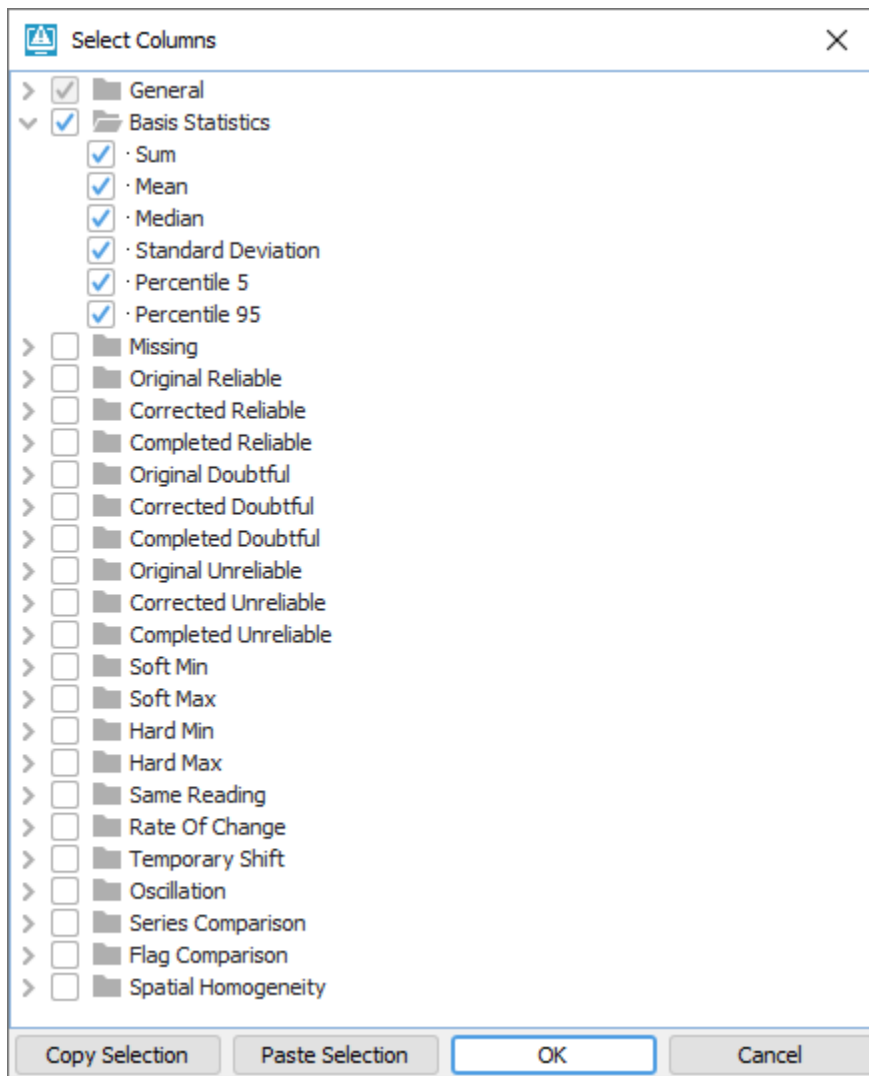


figure 3: Special filter in the Start/End time columns

## Meta Data Elements / Select Columns (F8)



**figure 4: Selecting different columns (elements) in the Time Series Lister**

The meta data elements are grouped as follows.

- General (e.g. moduleinstanceId, 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 Time Series Lister 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:

---

DOMAIN\_PARAMETER\_IDS  
LOCATION\_NAME  
Z  
START  
END  
PARTITION  
MODIFIED  
SIGMA  
MISSING  
MEDIAN  
TIME\_SPAN  
PERCENTILE\_5  
VALUE  
UNIT  
MIN\_VALUE\_TIME  
TIME\_SERIES\_TYPE  
MAX\_VALUE  
X  
COMMENT  
LOCATION\_ID  
TASK\_RUN\_ID  
LOCATION\_START\_TIME  
STANDARD\_DEVIATION  
VALUE\_TYPE  
PARAMETER\_ID  
EDIT  
WORKFLOW\_ID  
TIME\_0  
TIME\_STEP  
MIN\_VALUE  
VALUE\_BITS  
MODULE\_INSTANCE  
EXPIRY  
QUALIFIERS  
PARAMETER\_NAME  
SUM  
LOCATION\_END\_TIME  
PERCENTILE\_95  
SAMPLE\_ID  
MEAN  
PARAMETER\_GROUP  
MAX\_VALUE\_TIME  
LIFE\_SPAN  
QUALITY  
Y  
BED\_LEVEL  
VALUE\_RESOLUTIONS

figure 5: Copying the selection of columns to clipboard



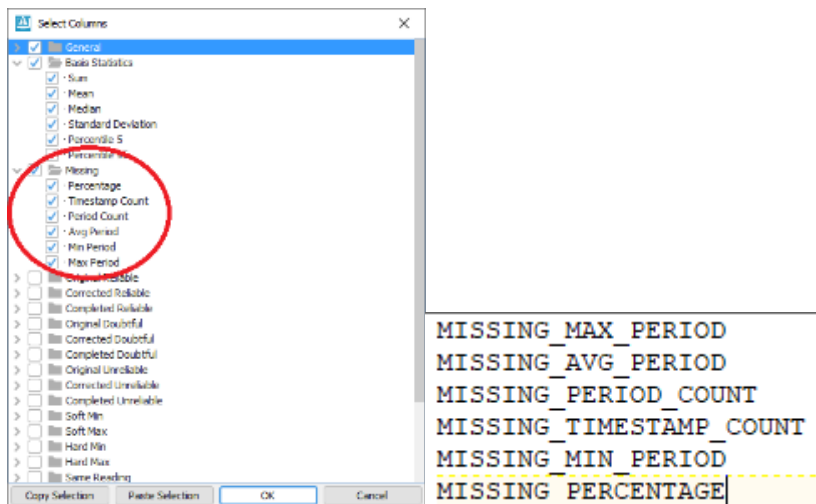


figure 6: Pasting the selection of columns from the clipboard

### Delete module instance from Time Series Lister

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

1. In Time Series Lister, select one workflow, press F12, a menu will pop out (figure 7).

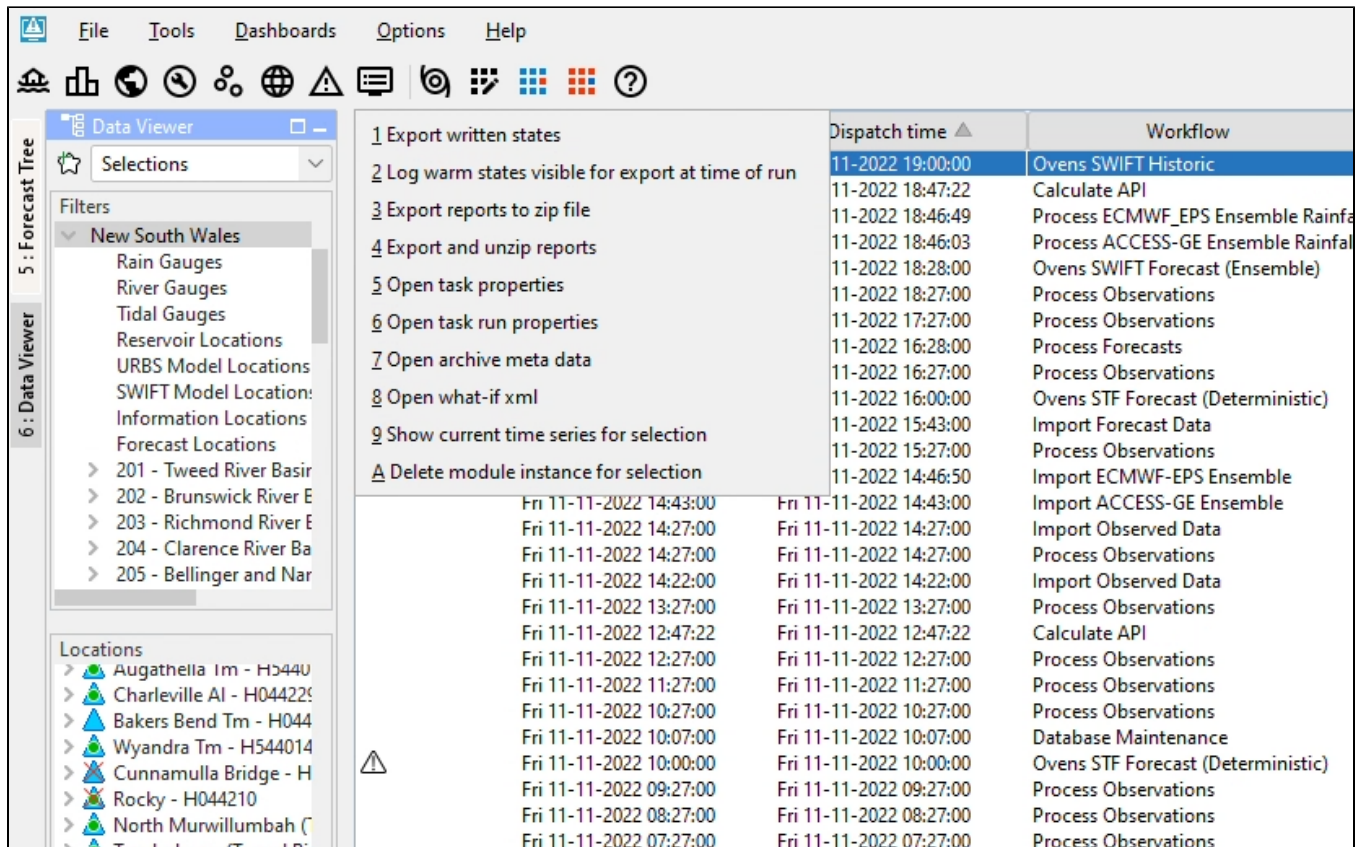


figure 7: <F12> menu in Time Series Lister

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.

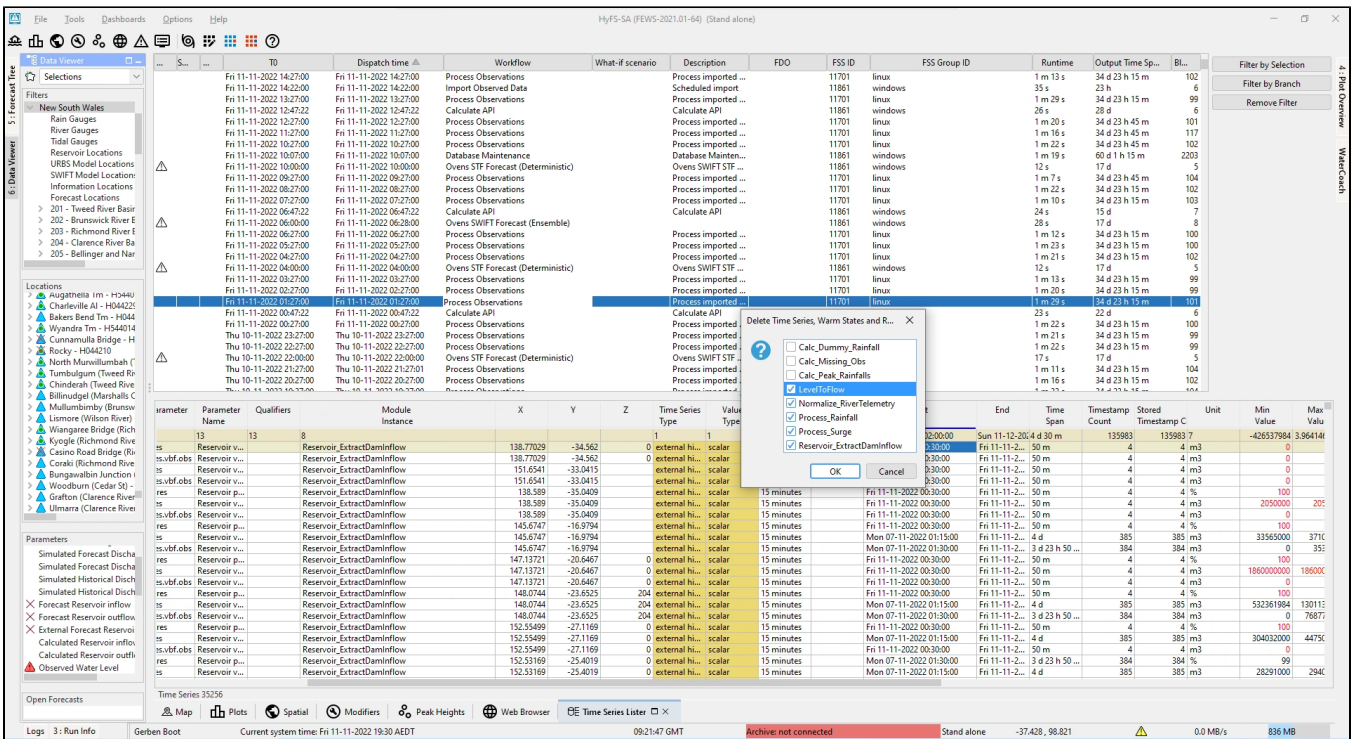


figure 8: select module instances to be removed from database

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 Time Series Lister.

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'.

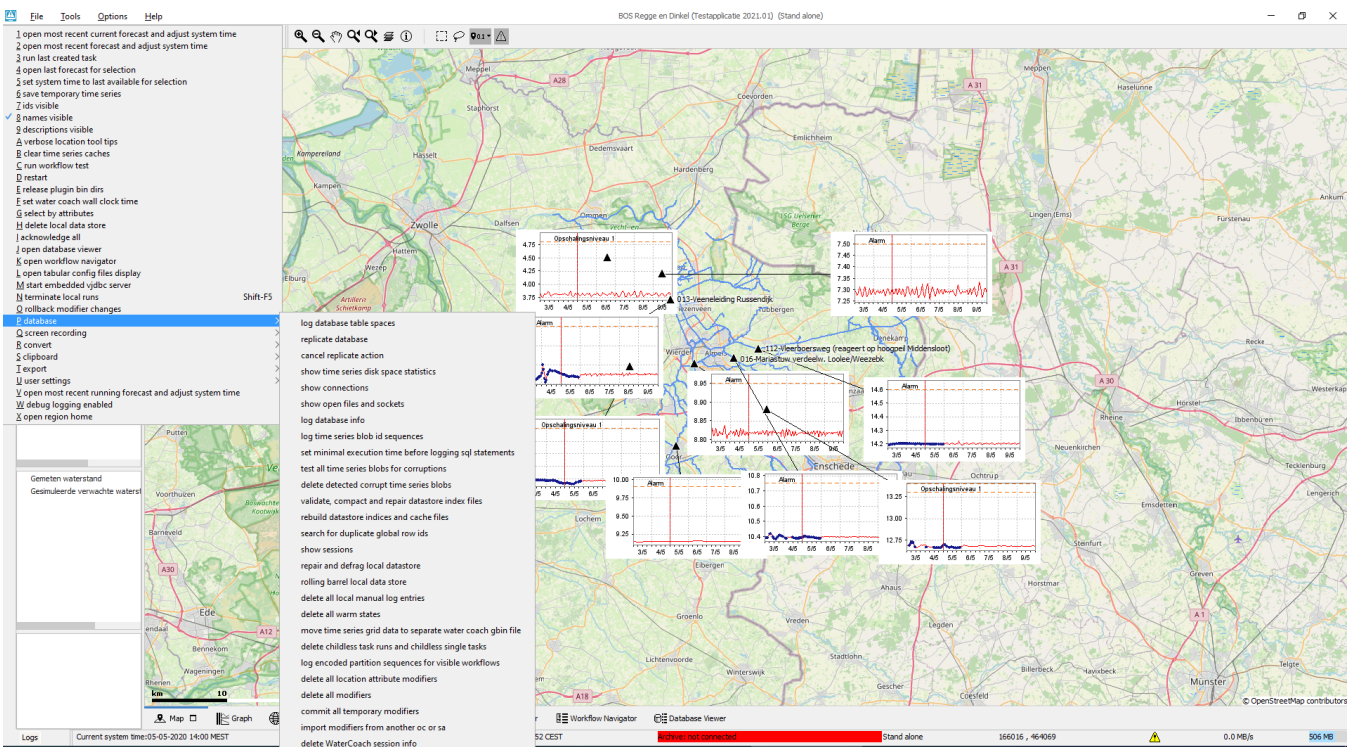


figure 9: Remove workflow and data using F12 - P - database menu



