Draft

Prepared for:

Environment Agency

NGMS Release Notes

Pilot-release 105330_NGMS_0.7

Report

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1 Introduction

This document contains the release notes for NGMS release 105330_NGMS_0.7 which has been shipped on DVD to CIS (Bristol) on December 11, 2006

The NGMS is a development project in which the DelftFEWS system infrastructure is utilized to implement a centrally hosted modelling environment for the groundwater and recharge models of the Environment Agency of England and Wales.

System installation instructions are provided in the System Installation Guide version 105330_NGMS_0.7.

These Release Notes describe the functionality that has been included in the current release, as well as known features and bugs. In addition, it addresses some issues where feedback is required from the EA-hydrogeologists and area staff to guide future configuration works.

2 Notes on the associated software

The pilot-versions of the NGMS are shipped with a development build. Release 105330_NGMS_0.6 is shipped with build number 3, dated Fri Oct 13 12:51:26 CEST 2006.

2.1 Known issues on the Operator Client

The follow bugs and features are known and on the list to be analysed and fixed where required.

Module	Issue/known feature/bug	Status/Work around
Spatial Display	Data set is loaded (i.e. slide bar shows dates) and animated. However, nothing happens on the map.	Solved in release 0.6
SpatialDisplay	At startup, the folder structure does not stay on left side	Scroll to the left.
What-if Scenario Editor	Exception on saving scenario after a data operation has been defined for one of the locations. Exception indicates that string length is too long.	Solved in release 0.6.
What-if Scenario Editor/ Transformation Module	Individual modifications of abstractions results in a failure at execution time. This is caused by an inappropriate character (:) in the locationId which has become part of a formula.	Solved in release 0.7

2.2 Known issues on the Forecasting Shell Server

The follow bugs and features are known and on the list to be analysed and fixed where required.

Item	Issue/known feature/bug	Status / Work around
Task scheduling	Manual tasks are pending for a relative long time after submission.	Wait a few minutes
Workflow execution	Workflow processing continues if a Module Instance fails. This may cause empty data records	None, i.e. to be analysed and resolved
General Adapter runs	The General Adapter does not yet handle redirecting arguments on the shell command line. The Modflow-executable and the Module Adapter are therefore kicked-off via a batch-file. Sequential execution of these executables has been observed while that should not be the case.	Don't start to many manual jobs after each other.
StreamAccretion Generation	Error in mapping time series data from grid to branches/longitudinal profile.	Solved in release 0.7

3 Notes on the configuration

Release 105330_NGMS_0.7 has been configured for the Test and Itchen model, West Midlands Worfe and Yare North Norfolk model.

The release has been tested on a stand-alone machine. Limited testing has been applied on the Client-Server environment as available at Delft Hydraulics.

3.1 The Test and Itchen configuration

The Test and Itchen configuration hardly changed compared to the PR03 workshop release. Known issues to be improved in the Test and Itchen configuration

Item	Issue/problem	Status
Locations	Location identifiers will be upgraded to a similar style as West Midlands Worfe.	Solved for GW-abstractions in release 0.7. Update needed for other location types.
Data availability	IdMapping between external Module Adapter and internal administration is not correct.	Solved for GW-abstractions in release 0.7. Incorrect for discharges
Scenarios	Due to the previous issue, abstraction modifications have been excluded from the scenarios.	Solved in release 0.7
Spatial Display	Small modifications in folder structure have been applied. Note that flow directions, units and associated numerical signs (loss/gain) should be correct.	
Spatial Display	Abstractions and discharges are not shown/not properly shown	Abstractions are shown. Discharges not.
Graph Display	Reported issues of PR03 workshop have not been addressed. Comparisons between various runs will only be accessible via the Graph Display shortcuts (i.e. not via the Explorer navigation panel). Not yet configured	

StreamAccretion	Results may be inappropriate as some rivers may be composed of branches with incorrect up/downstream connections	

Expected run times on a hyperthreaded 3.6 Ghz single core machine with 2 Gb memory:

- TI_import_modelinputdata: ca. 15 minutes
- TestItchen_References: between 4-5 hours
- TI_whatIf: no test result yet.

3.2 The West Midlands Worfe configuration

The West Midlands Worfe configuration has been upgraded to nearly the same level as the Test and Itchen configuration. Known issues to be improved in the West Midlands Worfe configuration are.

Item	Issue	Status
Maps	GIS-layers with point information have not yet been incorporated.	Unchanged in release 0.7
Locations	Location information of GW assessment points and SW assessment points has not yet been updated. Location information of GW abstractions is up to date, but ToolTip information may be reorganized in future	GW-abstractions are correct in release 0.7. GW-assessmetn points and river assessment points need update.
Data availabilit y	No IdMapping defined yet for discharge locations between external Module Adapter and internal NGMS administration. Consequently, no discharge information has been made available yet.	Unchanged in release 0.7
Locations	Parent locations have been applied for boreholes penetrating several layers. No data has been associated to parent locations yet. All data has been assigned to individual layers.	Solved in release 0.7
Spatial Display	As a consequence, GW abstractions cannot be shown properly in a splodge plot yet, as no layer distinction is applied yet. Feedback required (see next section).	Solved in release 0.7
Observed data	Data import has not been configured yet	Unchanged in release 0.7
Graph Display	No shortcuts have been configured except for overall model data.	Unchanged in release 0.7
What-If scenarios	What-if scenarios can be defined for abstractions in Historic and RecentActual Reference. Changes to all locations work fine. Individual locations generate an error during workflow execution.	Changes to individual abstractions should be handled properly in release 0.7
Spatial Display	Small modifications in folder structure. Note that flow directions, units and associated numerical signs (loss/gain) should be correct.	
Spatial Display	Recharge: Unit conversion is applied properly	Behaviour still not as expected. Is under research

Graph Display	Reported issues of PR03 workshop have not been addressed. Comparisons between various runs will only be accessible via the Graph Display shortcuts (i.e. not via the Explorer navigation panel)	Unchanged in release 0.7
StreamAccretion	Excluded from configuration due to error in data processing. Configuration update required	Stream accretion works for named rivers in release 0.7. However, data inconsistencies occur as upstream / downstream connections between branches do not seem correct.

Expected run times on a hyperthreaded 3.6 Ghz single core machine with 2 Gb memory:

- WMW_import_modelinputdata: ca. 5 minutes
- WestMidlandsWorfe_References: ca. 1 hour
- WMW_whatIf: no test result yet.

3.3 The Yare North Norfolk configuration

The Yare North Norfolk configuration has been upgraded to nearly the same level as the Test and Itchen configuration. Known issues to be improved in the Yare North Norfolk configuration are.

Item	Issue	Status
Maps	Appropriate GIS-layers (GWMU, point information, wetlands etc.) have not yet been provided (action EA!).	Unchanged in release 0.7
Locations	Location information of GW assessment points, SW assessment points and GW abstractions has not yet been updated to include tooltip info.	Solved in release 0.7
Data availability	No correct IdMapping defined yet between external Module Adapter and internal NGMS administration.	Solved in release 0.7
Locations	No parent locations have been defined yet for abstractions at same borehole.	Solved in release 0.7
Spatial & Graph Display	As a consequence, no GW abstractions are shown.	Solved in release 0.7
Graph Display	No shortcuts have been configured except for overall model data.	Unchanged in release 0.7
What-If scenarios	No what-if scenarios can be defined.	Solved in release 0.7
Spatial Display	Reported issues of PR03 workshop on colour schemes, classification breaks, folder structures have not been addressed. Note that flow directions, units and associated numerical signs (loss/gain) should be correct.	Unchanged in release 0.7
Spatial Display	Recharge: Unit conversion is applied properly	Unexpected behaviour in release 0.7
Spatial display	No Aquifer properties accessible yet	Unchanged in release 0.7

Graph Display	Reported issues of PR03 workshop have not been addressed. Comparisons between various runs will only be accessible via the Graph Display shortcuts (i.e. not via the Explorer navigation panel)	Unchanged in release 0.7
StreamAccretion	Excluded from configuration due to error in data processing. Configuration update required.	Stream accretion works for named rivers in release 0.7. However, data inconsistencies occur as upstream / downstream connections between branches do not seem correct.

3.4 Messages during task execution

During tasks execution a number of messages are reported in the log-file. The following messages (warnings) seem dramatic but are typically not harmful.

Message in the log-file	Cause
`WARN - GA.Execution.Model.Warn Warn in adapter model:` `Unrecognised flow component ( RULES ) - It is recommend that this flow component be added to the parameter ID file.`	Modflow Module Adapter does not yet support Rule-parameters as applied in MFSSQ02-code
`WARN - All values are unreliable in timeseries`	Data processes uses combination of data types with different validation levels. Consequently, the system flags this difference with a relative dramatic warning.

The following messages (warnings) tend to be more harmful and may be a cause of missing data.

Message in the log-file	Consequence	Cause
`Trying to store an empty array ….`	Next data processing steps within the workflow may fail	a) Database may already contain the associated data, or b) The Module started processing on an empty data set.
`Trying to read time series data for a not yet used key combination`	Additional data processing may not work properly, resulting in the message `WARN - No data available for timeseries`	a) No data had been stored in the database due to a production failure earlier in the workflow b) The data identification in the configuration may not be correct, e.g. incorrect combination of ParameterId, LocationId and ModuleInstanceId

Message in the log-file	Consequence	Cause
`WARN - No data available for timeseries`	Data processing does not work properly. Will most certainly result in message `WARN - Trying to store an empty array`	a) No data had been stored in the database due to a production failure earlier in the workflow b) The data identification in the configuration may not be correct, e.g. incorrect combination of ParameterId, LocationId and ModuleInstanceId

`ERROR - LocalDataStore.Error Configuration inconsistence`
`More than one time series found for a single time series set / location combination`
`The specified module instance set in the time series set is not specific enough`
`or multiple module instances in the specified module instance set has written the same location for the same time series set. In the last case you have to delete the datastore also.`
	System does not know which data to pick for processing/display.	Data identification is not sufficiently specific in the configuration.

To resolve these causes the following information should preferably be gathered:

- log-file from the Forecasting Shell Server[1] or the MCproxy.
- if this file is not available, the log-entries may be saved from the Operator Client (System Monitor, tab 'Log Browser' select logs)
- Alternative, the localDataStore-directory of the FSS[2] or the OC[3] may be provided.

For performance analysis, it is useful to gather log-files after each extensive workflow has been executed.

1 *At machine-root/<drive>/NGMS/<FSS-instance>/FewsShell/England/log.txt*
2 *At machine-root/<drive>/NGMS/<FSS-instance>/FewsShell/England/localDataStore*
3 *At machine-root/<drive>/NGMS_oc/England/localDataStore*

4 Feedback to guide future developments

4.1 Data navigation

Intuitive navigation to data for both modellers and area staff is important for the NGMS. A major facility for this navigation is an intuitive 'explorer-type' folder structure. Preferably, this folder structure is similar for the Spatial Display as well as for the shortcuts in the Graph Display and the Stream Accretion Profile display (to be configured).

Input from EA-modellers and staff is required to tailor the structure to their needs.
The current structure is as follows:

- region
  - model
    - stresses (input)
      - parameter group
        - reference
          - parameter (unit)
        - what-if scenario
          - parameter (unit)
        - differences
          - reference against reference
          - what-if against reference
    - responses (simulated)
      - parameter group
        - references
          - layer
        - what-if scenario
          - modified Historic scenario
            - layer
          - modified Naturalized scenario
            - layer
        - differences
          - reference against reference
            - layer
          - what-if against reference
            - layer
    - aquifer properties
      - parameter
        - layer

As this structure may not be sufficiently intuitive, alternative structures could be more appropriate.

For example, the following structure has reorganized the position of the What-ifs and the Differences and places them in closer relation to a reference.

- region
  - model
    - stresses (input)
      - parameter
        - reference
          - parameter (unit)
          - difference against other reference
          - what-if scenario
            - parameter (unit)
            - difference against reference
    - responses (simulated)
      - parameter
        - Historic based scenarios
          - Historic Reference
            - layer
            - Difference Historic against Naturalized reference
              - layer
          - Modified historic scenario
            - layer
            - Difference modified against original reference
              - layer
    - aquifer properties
      - parameter
        - layer

Feedback on this suggestion, or other suggestions are welcome.

4.2 How to present multi-layered time series in a graph ?

In many models, data is computed in multiple-layers. Typically this data can be presented for each layer, or a merge is undertaken such that the accumulative situation is represented. the latter has been applied for the ground water table and for the accumulated flow field.

Currently, groundwater abstractions are assigned to wells in the specific layers. Boreholes that penetrate multiple layers are shown on the map as one point, although several time series are related to its underlying layers. Abstraction hydrographs tend to be confusing as the total abstraction time series is typically equally divided over the layers, hence showing overlap on a graph. Since the abstraction is the accumulative time series of all layers, the presentation issue to be answered the following:
a) should multi-layer abstractions (e.g. Bratch (West Midlands Worfe model) be presented for each layer (thus resulting in overlapping graphs)
b) should multi-layer abstractions be presented as the accumulative time series over all layer
c) should both a) and b) be presented in one graph ?