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Delft-FEWS User Guide

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Delft-FEWS User Guide

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Pdf version of the Guide

01 Launching Delft FEWS

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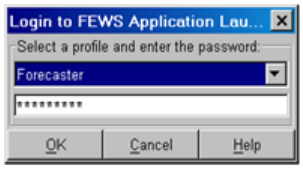
Launching Delft FEWS

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.

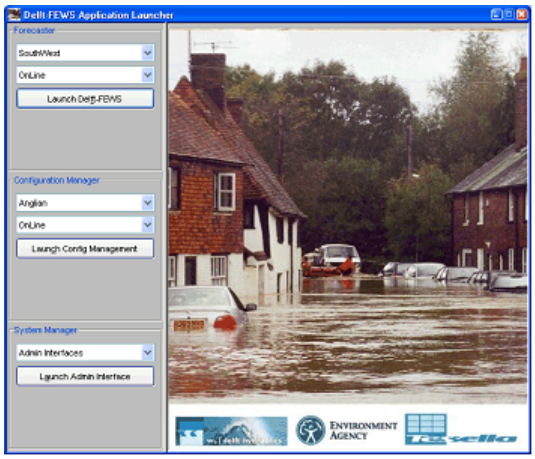


There are four profiles with each of them its own password:

- 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

This page last changed on 08-09-2008 by minett.

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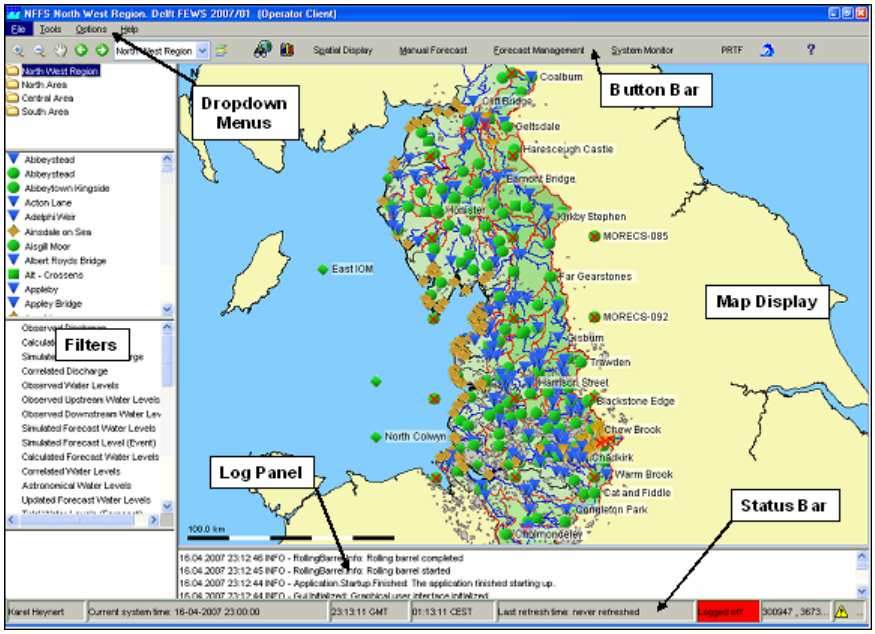
FEWS Explorer

Overview

FEWS Explorer is the principal window of Delft FEWS. The main elements of FEWS Explorer are highlighted in the figure below.



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.

Button bar

The Tool bar provides quick access to frequently used tools. Tools are plug-ins to FEWS Explorer.

Log Panel

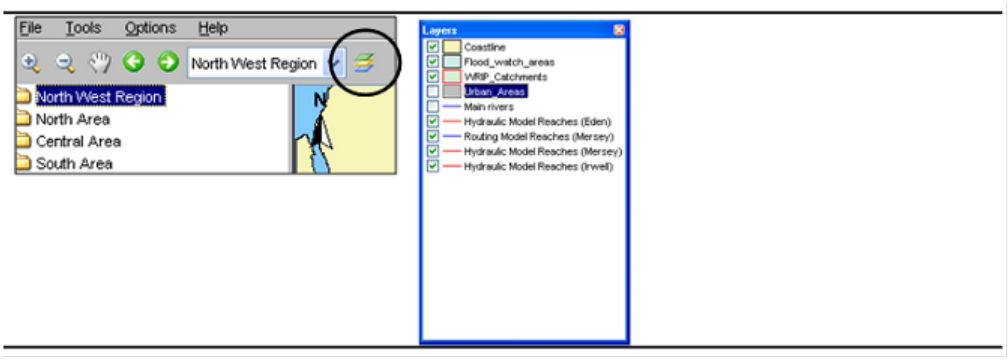
The Log Viewer relays high level messages generated by active system components. Additionally, detailed messages are available in the Log Browser.

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..



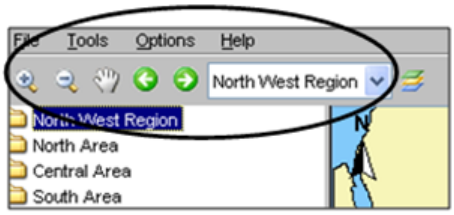
Tooptip

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.



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

Point and click the icon. The icon of the selected location will modify to show it has been selected. Multiple locations can be selected by holding down the [**CTRL**] key while selecting. Locations can also be selected in the list boxes.

Show map layer information

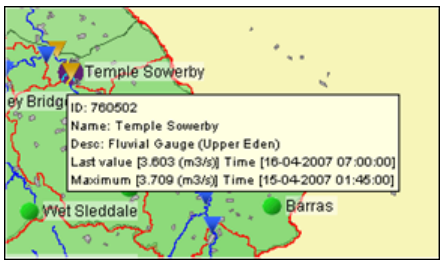
An icon on the toolbar can be pressed to activate the presentation of information for map layers as a tooltip. If a map layer has been configured such that it shows information from the dbf file, a user can show this information by clicking the information button.

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.

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.

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.

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.

		gauged fluvial site
		ungauged fluvial site
		meteorological site
		radar data site
		coastal site
		catchment centre point
		default site

Data availability

In case *all* data is missing in the configured view period, a red cross will be displayed on top of the location icon. The configured view period equals the length of historic run for observed data and the length of the forecast run for forecast data.

		no data available in view period
		example of fluvial site with missing data

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.

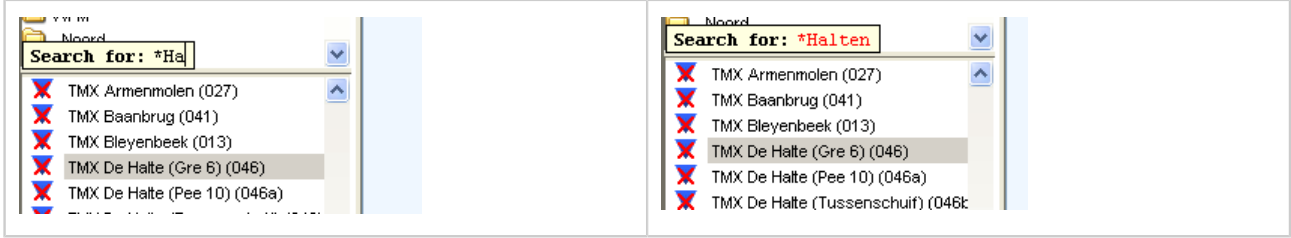
There are 5 extra icons pre-configured for 5 threshold levels that are merged with the original threshold icon. These extra icons are:

		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:

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. You can use the "*" sign in the search criteria 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.



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 *System 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)

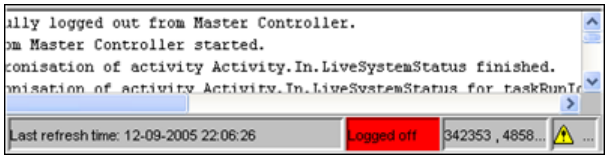
The time of last refresh indicates the last time the local data store has been synchronised with the Central Database. Not relevant for Stand alone FEWS configurations.

System status

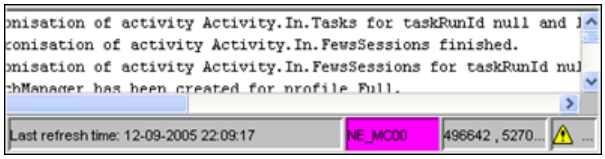
The system status indicates in what mode the system is currently operating: online, or stand-alone.

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

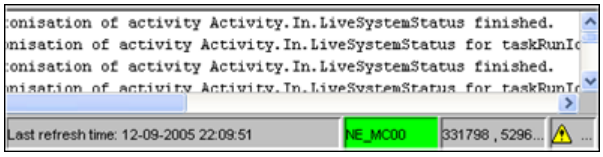
- In case the colour is red, the OC is logged off:



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



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



Mouse co-ordinates

Mouse co-ordinates displayed in the configured co-ordinate 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:

_Green __ ___

System is running normally but warnings have been encountered.

_Yellow __ ___

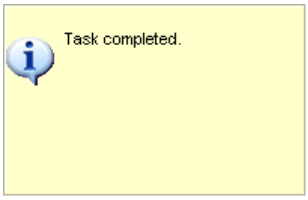
System encountered severe errors in the past 48 hours. This means that at least one system message has been generated with log level ERROR. After all messages with this log level have been acknowledged by the user via the System Monitor (see also *System Monitor*), the icon becomes green again.

_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 *System Monitor*), 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.



The F12 menu

This page last changed on 09-01-2008 by schelle@wldelft.nl.

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. Currently, these are the options available in 2007/01 (NFFS 7.3). They

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	Ids visible	Shows ids next to location name (filters)
5	Names visible (default)	Shows names in location filter
6	Descriptions visible	Shows description
7	Child locations visible	Shows child locations (if any)
8	Time series group missing validation icon visible	Debug feature
9	Verbose location tool tips	Extra info in tooltips
A	Tracking sql objects enabled	Debug feature
B	Clear track open sql statements	Debug feature
C	Print open sql statements	Debug feature
D	Load time series info	Debug feature
E	Compact localdatastore	Copy database to new one (MS Access)
F	Rolling Barrel local datastore	Execute Rolling Barrel
G	Start/resume recording	Start avi file (screen movie)
H	Pause recording	Pause recording (screen movie)
I	Stop recording	Stop recording (screen movie)
J	Copy current map scale to clipboard	Copies map scale to clipboard (paste in other application)
K	Copy current map extent to clipboard	Copies map extent (box) to clipboard (necessary for reports)
L	Copy current map to png file	Creates currentmap.png in /bin folder (necessary for reports)
M	Show database statistics last run	Displays info about timeseries read/written from last run

N	Clear time series memory caches	Clears memory
O	Restart	Hard restart of OC/SA

03 Dropmenu Menu

This page last changed on 10-11-2007 by schelle@wldelft.nl.

- Dropdown Menu
- File
- Log in
- Log out
- Reload Configuration
- Exit
- Tools
- Map Display
- Data Editor
- Data Display
- Spatial Display
- Longitudinal Display
- Manual Forecast
- Forecast Management
- Archiving
- System Monitor
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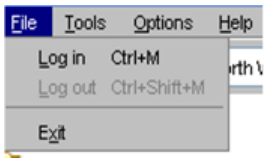
- Correlation
- Calibration
- Threshold display
- Other displays
- Options
- Map
- Status Bar
- Current System Time
- Help
- Contents

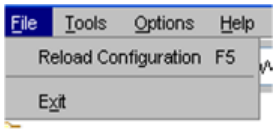
Dropdown Menu

File

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



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



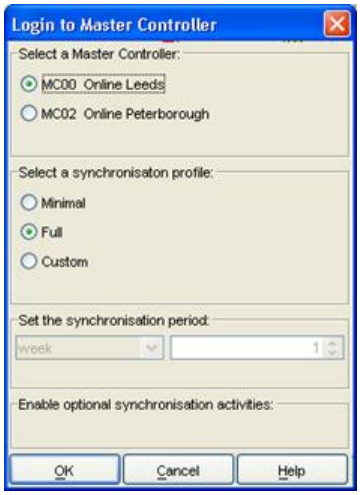
Log in

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 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.

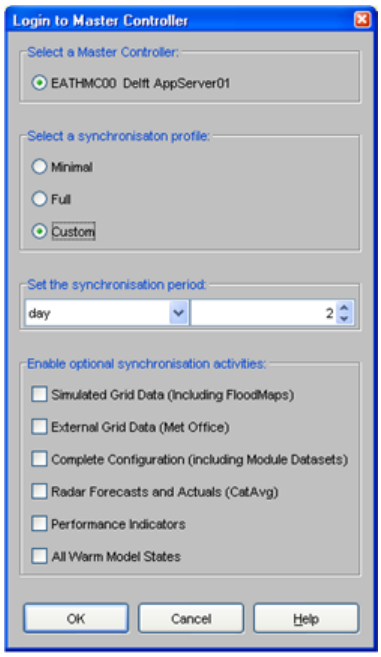


- *Full*
  This profile synchronises a larger amount of data required for a forecaster to perform the required tasks and have sufficient background data available. As a default, data is synchronised over the past 7 days.

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

In addition, a user can select to download:

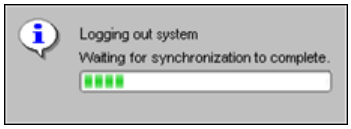
- Simulated Grid Data (e.g. flood maps)
- External Grid data (e.g. radar grids, surge forecast grids)
- Complete configurations (all versions of the configuration files in the database including the module datasets)
- Radar forecasts and actuals (catchment average time series)
- Performance indicators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



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:



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

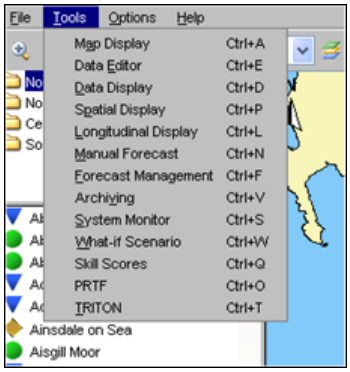
In the Standalone system you can reload your configuration from the file system without having to close your client. This may be practical when you have changed some configuration files and want to check the result of the changes.

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.*

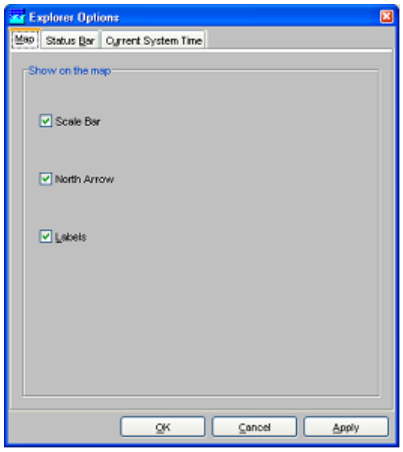
Options

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

Map

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

- scale bar
- north arrow
- labels



Status Bar

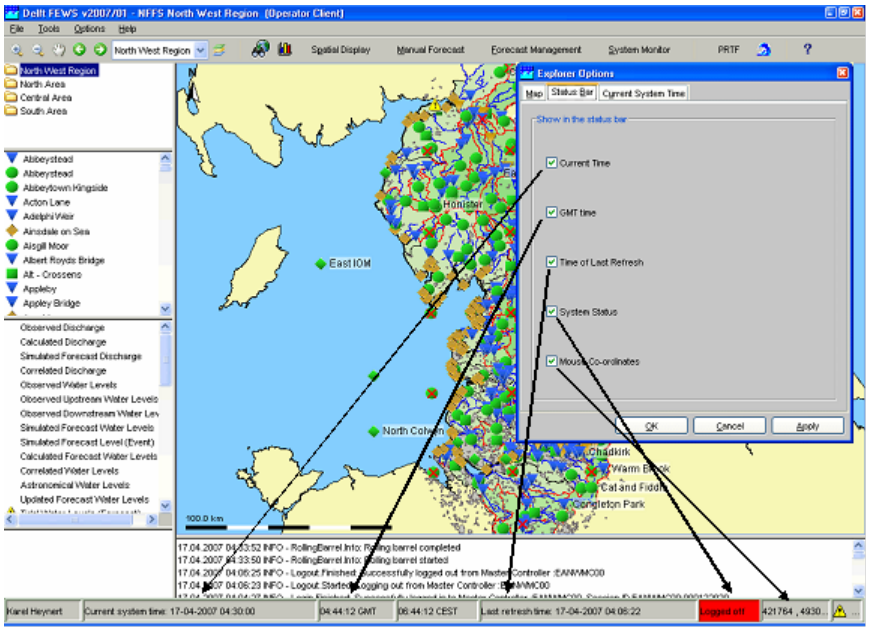
The *Status Bar Tab* allows the user to activate the display on the Status Bar of:

- 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.

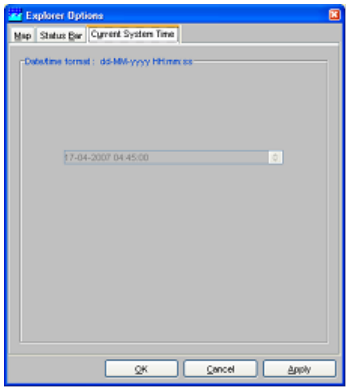
The *system status* indicates in what mode the system is currently operating: online, offline and stand-alone.

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.



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:

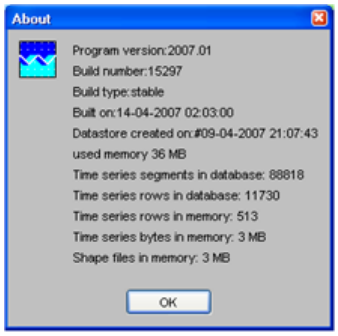
- About
- Contents

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
OK

04 Data Display and Data Editor

- Data Display and Data Editor
- Table
- Shortcuts
- Graph
- Descriptive statistics
- 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
- 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
- Historic Events
- Longitudinal profile

- The F12 menu (Timeseries Display)

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*).

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

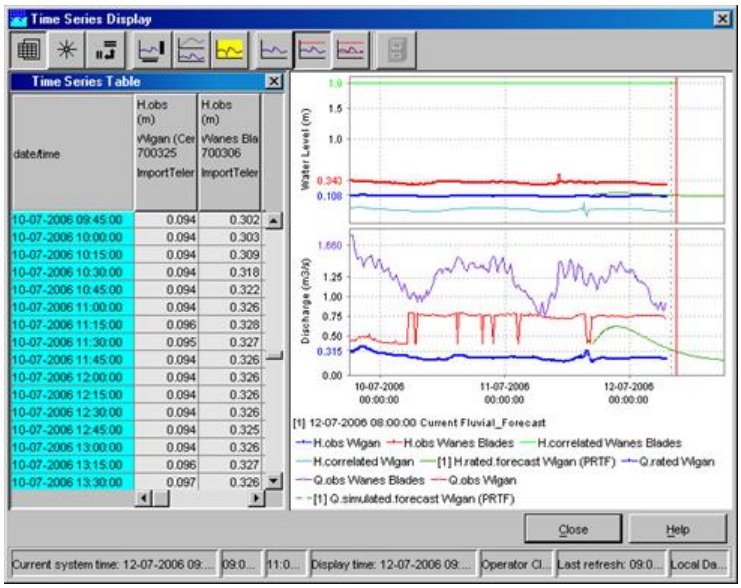
When data series of different data types have been selected, the data will be presented in different subplots with the data series of a single data type merged into one subplot.

The data in the graph is *updated automatically* in case new data becomes available.

Following buttons are used in the Time Series Display:

Table

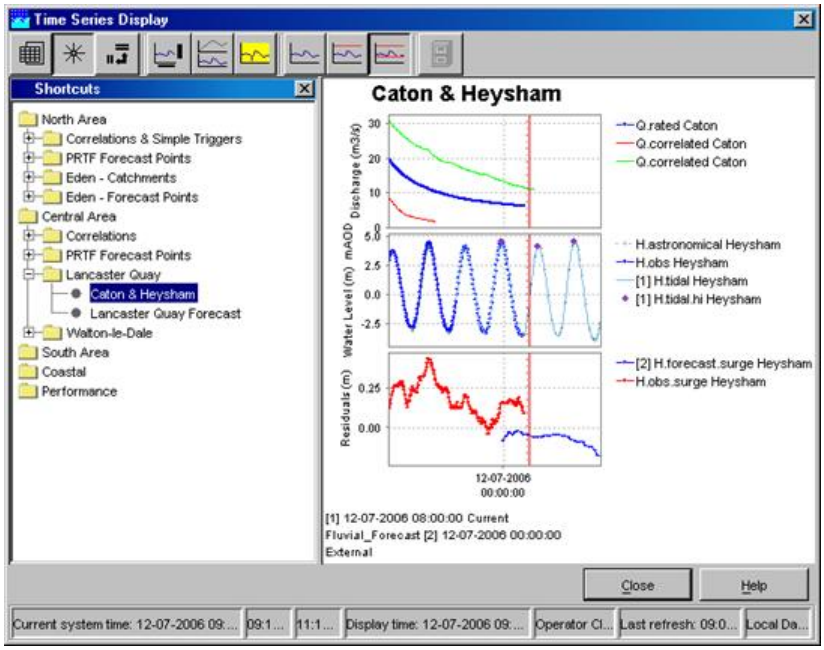
By clicking this button the time series in the graph is also displayed in tabular format. Please note that in case you like to edit data, you have to select the Data Editor from the Tools menu (see section 4.3).



Shortcuts

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 the graph. If the table was not yet selected, it will show up.

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)

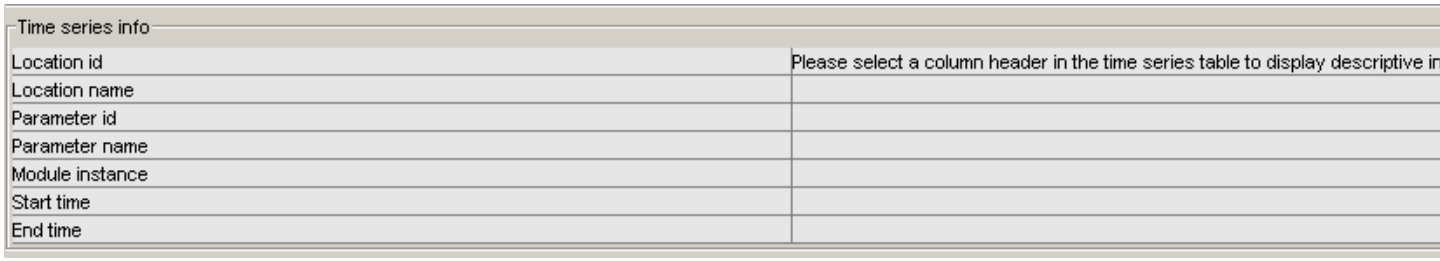
Time series information:

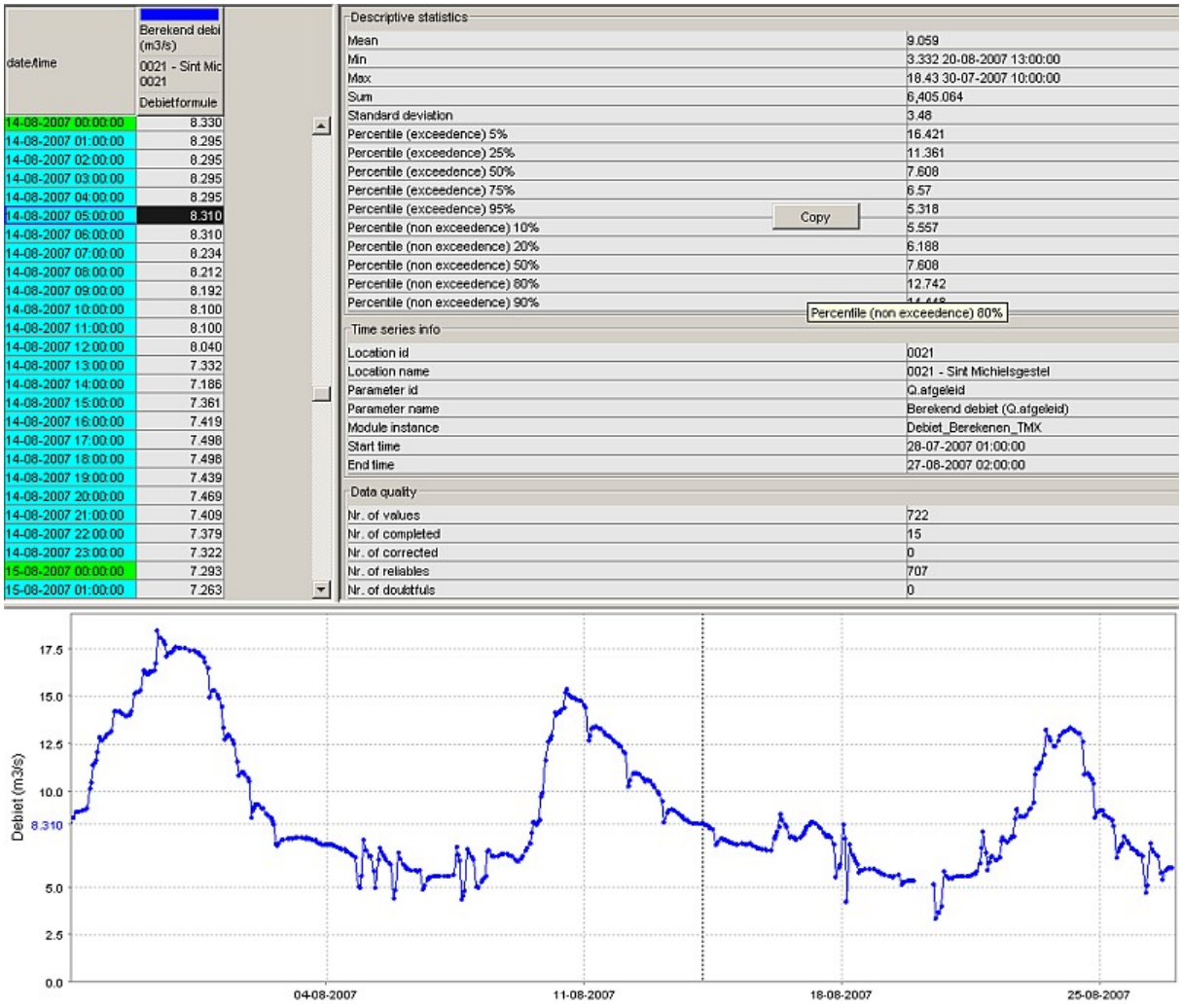
- Location id
- Location name
- Parameter id
- Parameter name
- Module instance
- Start time

- 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



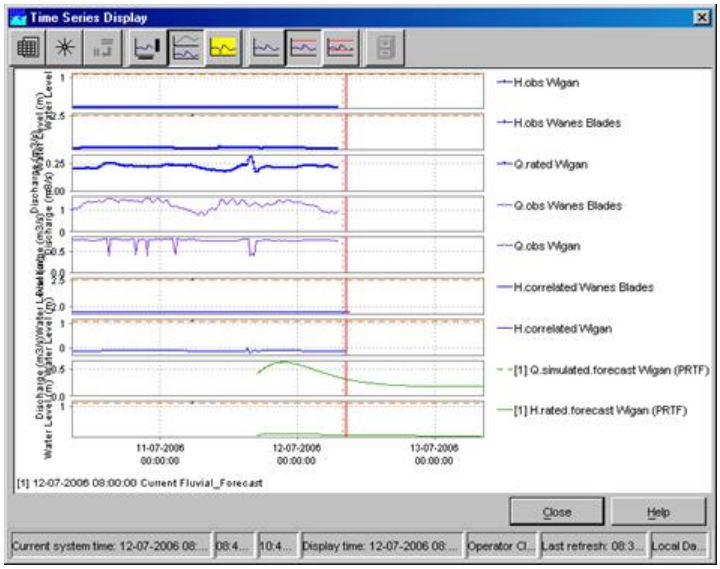


Rotate Splitter

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.



Toggle 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

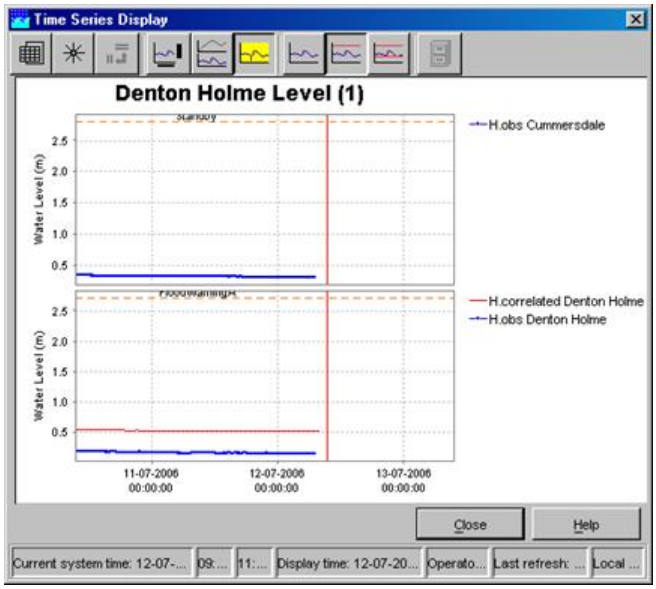
This button can be used to focus on time intervals with unreliable data within the selected time series. Data is marked as unreliable, if values exceed hard limits.

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.

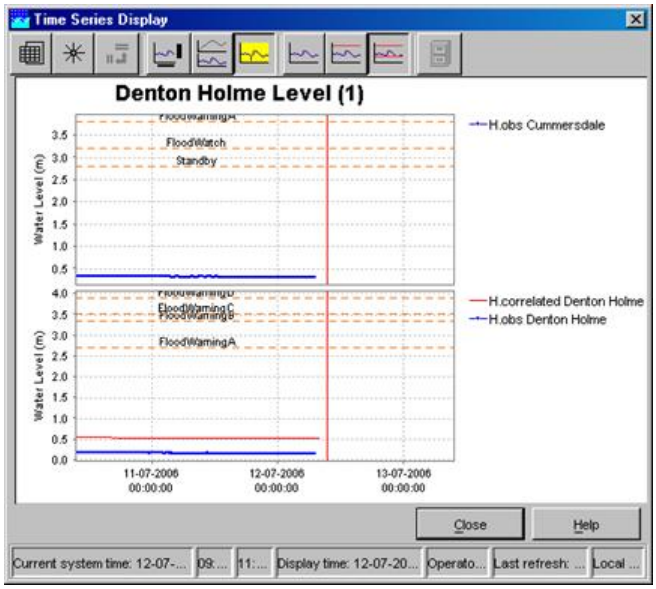
Scale to show relevant Thresholds

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:

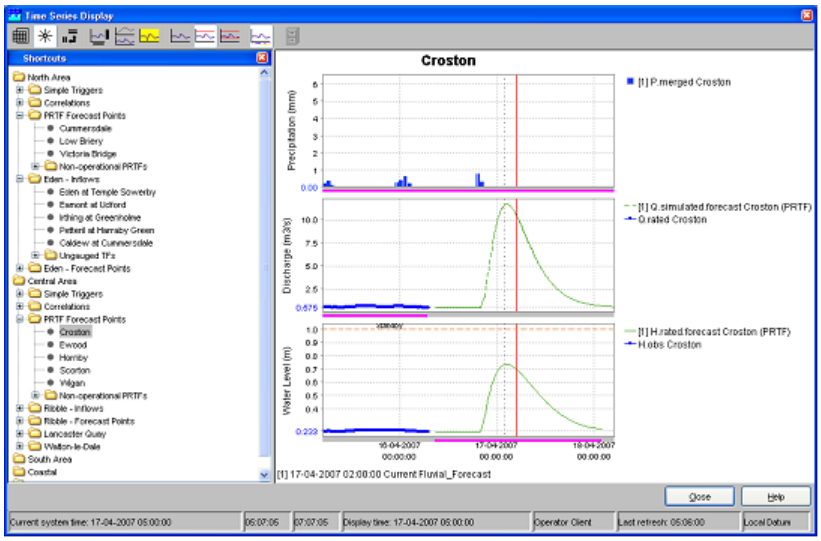
- the upper line indicates the origin of the data
- original data: no line is displayed
- corrected data (original data flagged as unreliable and automatically interpolated): blue line
- completed data (original data is missing and interpolated by system): magenta line

- the middle line indicates the quality of the data

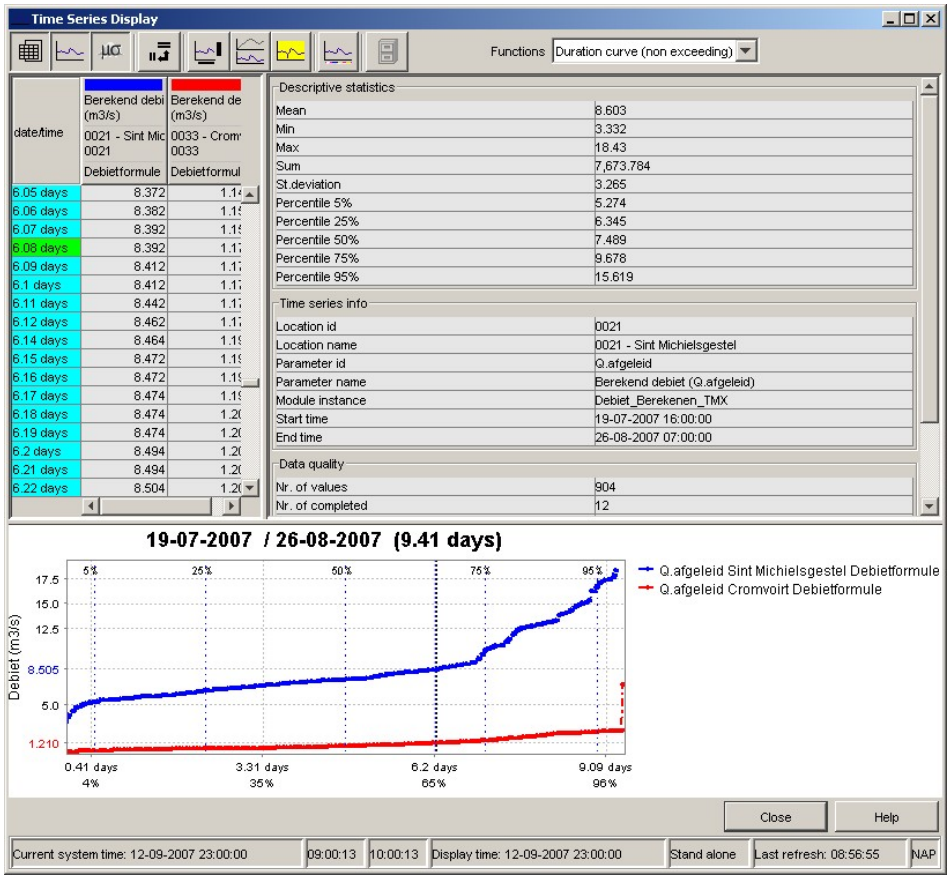
- reliable data: no line is displayed
- doubtful data: light yellow
- unreliable data: dark yellow

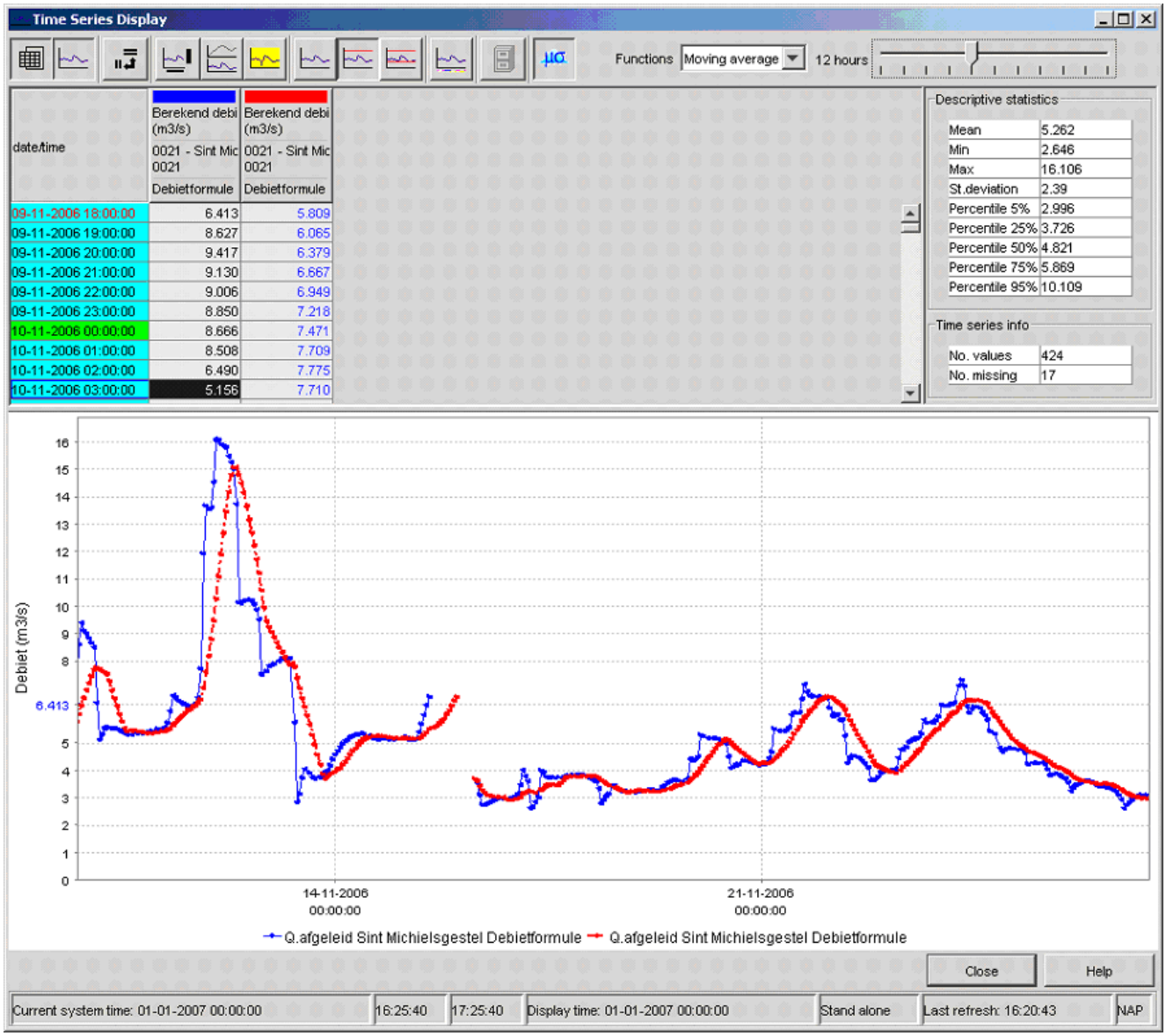
- the lower line indicates where comments have been added to the data
- no comment: no line is displayed
- comment available: dark red

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



Statistical graphing functions
If switched on in the configuration, statistical graphing functions are available to display aggregations, moving averages or duration curves. This functionality works independently from the descriptive statistics table.


Time Series Display
Functions
Duration curve (non exceeding)
date/time
Berekend debi (m3/s)
0021 - Sint Mic
0021
Debietformule
Berekend de (m3/s)
0033 - Crom
0033
Debietformul
6.05 days 8.372
6.06 days 8.382
6.07 days 8.392
6.08 days 8.392
6.09 days 8.412
6.1 days 8.412
6.11 days 8.442
6.12 days 8.462
6.14 days 8.464
6.15 days 8.472
6.16 days 8.472
6.17 days 8.474
6.18 days 8.474
6.19 days 8.474
6.2 days 8.494
6.21 days 8.494
6.22 days 8.504
Descriptive statistics
Mean 8.603
Min 3.332
Max 18.43
Sum 7,673.784
St.deviation 3.265
Percentile 5% 5.274
Percentile 25% 6.345
Percentile 50% 7.489
Percentile 75% 9.678
Percentile 95% 15.619
Time series info
Location id 0021
Location name 0021 - Sint Michielsgestel
Parameter id Q.afgeleid
Parameter name Berekend debiet (Q.afgeleid)
Module instance Debiet_Berekenen_TMX
Start time 19-07-2007 16:00:00
End time 26-08-2007 07:00:00
Data quality
Nr. of values 904
Nr. of completed 12
19-07-2007 / 26-08-2007 (9.41 days)
5%
25%
50%
75%
95%
17.5
15.0
12.5
8.505
5.0
1.210
Debiet (m3/s)
0.41 days
4%
3.31 days
35%
6.2 days
65%
9.09 days
96%
Q.afgeleid Sint Michielsgestel Debietformule
Q.afgeleid Cromvoirt Debietformule
Close
Help
Current system time: 12-09-2007 23:00:00
09:00:13
10:00:13
Display time: 12-09-2007 23:00:00
Stand alone
Last refresh: 08:56:55
NAP

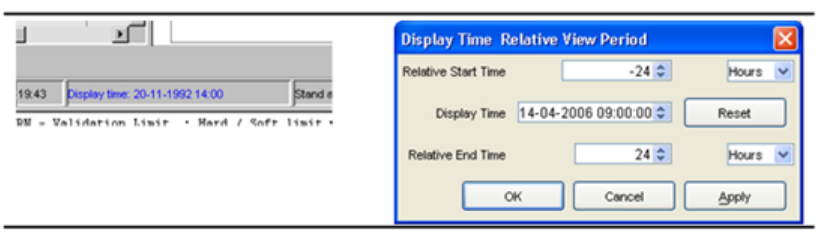


Historical Events

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.

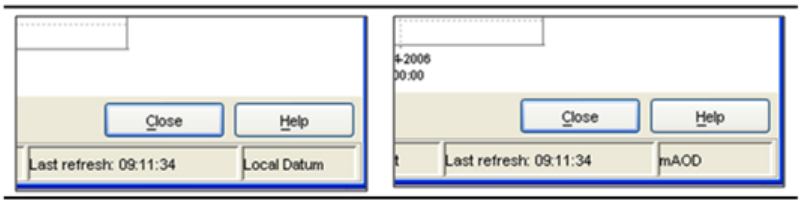
Display time

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.



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* .

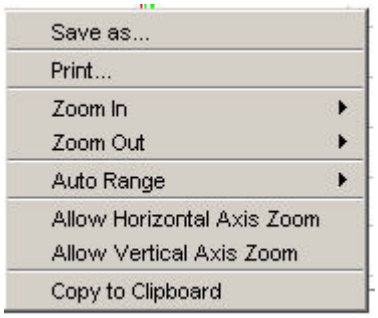


Navigating in Graphs

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

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

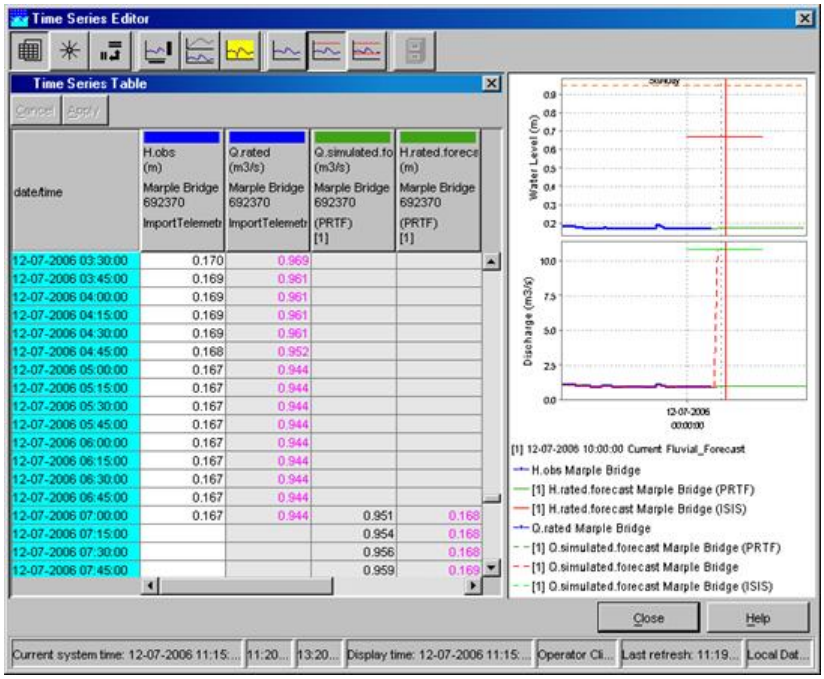
You can select to allow for zooming in and out along one of the axis with this option.

Auto Range

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

Data Editor

Select the Data Editor option of the FEWS Tools menu to present tables displaying the data. The splitter can be positioned in such a way, that the complete table is visible.



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:

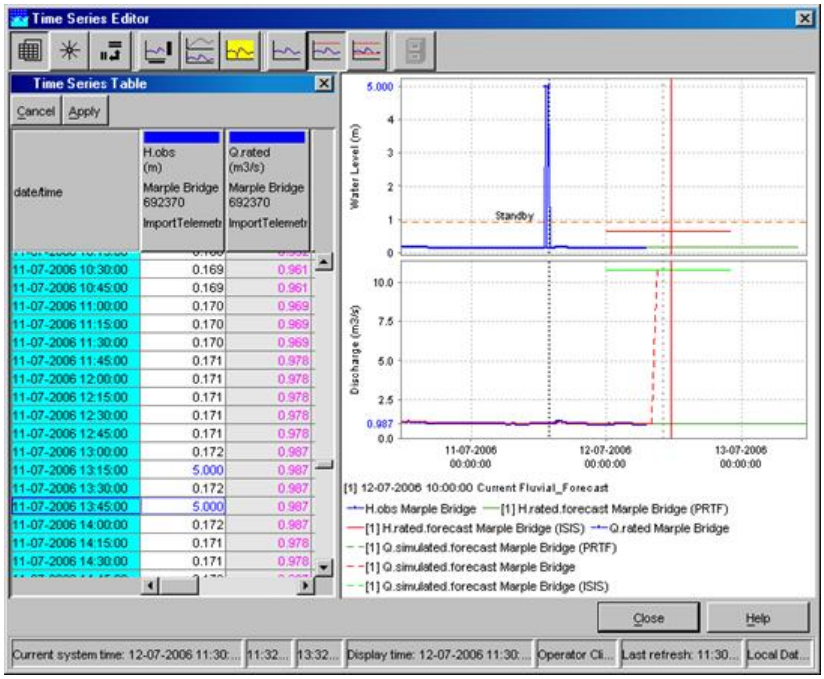
- Light blue: historical data, either observed or hindcast (data before T~0~)
- Dark blue: forecast data (data after T~0~)

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)

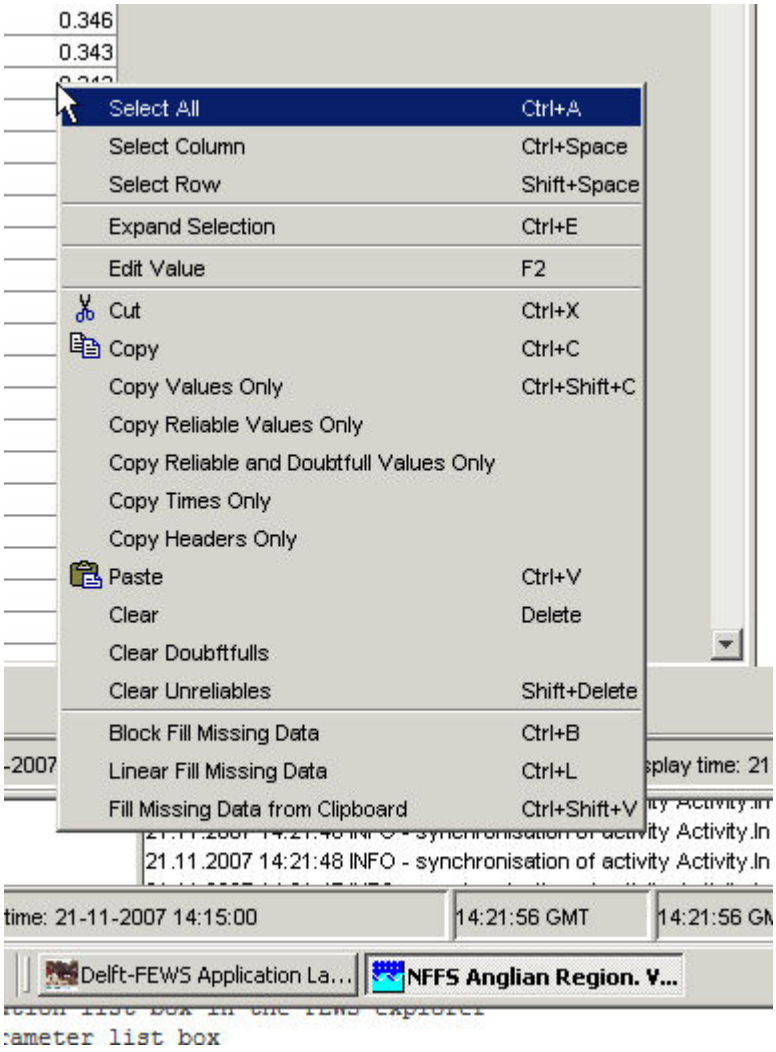


Data (only those with a white background) can be edited by double clicking a field in the column. Editing may be done in the table directly. The result of an edit action is directly displayed in the corresponding graph. Manually corrected data will be saved to the database by clicking [**Apply**]. With [**Cancel**] before saving, changes can be undone. With [**Enter**] the changes are validated.

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

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:

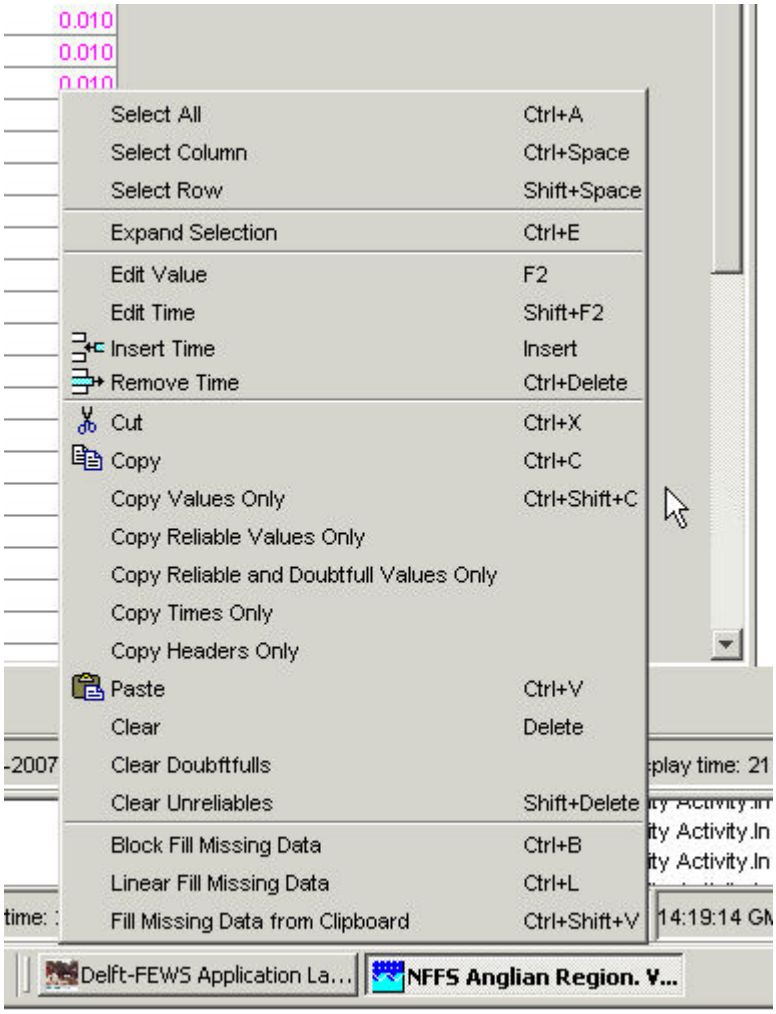


The options have the following meaning...

[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
[Expand Selection]	Select all data in the row in which the cursor is placed
[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

If the selected timeseries is non-equidistant two extra options will be shown:



The extra options are:

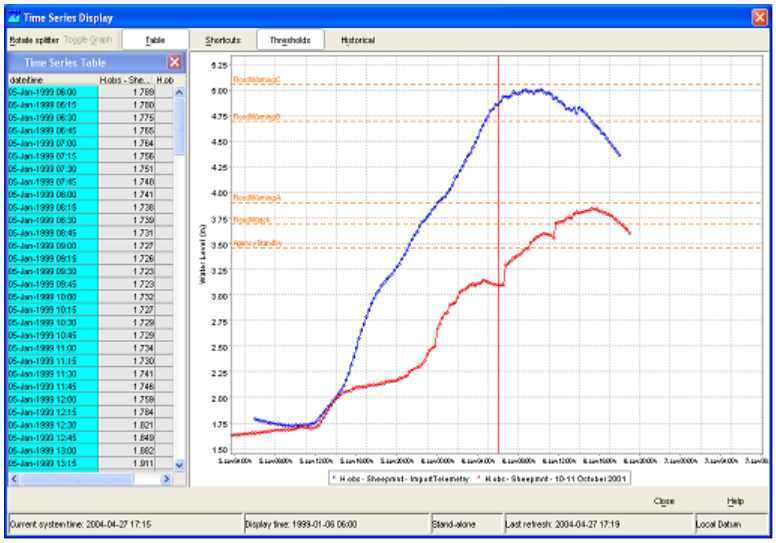
[Insert Time]	Insert a date/time for which a value can be entered
[Remove Time]	Remove a date/time. NOTE You can *only* remove a date/time if you have just inserted one using the **Insert Time** option and if you have not yet applied the change. Once stored in the database the time *cannot* be removed.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

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



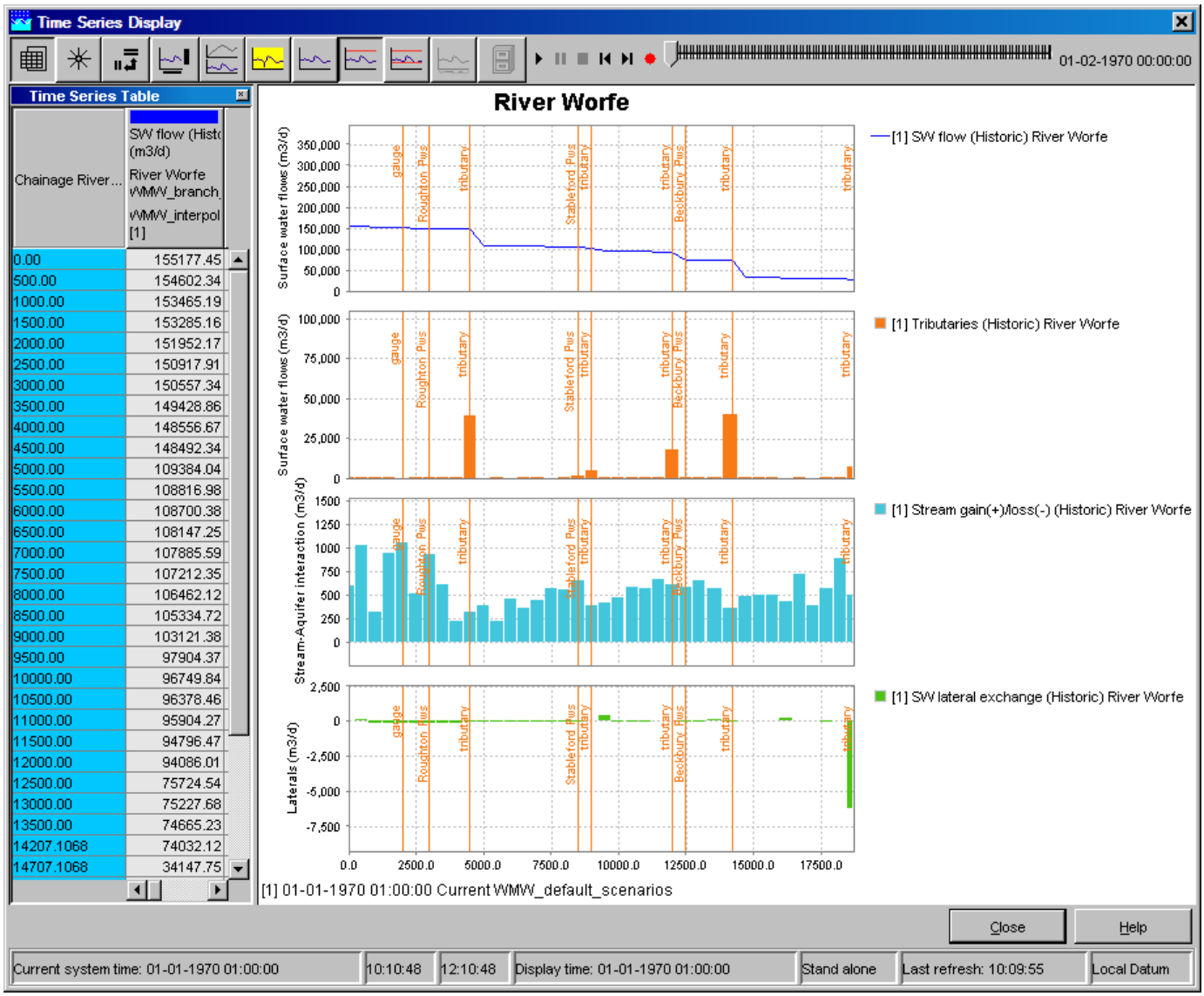
A new (red) line will be added to the chart. This event line can now be shifted forwards and backwards in time using the "+" and "-" keys on your keyboard. To activate this shift procedure press the [**Historic Events**] button in the Chart Display and select Shift Time.

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.



The F12 menu (Timeseries Display)

This page last changed on 09-01-2008 by schelle@wldelft.nl.

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. Currently, these are the options available in 2007/01 (NFFS 7.3). They options fro the timeseries display are listed below:

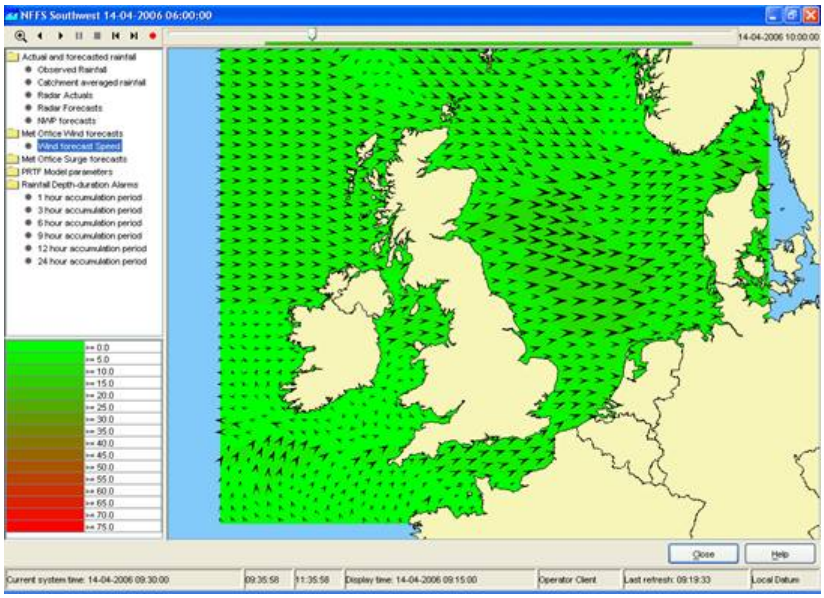
	F12 - Choice	**What does it do?**
1	Current and selected runs (default)	Shows current and selected runs
2	Current runs	Shows current runs only
3	Selected runs	Shows selected runs
4	Watched by selected runs	Shows time series watched
5	Added by selected runs	Shows time series added
6	Auto load time series chart	Automatic load of timeseries in chart (default)
7	Five most recent forecasts	Shows five most recent forecasts

05 Spatial Display

This page last changed on 06-10-2008 by kockx.

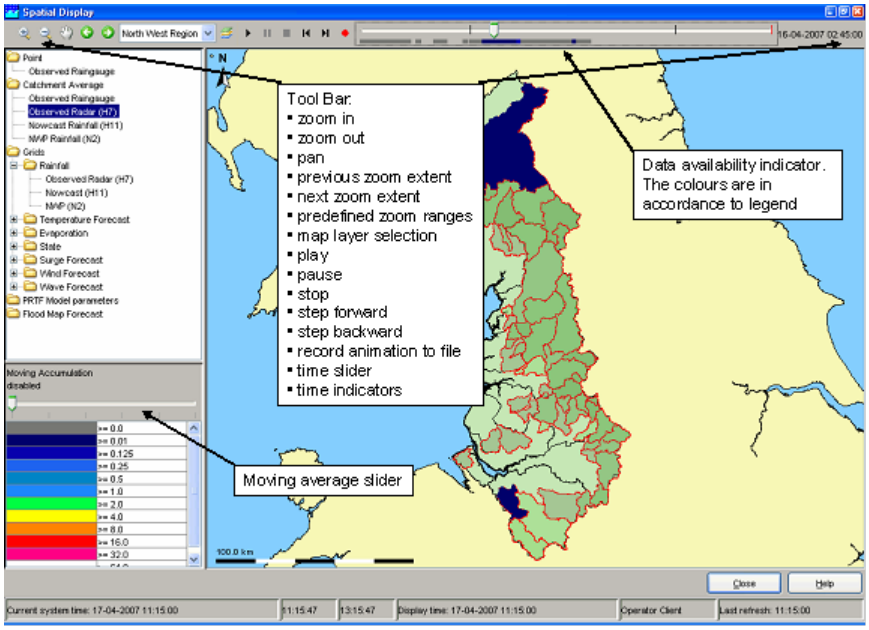
Spatial Display

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:

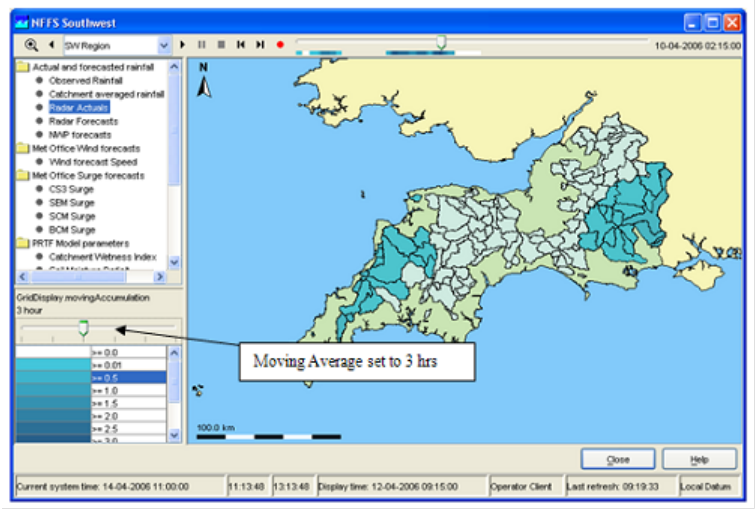
Button	Description
▶	**Play**. Starts continuous play mode. The slider will indicate the time slice being shown.
⏸	**Pause**. Stops continuous play mode. The time slider remains at the time displayed at the moment.
■	**Stop**. Stops continuous play mode. The time reverts back to the start time.
⏮	**Step backwards**. Moves the time slider back one timestep.
⏭	**Step forwards**. Moves the time slider forwards one timestep.
●	**Record**. Creates an AVI movie file. 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 cue 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.

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.

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.

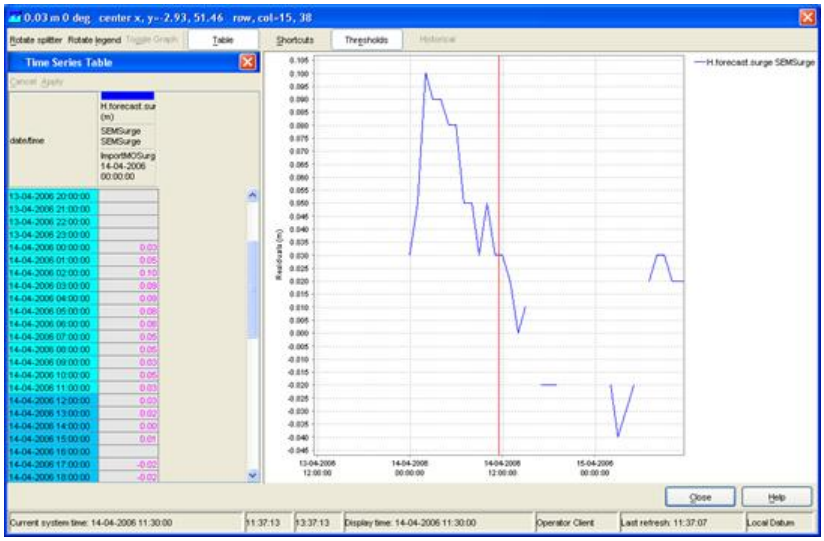
A series, that is extracted from a grid, is not related to a known location or polygon ID. The series will then be identified using the grid coordinates.

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.

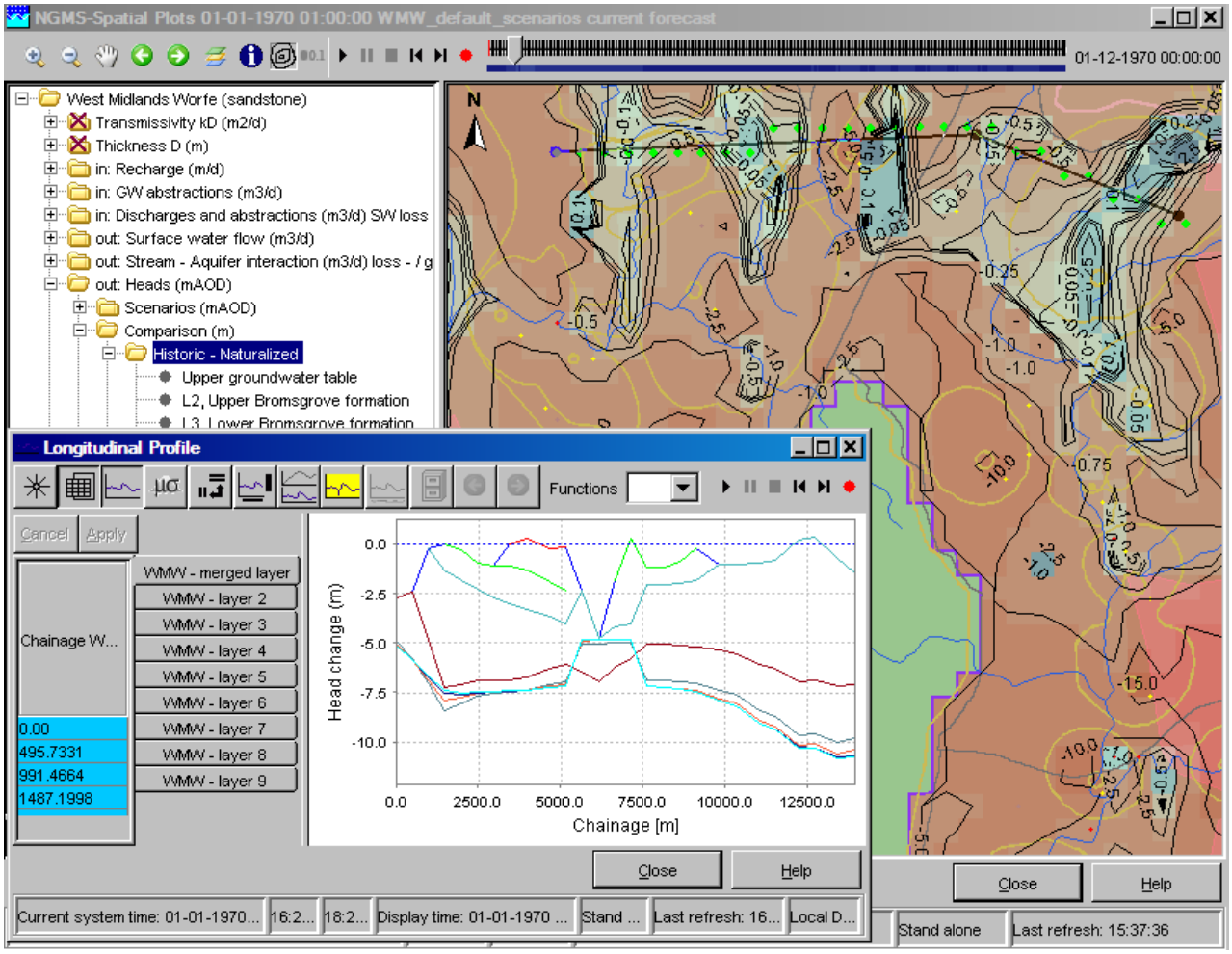
When animating the grid, the profile follows the same animation. When animating the profile only, the grid animation remains fixed. Note that the same cross section can be reused when switching to another plot (F2 will open a new window).

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.

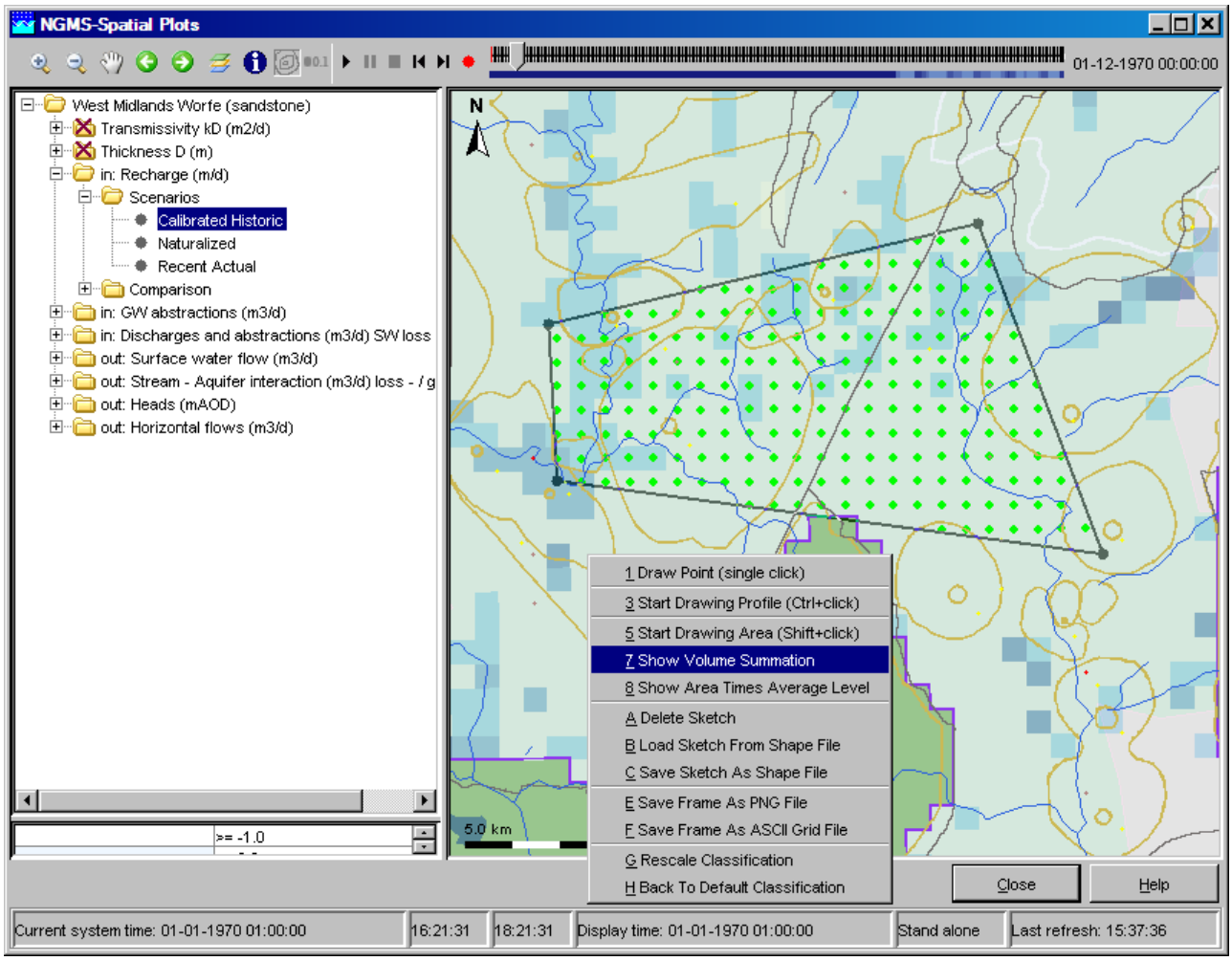
Grids that contain horizontal flow data in the form of u,v vectors:

- 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

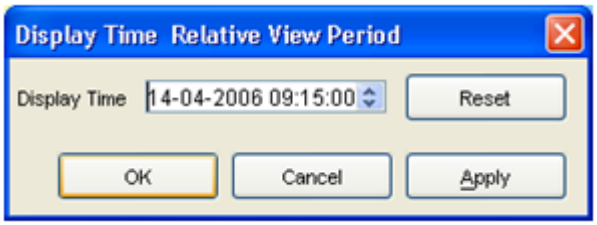
selecting 'Load Sketch From Shape File'. The loaded sketch can then be used for extracting data. When loading a sketch, the previous sketch will be erased.

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.



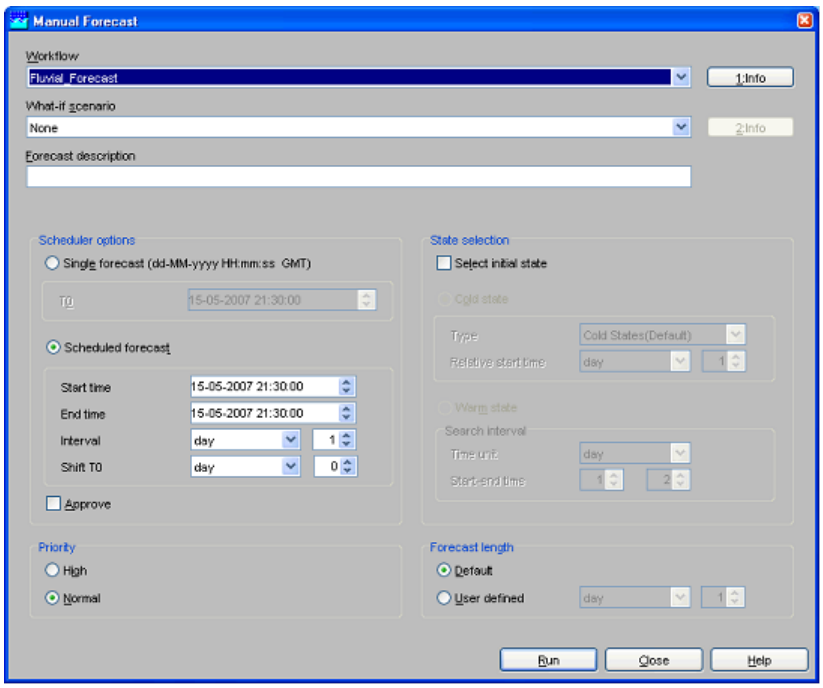
06 Manual Forecast Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

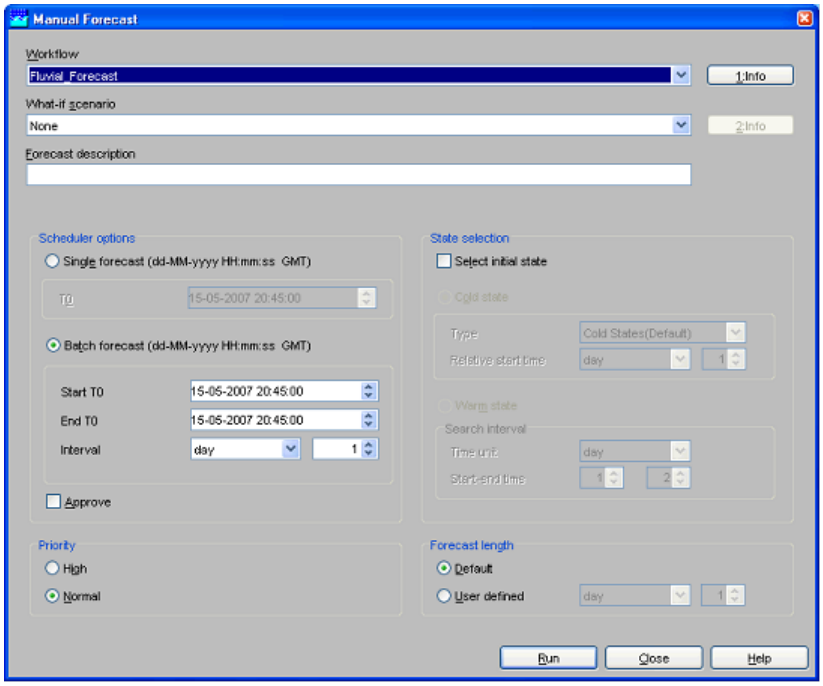
- Manual Forecast Display
-
  - Workflow
  - Notification after completion workflow
  - What-if Scenario
  - Forecast description
  - Batch Forecast options (only in standalone)
  - Automatically approving forecasts
  - State Selection
  - Priority
  - Forecast length

Manual Forecast Display

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



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.



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 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 *T~0~* 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 T~0~* allows the user to define a period of time over which the T~0~ 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 T~0~* 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 *T~0~* 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.

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 T~0~ 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 T~0~ , 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

This page last changed on 03-09-2008 by gijsber.

- 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)

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	Icon	Remarks
A	User selects cold state	-	cold state used		as expected: cold state selected and cold state used
B	User selects warm state	-	cold state used		not as expected: warm state could not be found in selected search period
C	User selects warm state	-	warm state used		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').

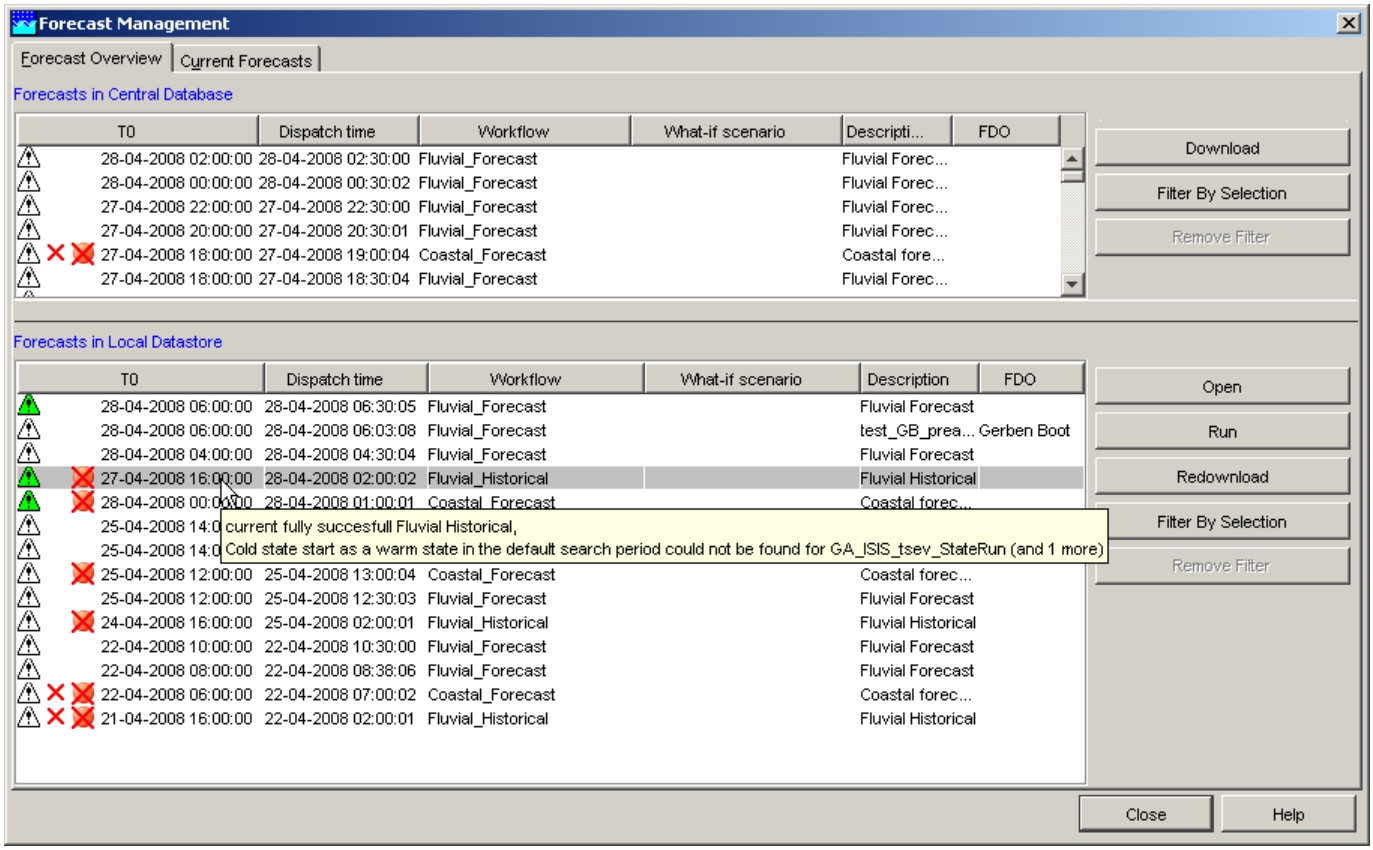
It is also possible to use a displayed icon as a filter. First click on a table cell that contains an icon. Then click the 'Filter By Selection' button to filter the list of visible forecasts on the selected icon. After filtering only forecasts that have the same icon in the corresponding column will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



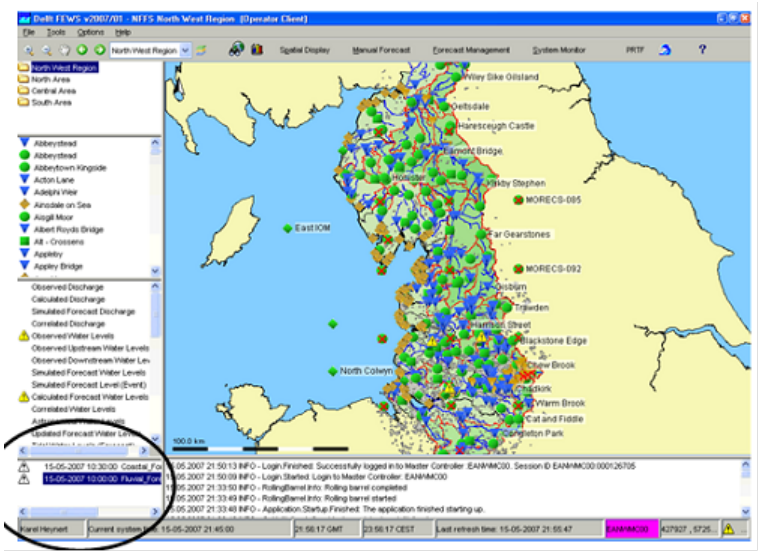
When moving the mouse over the forecast list a tool tip indicates whether the forecast has been fully successful or not.

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.

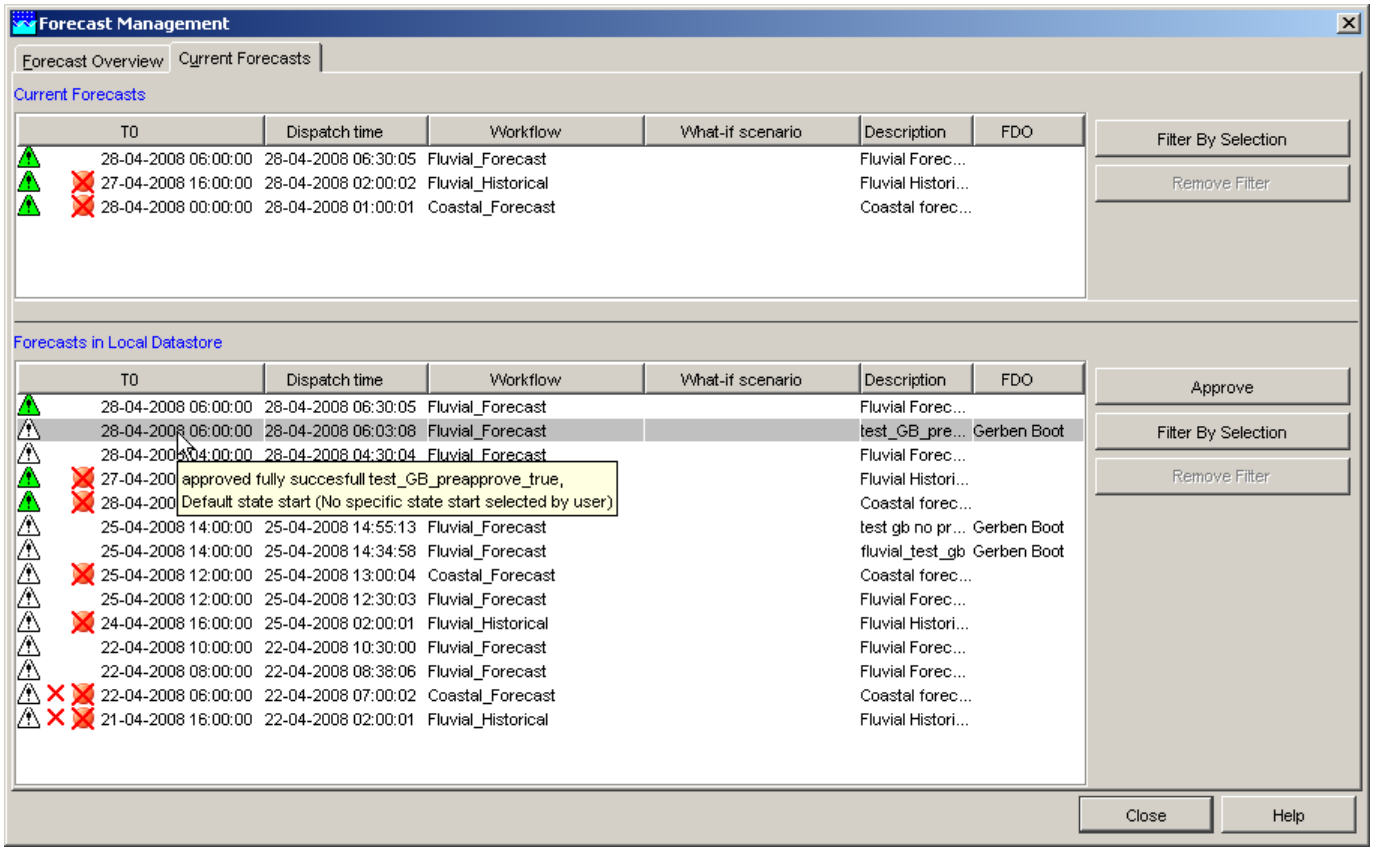
- *Approved Forecast*
  Approved Forecasts have been approved by the system or manually by an FDO to become the Current Forecast. The latest Approved Forecast is the Current Forecast.

- *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.



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)

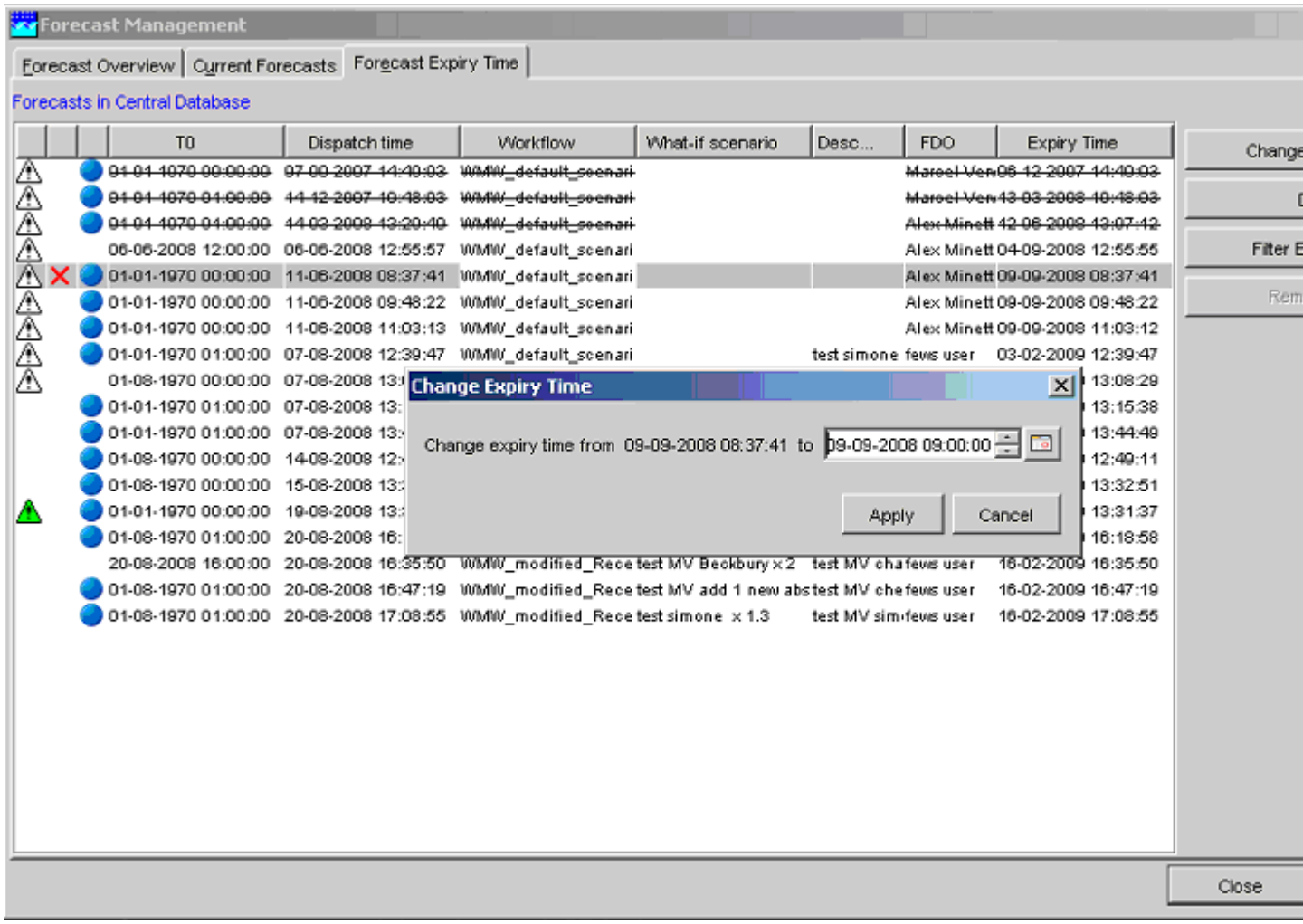
When logged in, forecasts that are available in the Central Database are listed in the table. Please note that only forecasts for which the user has delete permission are visible in the table. Forecasts can be

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.



08 System Monitor

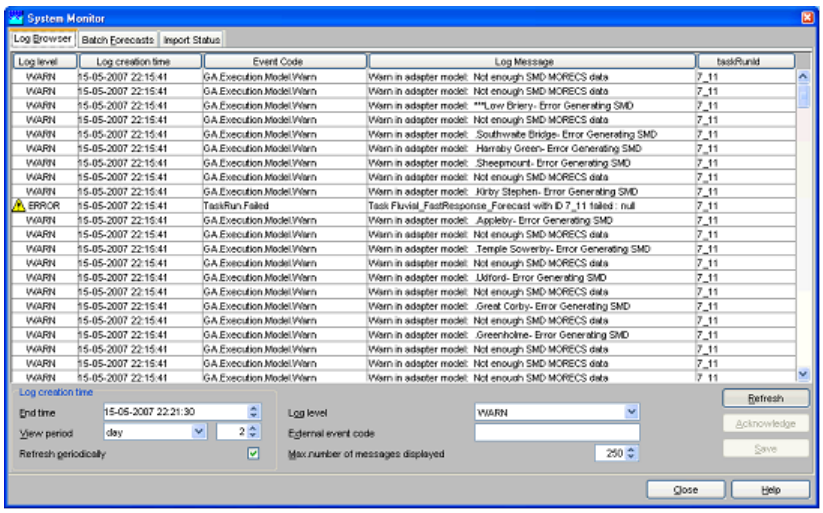
This page last changed on 10-11-2007 by schelle@wldelft.nl.

- 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

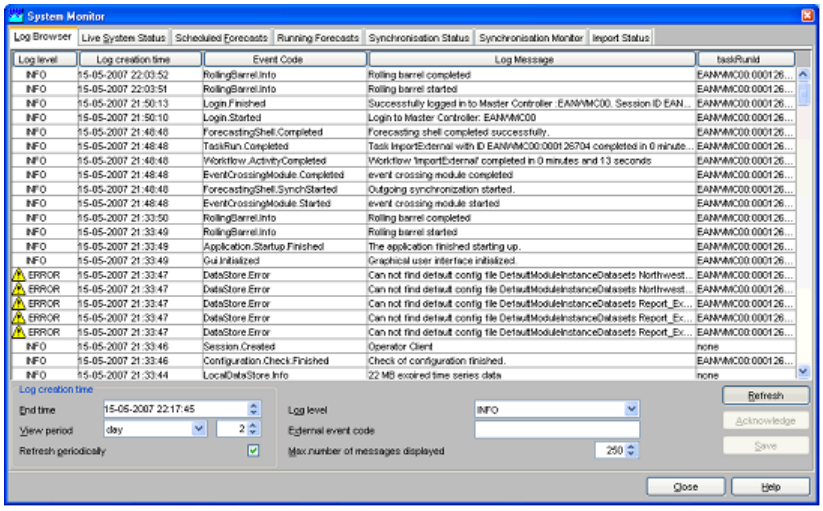
System Monitor

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.

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.



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.

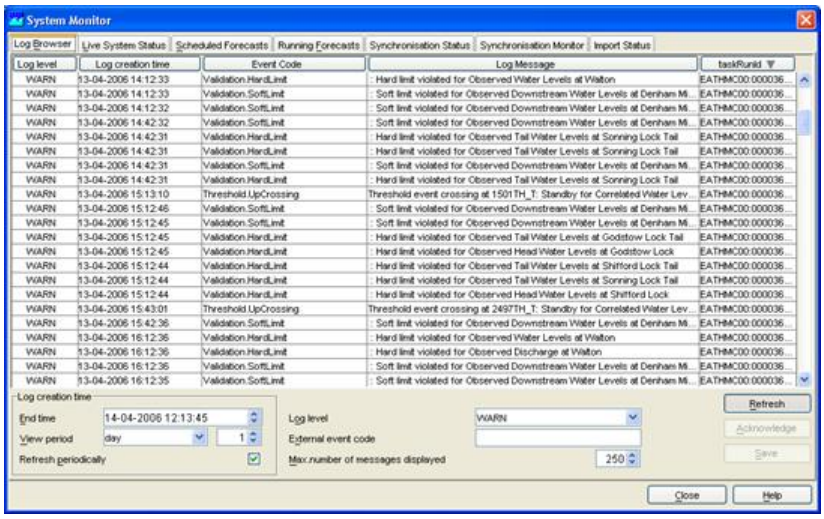


Each of the System Monitor tabs is detailed in the following paragraphs.

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.



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

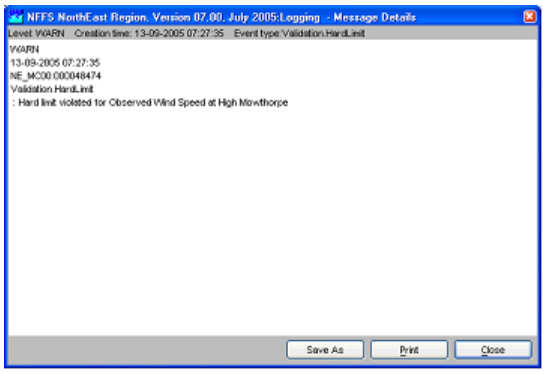
The following type of system messages are identified in the table below.

Log level	Icon	Description

Fatal		Severe errors that cause premature termination
Error		Other runtime errors or unexpected conditions
Warn	no	Events that are undesirable or unexpected, but not necessarily wrong
Info	no	Runtime events (startup/ shutdown) that allow tracking of the progress of the system

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.



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.

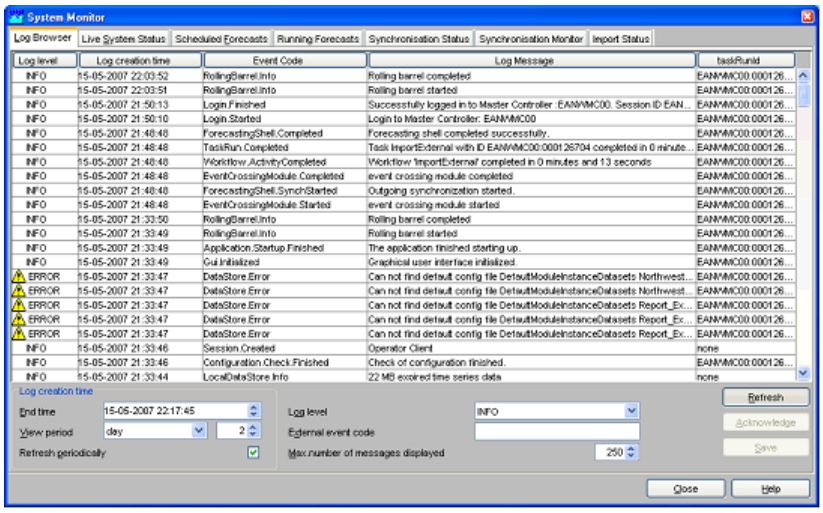
- *Log creation time*
  Messages can be displayed that have been created within a given period of time. The period is defined by entering an *end time* and the length of a *view period* in hours preceding the *end time* .

- *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

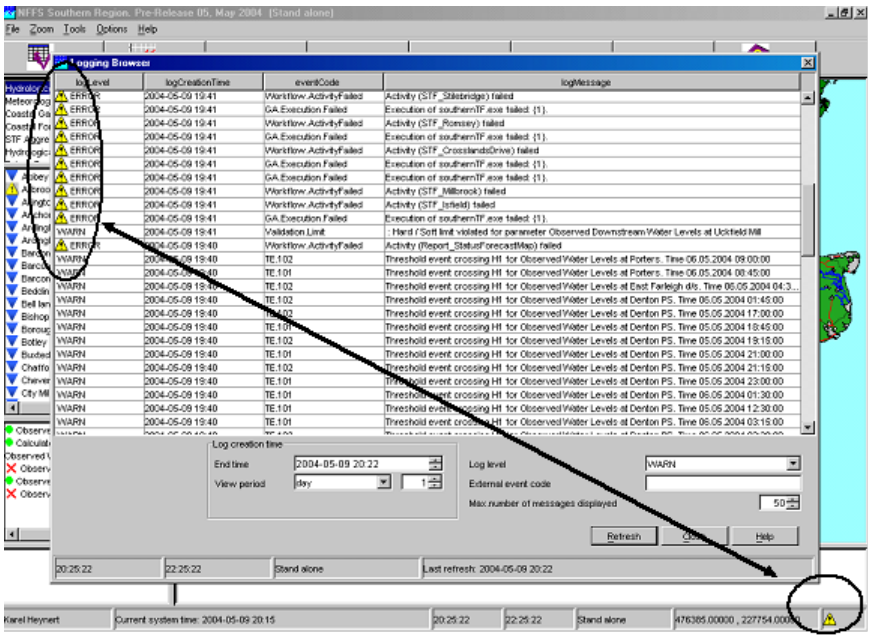
All messages having a level ERROR or FATAL should be can be acknowledged to identify that the message has been seen and appropriate action taken.



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.



Debug messages

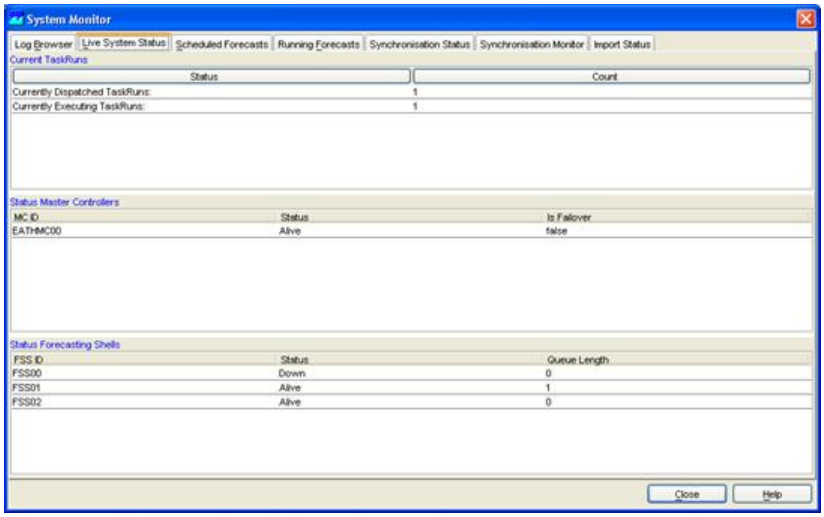
Please note that a System Manager can configure the system to also provide *Debug Messages* . These are used to log application internal events for system development and management. Typical debug events are the creation of a database connection or exceptions that occurred due to programming or configuration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

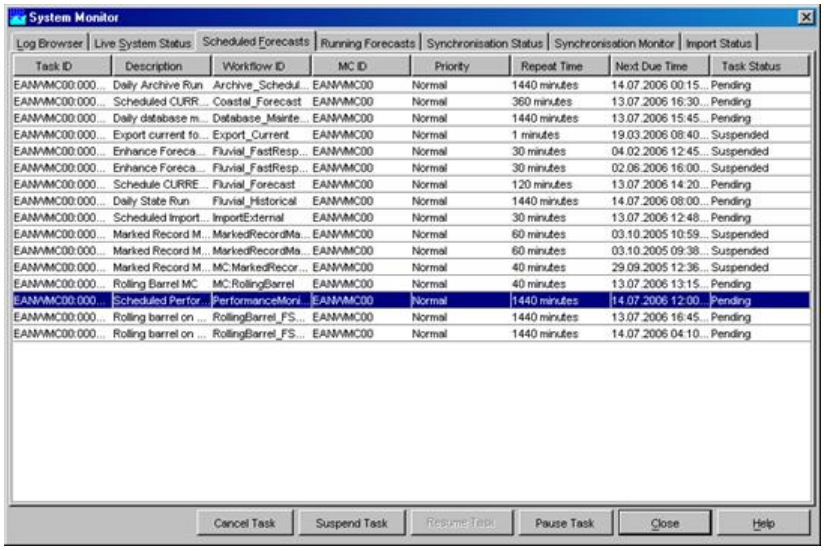
The status lists show the currently configured master controllers and forecasting shells. From this list a user can see if the systems are Alive or if they are down.



Scheduled Forecasts

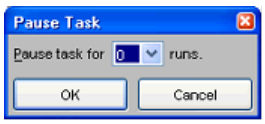
The Scheduled Forecasts tab includes a list with all scheduled forecasts together with some information of these forecasts. The following information is included:

- 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.



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'.

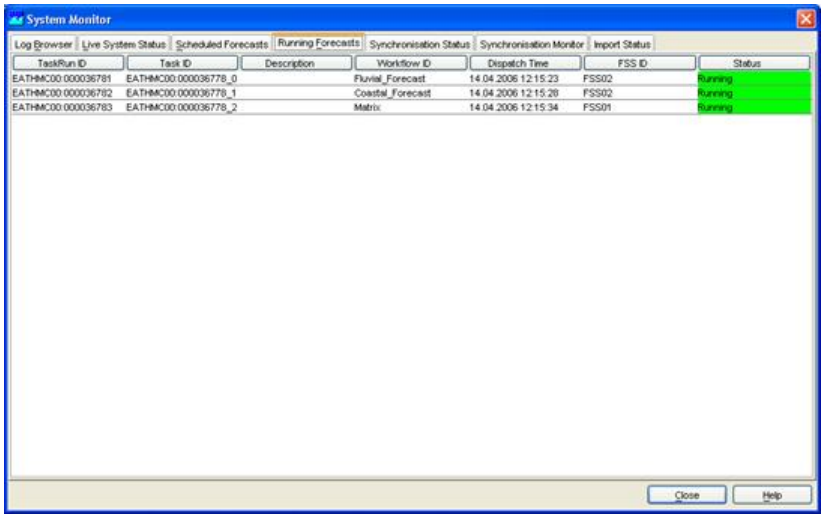


Please note that not all options are available for all workflows. A user can for example normally not cancel the current forecast and import runs runs scheduled by the super user. Also the status of system management workflows can normally not be changed by a user.

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.

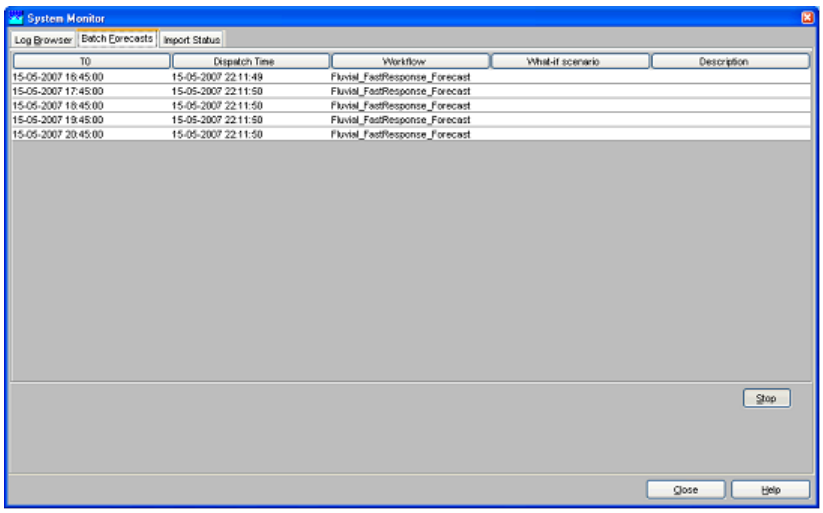


This display is refreshed after each synchronisation of the Operator Client with the Master Controller.

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

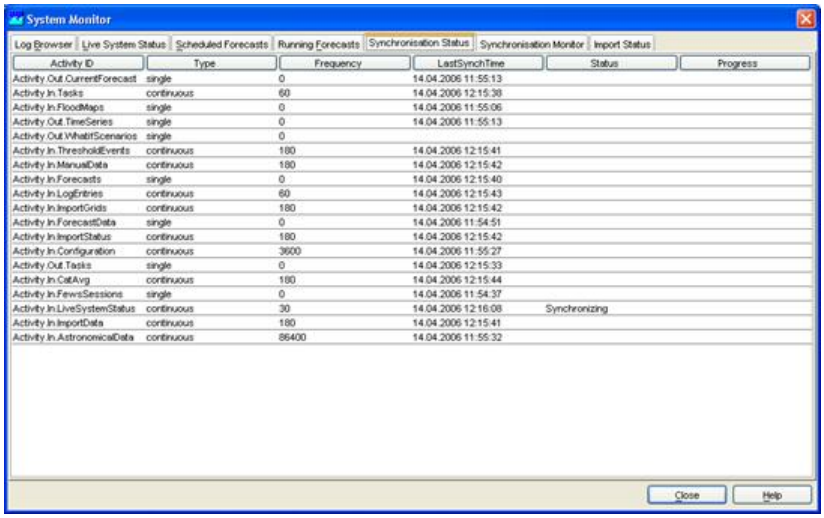
The Batch Forecast tab will list the forecasts that have been submitted in the Manual Forecast display of a standalone system. You stop all submitted forecast runs by clicking [Stop].



Synchronisation Status

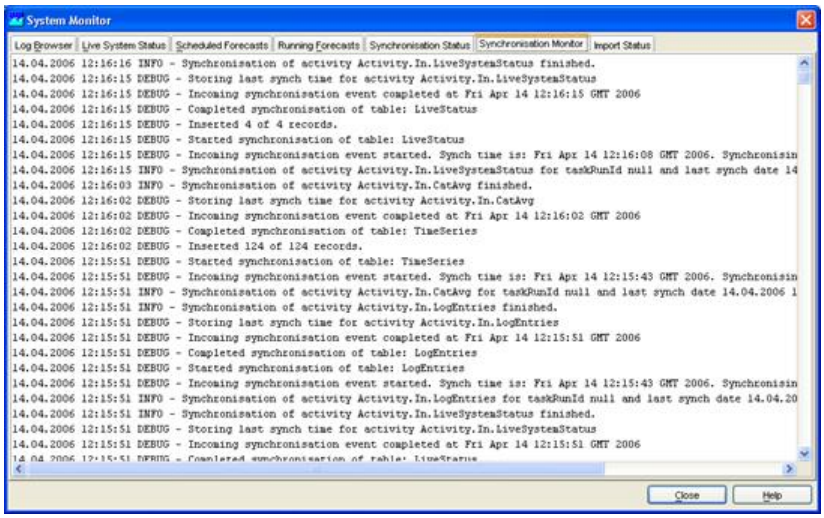
The Synchronisation Status tab provides the status of all synchronisation activities. For each synchronisation activity the following information is provided:

- 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.



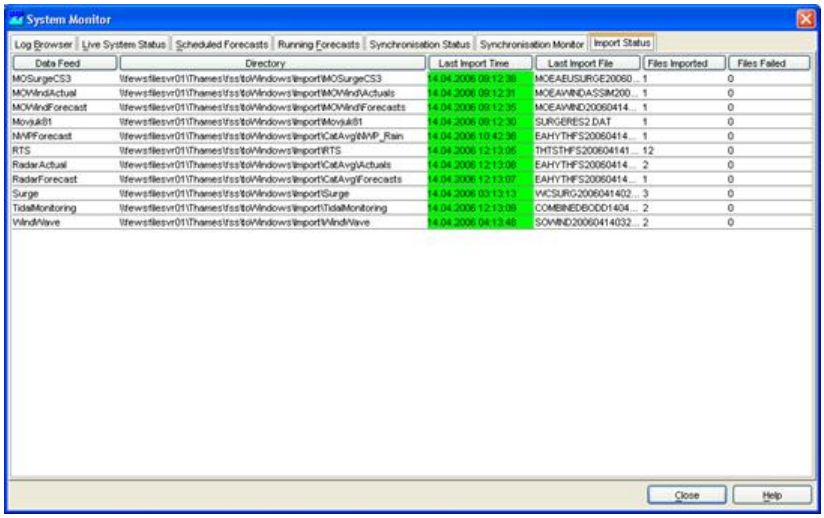
Synchronisation Monitor

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.



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.



09 What-if Scenario Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

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

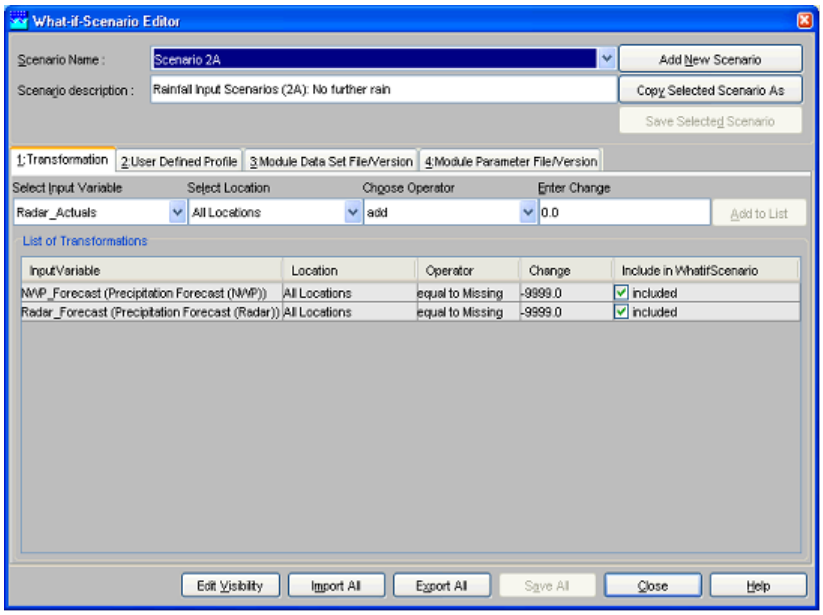
What-if Scenario Display

The What-if Scenario display allows for the definition of What-if Scenarios. The What-if Scenarios can be used, when running forecast 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



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.

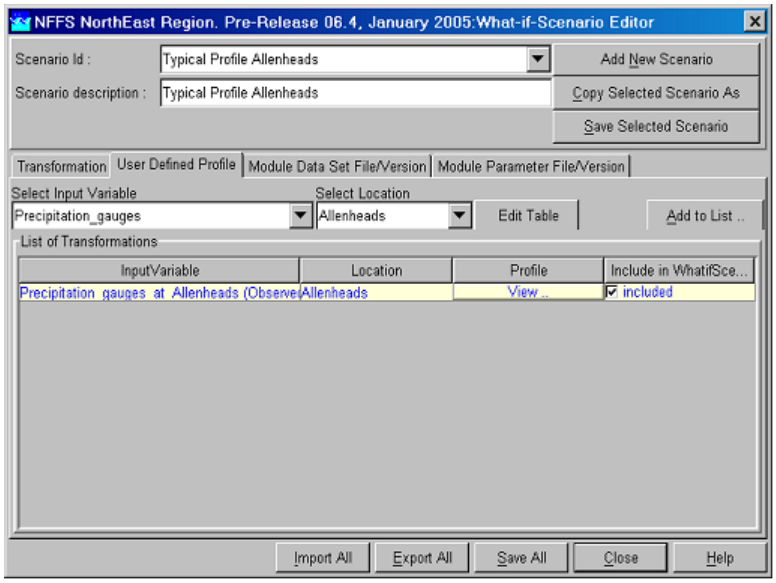
With [Save All], What-if Scenarios are stored in the database. In the Live System, What-if Scenarios are stored in the Central Database and may be used by others. After saving therefore, What-if Scenario can not be edited or deleted by a user.

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].

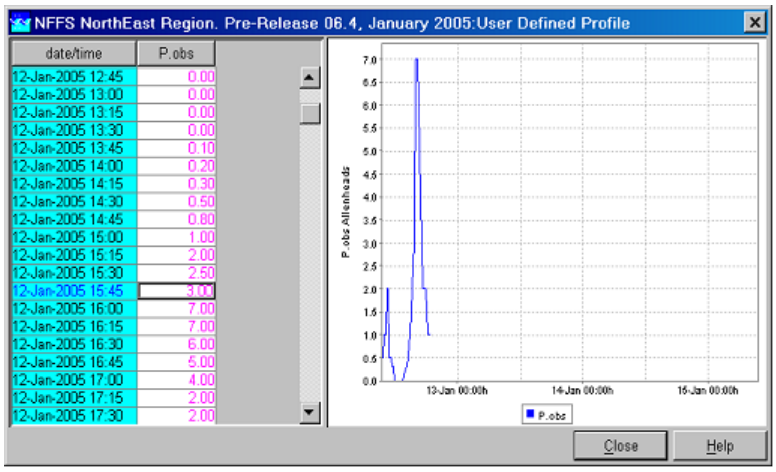
What-if Scenarios can be run via the Manual Forecast Display.

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.



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.

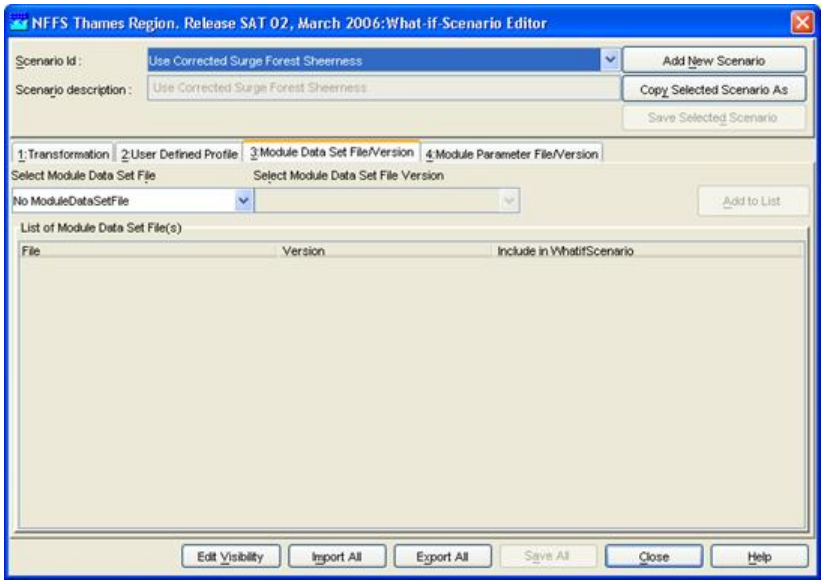
By pressing [Add to list], the user defined profile is added to the What-if Scenario and appears in the table at the bottom of the tab. A number of profiles can be defined within a single What-if Scenario by repeating the sequence described above.

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

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 alterative 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 locate 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 additional alternative Module Data sets to the list.



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 same way as described above.

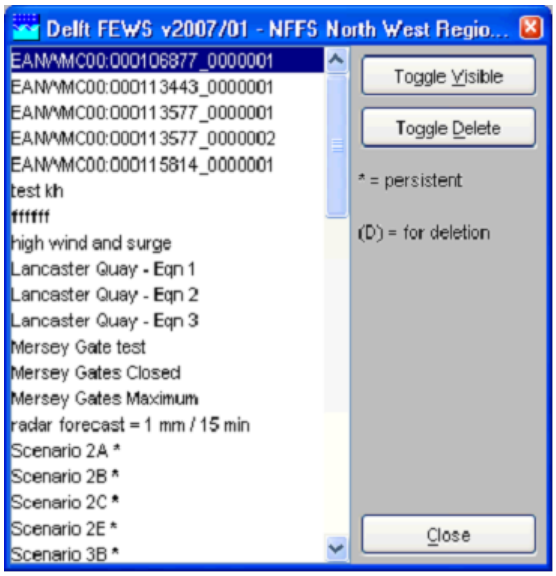
Edit Visibility button

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.



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

This page last changed on 10-04-2008 by minett.

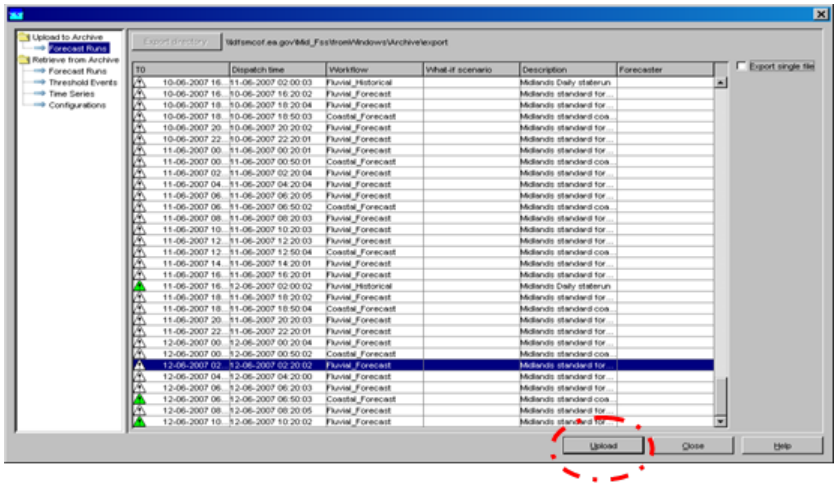
- Archiving Display
- - Manual Archiving
  - Importing Archives into the Standalone
  - - a) Importing Forecast Run Archives
    - b) Importing Threshold Event Archives
    - c) Importing Time Series Archives

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.

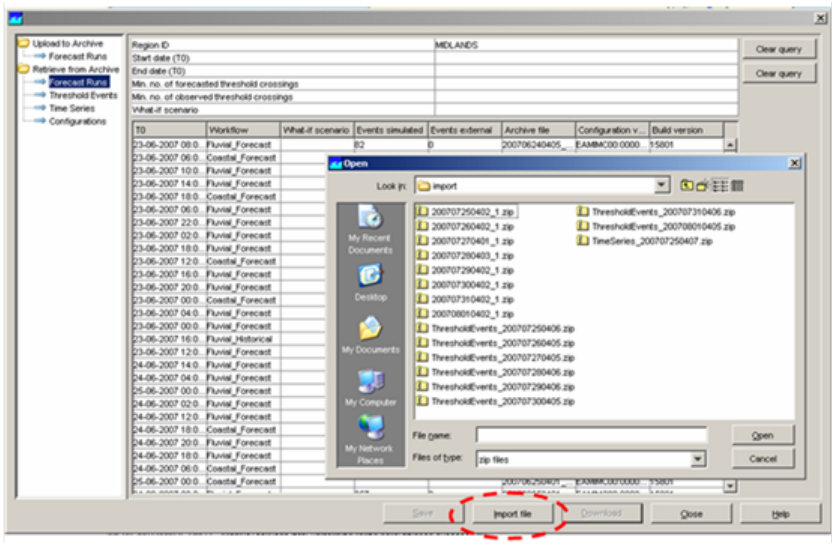


This forecast is then written to a zip file and stored in the file shares. If configured (deployed) an archiver process can pick up these zip files and process them.

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.

11 Skill Scores Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

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

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 number The first step is to set up a contingency table. Given criteria on time intervals to consider when matching thresholds, 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 thresholds).

	Threshold Observed	
Threshold Forecast	**Yes**	**No**
Yes	a	b
No	c	d
Forecast Available	**Yes**	**No**
Yes	e	
No	f	

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

False Alarm Rate

Probability of Detection

Critical Success Index

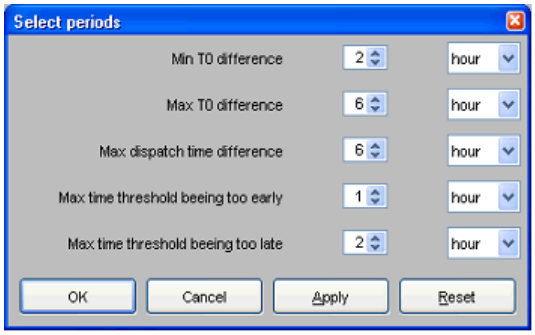
Critical Reliability (checks if a forecast is available at least some time (but not too late) before the observed threshold)

The First Forecast of Threshold (FFOT) is determined as the average time between the T~0~ of the forecast run in which a threshold was detected and the time of the threshold (i.e. the average lead time of the category **a** thresholds in the contingency table).

The Bias of paired thresholds is the average time between paired *observed* and *forecast* events.

Setting Criteria for Analyses

To specific what matching threshold crossings mean, a number of criteria can be used. When clicking the [Change Criteria] button the following display appears...



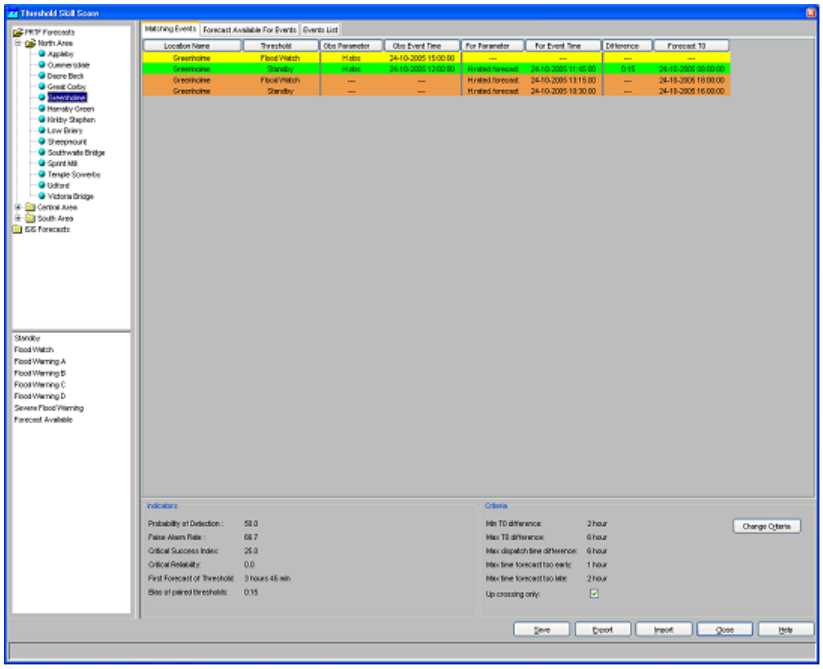
The criteria in the display have the following meaning...

- *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.

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 several models.

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

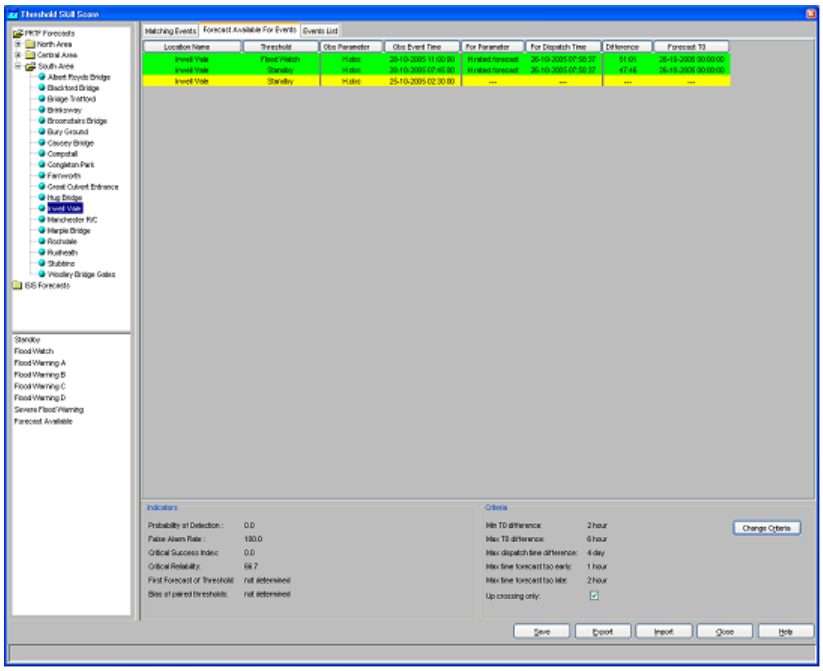
- probability of detection
- false alarm rate
- critical success factor
- first forecast of threshold
- bias of paired thresholds

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...

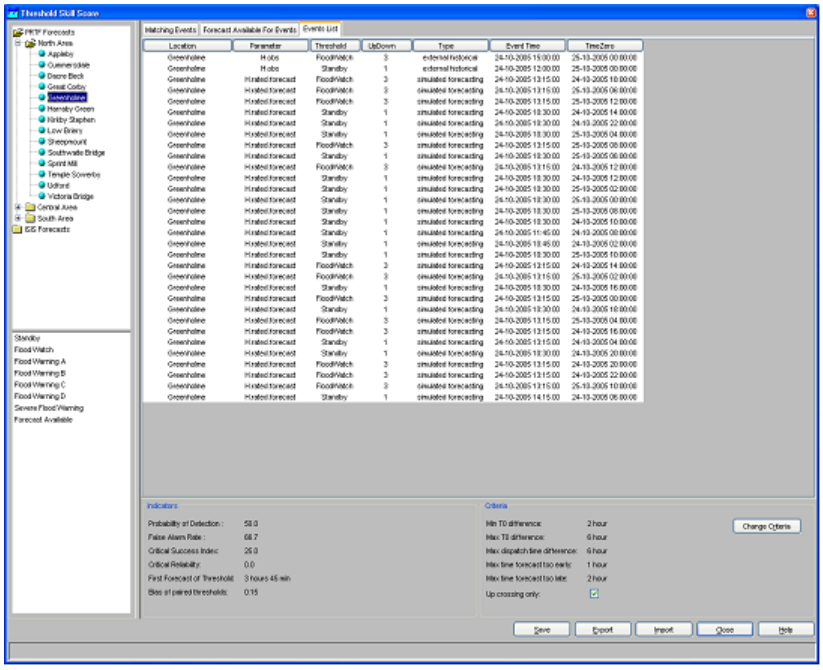
- green: a forecast is available for an observed threshold crossing event (sector e of contingency table)
- yellow no forecast available for an observed threshold crossing event (sector f)



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.



Archiving Events

As the thresholds 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 thresholds 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 thresholds, as described above, it's also possible to select some of them and export only this ones by using the [**Save**] button.

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

12 Thresholds Display & TRITON Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

- 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.

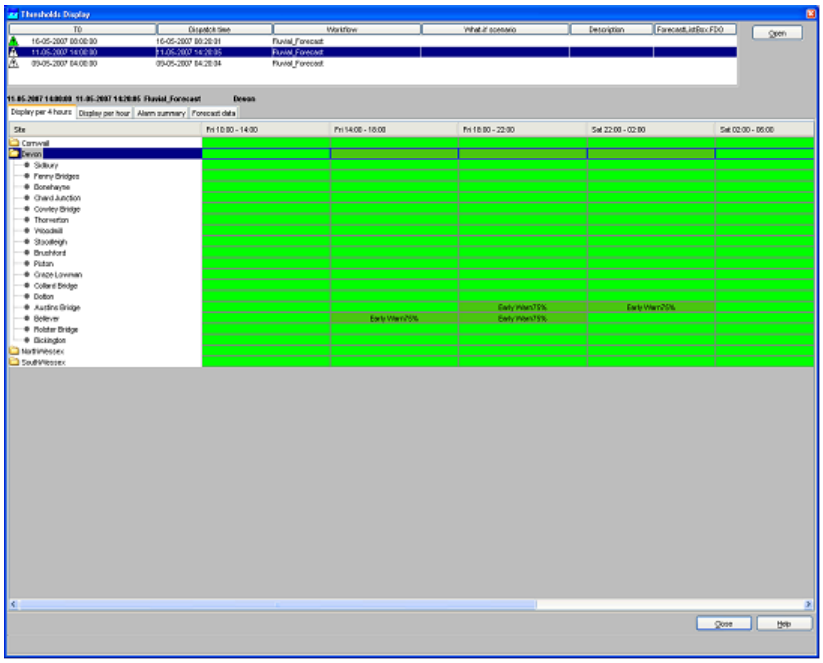
The Thresholds display provides an additional means to view and analyse threshold crossings. The module provides a number of different ways to obtain an overview of all threshold crossings. The TRITON display is a specific version of the Threshold display.

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

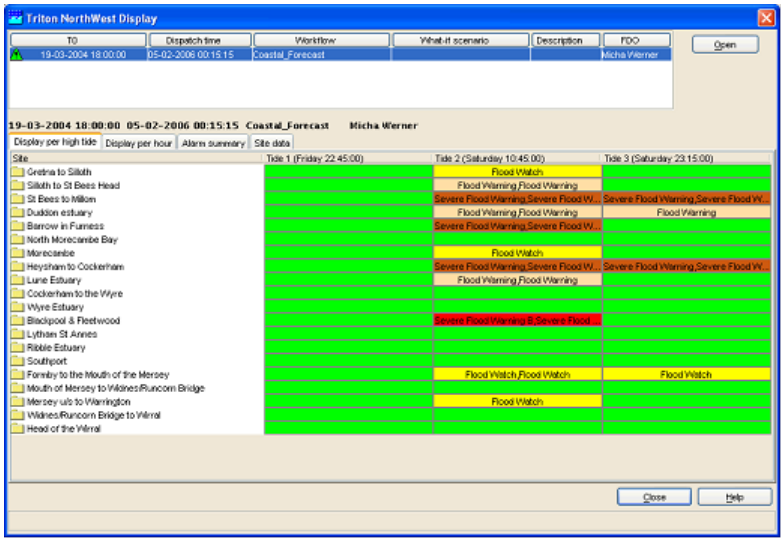
The workflow for which data should be displayed in the Threshold display can be selected at the top of the screen. Place your cursor on the workflow you would like to display and click [Open]. The selected workflow is shown in bold above the tabs.



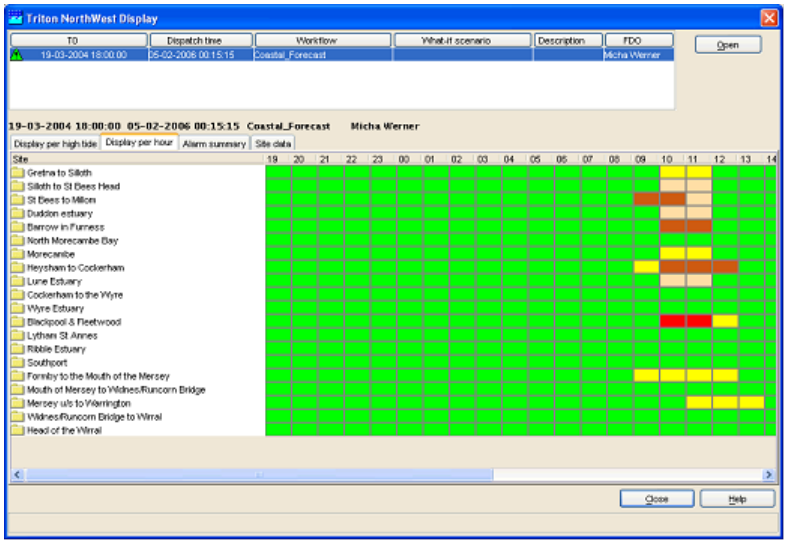
Threshold Status View

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.

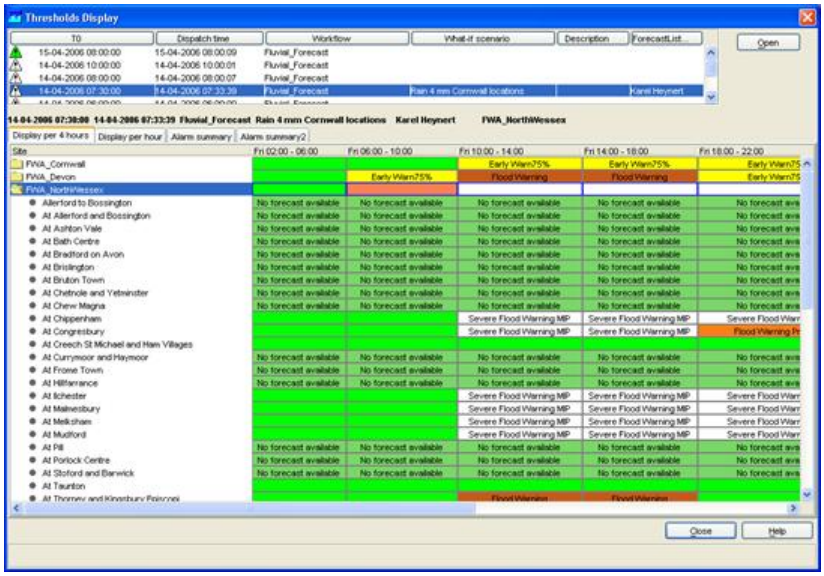


Coastal forecasting example: thresholds at high tides



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

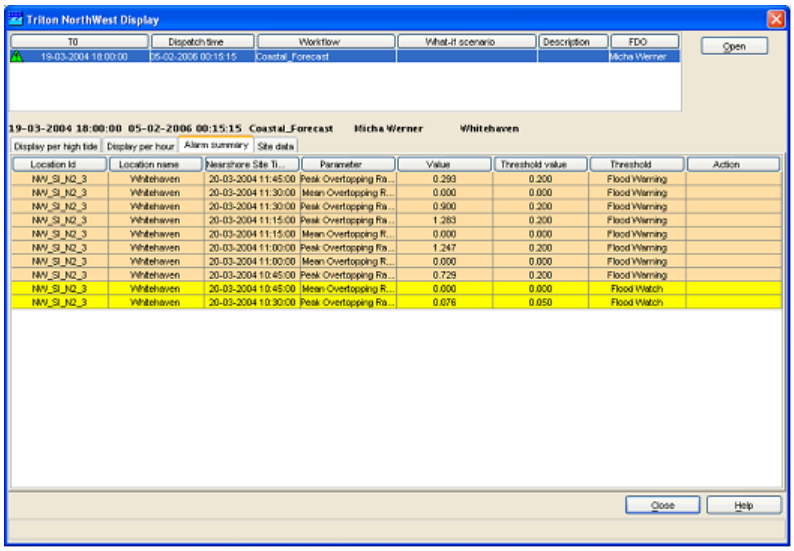
—



Fluvial forecasting example: threshold status over a 4 hour period

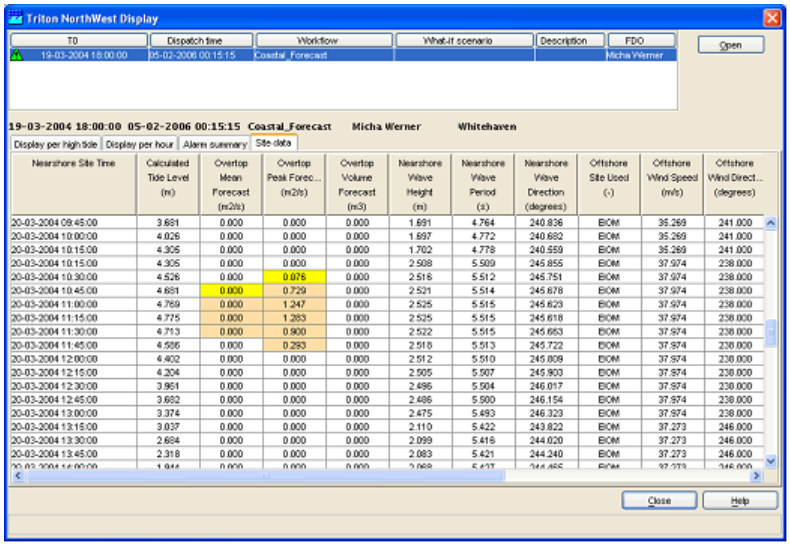
Alarm Summary View

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



Site Data View

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


Triton NorthWest Display
T0
Dispatch time
Workflow
What-if scenario
Description
FDO
19-03-2004 18:00:00
05-02-2006 00:15:15
Coastal_Forecast
Micha Werner
Open
19-03-2004 18:00:00 05-02-2006 00:15:15 Coastal_Forecast Micha Werner Whitehaven
Display per high tide
Display per hour
Alarm summary
Site data
Nearshore Site Time
Calculated Tide Level (m)
Overtop Mean Forecast (m2/s)
Overtop Peak Forec... (m2/s)
Overtop Volume Forecast (m3)
Nearshore Wave Height (m)
Nearshore Wave Period (s)
Nearshore Wave Direction (degrees)
Offshore Site Used (-)
Offshore Wind Speed (m/s)
Offshore Wind Direct... (degrees)
20-03-2004 09:45:00 3.681 0.000 0.000 0.000 1.891 4.764 240.836 BOM 35.269 241.000
20-03-2004 10:00:00 4.026 0.000 0.000 0.000 1.897 4.772 240.682 BOM 35.269 241.000
20-03-2004 10:15:00 4.305 0.000 0.000 0.000 1.702 4.778 240.559 BOM 35.269 241.000
20-03-2004 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
20-03-2004 10:45:00 4.681 0.000 0.729 0.000 2.521 5.514 245.678 BOM 37.974 238.000
20-03-2004 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
20-03-2004 11:30:00 4.713 0.000 0.900 0.000 2.522 5.515 245.663 BOM 37.974 238.000
20-03-2004 11:45:00 4.586 0.000 0.293 0.000 2.516 5.513 245.722 BOM 37.974 238.000
20-03-2004 12:00:00 4.402 0.000 0.000 0.000 2.512 5.510 245.809 BOM 37.974 238.000
20-03-2004 12:15:00 4.204 0.000 0.000 0.000 2.505 5.507 245.903 BOM 37.974 238.000
20-03-2004 12:30:00 3.961 0.000 0.000 0.000 2.496 5.504 246.017 BOM 37.974 238.000
20-03-2004 12:45:00 3.682 0.000 0.000 0.000 2.486 5.500 246.154 BOM 37.974 238.000
20-03-2004 13:00:00 3.374 0.000 0.000 0.000 2.475 5.493 246.323 BOM 37.974 238.000
20-03-2004 13:15:00 3.037 0.000 0.000 0.000 2.110 5.422 243.822 BOM 37.273 246.000
20-03-2004 13:30:00 2.684 0.000 0.000 0.000 2.099 5.416 244.020 BOM 37.273 246.000
20-03-2004 13:45:00 2.318 0.000 0.000 0.000 2.083 5.421 244.240 BOM 37.273 246.000
Close
Help

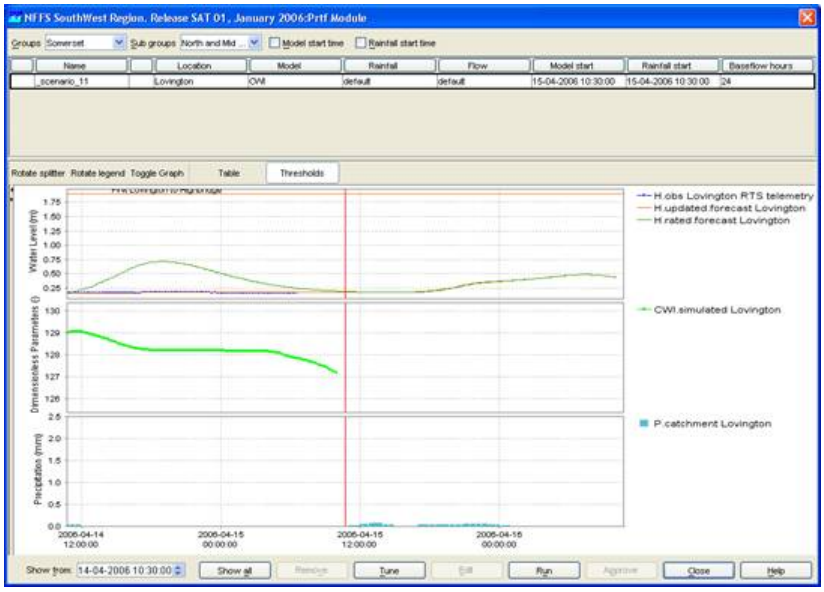
13 PRTF Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

- 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.

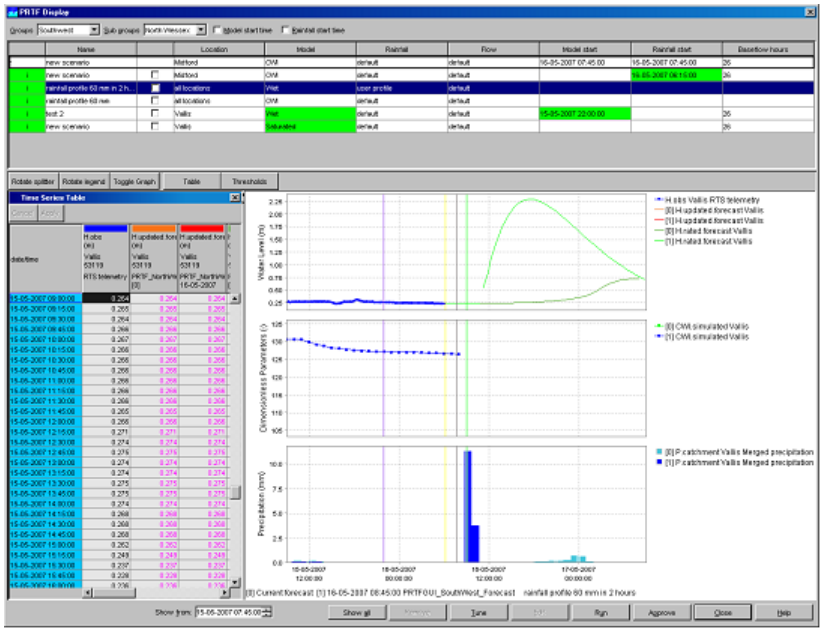


The PRTF display provides an interface to the configurable settings of the PRTF module. The settings entered by the user are stored in the form of a what-if scenario, that can then be run. Scenarios created with the PRTF display run locally on your own PC. The forecast result of each scenario can then 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

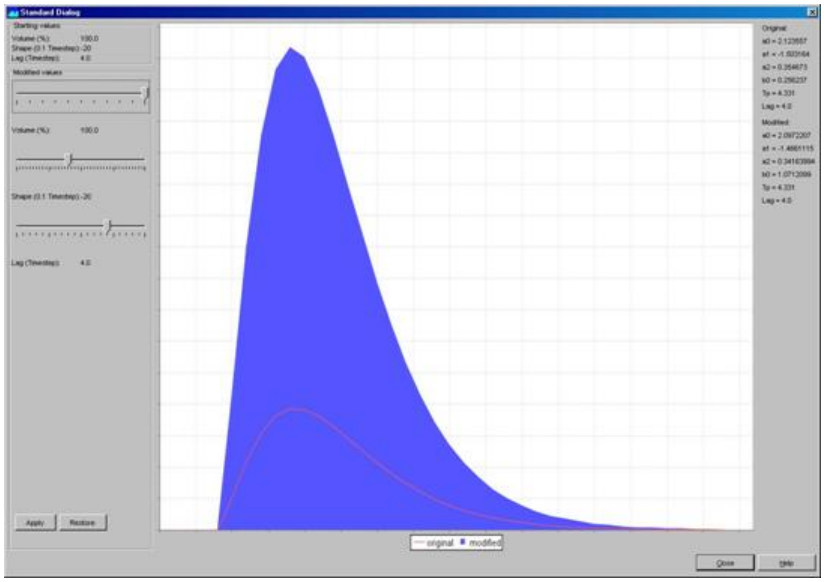
Within the PRTF Display it is possible to change the following settings:

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.

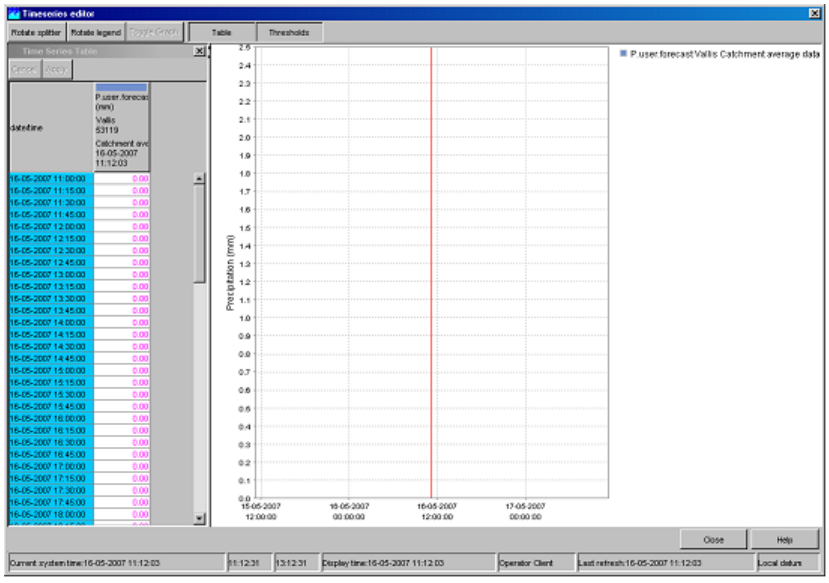


The red line shows the original settings and the blue graph shows the changed settings. The values for Volume, Shape and Lag can be modified by moving the slider bars. This results in a change in shape of the blue graph. After changing the Model parameters you should click on 'Apply' to add the modified 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

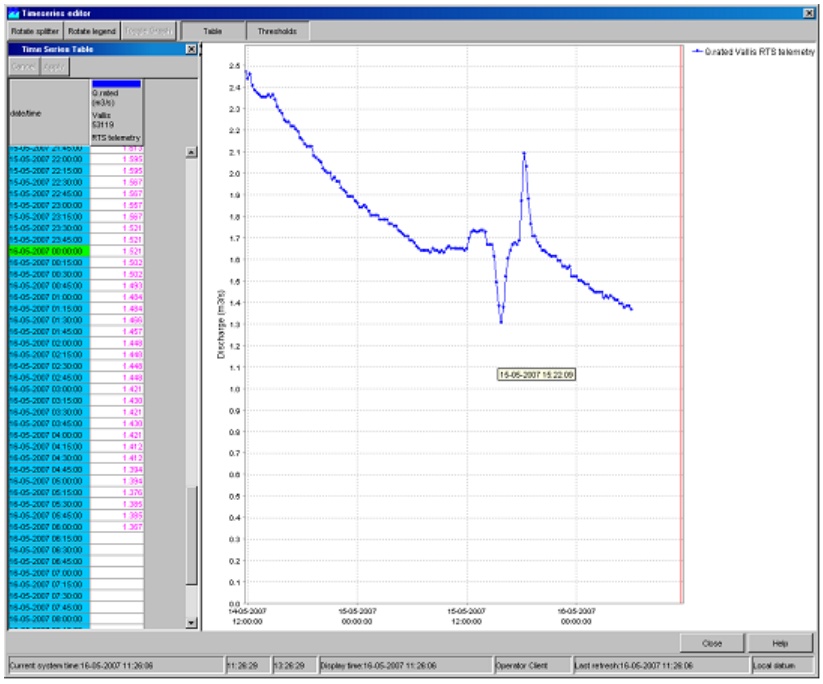
To create or select a rainfall profile you need to click on the cell in the column Rainfall. A dropdown box will appear with some predefined rainfall scenarios. You can select one of those predefined scenarios or you can select the option 'user profile' to create a new profile. When the option user profile 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).



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

This page last changed on 04-12-2008 by minett.

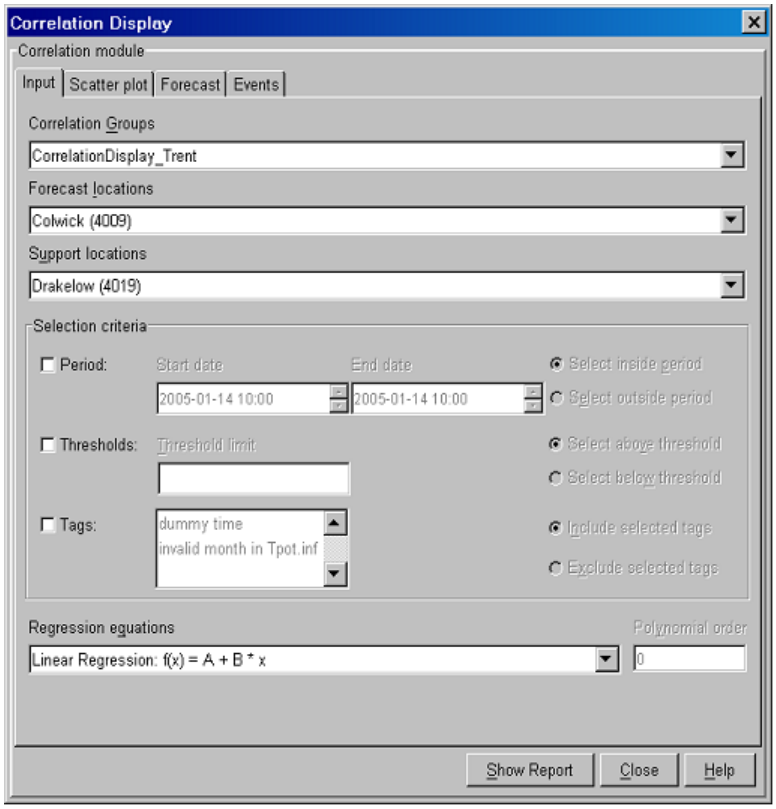
- Correlation Display
-
  - Input
  - Scatter Plot
  - Forecast
  - Events
  - Show Report and Close

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.

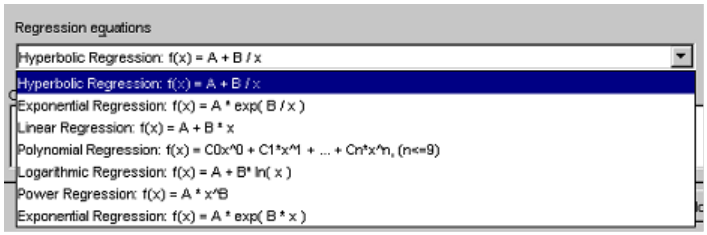


When required, the above mentioned dataset can be restricted on the basis of a number criteria...

- *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.



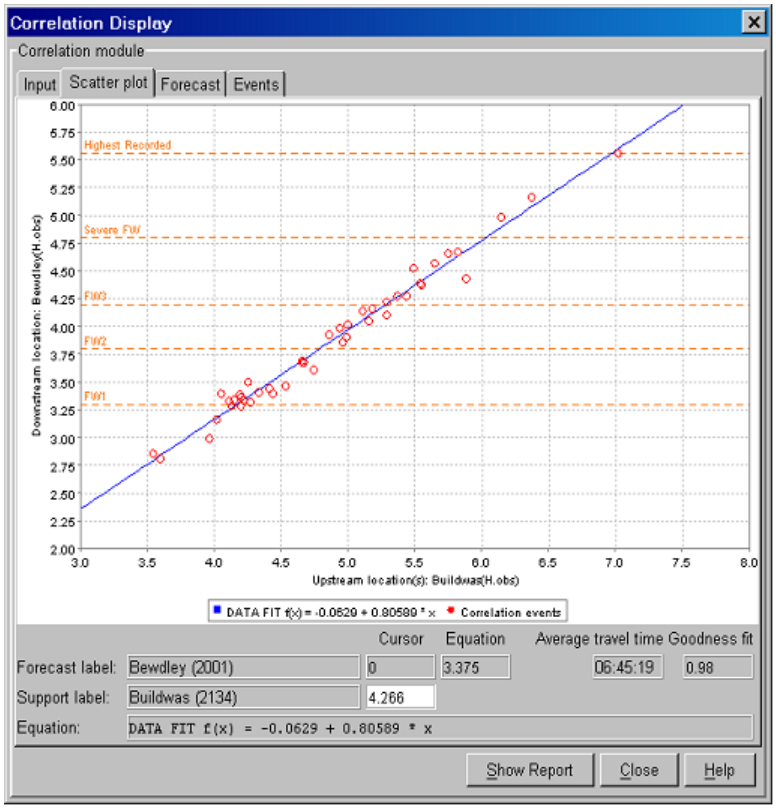
Scatter Plot

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* .



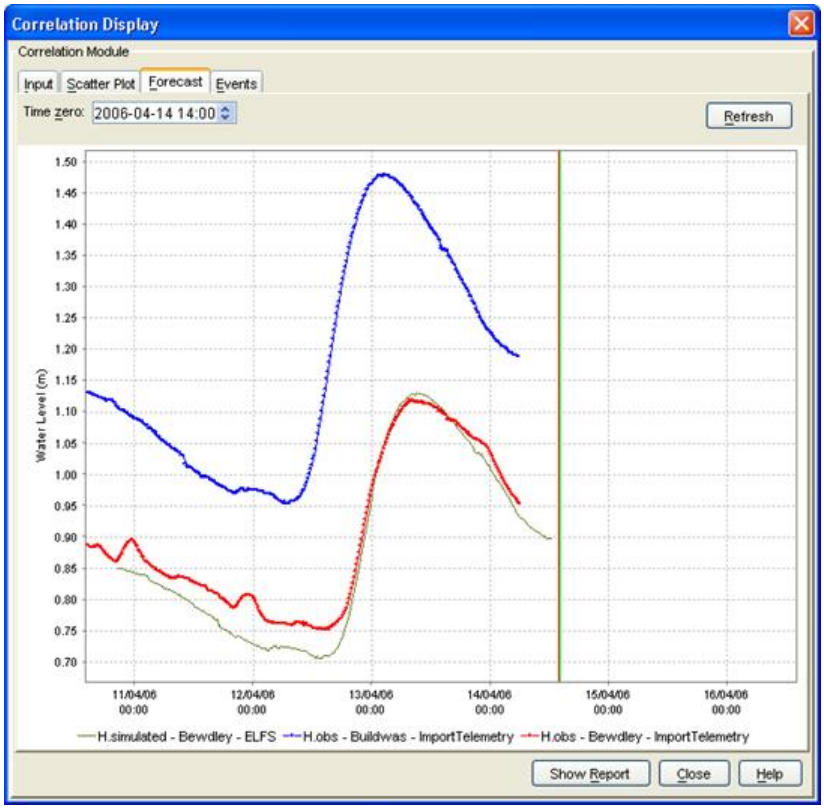
A forecaster can also enter a value in the cursor column for the support location. By pressing [ENTER] the correlation display computes the forecast with the equation and shows the result in the equation column.

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.



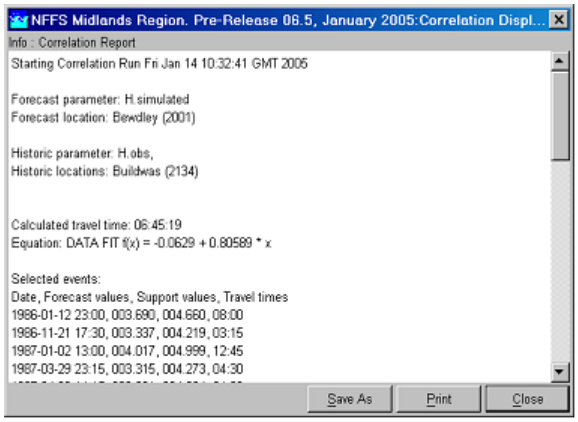
Events

The events tab shows a list of all events used in the correlation function. The list includes the dates, forecast level, support level and travel time of the selected events. 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.


NFFS Midlands Region. Pre-Release 06.5, January 2005:Correlation Displ...
Info : Correlation Report
Starting Correlation Run Fri Jan 14 10:32:41 GMT 2005
Forecast parameter: H.simulated
Forecast location: Bewdley (2001)
Historic parameter: H.obs,
Historic locations: Buildwas (2134)
Calculated travel time: 06:45:19
Equation: DATA FIT f(x) = -0.0629 + 0.80589 * x
Selected events:
Date, Forecast values, Support values, Travel times
1986-01-12 23:00, 003.680, 004.660, 08:00
1986-11-21 17:30, 003.337, 004.219, 03:15
1987-01-02 13:00, 004.017, 004.999, 12:45
1987-03-29 23:15, 003.315, 004.273, 04:30
Save As
Print
Close

15 Lookup Table Display

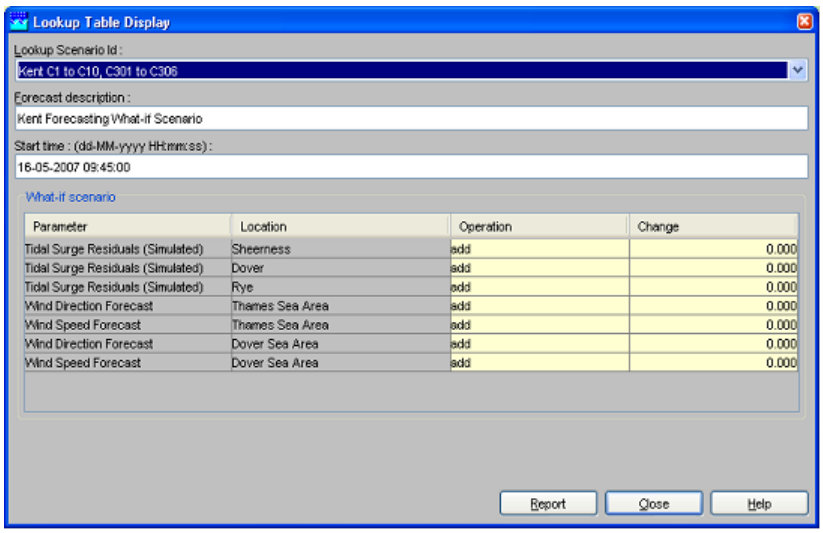
This page last changed on 10-11-2007 by schelle@wldelft.nl.

- 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.



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

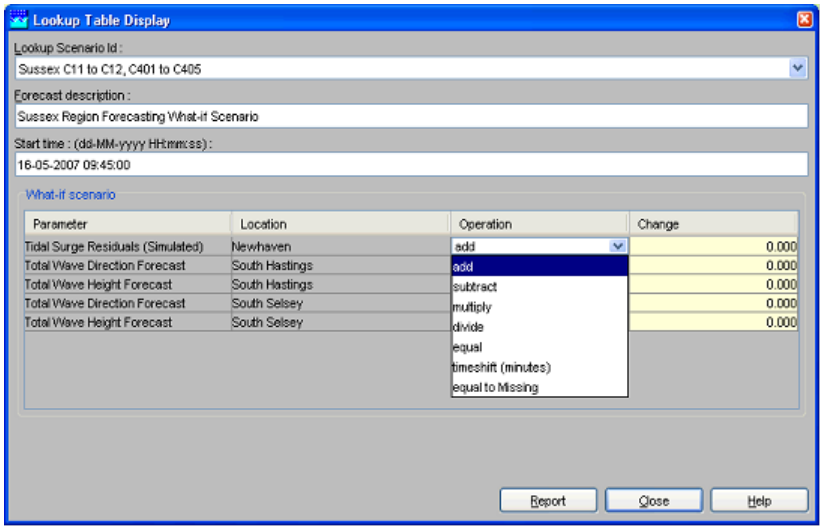
A description can be entered to identify the workflow run in the Lookup Table display.

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.

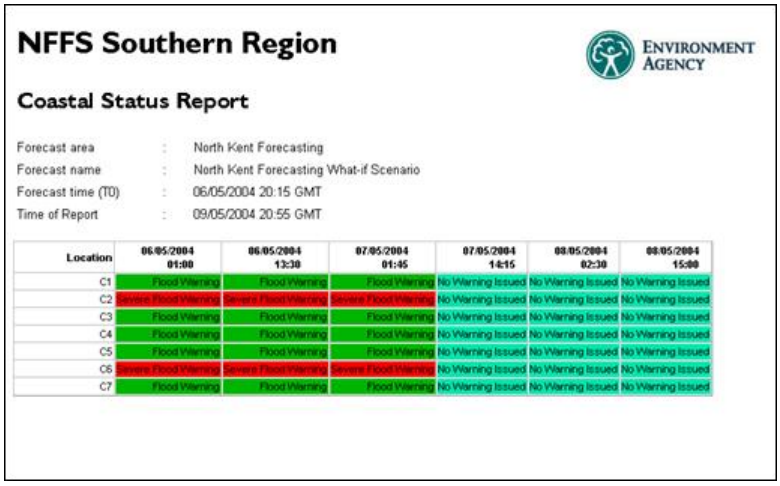
What-if Scenario

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* .



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 Southern Region

ENVIRONMENT AGENCY

Coastal Status Report

Forecast area	:	North Kent Forecasting
Forecast name	:	North Kent Forecasting What-if Scenario
Forecast time (T0)	:	06/05/2004 20:15 GMT
Time of Report	:	09/05/2004 20:55 GMT

Location	06/05/2004 01:00	06/05/2004 13:30	07/05/2004 01:45	07/05/2004 14:15	08/05/2004 02:30	08/05/2004 15:00
C1	Flood Warning	Flood Warning	Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C2	Severe Flood Warning	Severe Flood Warning	Severe Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C3	Flood Warning	Flood Warning	Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C4	Flood Warning	Flood Warning	Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C5	Flood Warning	Flood Warning	Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C6	Severe Flood Warning	Severe Flood Warning	Severe Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued
C7	Flood Warning	Flood Warning	Flood Warning	No Warning Issued	No Warning Issued	No Warning Issued

Close

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

16 KFlows Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

- 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

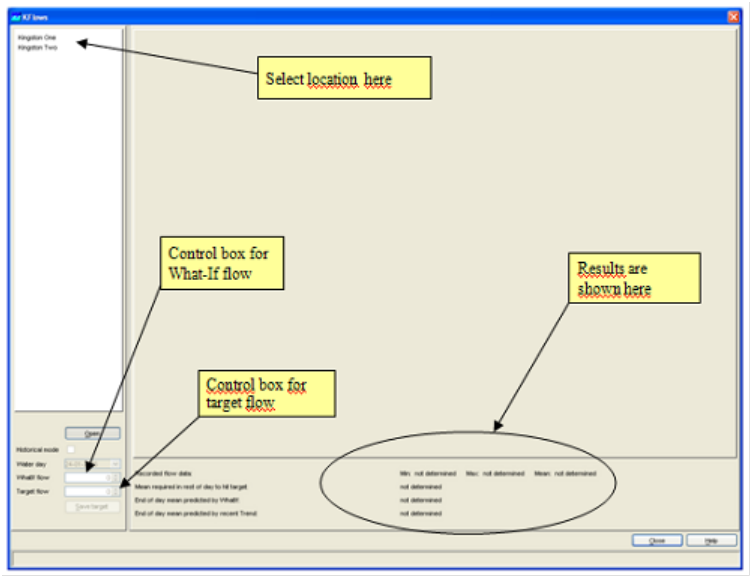
KFlows Calculations

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

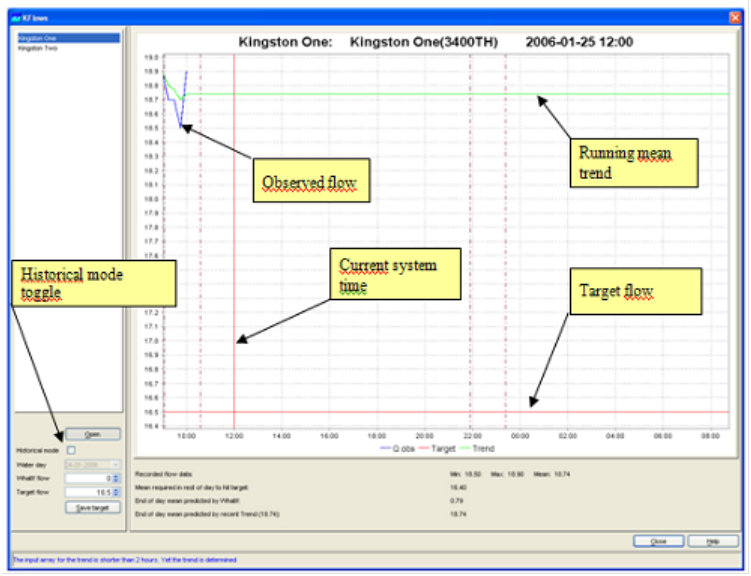
After opening the selected gauge the module will get the data and perform the calculations. If not enough data points (the number of points used is presently fixed at 8) are present between the current time and the configured start of the water day the calculation will use less points and a warning message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

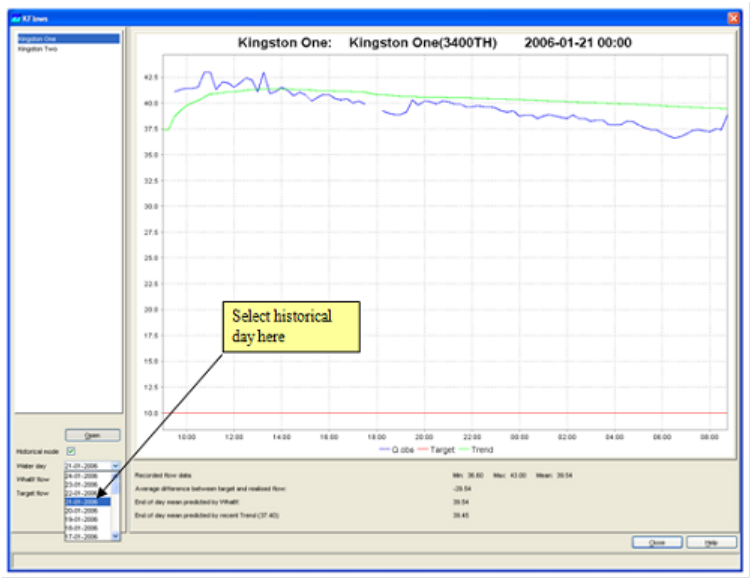
The periods with tidal influence (these are based on the Astronomical Highs and Lows) are shown as fine dashed vertical lines.

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.

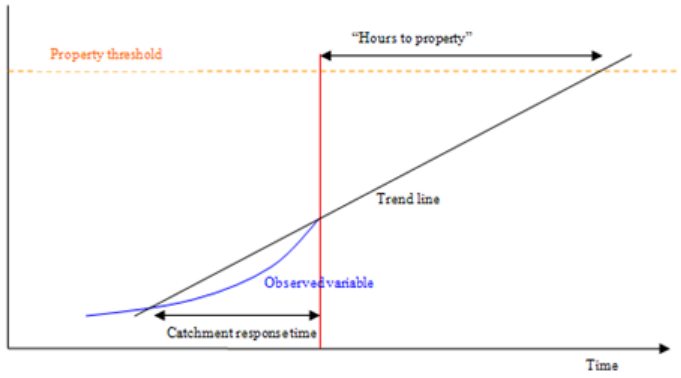

Kingston One: Kingston One(3400TH) 2006-01-21 00:00
Select historical day here

17 Trends Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

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.

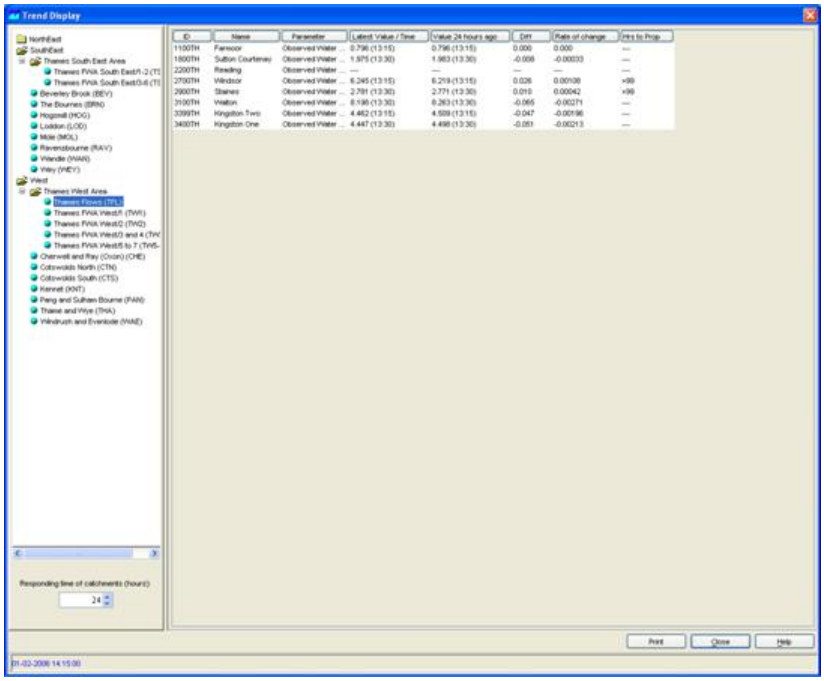


Note that when no data is available for the last hour up to the current system time, for that location the trend will not be determined.

The display shows the results for selectable groups of locations and may be printed to the default 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


Trend Display
NorthEast
SouthEast
Thames South East Area
Beverley Brook (BEV)
The Bournes (BRN)
Hogsmill (HOG)
Loddon (LOD)
Mole (MOL)
Ravensbourne (RAV)
Wandle (WAN)
Wey (WEY)
West
Thames West Area
Thames Flows (TFL)
Cotswolds North (CTN)
Cotswolds South (CTS)
Kennet (KNT)
Thame and Wye (THA)
Windrush and Evenlode (WAE)
ID
Name
Parameter
Latest Value / Time
Value 24 hours ago
Diff
Rate of change
Hrs to Prop
1100TH
Farncot
1800TH
Sutton Courtenay
2200TH
Reading
2700TH
Windsor
2900TH
Staines
3100TH
Wallon
3399TH
Kingston Two
3400TH
Kingston One
Responding time of catchments (hours)
24
Print
Close
Help

18 Longitudinal Profile Display

This page last changed on 10-11-2007 by schelle@wldelft.nl.

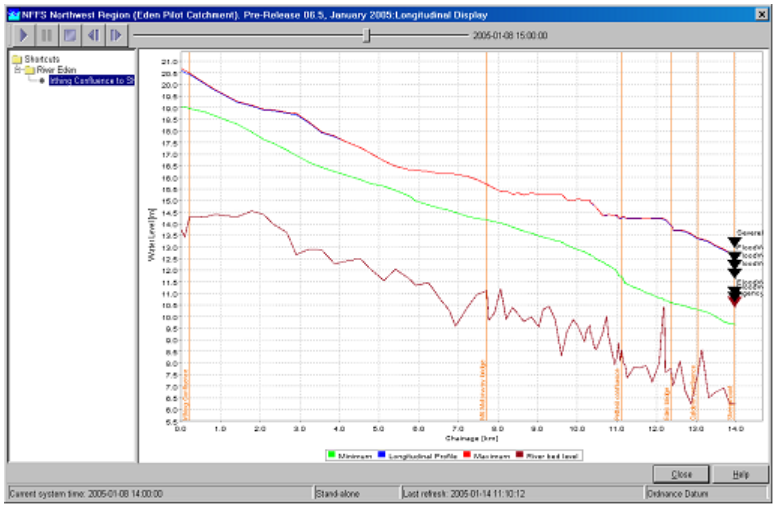
Longitudinal Profile Display

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

This page last changed on 10-11-2007 by schelle@wldelft.nl.

- 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.

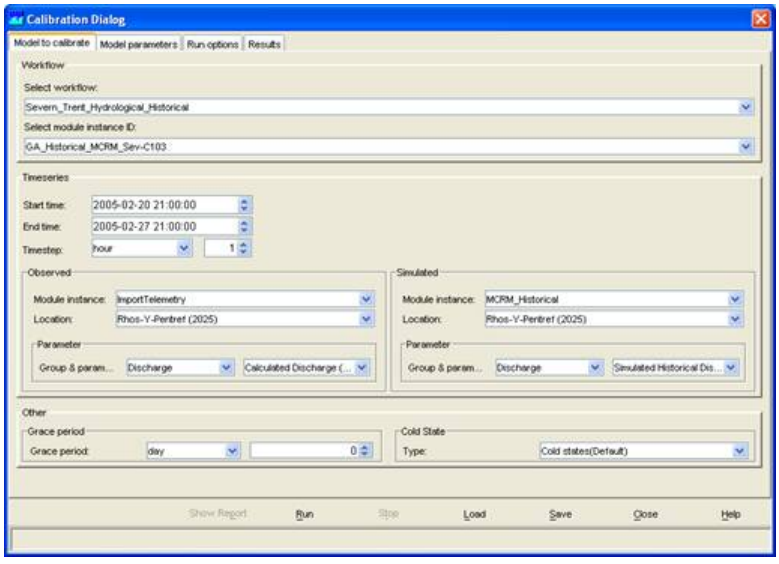
The calibration display will provide simple automatic calibration methods using either a non-derivative based local optimisation method or a more global optimisation approach (SCE-UA). While it is accepted that many alternative calibration approaches and algorithms are available, the functional scope 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.



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.

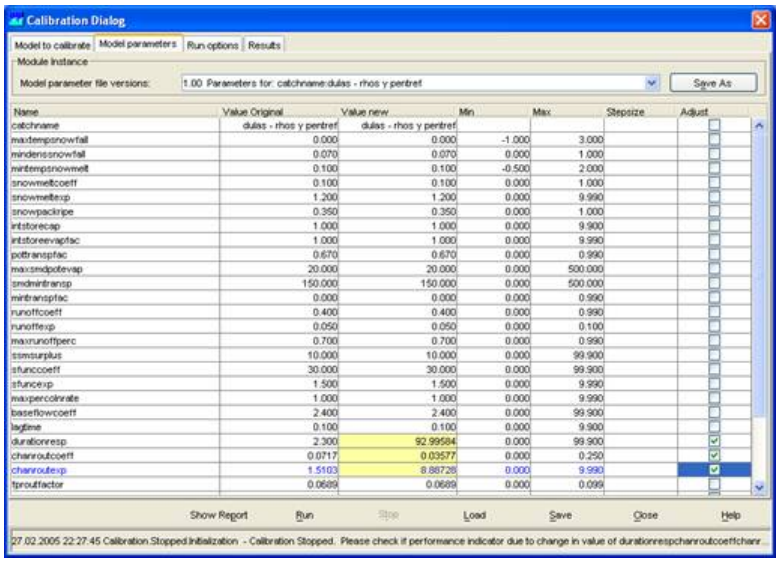
The required steps in the Model to Calibrate tab are:

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
4. 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.
5. 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.

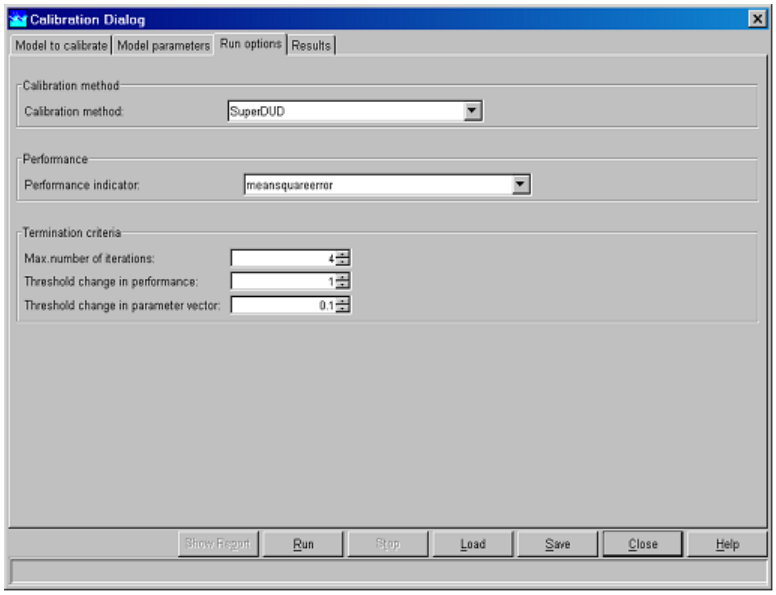


The parameters shown in the spreadsheet are the model parameters of the parameter file that is selected in the upper drop down list. Once the spreadsheet has been filled with parameter values the model parameters can be selected that need to be optimised through the calibration utility. A model parameter 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

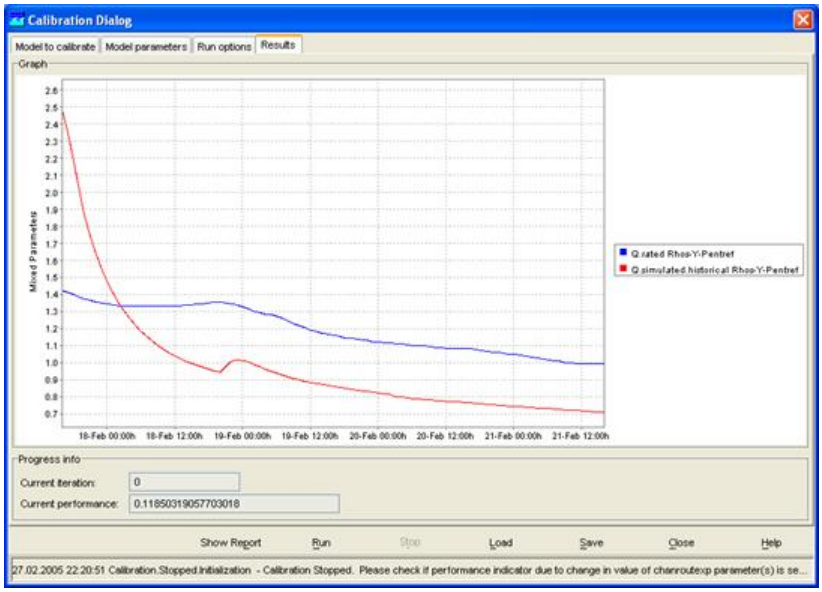
In the Run Options tab the final set of definitions must be set that allows the method and constraints of calibration to be defined. These include:

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



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

This page last changed on 11-12-2007 by schelle@wldelft.nl.

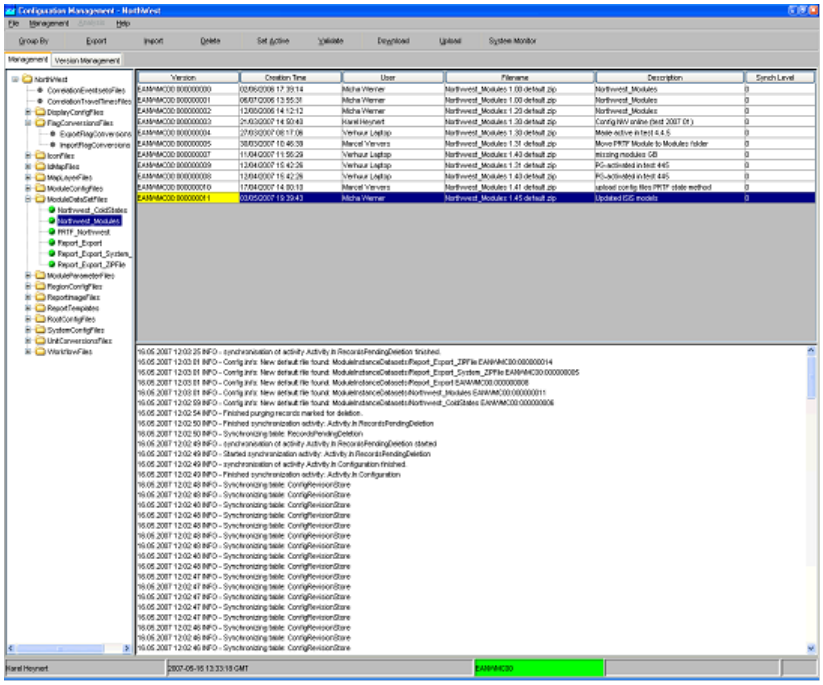
- Configuration Manager
- Dropdown Menus
- ◦ File
  ◦ Management
- Configuration Management
- ◦ - Export
  - Export All
  - Import
  - Delete
  - Set Active
  - Validate
  - Download
  - Upload
  - System Monitor
  ◦ Version Management
- Configuration Editor

Configuration Manager

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.



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.

Dropdown Menus

The following dropdown menus are available...

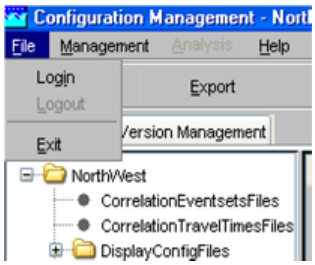
- File
- Management
- Help

The Analysis features of the Config Manager have been disabled.

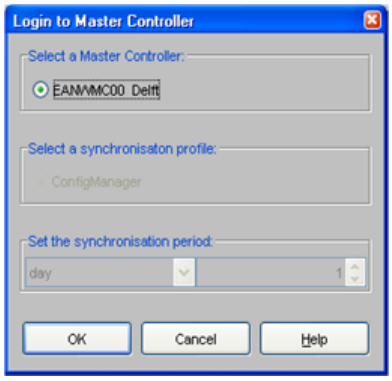
File

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.

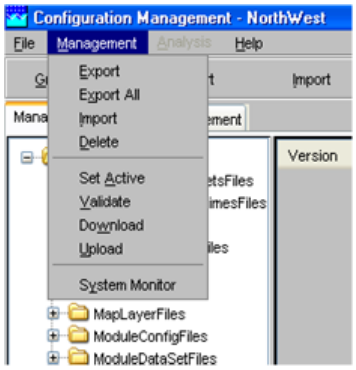


After selecting Login the following window is shown. In case multiple master controllers are available, these will be shown in the display.



Management

The management menu offers you the following options...



Please that most options are also available from the Button Bar.

Configuration Management

The various option available for managing configuration files are discussed below.

Export

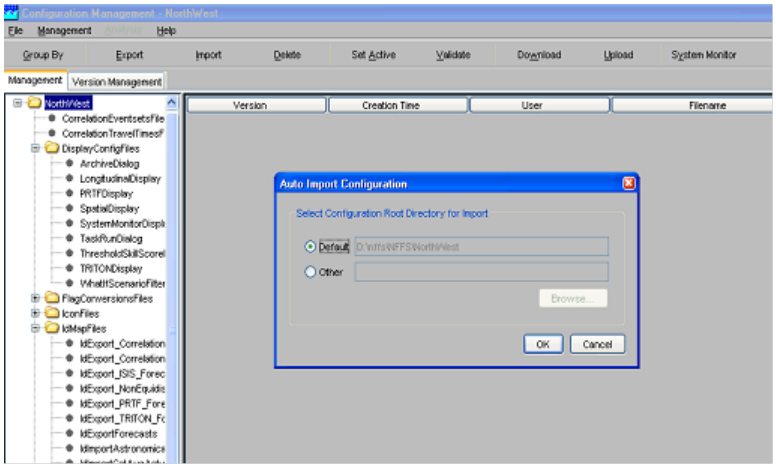
Allows you to export a selected configuration file to your file system. The exported files can be found in the \export_config folder in your Delft FEWS configuration folder.

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.

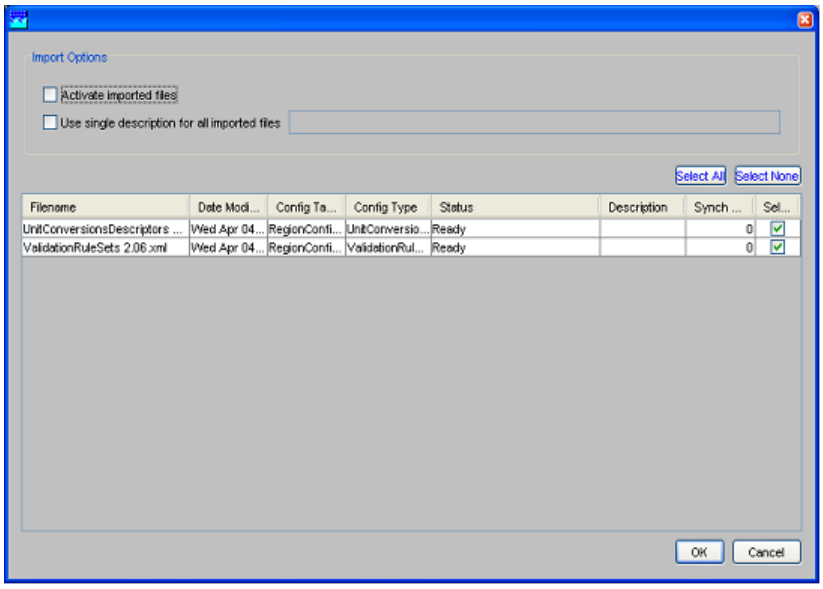
Import

Allows you to import configuration files from a user defined folder into the datastore of the Client. In case you place your select the root of the folder tree, you can import a complete configuration in one go.



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.



- 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

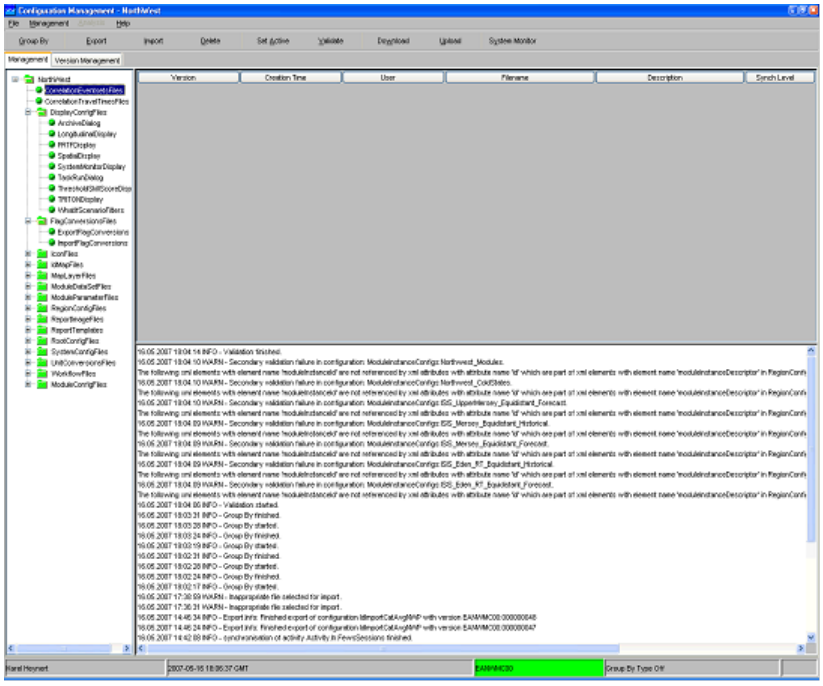
Allows you to set files to active. This means that when synchronised to the server, they will be used throughout the system.

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.



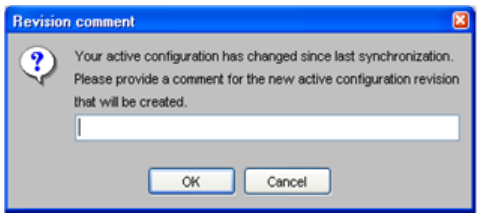
Download

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.

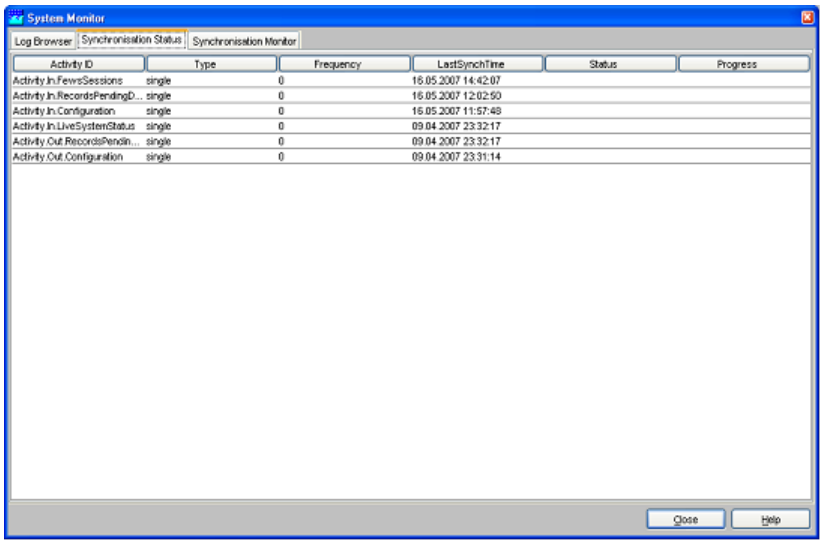


Uploading a configuration (file) involves that all modified and added configuration files are synchronized with the master controller database. An essential aspect of uploading is that the configuration files are provided with a unique Master Controller ID. The local ID that has been set for the configuration 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.

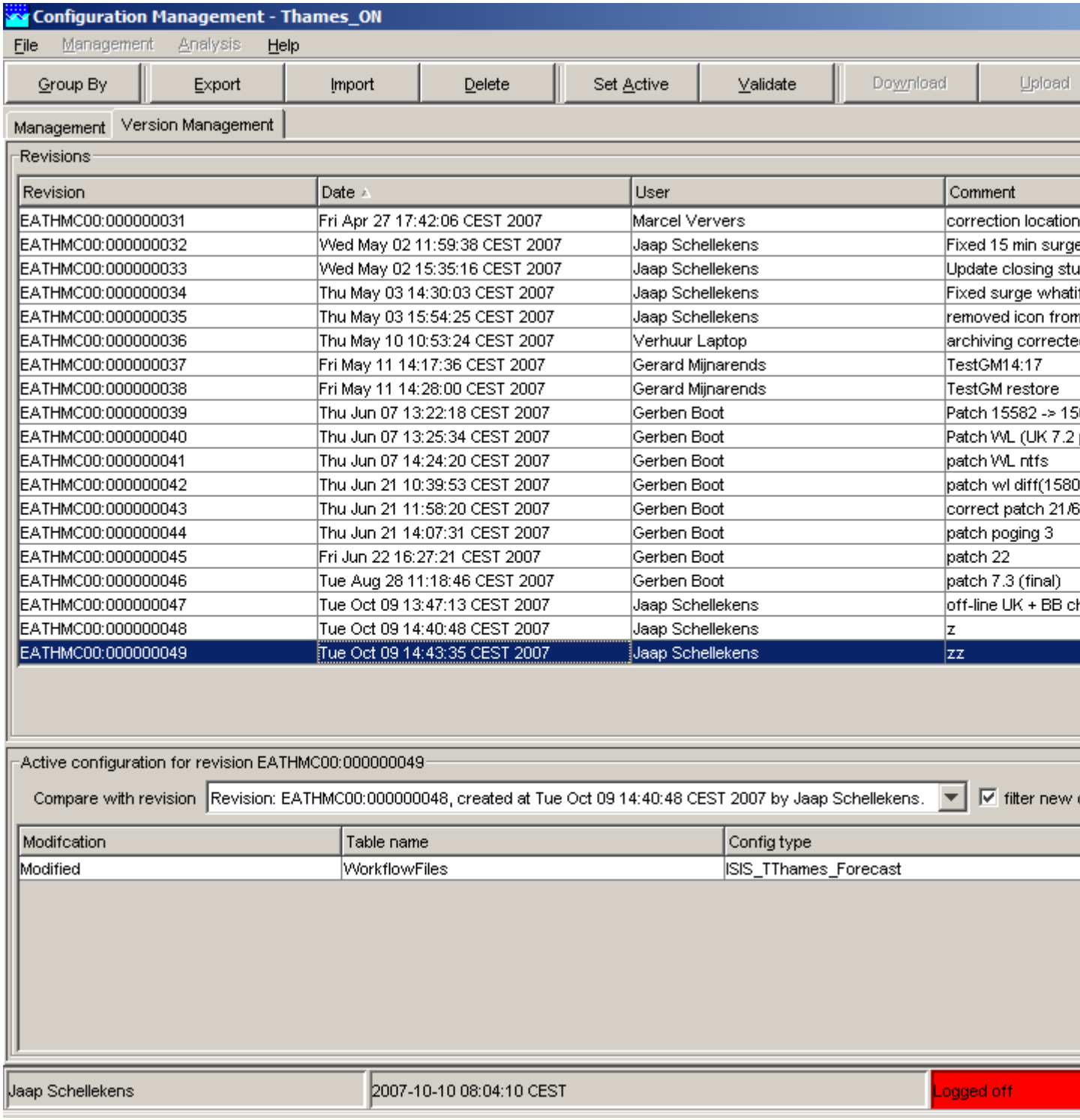
System Monitor

Opens the System Monitor to display log messages and status information. This display has been described elsewhere.



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.



With [Export] you can export a complete configuration to your file system. [Restore] allows you to revert back to a previously active configuration.

Configuration Editor

The configuration is described at a separate page.

21 Background Information

This page last changed on 11-12-2007 by schelle@wldelft.nl.

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.