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Delft-FEWS User Guide

Delft-FEWS User Guide



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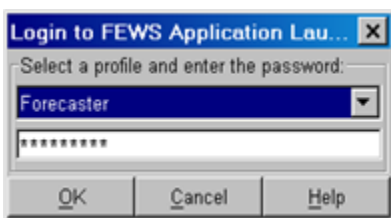
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[Pdf version of the Guide](#)

01 Launching Delft FEWS

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.

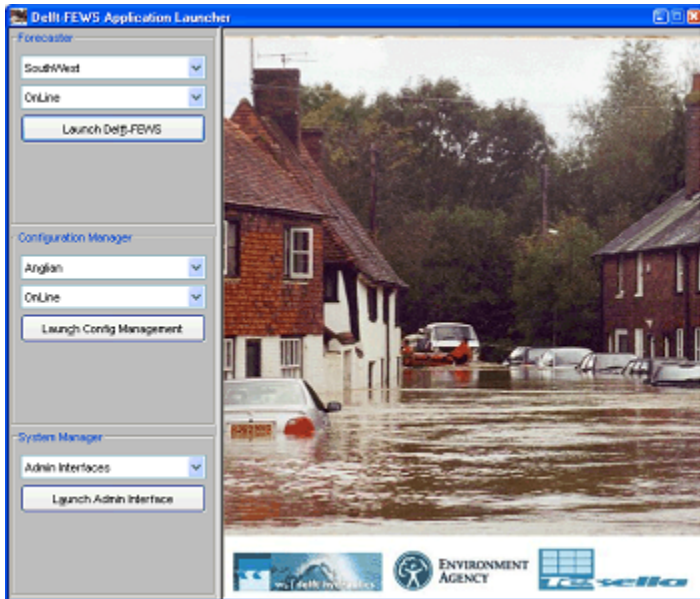


There are four profiles with each of them its own password:

- 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

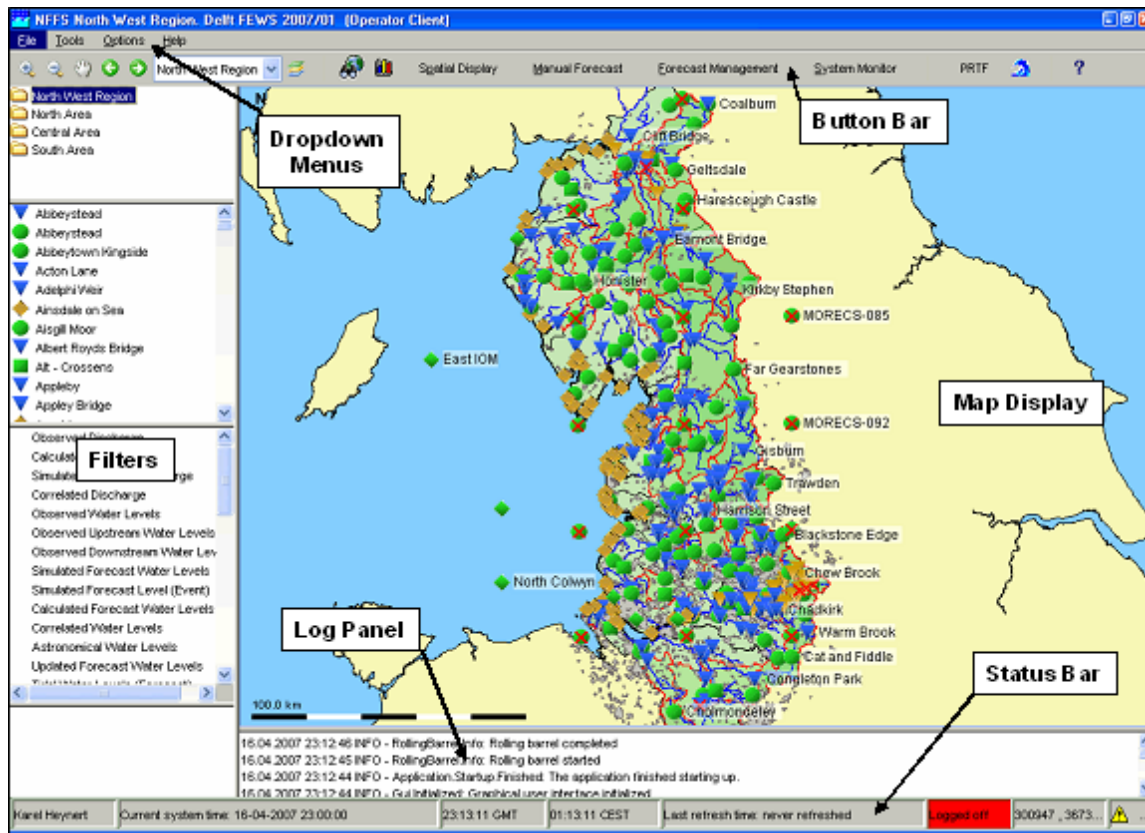
- FEWS Explorer
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 - System status icon (always displayed)
 - Notification (default disabled)
- The F12 menu

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:

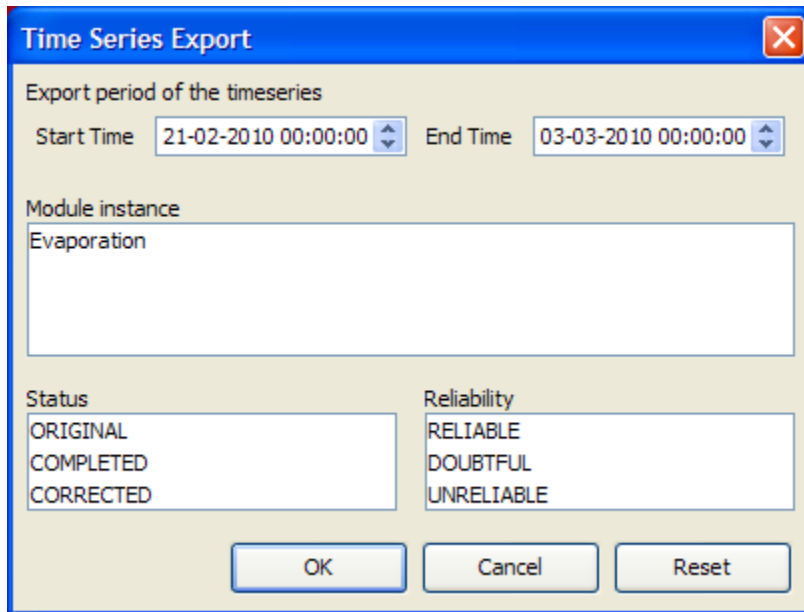
- Time series groups
- Locations
- Data types (parameters)
- Forecasts

Drop down menus

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

File - Export timeseries

This menu option opens the Export timeseries dialog.



The 'Time Series Export' dialog box has a blue title bar with a close button. It contains the following elements:

- Export period of the timeseries:** Two date-time pickers. 'Start Time' is set to '21-02-2010 00:00:00' and 'End Time' is set to '03-03-2010 00:00:00'.
- Module instance:** A text box containing the word 'Evaporation'.
- Status:** A list box with three items: 'ORIGINAL', 'COMPLETED', and 'CORRECTED'.
- Reliability:** A list box with three items: 'RELIABLE', 'DOUBTFUL', and 'UNRELIABLE'.
- Buttons:** Three buttons at the bottom: 'OK', 'Cancel', and 'Reset'.

This dialog can be used to filter the selected timeseries by view period, module instance, reliability and status. After the filter options are selected, the timeseries which match the given criteria are saved to a file. When the user selects in the Export timeseries dialog the reliability "unreliable", then only export formats that write quality flags are available, i.e. PI xml files, CSV files with quality flags and Dutch CSV files with quality flags. If "unreliable" is not selected in the export timeseries dialog, then all export formats are available. This is required, because if unreliable values would be exported without quality flags, then it would not be possible in the exported file to see which values are unreliable. In the case of csv format with quality flags, the complete text of the quality flags (including STATE and DETECTION flags, if they exist) are added to the timeseries. All export formats available in the Export timeseries dialog are: PI xml, GIN xml, csv, Dutch csv, csv with quality flags, Dutch csv with quality flags, iBever csv, Hymos transfer DB 4.50 mdb, Hymos transfer DB 4.03 mdb, Menyanthes csv and UM Aquo 2009 xml.

Button bar

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

Log Panel

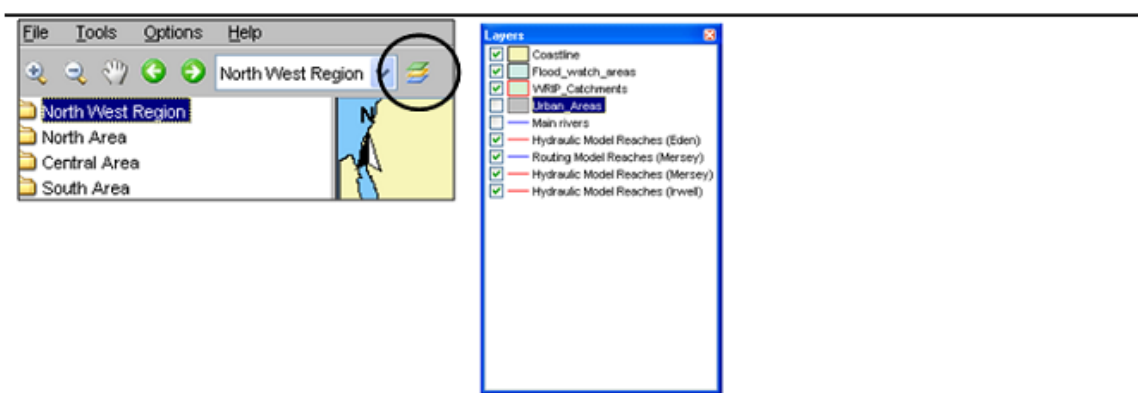
The Log Viewer relays high level messages generated by active system components. Additionally, detailed messages are available in the Log Browser.

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 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..



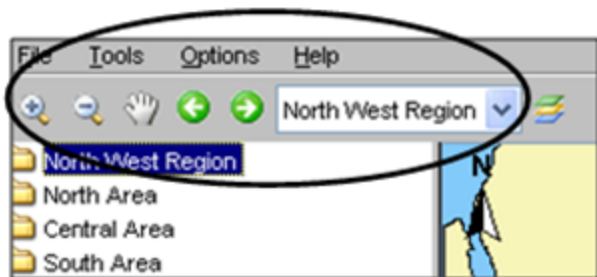
Tooltip

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

Map navigation

Map navigation options are set in the zoom toolbar item. After clicking the " button you can manually zoom in to a user defined map area. With the 'I' 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.

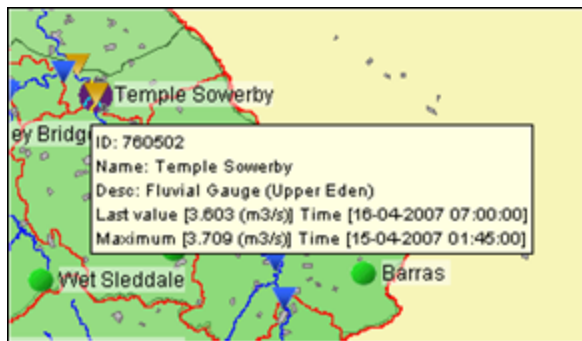
Note

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 and validation


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. Note that except for the red cross the other icons have to be activated first via configuration.

	no data available in view period
	data never written to database
	one or more timeseries completely missing (since 2011_02)
	missing data in view period
	soft validation limit exceeded
	hard validation limit exceeded
	data edited or interpolated

If more than one are valid - both icons will be shown concurrently. By default only the red crosses are shown to add the additional validation icons add the tag to the [filters](#) file

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:

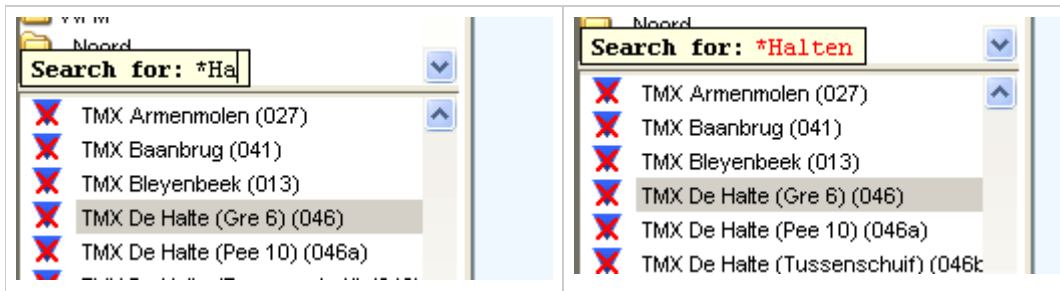
	Level 1 threshold crossing in historic and forecast period
	Level 2 threshold crossing in historic and forecast period
	Level 3 threshold crossing in historic and forecast period
	Level 4 threshold crossing in historic and forecast period
	Level 5 threshold crossing in historic and forecast period

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)

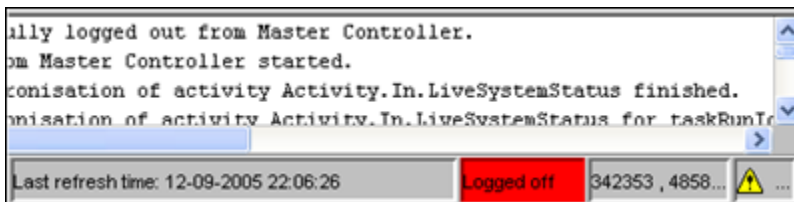
The time of last refresh indicates the last time the local data store has been synchronised with the Central Database. Not relevant for Stand alone FEWS configurations.

System status

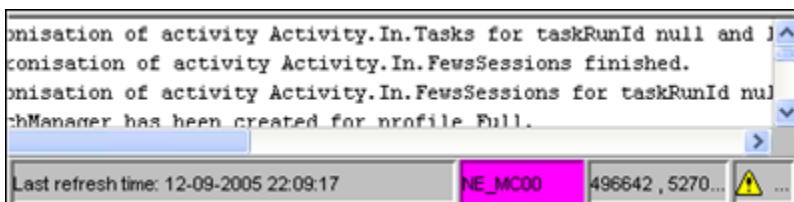
The system status indicates in what mode the system is currently operating: online, or stand-alone.

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

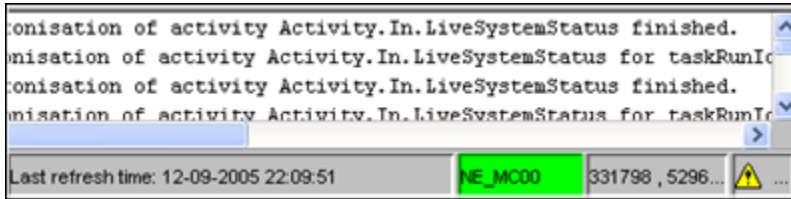
- In case the colour is red, the OC is logged off:



- 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  _

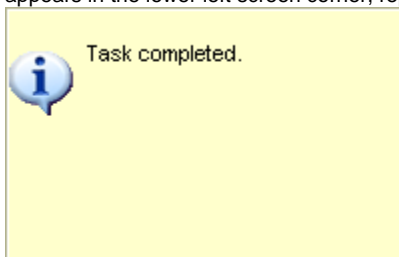
System encountered severe errors in the past 48 hours. This means that at least one system message has been generated with log level ERROR. After all messages with this log level have been acknowledged by the user via the System Monitor (see also *System Monitor*), the icon becomes green again.

_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

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

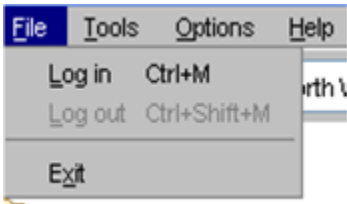
03 Dropdown Menu

- 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
 - What-if Scenario
 - Skill Scores
 - LookUp Table
 - Correlation
 - Calibration
 - Threshold display
 - Other displays
- Options
 - Map
 - Status Bar
 - Current System Time
- Help
 - Contents

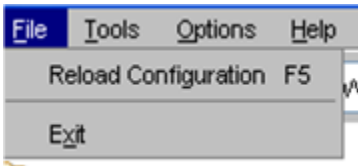
Dropdown Menu

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:

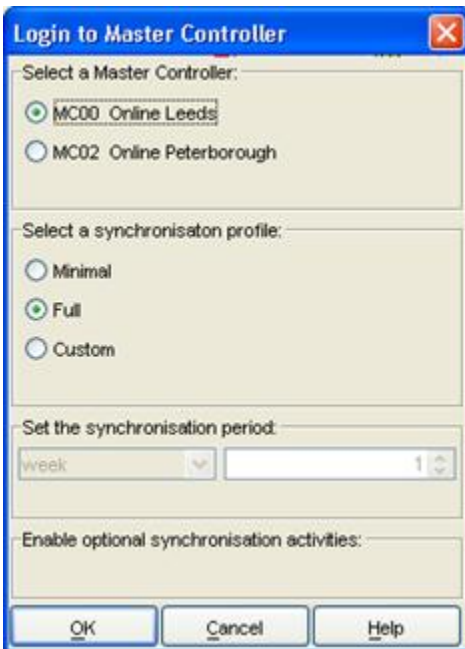


Log in

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:

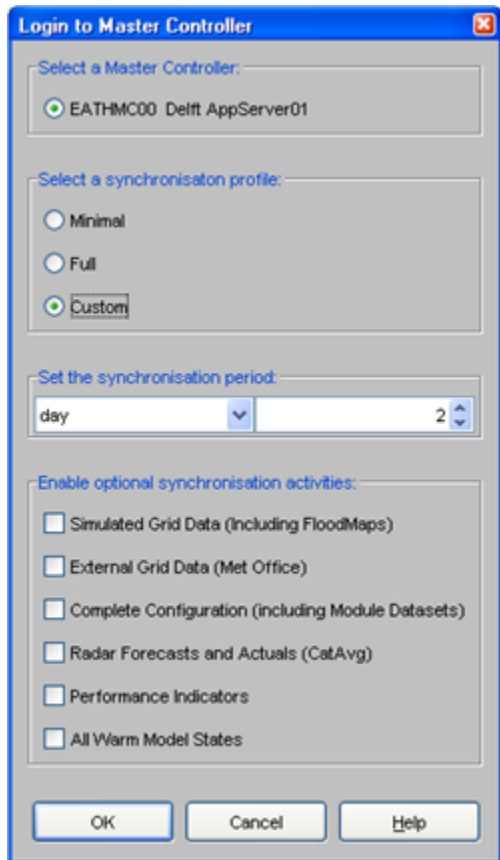
- *Minimal*
This profile synchronises a minimum amount of data required for a forecaster to perform the required tasks. As a default, data is synchronised over the past 2 days and no radar and grid data is transferred to the OC. This profile should be used, when logging in over a dial-in connection.



- *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:

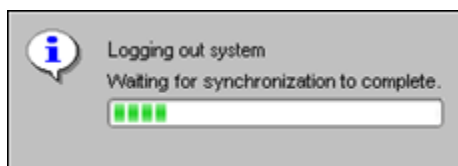
- Simulated Grid Data (e.g. flood maps)
- External Grid data (e.g. radar grids, surge forecast grids)
- Complete configurations (all versions of the configuration files in the database including the module datasets)
- Radar forecasts and actuals (catchment average time series)
- Performance indicators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

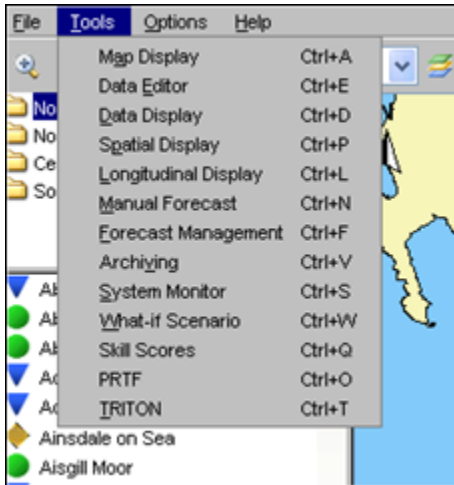
Exit

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*.



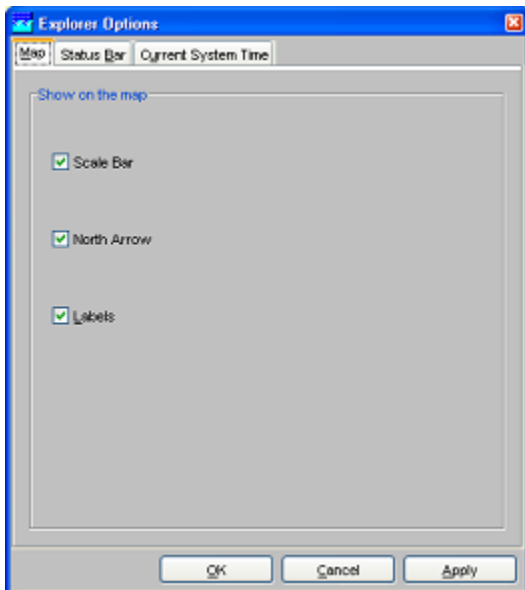
Options

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

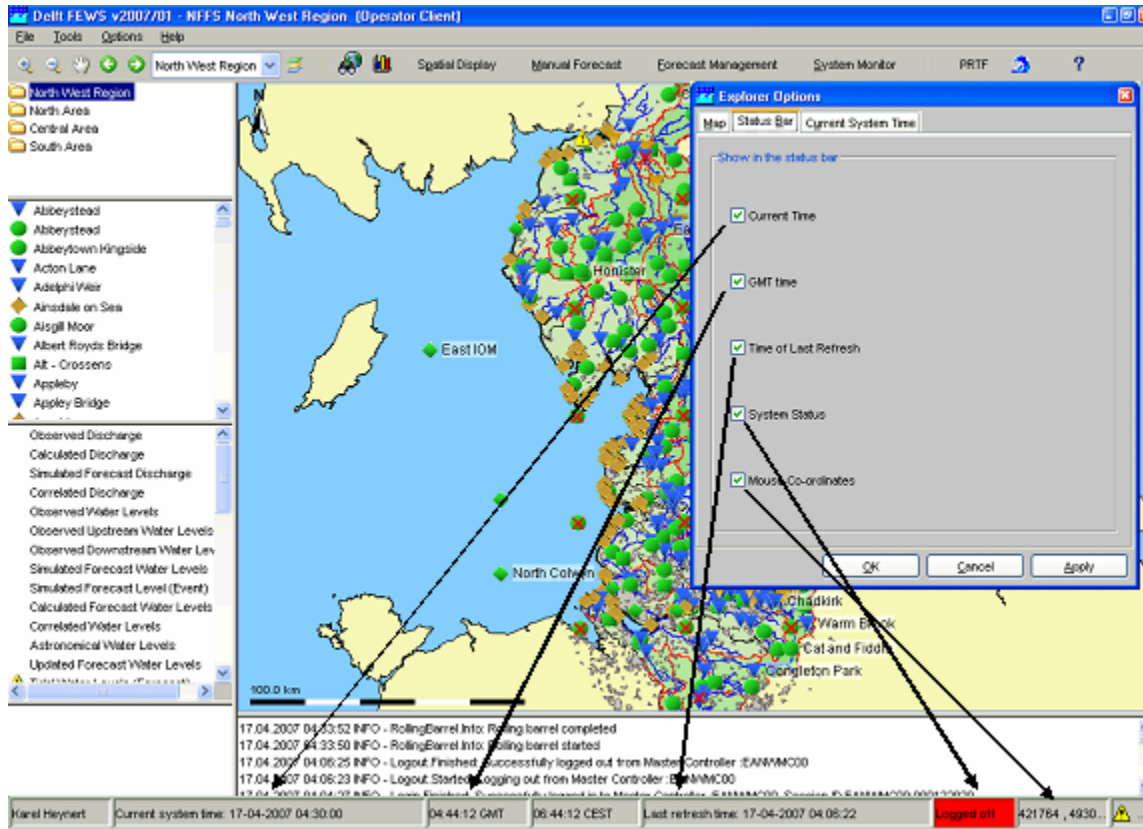
The *Status Bar Tab* allows the user to activate the display on the Status Bar of:

- 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.

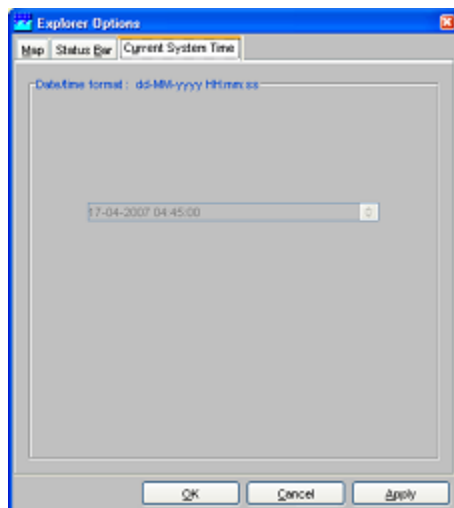
The *system status* indicates in what mode the system is currently operating: online, offline and stand-alone.

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

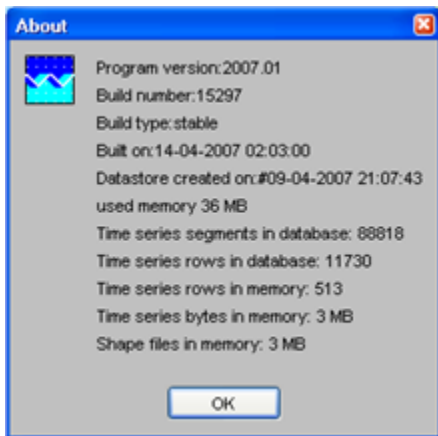
Contents give access to the context sensitive Help information. The On-line HELP provides:

- 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.



04 Data Display and Data Editor

- Data Display and Data Editor
 - Table
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 - Graph
 - Descriptive statistics
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 - Rotate Legend
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 - Show no Thresholds
 - Scale to show relevant Thresholds
 - Scale to show all Thresholds
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- Save As
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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__

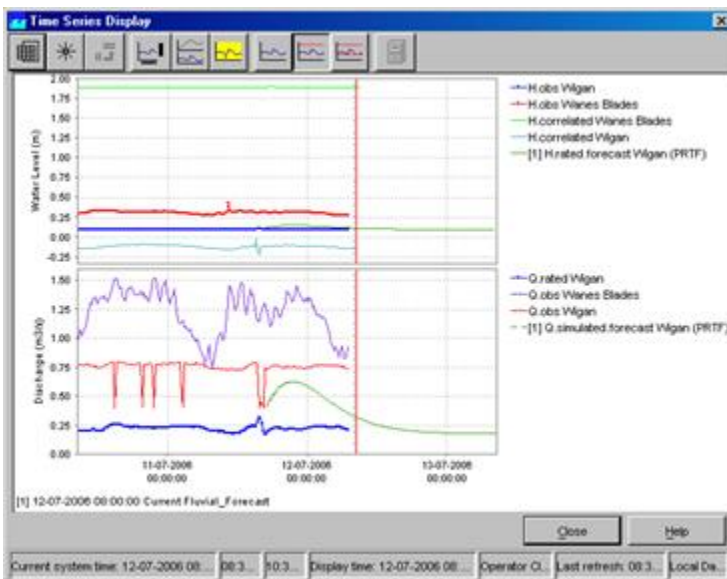
Data is displayed in a table and a graph simultaneously. The splitter between the table and the graph can be moved to modify the display. Select the data series, that should be displayed with help of the List Boxes and/or the Map Display (see also *Filters*).

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.

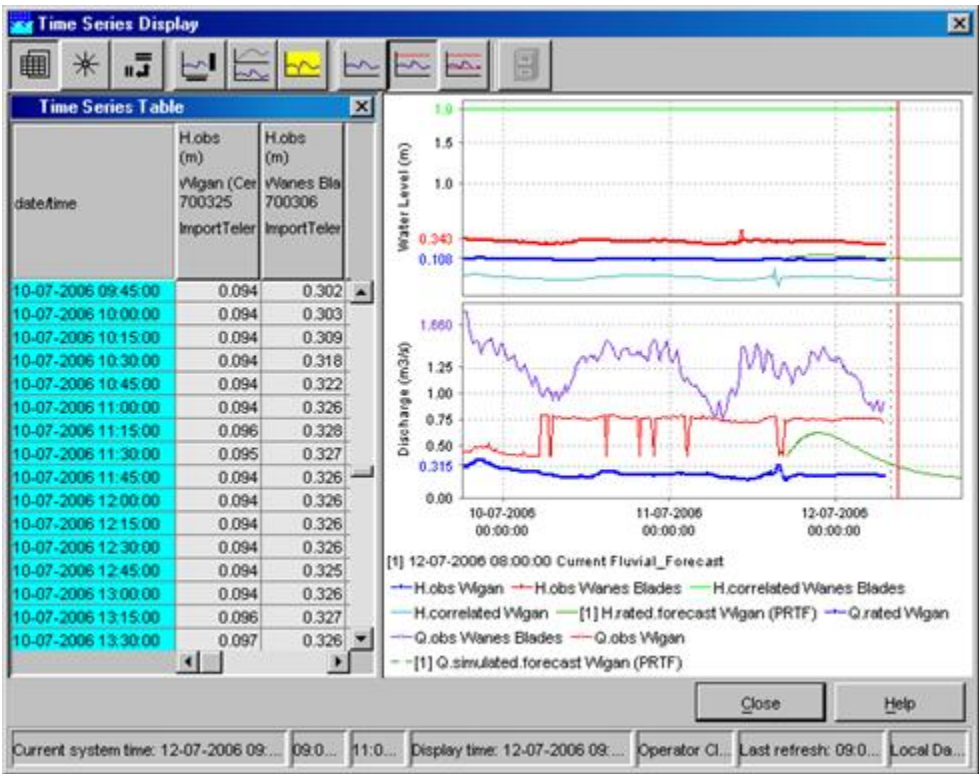


The data in the graph is *updated automatically* in case new data becomes available.

Following buttons are used in the Time Series Display:

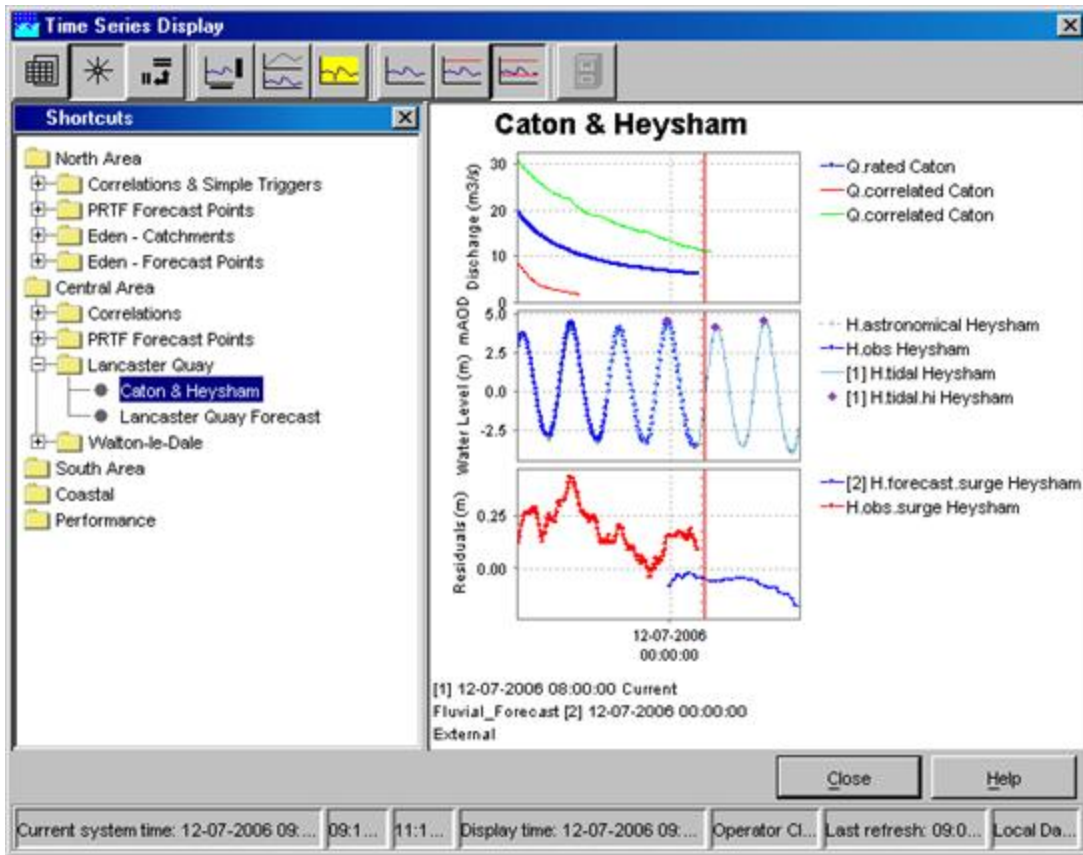


By clicking this button the time series in the graph is also displayed in tabular format. Please note that in case you like to edit data, you have to select the Data Editor from the Tools menu (see section 4.3).



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

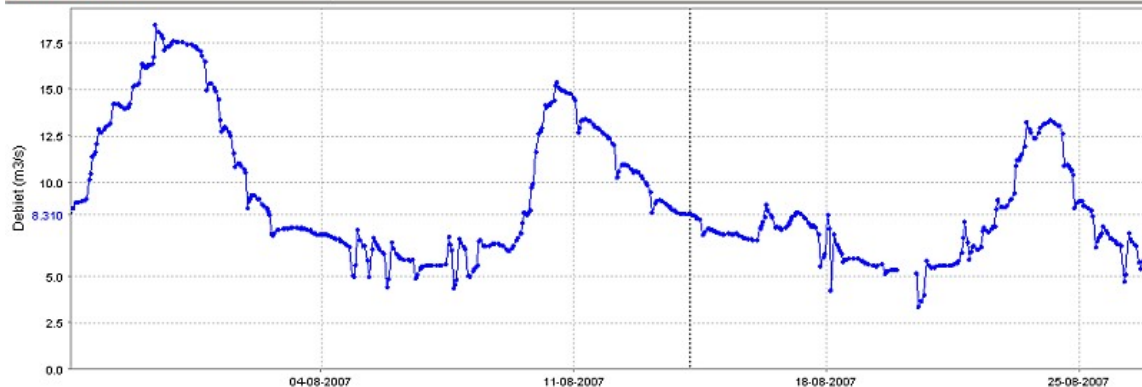
Time series info	
Location id	Please select a column header in the time series table to display descriptive information.
Location name	
Parameter id	
Parameter name	
Module instance	
Start time	
End time	

dateTime	Berekend debi (m3/s)	0021 - Sint Mic 0021	Debietformule		
14-08-2007 00:00:00	8.330				
14-08-2007 01:00:00	8.295				
14-08-2007 02:00:00	8.295				
14-08-2007 03:00:00	8.295				
14-08-2007 04:00:00	8.295				
14-08-2007 05:00:00	8.310				
14-08-2007 06:00:00	8.310				
14-08-2007 07:00:00	8.234				
14-08-2007 08:00:00	8.212				
14-08-2007 09:00:00	8.192				
14-08-2007 10:00:00	8.100				
14-08-2007 11:00:00	8.100				
14-08-2007 12:00:00	8.040				
14-08-2007 13:00:00	7.332				
14-08-2007 14:00:00	7.186				
14-08-2007 15:00:00	7.361				
14-08-2007 16:00:00	7.419				
14-08-2007 17:00:00	7.498				
14-08-2007 18:00:00	7.498				
14-08-2007 19:00:00	7.439				
14-08-2007 20:00:00	7.469				
14-08-2007 21:00:00	7.409				
14-08-2007 22:00:00	7.379				
14-08-2007 23:00:00	7.322				
15-08-2007 00:00:00	7.293				
15-08-2007 01:00:00	7.263				

Descriptive statistics	
Mean	9.059
Min	3.332 20-08-2007 13:00:00
Max	18.43 30-07-2007 10:00:00
Sum	6,405.064
Standard deviation	3.48
Percentile (exceedence) 5%	16.421
Percentile (exceedence) 25%	11.361
Percentile (exceedence) 50%	7.608
Percentile (exceedence) 75%	6.57
Percentile (exceedence) 95%	5.318
Percentile (non exceedence) 10%	5.557
Percentile (non exceedence) 20%	6.188
Percentile (non exceedence) 50%	7.608
Percentile (non exceedence) 80%	12.742
Percentile (non exceedence) 90%	14.642

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	28-07-2007 01:00:00
End time	27-08-2007 02:00:00

Data quality	
Nr. of values	722
Nr. of completed	15
Nr. of corrected	0
Nr. of reliables	707
Nr. of doubtfuls	0



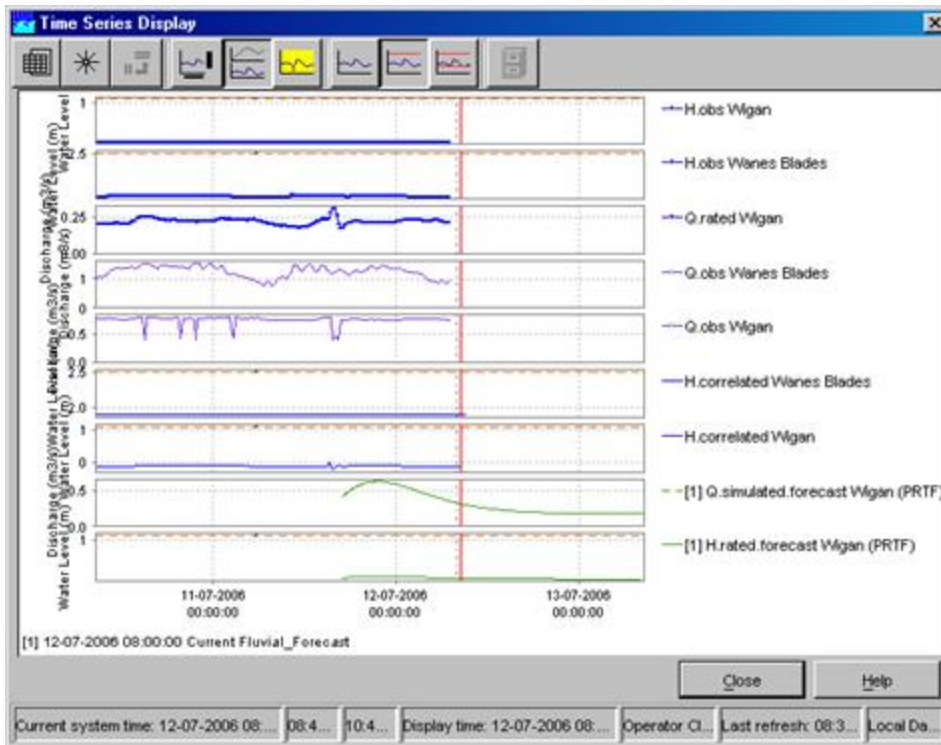
Rotate Splitter

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.



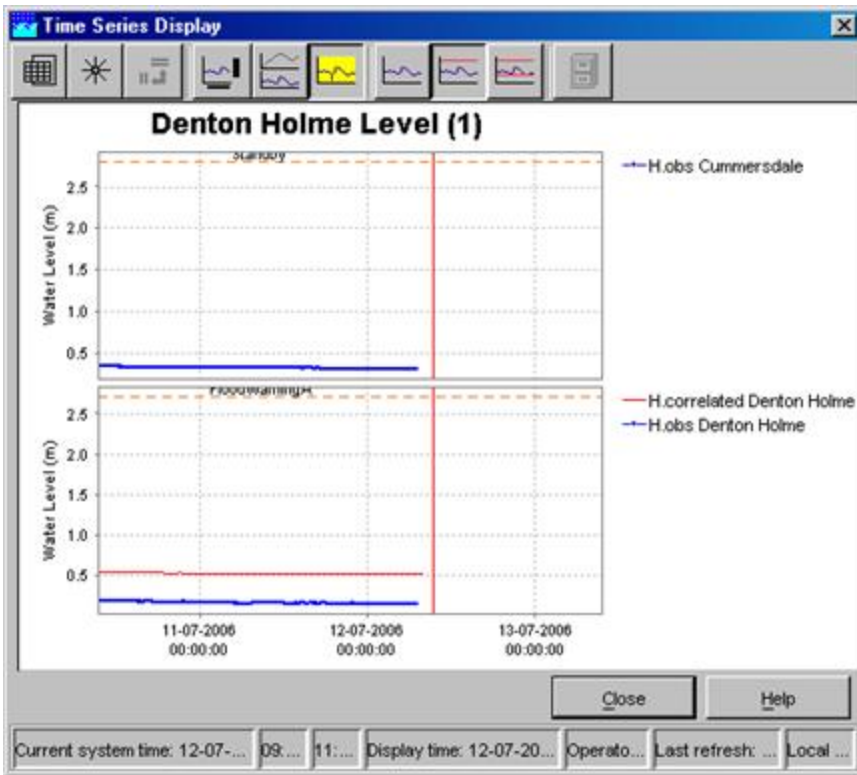
Show no Thresholds

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



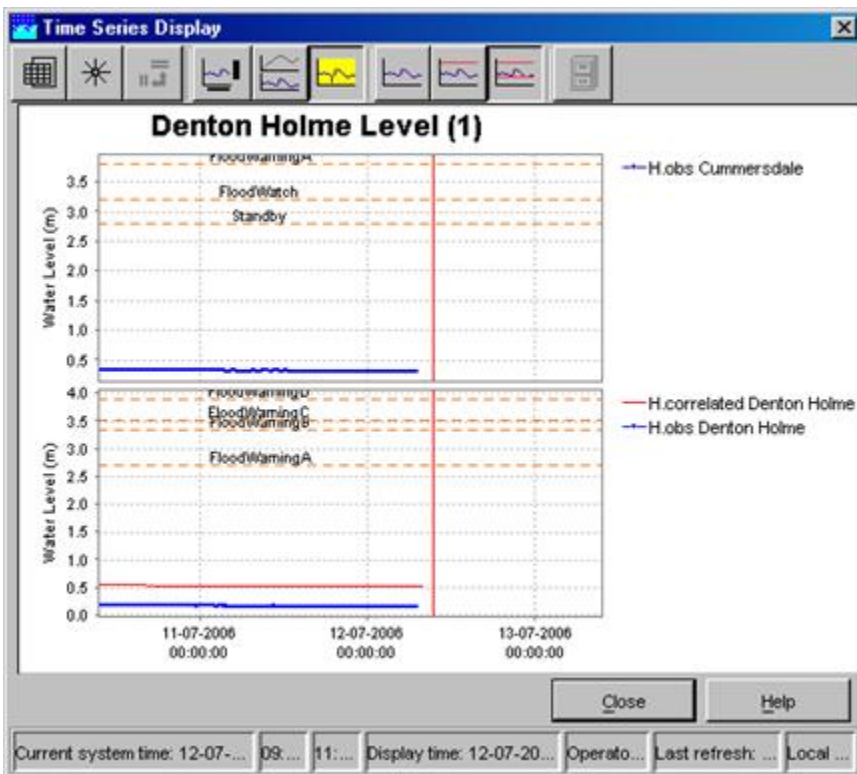
Scale to show relevant Thresholds

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.





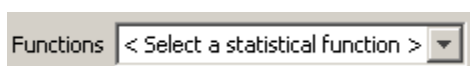
Show data labels

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 Functions

If switched on in the [configuration](#). This functionality works independently from the descriptive statistics table.

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

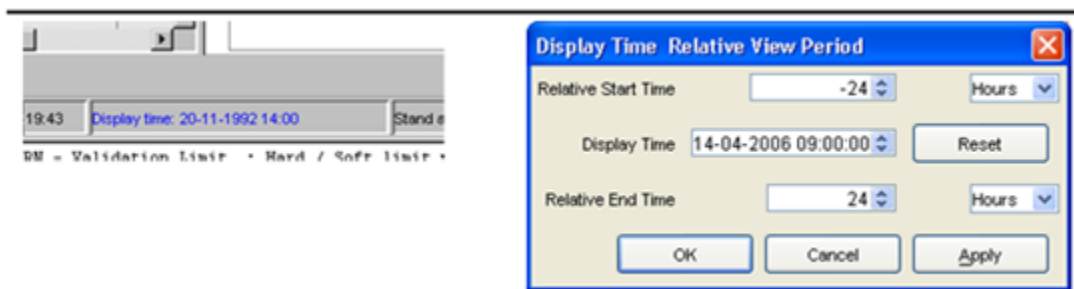


Historical Events

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.

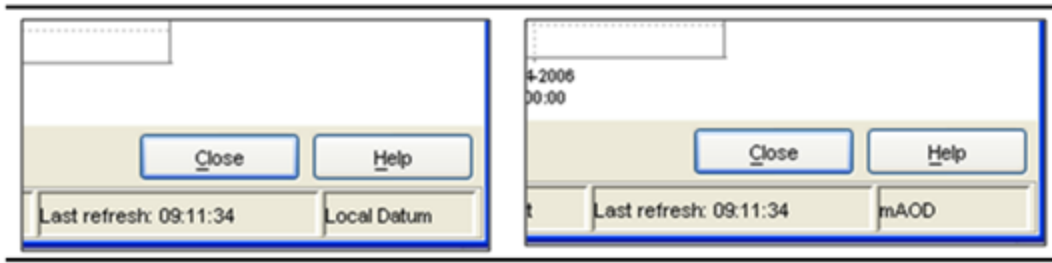
Display time

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*.

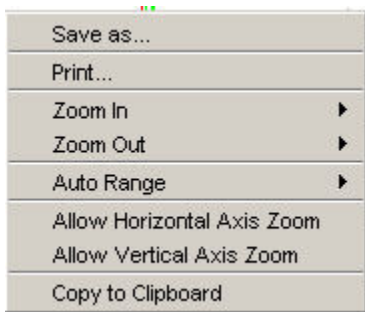


Navigating in Graphs

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

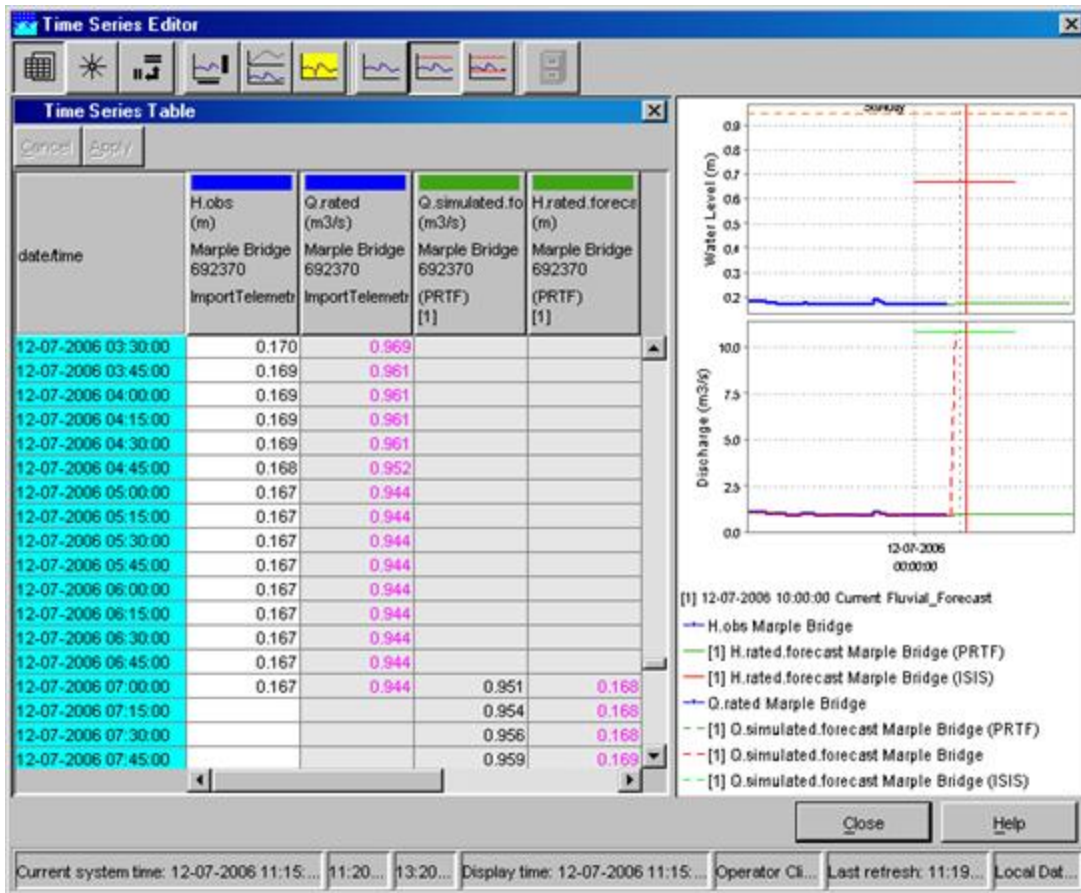
You can select to allow for zooming in and out along one of the axis with this option.

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~)

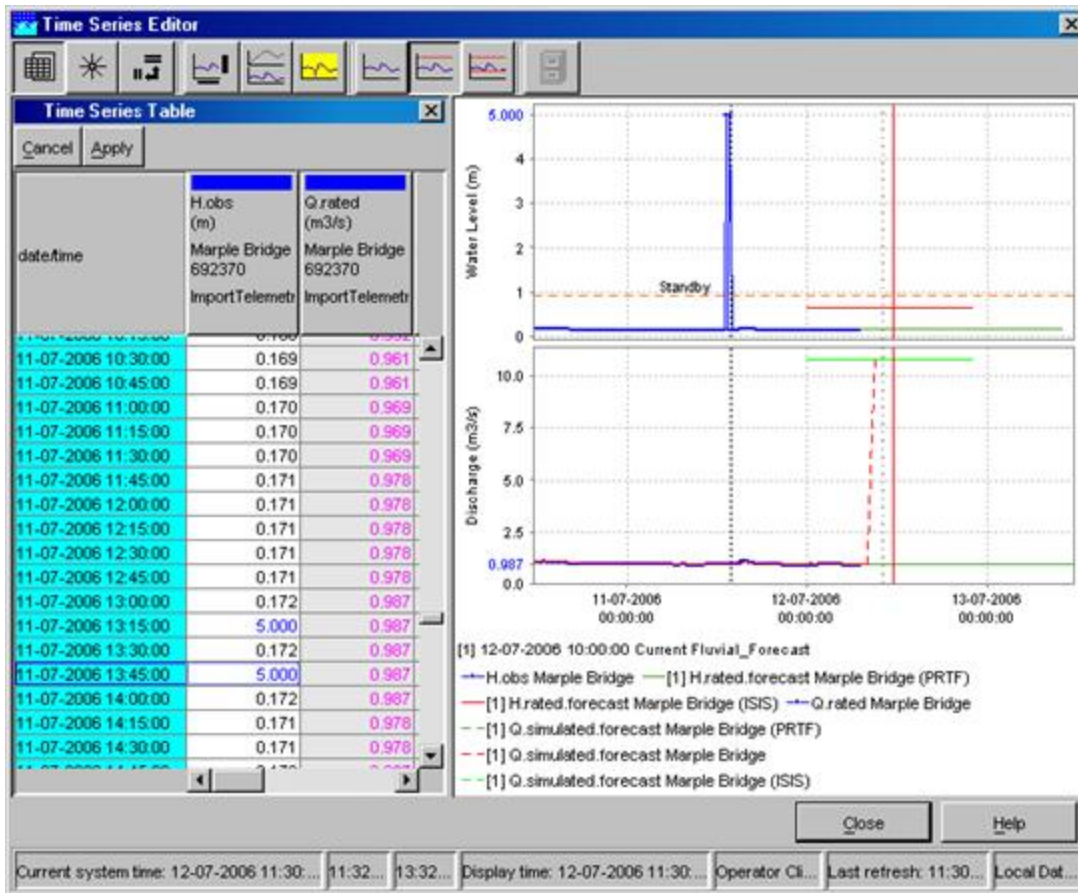
For the data columns the background colour is used to indicate the quality of the data, identified by the data flags set of the Validation utility.

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.

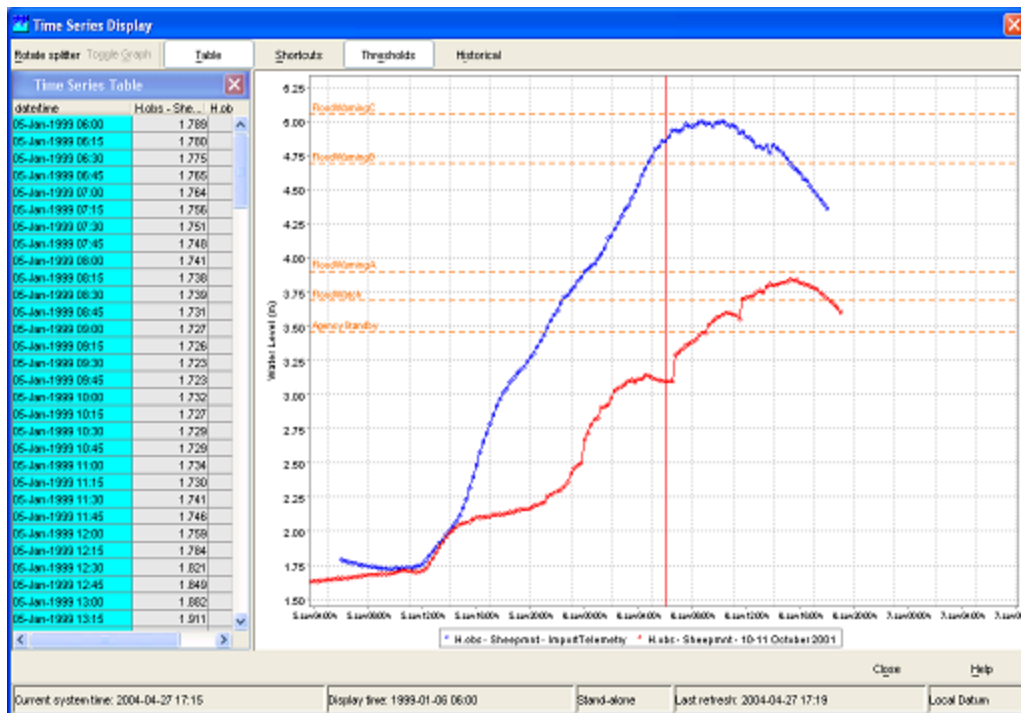
Editing Data

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

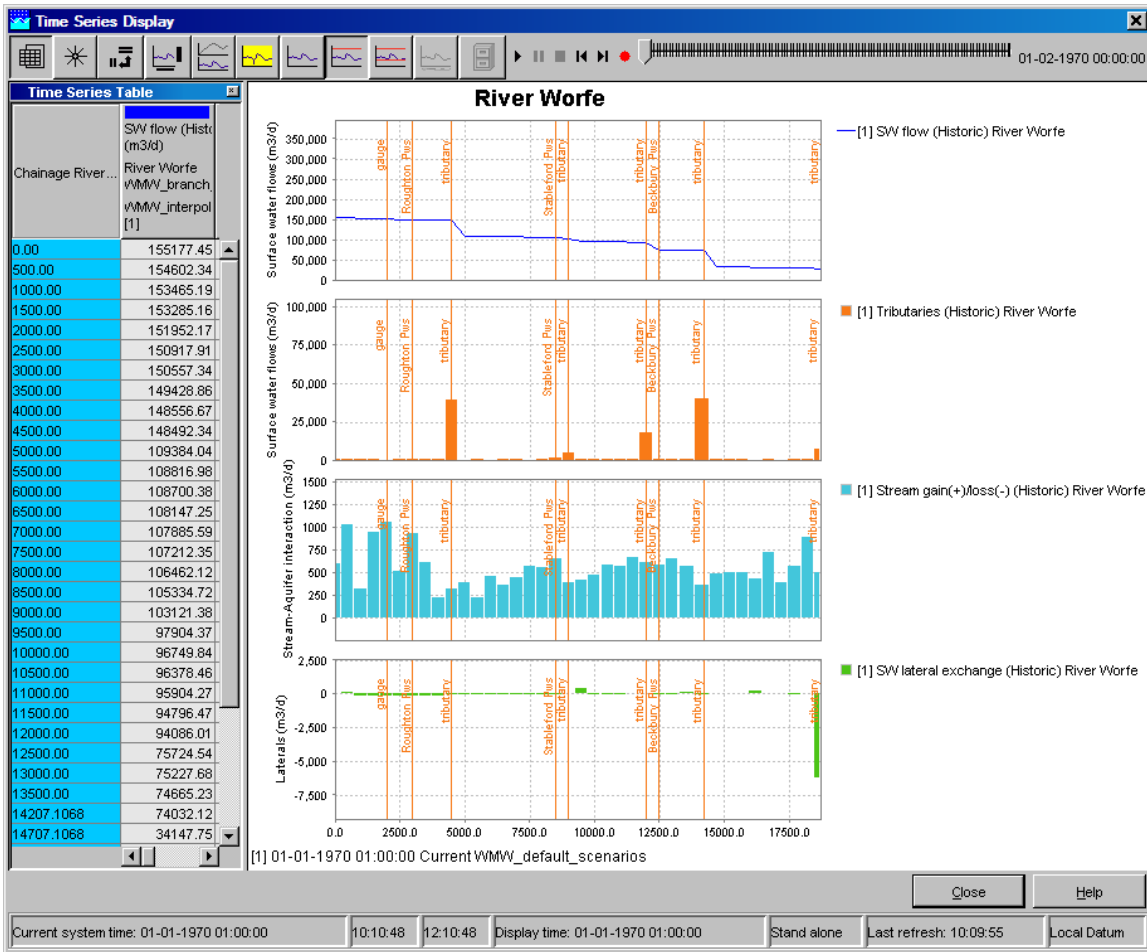


A new (red) line will be added to the chart. This event line can now be shifted forwards and backwards in time using the "+" and "-" keys on your keyboard. To activate this shift procedure press the **[Historic Events]** button in the Chart Display and select Shift Time.

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, either step by step or animated, via the time control toolbar, described in the Spatial display. both the graph and table will change over time as they shown data along the profile.

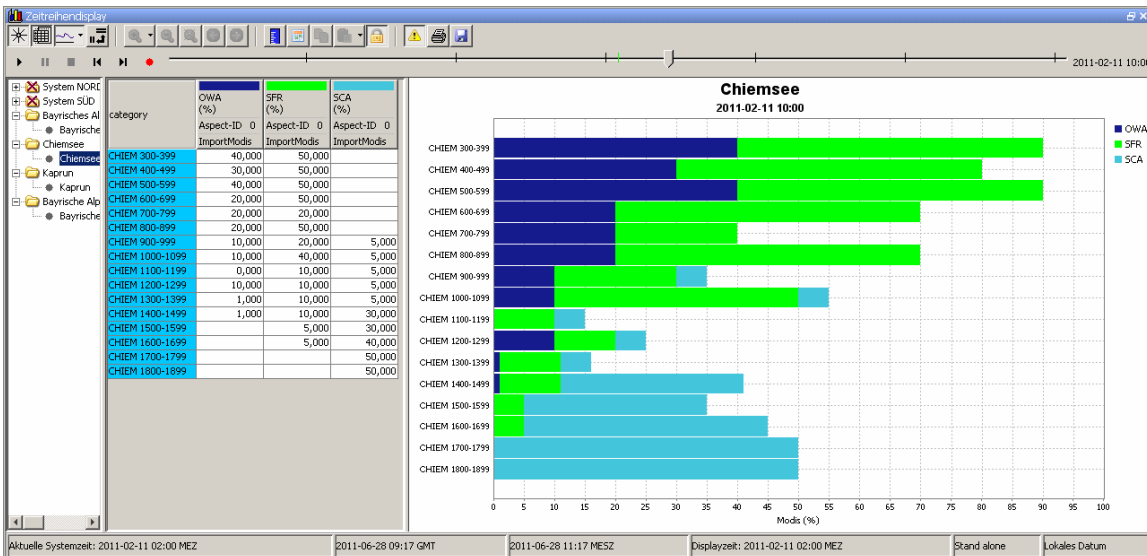


Category plot

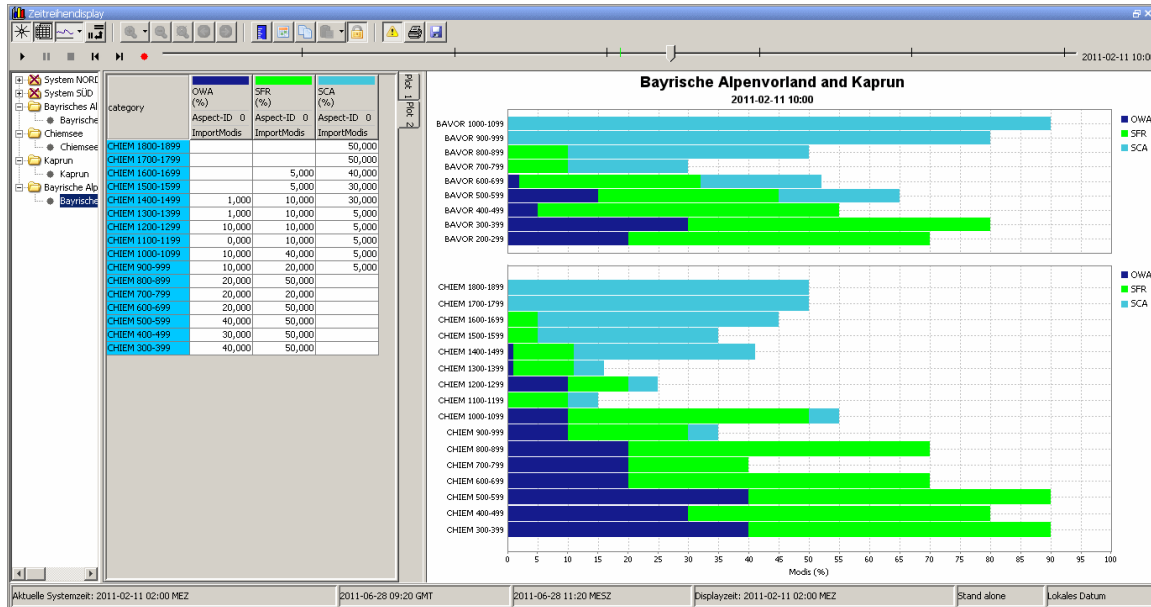
⚠ This graph type is available in DELFT-FEWS versions 2011.01 and higher.

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

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



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



Configuration

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

```
<plot id="MODISCategory1Plot">
  <subplot>

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

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

  </subplot>
  <plotViewerId>category</plotViewerId>
</plot>
```

Restrictions

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

Editing Data

- [Table edit functionality](#)
- [Chart edit functionality](#)

Table edit functionality

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




Select All	Ctrl+A
Select Column	Ctrl+Space
Select Row	Shift+Space
Expand Selection	Ctrl+E
Save As...	Ctrl+S
Save as special...	Ctrl+P
Edit Value	F2
 Cut	Ctrl+X
 Copy	Ctrl+C
Copy Values Only	Ctrl+Shift+C
Copy Reliable Values Only	
Copy Reliable and Doubtful Values Only	
Copy Times Only	
Copy Headers Only	
 Paste	Ctrl+V
Clear	Delete
Clear Doubtfuls	
Clear Unreliables	
Fill Missing Data	▶
Shift Values in Time	Ctrl+T
Apply Transformation	Ctrl+F
Apply Calibration	Ctrl+M
Add Comment	Ctrl+Insert
Clear Comments	
Mark	▶
Show History...	Ctrl+H

figure 1: Timeseries edit options

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

figure 1.1: Timeseries edit option - submenu Fill Missing Data

Reliable	Ctrl+R
Doubtful	Ctrl+D
Unreliable	Ctrl+U
Dried	Ctrl+Y
Inundated	Ctrl+N
Ice	Ctrl+I
Remove Manual Marks	Shift+Delete

figure 1.2: Timeseries edit option - submenu Mark

The options have the following meaning...

[Select All]	Select all data displayed in the editor
[Select Column]	Select all data in the column in which the cursor is placed
[Select Row]	Select all data in the row in which the cursor is placed
[Save As]	Save selected timeseries to file of format: PI xml, GIN xml, csv, Dutch csv, iBever csv, Hymos transfer DB 4.50 mdb or Hymos transfer DB 4.03 mdb
[Save as special]	Filter selected timeseries by reliability and status and save to file of format: PI xml, GIN xml, csv, Dutch csv, iBever csv, Hymos transfer DB 4.50 mdb or Hymos transfer DB 4.03 mdb (see also Export Timeseries from FEWS Explorer)
[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
[Shift Values in Time]	Moves the selected values in time
[Apply Transformation]	Change the selected values using a regular expression
[Apply Calibration]	Undo trend deviance of the selected values using a calibration timeseries

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




Save as special...	Ctrl+P
Edit Value	F2
Edit Time	Shift+F2
 Insert Time	Insert
 Remove Time	Ctrl+Backspace
 Cut	Ctrl+X

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

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

Chart edit functionality

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

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

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

A	B	C
Neerslaghoeve (mm)	Neerslaghoeve (mm)	Neerslaghoeve (mm)
0306-AME-01	0306-AME-02	0306-AME-03
r0000518	r0000519	r0002336
RH_RbgDisAgg	RH_RbgDisAgg	RH_RbgDisAgg

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

figure 3: Selected table header and chart legend

Apply Calibration

With this option a trend deviance can be undone using a calibration timeseries.

The series to calibrate and the series to calibrate by can be choosen in the popup , see figure 1.1

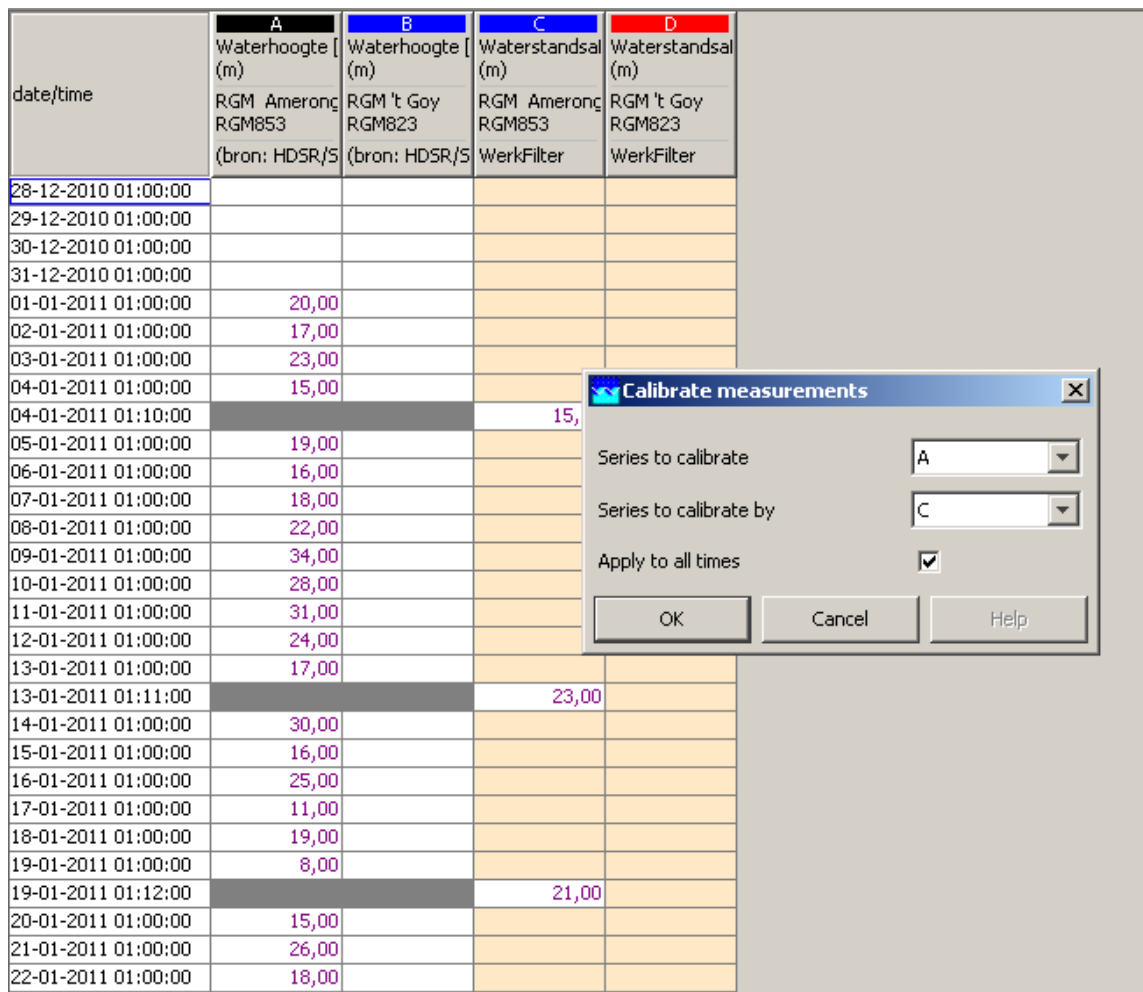


Figure 1.1: Calibrate timeseries A by timeseries C

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

Column ID's can be found in the coloured area of the column headers .

Choose option "Apply to all times" if the modification should be done for the whole period visible in the table, without selecting all rows in the table.

Note that there is always one time selected in the the table, it is the first time by default.

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

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

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

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

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

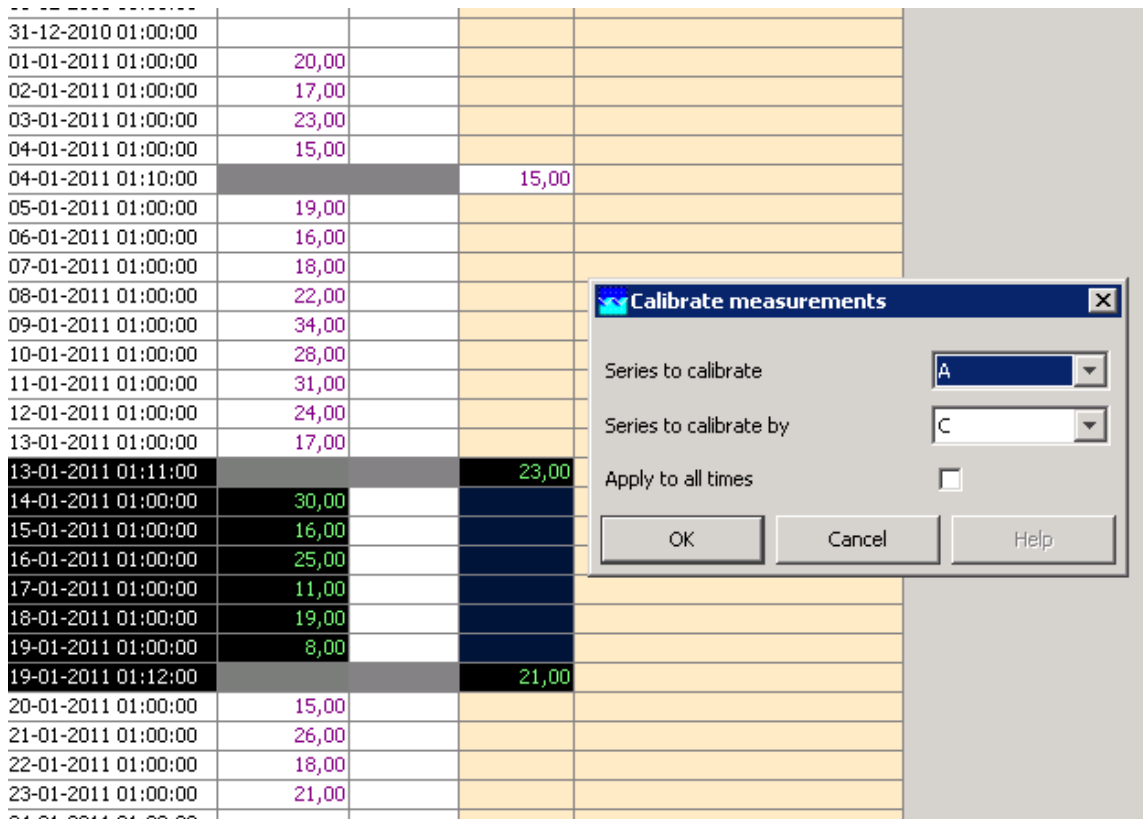


Figure 2.1: Calibrate values in selected period

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

Figure 2.2: Result of calibration in selected period

Apply Transformation

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

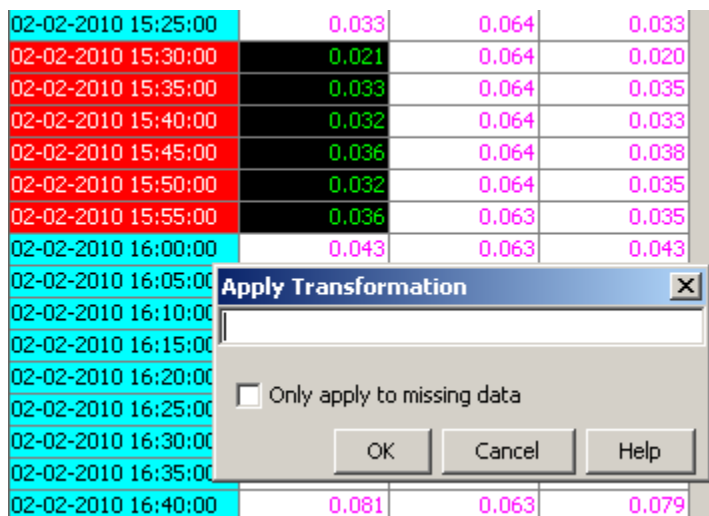


figure 1: Apply Transformation window

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

A regular expression can be composed using the following elements:

VARIABLES

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

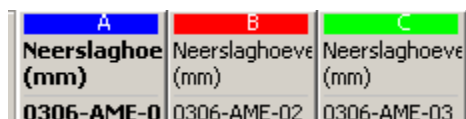


figure 2: Alphabetical column indices

OPERATORS

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

FUNCTIONS

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

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

Shift Values in Time

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

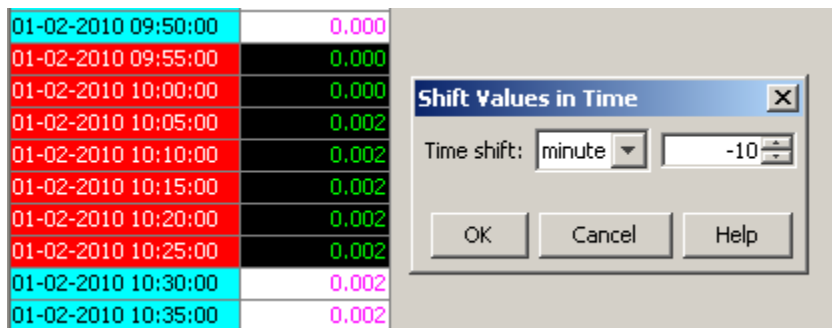


figure 1: Shift Values in Time window (back 10 mins)

This operation performs the following actions on the selected timeseries:

Equidistant timeseries

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

Non-equidistant timeseries

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

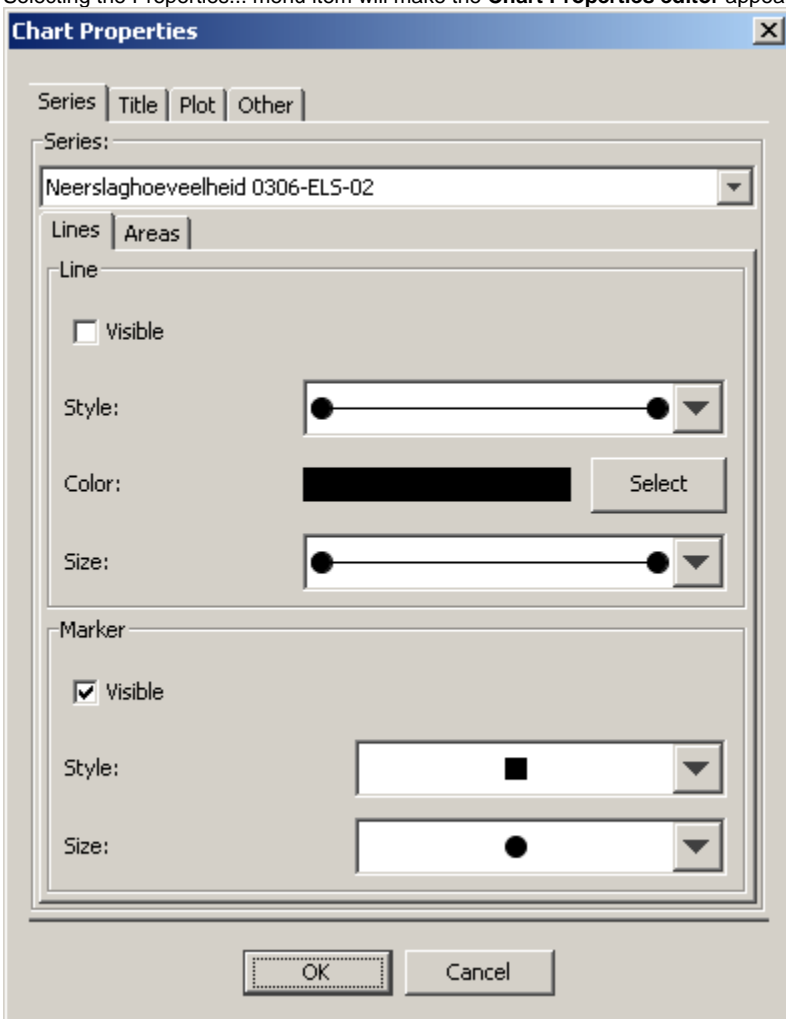
Changing display properties

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



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

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



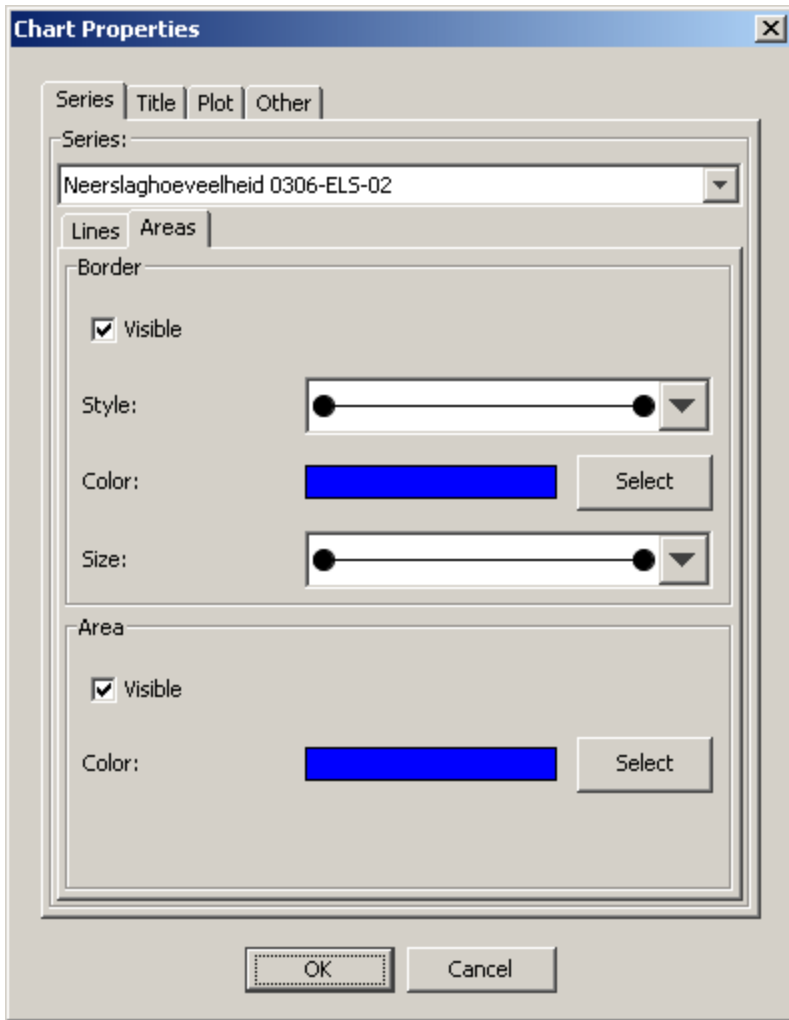


figure 2: Chart Properties editor; left - Lines tab, right - Areas tab

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

Lines tab

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

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

Areas tab

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

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

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

Interactively modifying display colours

Modifying display colours from within the client.

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

Map display

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

Grid display

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

Timeseries display

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

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

The F12 menu (Timeseries Display)

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

Statistical functions

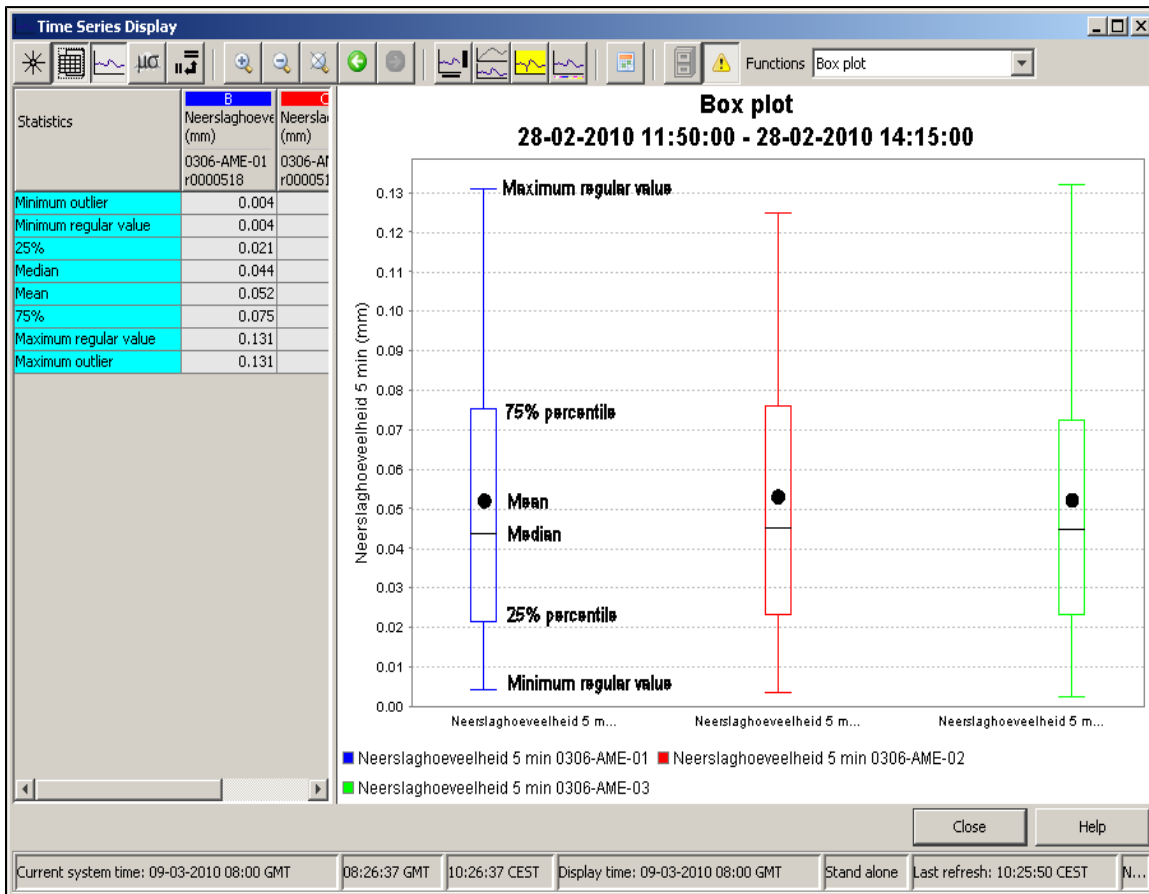
Statistical functions

- Statistical functions
 - Box plot

- Calendar aggregation
- Central moving average
- Display lows below value
- Display peaks above value
- Duration curve
- Frequency distribution
- Gaussian curve
- Scatter plot

Box plot

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



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

Statistical variables

Minimum outlier: minimum outlier value for selection.

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

25%: 25th percentile

Median: 50th percentile

Mean: average value for selection

75%: 75th percentile

Maximum regular value: maximum value for selection that is not defined as an outlier. Also known as the Whiskers

Maximum regular value: maximum value for selection that is not defined as an outlier. Also known as the Whiskers

Maximum outlier: maximum outlier value for selection.

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

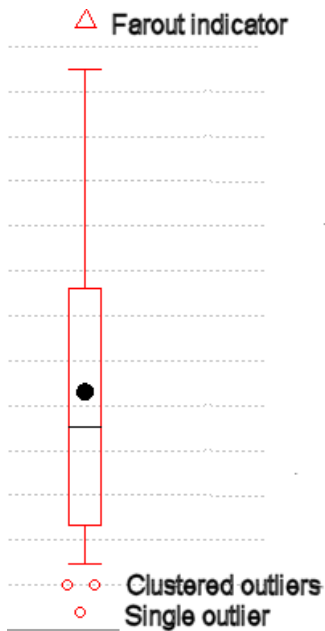
Far-out indicator: indicates that there are values that lie outside the plotted range of the axis.

Single outlier: a single outlier value.

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

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

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

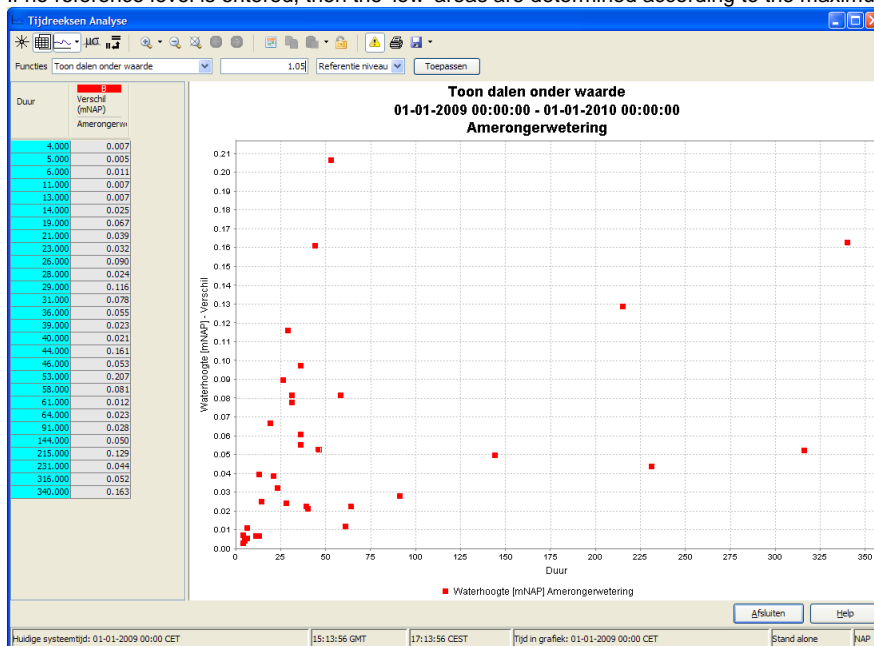


Calendar aggregation

Central moving average

Display lows below value

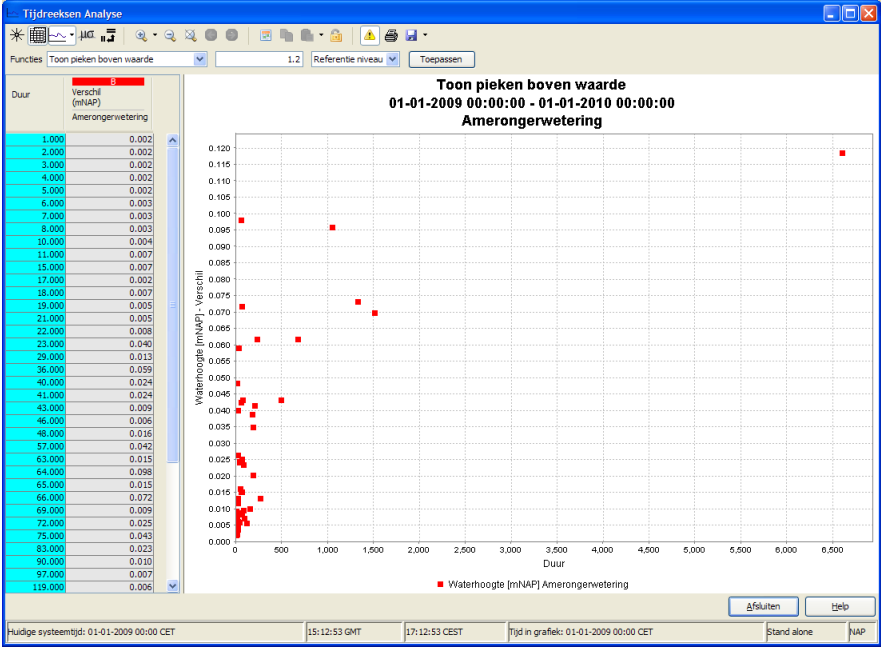
A scatterplot is made where the x-axis shows the duration of a 'low' (=values within this low-area are all beneath the given reference level), the y-axis shows the normalized difference between the parameter value and the reference level. The reference level can be altered by entering a value into the input field associated with this statistical function. After clicking 'Apply' the result time series array is returned. If no reference level is entered, then the 'low' areas are determined according to the maximum available value of the input time series array.



Display peaks above value

A scatterplot is made where the x-axis shows the duration of a 'peak' (=values within this peak-area are all above the given reference level), the y-axis shows the normalized difference between the parameter value and the reference level. The reference level can be altered by entering a

value into the input field associated with this statistical function. After clicking 'Apply' the result time series array is returned. If no reference level is entered, then the 'peak' areas are determined according to the minimum available value of the input time series array.

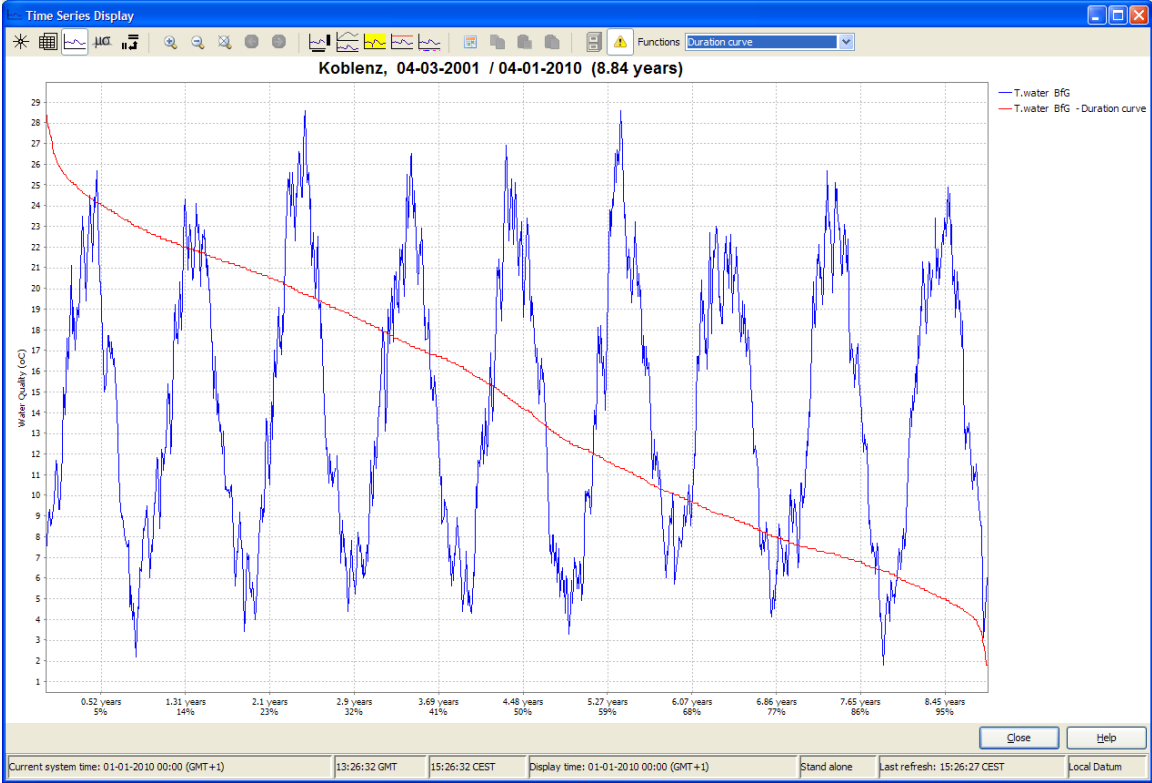


Duration curve

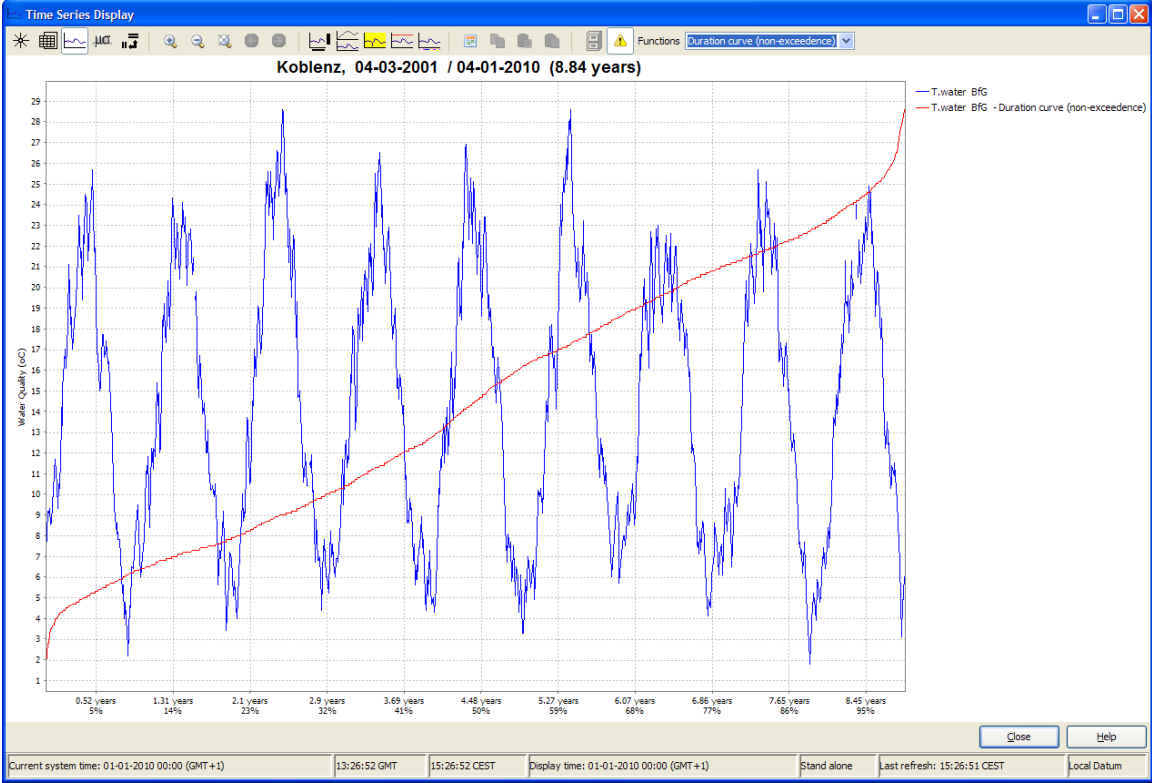
A convenient way to show the variation of hydrological quantities through time may be done by means of duration curves. For the selected time period the values of the selected quantity are sorted descending (durationExceedence) or ascending (durationNonExceedence). When the duration curve is plotted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

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

An example of the durationExceedence plot is given here:

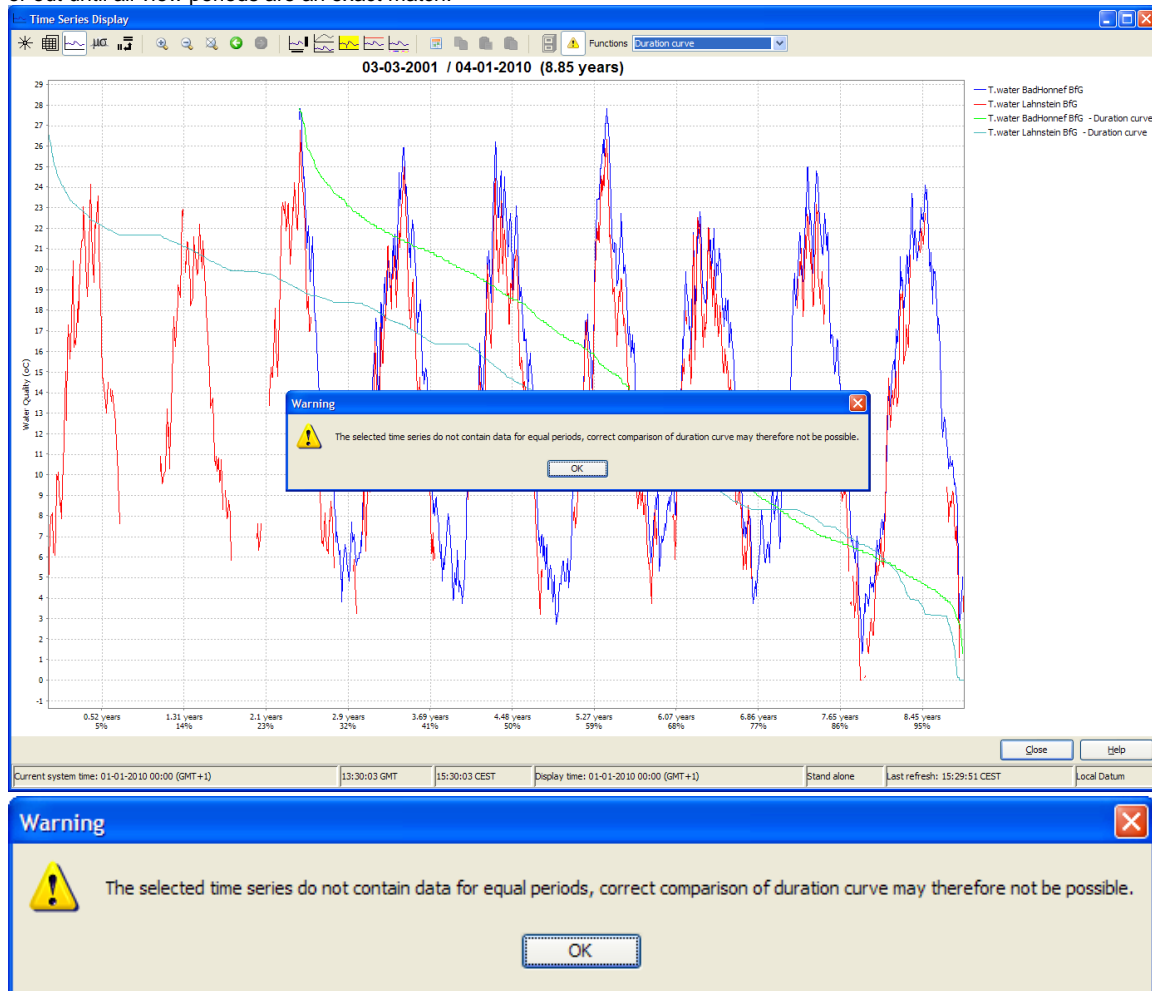


An example of the durationNonExceedence plot is given here:



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

or out until all view periods are an exact match.



Frequency distribution

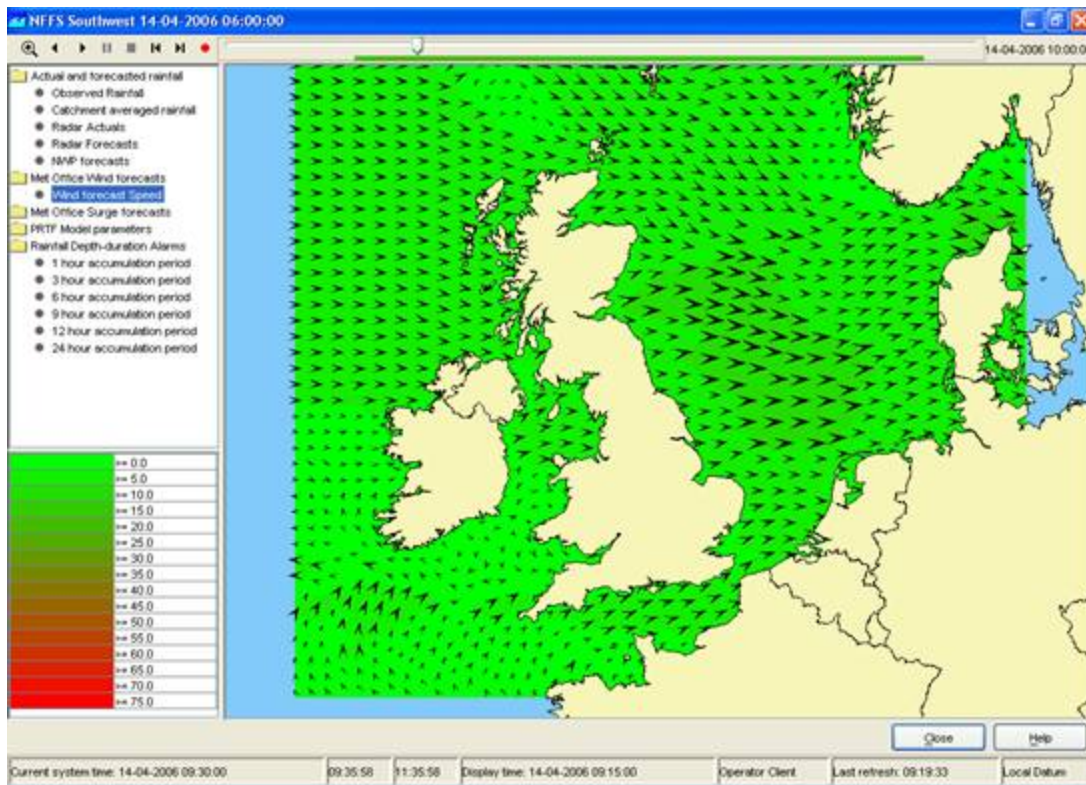
Gaussian curve

Scatter plot

05 Spatial Display

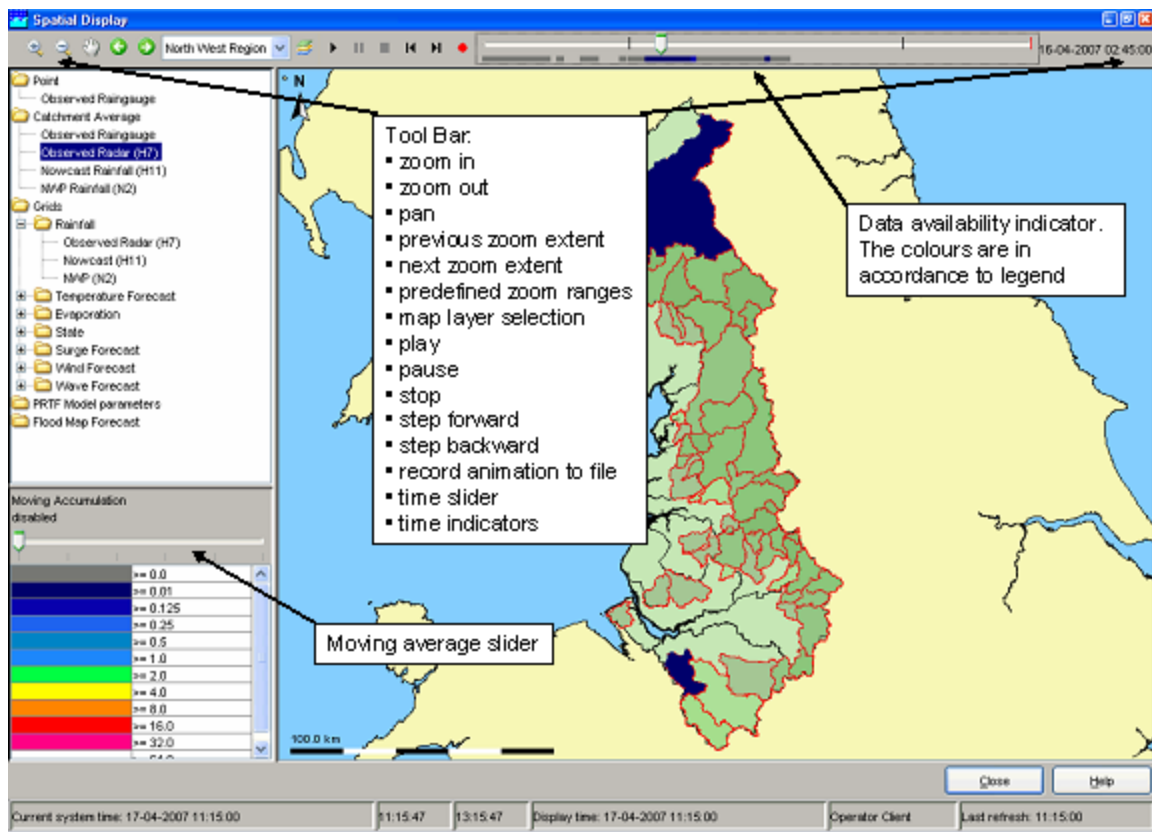
Spatial Display

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



The spatial display consists of following components:

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



Grid display selection filters

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

Control Toolbar

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

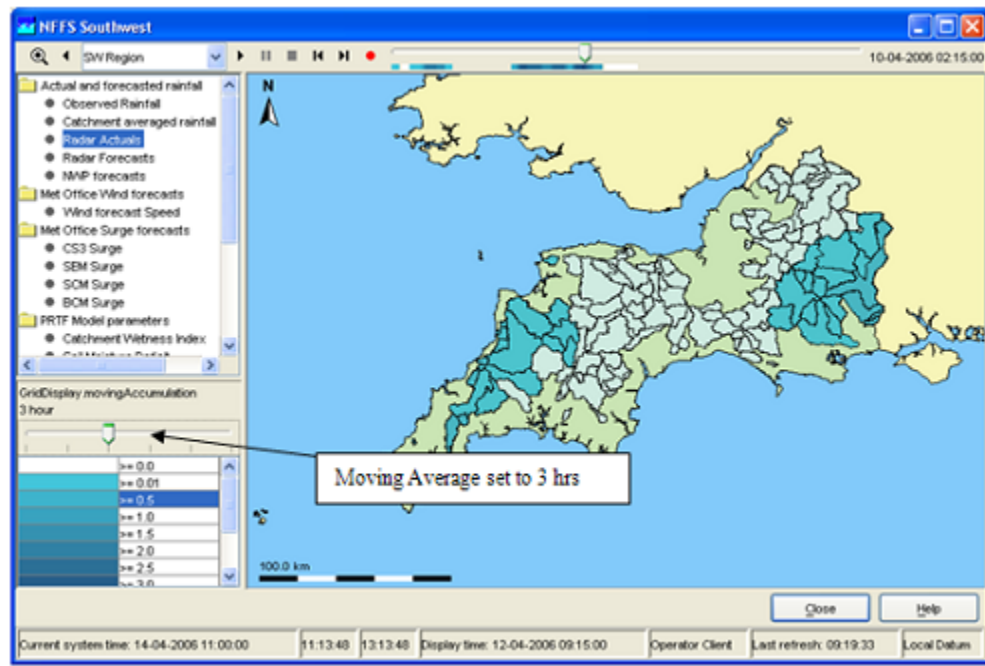
Button	Description
	Play. Starts continuous play mode. The slider will indicate the time slice being shown.
	Pause. Stops continuous play mode. The time slider remains at the time displayed at the moment.
	Stop. Stops continuous play mode. The time reverts back to the start time.
	Step backwards. Moves the time slider back one timestep.
	Step forwards. Moves the time slider forwards one timestep.
	Record. Creates an AVI or animated gif movie file. The avi format is used by default unless the filename ends with '.gif'. After opening the file, the display will start playing from the current time position, until the stop button is clicked.
Time slider	The time slider can be dragged to specific time slice.
Data availability	The data availability indicator provides a visual 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.

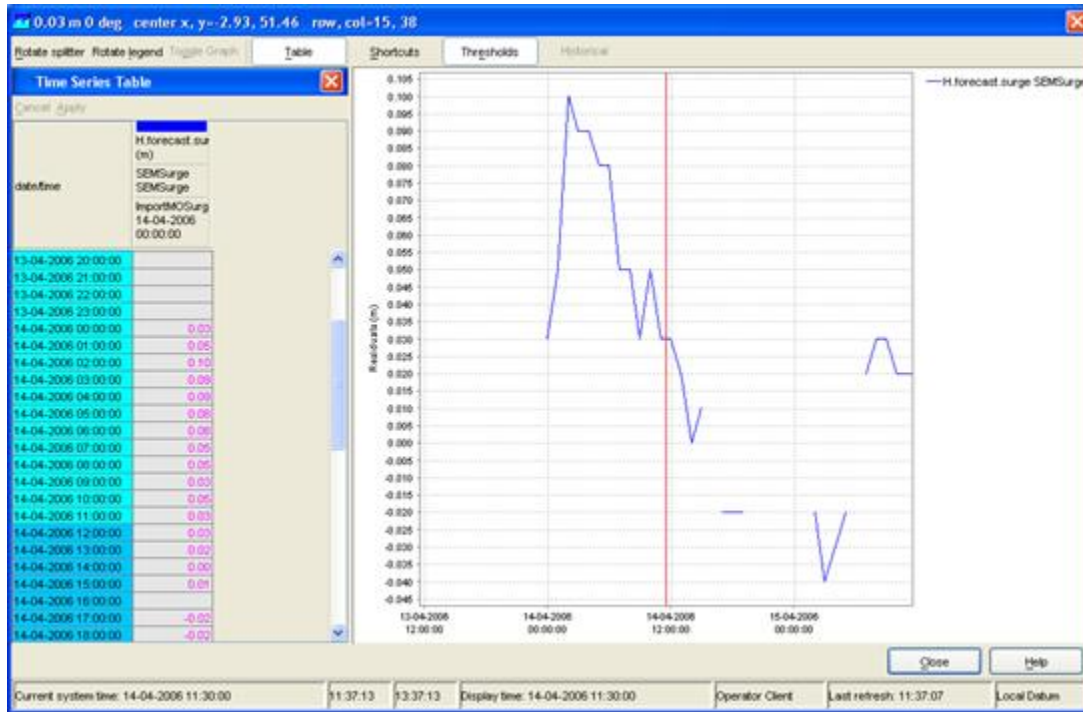
To extract a different scalar time series double-click on another point of interest. This will draw a new dot and extract a scalar time series for that point. Please be aware that when extracting a scalar time series from a data point in the display, then the dot drawn on top of the data point has a 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:

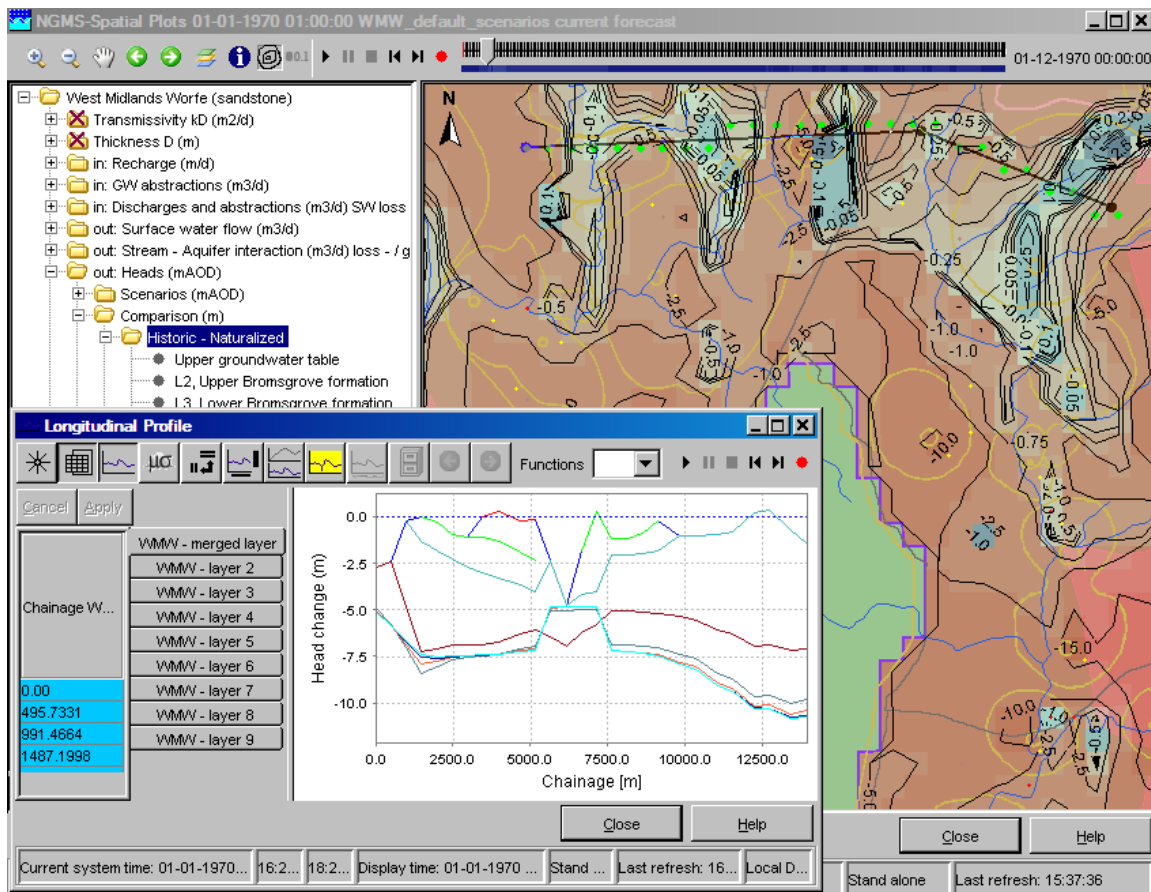
Even more essential than for scalars, it is wise to pause the grid animation when dragging a cross section to be shown.

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):

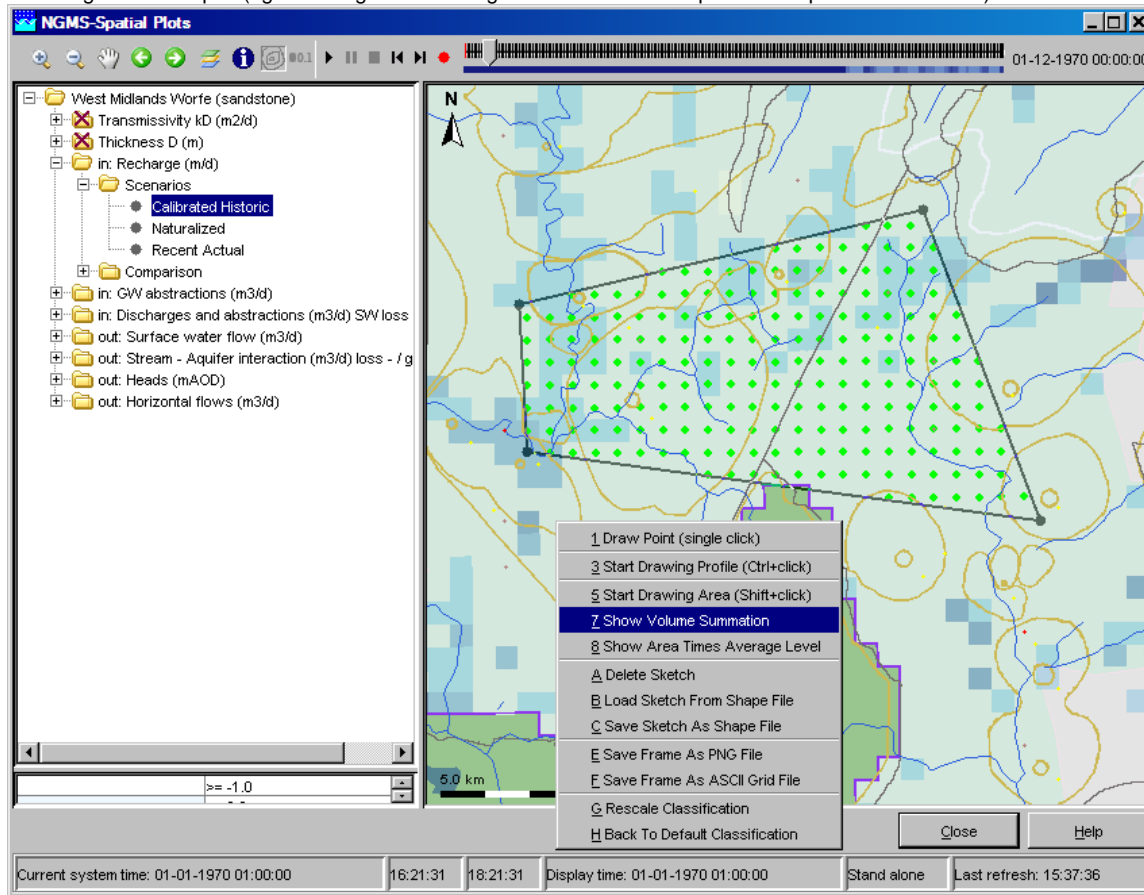
- For dimensions L3/T (e.g. flow in m3/s), L3 (e.g. volume in m3) and 'amount of substance' the calculation will be 'volume summation'. This calculates the sum of the values inside the area. This uses all grid cells that are (partially) inside the area. The value of each grid cell is weighted using the 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 than 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.

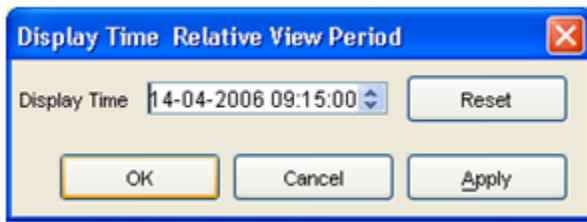
Note:

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

- 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.

Manual Forecast

Workflow

Fluvial Forecast

1:Info

What-if scenario

None

2:Info

Forecast description

Scheduler options

☐ Single forecast (dd-MM-yyyy HH:mm:ss GMT)

TO

15-05-2007 21:30:00

☒ Scheduled forecast

Start time

15-05-2007 21:30:00

End time

15-05-2007 21:30:00

Interval

day

1

Shift TO

day

0

☐ Approve

Priority

☐ High

☒ Normal

State selection

☐ Select initial state

☒ Cold state

Type

Cold States(Default)

Relative start time

day

1

☐ Warm state

Search interval

Time unit

day

Start-end time

1

2

Forecast length

☒ Default

☐ User defined

day

1

Run

Close

Help

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 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

- 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').

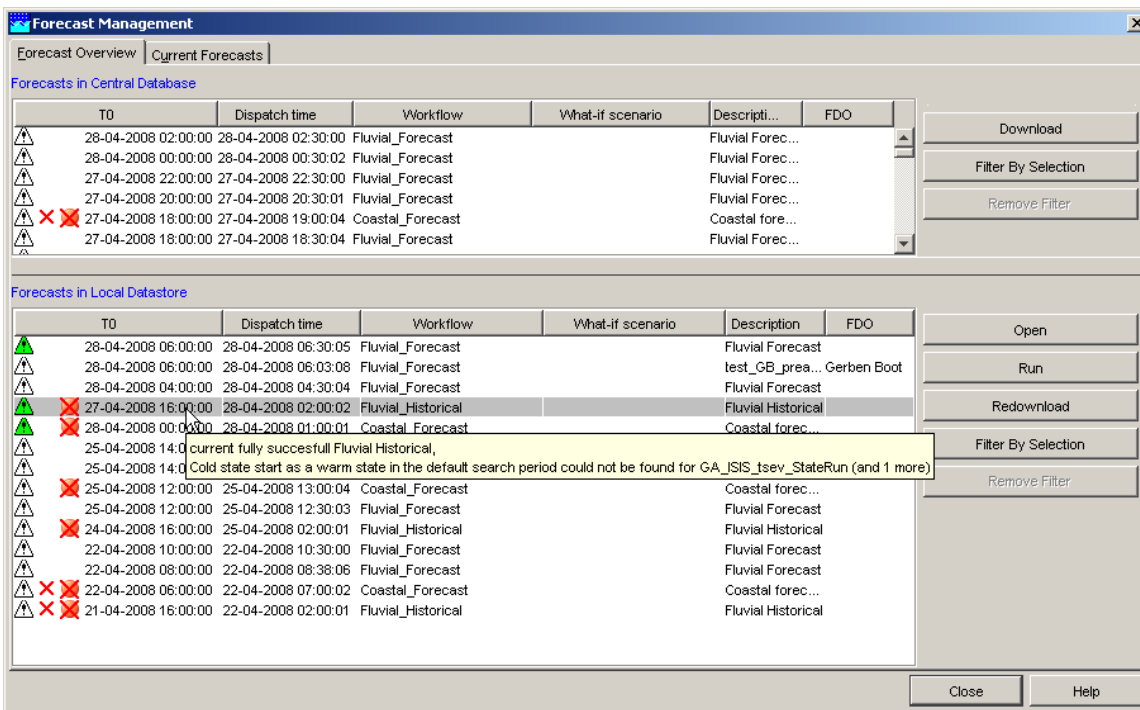
It is also possible to use a displayed icon as a filter. First click on a table cell that contains an icon. Then click the 'Filter By Selection' button to filter the list of visible forecasts on the selected icon. After filtering only forecasts that have the same icon in the corresponding column will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

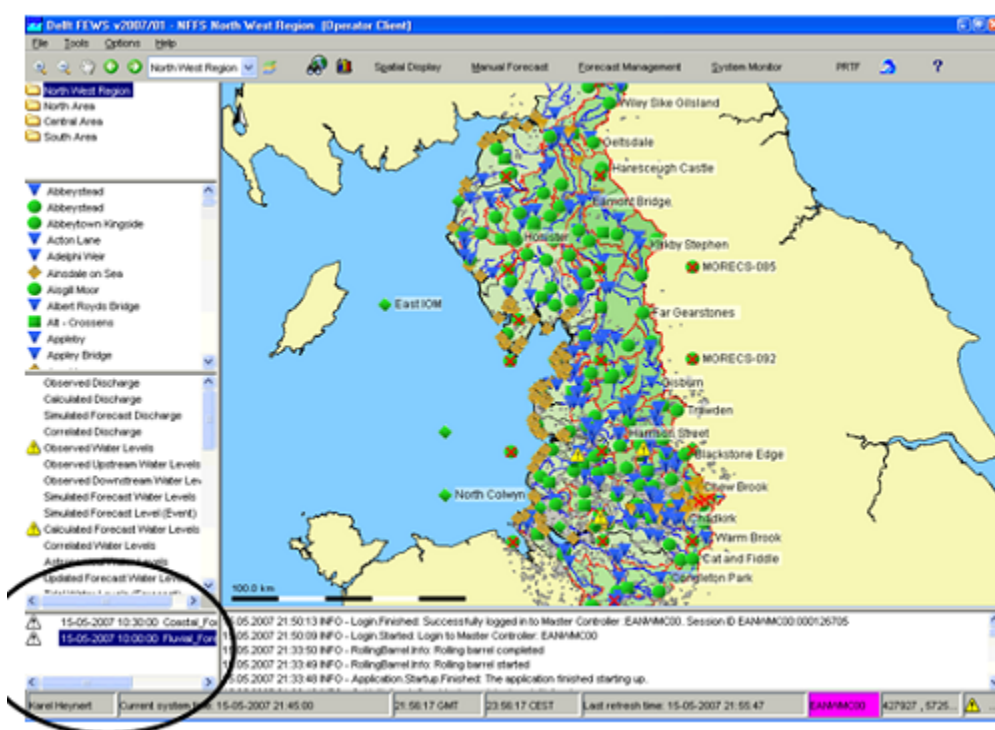
Adding workflows to forecast list box of FEWS Explorer

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 from 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.

Forecast Management						
Forecast Overview Current Forecasts						
Current Forecasts						
TO	Dispatch time	Workflow	What-if scenario	Description	FDO	
	28-04-2008 06:00:00	28-04-2008 06:30:05	Fluvial_Forecast	Fluvial Forec...		
	27-04-2008 16:00:00	28-04-2008 02:00:02	Fluvial_Historical	Fluvial Histori...		
	28-04-2008 00:00:00	28-04-2008 01:00:01	Coastal_Forecast	Coastal forec...		
Forecasts in Local Datasore						
TO	Dispatch time	Workflow	What-if scenario	Description	FDO	
	28-04-2008 06:00:00	28-04-2008 06:30:05	Fluvial_Forecast	Fluvial Forec...		
	28-04-2008 06:00:00	28-04-2008 06:03:08	Fluvial_Forecast	test_GB_pre... Gerben Boot		
	28-04-2008 04:00:00	28-04-2008 04:30:04	Fluvial_Forecast	Fluvial Forec...		
	27-04-2008 16:00:00	approved fully successful test_GB_preapprove_true,		Fluvial Histori...		
	28-04-2008 00:00:00	Default state start (No specific state start selected by user)		Coastal forec...		
	25-04-2008 14:00:00	25-04-2008 14:55:13	Fluvial_Forecast	test gb no pr... Gerben Boot		
	25-04-2008 14:00:00	25-04-2008 14:34:58	Fluvial_Forecast	fluvial_test_gb Gerben Boot		
	25-04-2008 12:00:00	25-04-2008 13:00:04	Coastal_Forecast	Coastal forec...		
	25-04-2008 12:00:00	25-04-2008 12:30:03	Fluvial_Forecast	Fluvial Forec...		
	24-04-2008 16:00:00	25-04-2008 02:00:01	Fluvial_Historical	Fluvial Histori...		
	22-04-2008 10:00:00	22-04-2008 10:30:00	Fluvial_Forecast	Fluvial Forec...		
	22-04-2008 08:00:00	22-04-2008 08:38:06	Fluvial_Forecast	Fluvial Forec...		
	22-04-2008 06:00:00	22-04-2008 07:00:02	Coastal_Forecast	Coastal forec...		
	21-04-2008 16:00:00	22-04-2008 02:00:01	Fluvial_Historical	Fluvial Histori...		

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

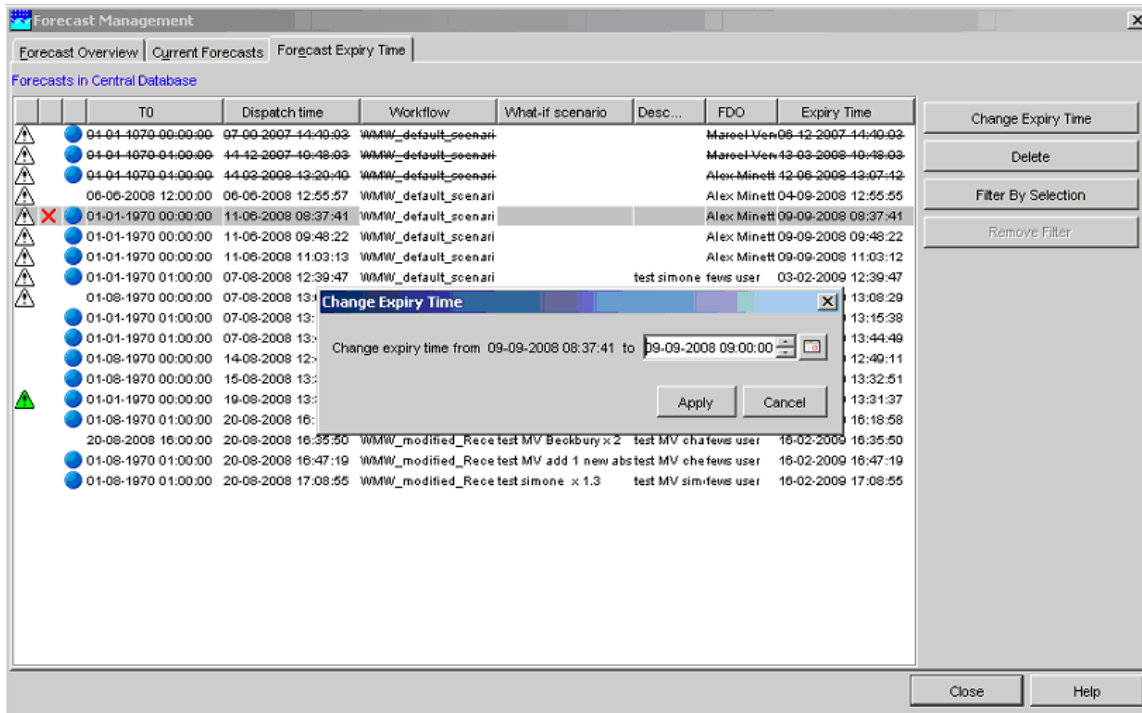
Deleting a forecast from the Central Database (only in OC)

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.



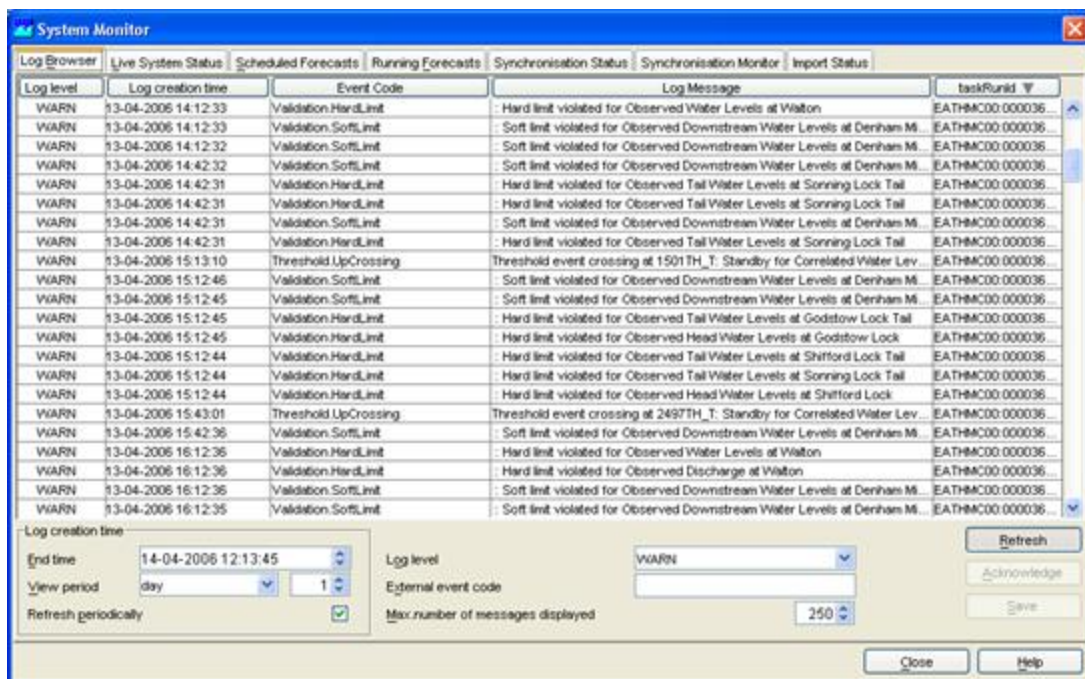
08 System Monitor

- 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.



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

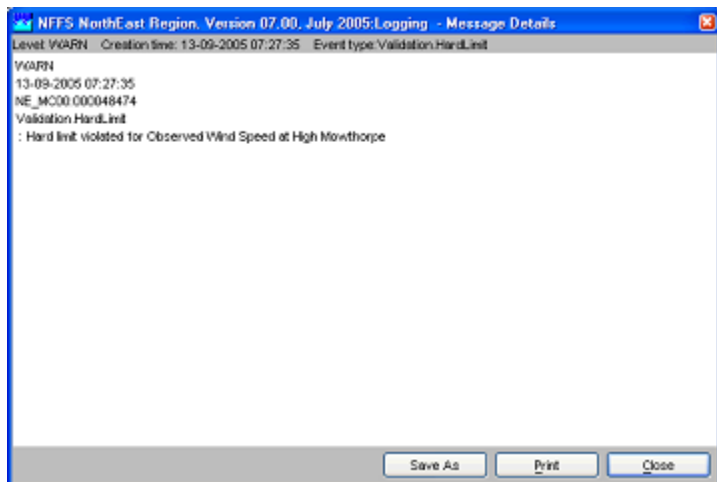
- Log level (see table above)
- Log creation time
- Event code (see Appendix A for listing)
- Log message (description)
- taskRunId

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

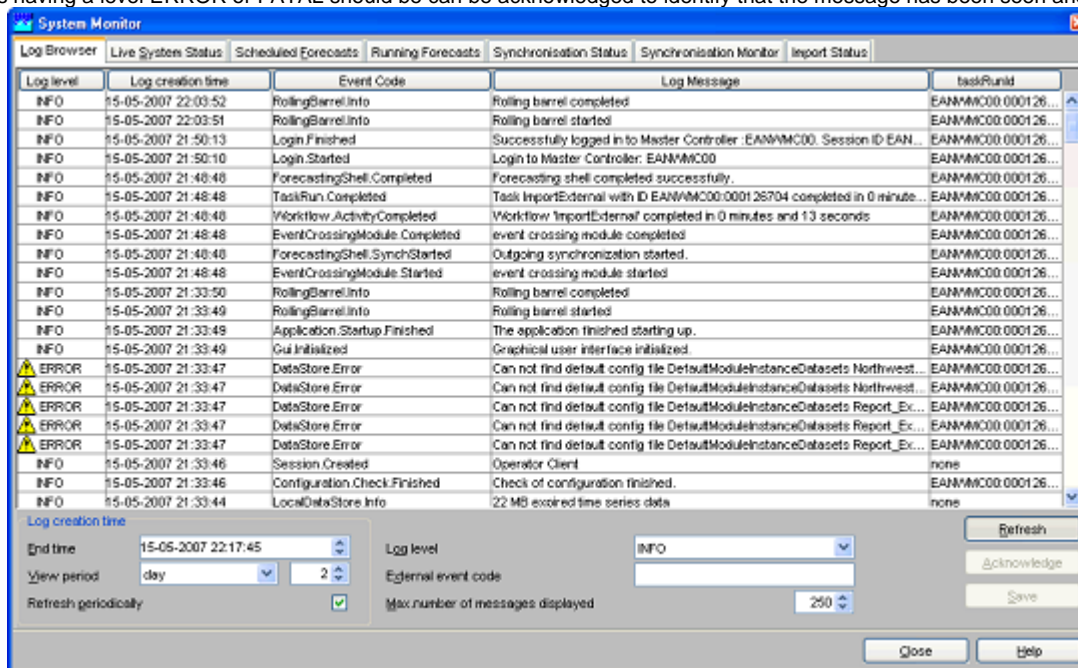
A query can be defined to select a subset of the messages to be displayed in the Log Browser. The following options are available:

- **Log level**
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 acknowledged to identify that the message has been seen and appropriate



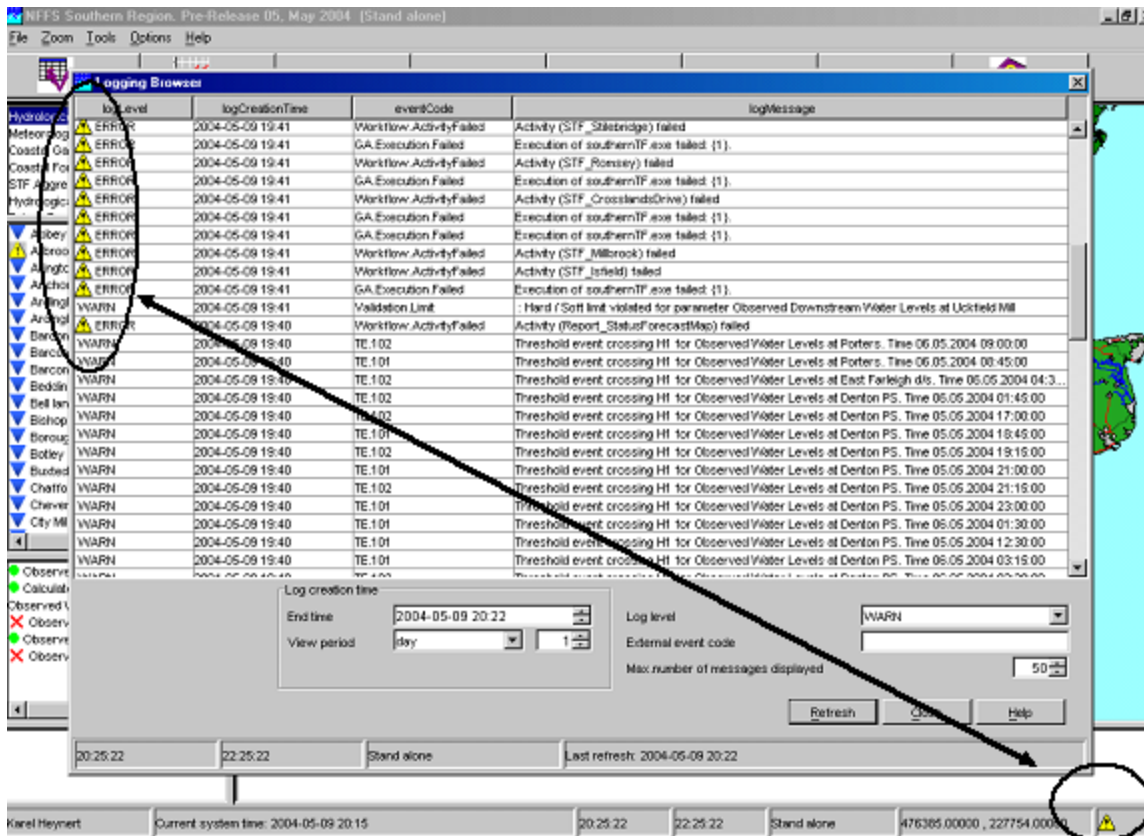
action taken.

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

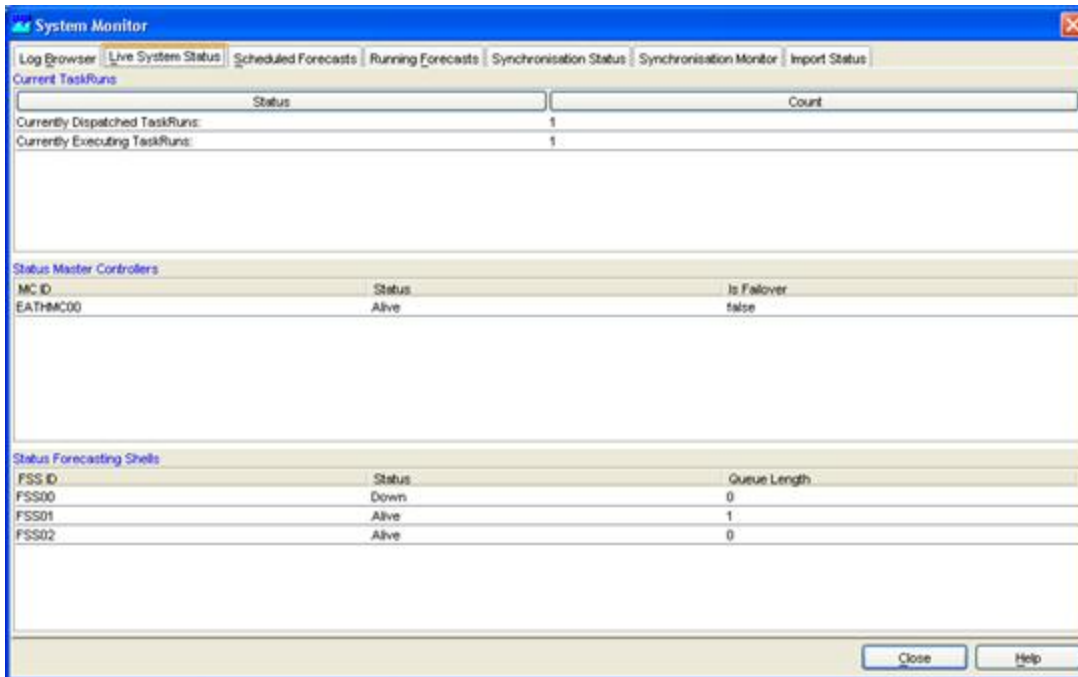
Please note that a System Manager can configure the system to also provide *Debug Messages*. These are used to log application internal events for system development and management. Typical debug events are the creation of a database connection or exceptions that occurred due to programming or configuration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

System Monitor

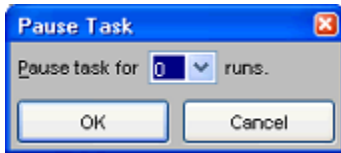
Log Browser | Live System Status | **Scheduled Forecasts** | Running Forecasts | Synchronisation Status | Synchronisation Monitor | Import Status

Task ID	Description	Workflow ID	MC ID	Priority	Repeat Time	Next Due Time	Task Status
EANVMC00:000...	Daily Archive Run	Archive_Schedul...	EANVMC00	Normal	1440 minutes	14.07.2006 00:15...	Pending
EANVMC00:000...	Scheduled CURR...	Coastal_Forecast	EANVMC00	Normal	360 minutes	13.07.2006 16:30...	Pending
EANVMC00:000...	Daily database m...	Database_Mainte...	EANVMC00	Normal	1440 minutes	13.07.2006 15:45...	Pending
EANVMC00:000...	Export current to...	Export_Current	EANVMC00	Normal	1 minutes	19.03.2006 08:40...	Suspended
EANVMC00:000...	Enhance Foreca...	Fluvial_FastResp...	EANVMC00	Normal	30 minutes	04.02.2006 12:45...	Suspended
EANVMC00:000...	Enhance Foreca...	Fluvial_FastResp...	EANVMC00	Normal	30 minutes	02.06.2006 16:00...	Suspended
EANVMC00:000...	Schedule CURRE...	Fluvial_Forecast	EANVMC00	Normal	120 minutes	13.07.2006 14:20...	Pending
EANVMC00:000...	Daily State Run	Fluvial_Historical	EANVMC00	Normal	1440 minutes	14.07.2006 08:00...	Pending
EANVMC00:000...	Scheduled Import...	ImportExternal	EANVMC00	Normal	30 minutes	13.07.2006 12:48...	Pending
EANVMC00:000...	Marked Record M...	MarkedRecordMa...	EANVMC00	Normal	60 minutes	03.10.2005 10:59...	Suspended
EANVMC00:000...	Marked Record M...	MarkedRecordMa...	EANVMC00	Normal	60 minutes	03.10.2005 09:38...	Suspended
EANVMC00:000...	Marked Record M...	MC:MarkedRecor...	EANVMC00	Normal	40 minutes	29.09.2005 12:36...	Suspended
EANVMC00:000...	Rolling Barrel MC	MC:RollingBarrel	EANVMC00	Normal	40 minutes	13.07.2006 13:15...	Pending
EANVMC00:000...	Scheduled Perfor...	PerformanceMoni...	EANVMC00	Normal	1440 minutes	14.07.2006 12:00...	Pending
EANVMC00:000...	Rolling barrel on ...	RollingBarrel_FS...	EANVMC00	Normal	1440 minutes	13.07.2006 16:45...	Pending
EANVMC00:000...	Rolling barrel on ...	RollingBarrel_FS...	EANVMC00	Normal	1440 minutes	14.07.2006 04:10...	Pending

Cancel Task Suspend Task Resume Task Pause Task Close Help

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'.

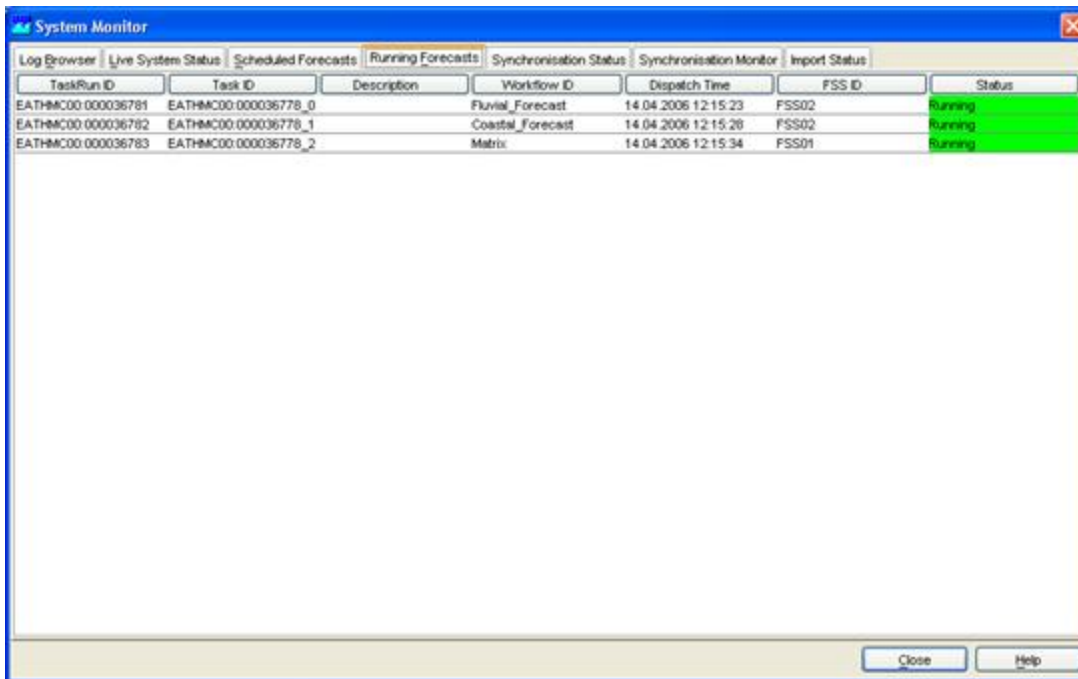


Please note that not all options are available for all workflows. A user can for example normally not cancel the current forecast and import runs runs scheduled by the super user. Also the status of system management workflows can normally not be changed by a user.

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.

A screenshot of the "System Monitor" application window, specifically the "Running Forecasts" tab. The window has a menu bar with "Log Browser", "Live System Status", "Scheduled Forecasts", "Running Forecasts" (selected), "Synchronisation Status", "Synchronisation Monitor", and "Import Status". Below the menu bar is a table with the following columns: "TaskRun ID", "Task ID", "Description", "Workflow ID", "Dispatch Time", "FSS ID", and "Status". The table contains three rows of data, all with a green background. The first row shows a "Fluvial_Forecast" task running on FSS02. The second row shows a "Coastal_Forecast" task running on FSS02. The third row shows a "Matrix" task running on FSS01. At the bottom right of the window are "Close" and "Help" buttons.

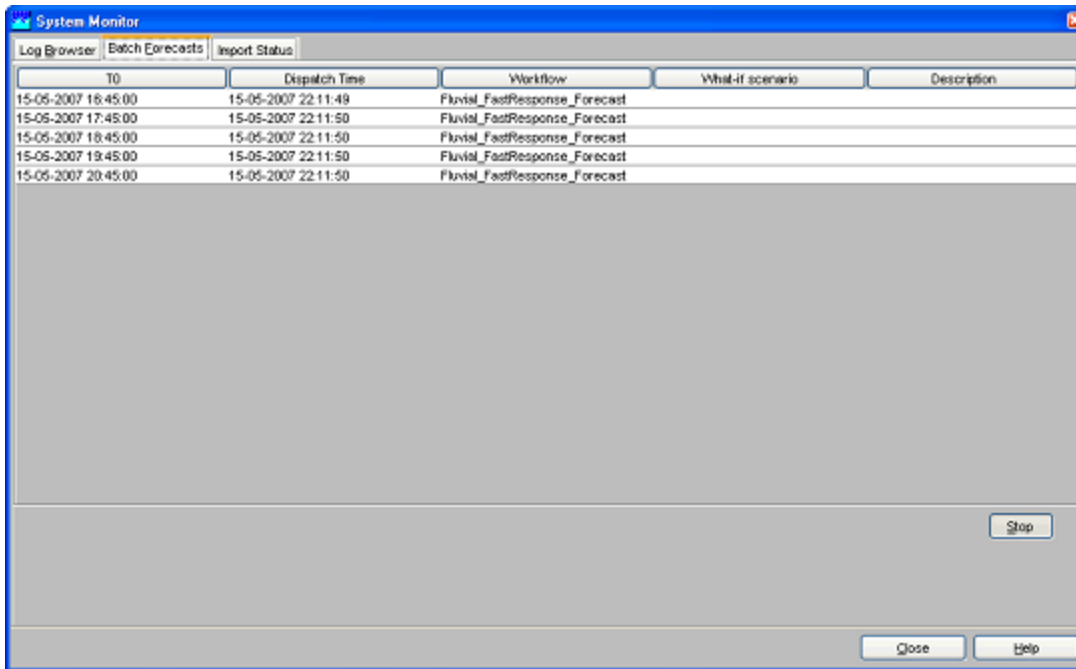
TaskRun ID	Task ID	Description	Workflow ID	Dispatch Time	FSS ID	Status
EATHMC00 000036781	EATHMC00 000036778_0	Fluvial_Forecast		14.04.2006 12:15:23	FSS02	Running
EATHMC00 000036782	EATHMC00 000036778_1	Coastal_Forecast		14.04.2006 12:15:26	FSS02	Running
EATHMC00 000036783	EATHMC00 000036778_2	Matrix		14.04.2006 12:15:34	FSS01	Running

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

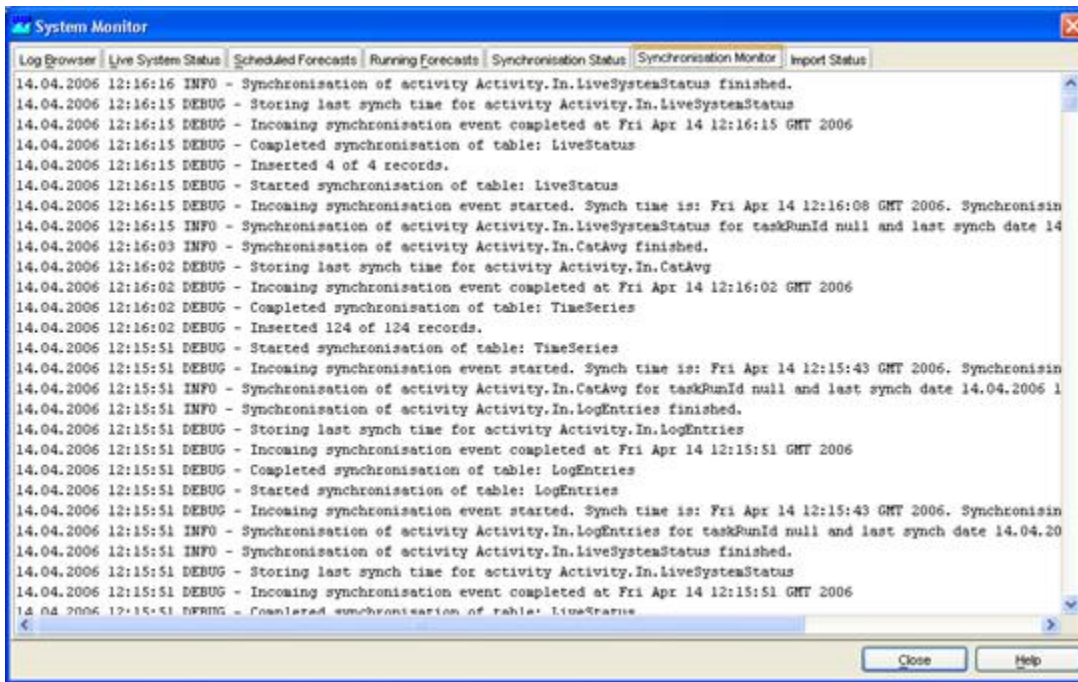
The Synchronisation Status tab provides the status of all synchronisation activities. For each synchronisation activity the following information is provided:

- 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.

Activity ID	Type	Frequency	LastSynchTime	Status	Progress
Activity Out CurrentForecast	single	0	14.04.2006 11:55:13		
Activity In Tasks	continuous	60	14.04.2006 12:15:38		
Activity In FloodMaps	single	0	14.04.2006 11:55:06		
Activity Out TimeSeries	single	0	14.04.2006 11:55:13		
Activity Out WhatIfScenarios	single	0			
Activity In ThresholdEvents	continuous	180	14.04.2006 12:15:41		
Activity In ManualData	continuous	180	14.04.2006 12:15:42		
Activity In Forecasts	single	0	14.04.2006 12:15:40		
Activity In LogEntries	continuous	60	14.04.2006 12:15:43		
Activity In ImportGrids	continuous	180	14.04.2006 12:15:42		
Activity In ForecastData	single	0	14.04.2006 11:54:51		
Activity In ImportStatus	continuous	180	14.04.2006 12:15:42		
Activity In Configuration	continuous	3600	14.04.2006 11:55:27		
Activity Out Tasks	single	0	14.04.2006 12:15:33		
Activity In CatAvg	continuous	180	14.04.2006 12:15:44		
Activity In FewerSessions	single	0	14.04.2006 11:54:37		
Activity In LiveSystemStatus	continuous	30	14.04.2006 12:16:08	Synchronizing	
Activity In ImportData	continuous	180	14.04.2006 12:15:41		
Activity In AstronomicalData	continuous	86400	14.04.2006 11:55:32		

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.

Data Feed	Directory	Last Import Time	Last Import File	Files Imported	Files Failed
MOSurgeCS3	W:\ews\filesrv01\Thames\fsst\Windows\Import\MOSurgeCS3	14.04.2006 09:12:36	MOEAEUSURGE20060...	1	0
MOWindActual	W:\ews\filesrv01\Thames\fsst\Windows\Import\MOWindActuals	14.04.2006 09:12:31	MOEAWINDASSM200...	1	0
MOWindForecast	W:\ews\filesrv01\Thames\fsst\Windows\Import\MOWindForecasts	14.04.2006 09:12:35	MOEAWIND20060414...	1	0
MovjukB1	W:\ews\filesrv01\Thames\fsst\Windows\Import\MovjukB1	14.04.2006 09:12:30	SURGERES2.DAT	1	0
MNPFforecast	W:\ews\filesrv01\Thames\fsst\Windows\Import\CatAvg\MNP_Rain	14.04.2006 10:42:30	EAHYTHFS20060414...	1	0
RTS	W:\ews\filesrv01\Thames\fsst\Windows\Import\RTS	14.04.2006 12:13:05	THSTHFS200604141...	12	0
RadarActual	W:\ews\filesrv01\Thames\fsst\Windows\Import\CatAvg\Actuals	14.04.2006 12:13:06	EAHYTHFS20060414...	2	0
RadarForecast	W:\ews\filesrv01\Thames\fsst\Windows\Import\CatAvg\Forecasts	14.04.2006 12:13:07	EAHYTHFS20060414...	1	0
Surge	W:\ews\filesrv01\Thames\fsst\Windows\Import\Surge	14.04.2006 03:13:13	WCSURG2006041402...	3	0
TidalMonitoring	W:\ews\filesrv01\Thames\fsst\Windows\Import\TidalMonitoring	14.04.2006 12:13:09	COMBINEDBODD1404...	2	0
WindWave	W:\ews\filesrv01\Thames\fsst\Windows\Import\WindWave	14.04.2006 04:13:46	SOWIND20060414032...	2	0

09 What-if Scenario Display

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

- Import All
- Export All

What-if Scenario Display

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

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

Four types of What-if Scenarios can be defined:

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

Transformation

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

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

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

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

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

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

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

User Defined Profile

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

Scenario Id : Typical Profile Allenheads Add New Scenario

Scenario description : Typical Profile Allenheads Copy Selected Scenario As

Save Selected Scenario

Transformation User Defined Profile Module Data Set File/Version Module Parameter File/Version

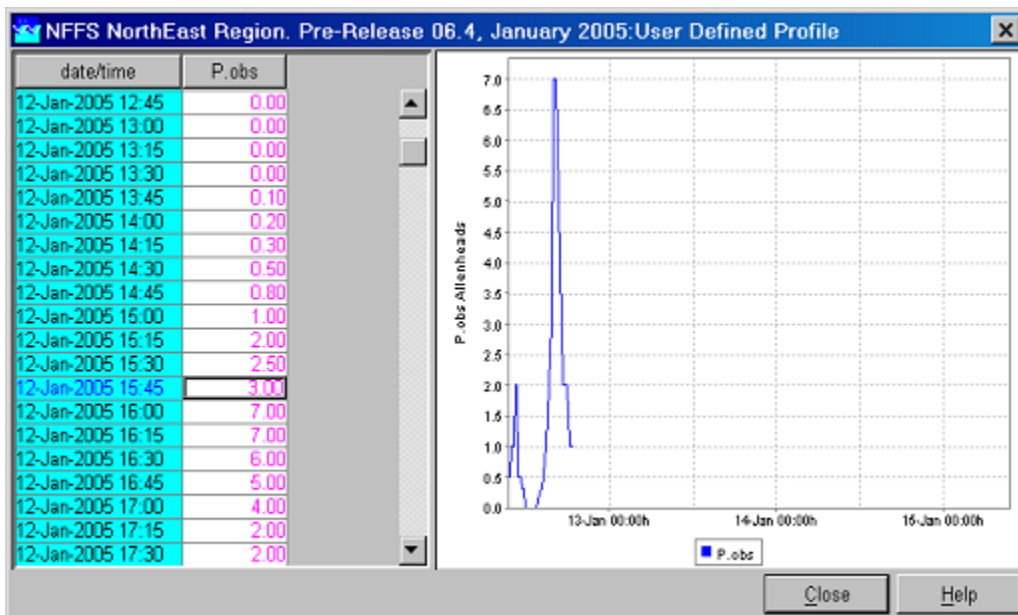
Select Input Variable Select Location

Precipitation_gauges Allenheads Edit Table Add to List ..

InputVariable	Location	Profile	Include in WhatifSce...
Precipitation gauges at Allenheads (Observe)	Allenheads	View ..	<input checked="" type="checkbox"/> included

Import All Export All Save All Close Help

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

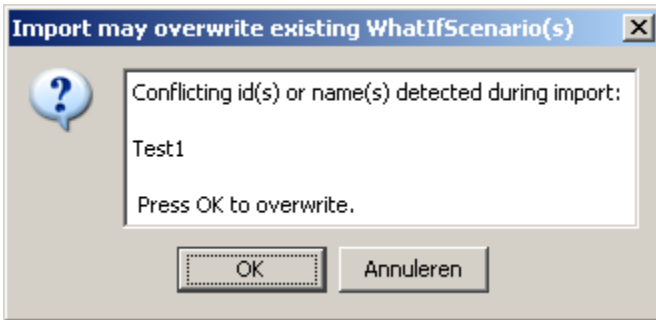


The table includes a spreadsheet and a graph showing the entered values. Values can also be copied from other programs like Microsoft Excel by using the [CTRL+C] keys. When all data is entered, press the [Close] button.

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

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

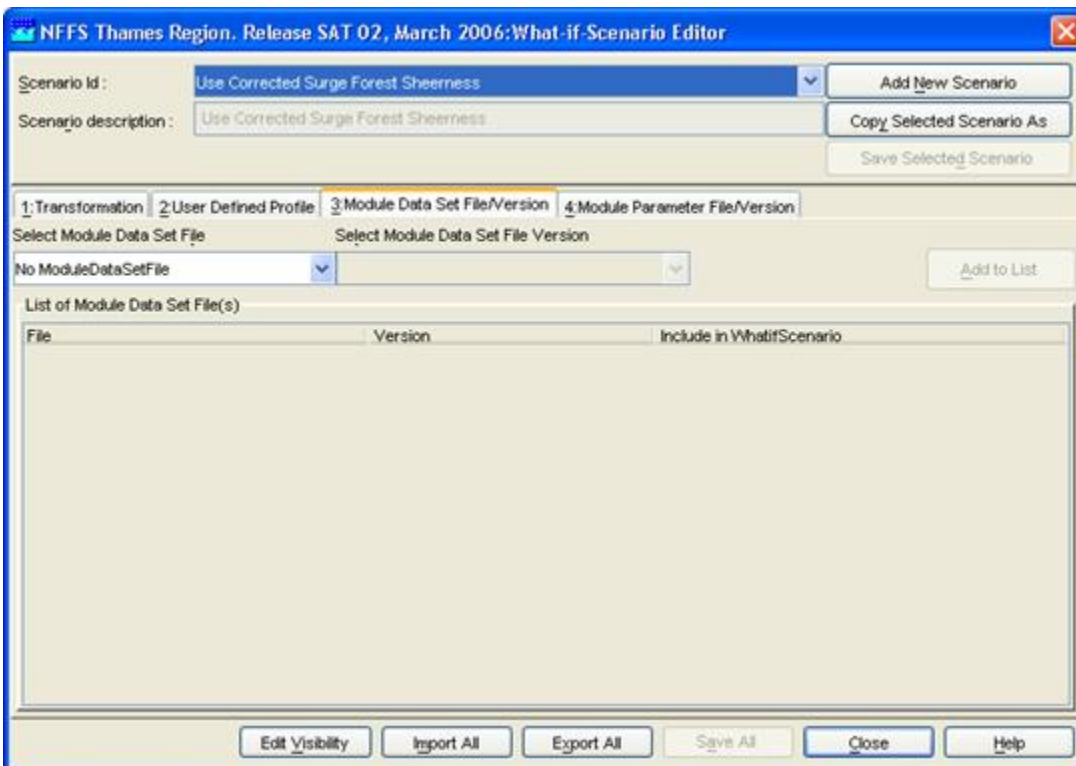
confirmation screen may be prompted to deal with this situation.



Module Data Sets and Module Parameters

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

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



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

Buttons

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

Edit Visibility button

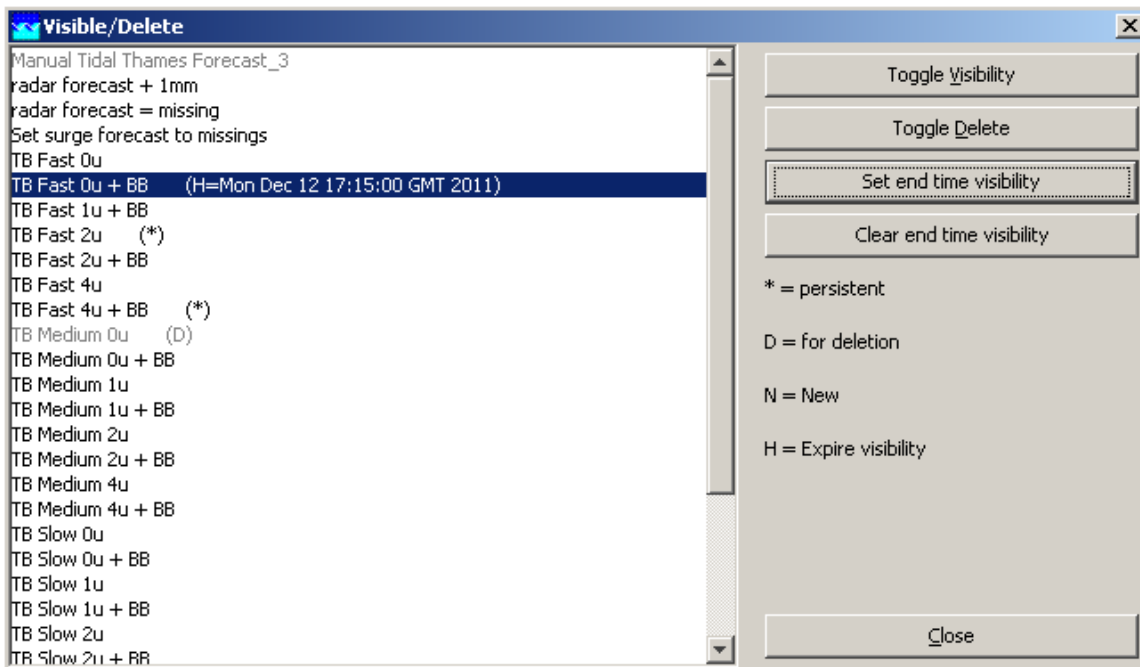
The number of What-if Scenarios in the system can become quite large. To limit the number of visible What-if Scenarios each scenario may either be deleted or made invisible to all users.

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

- [Toggle Visible] make the selected what-if scenario invisible to users and as it can not be used when running forecasts. Note that a

- what-if scenario, which has been made invisible, is invisible to *all* users. When made invisible, the what-if scenario name is greyed out.
- [Toggle Delete] permanent deletes what-if scenarios from the system. These scenario are marked with (D) when the display is still open.

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



Import All

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

Export All

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

10 Archiving Display

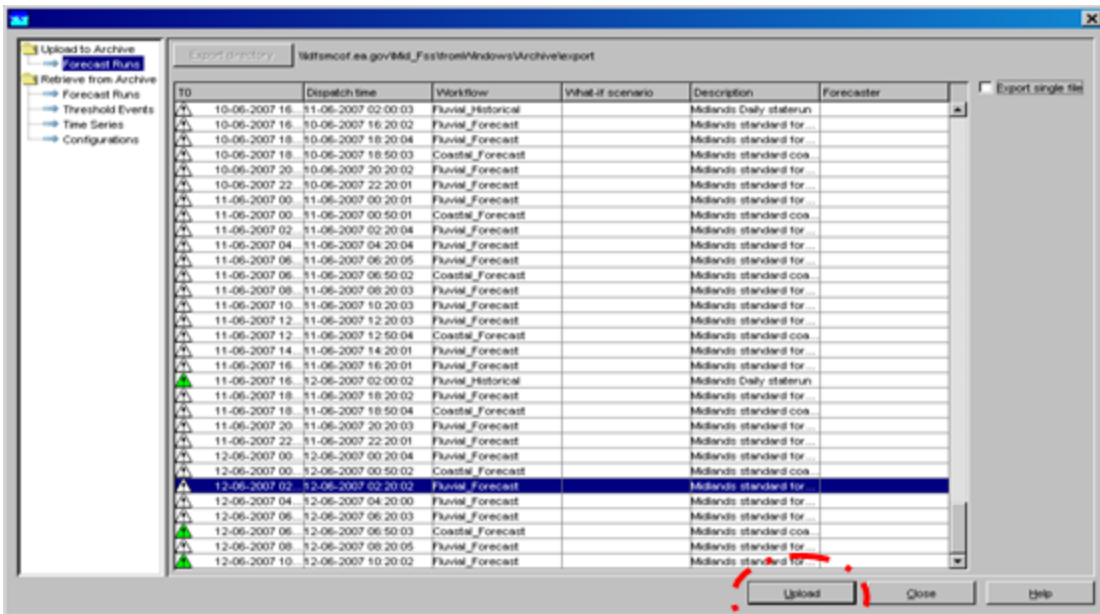
- Archiving Display
 - Manual Archiving
 - Importing Archives into the Standalone
 - a) Importing Forecast Run Archives
 - b) Importing Threshold Event Archives
 - c) Importing Time Series Archives
 - Configuring RegionId

Archiving Display

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

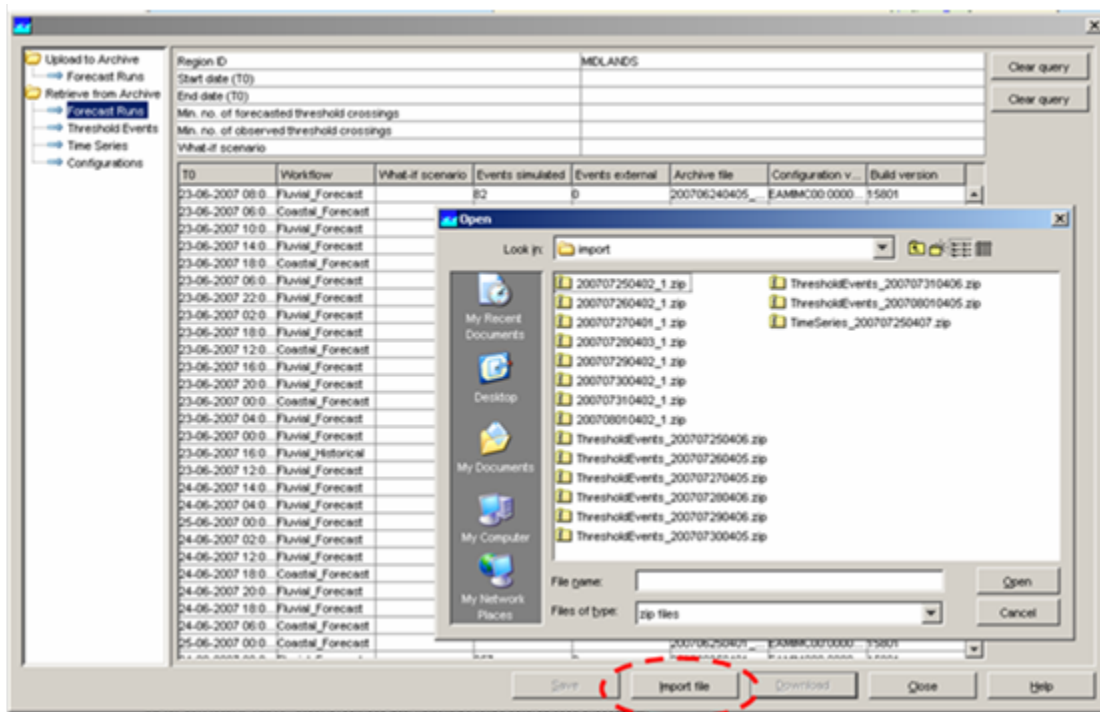


This forecast is then written to a zip file and stored in the file shares. If configured (deployed) an archiver process can pick up these zip files and process them.

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.

Configuring RegionId

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

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

11 Skill Scores Display

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

Skill Scores Display

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

Background

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

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

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

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

False Alarm Rate

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

Probability of Detection

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

Critical Success Index

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

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

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

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

Setting Criteria for Analyses

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

Threshold Skill Score

Matching Events | Forecast Available For Events | Events List

Location Name	Threshold	Obs Parameter	Obs Event Time	For Parameter	For Event Time	Difference	Forecast T0
Greenholme	Flood Watch	H obs	24-10-2005 15:00:00	---	---	---	---
Greenholme	Standby	H obs	24-10-2005 12:00:00	H rated Forecast	24-10-2005 11:45:00	0:15	24-10-2005 08:00:00

Indicators:

- Probability of Detection : 50,0
- False Alarm Rate : 0,0
- Critical Success Index : 50,0
- Critical Reliability : 0,0
- First Forecast of Threshold : 3 hours 45 min
- Bias of paired thresholds : 0:15

Criteria:

- Min T0 difference : 2 hour
- Max T0 difference : 6 hour
- Max dispatch time difference : 6 hour
- Max time forecast too early : 1 hour
- Max time forecast too late : 2 hour
- Up crossing only : ☒

Change Criteria

Filter Save Criteria Save Export Import Close Help

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

Select periods

Criteria

Min T0 difference	<input type="text" value="2"/>	<input type="text" value="hour"/>
Max T0 difference	<input type="text" value="6"/>	<input type="text" value="hour"/>
Max dispatch time difference	<input type="text" value="6"/>	<input type="text" value="hour"/>
Max time threshold being too early	<input type="text" value="1"/>	<input type="text" value="hour"/>
Max time threshold being too late	<input type="text" value="2"/>	<input type="text" value="hour"/>

Apply to

☒ Apply global

☐ Apply to selected

OK Cancel Apply Reset

The criteria in the display have the following meaning.

- *Min/Max T~0~ difference* . These criteria define in what time interval the T0 of a forecast should fall that has predicted a threshold crossing in order for this threshold crossing event to be included in the analysis.
- *Max dispatch time difference* . This criterion is used to compute the Critical Reliability (CR) which determines whether a forecast was available at the time of an observed crossing irrespective of its quality. By setting this criterion the maximum time difference can be defined between the dispatch time of a forecast and the time of an observed crossing.
- *Max time threshold being too early/late* . These criteria define what the maximum difference between a forecasted threshold crossing and an observed threshold crossing are allowed to be in order to consider them as matching.

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

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

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

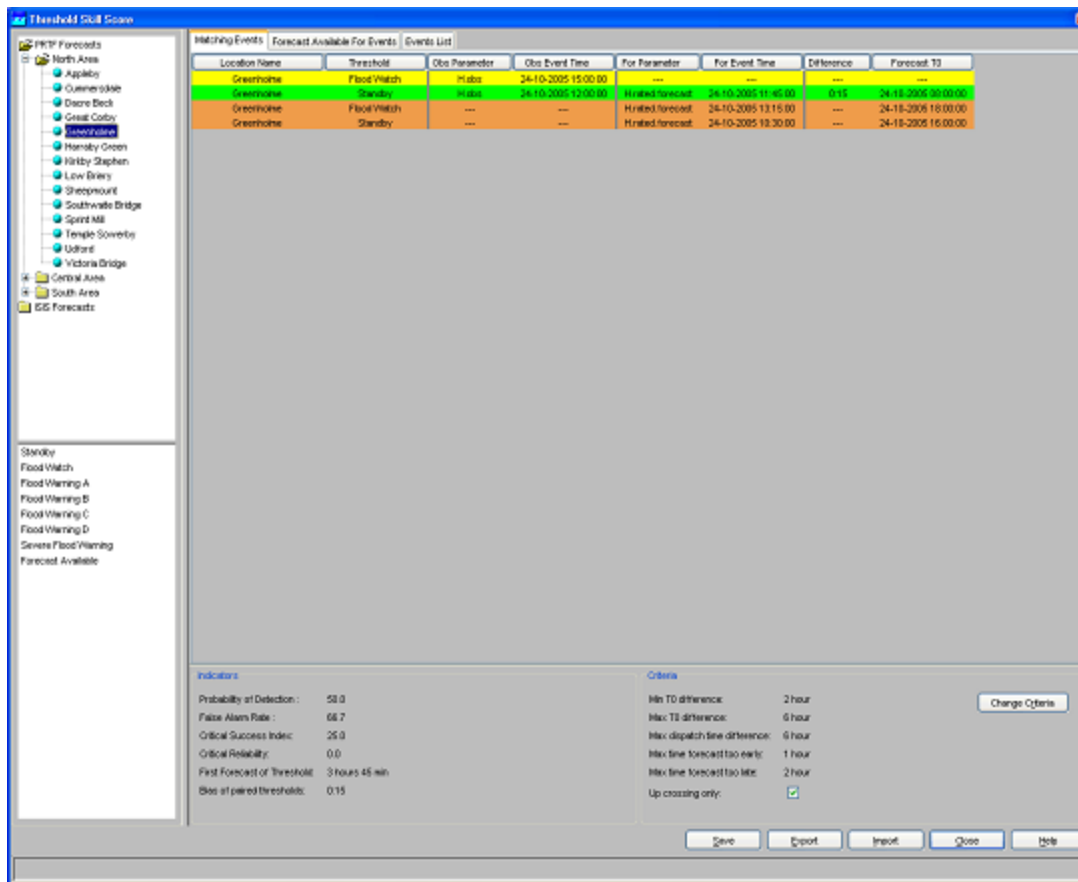
This way it is possible to change the criteria settings for individual locations/groups. If a location/group has no individual criteria settings, then the global criteria are used for that location/group. If multiple locations/groups with different criteria are selected, then the global criteria are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

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

Matching Events

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

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



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

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

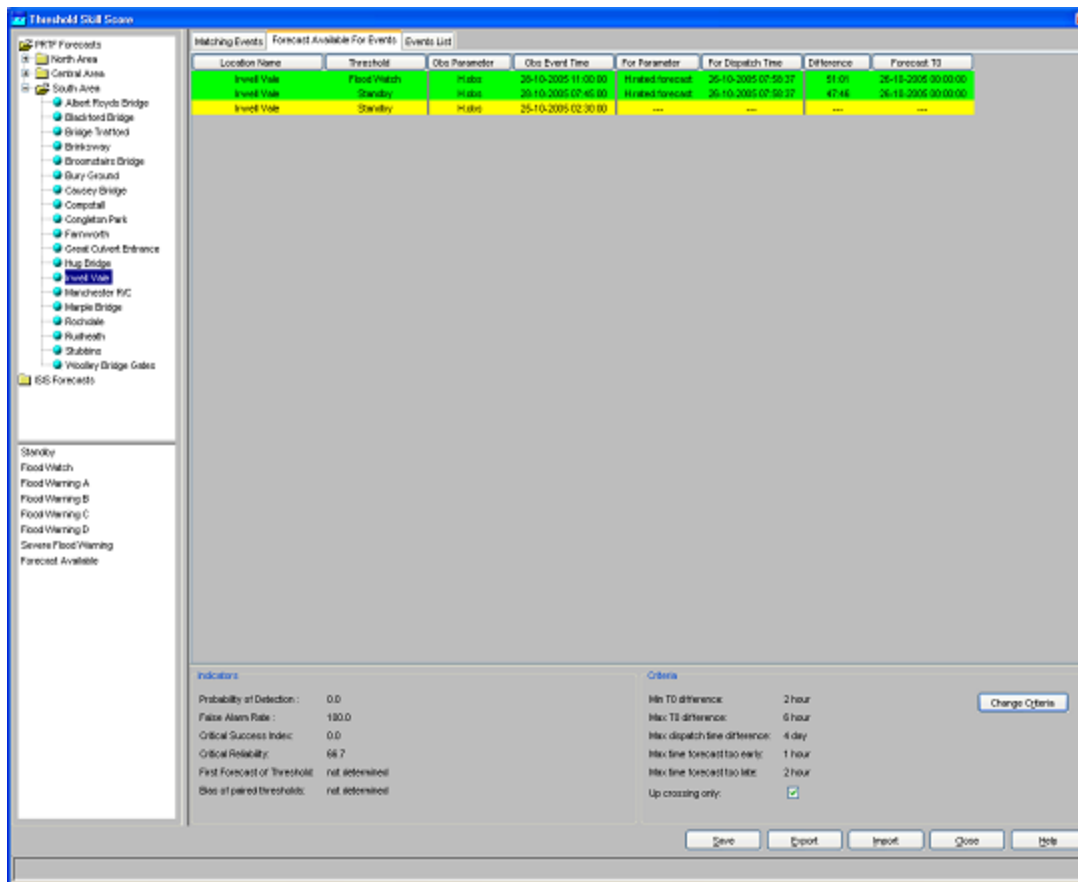
- probability of detection
- false alarm rate
- critical success factor
- first forecast of threshold
- bias of paired thresholds

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

Forecast Available for Events

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

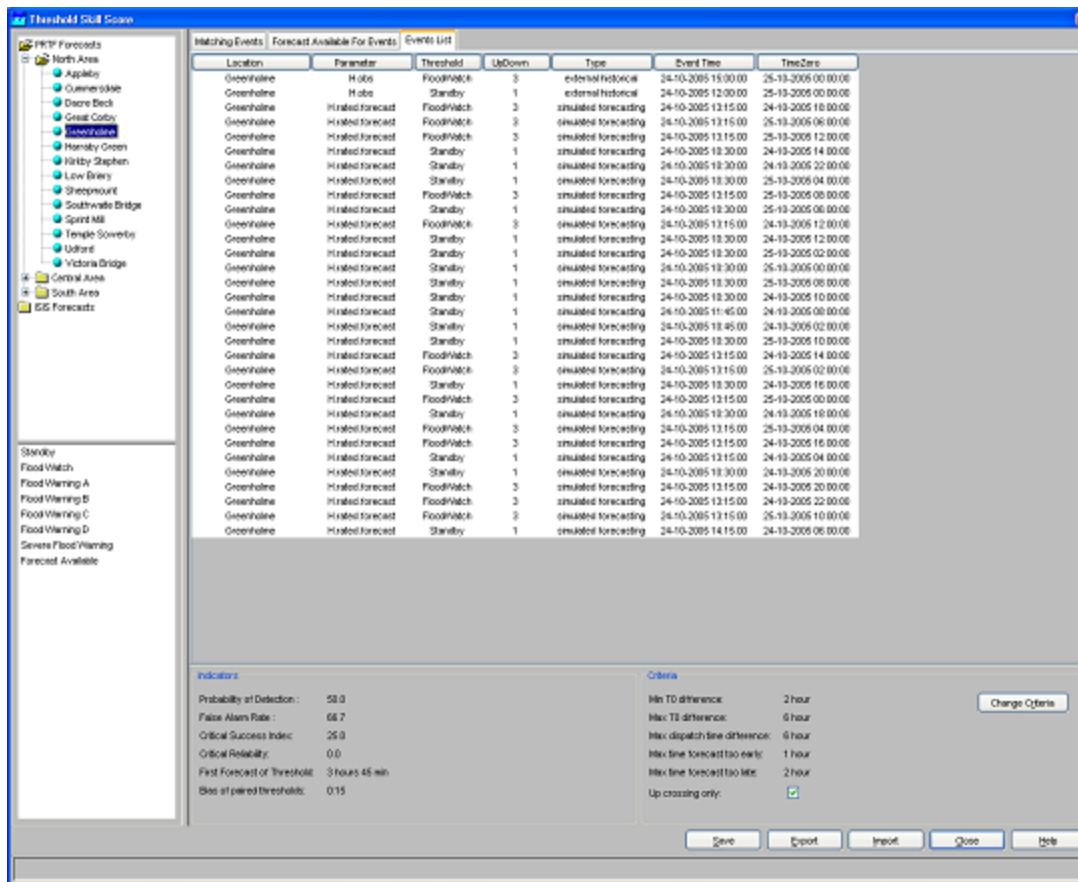
- green: a forecast is available for an observed threshold crossing event (sector e of contingency table)
- yellow: no forecast available for an observed threshold crossing event (sector f)



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

Thresholds List

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



Archiving Events

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

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

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

Excluding Events and TaskRuns

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

Include	Task Run Id	T0	Workflow	What-if scenario	Description	FDO
<input checked="" type="checkbox"/>	1_0	20-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input checked="" type="checkbox"/>	1_1	21-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input checked="" type="checkbox"/>	1_2	22-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input checked="" type="checkbox"/>	1_3	23-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input checked="" type="checkbox"/>	1_4	24-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input checked="" type="checkbox"/>	1_5	25-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input checked="" type="checkbox"/>	1_6	26-10-2005 00:00:00	ImportExternal			Marc van Dijk
<input type="checkbox"/>	3_0	24-10-2005 00:00:00	Fluvial_Forecast		Performance test	Marc van Dijk
<input checked="" type="checkbox"/>	3_1	24-10-2005 02:00:00	Fluvial_Forecast		Performance test	Marc van Dijk
<input checked="" type="checkbox"/>	3_10	24-10-2005 20:00:00	Fluvial_Forecast		Performance test	Marc van Dijk
<input checked="" type="checkbox"/>	3_11	24-10-2005 22:00:00	Fluvial_Forecast		Performance test	Marc van Dijk

Include	Location	Parameter	Threshold	UpDown	Type	Event Time	T0
<input checked="" type="checkbox"/>	Kirkby Stephen	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 08:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Kirkby Stephen	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 09:15:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Greenholme	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 10:45:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Greenholme	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 17:00:00	24-10-2005 02:00:00
<input type="checkbox"/>	Brock A6	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 06:45:00	24-10-2005 02:00:00
<input type="checkbox"/>	Brock A6	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 10:00:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Garstang FCS	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 08:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Garstang FCS	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 10:45:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Kirkby	H.rated.forecast	Standby	1	simulated forecasting	23-10-2005 04:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Kirkby	H.rated.forecast	Standby	2	simulated forecasting	23-10-2005 13:15:00	24-10-2005 02:00:00
<input type="checkbox"/>	Kirkby	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 03:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Kirkby	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 13:15:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Croston	H.rated.forecast	Standby	1	simulated forecasting	23-10-2005 14:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Croston	H.rated.forecast	Standby	2	simulated forecasting	23-10-2005 21:15:00	24-10-2005 02:00:00
<input type="checkbox"/>	Croston	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 05:45:00	24-10-2005 02:00:00
<input type="checkbox"/>	Croston	H.rated.forecast	FloodWatch	3	simulated forecasting	24-10-2005 11:45:00	24-10-2005 02:00:00
<input type="checkbox"/>	Croston	H.rated.forecast	FloodWatch	4	simulated forecasting	24-10-2005 13:00:00	24-10-2005 02:00:00
<input type="checkbox"/>	Croston	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 21:45:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Reedyford	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 06:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Reedyford	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 10:30:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Wigan (Central Park)	H.rated.forecast	Standby	1	simulated forecasting	24-10-2005 10:00:00	24-10-2005 02:00:00
<input checked="" type="checkbox"/>	Wigan (Central Park)	H.rated.forecast	Standby	2	simulated forecasting	24-10-2005 14:45:00	24-10-2005 02:00:00

OK Cancel Apply Exclude All Save Filters Load Filters

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

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

12 Thresholds Display & TRITON Display

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

Thresholds Display & TRITON Display

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

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

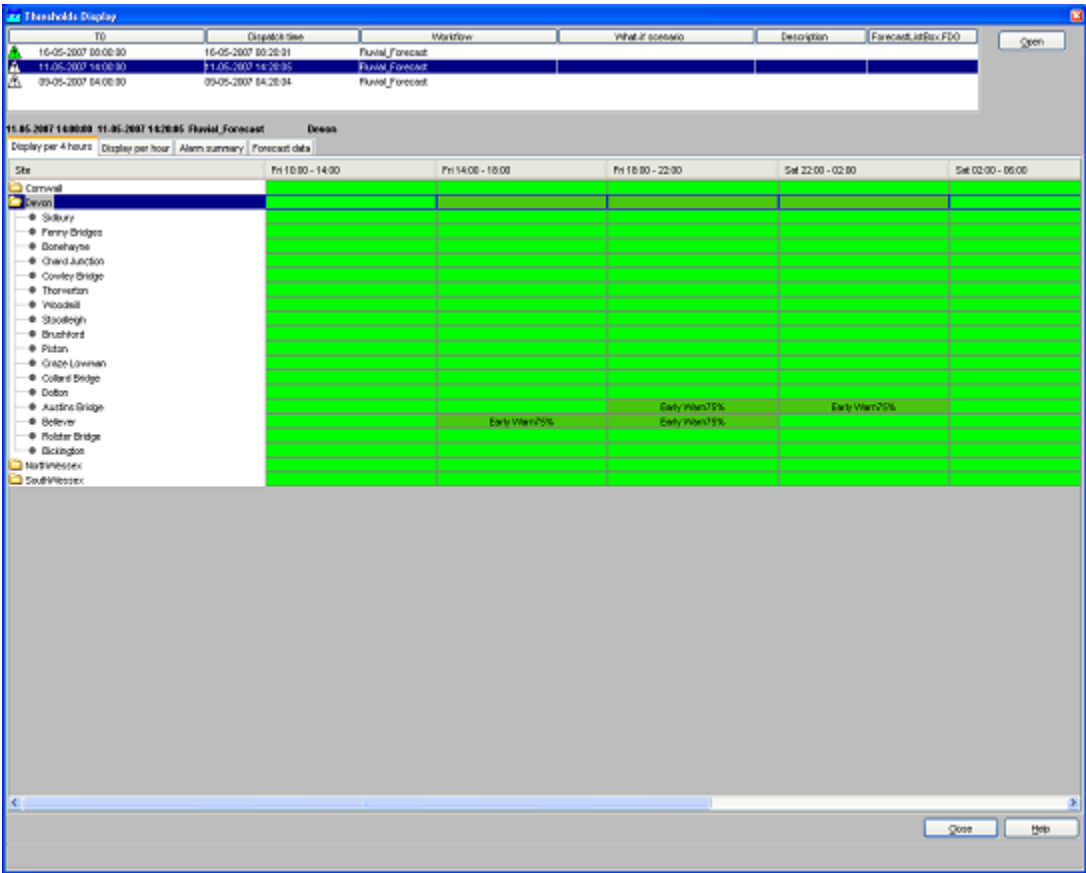
For a selected forecast, the Thresholds display presents information in three different views:

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

Selecting a Workflow for Display

The workflow for which data should be displayed in the Threshold display can be selected at the top of the screen. Place your cursor on the

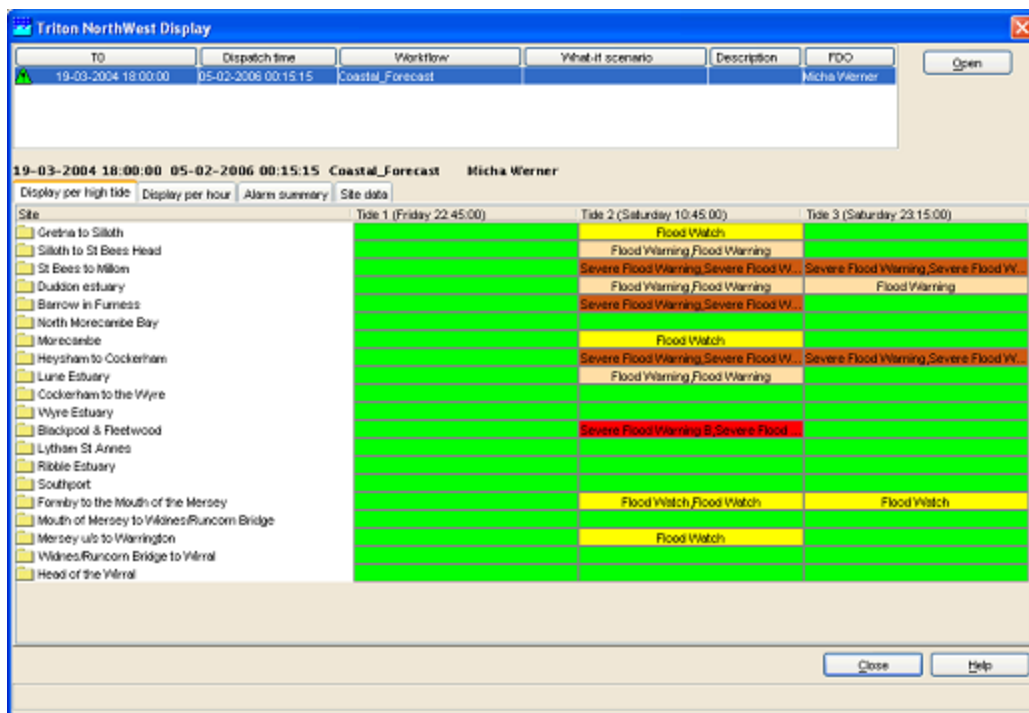
workflow you would like to display and click [Open]. The selected workflow is shown in bold above the tabs.



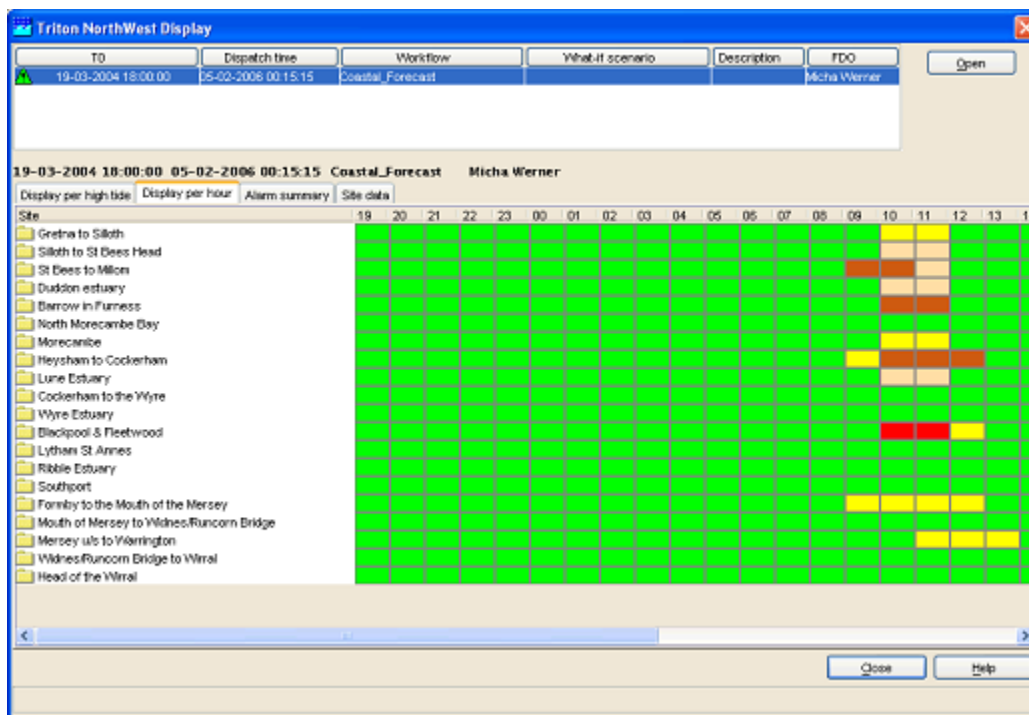
Threshold Status View

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:

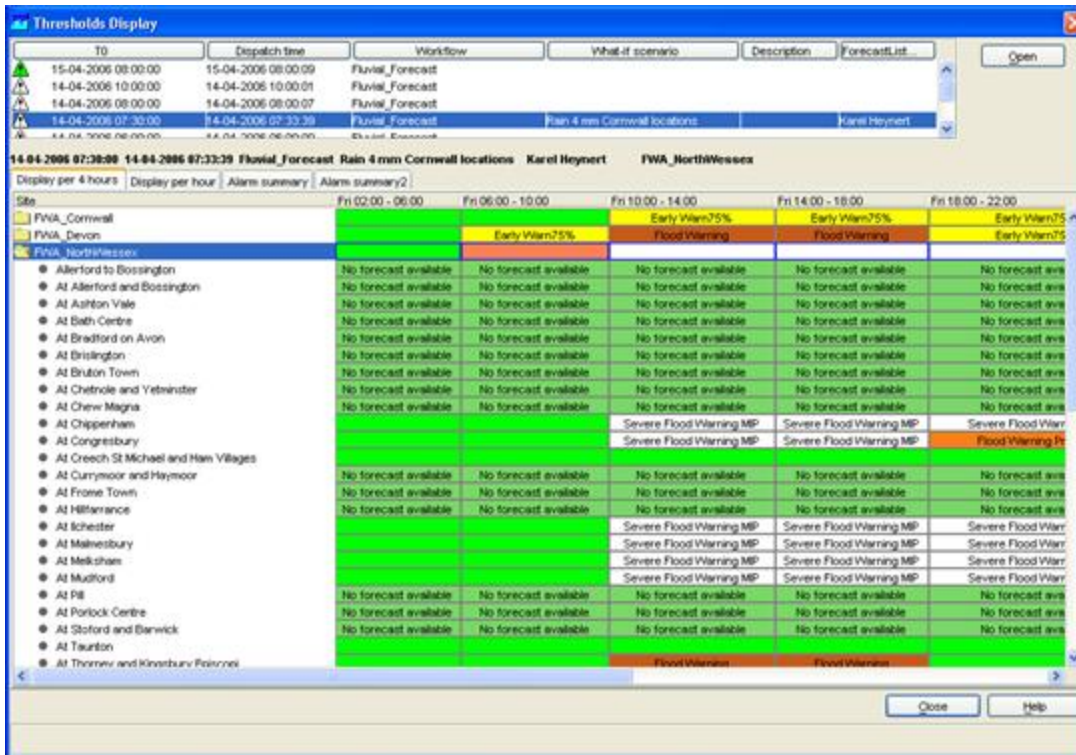
- For coastal forecasting the threshold status at high tide. The input data is non-equidistant and all values are shown. See the example below, where Triton results are shown at high tide.
- For coastal forecasting the threshold status per hour. This shows how the threshold status develops in a 24 hour 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



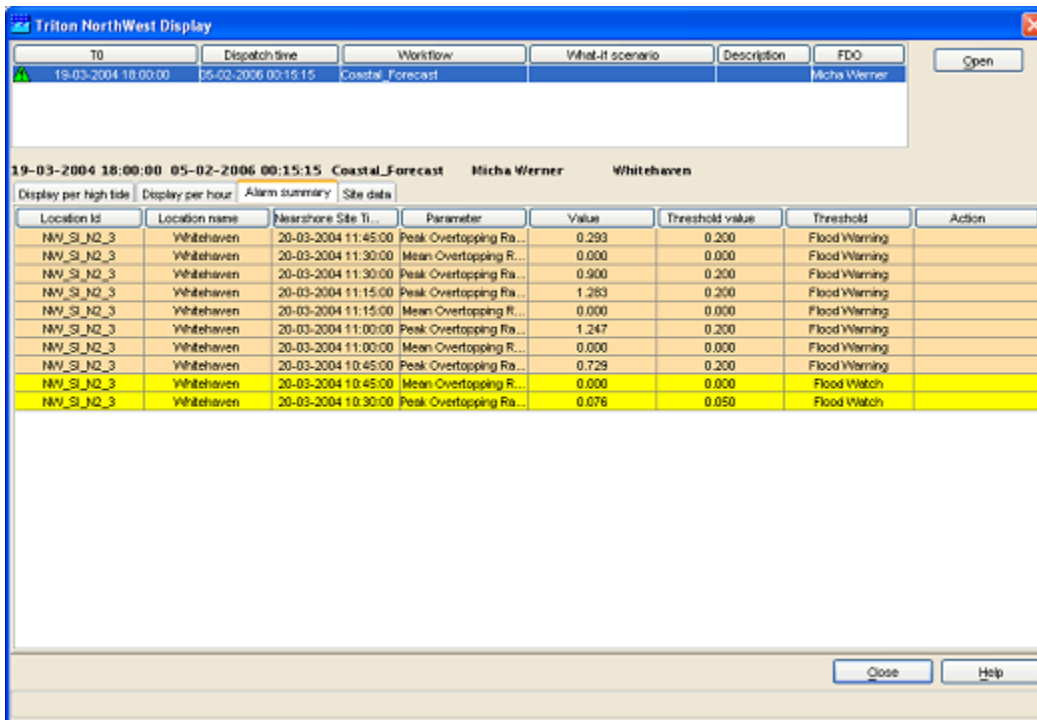
Coastal forecasting example: thresholds per hour. High tide as in the previous example is at 10:45.



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

TO

Dispatch time

Workflow

What-if scenario

Description

FDO

19-03-2004 18:00:00

25-02-2006 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)	Overlap Mean Forecast (m2/s)	Overlap Peak Forecast (m2/s)	Overlap 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	1.691	4.764	240.836	BIOM	35.269	241.000
20-03-2004 10:00:00	4.026	0.000	0.000	0.000	1.697	4.772	240.682	BIOM	35.269	241.000
20-03-2004 10:15:00	4.305	0.000	0.000	0.000	1.702	4.778	240.559	BIOM	35.269	241.000
20-03-2004 10:30:00	4.305	0.000	0.000	0.000	2.508	5.509	245.855	BIOM	37.974	238.000
20-03-2004 10:45:00	4.526	0.000	0.076	0.000	2.516	5.512	245.751	BIOM	37.974	238.000
20-03-2004 10:45:00	4.681	0.000	0.729	0.000	2.521	5.514	245.678	BIOM	37.974	238.000
20-03-2004 11:00:00	4.789	0.000	1.247	0.000	2.525	5.515	245.623	BIOM	37.974	238.000
20-03-2004 11:15:00	4.775	0.000	1.263	0.000	2.525	5.515	245.616	BIOM	37.974	238.000
20-03-2004 11:30:00	4.713	0.000	0.900	0.000	2.522	5.515	245.663	BIOM	37.974	238.000
20-03-2004 11:45:00	4.586	0.000	0.293	0.000	2.510	5.513	245.722	BIOM	37.974	238.000
20-03-2004 12:00:00	4.402	0.000	0.000	0.000	2.512	5.510	245.809	BIOM	37.974	238.000
20-03-2004 12:15:00	4.204	0.000	0.000	0.000	2.505	5.507	245.900	BIOM	37.974	238.000
20-03-2004 12:30:00	3.951	0.000	0.000	0.000	2.486	5.504	246.017	BIOM	37.974	238.000
20-03-2004 12:45:00	3.682	0.000	0.000	0.000	2.486	5.500	246.154	BIOM	37.974	238.000
20-03-2004 13:00:00	3.374	0.000	0.000	0.000	2.475	5.493	246.323	BIOM	37.974	238.000
20-03-2004 13:15:00	3.037	0.000	0.000	0.000	2.110	5.422	243.822	BIOM	37.273	246.000
20-03-2004 13:30:00	2.684	0.000	0.000	0.000	2.099	5.416	244.020	BIOM	37.273	246.000
20-03-2004 13:45:00	2.318	0.000	0.000	0.000	2.083	5.421	244.240	BIOM	37.273	246.000
20-03-2004 14:00:00	1.944	0.000	0.000	0.000	2.068	5.417	244.456	BIOM	37.273	246.000

Close

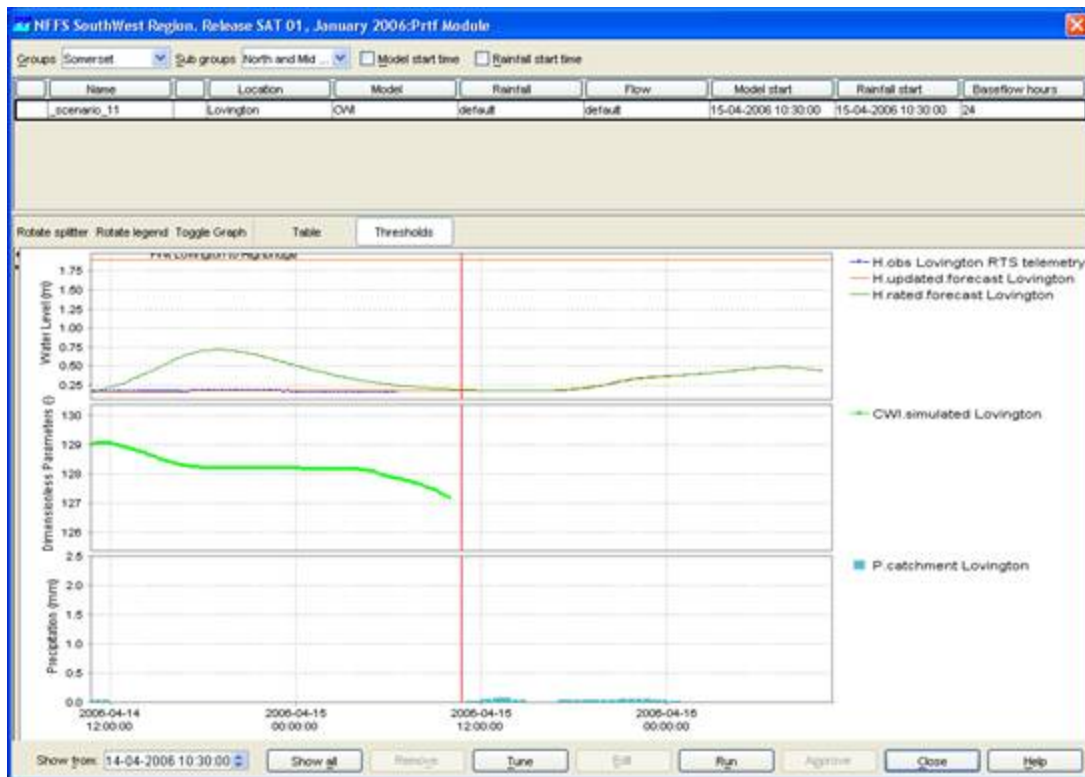
Help

13 PRTF Display

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

PRTF Display

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

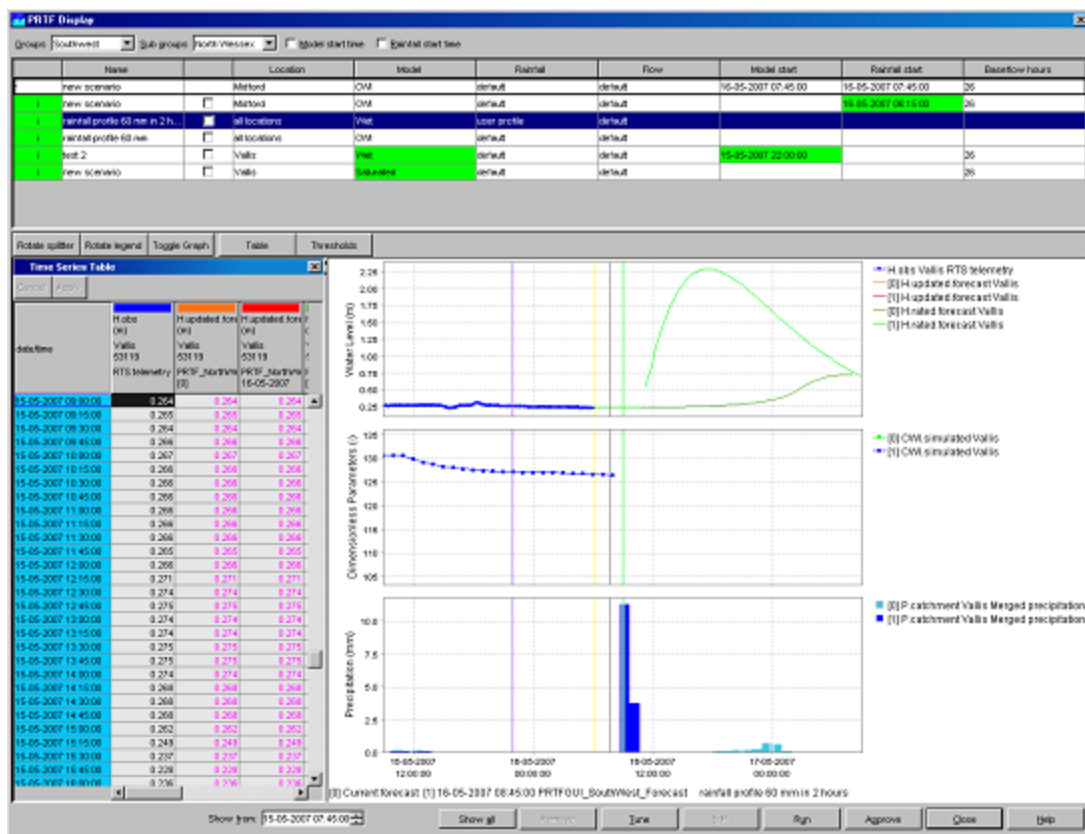


The PRTF display provides an interface to the configurable settings of the PRTF module. The settings entered by the user are stored in the form of a what-if scenario, that can then be run. Scenarios created with the PRTF display run locally on your own PC. The forecast result of each scenario can then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

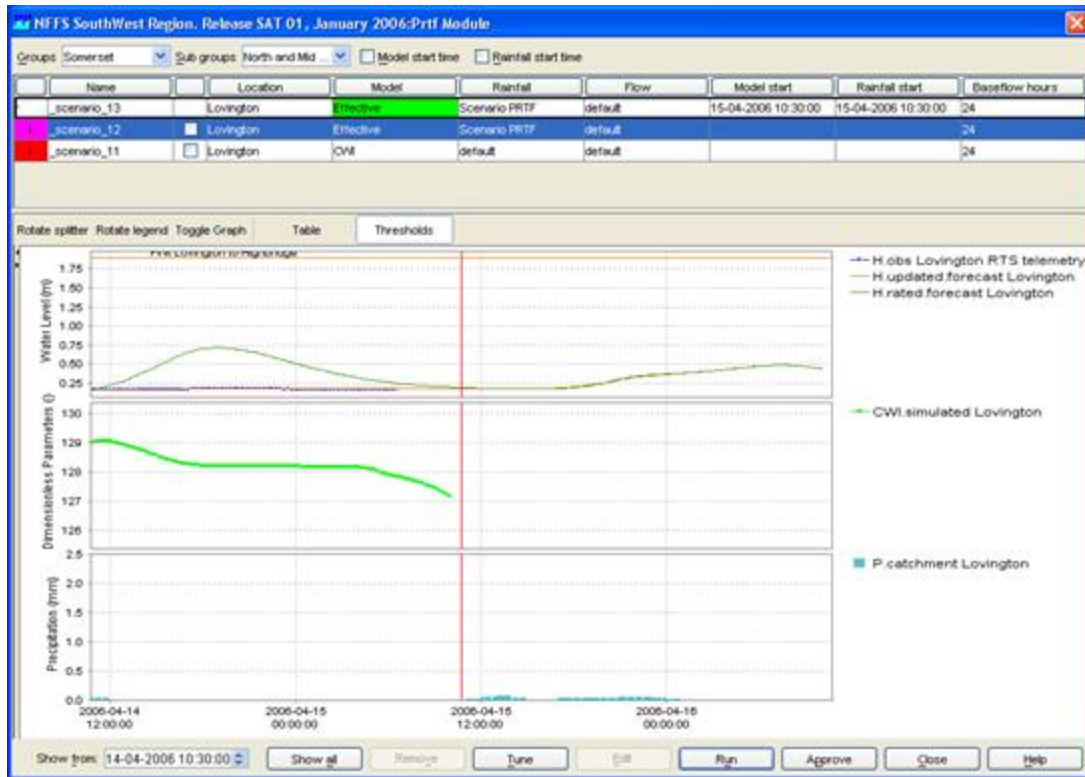


To create a new scenario you have to select a group of sites in the top part of the display and optionally you also have to select a subgroup (Southwest only). Then you select a site or the option 'all locations' in the top row of the scenarios list and change the settings you want. If you change one 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

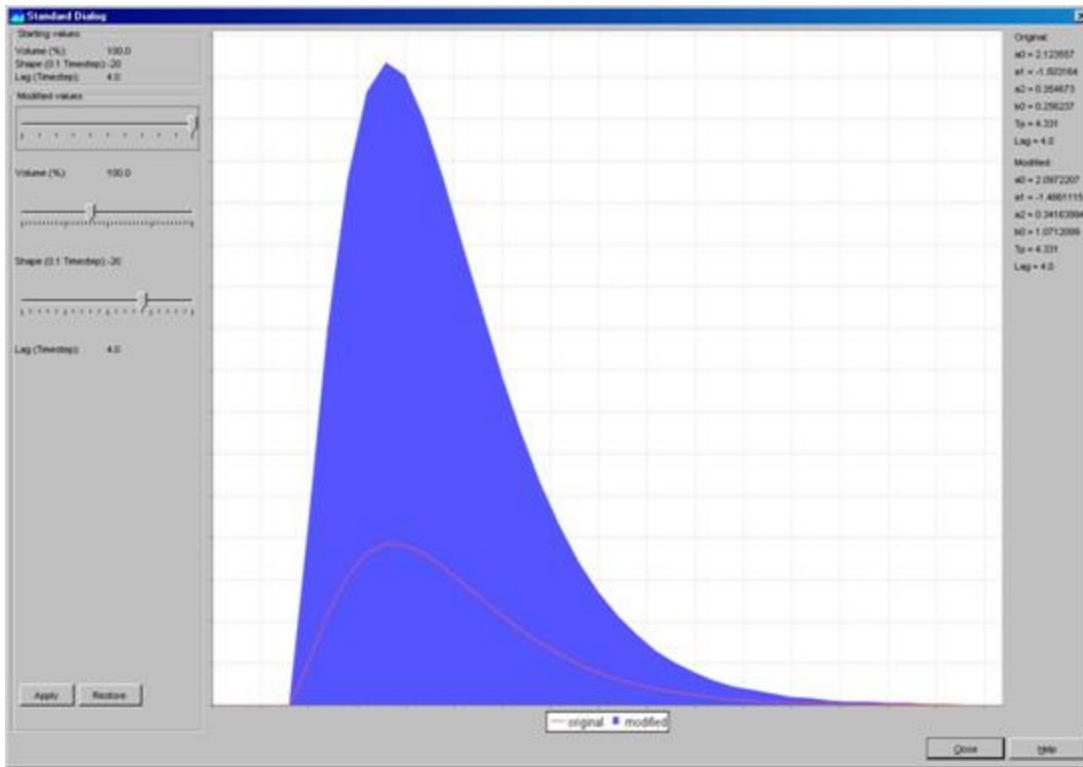
Within the PRTF Display it is possible to change the following settings:

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 choose 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.

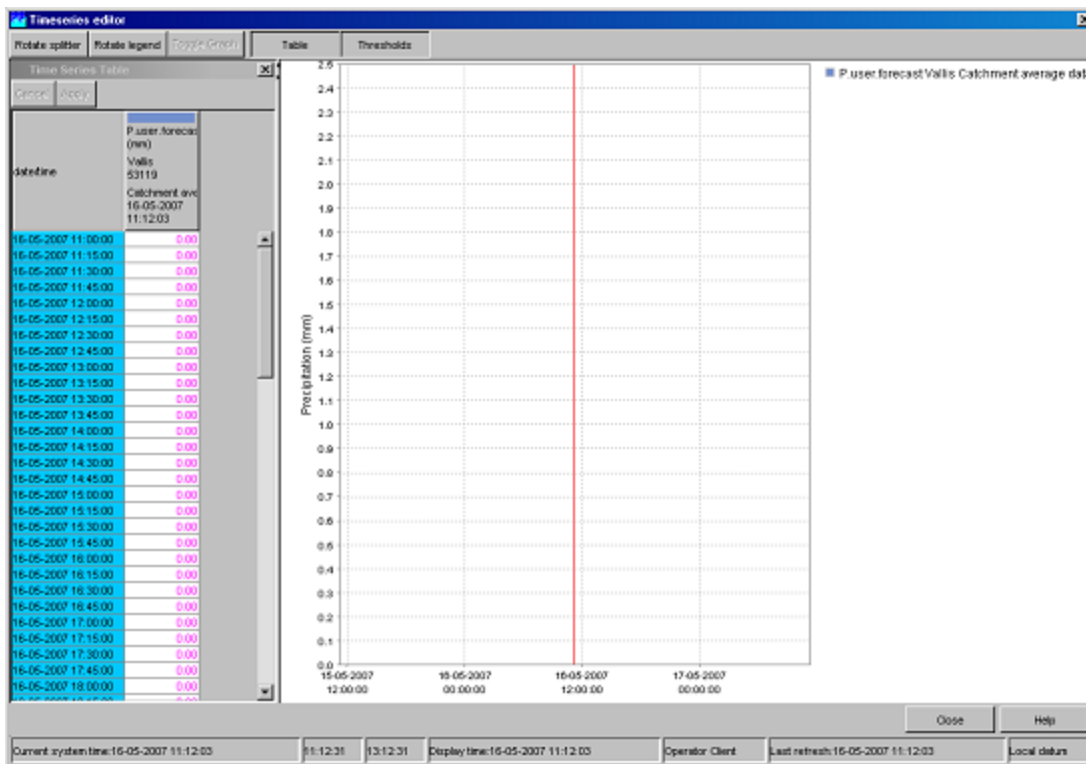


The red line shows the original settings and the blue graph shows the changed settings. The values for Volume, Shape and Lag can be modified by moving the slider bars. This results in a change in shape of the blue graph. After changing the Model parameters you should click on 'Apply' to add the modified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

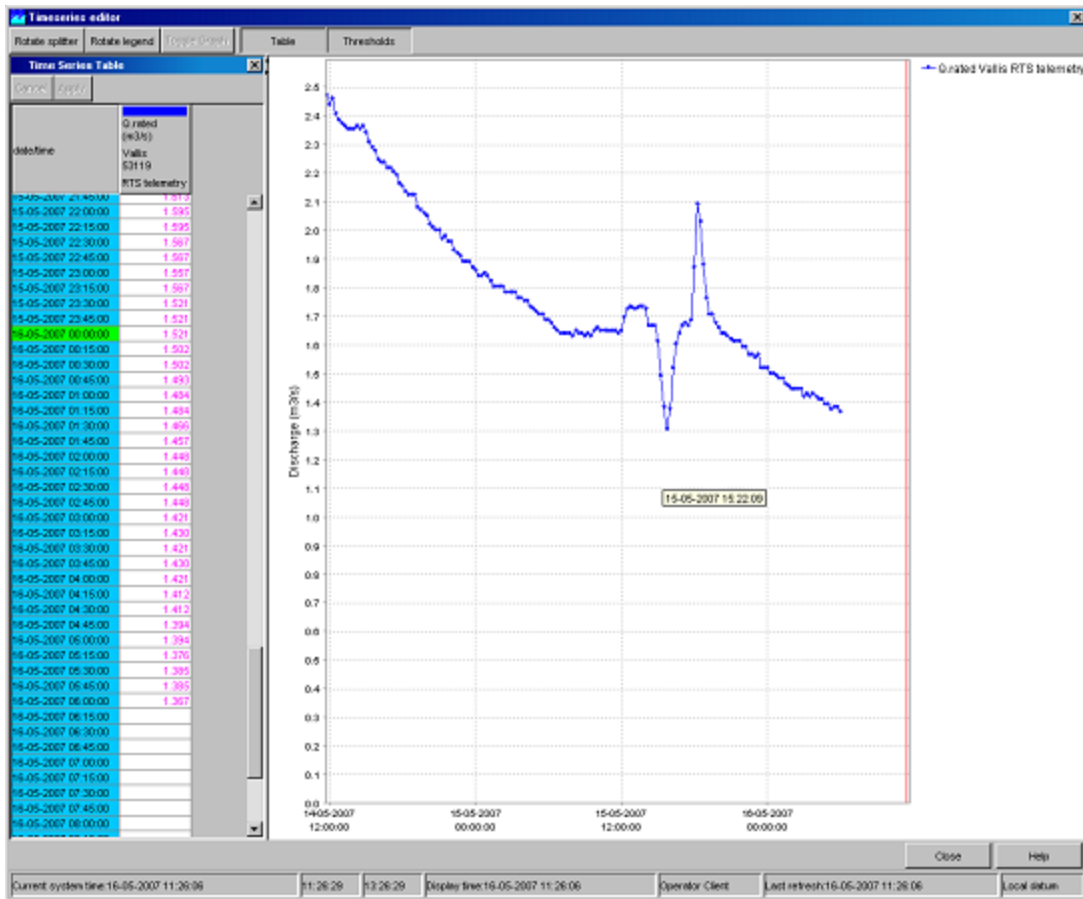
To create or select a rainfall profile you need to click on the cell in the column Rainfall. A dropdown box will appear with some predefined rainfall scenarios. You can select one of those predefined scenarios or you can select the option 'user profile' to create a new profile. When the option user profile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

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

Correlation Display

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

Input

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

Correlation Display

Correlation module

Input | Scatter plot | Forecast | Events

Correlation Groups
CorrelationDisplay_Trent

Forecast locations
Colwick (4009)

Support locations
Drakelow (4019)

Selection criteria

☐ Period: Start date: 2005-01-14 10:00 End date: 2005-01-14 10:00
☒ Select inside period
☐ Select outside period

☐ Thresholds: Threshold limit:
☒ Select above threshold
☐ Select below threshold

☐ Tags: dummy time
 invalid month in Tpot.inf
☒ Include selected tags
☐ Exclude selected tags

Regression equations
 Linear Regression: $f(x) = A + B * x$
 Polynomial order: 0

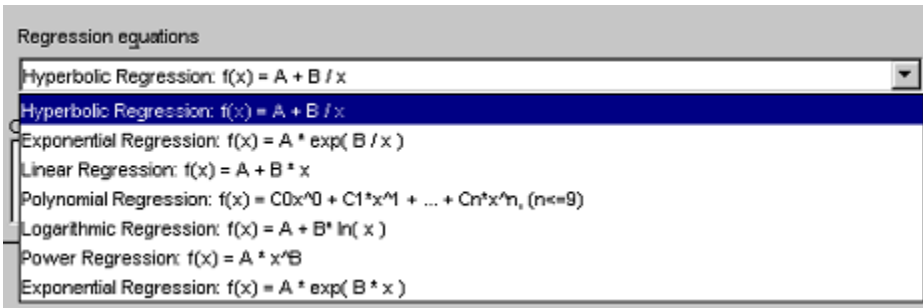
Show Report Close Help

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

- *Period*
A period can be defined inside or outside which data points should be included in the analysis.
- *Thresholds*
A threshold can be defined below or above which data points should be included in the analysis.
- *Tags*
One or more tags of data points can be selected. Data points that have a corresponding tag are or are not included in the analysis.

Please note that these tags should be available in the datasets. Typical tags could be winter or summer event.

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



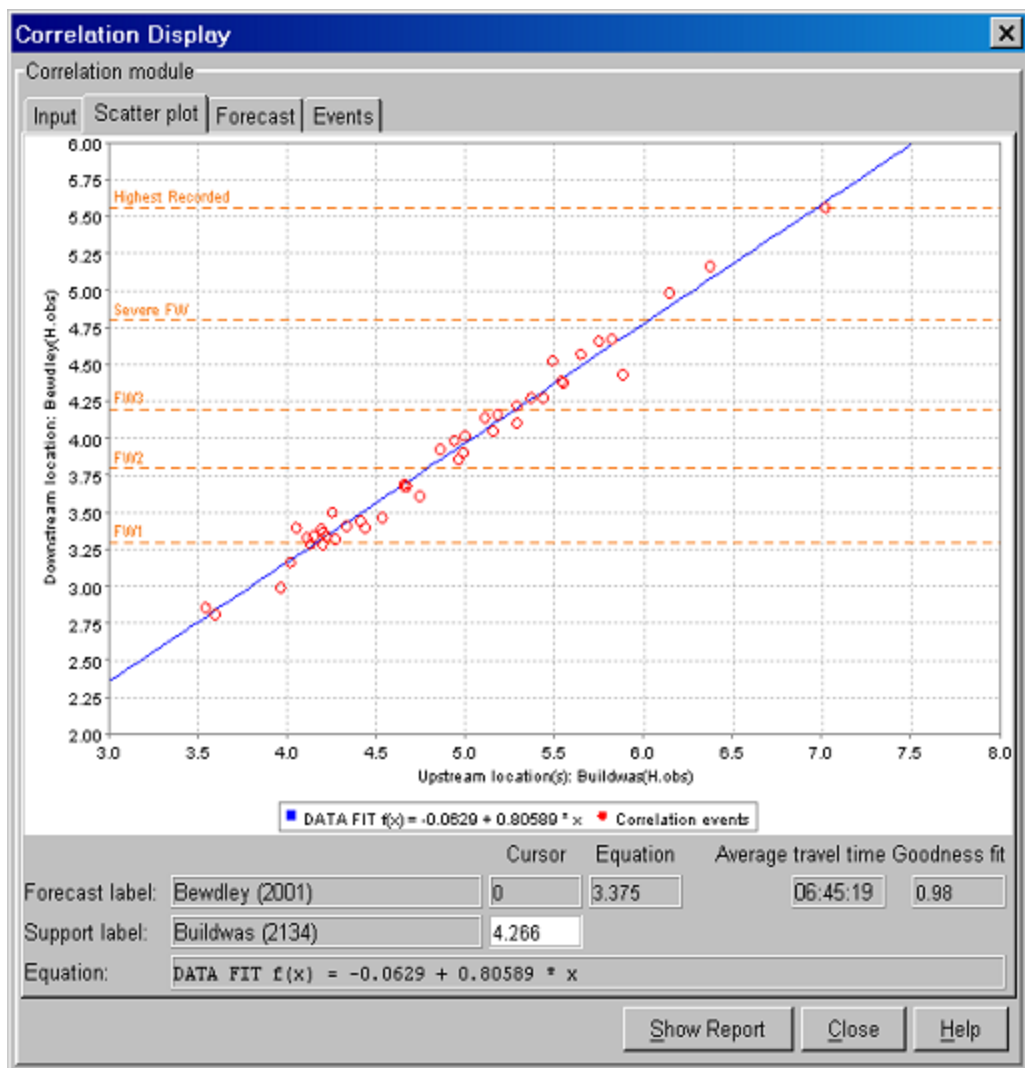
Scatter Plot

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* .



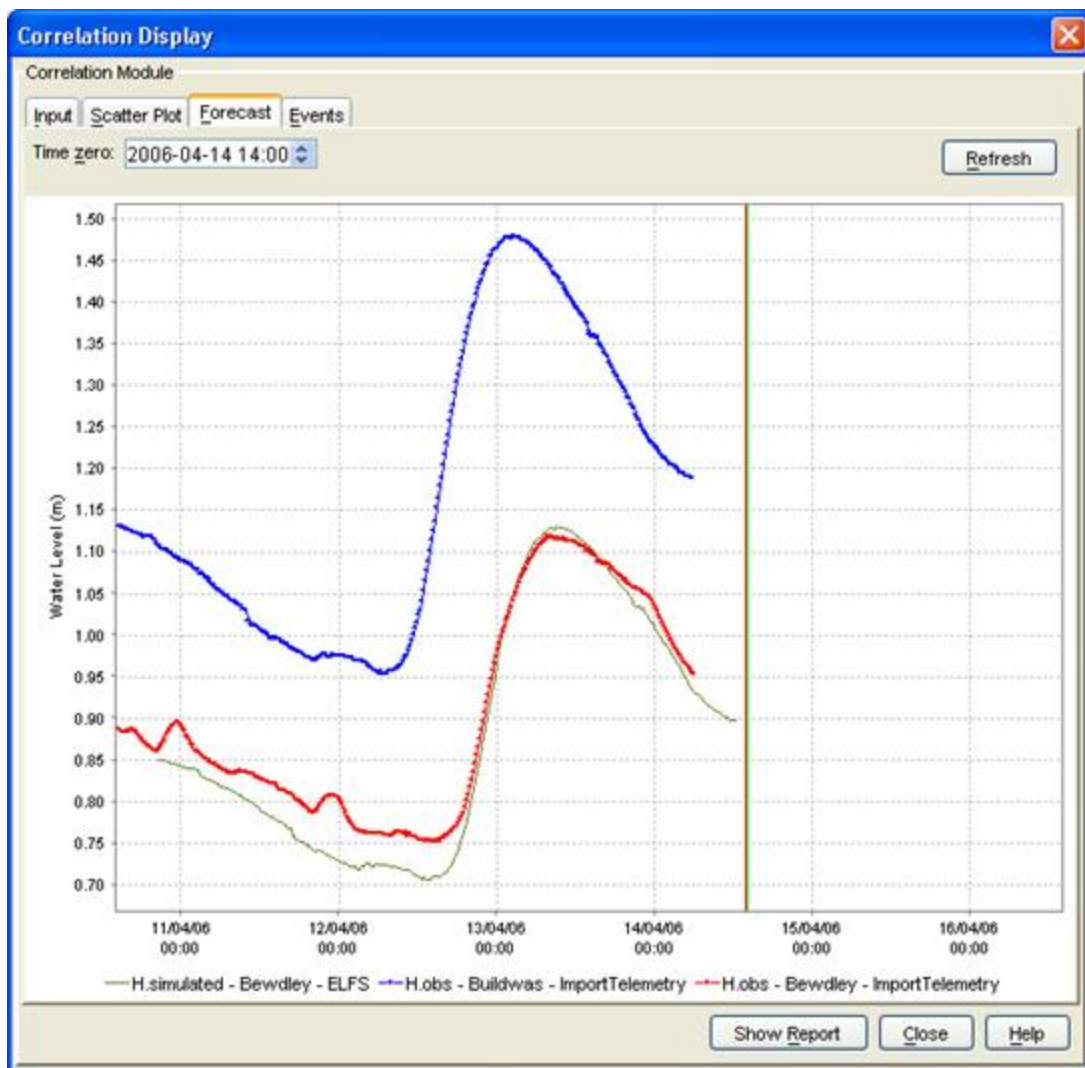
A forecaster can also enter a value in the cursor column for the support location. By pressing [ENTER] the correlation display computes the forecast with the equation and shows the result in the equation column.

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.



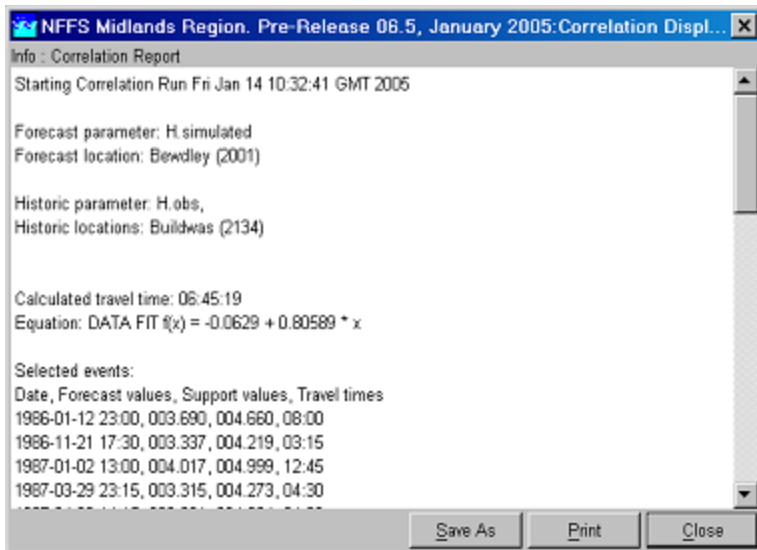
Events

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.



15 Lookup Table Display

- [Lookup Table Display](#)
 - [Lookup Scenario Id](#)
 - [Forecast Description](#)
 - [Start time](#)
 - [What-if Scenario](#)
 - [Report](#)
 - [Close](#)

Lookup Table Display

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

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

Lookup Scenario Id:
Kent C1 to C10, C301 to C306

Forecast description:
Kent Forecasting What-if Scenario

Start time : (dd-MM-yyyy HH:mm:ss) :
16-05-2007 09:45:00

What-if scenario

Parameter	Location	Operation	Change
Tidal Surge Residuals (Simulated)	Sheerness	add	0.000
Tidal Surge Residuals (Simulated)	Dover	add	0.000
Tidal Surge Residuals (Simulated)	Rye	add	0.000
Wind Direction Forecast	Thames Sea Area	add	0.000
Wind Speed Forecast	Thames Sea Area	add	0.000
Wind Direction Forecast	Dover Sea Area	add	0.000
Wind Speed Forecast	Dover Sea Area	add	0.000

Report Close Help

Lookup Scenario Id

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

Forecast Description

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

Start time

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

What-if Scenario

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

Lookup Table Display

Lookup Scenario Id :
Sussex C11 to C12, C401 to C405

Forecast description :
Sussex Region Forecasting What-if Scenario

Start time : (dd-MM-yyyy HH:mm:ss) :
16-05-2007 09:45:00

What-if scenario

Parameter	Location	Operation	Change
Tidal Surge Residuals (Simulated)	Newhaven	add	0.000
Total Wave Direction Forecast	South Hastings	add	0.000
Total Wave Height Forecast	South Hastings	subtract	0.000
Total Wave Direction Forecast	South Selsey	multiply	0.000
Total Wave Height Forecast	South Selsey	divide	0.000
		equal	
		timeshift (minutes)	
		equal to Missing	

Report Close Help

Report

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

NFFS Southern Region

Coastal Status Report

Forecast area : North Kent Forecasting
Forecast name : North Kent Forecasting What-if Scenario
Forecast time (TD) : 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

- 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 NFFS version will perform the calculations if less than two hours worth of data is available. A warning message will be issued if this happens

KFlows can be used in two working modes:

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

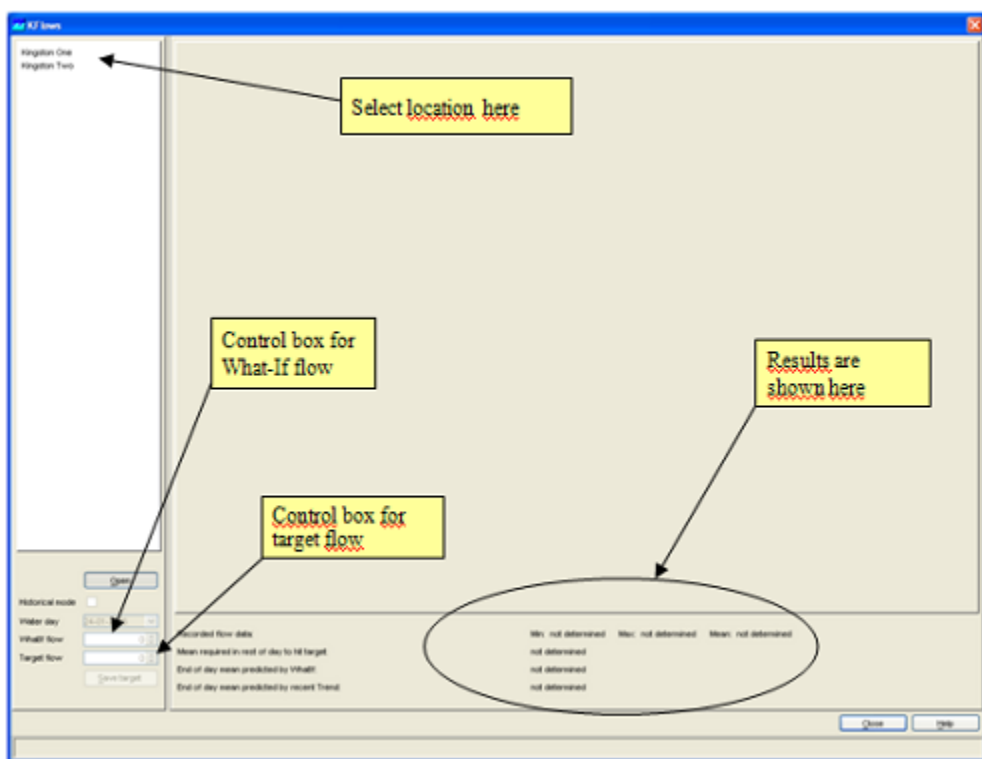
KFlows Calculations

The KFlows module performs the following calculations:

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

Current day mode

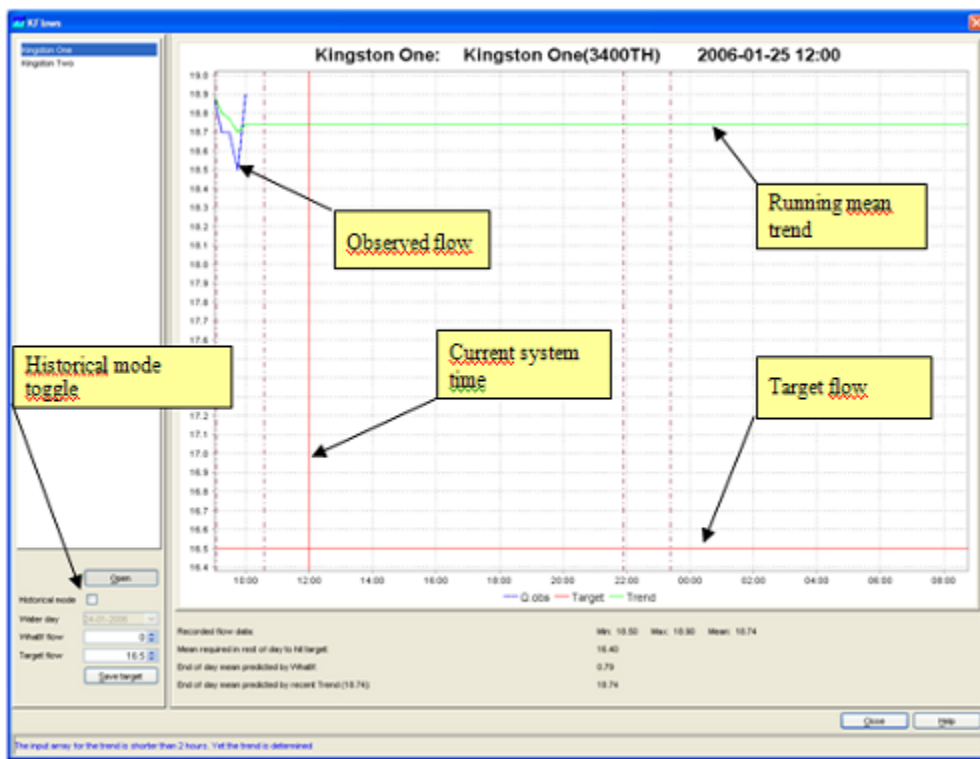
After opening the selected gauge the module will get the data and perform the calculations. If not enough data points (the number of points used is presently fixed at 8) are present between the current time and the configured start of the water day the calculation will use less points and a warning message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



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

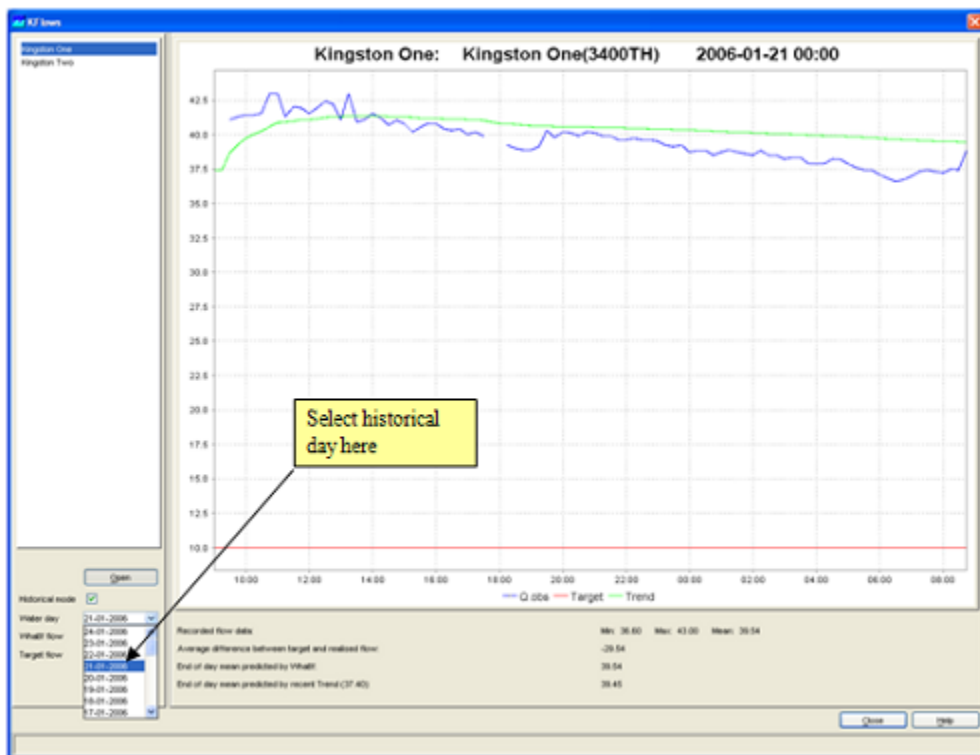
The periods with tidal influence (these are based on the Astronomical Highs and Lows) are shown as fine dashed vertical lines.

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



Historical mode

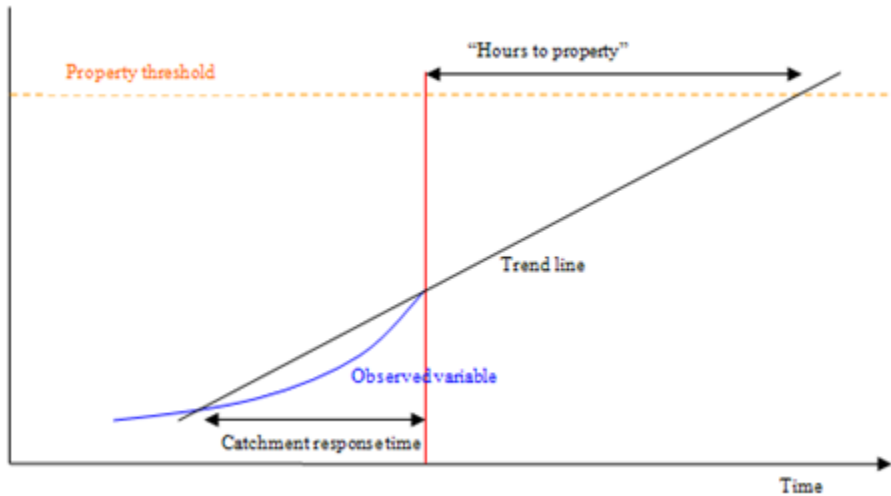
The historical mode can be selected using the historical model toggle. After selecting this toggle the drop down box can be used to select a specific water day. The display will show recorded flow, target flow and the running mean trend for that day.



17 Trends Display

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.

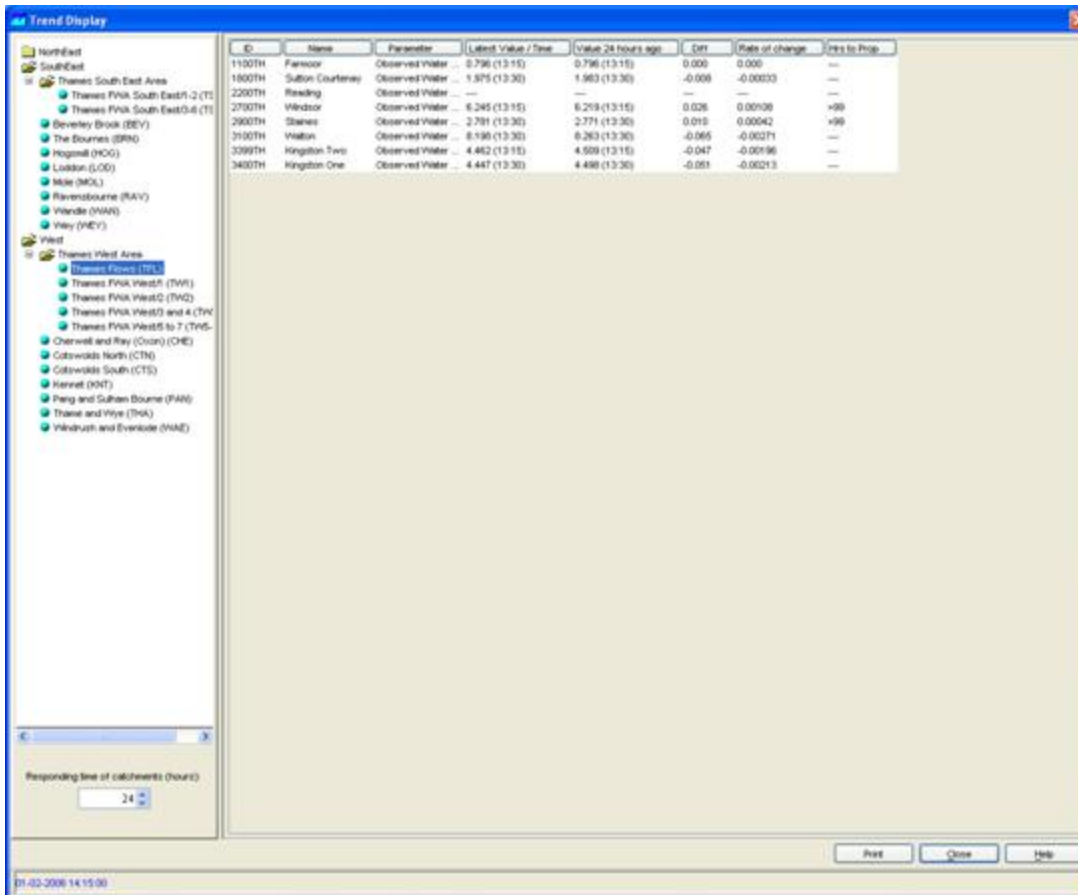


Note that when no data is available for the last hour up to the current system time, for that location the trend will not be determined.

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



18 Longitudinal Profile Display

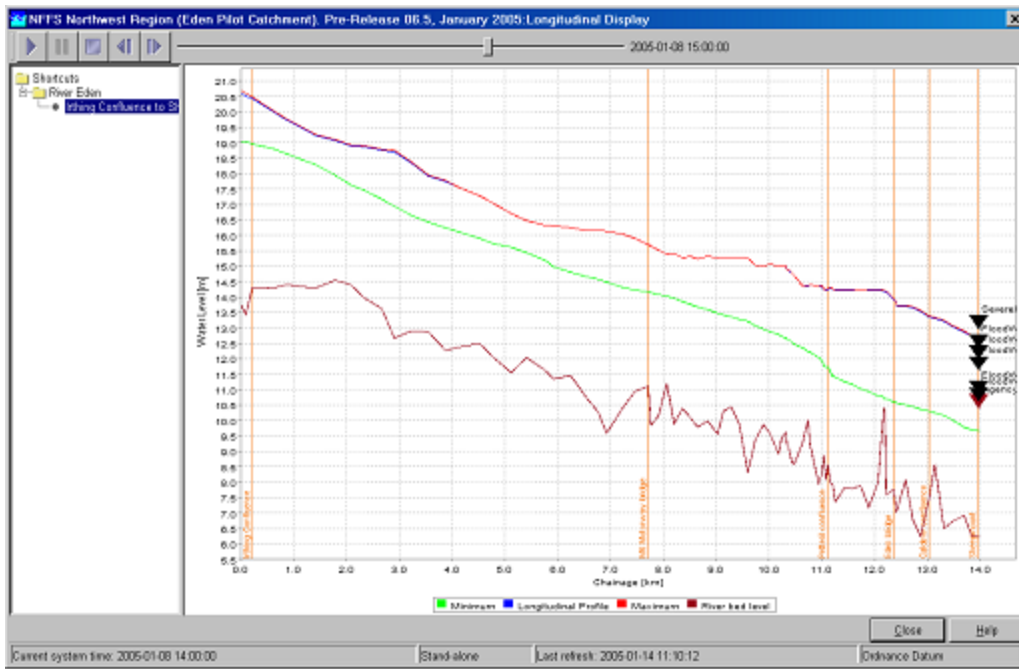
Longitudinal Profile Display

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

- 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 through 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.

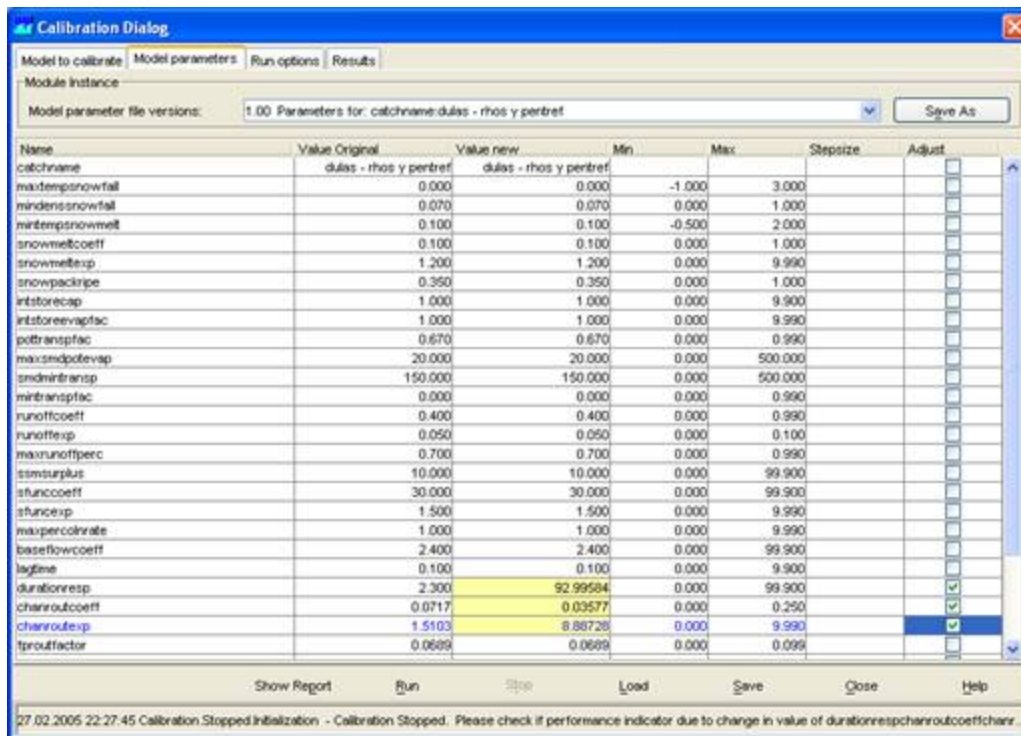
The required steps in the Model to Calibrate tab are:

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

Calibration Dialog

Model to calibrate | Model parameters | Run options | Results

Calibration method:
Calibration method: SuperDUD

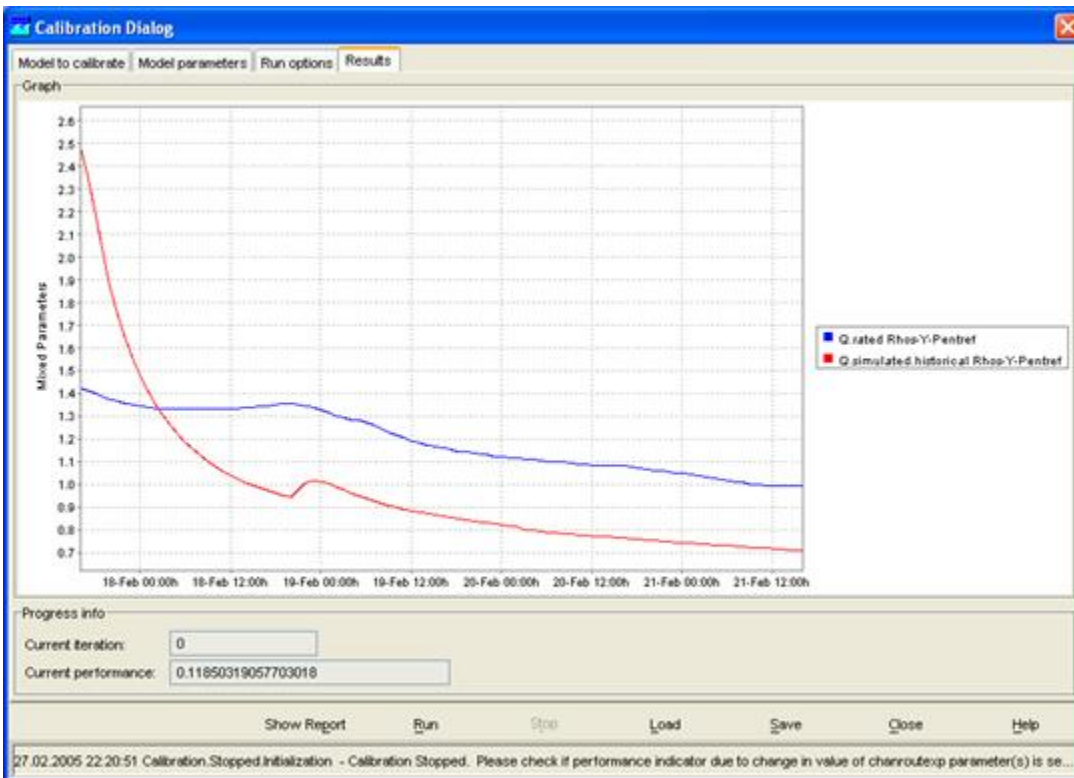
Performance:
Performance indicator: meansquareerror

Termination criteria:
 Max. number of iterations: 4
 Threshold change in performance: 1
 Threshold change in parameter vector: 0.1

Show Report Run Stop Load Save Close Help

Results

The results tab shows the calibration results in a graph. To start the calibration utility the [Run] button must be pressed. The workflow will be started and the model parameters adjusted by the calibration utility. The user can follow the calibration progress by analysing the graph and the current iteration and current performance values located in the progress info frame.



After the calibration run is completed you can select to see a report by pressing the [Report] button. The report of the calibration run contains information on the model parameters that have been optimised in each iteration step.

By pressing [Close] the Calibration display can be closed.

Working efficiently with calibration

When working with the calibration utility a complete workflow must be run in order to optimise one of the modules in that workflow. In the calibration process this workflow will be run for multiple iterations. When the module is included in a fluvial workflow for the complete region each iteration will require a long time to complete. It is therefore recommended to create specific "calibration" workflows that only include one or several modules; the number of modules not contributing to the calibration module must be minimised. This will bring down the calculation time considerably. Especially for rainfall-runoff modules it will not take much time to create such calibration workflows.

When running the calibration utility a database must be used with a complete set of historical data. Such a database can be created using the on-line or off-line systems or by importing data from HARP.

20 Configuration Manager

- Configuration Manager
- Dropdown Menus
 - File
 - Management
- Configuration Management
 - Export
 - Export All
 - Import
 - Delete
 - Set Active
 - Validate
 - Download
 - Upload
 - System Monitor
- Version Management
- Configuration Editor
- Additional options
 - Automatically download configuration with -auto_download_configuration
 - Using the *.jpif
 - No Upload
 - Extra confirmation of upload
 - Using the fews.sh script (LINUX)
 - Using the *.jpif
 - Using the launcher (FEWSLauncher.xml from FEWS Scotland as example)
 - Prevention of deletion
 - Using the *.jpif
 - Using the launcher (FEWSLauncher.xml from FEWS Scotland as example)
 - Note on *.jpif

Configuration Manager

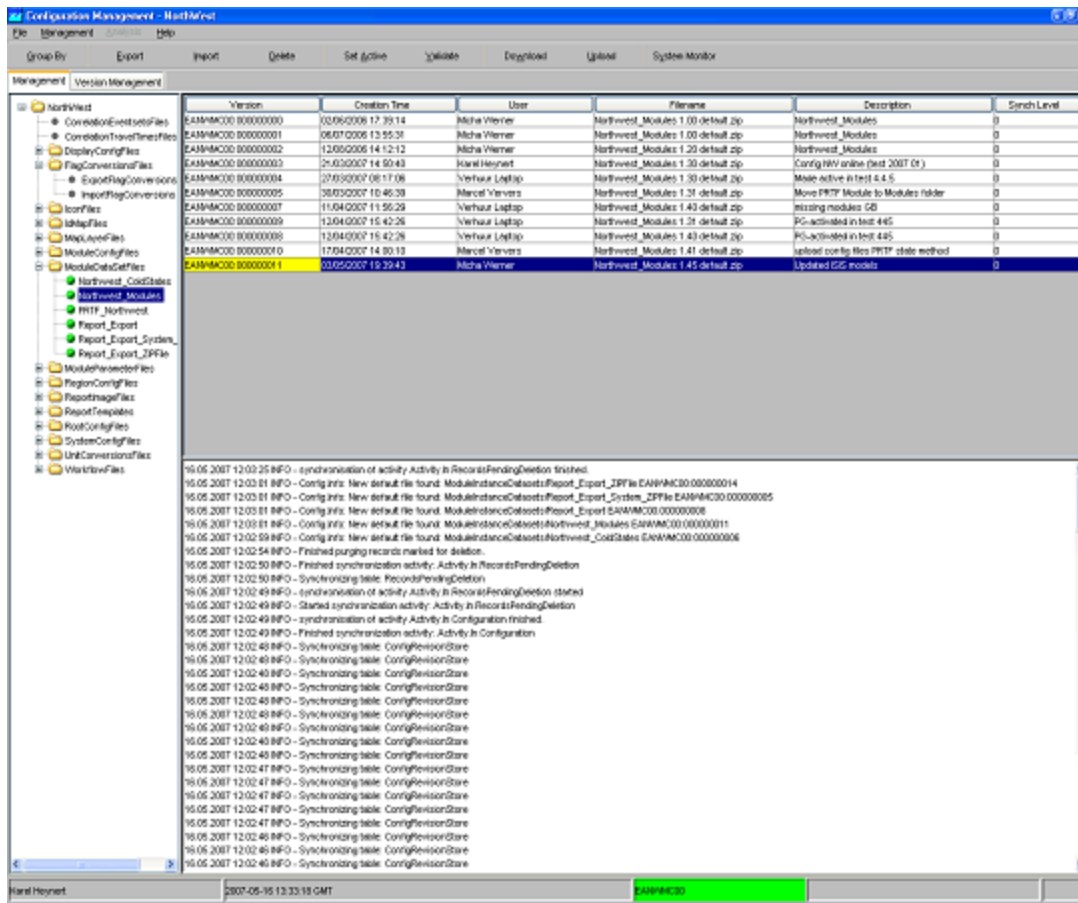


From Delft-FEWS 2011_01 onwards the Configuration Revisions are stored more efficiently in the database. Please note that when the ConfigManager 2011_01 is started, it will not display Configuration Revisions from before 2011_01. Read [Migration of Configuration Revisions](#) (restricted access) for information on how to migrate the Configuration Revisions to the new 2011_01 format.

The Configuration Manager supports management of Delft-FEWS configurations. With help of the Config Manager files can be uploaded to and downloaded from the FEWS system. The tool also facilitates version management.

The display of the Config Manager is presented below.

- The tree view on the left hand side of the screen shows the various groups of configuration files.
- Configuration files of a selected type are displayed in the table in the centre of the screen. Files highlighted with yellow are part of the active configuration.
- Log messages generated during configuration management actions are displayed in the Log Panel.



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...

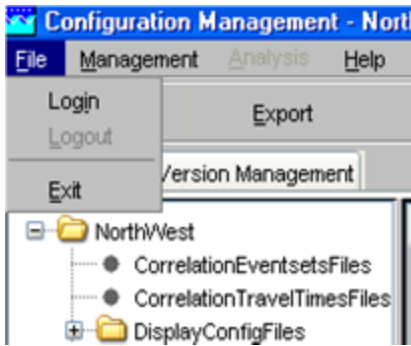
- File
- Management
- Help

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.

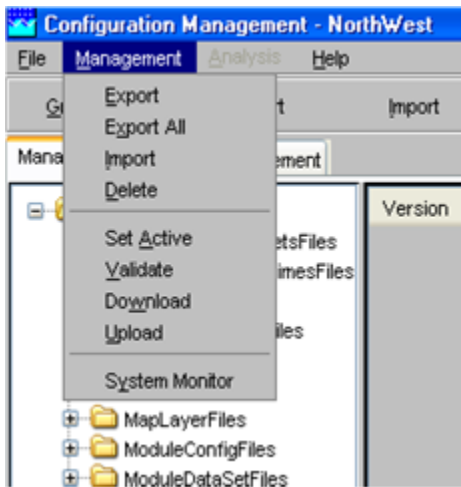


After selecting Login the following window is shown. In case multiple master controllers are available, these will be shown in the display.



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

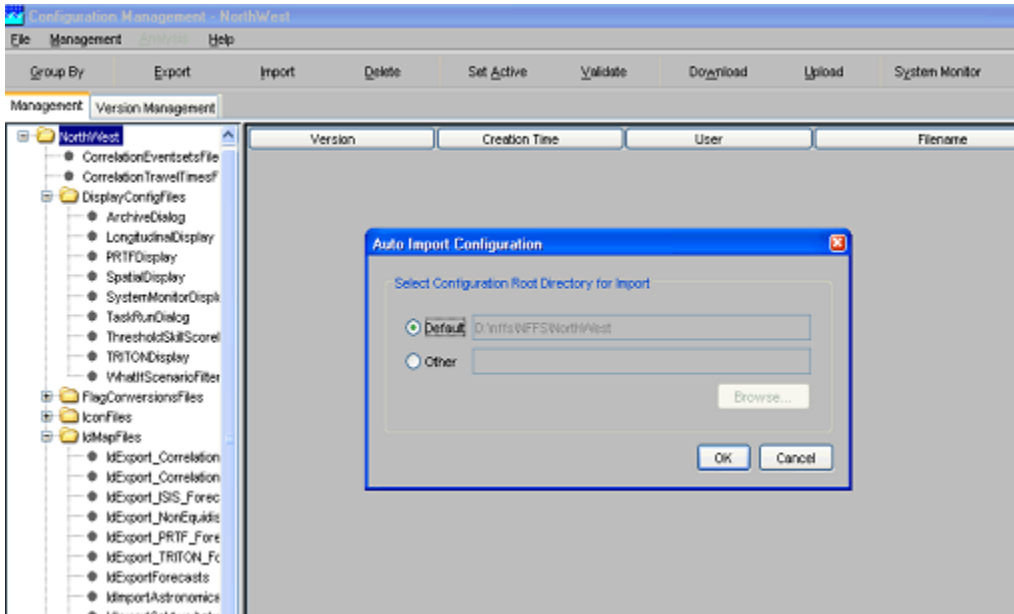
FEWS configuration folder.

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.

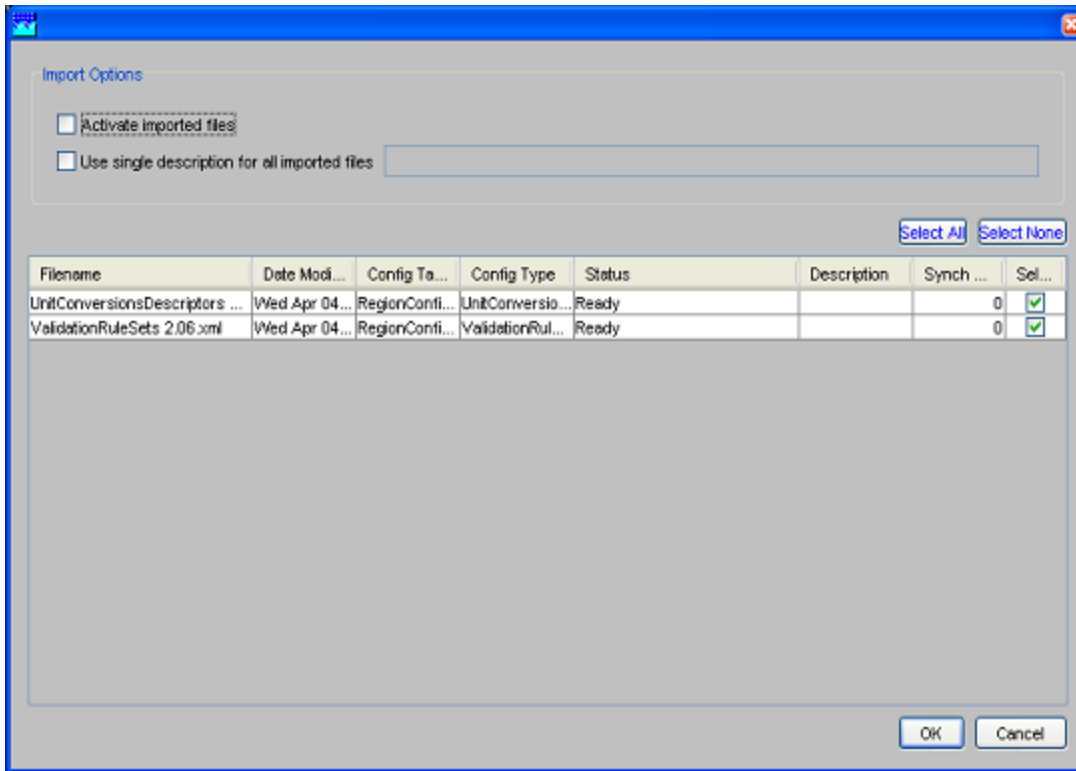
Import

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

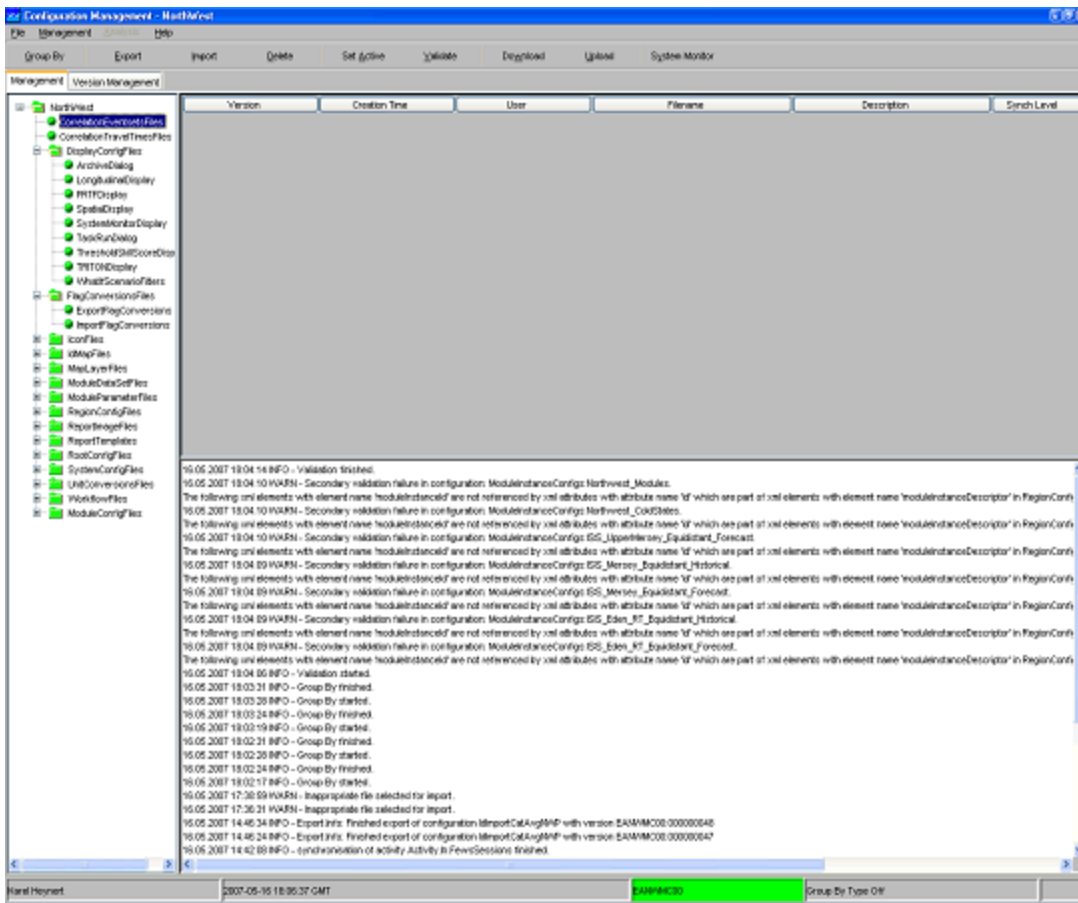
Allows you to set files to active. This means that when synchronised to the server, they will be used throughout the system.

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.



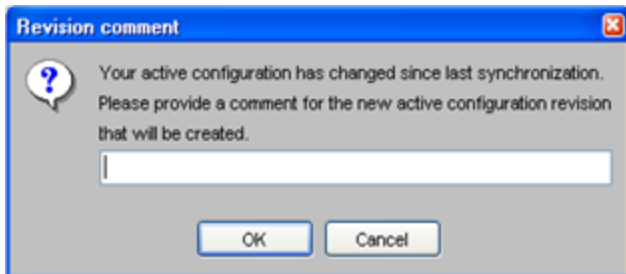
Download

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 identify 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.

System Monitor					
Log Browser Synchronisation Status Synchronisation Monitor					
Activity ID	Type	Frequency	LastSynchTime	Status	Progress
Activity In.FewerSessions	single	0	16.05.2007 14:42:07		
Activity In.RecordsPendingD...	single	0	16.05.2007 12:02:50		
Activity In.Configuration	single	0	16.05.2007 11:57:48		
Activity In.LiveSystemStatus	single	0	09.04.2007 23:32:17		
Activity Out.RecordsPensin...	single	0	09.04.2007 23:32:17		
Activity Out.Configuration	single	0	09.04.2007 23:31:14		

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.

Configuration Management - Thames_ON					
File Management Analysis Help					
Group By Export Import Delete Set Active Validate Download Upload System Monitor					
Management Version Management					
Revisions					
Revision	Date	User	Comment	Changes	
EATHMC00:000000031	Fri Apr 27 17:42:06 CEST 2007	Marcel Ververs	correction locationIDs in polygons file		1
EATHMC00:000000032	Wed May 02 11:59:38 CEST 2007	Jaap Schellekens	Fixed 15 min surge/windwave issues		3
EATHMC00:000000033	Wed May 02 15:35:16 CEST 2007	Jaap Schellekens	Update closing stuff		13
EATHMC00:000000034	Thu May 03 14:30:03 CEST 2007	Jaap Schellekens	Fixed surge whatif problem		3
EATHMC00:000000035	Thu May 03 15:54:25 CEST 2007	Jaap Schellekens	removed icon from taskrundialog		1
EATHMC00:000000036	Thu May 10 10:53:24 CEST 2007	Verhuur Laptop	archiving corrected - GB		4
EATHMC00:000000037	Fri May 11 14:17:36 CEST 2007	Gerard Minarends	TestGM14.17		1
EATHMC00:000000038	Fri May 11 14:28:00 CEST 2007	Gerard Minarends	TestGM restore		1
EATHMC00:000000039	Thu Jun 07 13:22:18 CEST 2007	Gerben Boot	Patch 15582 -> 15683 including UK 7.2 cile...		1
EATHMC00:000000040	Thu Jun 07 13:25:34 CEST 2007	Gerben Boot	Patch VML (UK 7.2 patch removed)		1
EATHMC00:000000041	Thu Jun 07 14:24:20 CEST 2007	Gerben Boot	patch VML ntfs		1
EATHMC00:000000042	Thu Jun 21 10:39:53 CEST 2007	Gerben Boot	patch w/ diff(15801-15582)		1
EATHMC00:000000043	Thu Jun 21 11:58:20 CEST 2007	Gerben Boot	correct patch 216		1
EATHMC00:000000044	Thu Jun 21 14:07:31 CEST 2007	Gerben Boot	patch pging 3		1
EATHMC00:000000045	Fri Jun 22 16:27:21 CEST 2007	Gerben Boot	patch 22		1
EATHMC00:000000046	Tue Aug 28 11:18:46 CEST 2007	Gerben Boot	patch 7.3 (final)		1
EATHMC00:000000047	Tue Oct 09 13:47:13 CEST 2007	Jaap Schellekens	off-line UK + BB changes		851
EATHMC00:000000048	Tue Oct 09 14:40:48 CEST 2007	Jaap Schellekens	z		6
EATHMC00:000000049	Tue Oct 09 14:43:35 CEST 2007	Jaap Schellekens	zz		1

Active configuration for revision EATHMC00:000000049					
Compare with revision Revision: EATHMC00:000000048, created at Tue Oct 09 14:40:48 CEST 2007 by Jaap Schellekens. <input checked="" type="checkbox"/> filter new or modified items					
Modification	Table name	Config type	Version		
Modified	WorkflowFiles	ISIS_TThames_Forecast	EATHMC00:000000013		

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](#).

Additional options

Automatically download configuration with -auto_download_configuration

For users of the ConfigManager who want to automatically download the latest config, the option -auto_download_configuration is available (since 2011_02).

This option can be added in the .jpf file under Windows or in the fews.sh script under linux.

```
if \[ "$configmanager" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx512M $JVM_OPTS \-Djava.library.path=$BINDIR \
\ -classpath "$classes" \
nl.wldelft.fews.configmanagement.ConfigManagementApplication $REGIONHOME $BINDIR
-auto_download_configuration
elif \[ "$launcher" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx128M $JVM_OPTS \-Djava.library.path=$BINDIR \
\ -classpath "$classes" \
nl.wldelft.fews.launcher.Launcher $REGIONHOME
else
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx512M $JVM_OPTS \-Djava.library.path=$BINDIR \
\ -classpath "$classes" \
nl.wldelft.fews.gui.explorer.Application $REGIONHOME $BINDIR
fi
```

Using the *.jpf

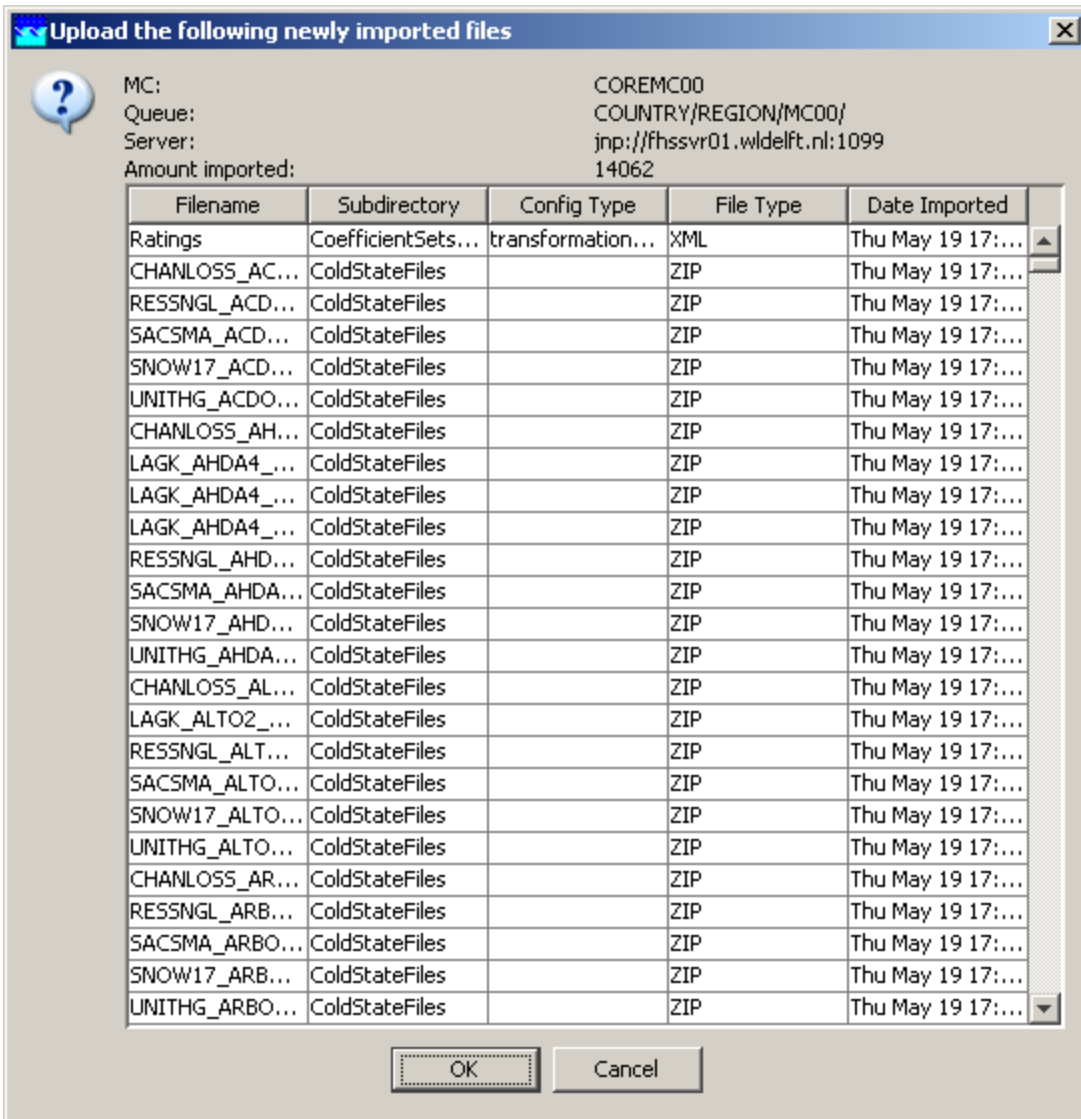
```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
[FEWS_APPLICATION_DIRECTORY]
-auto_download_configuration
```

No Upload

For novice users, there is the option -no-upload that will allow only download and disable the upload button.

Extra confirmation of upload

In order to have the ConfigManager display an additional confirmation screen containing the newly imported configuration files, the ConfigManager can be started using the -upload_confirmation command-line option. This will allow the user to confirm before the upload is executed.



To have this functionality as default behaviour, you can configure this as follows (look for the location of the "-upload_confirmation" option in the examples below):

Using the fews.sh script (LINUX)

```
if \[ "$configmanager" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java -Xmx512M $JVM_OPTS -Djava.library.path=$BINDIR \
-classpath "$classes" \
nl.wldelft.fews.configmanagement.ConfigManagementApplication $REGIONHOME $BINDIR -upload_confirmation
elif \[ "$launcher" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java -Xmx128M $JVM_OPTS -Djava.library.path=$BINDIR \
-classpath "$classes" \
nl.wldelft.fews.launcher.Launcher $REGIONHOME
else
${JAVA_HOME:-/opt/fews/java}/bin/java -Xmx512M $JVM_OPTS -Djava.library.path=$BINDIR \
-classpath "$classes" \
nl.wldelft.fews.gui.explorer.Application $REGIONHOME $BINDIR
fi
```

Using the *.jpf

```

..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
[FEWS_APPLICATION_DIRECTORY]
-upload_confirmation

```

Using the launcher (FEWSLauncher.xml from FEWS Scotland as example)

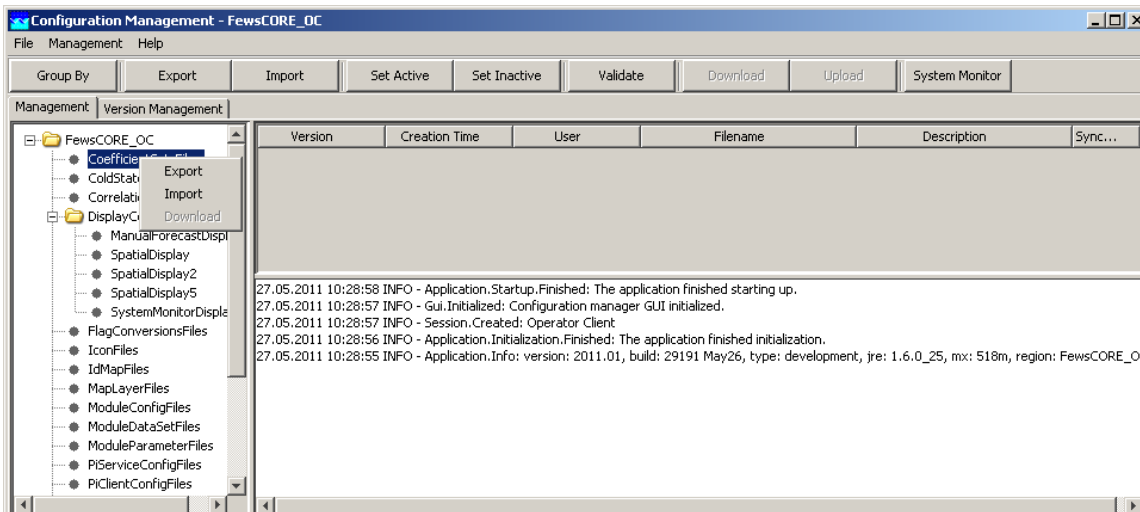
```

...
<javaApp region="FEWS Scotland" operationMode="OnLine"
javaClass="nl.wldelft.fews.configmanagement.ConfigManagementApplication" jvmOption="-Xmx512m"
argument="FewsSC_OC -upload_confirmation" />
...

```

Prevention of deletion

By design, the deletion of configuration files means that some existing config revisions may become incomplete (or corrupted). In order to prevent deletion of config files using the ConfigManagementApplication, the option *-prevent_deletion* has been added. This option will hide the buttons / menuitems and popup menu items that allow this to happen. The following screen shot illustrates that there is no delete button visible.



To have this functionality as default behaviour, you can configure this as follows (look for the location of the "-prevent_deletion" option in the examples below):

Using the fews.sh script (LINUX)

```

if \[ "$configmanager" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx512M $JVM_OPTS \-Djava.library.path=$BINDIR \
\ -classpath "$classes" \
nl.wldelft.fews.configmanagement.ConfigManagementApplication $REGIONHOME $BINDIR -prevent_deletion
elif \[ "$launcher" = "true" \]; then
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx128M $JVM_OPTS \-Djava.library.path=$BINDIR \
\ -classpath "$classes" \
nl.wldelft.fews.launcher.Launcher $REGIONHOME
else
${JAVA_HOME:-/opt/fews/java}/bin/java \-Xmx512M $JVM_OPTS \-Djava.library.path=$BINDIR \
\ -classpath "$classes" \
nl.wldelft.fews.gui.explorer.Application $REGIONHOME $BINDIR
fi

```

Using the *.jpfif

```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
[FEWS_APPLICATION_DIRECTORY]
-prevent_deletion
```

Using the launcher (FEWSLauncher.xml from FEWS Scotland as example)

```
...
<javaApp region="FEWS Scotland" operationMode="OnLine"
javaClass="nl.wldelft.fews.configmanagement.ConfigManagementApplication" jvmOption="-Xmx512m"
argument="FewsSC_OC -prevent_deletion"/>
...
```

Note on *.jpif

Note that the last line should be a linefeed.

Configuration Editor

Getting started

Stand-alone using the file system

```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configeditor.main.ConfigEditorController
<REGION FOLDER>
```

Using within the Config Manager

Add the option "-edit-menu" to the JPIF to get the Editor available in the Config Manager. The Editor can be started through the menu option <Edit>.

```
..\jre
-mx512m
-cp
$JARS_PATH$
nl.wldelft.fews.configmanagement.ConfigManagementApplication
<REGION FOLDER>
-edit-menu
```

21 Background Information

Background Information

Use of Time in FEWS

Within Delft FEWS, different concepts of time are used. In this section an overview is given of the various time concepts and their role in the system.

Internal time

The internal time is always Greenwich Mean Time (GMT). All time related information is stored in the FEWS database in GMT.

Current time

The current time is taken from the computer clock. For internal use GMT is derived from the computer clock and the time zone. The current time is by default displayed in GMT, but can also be displayed in local time.

Current system time

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

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

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

Display time

The display time is used in the time series display and allows the operator to define view windows on the selected time series. Setting the display time has no effect on data stored in the database.

22 Interactively modifying display colors

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

Map display

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

Grid display

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

Timeseries display

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

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

23 Interactive Forecasting Displays

What is the IFD?

The IFD is short for Interactive Forecast Displays.

The IFD is a set of displays which enable the forecaster to create a forecast manually in comparison to a batch run which creates a forecast in a background process triggered either by a schedule or manually.

When a forecaster creates a forecast in the IFD, the forecast created in the background process is usually used as the starting point for the forecaster.

The forecaster validates the results from the server run and adjusts the forecast by using modifiers were needed.

When the forecaster is satisfied with the adjusted forecast the forecast is finalized and published to other forecasters.

Usually when creating a forecast by using the IFD, FEWS runs in a mode where all the windows are dockable.

This is an important aspect of the IFD because this feature enables the forecaster to keep an overview of the system.

Contents

- What is the IFD?
- Contents
- Which displays are used in the IFD?
 - Forecast panel
 - Modifiers panel
 - Topology panel
 - Plot
 - Plot overview
 - Forecaster help
 - Run info
 - Forecaster notes
- How to create a forecast with the IFD
 - Steps in creating a forecast
 - Starting FEWS
 - Selecting the forecast panel
 - Review the list of available state date/times
 - Adjust state and/or forecast length
 - Starting the forecast process
 - Reviewing run status workflow
 - Review graphs (graph display listens to segment selection)
 - Creating a mod in the time series display
 - Creating a mod in the mods display
 - Continue with the forecast process downstream
 - Ending the forecast process
- Dockable windows
 - Docking and undocking main displays
 - Save display layout and reload on opening with same user
 - Save display layout and reload default layout

Which displays are used in the IFD?

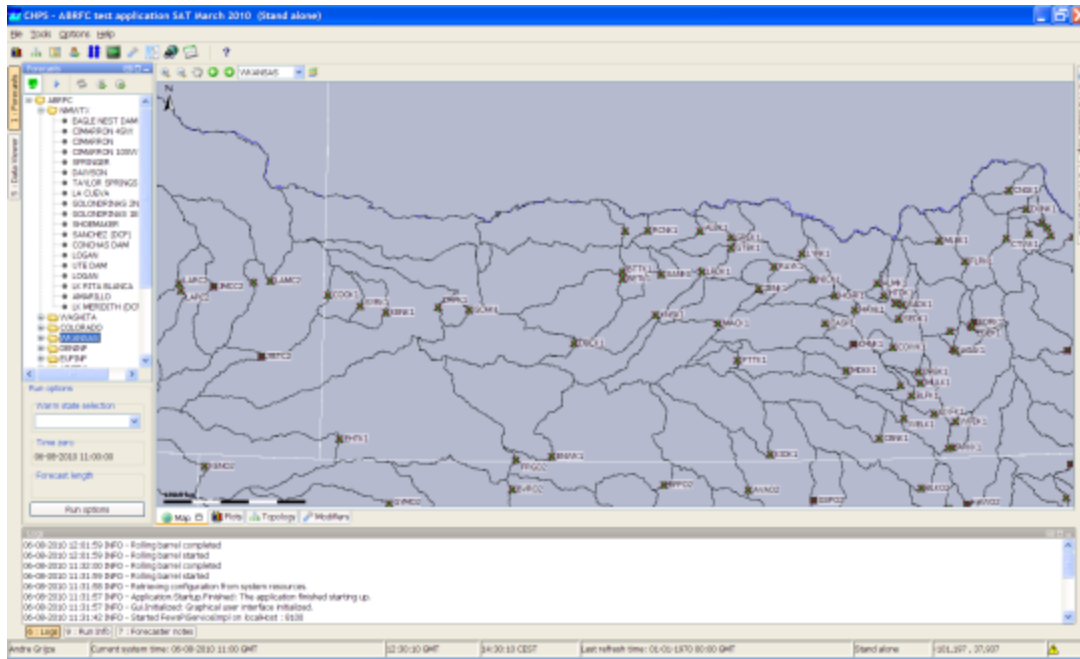
The IFD consists of several panels.

Each of these panels has a specific role in the process of creating a forecast with the IFD.

In this chapter the functionality of each panel in the IFD will be explained.

In the next chapter will be explained with a use case how a forecast can be created with the IFD by using the combined functionality of the separate panels.

Forecast panel



The forecast panel plays a central role in creating a forecast in the IFD.

The forecast panel shows a tree with all the forecast points for a region and the grouping of these forecast points.

Each node in the tree can be linked to a workflow. For example node EAGLE NEST DAM has its own workflow.

Each node also shows the current status of the last run of the workflow to which the node refers.

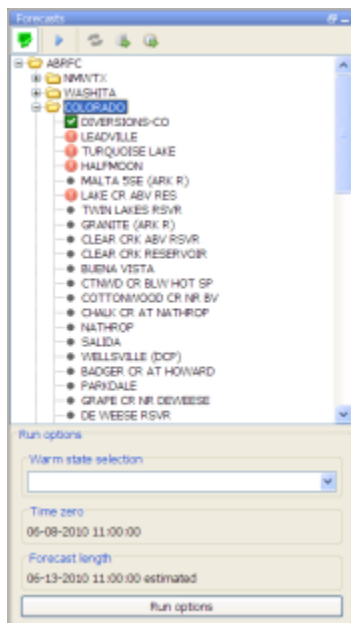
Workflows of parent nodes are always run on the server. By default leaf nodes are locally run, however it is also possible that these workflows are run on the server.

This can be done by setting the optional tag localRun to false for a node.

The leaf nodes are indicated by the small black balls in the display, parent nodes (node containing other parent nodes or leaves) are indicated as a folder in the forecast display.

When a leaf node is selected the ifd will automatically run the workflow of that node.

This behaviour can however be disabled in the configuration by setting the enableAutoRun-tag to false in the topolog.xml.



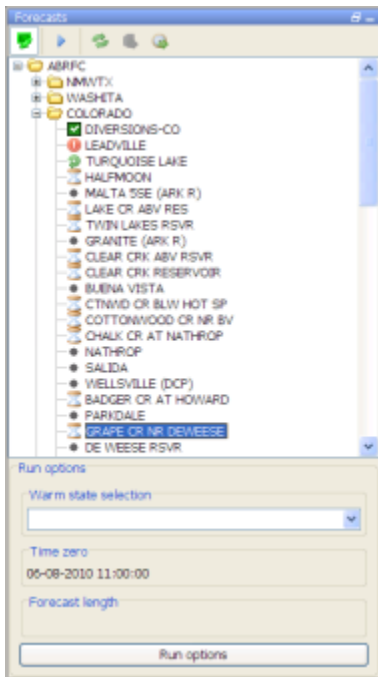
If the node shows a green checkbox (as is seen in the image above at the node DIVERSIONS-CO) item it means that the workflow has run successfully.

A red exclamation (as is seen in the image above at the LEADVILLE node) mark indicates that the workflow is failed.

A yellow ball indicates that the workflow was successful in a prior run, but the results have since been invalidated by some upstream change. For example, when the forecaster has created a modifier but did not rerun the workflow yet.

Or when an upstream node was run later than one of its downstream nodes then the results of the downstream nodes are set to invalid.

When a folder is shown for a parent node (as is seen for the COLORADO node in the image below) or a black ball for a leaf node (as is seen in the MALTA 5SE node) then the workflow has not run yet for the current time zero.

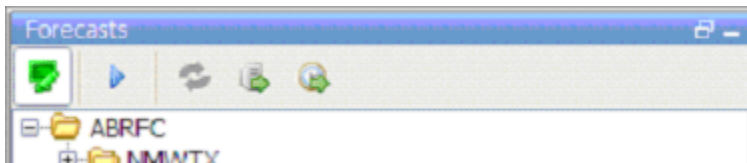


A green arrow (as is seen in the node TURQUOISE LAKE) indicates that the workflow is currently running (locally or at server).

An hour glass (see node HALFMOON above) indicates the workflow is scheduled to run.

Go to next segment Adjust T0

Run on ServerForecast/View-button



Re-Run button

At the top of the forecast panel several buttons are shown.

The first button is a **Forecast/View** toggle button (Put image of the button here) which can be used to switch from *View* mode to *Forecast* mode.

In the *Forecast* mode the forecaster can create modifiers and when a leaf node is selected the workflow is run automatically . In *View* mode the forecaster can view the results of other forecasts.

However, it is not allowed to create modifiers and workflows will not be run automatically when a node is selected. A workflow can be forced to run by pressing the **Re-Run** button.

The second button is the **Go to Next Segment**-button (image of button here). By pressing this button automatically the next leaf-node in the forecast panel will be selected.

The third button is the **Re-Run**-button (need button image). This button is only enabled when a node is selected which has a workflow which runs locally.

The fourth button is the **'Run on Server'**-button (need button image here). This button is only enabled when a node is selected with a workflow which should run on the server.

The last button is the **Adjust T0** (need image of button) button which allows the forecaster to adjust the current system time to the nearest cardinal time step prior to the current time.

Run options

Warm state selection

Time zero

06-08-2010 11:00:00

Forecast length

06-13-2010 11:00:00 estimated

Run options

At the bottom of the forecast panel there is a Run options section. In this section the forecaster can set the properties of the run. The warm state can be selected and the current Time zero is also displayed. More advanced options are available with the button **Run options**.

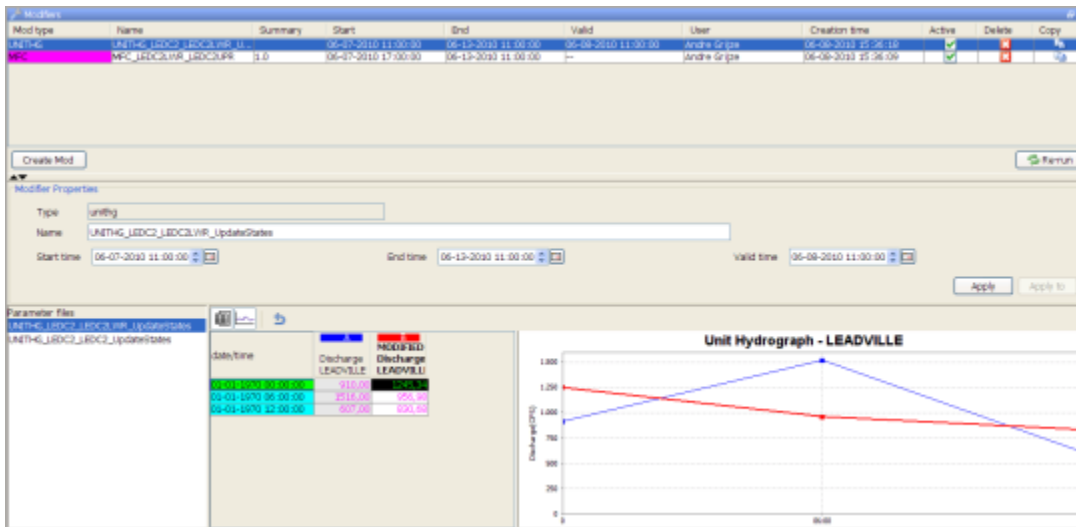
Modifiers panel

The modifiers panel is an important display in the IFD.

It shows the modifiers which are created for a certain node. Modifiers can be created, modified or deleted in this panel.

The upper part of the display gives an overview of the modifiers created for the currently selected node in the forecaster panel. It lists the Start Date, the End Date, the Valid Date and the Creation time of the mod. It also allows the user to make mods active and inactive with the checkbox in the column Active.

A mod can be deleted by pressing the red cross icon and a copy can be made pressing the copy-icon.



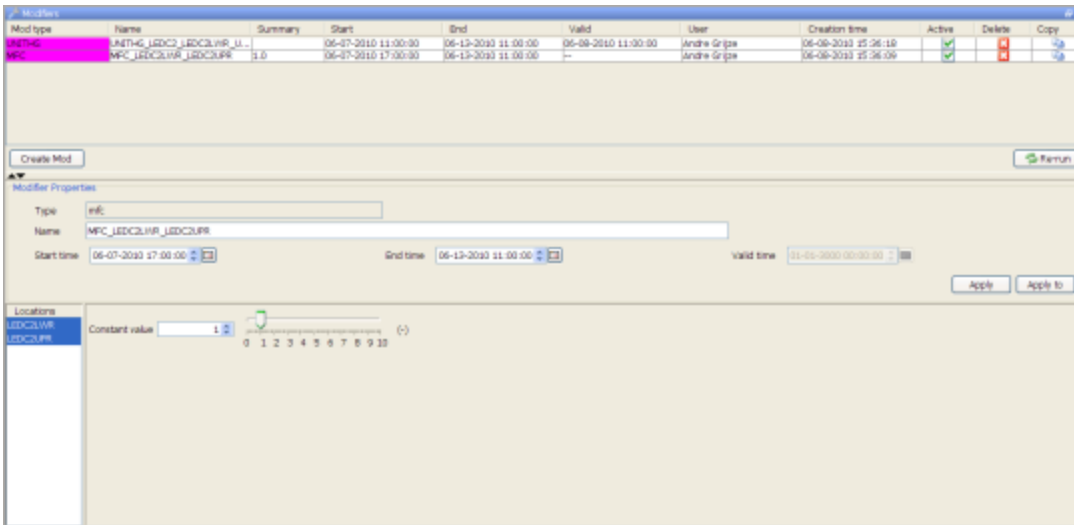
With the create mod-button the forecaster can create new modifiers. When the button is pressed a dropdown-list with the available modifier types for the currently selected node is shown.

The modifiers which are shown are depended on the models, transformations and module parameterfiles available in the workflow of the selected node and the plots which are associated with the node.

In the modifierTypes.xml is defined which modifiers are available for the forecaster. The combination of the configuration of the modifierTypes.xml and the workflow and the time series in the plots

When a modifier type is selected, the details of the new modifier is shown in the lower part of the display. In some cases it is also necessary to specify to which models the modifier should be applied.

For example when the forecaster selects the modifier type MFC and there are two SNOW17-models available in the segment, the forecaster should also specify to which models the modifier should be applied.



When the modifier can be applied to more than one model in a basin a 'location'-panel shows up at the left part of the details display. In this panel the forecaster can select to which locations the modifier should be applied.

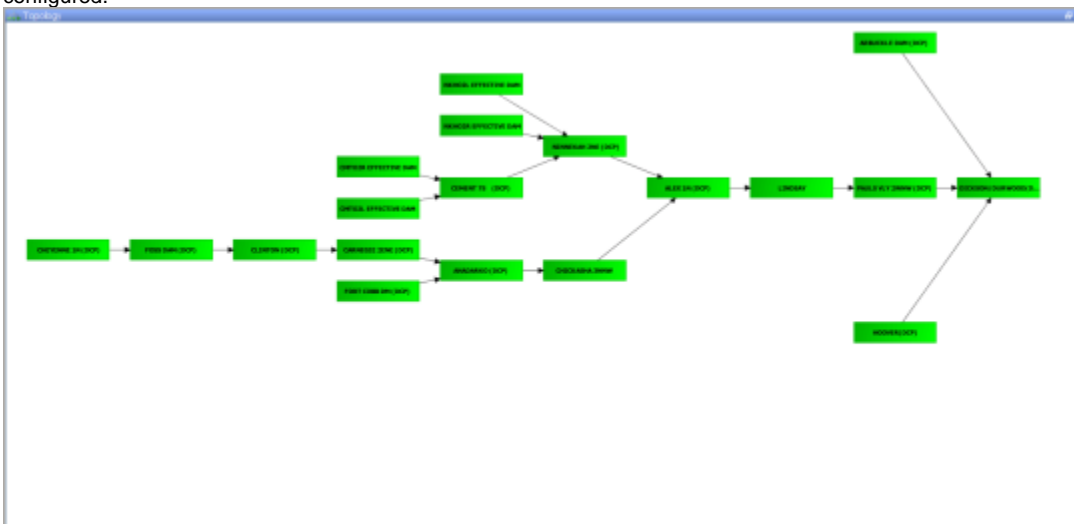
The Re-run button runs the workflow from the selected node and the workflows from the upstream nodes.

The lower part of the display shows the details of the selected modifier or when the forecaster is creating a new modifier the details of the new modifier.

Topology panel

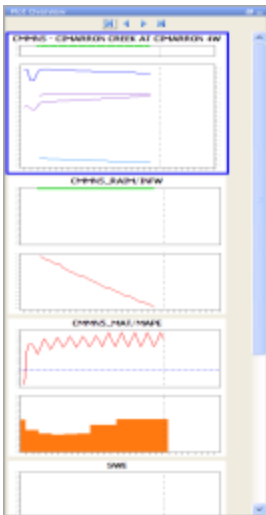
The topology panel shows the topology of the selected node. When a leaf node is selected the topology of the parent node is shown. When a parent node is selected the topology of its children is shown.

The colors of the boxes in the topology change when a threshold is passed. The color of the box and the thresholds which are monitored can be configured.

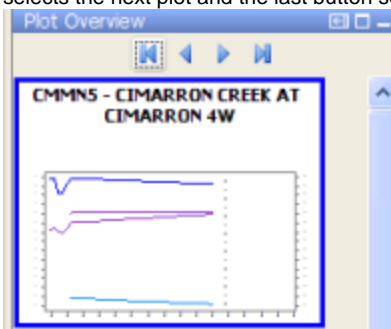


Plot

The plot display is used to show scalar time series. Each node has its own set of predefined displays configured. When a node is selected the plots display automatically updates the plots which are already displayed to show data for the new node. The first plot configured for the selected node is automatically shown in this display.



At the top of the panel there are four buttons. The first button selects the first plot, the second button selects the previous plot, the third button selects the next plot and the last button selects the last plot.



Forecaster help

The forecaster help panel shows user provided documentation which is available for a node.

Currently the following formats are supported: textfiles, images and pdf-files.

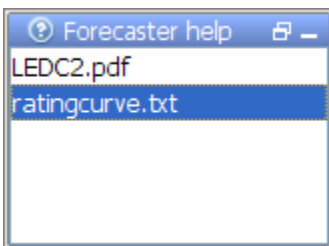
Users can place documents in a directory within a predefined directory.

This directory can be configured in the global.properties by defining the INFORMATION_PANEL_FOLDER property.

Within this directory each node has its own directory. The directory should have the same name as the node id.

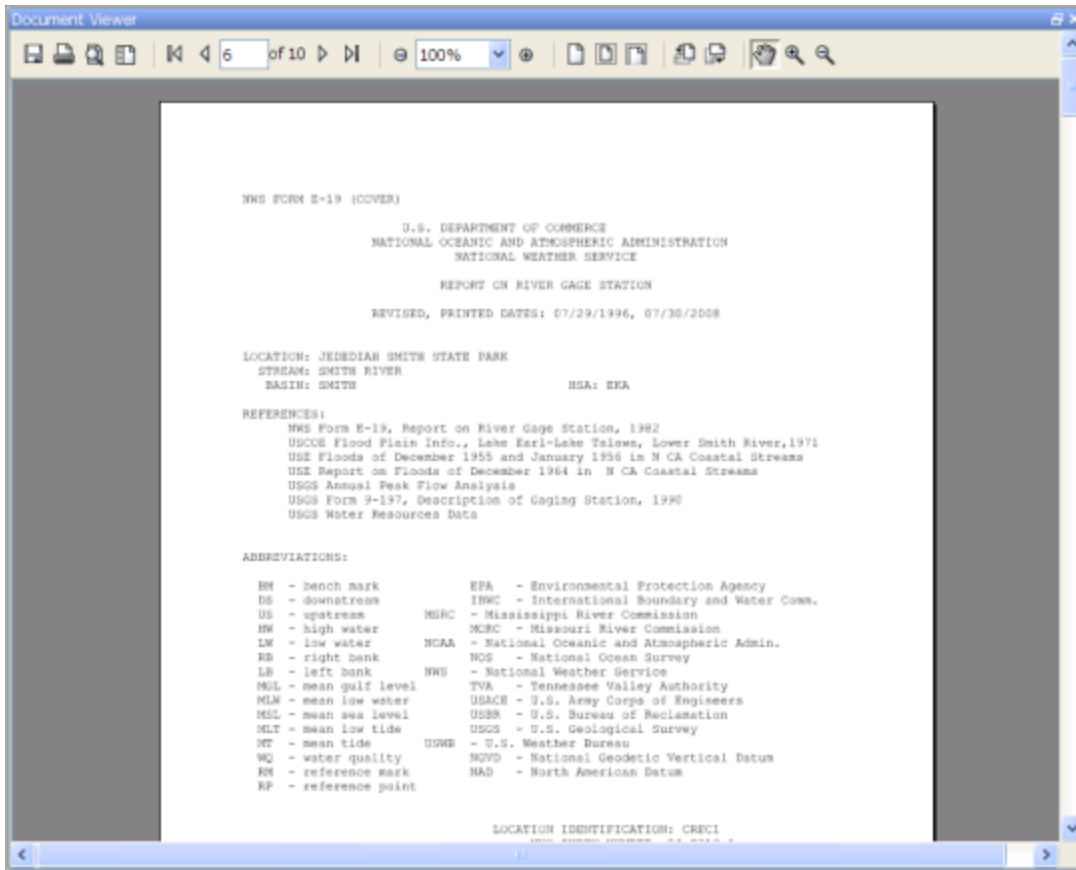
Within that directory that documentation for that node can be placed.

Below an example of the tool window forecaster help. In this example the forecaster has two documents available for information.



When one of the files is selected in this panel the content of the selected file is shown in the document viewer.

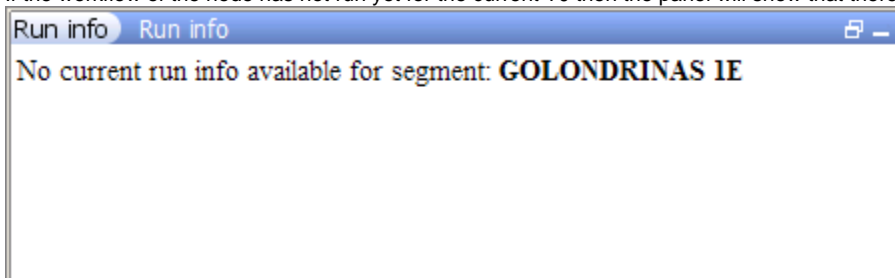
The document viewer is a dockable window in the centre of FEWS.



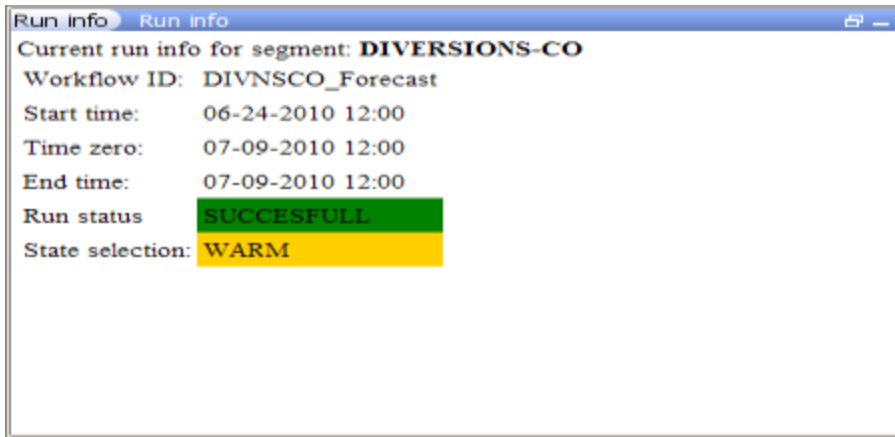
The content of the forecast help dialog is depended of which node is selected in the forecaster panel. When a new node is selected the content of the forecaster help dialog is automatically updated.

Run info

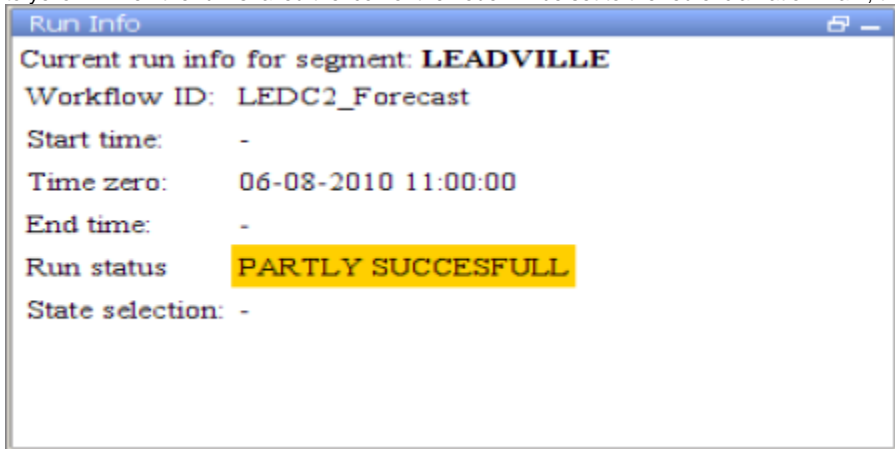
The run info panel shows detail information of the latest run of the workflow of the selected node. If the workflow of the node has not run yet for the current T0 then the panel will show that there is no current run info available



When the workflow has run. The status can either be succesfull, failed or partly successful. Only when the workflow was succesfull than the icon of that node will be set to green. The run status will be shown green in the run info box.

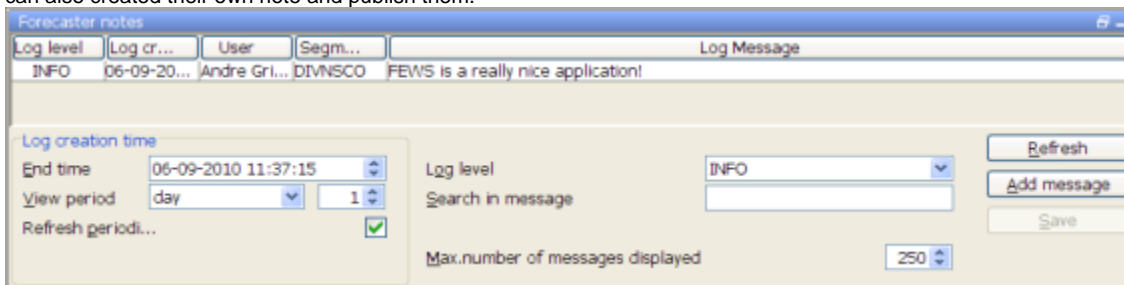


When the run is partly successful the icon of that node will be set to the red exclamation mark, the run status box in the run info panel will be set to yellow. When the run is failed the icon of the node will be set to the red exclamation mark, the run status box will be set to red.



Forecaster notes

The forecaster notes panel shows the notes other forecaster have created regarding their previous forecasts for the forecast point. Forecasters can also created their own note and publish them.



How to create a forecast with the IFD

Steps in creating a forecast

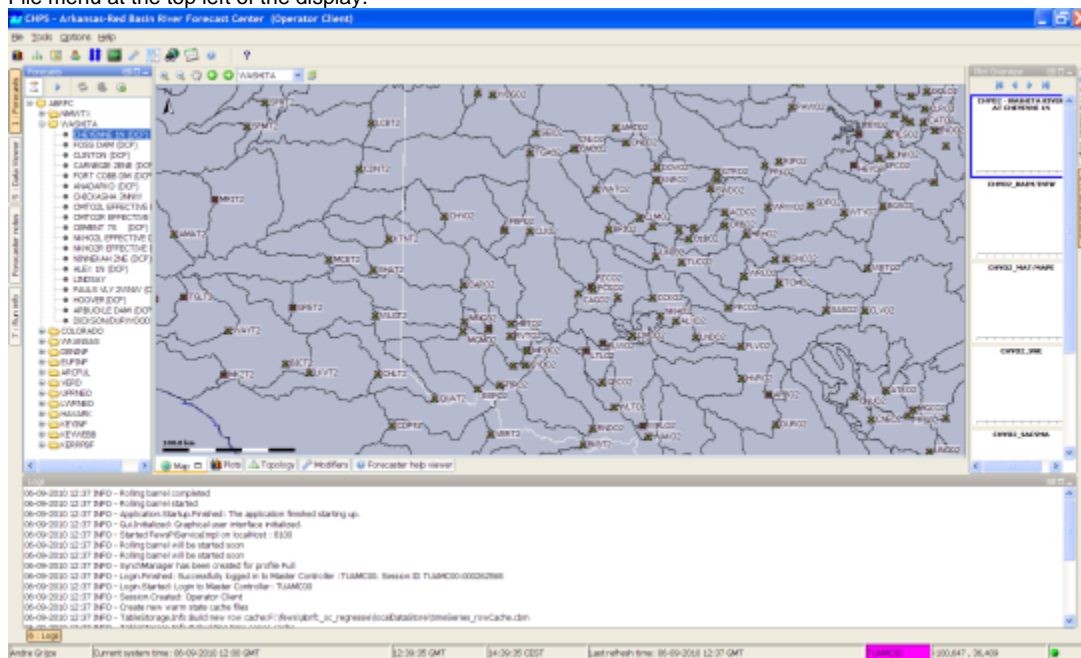
Below is a list of all possible steps in creating a forecast with the IFD. Please note that not all of the listed steps are obligated. For each step will be explained how this step can be carried out using the IFD in FEWS.

1. Start FEWS
2. Selecting the forecast panel
3. Reviewing the topology
4. Review the list of available state date/times
5. Adjust state and/or forecast length
6. Starting the forecast process and selecting the workflow for which the forecast should be made

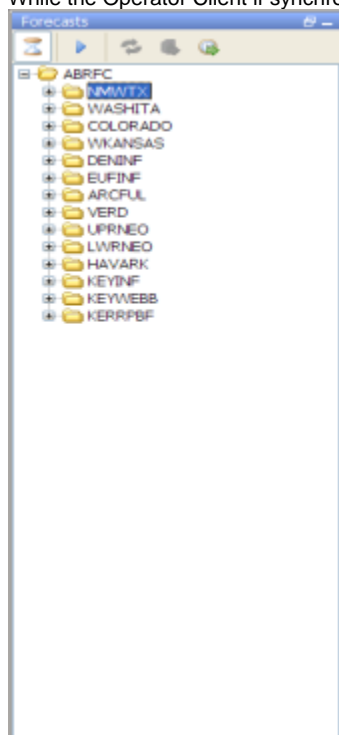
7. Reviewing workflow status
8. Reviewing graphs (graph display listens to segment selection)
9. Reviewing graphs (graph display is independent from segment selection)
10. Continue with the forecast process downstream
11. Ending the forecast process

Starting FEWS

After starting FEWS, the map-display will be displayed in the centre and the Forecast Panel-tab at the left will be selected. This the default layout. The layout after starting FEWS is however configurable by creating and saving a custom layout by using the option in the File menu at the top left of the display.



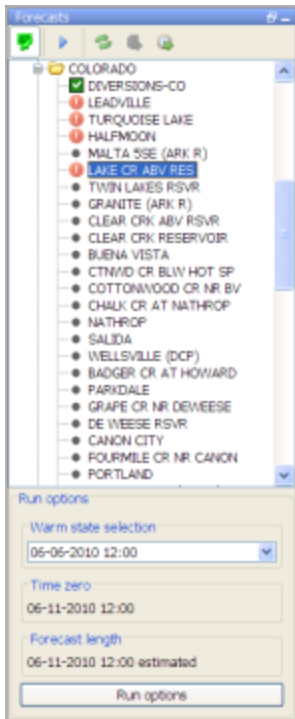
First the IFD will try to synchronize the local datastore with the central database. Until that process is finished it is not possible to create a forecast with the IFD. To indicate that the IFD is doing its initial synchronization after startup the forecast-button shows a hour glass icon. While the Operator Client if synchronizing, it is possible to view scalar and spatial data.



The whole process of creating of forecast by using the IFD is managed by the forecast dialog, therefore the first step is selecting the Forecast tab at the left of the display. The Forecast tab will give an list, in computational order of the basins of the region.

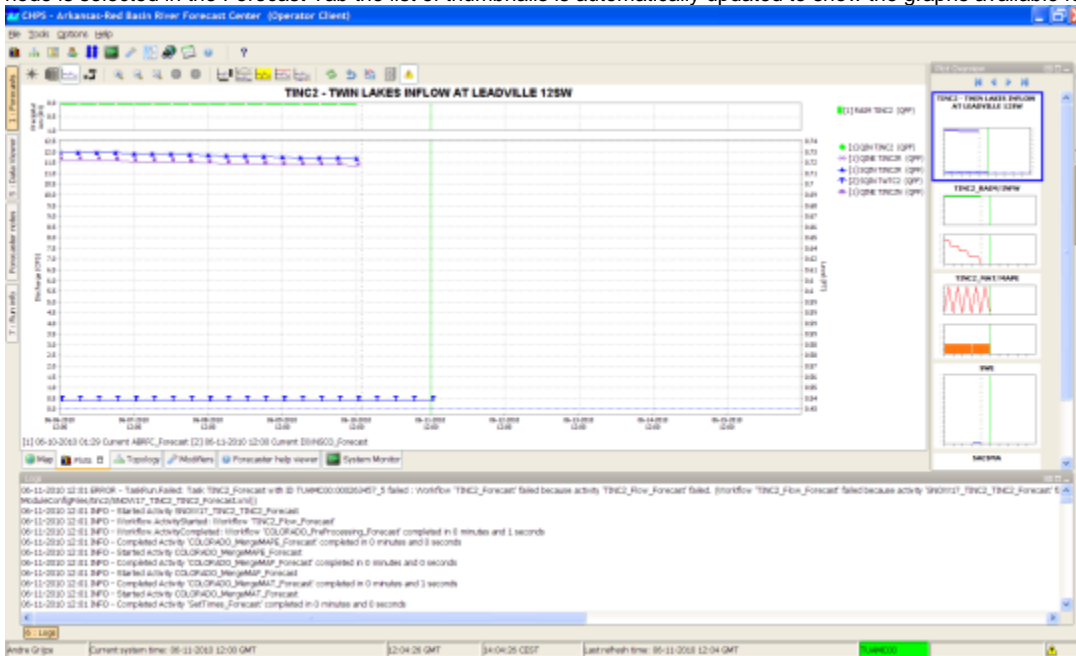


130

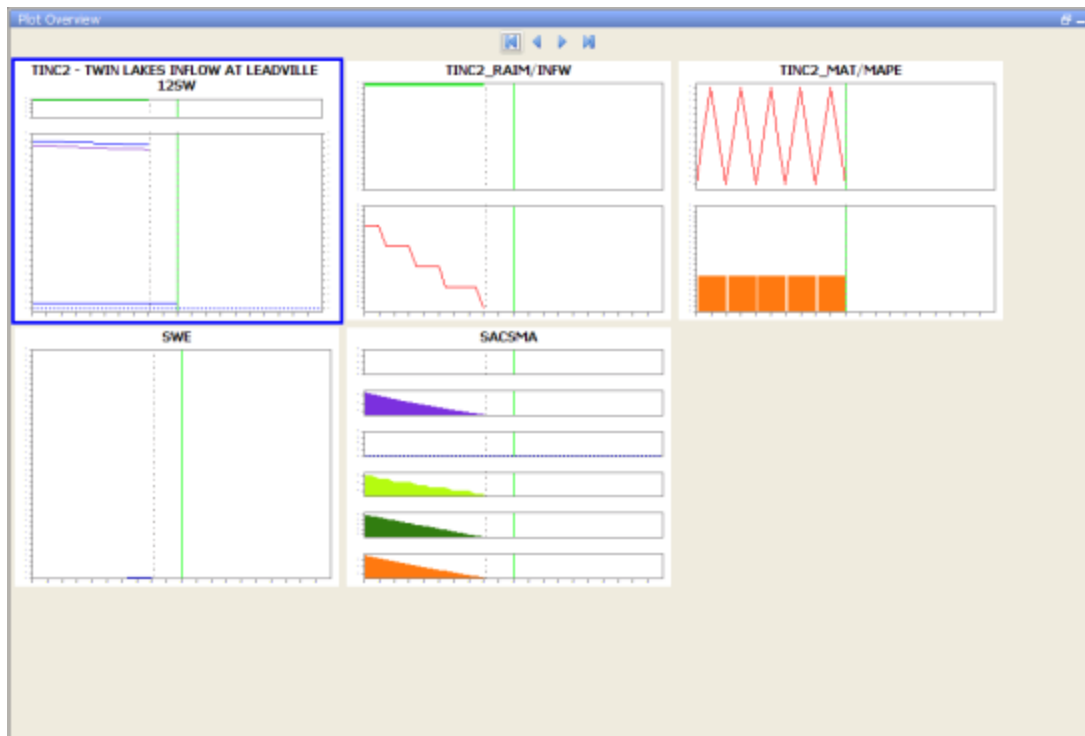


Review graphs (graph display listens to segment selection)

When a basin run has finished the results of the run should be reviewed. By selecting the plot overview at the right a list of thumbnails will be displayed. For each graph available for the current node a thumbnail will be shown. To display a graph, the forecaster selects a thumbnail and then this graph is displayed in the main plot window. The plot display will show the selected graph. Navigation between the graphs can be done by selecting a graph by clicking on a thumbnail with the mouse or by pressing alt+g (go to next graph) or by pressing shift+alt+g (go to previous graph). When the Thumbnail Panel is selected it is also possible to navigate by using the arrow keys up and down on that panel. When a new node is selected in the Forecast Tab the list of thumbnails is automatically updated to show the graphs available for the newly selected node.



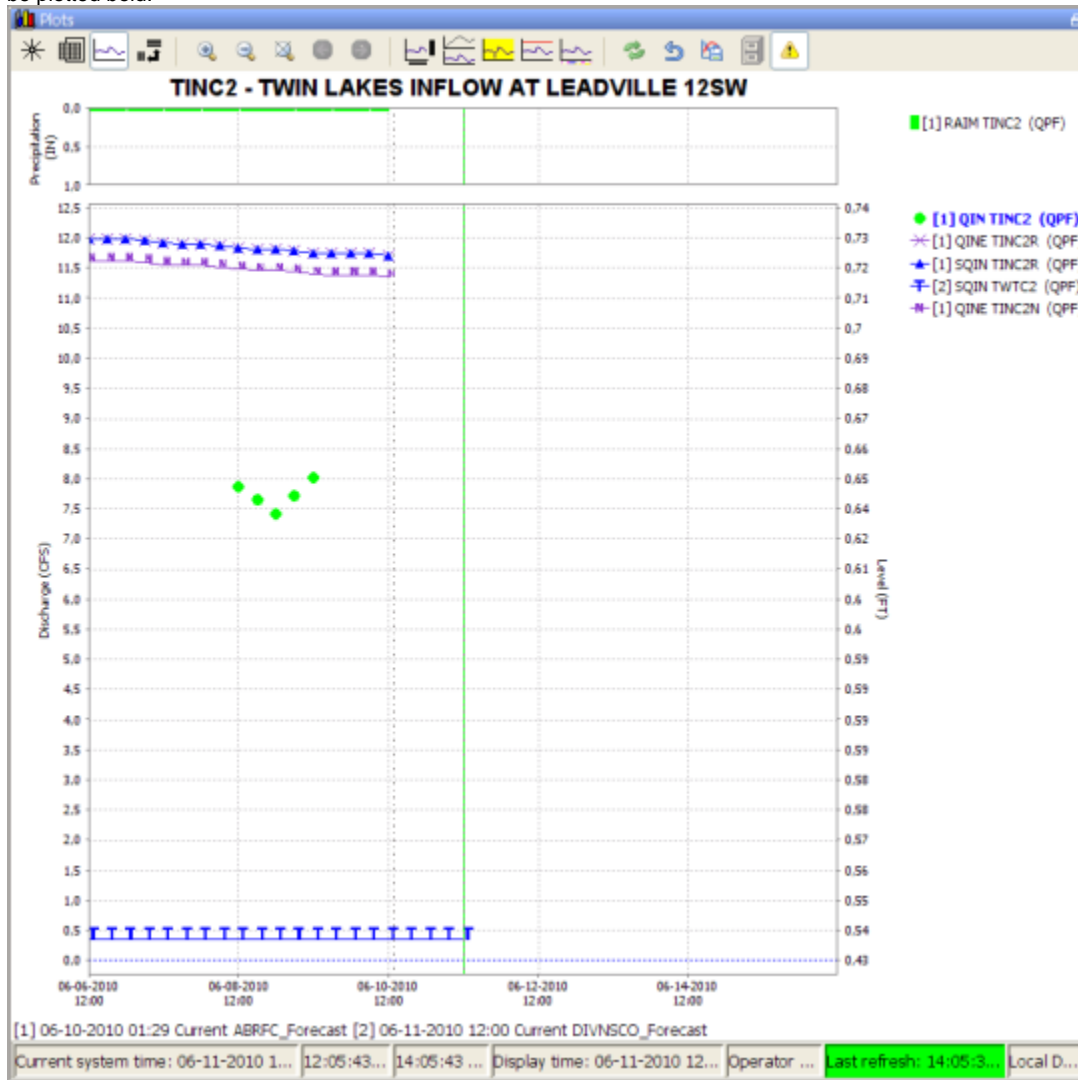
The Plot Overview panel can be undocked. When the display is expanded the plots are automatically resized.



Creating a mod in the time series display

Modes can be created in the mods display or directly in the plot display. To modify a time series directly in a plot, a time series has to be selected. This can be done by selecting a time series in the legend of the plot. To indicate that a time series is selected the legend and the time series will

be plotted bold.



Creating a mod in the mods display

The modifier display can be started by clicking on the wrench-icon at the toolbar or by using the shortcut ctrl+m. The modifier display will show all the mods which are applied in the currently selected segment. By clicking on the create mod-button a new mod can be created. After pressing the create mod-button a list of available mods will be shown. When the mod is created it can be applied by pressing the apply-button. With the run-buttons (rerun, rerun to selected and rerun all to selected) it is possible to rerun the workflows. Pressing the run-buttons will also automatically apply the mod.

Continue with the forecast process downstream

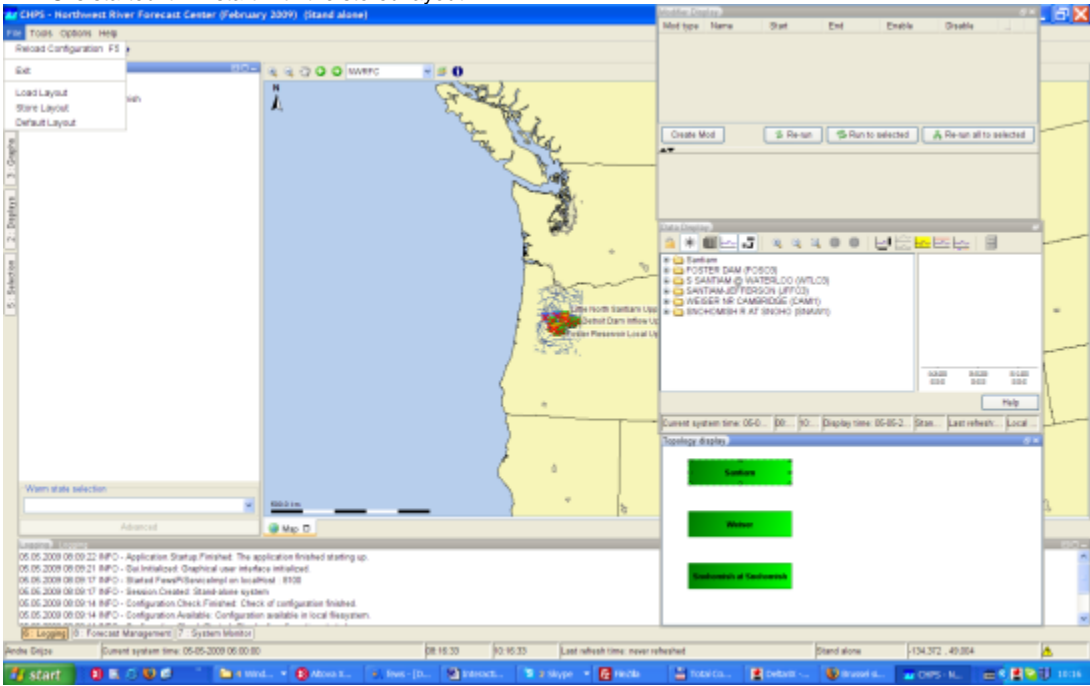
After reviewing the graphs and if needed applying mods the forecaster can proceed to the next segment. Going to the next segment can be done easily by pressing alt+s (go to next segment) or by pressing the next segment-button in the forecast panel or by selecting the next node. After selecting the segment the workflow will be run automatically and after finishing the run the status of the run will be shown by color of the dot of the segment.

Ending the forecast process

When the forecaster thinks that the current forecast is sufficient. The forecast can select the parent node of the leaf nodes and press the 'run on server'-button. When this button is pressed, first all the new modifiers and changes to the existing modifiers of the child nodes of the selected node will be uploaded to the server. When the upload is successful the workflow will be run at the server. The locally created runs will be deleted when the server run was successful and the results are downloaded successfully back to the Operator Client.

Docking and undocking main displays

By default FEWS will start with the map display opened in the centre section of the display and with the map display, data display and the topology display docked in the centre section of FEWS. It is possible to customize the display layout. First step in customizing the display layout is to manually place the display in the desired display layout. In the example below three displays are undocked and the graph-tab and the display are moved to the left section of the display. In the File-menu the user can store this layout by selecting the option store layout. The next time FEWS is started it will start with the stored layout.



Save display layout and reload default layout

The file-menu also provides an option default layout. By selecting this option the default layout can be reloaded.

24 Archiving and extended filtering of log messages

Archiving and extended filtering of log messages

For Water Coach purposes archiving and extended filtering of log messages is available. This functionality includes:

- inserting (retrospectively) extended manual messages,
- archiving selected log messages the users are interested in, and
- downloading archived messages and filtering them from the other messages.

The collected and filtered log messages can be used to build Water Coach game.

Archiving log messages

Create ArchiveRun module with export task LogEntriesArchive and include it in an archiving workflow. Log messages are archived by (periodically) running this archiving workflow. Use constraints to select log messages that should be archived. A log message will be archived when its event code is configured as logEventConstraint option and/or the log message text contains the specified messageText configured as logEventConstraint option.

Configuration example:

```
<exportArchiveRun>
  <archivePeriod start="-2" end="0" unit="day"/>
  <archiveType>LogEntriesArchive</archiveType>

  <logEventConstraint eventCode="Manual." />
  <logEventConstraint eventCode="Validation.HardLimit" />
  <logEventConstraint eventCode="Validation.SoftLimit" messageText="at Lobith"/>
  <logEventConstraint eventCode="Workflow.ActivityStarted" messageText="Workflow
'Rijntakken_Forecast' " />
  <logEventConstraint eventCode="Workflow.ActivityCompleted" messageText="Workflow
'Rijntakken_Forecast' " />

</exportArchiveRun>
```

In this example the following messages will be archived:

- all manual messages,
- all Validation.HardLimit messages
- Validation.SoftLimit messages only for Lobith
- Workflow.ActivityStarted/Finished messages only for workflow Rijntakken_Forecast

Retrieving archived log messages from archive

Log messages can be retrieved using ArchivedDialog. The user selects and downloads the log messages archive in the same way as for example thresholds.

ArchiveDialog configuration

Configure in this dialog an archive type LogEntriesArchive. An example:


```

<archiveTask name="Log Entries" workflowId="Import_Archive_LogEntries"
iconName="icons/LookUpTable.gif" queryServiceUrl="$ARCHIVE_SERVER_URL$">

<archiveRun>
  <importDirectory>$ARCHIVE_IMPORT_PATH$</importDirectory>
  <importArchiveRun>
    <archiveType>LogEntriesArchive</archiveType>
  </importArchiveRun>
</archiveRun>
</archiveTask>

```

ArchiveRun configuration

Create ArchiveRun module with import task LogEntriesArchive and include this module in the workflow specified in ArchiveDialog. An example:

```

<importArchiveRun>
  <archiveType>LogEntriesArchive</archiveType>
</importArchiveRun>

```

Displaying and filtering archived log messages in SystemMonitor

By default, all non-manual messages are displayed in LogBrowser tab, and all manual messages are displayed in BulletinBoard. For Water Coach purposes we need to display both manual and selected non-manual messages in one tab. For this purpose a new tab has been added – BulletinBoardPlus. In this new tab we also have some more choices to create manual messages quickly.

To show this tab, configure in SystemMonitorDisplay:

```

<bulletinBoardPlus>
  <tabName>Interesting events</tabName>
</bulletinBoardPlus>

```

We can also add several optional 'messageTemplates' to create quickly messages with a specific mark. Similarly we can add several optional 'users' to quickly create messages from a specific user.

An example:

```

<bulletinBoardPlus>
  <tabName>Interesting events</tabName>

  <messageTemplate>Analysed by operator</messageTemplate>
  <messageTemplate>Phone line went dead</messageTemplate>
  <messageTemplate>Emergency advice requested</messageTemplate>

  <userTemplate>Simone De Kleermaeker</userTemplate>
  <userTemplate>gast gebruiker</userTemplate>

</bulletinBoardPlus>

```

An example of BulletinBoardPlus tab of SystemMonitor:

System Monitor						
Log Browser Interesting events Batch Forecasts						
Log level	Log creation time	Event Code	Event time	User	Template	Log Message
WARN	29-11-2011 19:35:39	Validation.SoftLimit	29-11-2011 19:35:39			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 19:35:39	Validation.HardLimit	29-11-2011 19:35:39			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
WARN	29-11-2011 19:06:21	Validation.HardLimit	29-11-2011 19:06:21			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261...
WARN	29-11-2011 19:06:21	Validation.SoftLimit	29-11-2011 19:06:21			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 19:06:21	Validation.HardLimit	29-11-2011 19:06:21			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 bel...
WARN	29-11-2011 19:06:21	Validation.HardLimit	29-11-2011 19:06:21			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
WARN	29-11-2011 19:06:07	Validation.SoftLimit	29-11-2011 19:06:07			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 19:06:07	Validation.HardLimit	29-11-2011 19:06:07			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
WARN	29-11-2011 19:06:07	Validation.HardLimit	29-11-2011 19:06:07			HardLimit min violated for Water level (H.m) at Speyer, value -176.64 b...
ERROR	21-12-2011 12:03:20	Manual.Error	29-11-2011 18:55:00	Simone De Kleermaeker	Phone line went dead	still dead !!
ERROR	21-12-2011 12:02:58	Manual.Error	29-11-2011 18:45:00	Simone De Kleermaeker	Phone line went dead	
WARN	21-12-2011 12:02:38	Manual.Warning	29-11-2011 18:40:00	Simone De Kleermaeker	Analysed by operator	
WARN	29-11-2011 18:35:50	Validation.HardLimit	29-11-2011 18:35:50			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 bel...
WARN	29-11-2011 18:35:50	Validation.HardLimit	29-11-2011 18:35:50			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261...
WARN	29-11-2011 18:35:50	Validation.HardLimit	29-11-2011 18:35:50			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
WARN	29-11-2011 18:35:50	Validation.SoftLimit	29-11-2011 18:35:50			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 18:35:35	Validation.HardLimit	29-11-2011 18:35:35			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
WARN	29-11-2011 18:35:35	Validation.SoftLimit	29-11-2011 18:35:35			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 18:35:34	Validation.HardLimit	29-11-2011 18:35:34			HardLimit min violated for Water level (H.m) at Speyer, value -176.64 b...
WARN	29-11-2011 18:05:59	Validation.SoftLimit	29-11-2011 18:05:59			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 18:05:58	Validation.HardLimit	29-11-2011 18:05:58			HardLimit min violated for Water level (H.m) at Altenahr, value 0.39 bel...
WARN	29-11-2011 18:05:58	Validation.HardLimit	29-11-2011 18:05:58			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261...
WARN	29-11-2011 18:05:58	Validation.HardLimit	29-11-2011 18:05:58			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
WARN	29-11-2011 18:05:46	Validation.SoftLimit	29-11-2011 18:05:46			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...
WARN	29-11-2011 18:05:46	Validation.HardLimit	29-11-2011 18:05:46			HardLimit min violated for Water level (H.m) at Speyer, value -176.64 b...
WARN	29-11-2011 18:05:46	Validation.HardLimit	29-11-2011 18:05:46			HardLimit min violated for Water level (H.m) at Rheinfelden, value 0.0 ...
INFO	29-11-2011 18:01:00	Workflow.ActivityCompleted	29-11-2011 18:01:00			Workflow 'Rijntakken_Forecast' completed in 0 minutes and 35 seconds
INFO	29-11-2011 18:00:24	Workflow.ActivityStarted	29-11-2011 18:00:24			Workflow 'Rijntakken_Forecast'
INFO	21-12-2011 12:00:59	Manual.Info	29-11-2011 17:50:00	Simone De Kleermaeker	Emergency advice requested	
WARN	29-11-2011 17:35:56	Validation.HardLimit	29-11-2011 17:35:56			HardLimit max violated for Water level (H.m) at Rheinfelden, value 261...
WARN	29-11-2011 17:35:56	Validation.SoftLimit	29-11-2011 17:35:56			SoftLimit min violated for Discharge (Q.m) at Lobith, value 786.33997 b...

Button Add message

Using this button we add a manual message 'plus'.

Messages Creation

Log time

21-12-2011 12:07:00

Log level

WARN

User

Simone De Kleermaeker

Log template

Emergency advice requested

Text

Add

Close

Help

Manual message 'plus' is actually a standard manual message. The information entered in the additional fields, is stored in the messages text (message body) in LogEntries table field 'logMessage'. Compared to standard manual message , the additional fields are Event Time (default value is Current System Time) and messageTemplate.

The message text (body) entered in the example above is stored as follows:

Simone De Kleermaeker@05-12-2011 13:47:00@Phone line went dead@

If we enter also some additional text, the messages body looks like:

Simone De Kleermaeker@05-12-2011 13:47:00@Phone line went dead@my comment

View period

is applicable to the Event Time, not to the log message creation time. For example, if we choose one month, the log messages with event time inside this period are displayed. Event time of the messages generated automatically is the same as message creation time, so column "Event time" shows the same time as column "event creation time"

User

The drop down box 'User' is filled with the current system user name and optionally with the userTemplates as defined in the configuration. It is also possible to enter any name in this editable drop down box.

The user names can be entered while creating manual messages. Configure the userTemplates if you want to enter usernames that are different from the system user.

Template

The drop down box 'Template' is filled with messageTemplates configured in SystemMonitorDisplay <bulletinBoardPlus> tab. It is also possible to enter any text in this editable drop down box.

Other fields in the tab BulletinBoardPlus

Buttons Refresh, Save and fields log Level, Search in Message, Max number of events have the same meaning and behaviour as in standard BulletinBoard.