

Deltres

Enabling Delta Life





Delft-FEWS Basic Training

For NERC-CCCC

Date: 28 September 2022

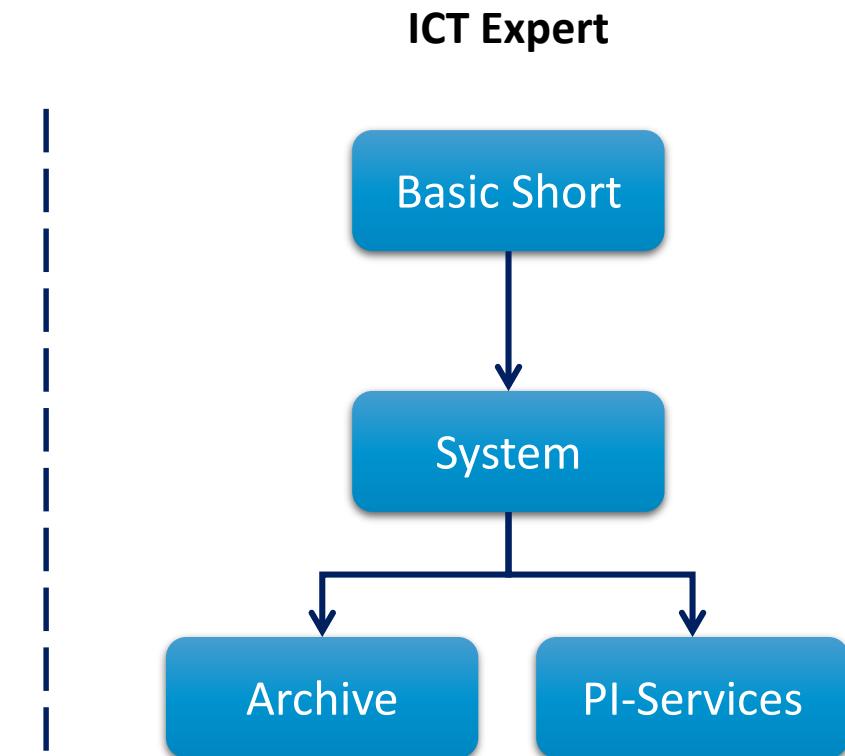
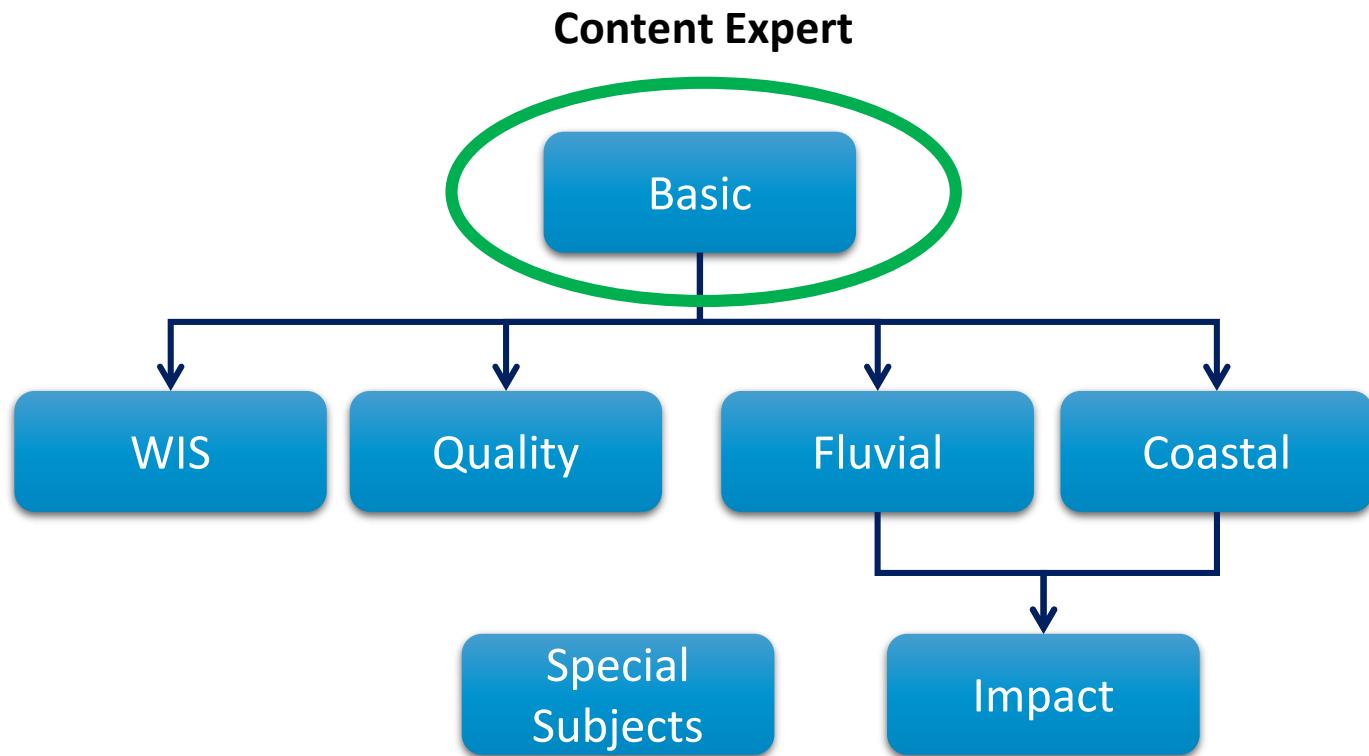
Training Overview

- Objective
 - Detailed system introduction of FEWS-Gulf of Guinea
 - System user training
 - System support & maintenance training
 - Simple system configuration training
- Required software:
 - FEWS-GoG Stand Alone system deployed on the participants` local machine with proper internet connection.
 - Optional: Altova XMLSpy should be installed for editing and validating xml files. One can also editing xml files with any other text editor (e.g. Notepad++), however there are several drawbacks compare to an official xml editor.
 - Optional: Total commander, strongly advised for working with FEWS configuration.

Training Overview

- Prerequisite knowledge
 - FEWS-GoG system architecture and forecast data flow, no knowledge of Delft-FEWS configuration is required.
- Agenda: Day 1 & 2
 - The concept of forecasting and early warning
 - Delft-FEWS basics: navigate the system
 - Exercise

Delft-FEWS Courses

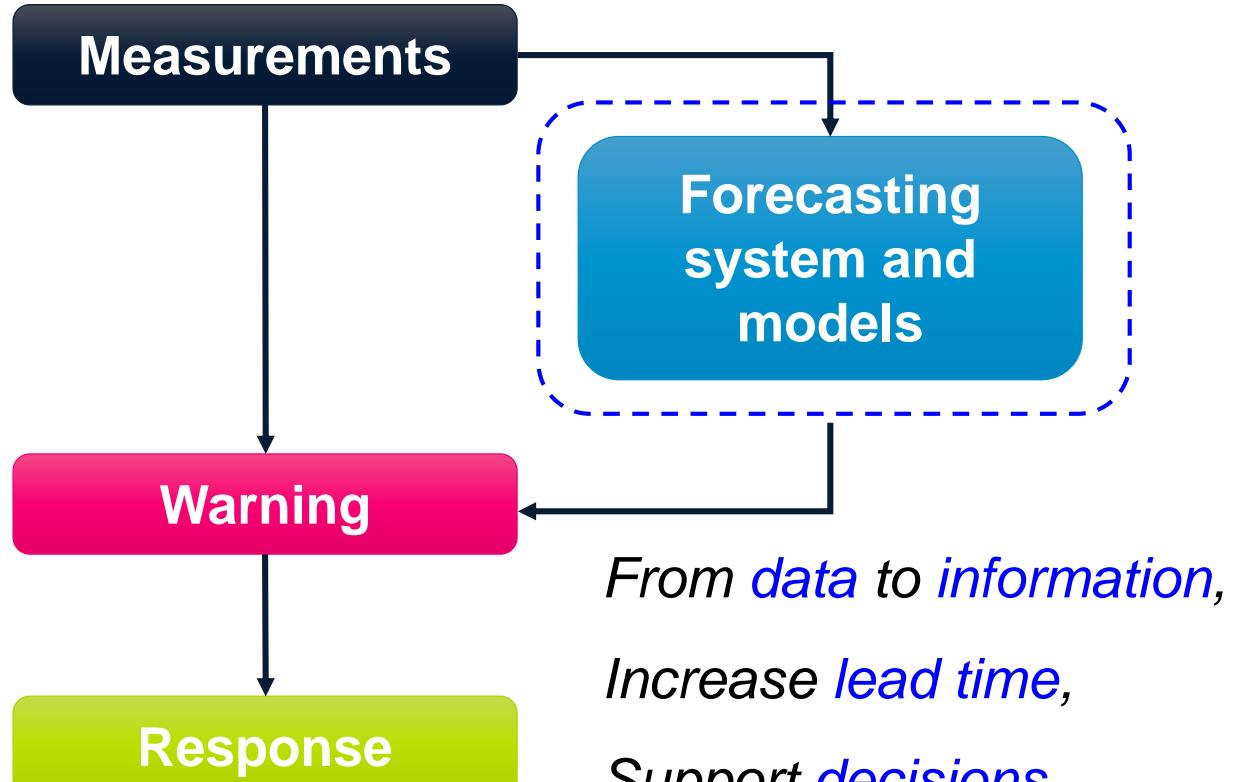




Module 1b

Introduction to Delft-FEWS

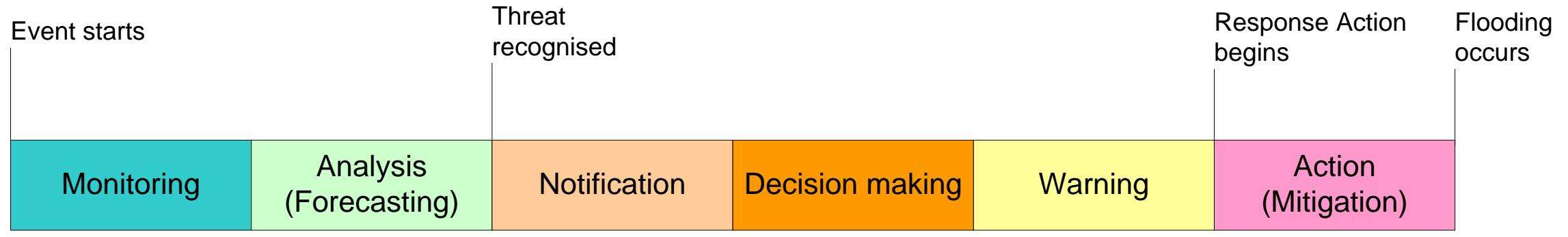
Operational Forecasting



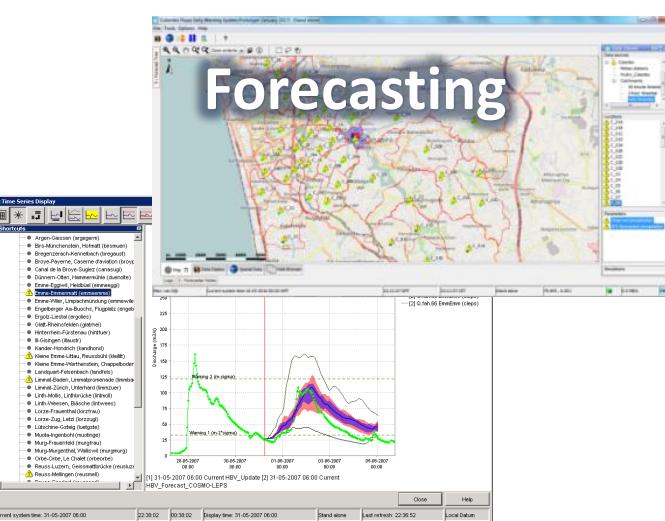
Response required



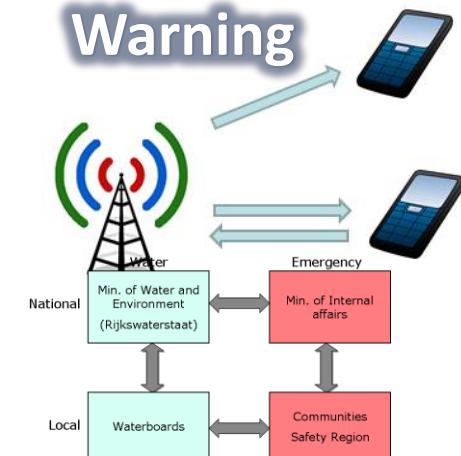
Flood Forecasting, Warning & Response



Maximum (potential) lead time



Lead time



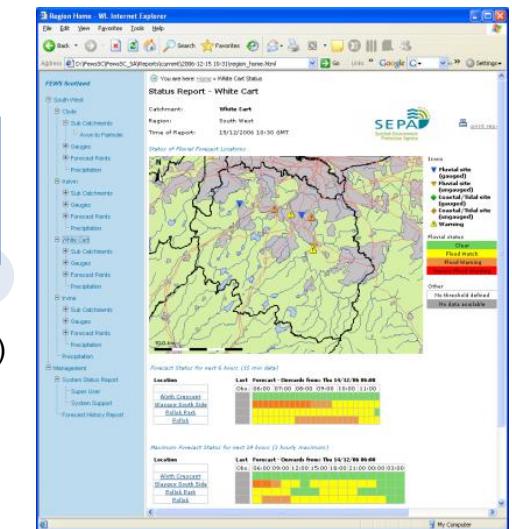
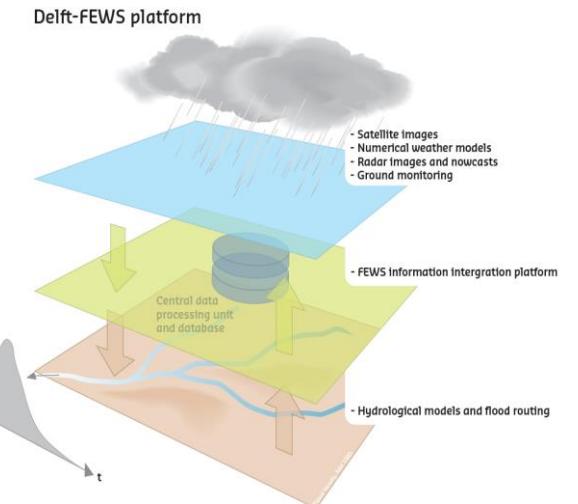
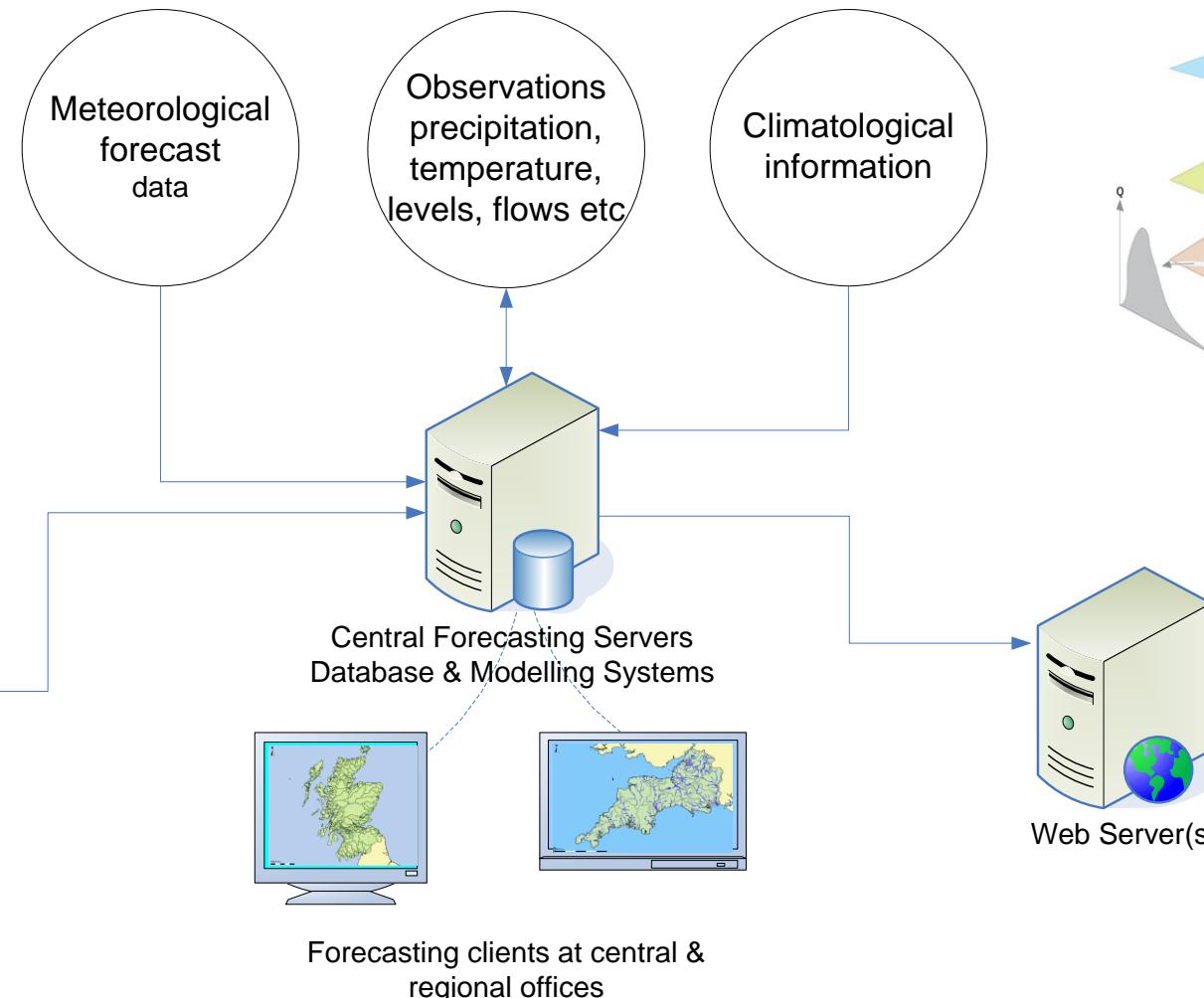
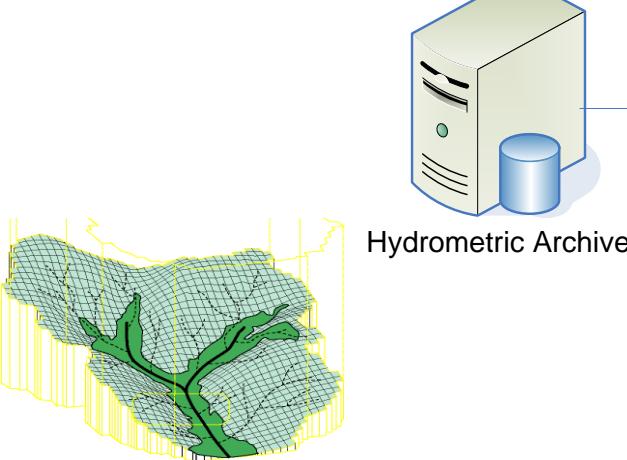
Mitigation time

Response

The figure contains two photographs. The top photograph shows a group of people in military-style uniforms standing on a grassy embankment next to a flooded river, possibly conducting a survey or preparing for a rescue operation. The bottom photograph shows a long line of yellow and black public service buses parked along a road, likely used for evacuation or transport during the flood emergency.



Put the components into the operational domain



Deltares

Role of observation data in a Delft-FEWS application

- In operational forecasting it is essential to have reliable, real time data
- Typical examples of observation data in a Delft-FEWS application:
 - Hydrological data: water level data and/or discharge
 - Meteorological data: rainfall, temperature, wind
 - Coastal data: astronomical tides, surge
 - Structures: weir operation and reservoir operation

Meteorological station



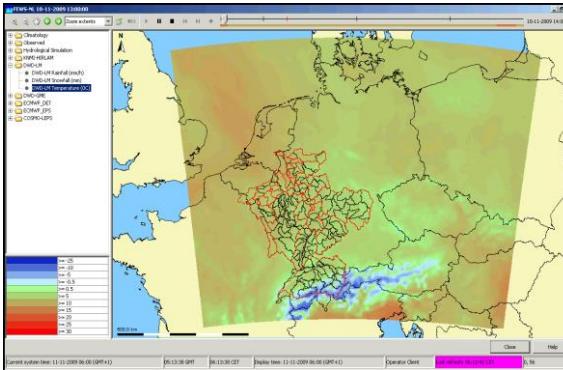
River gauging station



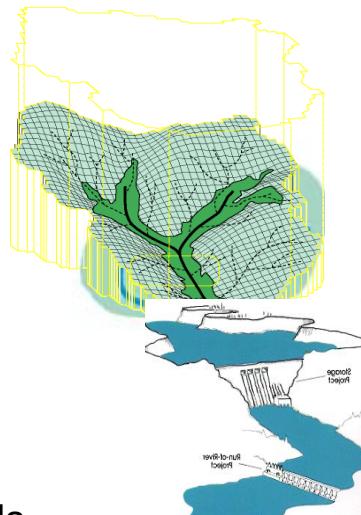
Satellite imaging



Using models to predict floods



Numerical Weather
Prediction models



Rainfall-runoff modeling
& snow modeling

Reservoir Models



Flood inundation models

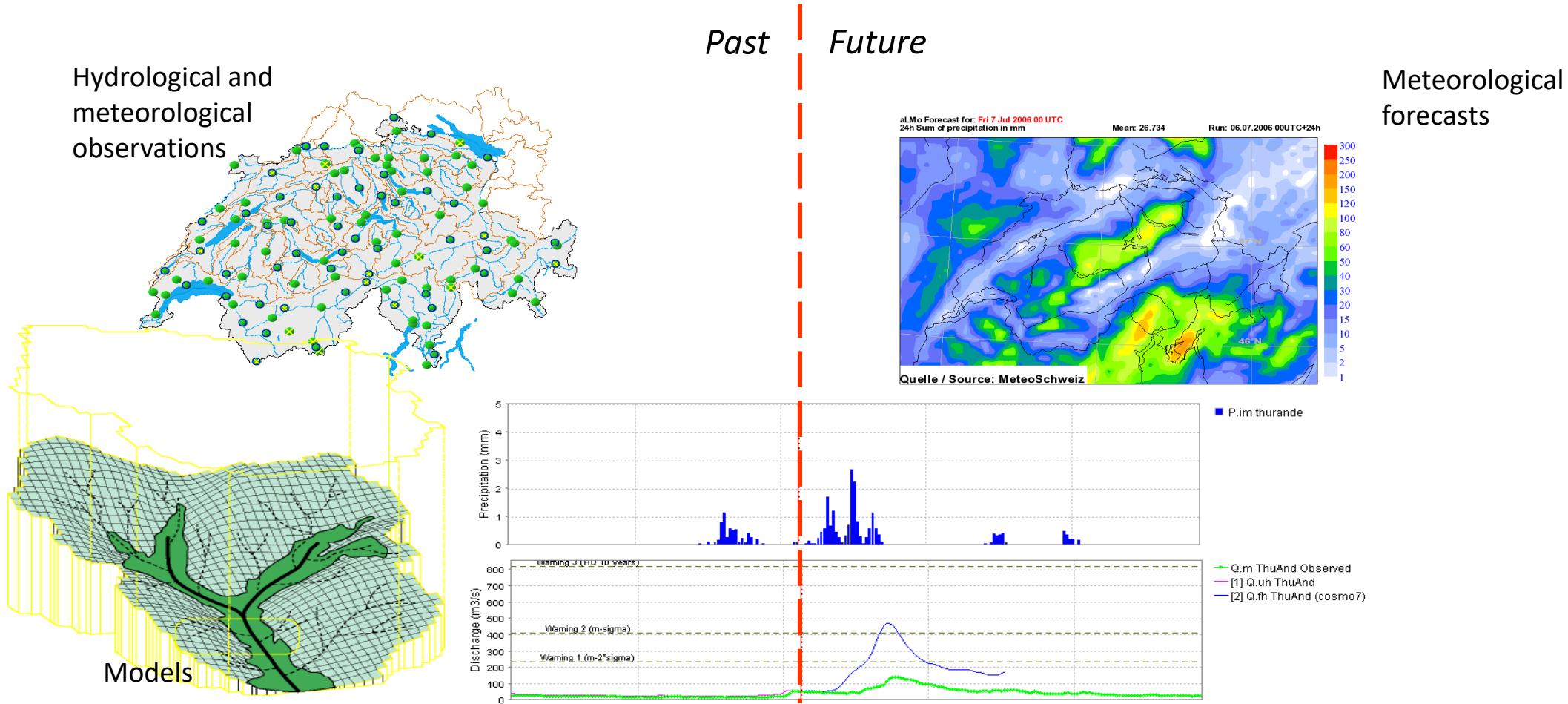


Urban drainage models

Coastal shelf models
(2D Hydrodynamic)

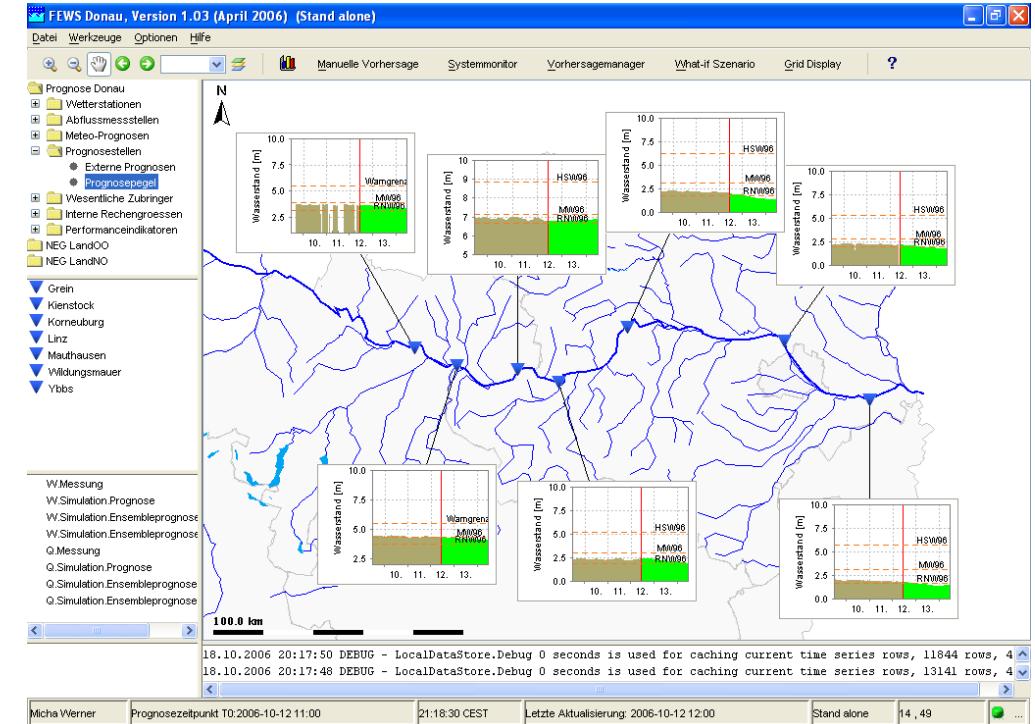
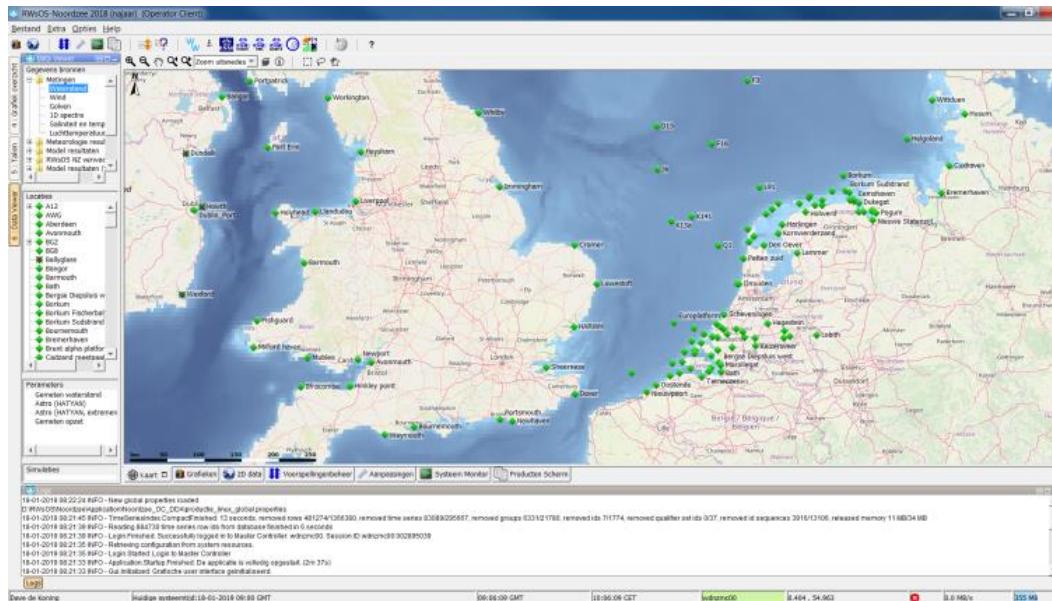
Purpose of Forecasting

Forecast levels / flows by combining data and models well in advance



Flood Forecasting System

- Provides the forecaster a framework and an interface to data and models
- Time is critical!
- Organize the forecasting process
- Run models efficiently
- Provide clear information
- Overview of data & status



FEWS Donau (Austria) – Graphs at key stations

RWsOS Noordzee – Coastal FEWS system for the Dutch government

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Delft-FEWS – Open Shell Forecasting System

- Generic information platform for data processing for flood and environmental forecasting systems
- Data centric forecasting system
- Organizing data process from input to forecast to dissemination
- Open approach to integrating models
- Operating system independent, very scalable
- Fully configurable by (super)users
- Software free of charge, with central role for user community

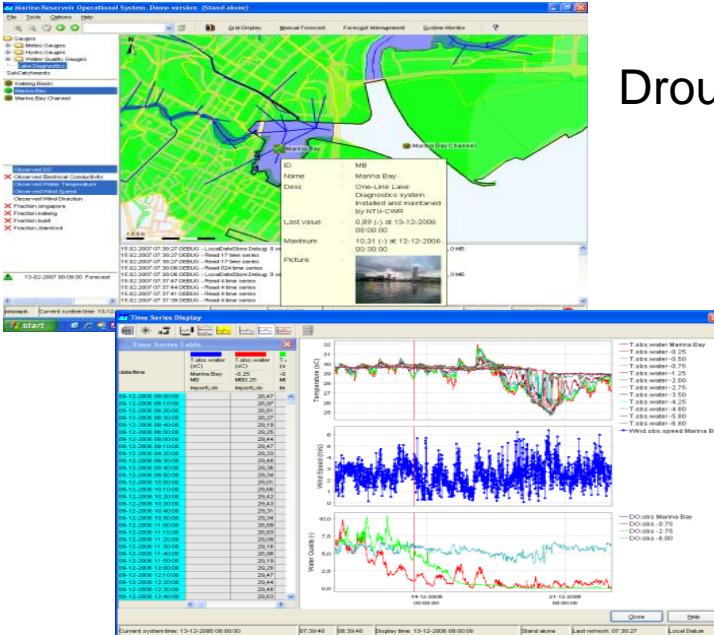
<http://oss.deltares.nl/web/delft-fews>

<http://publicwiki.deltares.nl/display/FEWSDOC/Home>

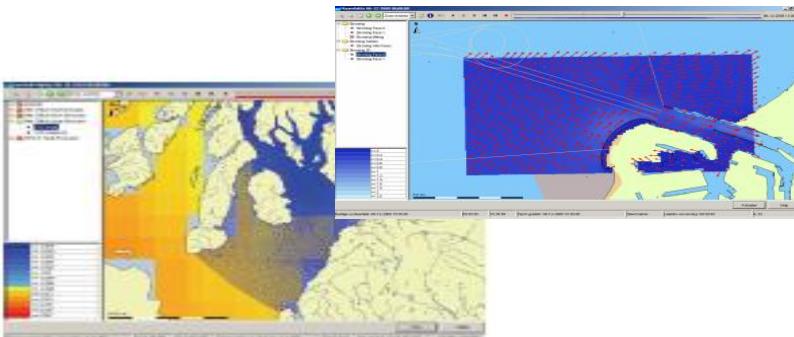


Delft-FEWS is more than forecasting...

Water quality

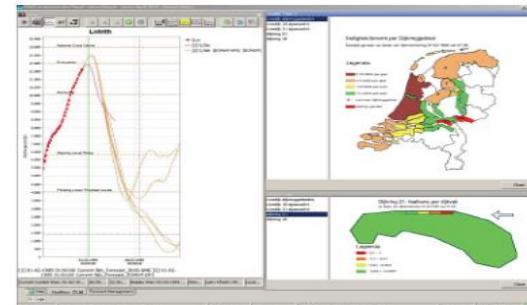


Storm surge



Drought

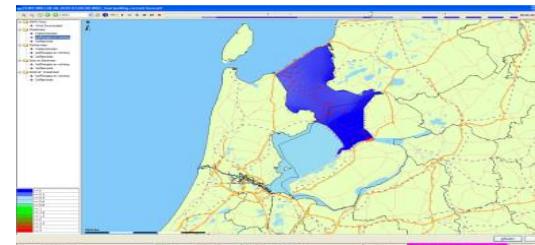
Dike/Dam strength



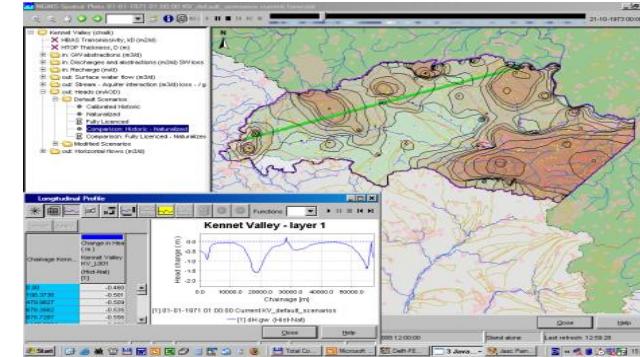
River basin



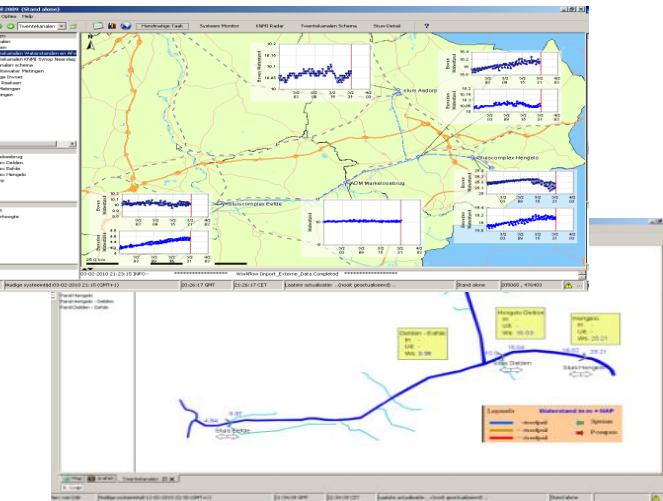
Lake and reservoir



Groundwater



Optimization



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Delft-FEWS Community



Deltires



Module 2

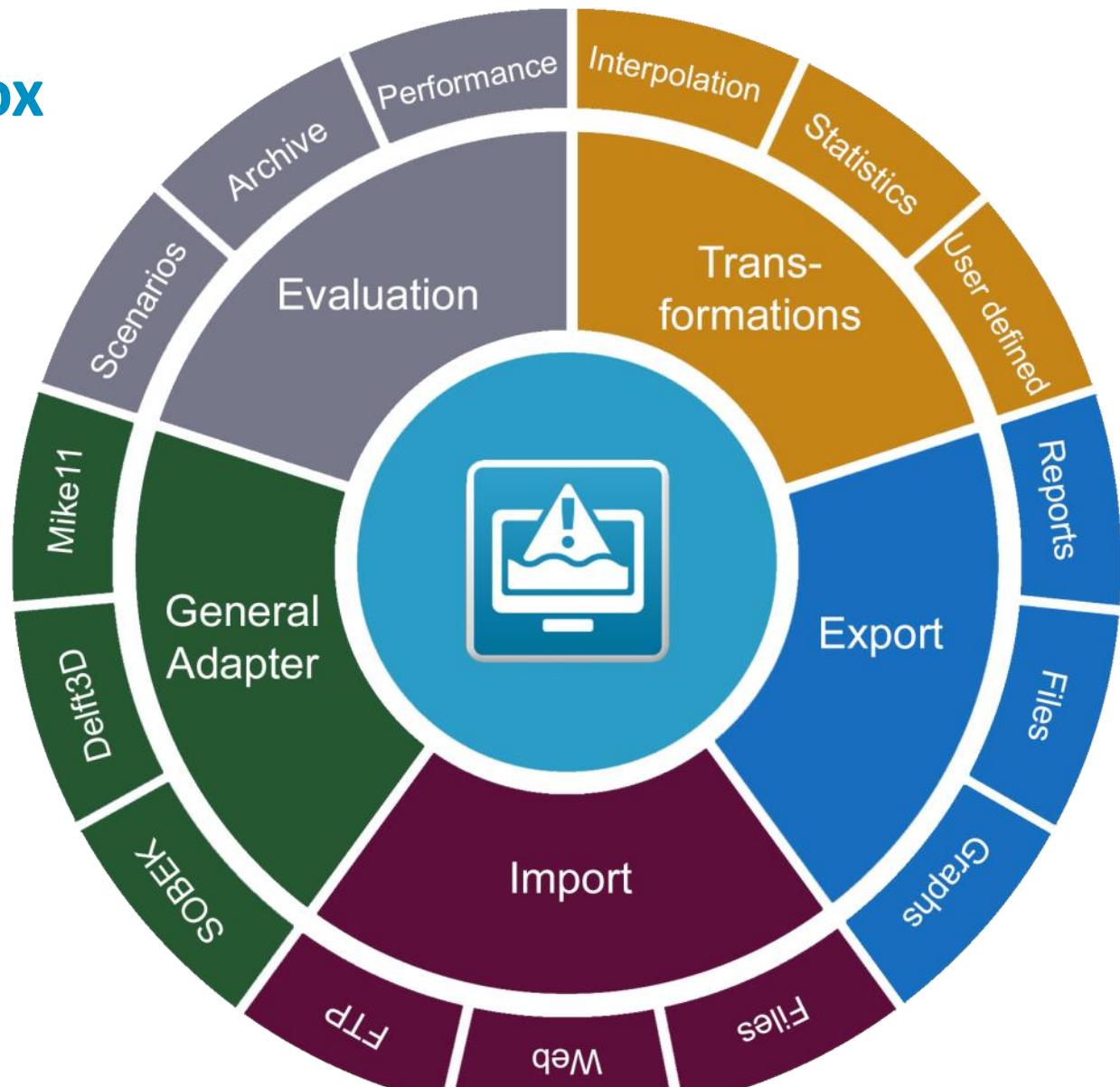
Basic Configuration Course Application

Delft-FEWS: A Modular Toolbox

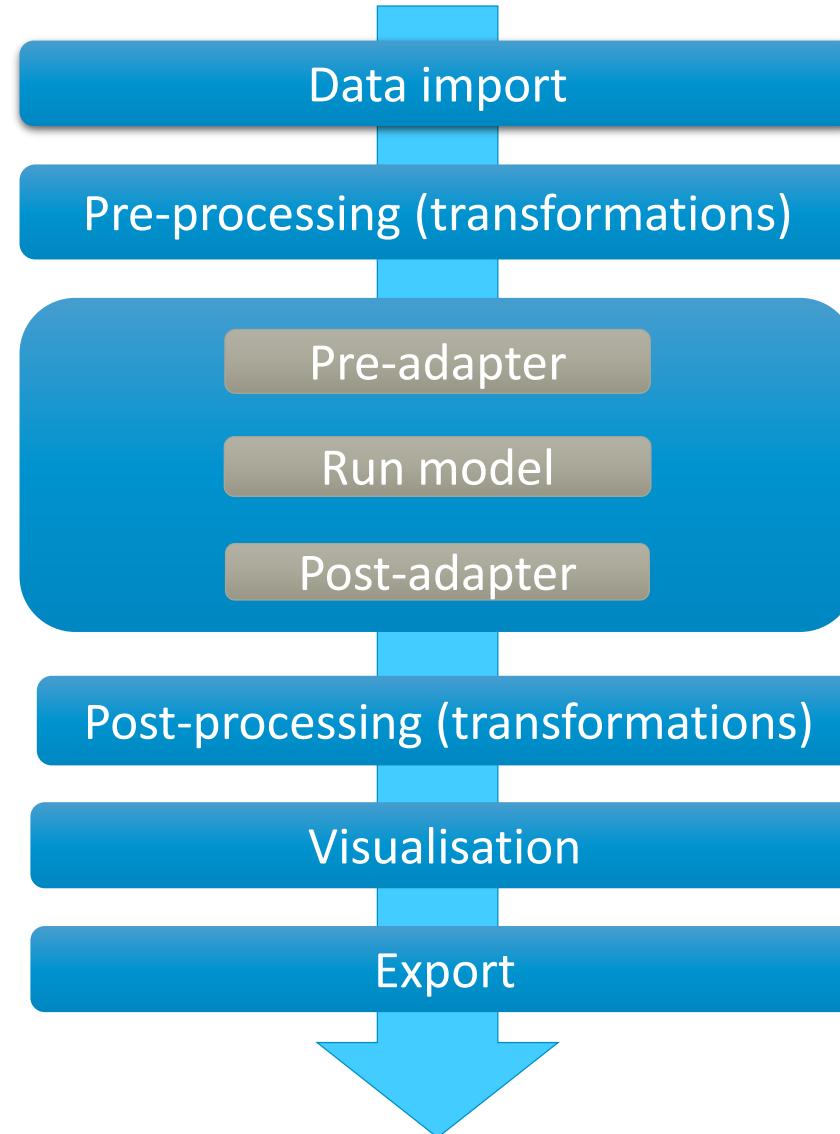
Delft-FEWS provides generic functionality (modules) which can easily be configured and organized for specific applications (processing data, running models, ...).

In this course we focus on:

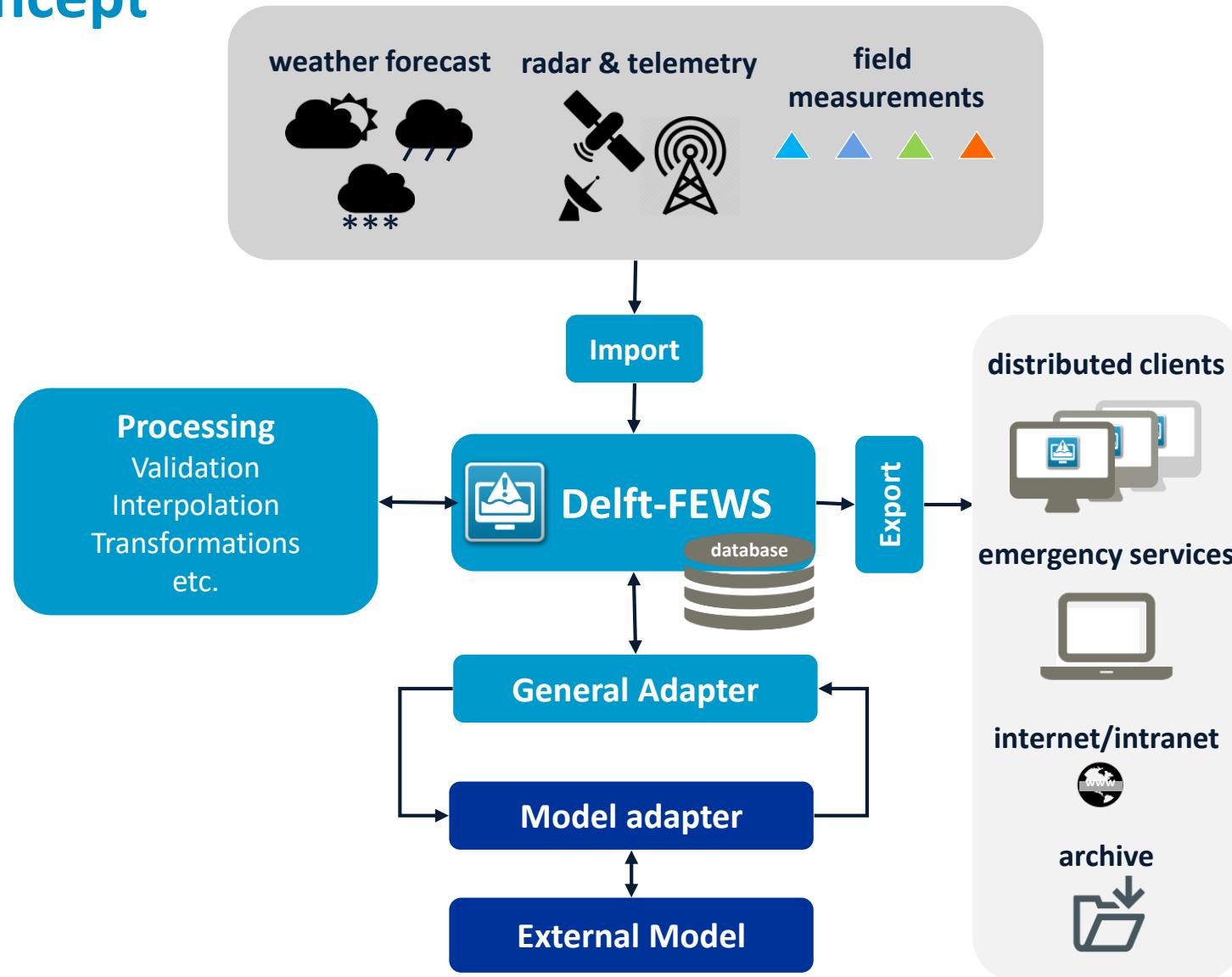
- general configuration
- importing scalar and gridded data
- displaying data in the Delft-FEWS GUI
- data transformation



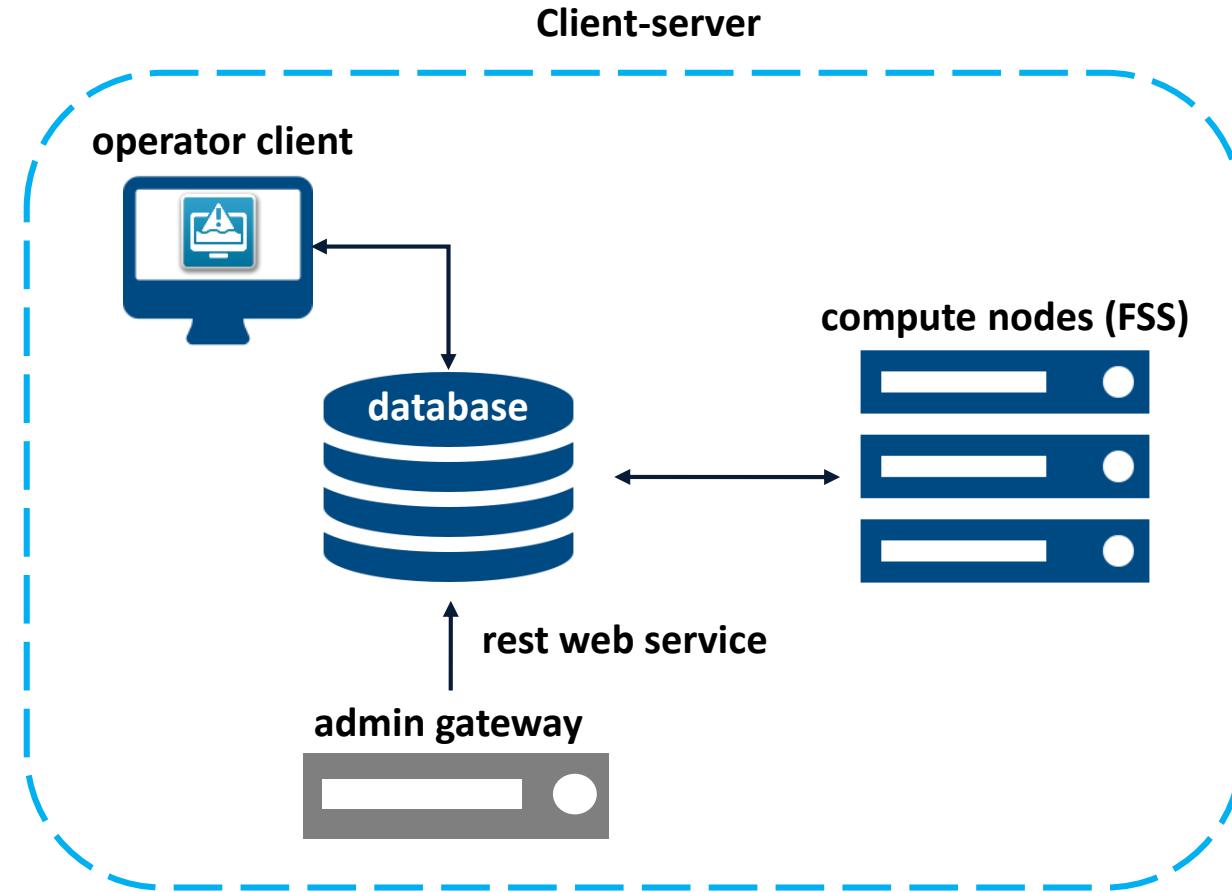
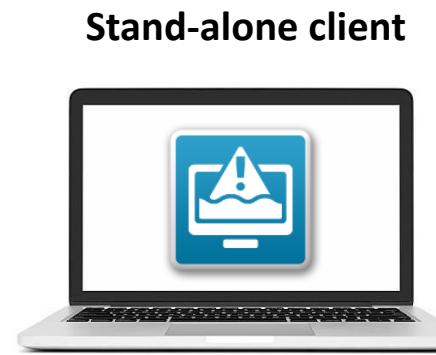
Delft-FEWS Generic Workflow



Delft-FEWS Concept



Delft-FEWS, application flavors





Module 3

Delft-FEWS Displays

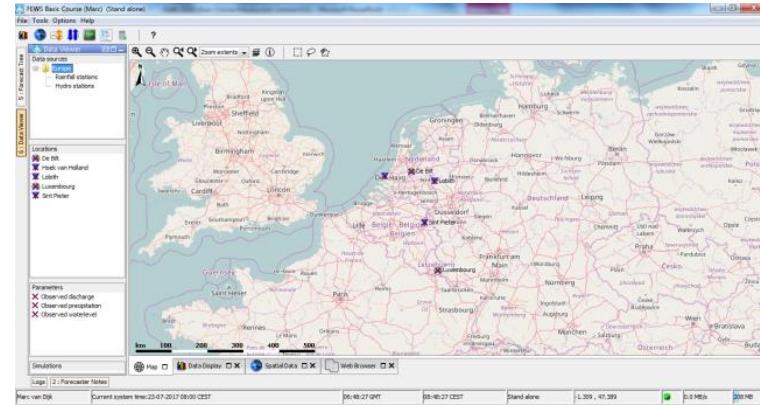
Delft-FEWS: Data Displays

Delft-FEWS has several displays to show time series and other information

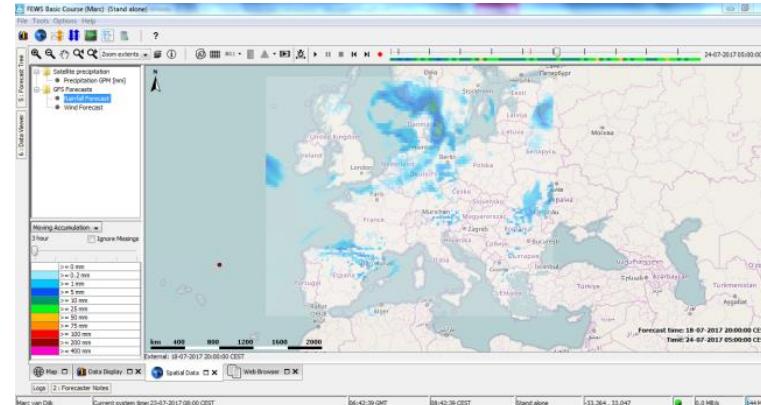
Key displays:

- Map Display: Main display where location icons and maps are presented
- Spatial Display: Shows spatial time series (scalar, gridded and longitudinal)
- Time Series Display: Display where scalar and longitudinal time series are presented

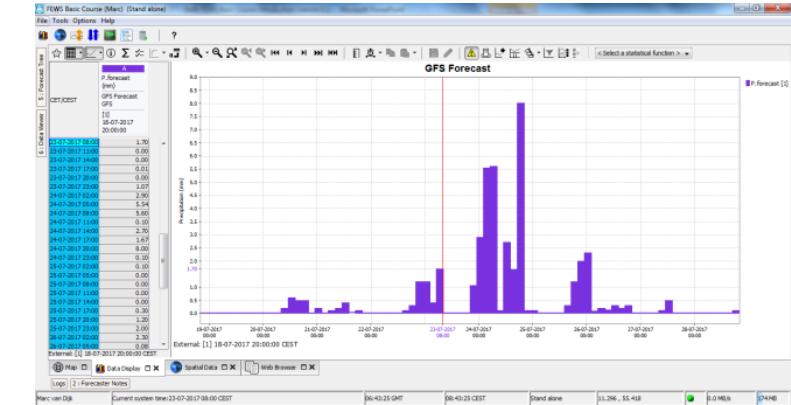
Map Display



Spatial Display



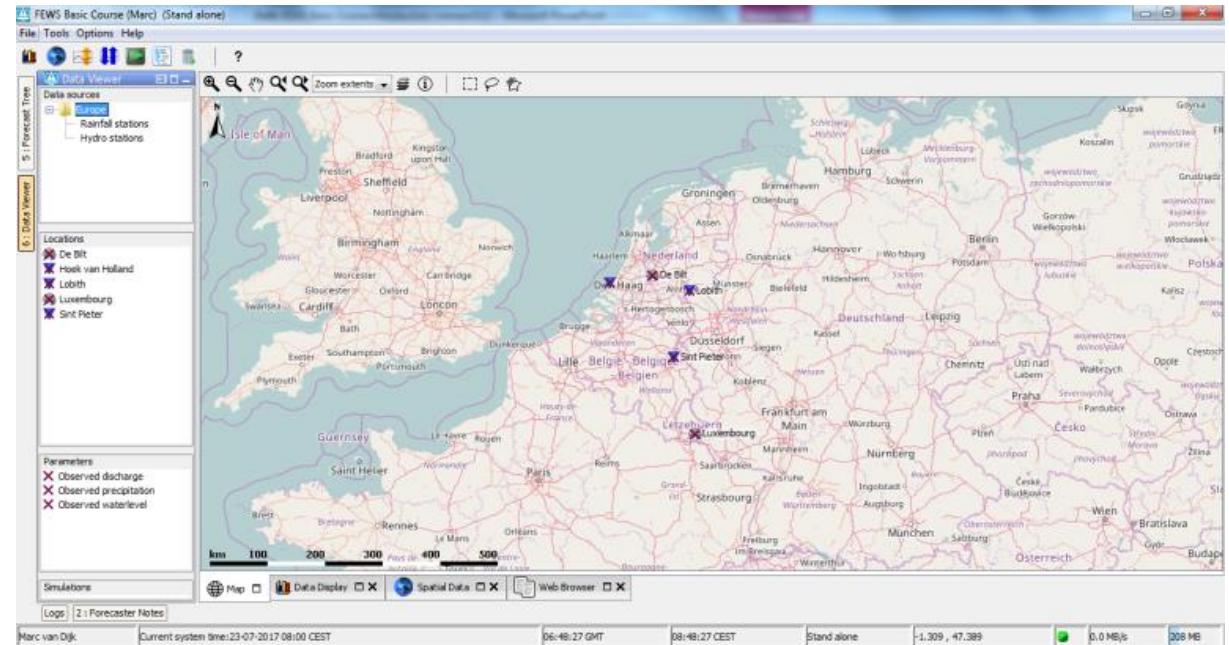
Time Series Display



Delft-FEWS: Map Display

The Delft-FEWS Map Display contains a GIS-like mapping component to show:

- Map layers and location icons
- ArcGIS shapefiles
- OpenStreetMap, Google Earth, Virtual earth
- WMS-layers

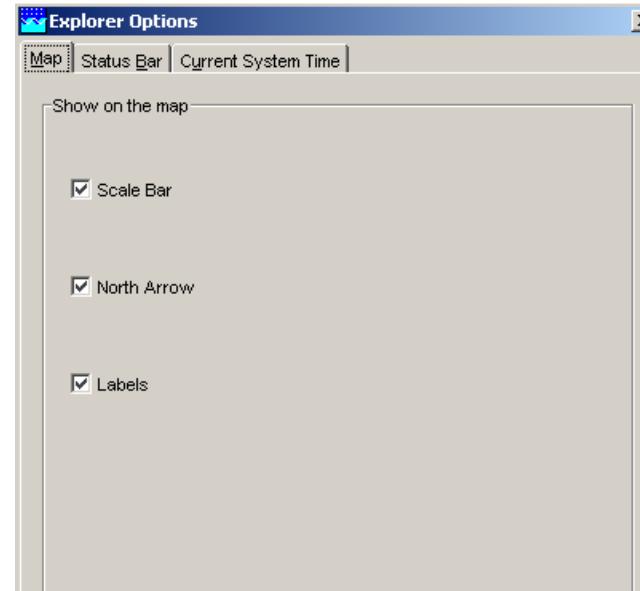


Layers are saved in the “\MapLayerFiles” folder

WMS stored in Cache folder in the root

Configuration through file:
\SystemConfigFiles\Explorer.xml

Scale bar, etc. can be switched off via menu:



Delft-FEWS: “Map” Component

Used in both Map Display and Spatial Display and has many configuration options:

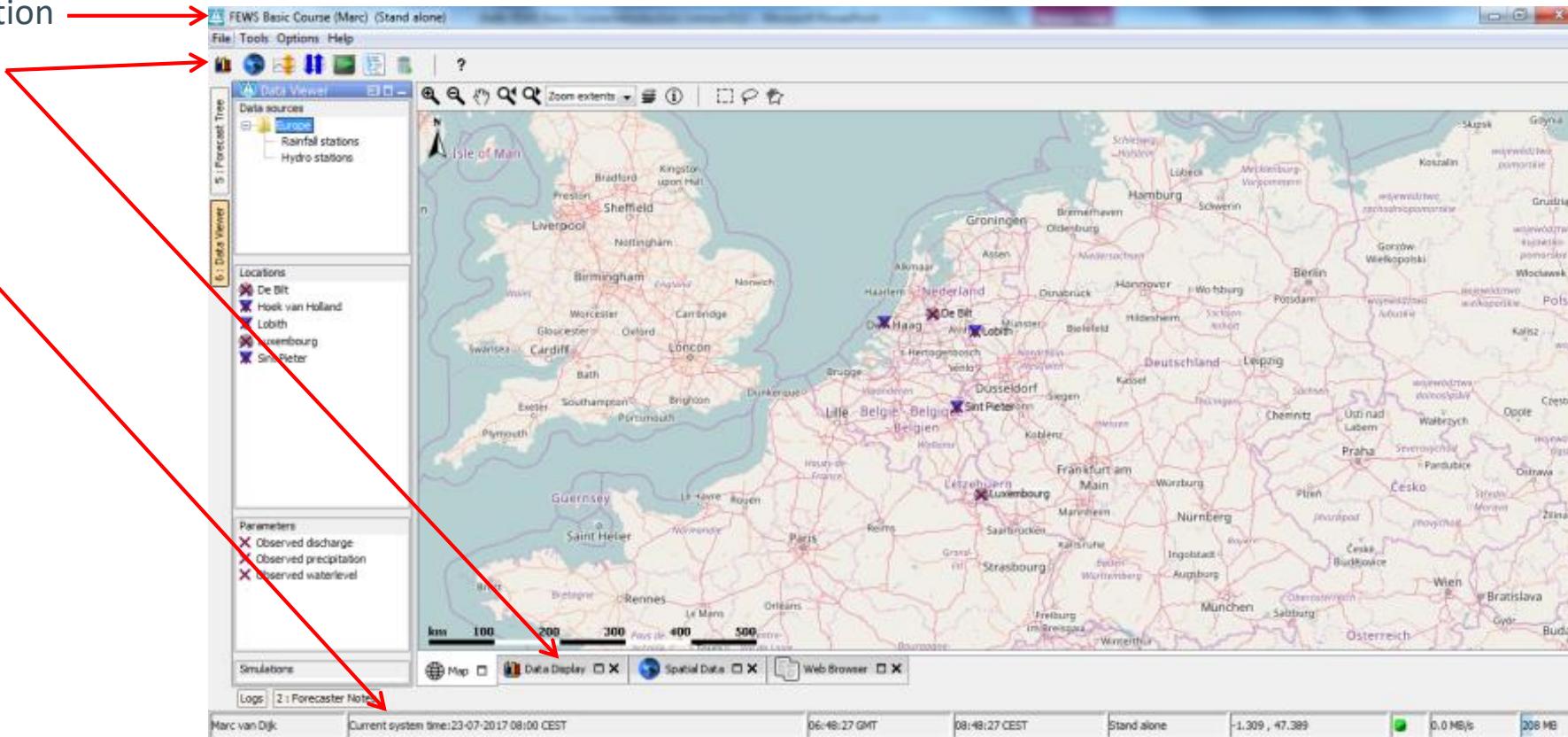
- Geodatum
- Projection
- View extents
- Visibility of map elements
- Map Layers
 - Open Street Map
 - WMS / WCS
 - Esri Shape Layer
 - Esri Server

map	
geoDatum	WGS 1984
projection	web_mercator
defaultExtent id=World	
extraExtent id=Europe	
scaleBarVisible	true
northArrowVisible	true
labelsVisible	true
backgroundColor	white
openStreetMapLayer (2)	
layer id=Satellite	
wmsLayer	
id	srtmv4.1_s0_pyramidal_color
url	http://www.webservice-energy.org/mapserv/srtm?
wmsLayerName	srtmv4.1_s0_pyramidal_color
visible	false
cacheDir	\$CACHE_FOLDERS/WMSLayers/srtmv4.1_s0_pyramidal_color
esriShapeLayer id=World	

Delft-FEWS: Explorer

The Delft-FEWS *Explorer.xml* configuration file contains many elements

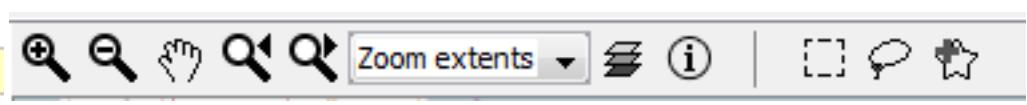
- System Information
- Explorer Tasks
- Status Bar
- Data Time
- Global Datum
- Log panel



Delft-FEWS: Explorer

Most used configurable elements of the *Explorer.xml* file

- Pre-configured zoom levels that can be selected from Maps toolbar



defaultExtent (1)		= id	left	right	top	bottom	Zoom extents		Info	Comment	Star
1	World	-180	180	90	-70						
extraExtent (1)											
extraExtent (1)		= id	left	right	top	bottom	Zoom extents		Info	Comment	Star
1	Europe	-30	50	70	30						

- Tools / Displays that can be started out from the Explorer and must be open on start-up of FEWS Application

explorerTask (13)												
= name	iconFile	mnemonic	arguments	taskClass	displayConfigFileName	predefinedDisplay	toolbarTask	menubarTask	all	disabled	visible	enabled
1 Map Display	splitmap.gif	A	MapDisplay	nl.wldelft.fews.gui.plugin.map.MapDisplay					false	true		
2 Data Display	graph.gif	D		nl.wldelft.fews.gui.plugin.timeseries.EditorTimeSeriesDialog					true	true	true	
3 Spatial Data	spatial.png	G	GridDisplay	nl.wldelft.fews.gui.plugin.grid.GridDisplay					true	true		
4 Manual Forecast	manforc.png	M		nl.wldelft.fews.gui.plugin.manualforecast.ManualForecastDialog					true	true		
5 Forecast Management	forcman.png	F		nl.wldelft.fews.gui.plugin.forecast.ForecastDialog					true	true		
6 System Monitor	sysmon.png	S		nl.wldelft.fews.gui.plugin.systemmonitor.SystemMonitorDialog					true	true		



Delft-FEWS: Explorer

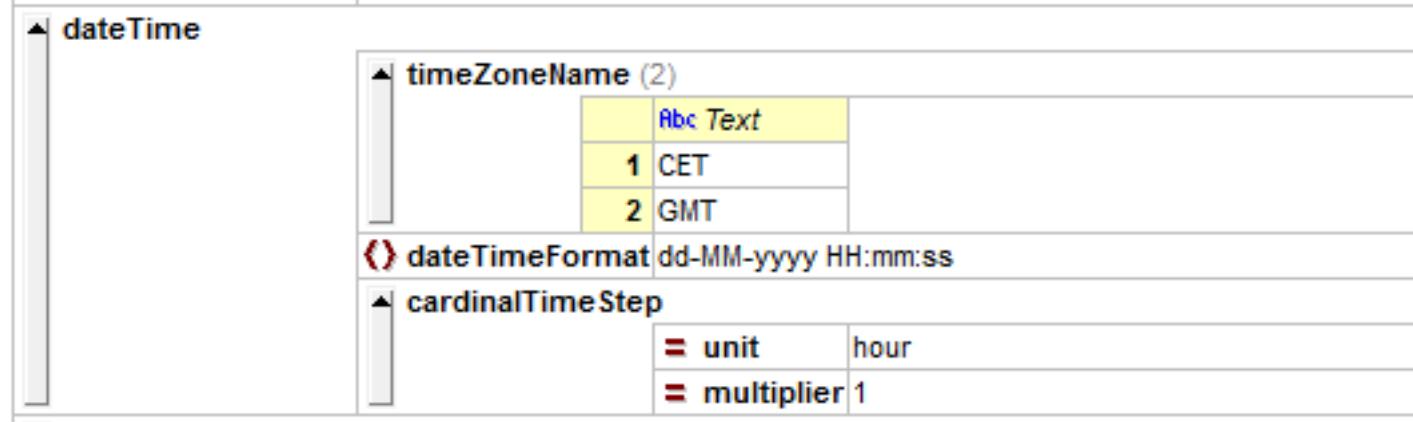
Most used configurable elements of the *Explorer.xml* file

- Global (vertical) datum



- DateTime

- Time Zones
- Date Time Format
- Cardinal Timestep



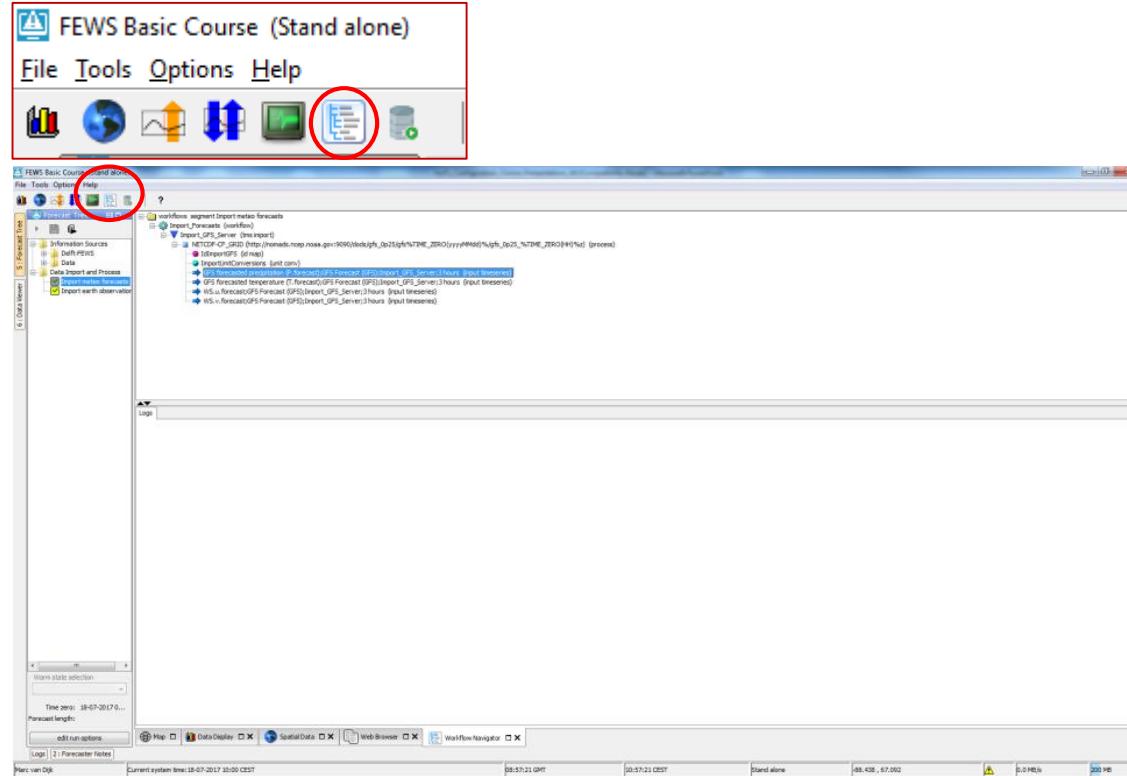
Current system time: 23-07-2017 08:00 CEST

07:11:51 GMT

09:11:51 CEST

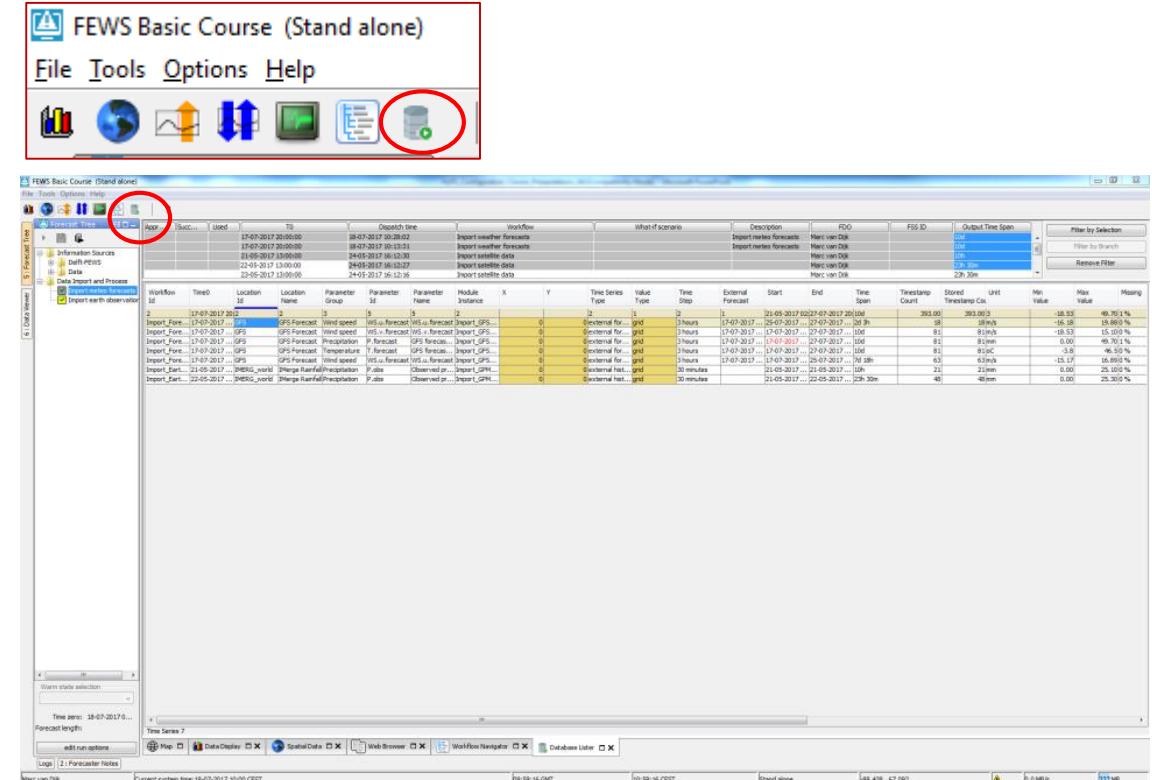
Useful displays for configuration support

- Workflow Navigator (Ctrl W)



- Access to input and output time series of latest successful (Current) run
 - Helps in finding configuration errors

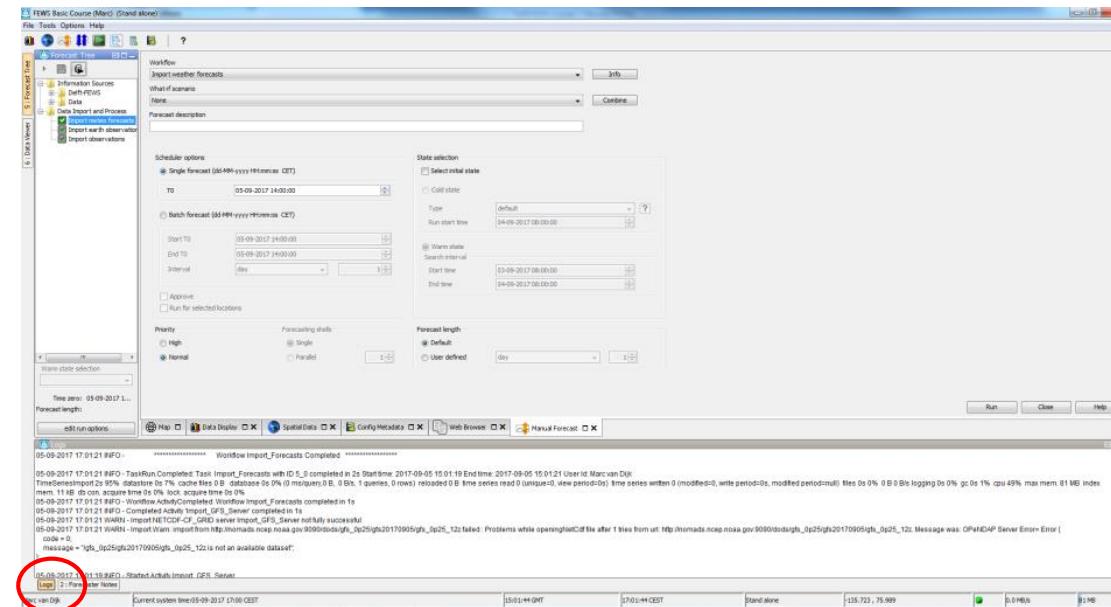
- Database Lister (Ctrl L)



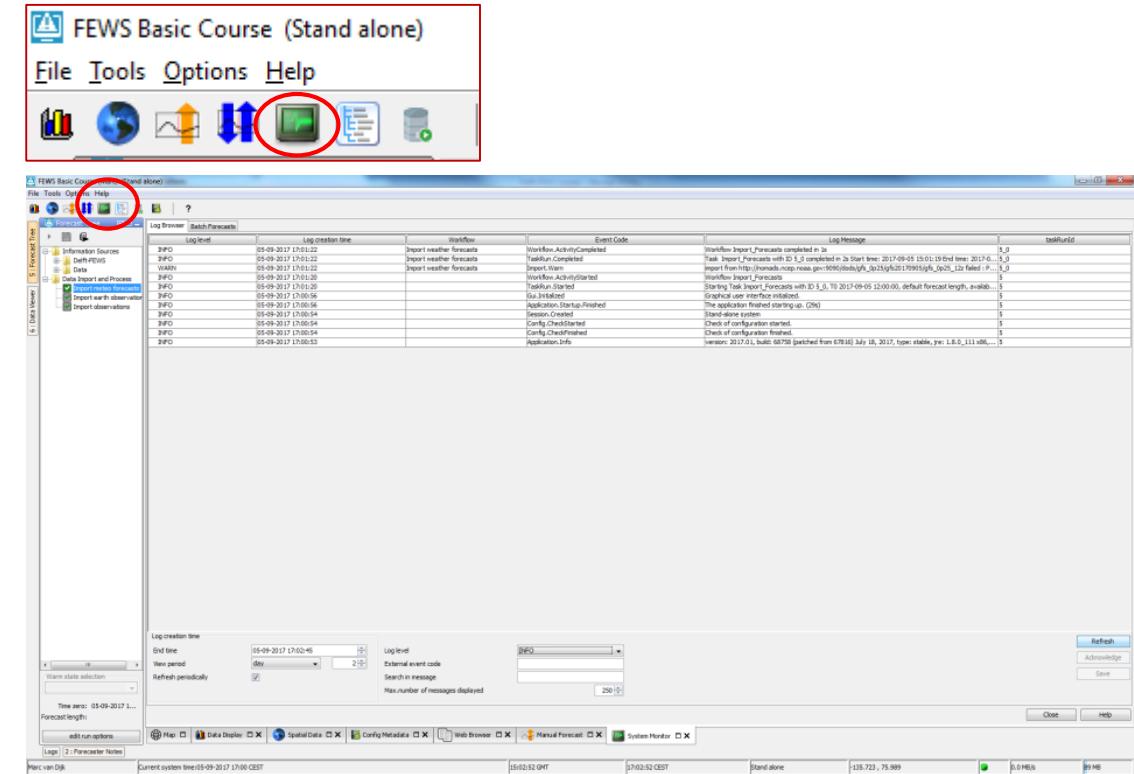
- Access to result time series of latest run (successful or not)
 - Shows exact details of time series
 - Helps in finding configuration errors

Useful displays for configuration support

- Log Browser (-)



- System Monitor (Ctrl S)



- Logging of Delft-FEWS modules
- Same information also available in log.txt file

- Shows main log messages stored in the database
- Also log messages from previous sessions can be shown

Delft-FEWS-Basic application: Navigation

Forecast Tree (*Topology.xml*) can:

- Access websites, e.g.:
 - Delft-FEWS User Guide
 - Data products
- Start configured workflows
 - Import data
 - Process data
 - Run models
- Navigate to tasks and data

