

Deltares

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# **Delft-FEWS Developments**

## **Delft-FEWS International User Days 2021**

**Delft-FEWS Product Management**

Gerben Boot, Marcel Ververs & Erik Pelgrim

November 2021

# Set-up of the Delft-FEWS developments *trilogy*

Part	Theme	When	By	Covering...
#1	Delft-FEWS in (extreme) practice	Today, 8 <sup>th</sup> of Nov	Gerben	Delft-FEWS practic(aliti)es...
#2	End Users and Operators	Thu, 11 <sup>th</sup> of Nov	Erik	Front-end developments
#3	Technical Delft-FEWS developments	Mon, 15 <sup>th</sup> of Nov	Marcel	Back-end developments



Gerben



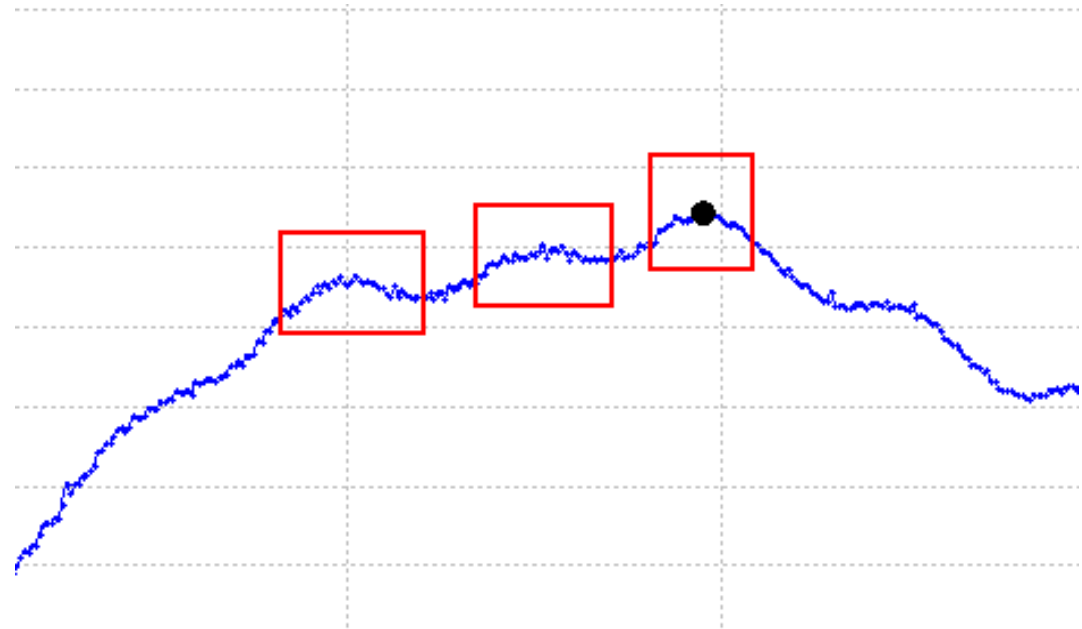
Erik



Marcel

# Find Peaks by Topographic Prominence

- New transformation
  - `<selection>`  
`<topographicProminencePeaks>`
- Uses official method to distinguish mountains
  - Not by horizontal distance
  - "How far would you have to descend to reach a higher peak"
- Define a minimum prominence value
- Used by BoM to check whether their peak water level forecasts were correct
- [More information](#)



# Verification Analysis Display

- Performance Analysis Tool (BoM)
- Used to evaluate the quality of forecasts
  - Comparing predicted peaks to observed peaks
  - Predicted threshold crossings
  - Forecasts sent on time
- Value properties viewer
  - Editing possible
- [More information](#)

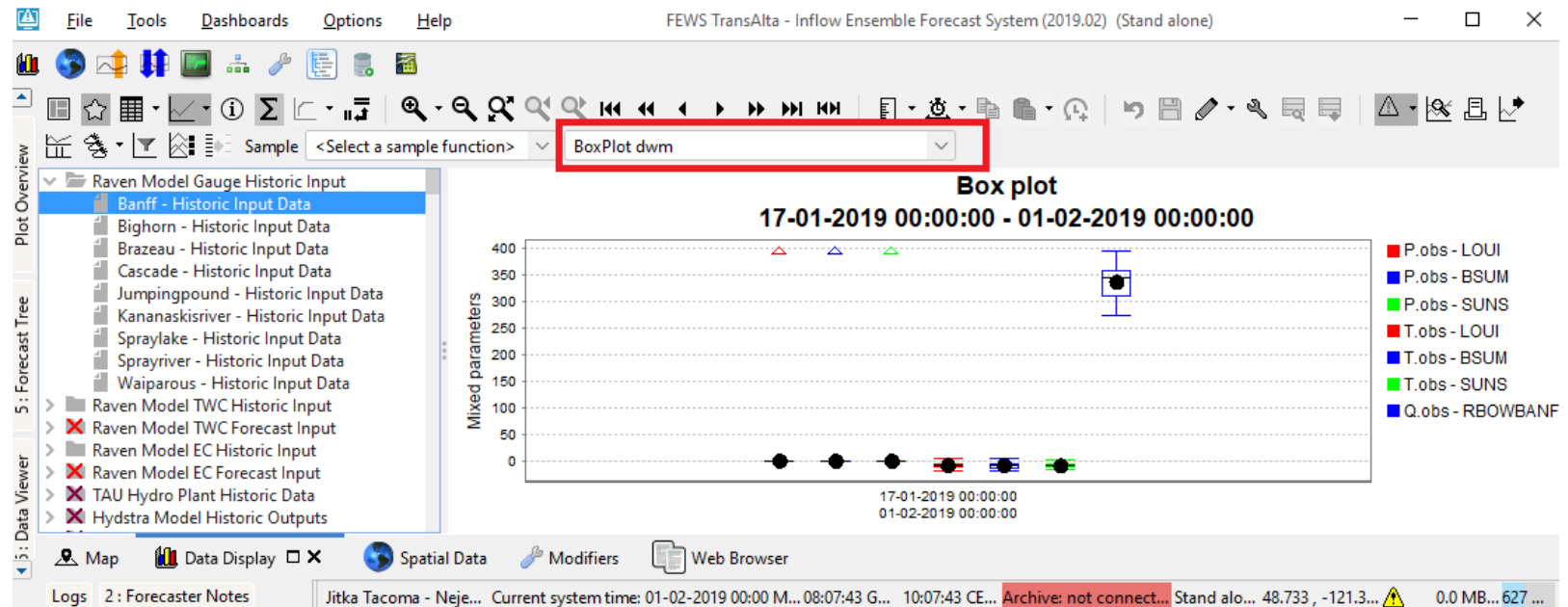
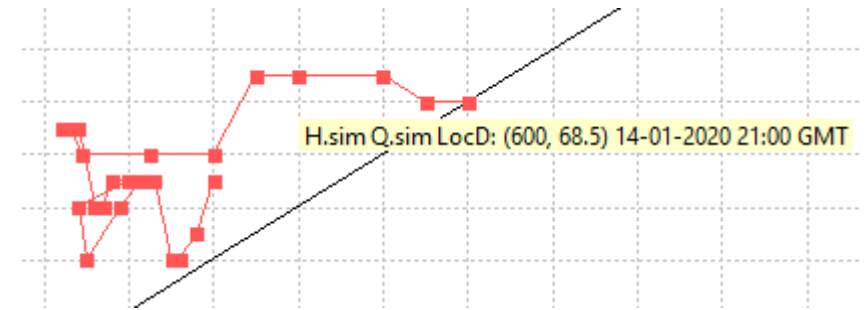
Flood Watches		Flood Warnings		Forecast Locations	
Location			Number of Forecast Locations	Max	
Webbs Ck-Wisemans Ferry (Hawkesbury River)...			59	Major	
Lower Portland (Hawkesbury River) - H067094			57	Major	
Sackville (Hawkesbury River) - H063280			57	Major	
Windsor Pwd (Hawkesbury River) - H567044			53	Major	
Daly River Police Station - H514910			49	Moderate	
Noonkanbah - H503007			45	Minor	
Hungerford (Paroo River) - H044181			40	Major	
Maitland Belmore Bridge (Hunter River) - H061...			37	Minor	
Talwood - H042066			37	Major	

Location ID	Prediction Type	Prediction Magnitude	Prediction Time	Observed Peak Level	Observed Peak Time
H561004	Peak	4.4	24-03-2021 10:00:00	4.358	23-03-2021 22:45:00
H561004	Peak	4.4	24-03-2021 10:00:00	4.358	23-03-2021 22:45:00
H561004	Peak	4.4	24-03-2021 10:00:00	4.358	23-03-2021 22:45:00
H561004	Peak	4.4	24-03-2021 10:00:00	4.358	23-03-2021 22:45:00
H561004	Peak	4.3	24-03-2021 10:00:00	4.358	23-03-2021 22:45:00
H561004	Peak	4.3	24-03-2021 10:00:00	4.358	23-03-2021 22:45:00
H561004	Peak	4.3	23-03-2021 10:00:00		
H561004	Peak	4.3	23-03-2021 10:00:00		
H561004	Peak	4.3	23-03-2021 10:00:00		

# Statistics Improvements

- Tooltip for data points in scatter plot in display groups
  - Location, parameter, values and time
- Statistical functions in display groups
  - `<display name="Central Moving Average">`
  - `<locationId>LocD</locationId>`
  - `<plotId>PlotId</plotId>`
  - `<statisticalFunctionId>CMD</statisticalFunctionId>`
  - `</display>`
- [More information](#)



# Auto Calibration via integrated OpenDA

- Workflow parameters can be automatically calibrated with OpenDA
  - OpenDA runs on the background
  - User only sees Delft-FEWS
- OpenDA suggests new parameters by comparing model results with observations
  - Tries to minimize the error
- Select parameters that need calibrating
  - Delft-FEWS runs workflow many times with different parameter values suggested by OpenDA
  - The best set is chosen by comparing model results with observations
- Further developed
  - Algorithm, default / user settings
  - Saving runs with description
- [More information](#)

Parameter name	KLCA2LWR	
	original value	modified value
SCF	1	0.243 <b>AC</b>
MFMAX	0.85	0.85 AC
MFMIN	0.1	0.1 AC
NMF	0.15	0.15 AC
UADJ	0.05	0.05 AC
SI	9999	9999 AC
DAYGM	0	0 AC
MRBASE	0	0 AC

Auto Calibration

Workflow start time: 10-01-1975 00:00

Calibration start time: 10-01-2012 00:00

Calibration end time: 07-01-2013 00:00

Min improvement percentage: 0.0

Shuffling Loops for min Improvement: 2

Number of complexes: 1

Maximum number of evaluations: 10

OpenDA Debug:

Auto calibrate Cancel

# Sample Viewer Extension

- Used for Water Quality
- Search options
  - Start, end time & season
- Value properties separated from sample properties
- Edit options
  - Option to delete samples via right mouse
  - Value, comment, value properties
  - Via permissions
- Extra columns
  - Comment, Quality Flag, Value properties
- [More information](#)

Location Name		Sample Id		Namespace	X_m...	Y_r
Woerden Wijkpark Molenvliet Woerden (95)		18-21095_WD95_OW_ECO		NL14		
Woerden Wijkpark Molenvliet Woerden (95)		18-21095_WD95_OR_ECO		NL14		
Houten Imkerpark (296)		18-21296_HT296_OW_ECO		NL14		
Houten Imkerpark (296)		18-21296_HT296_OR_ECO		NL14		
...						
Location Name	Parameter Name	Value	Unit	Comment	Taxontype	Biotaxon
1	2	17	2	1	1	2
21112 Woerden ...	Bedekking[%]	3	%	Edited	Macrofyten	Nuphar lutea
21112 Woerden ...	Bedekking[%]	1	%		Macrofyten	Ceratophyllum demersum
21112 Woerden ...	Bedekking[%]	0	%		Macrofyten	
21112 Woerden ...	Bedekking[%]	0	%		Macrofyten	
21112 Woerden ...	Bedekking[%]	5	%		Macrofyten	
21112 Woerden ...	Bedekking[%]	0	%		Macrofyten	
21112 Woerden ...	Bedekking[%]	5	%		Macrofyten	
21112 Woerden ...	Bedekking[%]	1	%		Macrofyten	
21112 Woerden ...	Breedte[m]	17	m		Macrofyten	

# Computational Framework

- Delft-FEWS in *scenario mode* (not strictly in the 'now' time frame).
- What-if scenario developments
  - Will replace the old what-if scenario's at 2023
  - IFD now has access to the what-if scenarios
  - Icons will show what-if status
  - Deleting what-if scenarios

- [Peter Gijbers](#) and [Andre Grijze](#)



- [More information](#)

The screenshot shows the Delft-FEWS software interface. The top menu bar includes File, Tools, Dashboards, Options, and Help. Below the menu is a toolbar with various icons. The main window is divided into two panes. The left pane, titled 'Tasks', shows a hierarchical list of tasks. The right pane, titled 'Data Viewer', shows the configuration for the selected task.

**Tasks**

- Run Whatif Tests
  - Test No Whatif (default properties and modifiers)
  - Test Whatif Properties (t1)
    - whatif.1
      - whatif2
  - Test Whatif Properties (t2)
  - Test Copy whatif property based TSS (t1)
  - Test Import Archived Whatif
  - Test Whatif Modifiers (t3)
    - never1\_up only1\_pyramid
      - never1\_only1\_attrBCB
    - no modifier
  - Archive Test Whatif Modifiers (t3)
    - never1\_up only1\_pyramid
      - never1\_only1\_attrBCB
    - no modifier
  - Test Whatif Modifiers (t4)
  - Test Whatif Propeties and Modifiers (t5)

**Data Viewer**

Name: never1\_up only1\_pyramid

Description:































**Whatif modifiers**

- Modify time series (only applied in whatif)
- Modify time series (never applied in whatif)
- Specify attributes








# Annotation Display

- Notes on location level instead of time series & time step level
- Adding, copying, editing, deleting, exporting, importing
- Location, start time, end time, annotation text, user, any number of extra properties
- Icon will turn black when annotation is available for location, white when not
- [More information](#)

Actions	Location	Start time	End time	Annotation <span>∨</span>	User
  	KNMI-RADAR		30-12-2020 14:00:00	Zelfs nog beter	
  	KNMI-RADAR		30-12-2020 14:00:00	Zelfs nog beter	
  	KNMI-RADAR			Z	
  	62079_Debiet_...		09-12-2020 14:00:00	Veranderde locatie en eindtijd	
  	KNMI-RADAR			Text close after apply	
  	KNMI-RADAR	18-11-2020 14:00:00		Nog beter2	Erik Pelgrim
  	EPS_SCHIP_WI...	09-12-2020 14:00:00		My second	
  	NEERSLGDB-R...			My first annotation	
  	KNMI-RADAR	09-12-2020 14:00:00		Is	
  	KNMI-RADAR	18-11-2020 14:00:00	30-12-2020 14:00:00	Heel Goed	

Create new annotation  Filter for selection

 Map
 Grafiek2
 Grafiek
 Annotation Display  

# Import

- New import types: Itaipu (4x), BMA (2x), RivDaily and more
- Option to let empty comments overwrite existing ones
- Option to take forecast time from zip file name
  - Nice combination when time of data is taken from name of files within zip
- Improvements for rejecting samples
  - Reject on duplicate values
  - Reject on (alpha)numerical values are in the wrong column
  - More consistent logging
- [More information](#)

# Export

- Correlation Event Sets
  - Useful for peak heights
  - Xml
- Itaipu (2x)
- Location attributes to netcdf
- Pi extensions: value source manual, state and milliseconds
- Annotations by label instead of code
- [More information](#)



# Poll

What topic of the Delft-FEWS Front-end developments should be part of the Delft-FEWS Advanced Configuration Course on 29<sup>th</sup> of November?

Min. 10 participants!!



Max 1, anonymous choice per participant (free text is possible)

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