

# Deltares

# Deltares

# Delft-FEWS in Extreme Practice



Deltares

**Deltares**

# **Delft-FEWS Developments**

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

**Delft-FEWS Product Management**

Gerben Boot, Marcel Ververs & Erik Pelgrim

November 2021

# Introduction...

- Welcome
- Setup of the Delft-FEWS developments *trilogy*
- Looking back on 2021
- Delft-FEWS Vision and roadmap update
- Documentation News
- Web Operator Client
- Outlook to 2022
- Teaser for session #2

As usual: [Links for more info](#)

**Deltares**



# Welcome on behalf of Delft-FEWS PM...

**Deltares Software Support (1<sup>st</sup> line) & Delft-FEWS Support Team (2<sup>nd</sup> line)**



**Marcel**



**Nadine**



**Department of Operational Water Management**



**piet**

**sonny**



**melvin**

**niels**

**Portal moderators, course leaders**



**Ilonka**



**Developments**

**Gerben**



**Delft-FEWS Development Team**



**Community**

**Deltares**

# 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**

# Looking back...



2 [releases](#)



260+ [new features](#) implemented



1000+ bugs repaired  
(majority found in testing)



2 [webinars](#) on new features



5 national, regional and international  
User [meetings](#) (co-) organized



6 roadmap themes made progress



9 (online) [courses](#) (3 more planned in '21)



1 new *what-if scenario* concept added  
(computational framework, topology editor)



mongo DB

1 source/destination added to the open archive



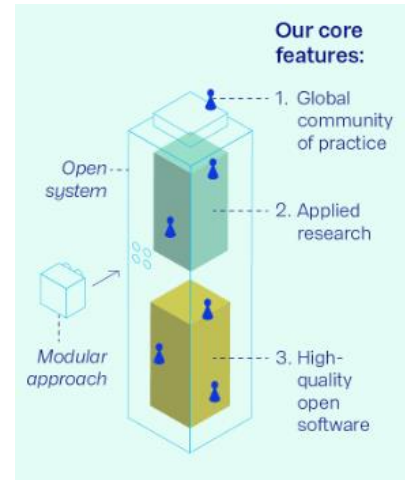
1 new, consistent flat look & feel



# Delft-FEWS Vision 2025...

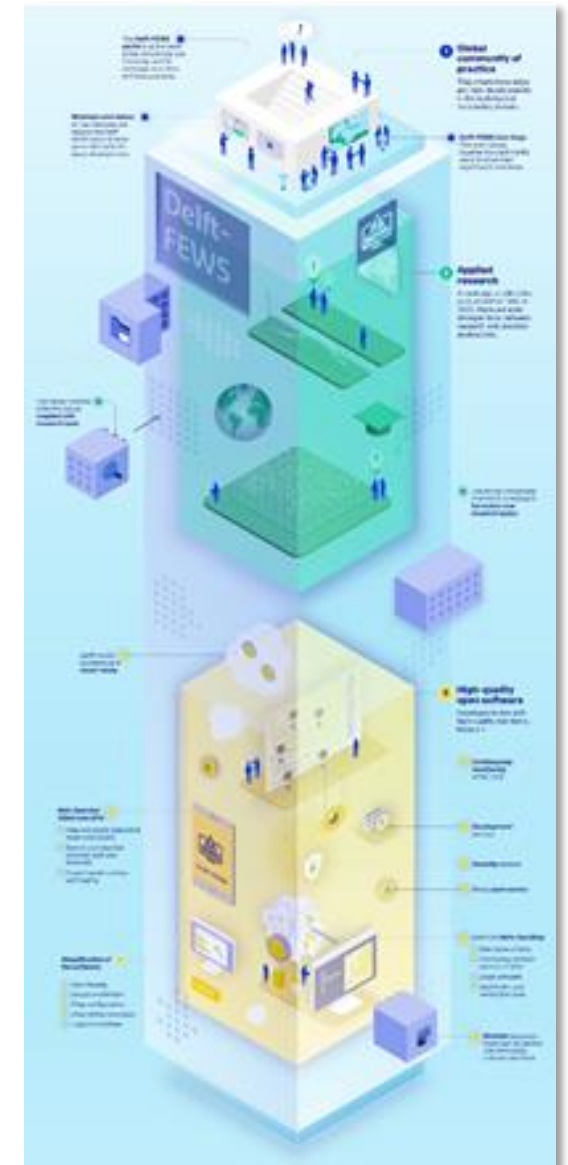
- Delft-FEWS Vision 2025 core features

- 1 Global Community of Practice
- 2 Applied Research
- 3 High quality open software

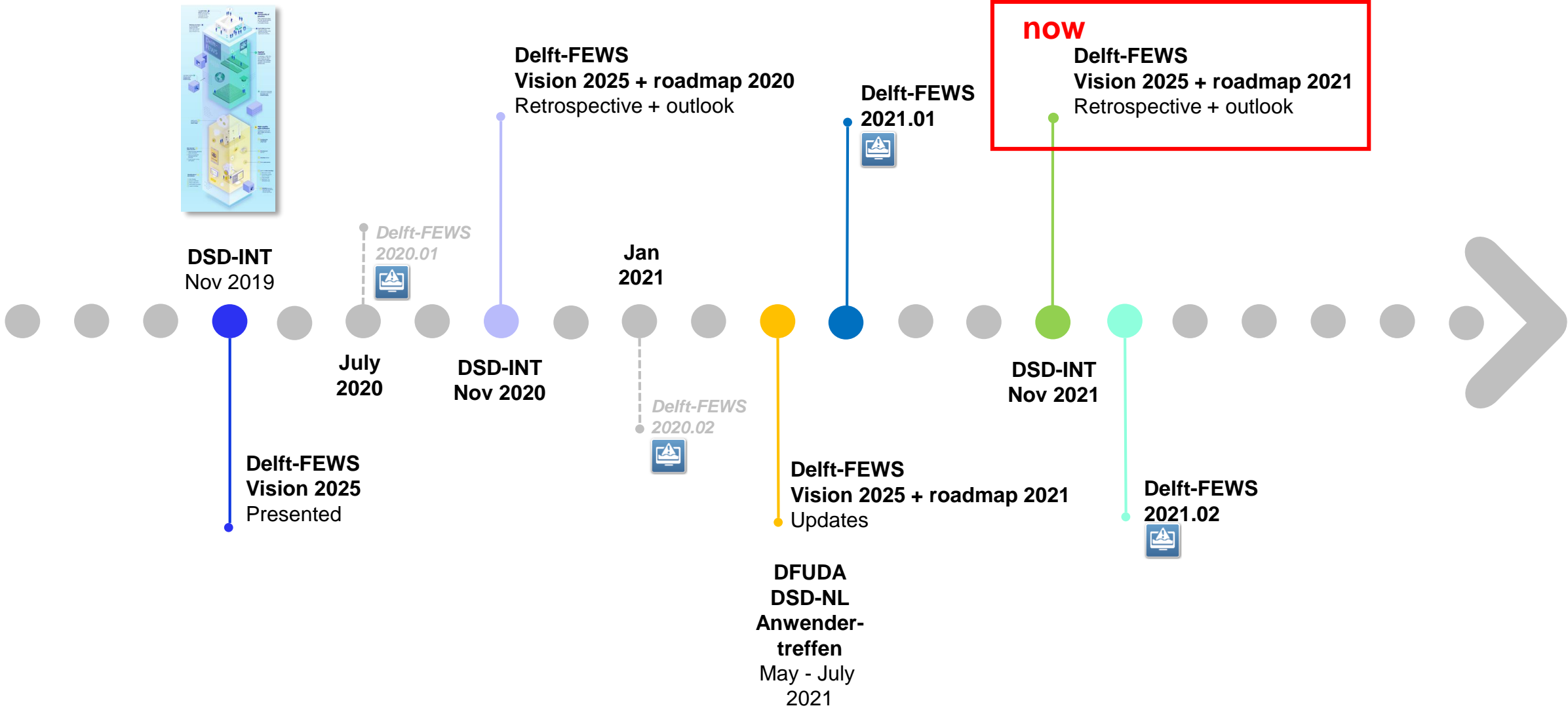


- Show and tell...story, presentations and infographic

- Delft-FEWS [portal](#)
- [Video](#)
- [User Days / Events](#)
- Updates to the [CSB](#)

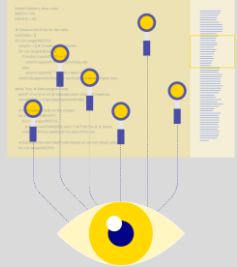


# Delft-FEWS Vision 2025: timeline



# Roadmap 2021...

## code quality



- Automatic code commits validation (SonarQube and SIG monitor)
- Increase of unit-test coverage
- Consistent code reviews & follow-up
- Code clean-up: identified + moved deprecated functionality (+ <F12> check!)

## development process



- Extended 'live' component testing using Docker containers
- Up-to-date Open Archive available for testing different versions
- Internal: more (shorter) stand-ups, estimating workloads, retrospectives
- Knowledge transfer sessions

## security



- OWASP - top 10 check installed (on build agents)
- All (critical) errors concerning third party libs resolved
- Third party libs upgrades done and planned
- Delft-FEWS Security Principles and Guidelines (documents to share)

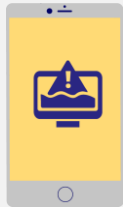
# Roadmap 2021...

cloud



- Clients (all over the world) assisted in migrating & maintaining Delft-FEWS
- Experiences with ARM templates and cloud-managed services
- Deployment pipeline: Using AI REST API icw patch upload (CM)

web operator  
client



- Basic architecture available
- Components selection (dev. framework, map, table, graph)
- Requirements collected for a “Minimum Viable Product”
- First sprints

modularity

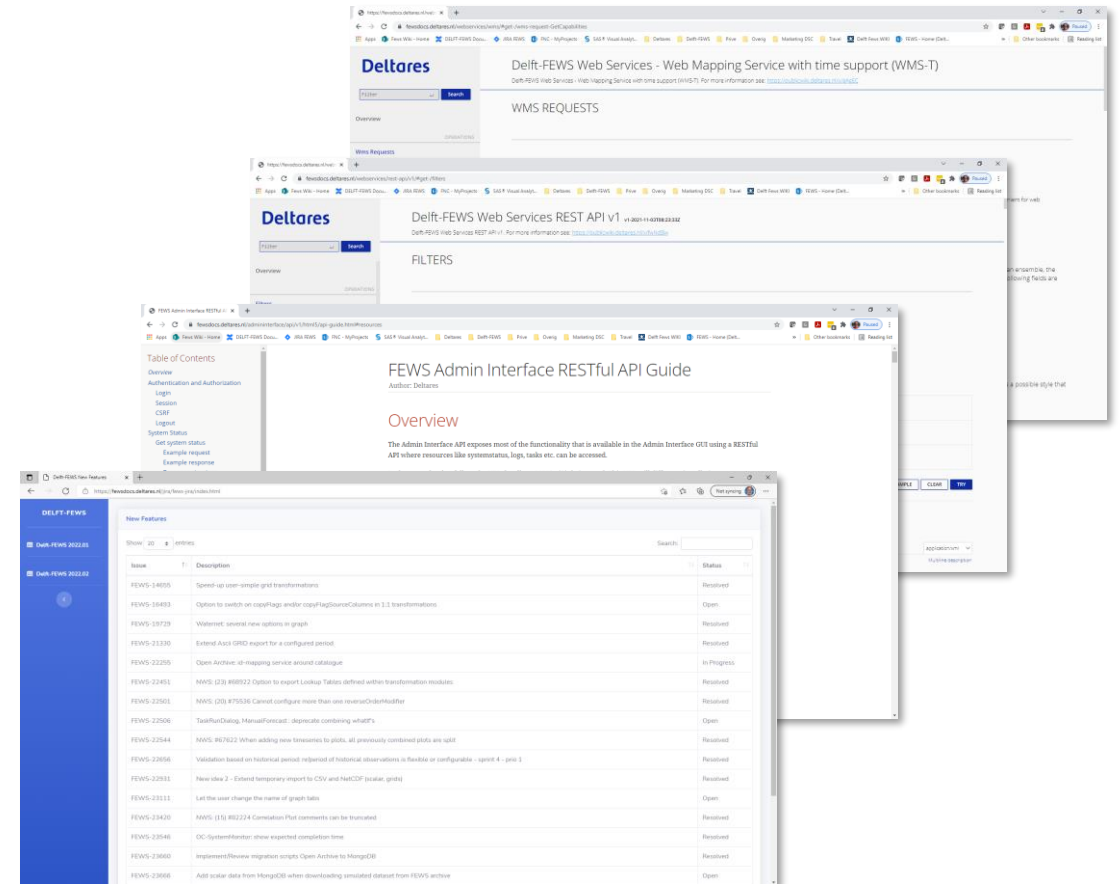


- Rolling barrel module refactored & simplified
- Computational Framework (scenario mode) → OC's & Archive combination
- New (MongoDB) module as new source for archiving scalar data (BI-tools)

# Documentation...

400+  
↓

- [Documentation WIKI](#) issues → download alternative...
- **Improved** documentation ([installations](#))
  - Version specific
  - Easier maintainable
- Documentation based on **Open API** specification
  - Delft-FEWS [REST-API](#)
  - Delft-FEWS [WMS](#)
  - Delft-FEWS [Admin Interface REST-API](#)
- **Sneak Preview** ([WIKI](#) and [Community Portal](#))
  - Open, on-hold and resolved features next releases
  - GDPR proof (no client names, estimates etc.)
  - Available (at the latest): when WIKI is up again!



# Web Operator Client

- Product Owners:

- Daniel Twigt
- Tom Bogaard



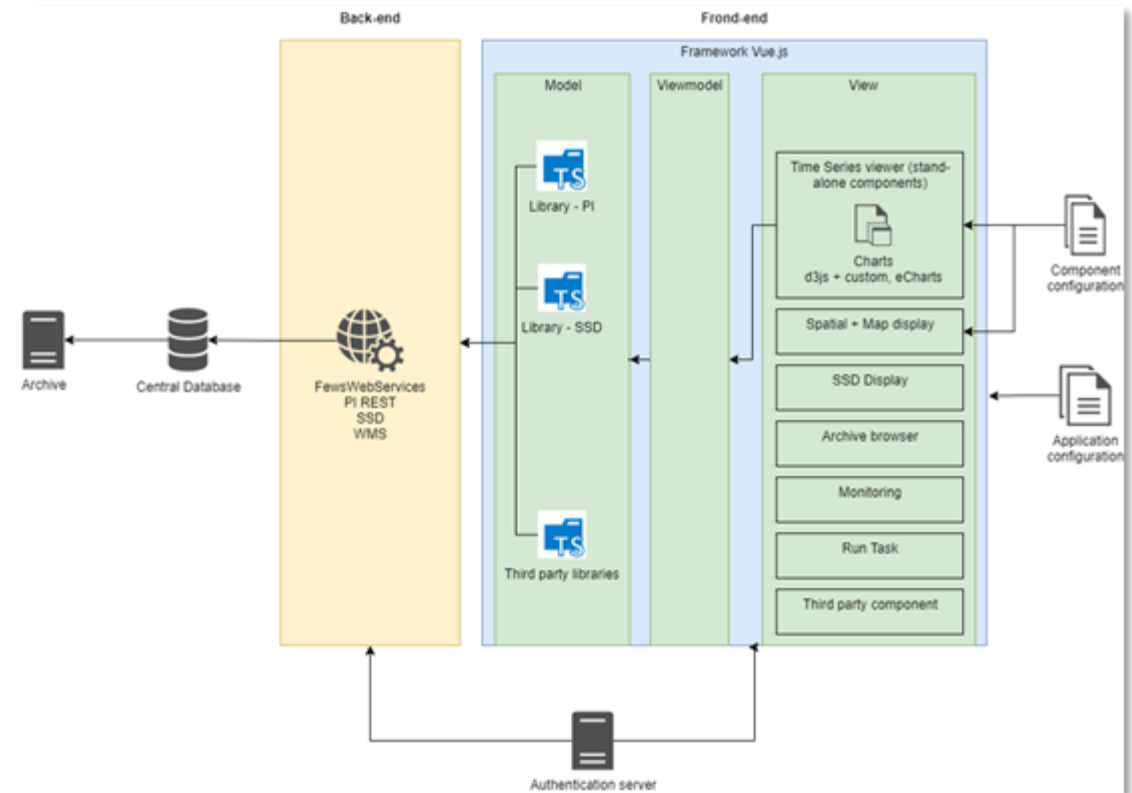
- Status:

- Architecture (base-plate)
- Requirements collected
- Choice of components (technical)
- 2 initial development sprints
- Launching customers & funding

- What's coming...

- Share progress in **Part #3** (15<sup>th</sup> of Nov)
- UX/UI
- Interactive break-out session

- More frequent updates via the Delft-FEWS Portal!



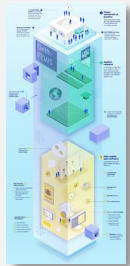
# Outlook...

2022  
developments



- Hooking up to national registers using webservice (import as temporary data)
- Archive: External netcdf storage available for all timeseries types
- Archive: Embracing the principle of self-describing netcdf files
- CF: final developments (managing, searching scenarios, running in batch)
- Seamless integration: final developments

Roadmap  
developments



- (automated) FSS scaling, use of kubernetes
- For testing: generate client-server system from LDS (reverse-replicate)
- Patchable Admin Interface
- ...

Roadmap  
themes



- Security: implement OpenID connect (secure connections via DB proxy)
- Pilot (CI/CD – DevOps): development, testing, packaging, deploying pipeline
- (real) code clean-up starts...

# What's coming up...

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Gerben



Erik



Marcel



# Contact

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Thank you for your attention!

**Deltares**

# End-users and operators



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

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Gerben



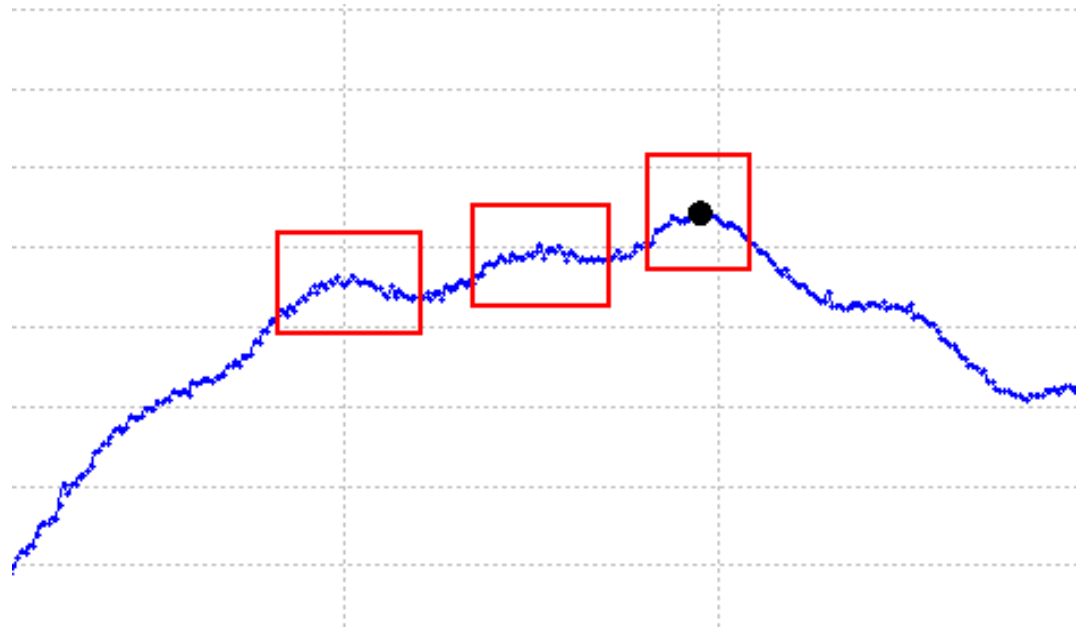
Erik



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](#)

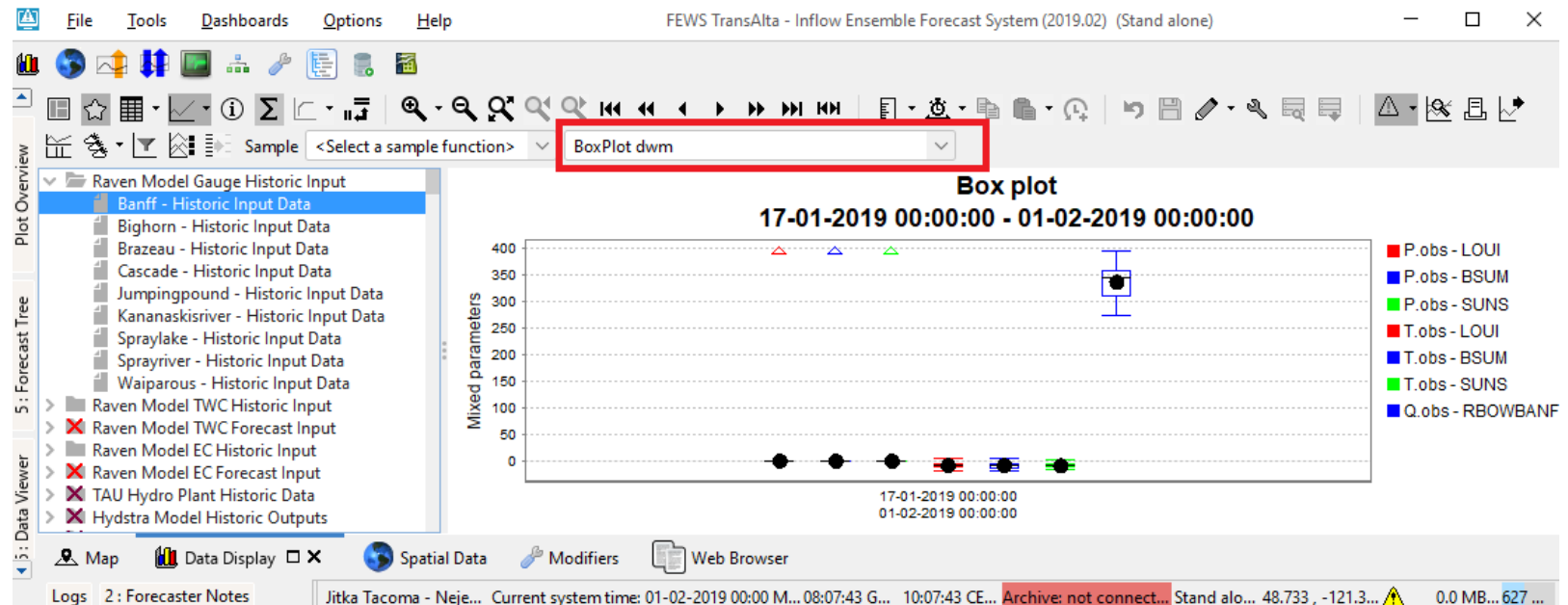
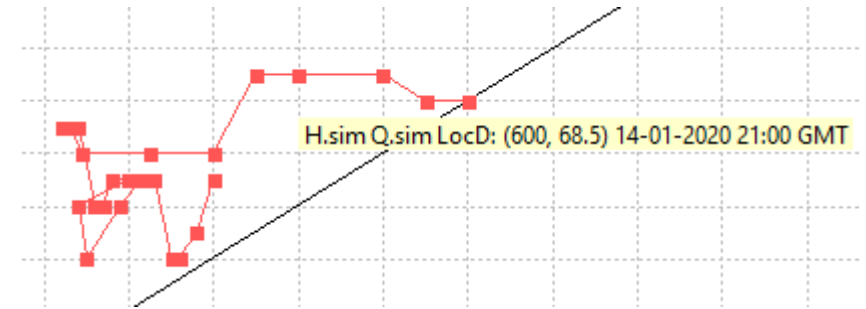
| Flood Watches                                    |  | Flood Warnings |                              | Forecast Locations |  |
|--|--|----------------|------------------------------|--------------------|--|
| Location   |  |                | Number of Forecast Locations | Max                |  |
| Webbs 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 'Tasks' panel on the left lists various tasks, including 'Run Whatif Tests', 'Test No Whatif (default properties and modifiers)', 'Test Whatif Properties (t1)', 'Test Whatif Properties (t2)', 'Test Copy whatif property based TSS (t1)', 'Test Import Archived Whatif', 'Test Whatif Modifiers (t3)', and 'Test Whatif Modifiers (t4)'. The 'Test Whatif Modifiers (t3)' task is expanded, showing sub-tasks like 'never1\_up only1\_pyramid', 'never1\_only1\_attrBCB', and 'no modifier'. The 'never1\_up only1\_pyramid' sub-task is selected. The right panel shows the 'Whatif modifiers' section with buttons for 'Copy', 'Apply', and 'Delete', and a text field containing 'never1\_up only1\_pyramid'. Below this, there are three rows of modifiers: 'Modify time series (only applied in whatif)', 'Modify time series (never applied in whatif)', and '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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Gerben



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# Technical Developments



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Gerben



Erik



Marcel



# Introduction...

- Welcome
- Last part of the Delft-FEWS developments *trilogy*
- Improvements to Admin Interface (and API)
- New functionality in Config Manager
- Extension of WebServices
- Integration Open Archive with MongoDB

# Admin Interface (API)

The screenshot displays the 'Delft-FEWS Admin Interface - Log Manager' page. On the left is a navigation sidebar with items like System Status, Dashboard, Master Controllers, Forecasting Shell Servers, View Logs, Log Manager (selected), Collect System Log Files, Database Connections, Forecast Tasks, Workflow and FSSs, Files, User Administration, System Control, Software and Configuration Management, Database Analysis, Documentation, and Logout coremc00. The main content area shows a 'Purge Logs by Date and Level' dialog with a date input set to '03/11/2021' and a severity level dropdown set to 'Info, Warning, Error'. A 'Purge' button is visible in the top right of this dialog. A 'Confirm purging' modal is overlaid on top, containing the text: 'All log entries will be deleted that were created before: 03/11/2021 and have a severity level: INFO,WARNING,ERROR. The number of log entries that will be deleted is: 254712'. At the bottom of the modal are 'Confirm' and 'Cancel' buttons.

# Admin Interface (API)

Filters

Download Upload Delete

Windows hidden Search:

| Workflow  | linux                    |
|--|--------------------------|
| Archive_Export_Daily   | <input type="checkbox"/> |
| Archive_Import_Data  | <input type="checkbox"/> |
| Archive_Import_HistoricalEvents  | <input type="checkbox"/> |
| Import_Earth2Observe   | <input type="checkbox"/> |
| Import_EarthObservation  | <input type="checkbox"/> |
| Import_Forecasts   | <input type="checkbox"/> |
| Import_HYCOM_All   | <input type="checkbox"/> |
| Import_Hydro_Observations  | <input type="checkbox"/> |
| Import_WaveWatch3  | <input type="checkbox"/> |
| Process_Operational_Grids  | <input type="checkbox"/> |
| WFlow_E2O_historic   | <input type="checkbox"/> |
| WFlow_forecast   | <input type="checkbox"/> |

# Admin Interface (API)

- Upload Master Controller Configuration
- Upload (zipped) Delft-FEWS configuration
- Uploaded MC/CM patch also for OC & FSS
- Manage (delete) base builds
- Logging in with Single Sign on using Active Directory (AD) or Azure AD (OAuth2)
- More information
  - [Single Sign on](#)
  - [Admin Interface](#)
  - [Admin Interface API](#)

The image displays three overlapping screenshots of the Delft-FEWS Admin Interface. The top screenshot shows the 'Master Controller Configuration' page with options to download or upload configuration files. The middle screenshot shows the 'Upload Base Build' page with a file upload field. The bottom screenshot shows a 'Single Sign-On' login form and a table of base builds.

| Version | Build  | Actions                          |
|---------|--------|----------------------------------|
| 2020.01 | 93468  | <input type="button" value="x"/> |
| 2020.01 | 97394  | <input type="button" value="x"/> |
| 2021.01 | 102382 |                                  |

# Module Run Times

Delft-FEWS Admin Interface - Module Run Times

System Status <

Forecast Tasks <

Scheduled Tasks

Running Tasks

**Module Run Times**

Workflow and FSSs <

Files <

User Administration <

System Control <

Software and Configuration Management <

Database Analysis <

Documentation <

Logout nldfedmc00

Timezone: GMT

Show 1000 entries

| Workflow Id                            | Module Instance Id              | Expected Pending Duration | Expected Running Duration | Expected Start Time | Expected Completion Time |
|--|---------------------------------|---------------------------|---------------------------|---------------------|--------------------------|
| Spatial_Forcing_ECMWF_ENS_EXT          | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Spatial_Forcing_ECMWF_ENS              | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Spatial_Forcing_DWD_ICON_EU            | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Spatial_Forcing_DWD_ICON               | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Spatial_Forcing_DWD_COSMO_LEPS         | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Rhine_WFLOW_HBV_Spatial_Forcing_Update | GENRE_CalculateRain             | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Rhine_WFLOW_HBV_Spatial_Forcing_Update | CalculateHourlyTemp             | 4s                        | 0s                        | 22/04/2021 13:13:57 | 22/04/2021 13:13:57      |
| Rhine_WFLOW_HBV_Forecast               | Rhine_WFLOW_HBV_Forecast        | 54s                       | 0s                        | 10/05/2021 16:30:54 | 10/05/2021 16:30:54      |
| Rhine_WFLOW_HBV_Forecast               | HYRAS_Temperature_ModelGrid     | 23s                       | 0s                        | 10/05/2021 16:30:23 | 10/05/2021 16:30:23      |
| Rhine_WFLOW_HBV_Forecast               | HYRAS_Temperature_DEM           | 22s                       | 0s                        | 10/05/2021 16:30:22 | 10/05/2021 16:30:22      |
| Rhine_WFLOW_HBV_Forecast               | Export_Rhine_WFLOW_HBV_Forecast | 3m 52s                    | 0s                        | 10/05/2021 16:33:52 | 10/05/2021 16:33:52      |
| Rhine_WFLOW_HBV_Forecast               | CalculateDailyTemp              | 1s                        | 0s                        | 10/05/2021 16:30:01 | 10/05/2021 16:30:01      |
| Rhine_Spatial_Forcing_Update           | GENRE_CalculateRain             | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Rhine_Spatial_Forcing_Update           | CalculateHourlyTemp             | 9s                        | 0s                        | 22/04/2021 13:14:02 | 22/04/2021 13:14:02      |
| Rhine_NO_RAIN                          | Dummy                           | 0s                        | 0s                        | 10/05/2021 16:15:00 | 10/05/2021 16:15:00      |
| Rhine_ECMWF_HRES                       | Rhine_MeteoPreprocessing        | 1s                        | 0s                        | 11/05/2021 01:00:01 | 11/05/2021 01:00:01      |
| Rhine_ECMWF_HRES                       | Dummy                           | 2s                        | 0s                        | 11/05/2021 01:00:02 | 11/05/2021 01:00:02      |
| Rhine_ECMWF_ENS_EXT                    | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Rhine_ECMWF_ENS                        | Dummy                           | 0s                        | 0s                        | 11/05/2021 00:00:00 | 11/05/2021 00:00:00      |

# Module Run Times

- Estimate run times based on history of results
- For longer workflows to know:
  - Progress status
  - How long to complete
- Information is stored in database
- Info in Admin Interface + REST API
  - Now also in client!
  - Approval while running workflow is possible

Admin Interface - Module Run Times

Show 1000 entries

| Workflow Id                            | Module Instance Id              | Expected Pending Duration | Expected Running Duration | Expected Start Time | Expected Completion Time |
|--|---------------------------------|---------------------------|---------------------------|---------------------|--------------------------|
| Spatial_Forcing_ECMWF_ENS_EXT          | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Spatial_Forcing_ECMWF_ENS              | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Spatial_Forcing_DWD_ICON_EU            | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Spatial_Forcing_DWD_ICON               | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:54 | 22/04/2021 13:13:54      |
| Spatial_Forcing_DWD_COSMO_LEPS         | Dummy                           | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Rhine_WFLOW_HBV_Spatial_Forcing_Update | GENRE_CalculateRain             | 0s                        | 0s                        | 22/04/2021 13:13:53 | 22/04/2021 13:13:53      |
| Rhine_WFLOW_HBV_Spatial_Forcing_Update | CalculateHourlyTemp             | 4s                        | 0s                        | 22/04/2021 13:13:57 | 22/04/2021 13:13:57      |
| Rhine_WFLOW_HBV_Forecast               | Rhine_WFLOW_HBV_Forecast        | 54s                       | 0s                        | 10/05/2021 16:30:54 | 10/05/2021 16:30:54      |
| Rhine_WFLOW_HBV_Forecast               | HYRAS_Temperature_ModelGrid     | 23s                       | 0s                        | 10/05/2021 16:30:23 | 10/05/2021 16:30:23      |
| Rhine_WFLOW_HBV_Forecast               | HYRAS_Temperature_DEM           | 22s                       | 0s                        | 10/05/2021 16:30:22 | 10/05/2021 16:30:22      |
| Rhine_WFLOW_HBV_Forecast               | Export_Rhine_WFLOW_HBV_Forecast | 3m 52s                    | 0s                        | 10/05/2021 16:33:52 | 10/05/2021 16:33:52      |
| Rhine_WFLOW_HBV_Forecast               | CalculateDailyTemp              | 1s                        | 0s                        | 10/05/2021 16:30:01 | 10/05/2021 16:30:01      |

|                          |                                 |
|--------------------------|---------------------------------|
| Rhine_WFLOW_HBV_Forecast | Rhine_WFLOW_HBV_Forecast        |
| Rhine_WFLOW_HBV_Forecast | HYRAS_Temperature_ModelGrid     |
| Rhine_WFLOW_HBV_Forecast | HYRAS_Temperature_DEM           |
| Rhine_WFLOW_HBV_Forecast | Export_Rhine_WFLOW_HBV_Forecast |
| Rhine_WFLOW_HBV_Forecast | CalculateDailyTemp              |

Log Browser | Bulletin Board | Live System Status | Scheduled Forecasts | **Running Forecasts** | Import Status | Archive Server Status

| TaskRun ID          | Task ID             | Description             | Workflow ID      | Dispatch Time       | FSS ID    | Status                | FDO | Activity progress | Workflow Node In... |
|---------------------|---------------------|-------------------------|------------------|---------------------|-----------|-----------------------|-----|-------------------|---------------------|
| roadmapmc00:0000... | roadmapmc00:0000... | Import_Grid             | Import_Grid      | 12-11-2021 14:00:00 |           | PENDING               |     | 0                 | 0                   |
| roadmapmc00:0000... | roadmapmc00:0000... | Scheduled Forecast ...  | Meuse_ECMWF_HRES | 12-11-2021 14:00:00 |           | PENDING               |     | 0                 | 0                   |
| roadmapmc00:0000... | roadmapmc00:0000... | Scheduled Forecast ...  | Rhine_ECMWF_ENS  | 12-11-2021 13:00:00 | 1240 1240 | 2 PENDING, 1 RUNNI... |     | 0                 | 0                   |
| roadmapmc00:0000... | roadmapmc00:0000... | Scheduled Forecast ...  | Rhine_ECMWF_HRES | 12-11-2021 14:00:00 | 1340      | RUNNING               |     | 0                 | 22                  |
| roadmapmc00:0000... | roadmapmc00:0000... | test import grids on... | Import_Grid      | 12-11-2021 14:00:17 |           | PENDING               |     | 0                 | 0                   |

| Module Instance Id                  | Expected start time | Expected End Time   | Progress |
|-------------------------------------|---------------------|---------------------|----------|
| Export_Matros_Netcdf_ECMWF_Rijn     | 12-11-2021 14:03:05 | 12-11-2021 14:03:05 | Pending  |
| HBV_Rhine_PBC_ECMWF_HRES            | 12-11-2021 14:00:06 | 12-11-2021 14:00:06 | 100%     |
| Rijn_SpatialInterpolationECMWF_HRES | 12-11-2021 14:00:03 | 12-11-2021 14:00:05 | 100%     |

# Config Manager

The screenshot shows the Config Manager application window. The title bar reads "Configuration Management - Ontwikkel\_LocalIMC201702\_ConfigManager2 unknown". The interface has a menu bar with "File", "Management", and "Help". Below the menu bar, there are two tabs: "&Management" and "Version Management", with "Version Management" being the active tab.

The "Revisions" section contains a table with the following data:

| Revision  | Date                          | User         | Comment                            | Changes |
|-----------|-------------------------------|--------------|------------------------------------|---------|
| unknown;9 | Tue Aug 31 16:46:41 CEST 2021 | Erik Pelgrim | Test upload whole new revision ... | 6615    |
| unknown;8 | Tue Aug 31 16:14:03 CEST 2021 | Erik Pelgrim | Test recoverable exception         | 4       |
| unknown;7 | Tue Aug 03 16:18:50 CEST 2021 | Erik Pelgrim | None                               | 1       |
| unknown;6 | Fri May 07 11:30:06 CEST 2021 | Erik Pelgrim | AnnotationMetadataSchema           | 1       |
| unknown;5 | Fri May 07 11:28:48 CEST 2021 | Erik Pelgrim | AnnotationDisplay                  | 1       |
| unknown;4 | Thu Mar 18 16:56:51 CET 2021  | Erik Pelgrim | None                               | 1       |

Below the table is a toolbar with buttons: "&Full Reset", "Clean up", "Delete", "Export", "Export xml", and "Restore". The "Clean up" and "Delete" buttons are highlighted with a red box.

The "Active configuration for revision unknown;8" section shows a dropdown menu set to "Revision: unknown;7, created at Tue Aug 03 16:18:50 CEST 2021 by Erik Pelgrim" and a checked checkbox for "filter new or modified items".

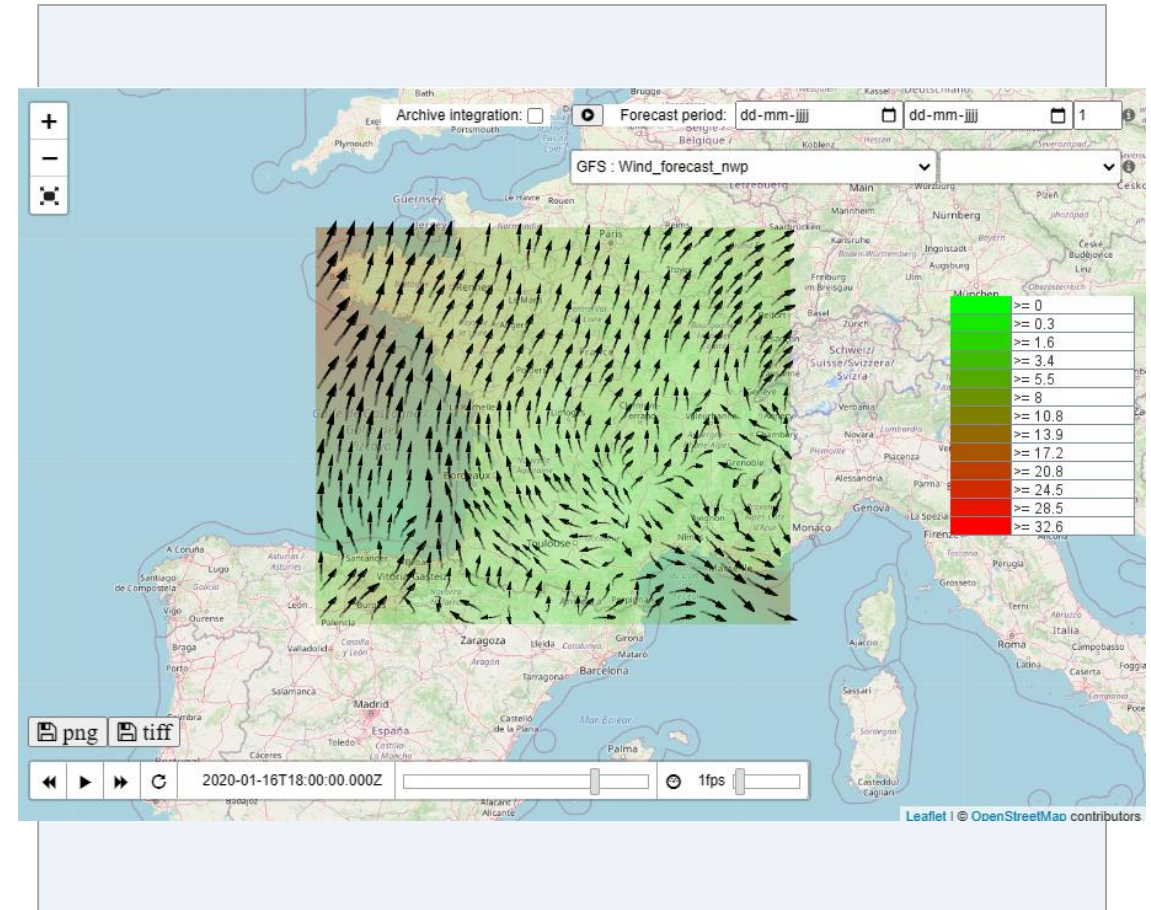
Below this is a comparison table:

| Modification | Table name | Config type | Version   |
|--------------|------------|-------------|-----------|
| modified     | IdMaps     | GRIB_ecmwf  | unknown;4 |
| new          | IdMaps     | IdExportBOS | unknown;8 |

The status bar at the bottom shows "Erik Pelgrim", "2021-10-04 10:23:48 CEST", "unknown", "35 MB", and a warning icon.

# Webservices

- Obtain wind layer data as [Geotiff](#)
  - U and V data provided as RG values
  - Offset and scale stored as geotiff tags
  - Calculate original u and v values from tiff
- PI REST API supports [additional formats](#)
  - Geojson format
  - Digitale Delta json format
  - NAME\_LIST format
  - NOOS\_TXT format
- Data from database and archive (locations / parameters (+ attributes))





# Webservices

The screenshot displays a web mapping application interface. On the left, a map of Europe is shown with numerous grey circular markers placed across various countries including the United Kingdom, Ireland, Germany, and the Netherlands. A central pop-up window is open, showing a configuration table for a marker:

|               |                                     |
|---------------|-------------------------------------|
| marker-color  | <input type="color" value="black"/> |
| marker-size   | medium                              |
| marker-symbol |                                     |
| locationId    | eemsboel51                          |
| locationName  | Eemsboel 51                         |

Below the table are options to '+ Add row' and a checked 'Show style properties' checkbox. At the bottom of the pop-up are 'Save', 'Cancel', and 'Delete feature' buttons.

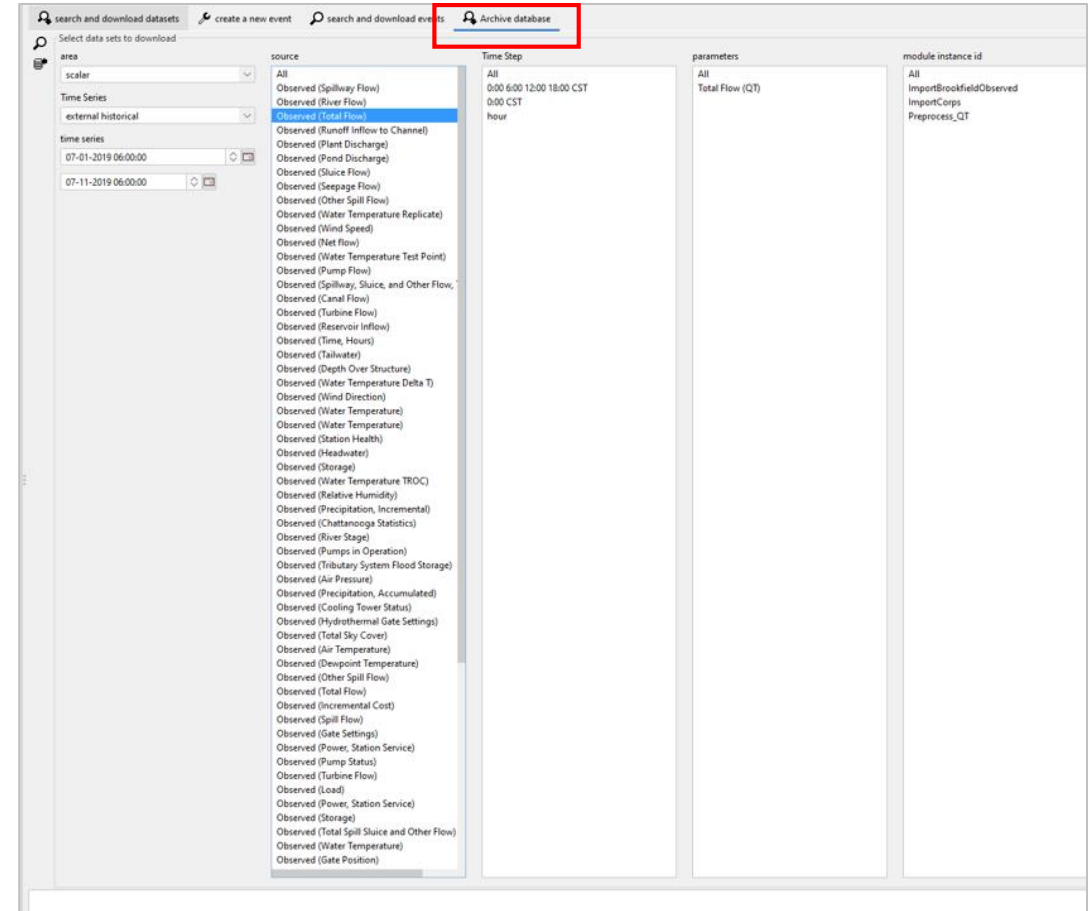
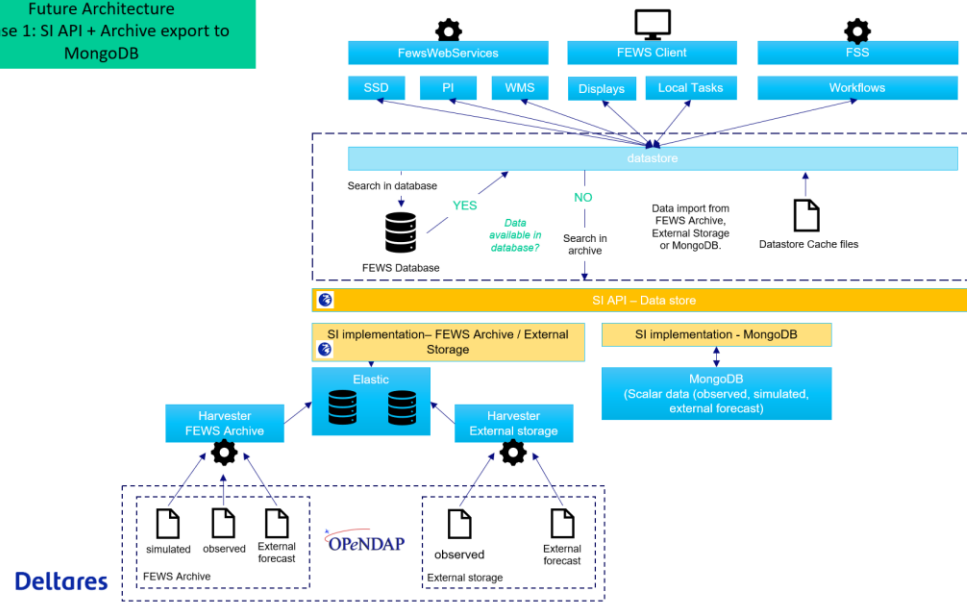
On the right side of the application, a panel displays JSON data for the selected feature. The visible portion of the JSON is as follows:

```
1821     "locationName" : "Whitby"
1822   }
1823 }, {
1824   "type" : "Feature",
1825   "geometry" : {
1826     "type" : "Point",
1827     "coordinates" : [ -3.0799999237060547, 58.43000030517578 ]
1828   },
1829   "properties" : {
1830     "locationId" : "wick",
1831     "locationName" : "Wick"
1832   }
1833 }, {
1834   "type" : "Feature",
1835   "geometry" : {
1836     "type" : "Point",
1837     "coordinates" : [ 5.960000038146973, 53.52000045776367 ]
1838   },
1839   "properties" : {
1840     "locationId" : "wierumergronden",
1841     "locationName" : "Wierumergronden"
1842   }
1843 }, {
1844   "type" : "Feature",
1845   "geometry" : {
1846     "type" : "Point",
1847     "coordinates" : [ 8.380000114440918, 54.630001068115234 ]
1848   },
1849   "properties" : {
1850     "locationId" : "wittduen",
1851     "locationName" : "Wittduen"
1852   }
1853 }, {
1854   "type" : "Feature",
1855   "geometry" : {
1856     "type" : "Point",
1857     "coordinates" : [ -3.569999933242798, 54.650001525878906 ]
1858   },
1859   "properties" : {
1860     "locationId" : "workington",
1861     "locationName" : "Workington"
1862   }
1863 }, {
1864   "type" : "Feature",
1865   "geometry" : {
1866     "type" : "Point",
1867     "coordinates" : [ 3.300000045603716, 51.31000047141001 ]
```

# Integration Open Archive with MongoDB

- MongoDB for scalar time series
- Combine with standard Open Archive
- Database API → plugin structure (other databases possible)

Future Architecture  
Phase 1: SI API + Archive export to MongoDB



# Poll

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

Min. 10 participants!!



A screenshot of a chat window titled 'Chat' with a notification bubble showing '1'. The chat contains a poll with five topics, each with a timestamp of 11:28 and a thumbs-up icon followed by the number '1'. The topics are: 'Admin Interface (API)', 'Configuration Manager', 'Delft-FEWS WMS webservice', 'Delft-FEWS PI REST webservice', and 'Delft-FEWS Open Archive extension - MongoDB'. Below these is a text input field containing 'other: &lt;TYPE A TOPIC&gt;' and a final message that says 'my topic suggestion: Dashboarding' with a send button.

# 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

# Questions



# Contact

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