Deltares

Delft-FEWS AnwenderTreffen

**New Features
Highlights 2022.02 and 2023.01**

Delft-FEWS Product Management

June 2023

enabling delta life

Introduction…

- Welcome

- Highlights in 2022.02

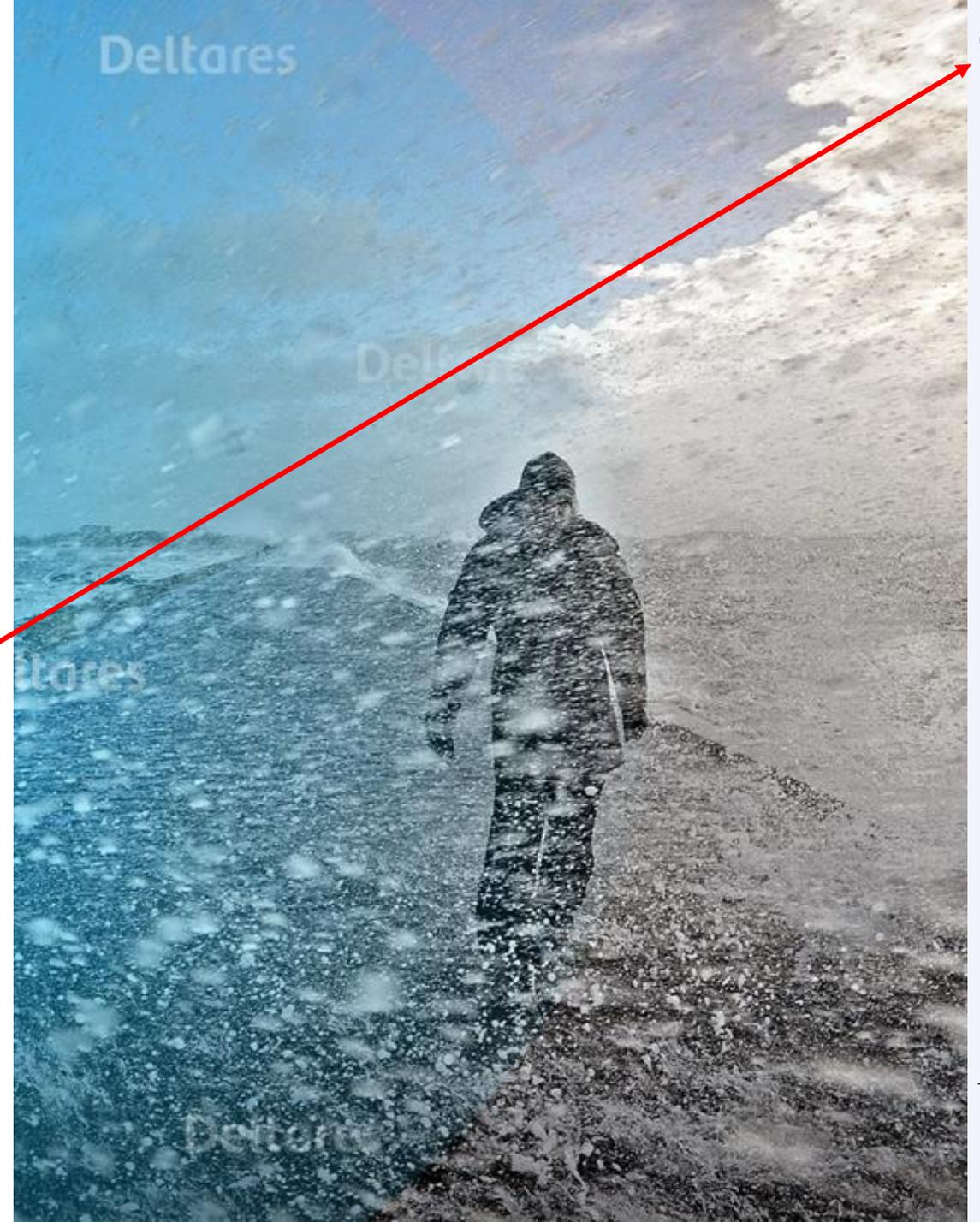- What's new in 2023.01?

- Outlook to 2023.02

As usual: [Links for more info]

Links to WIKI
or other URL´s

Link to WIKI
(module, display)

try it out…

Deltares

Delft-FEWS 2022.02 Benchmarks

Delft-FEWS
2022.02

- **±120** new features
- **211** bugs reported/**202** fixed (release date)
- **7** new import modules
- **10** new features in FEWS-webservices
- **5** improvements to the admin interface
- **10** new features in timeseries display

- **Web OC** components testable on OC/SA
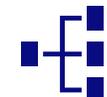- **Graphical** editing & **Scatterplot** improvements
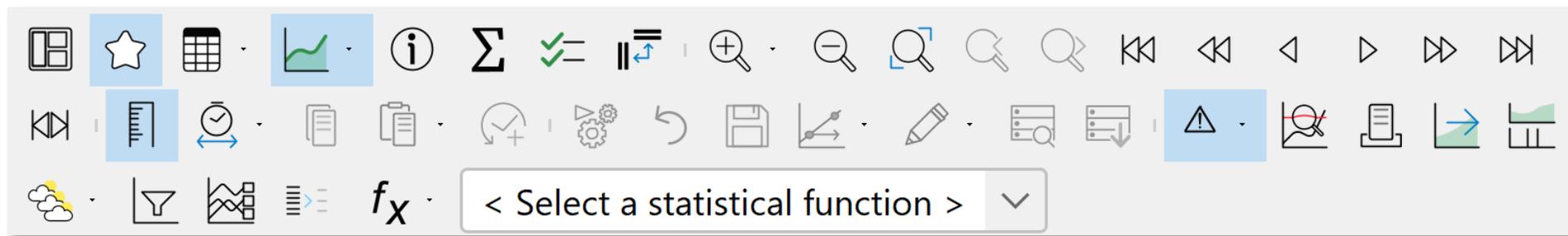- **4** new export modules
- **8** improvements to the open archive
- **600+** new (scalable) icons in the GUI
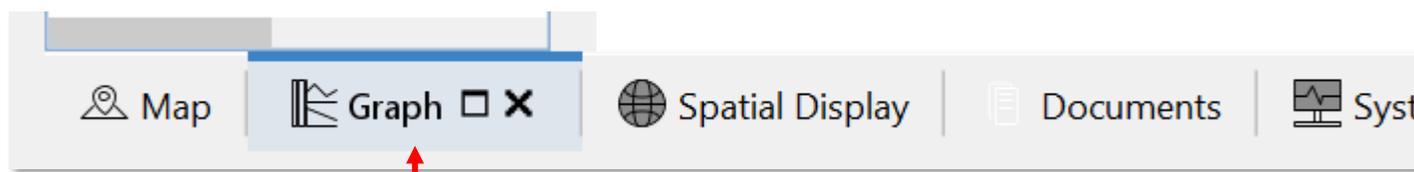- **numerous** improvements to What-if functionality
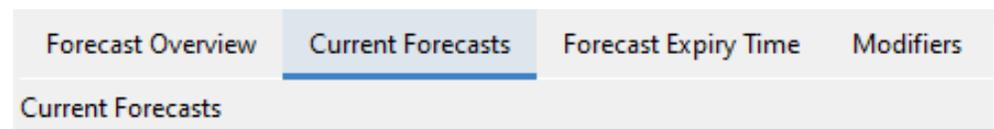
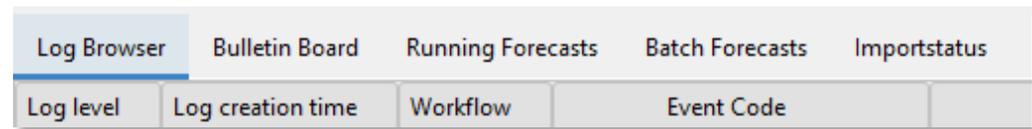**Deltares**

GUI improvements

- New icons
  - **500-600** icons replaced
  - All **SVG**-based → scalable without losing quality (4K monitors)

- GUI **scalable** to 300% (was: 200%)

- **Selected tab** indication (main displays) now consistent with selected tab within multi-tab displays
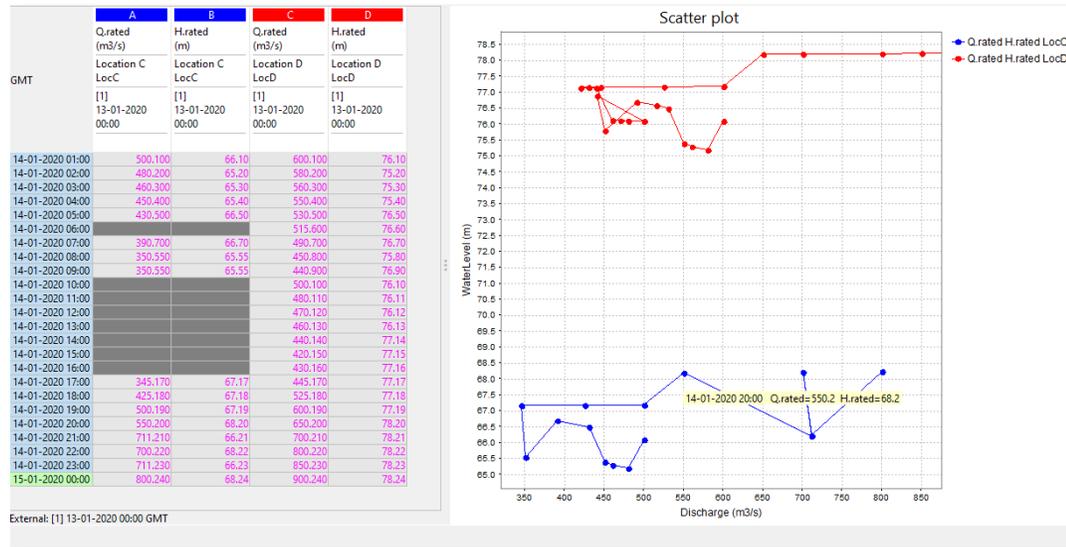

**Deltares**

Display improvements

? Scatterplot

- Autoscale to available data
- Table shows full information (values and header)
- Tooltip

? Graphical Editing

- New function in data editor to enable user to fit values from one time series into another
- Selecting "fit to start" and/or "fit to end" data from the source series will be linearly transformed to be equal to the start and/or end of the selected part of the target time series
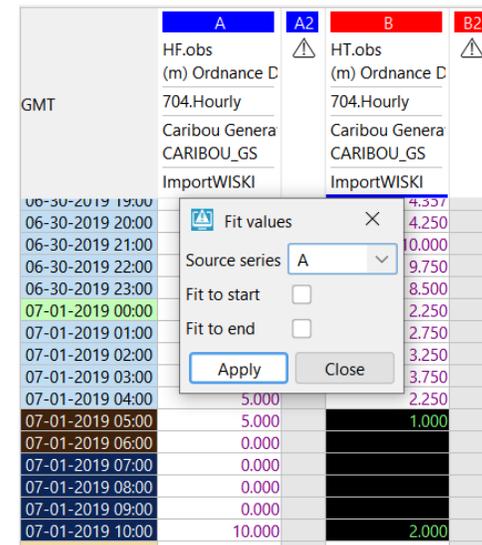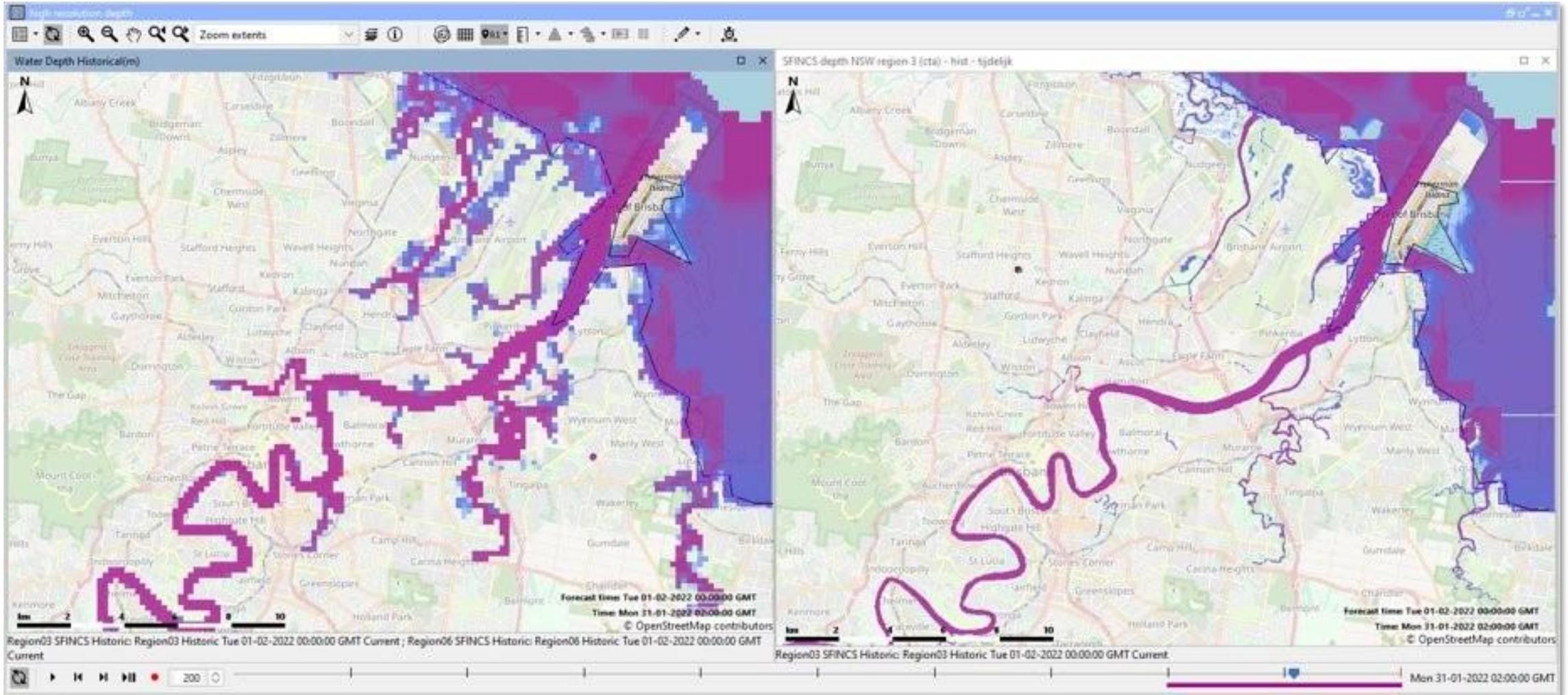
Grid transformations
(for e.g. supporting flood inundation calculations)

- **GridToPolygons** transformation supports now **DEM*/CTA* layers**

- The grid is first converted to a **high resolution grid** based on the resolution of the DEM/CTA layer.

- Then it is converted to a time series of polygons

- Warning: **high memory setting** of several GBs is required to perform the transformation in most cases.

* DEM: Digital Elevation Model
 CTA: Coverage Tile Archive

```xml
<transformation id="gridToPolygon">
    <interpolationSpatial>
        <gridToPolygons>
            <inputVariable>
                <timeSeriesSet>
                    <moduleInstanceId>SpatialInterpolationGridToPolygonsCtaTest</moduleInstanceId>
                    <valueType>grid</valueType>
                    <parameterId>T.historical</parameterId>
                    <locationId>ECMWF</locationId>
                    <timeSeriesType>external historical</timeSeriesType>
                    <timeStep unit="day"/>
                    <relativeViewPeriod unit="day" start="0" end="0"/>
                    <readWriteMode>add originals</readWriteMode>
                </timeSeriesSet>
            </inputVariable>
            <polygonValue>7</polygonValue>
            <polygonValue>8</polygonValue>
            <polygonValue>9</polygonValue>
            <areaOfInterestLocationId>triangle</areaOfInterestLocationId>
            <localDatumCoverageTileArchiveFile>dem.cta</localDatumCoverageTileArchiveFile>
            <zoomLevel>5</zoomLevel>
            <outputVariable>
                <timeSeriesSet>
                    <moduleInstanceId>SpatialInterpolationGridToPolygonsCtaTest</moduleInstanceId>
                    <valueType>polygon</valueType>
                    <parameterId>T.historical</parameterId>
                    <locationId>polygonLocation2</locationId>
                    <timeSeriesType>external historical</timeSeriesType>
                    <timeStep unit="day"/>
                    <relativeViewPeriod unit="day" start="0" end="10"/>
                    <readWriteMode>add originals</readWriteMode>
                </timeSeriesSet>
            </outputVariable>
        </gridToPolygons>
    </interpolationSpatial>
</transformation>
</transformationModule>
```

Deltares

Grid transformations
(for e.g. supporting flood inundation calculations)

Open Archive

Open Archive

Launch & test the FEWS web services easily

- **Embedded web services** can run on SA (OC)
    - Logging provide useful URL's

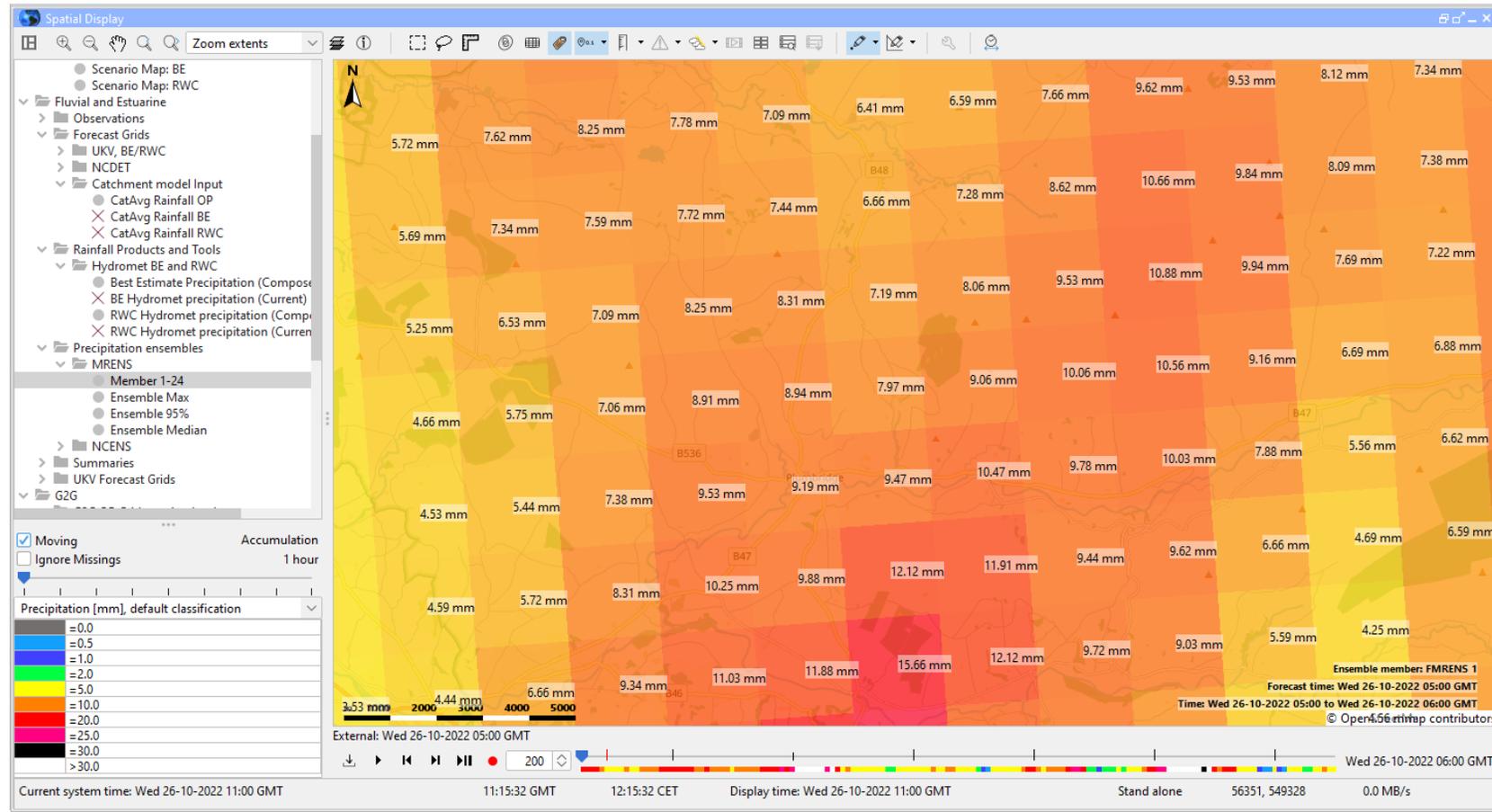- **Testing** / developing using **FEWS webservices**
    - *http://localhost:8080/FewsWebServices*

- **Testing** the **Web Operator Client**
    - *http://localhost:8080*
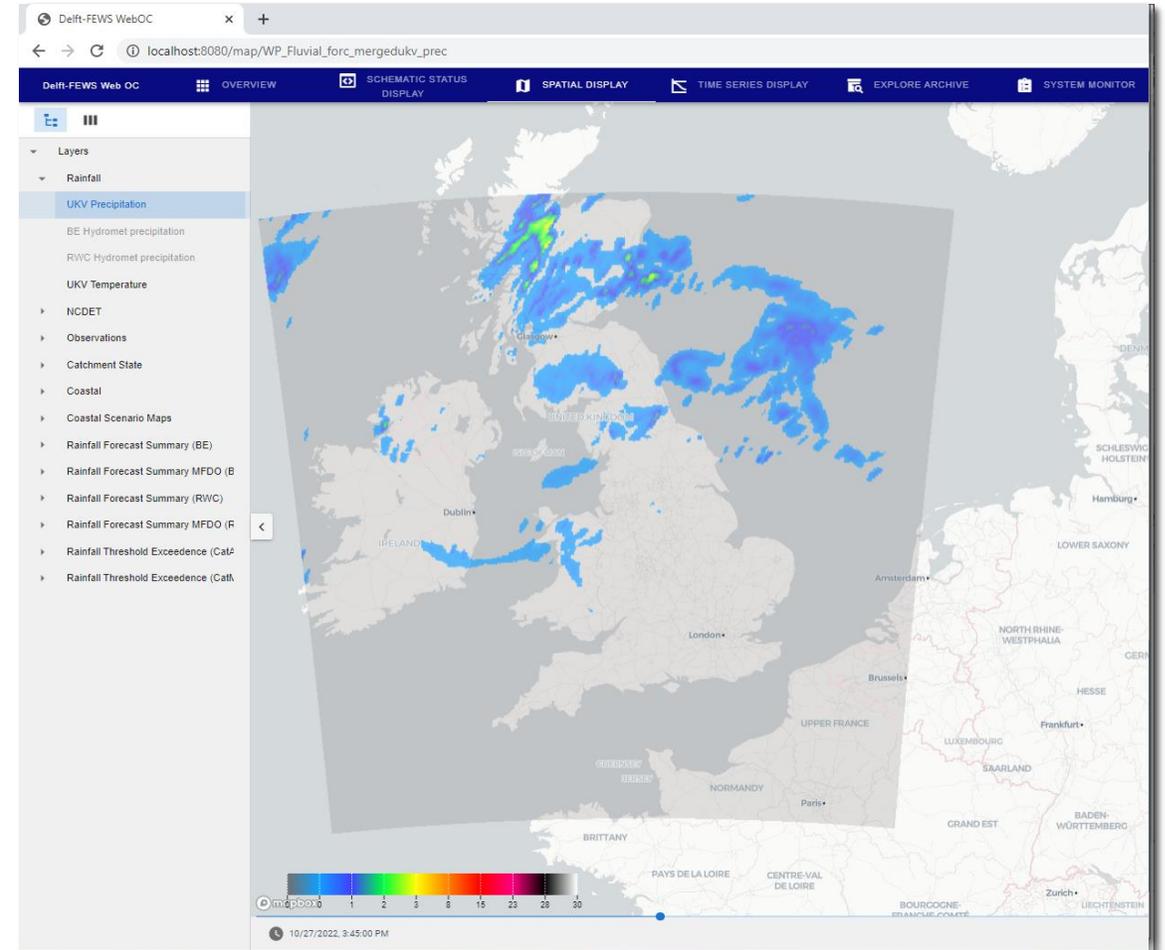

Deltares

Grid Display

- Add **labels** to grid-values (+display while zooming)

Water Coach
'Training mode' of Delft-FEWS

- Water Coach on-the-fly:
  - Easy way to generate a watercoach scenario database

- Option: Import "grids as reference" (to minimize datastore size)
  - Grids are stored separately (central location)
  - Only when needed, the grids are imported, opened.

- Downloading the latest configuration in chosen period

- Show total download size before downloading

Deltares
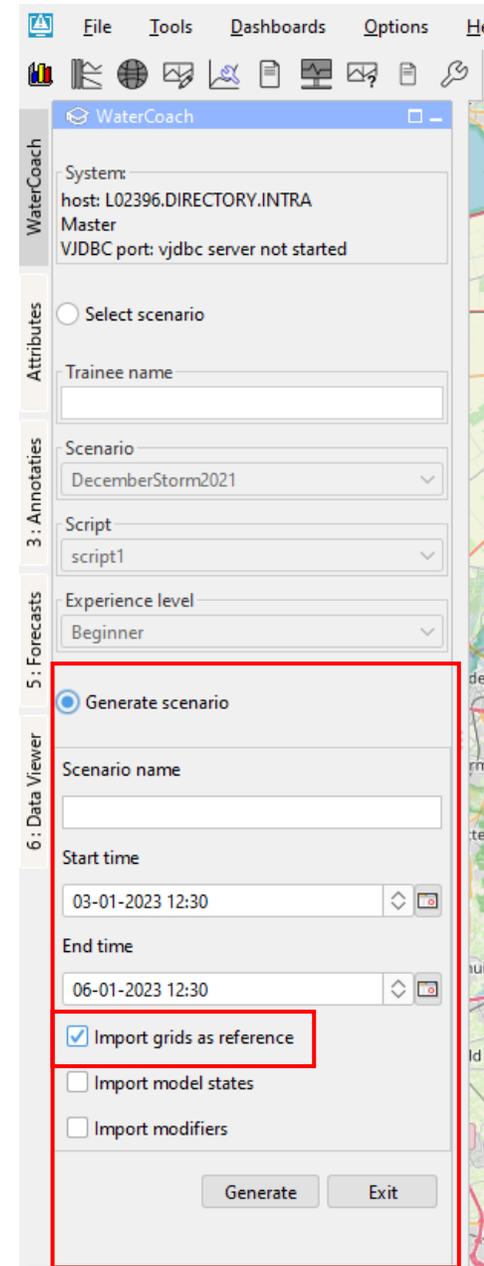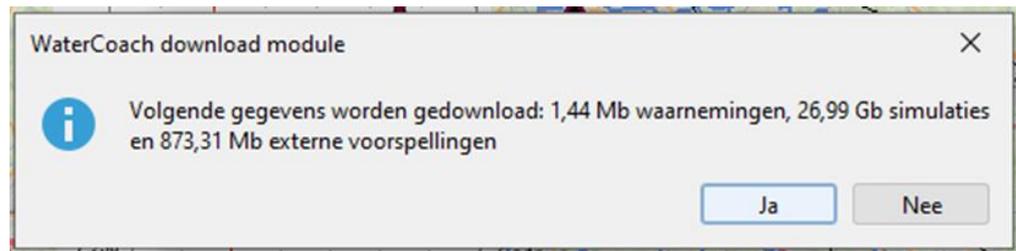
Delft-FEWS 2023.01 Benchmarks

Delft-FEWS

2023.01

- **±115** new features
- **± 150** bugs reported **(100+** fixed**)**
- 11 new import modules
- **13** new features in FEWS-webservices
- **WFS** as a new service
- **Tomcat 10** migration

- **Web OC** configuration
- Migrated to **Java 17**
- **Many new** and **updated** 3rd party libraries
- **10+** improvements to the open archive
- Integration with Azure DevOps
- **continuous** improvements to what-if functionality
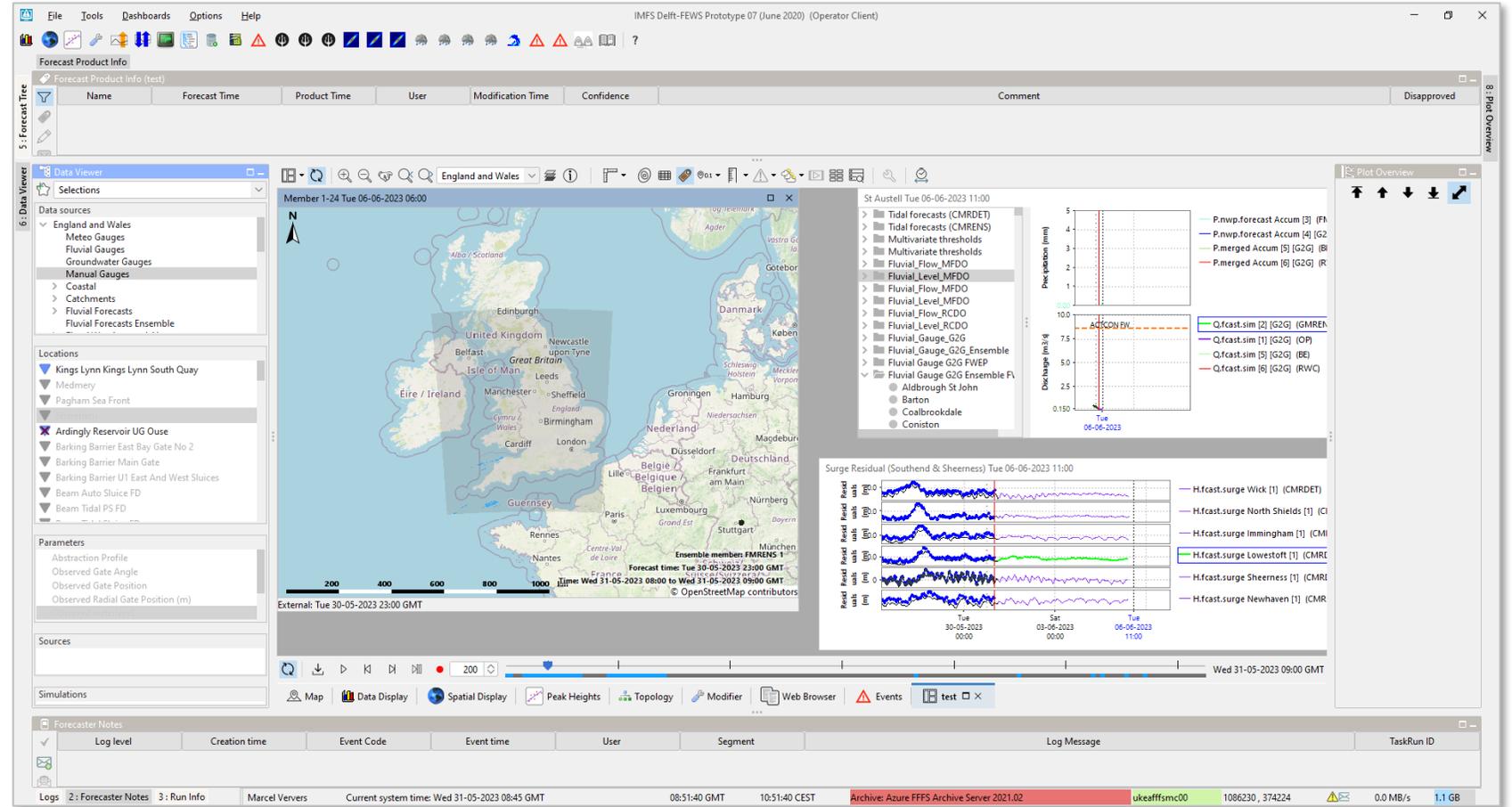
Deltares

Explorer

- Open "At Startup" menu item

- Only available when not already opened at start-up

- Last selected tab also saved in user settings
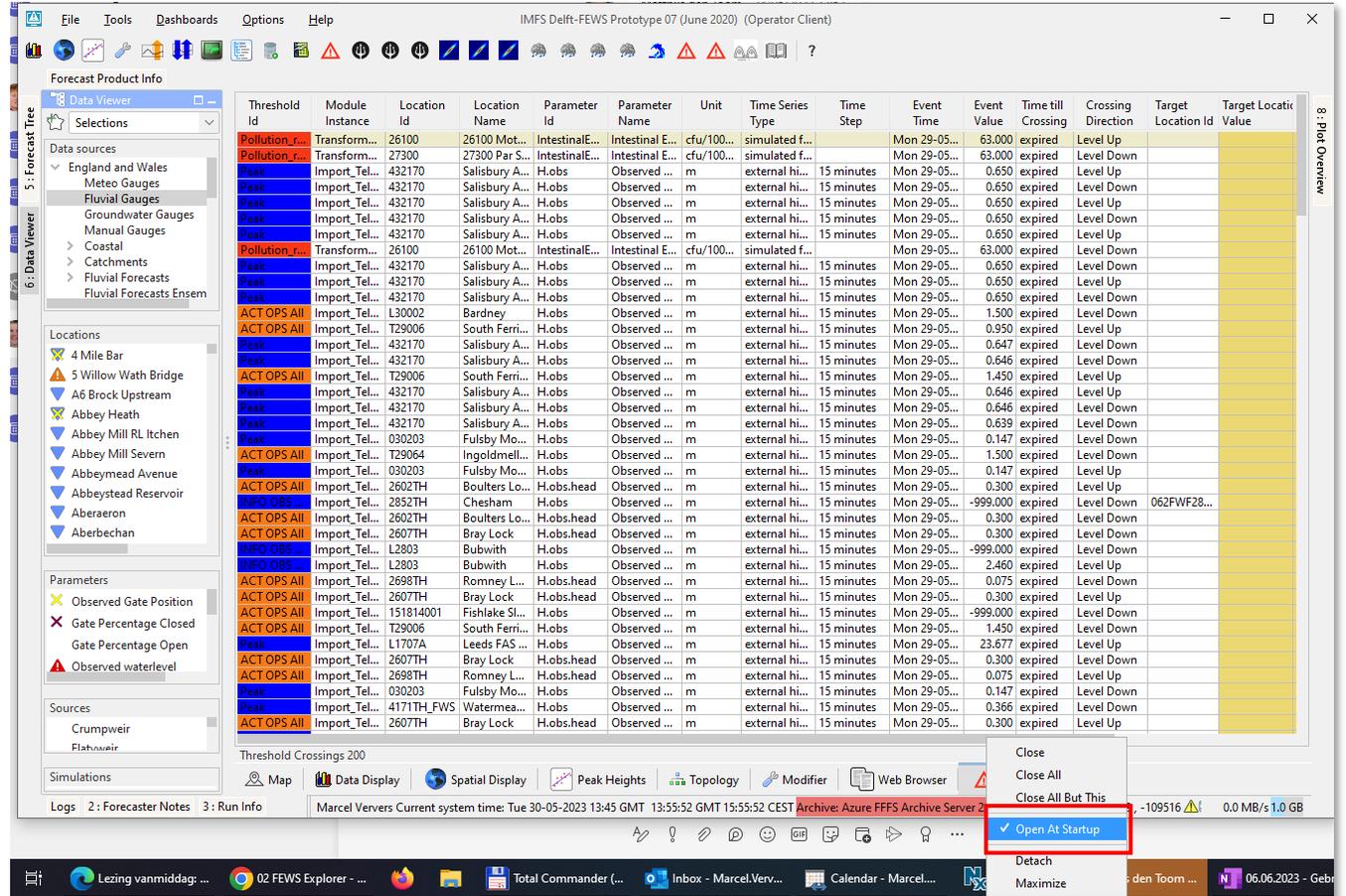
Dashboard Display

- 'powerpoint' approach for aligning

- 'Shift + space' will toggle between free dragging / resizing and fixed steps

Workflow navigator

Open Archive

- Area selection automatically
- History of data edits in archive
- Import grids as references

Open Archive – Seamless Integration

Transformations

- New transformation to write values to output series when threshold values are crossed on input series

- Use case: threshold crossing one location should lead to warnings for another location

- Multi-valued attributes consisting of different output locationId's and different threshold levels

```xml
<transformation id="MultipleOutputLocationThresholdsDown">
    <multipleLocationAttributes>
        <multipleOutputLocationThresholds>
            <inputVariable>
                <variableId>input</variableId>
            </inputVariable>
            <thresholdValueAttributeId>thresholdValue</thresholdValueAttributeId>
            <crossingDirection>down</crossingDirection>
            <filterAttribute id="filter" value="include"/>
            <outputValue>1</outputValue>
            <outputLocationAttributeId>outputId</outputLocationAttributeId>
            <outputVariable>
                <variableId>output</variableId>
            </outputVariable>
        </multipleOutputLocationThresholds>
    </multipleLocationAttributes>
</transformation>
```

Deltares

IFD - Topology

- From the **Topology** you can open a **Spatial Display** and select a specific groupId and plotId from the tree.

- **<gridDisplaySelection>** element

```
∨ Node in Topology.xml:

  <node id="node-id" name="Node Name">
    <workflowId>workflow</workflowId>
    <gridDisplaySelection>
      <groupId>group name</groupId>
      <plotId>plot name</plotId>
    </gridDisplaySelection>
  </node>
```
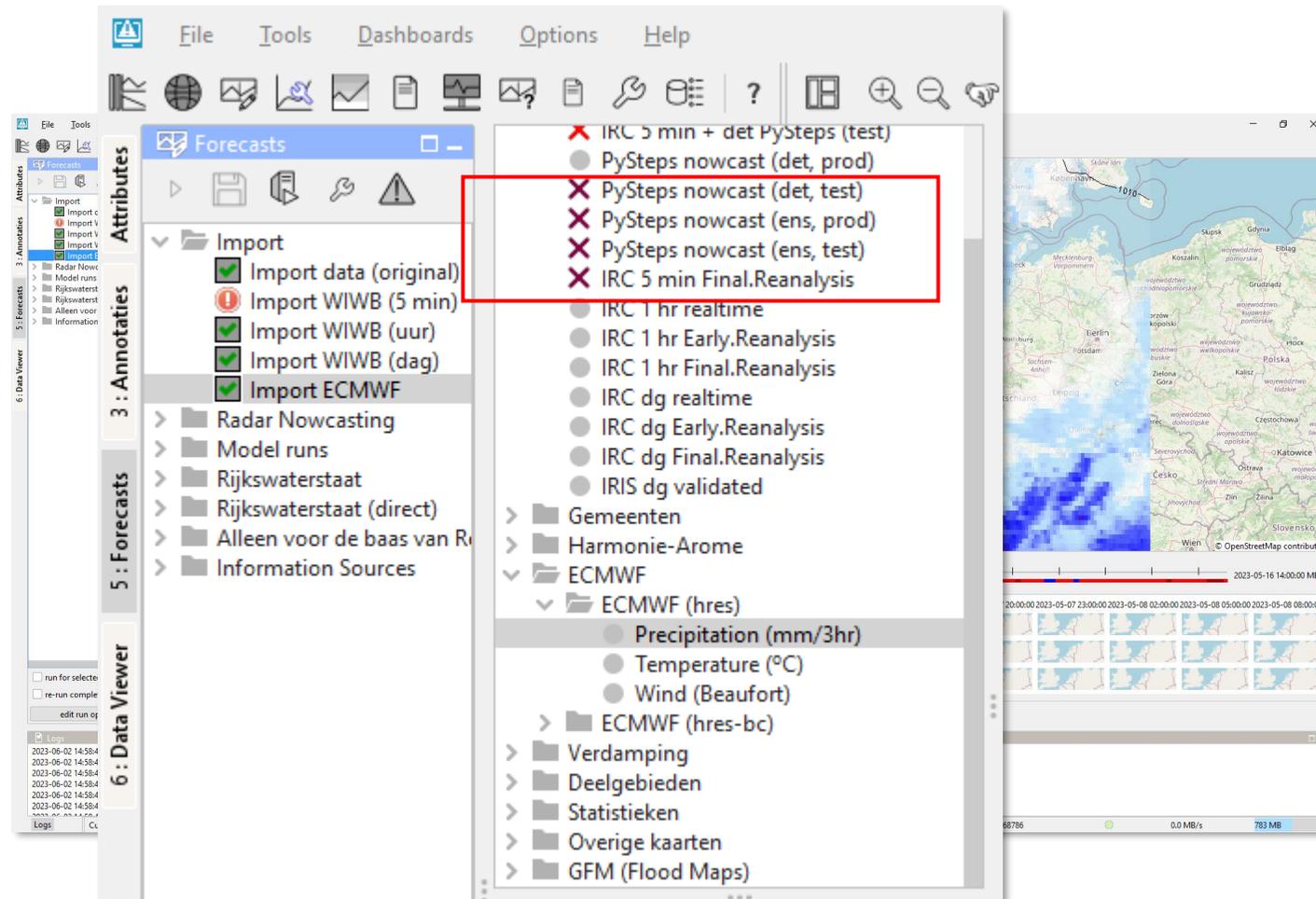

Deltares

IFD - Topology

- From the **Topology** you can open a **Spatial Display** and select a specific groupId and plotId from the tree.

- **<gridDisplaySelection>** element

- **Fixed** coldstate start time/date

WhatIf Editor (Scenarios)

- New WhatIf **ModifierType**
  - "apply according to creation method"
  - Modifier created in ModifierDisplay → apply in regular forecast workflow only
  - Modifier created in Whatif Editor → apply in what-if workflows only

- The **Import button** is now always enabled in the What-if editor

- Improvements:
  - Robustness (general)
  - Consistency (icons)
  - Logic (automatic re-run of sub workflows)
  - Visibility of modifiers (type of node)
  - Documentation
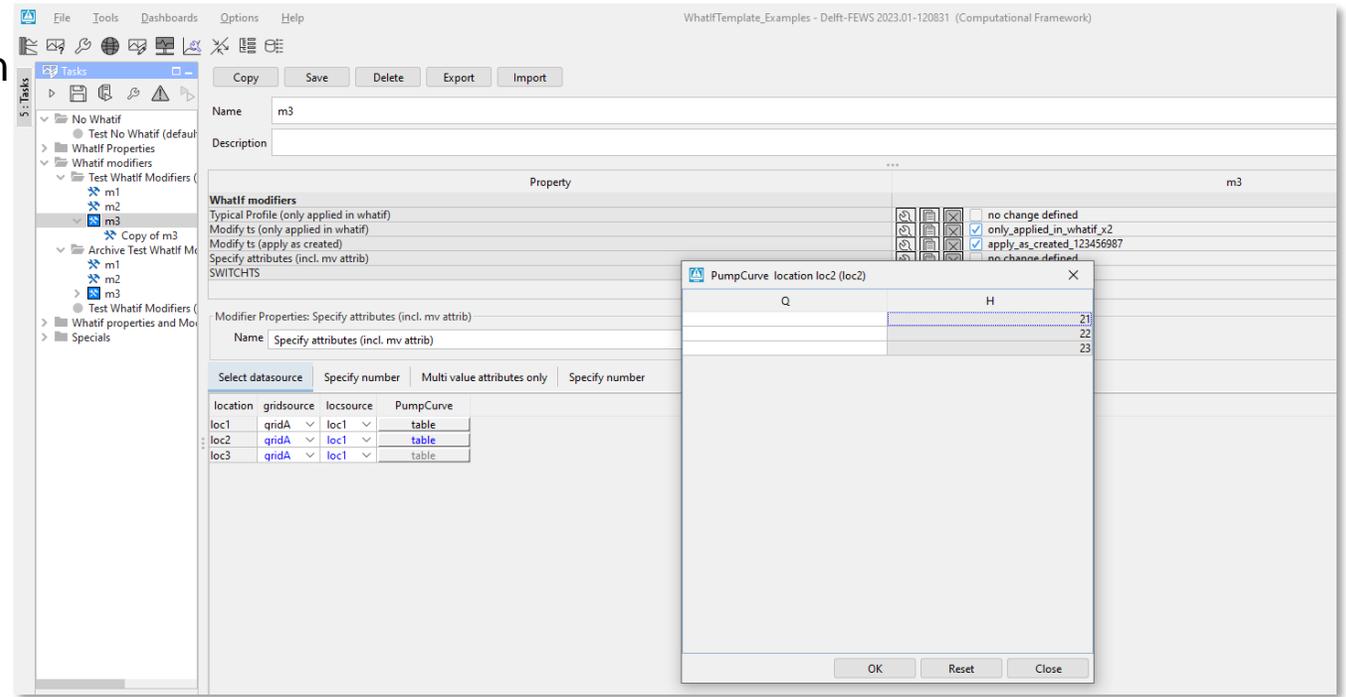
FEWS Web services

- Web Feature Service (WFS) 1.0

- Locations endpoint: get GeoJSON file for associated polygons

- Get **plot** directly in PNG (thumbnails)

- **Rating Curve** endpoints
  - Convert values (POST)
  - Add key-value pairs (for recognizability)
  - Retrieve headers only

- **EnsembleMemberIds** endpoint

- SOAP → REST migration (NWS)
  - GetLastModificationTime
  - Get timeseries in binary format
  - Get Cold/Warm States
  - Enabling UnitConversions
  - Get GUI selections

Deltares

Deltares
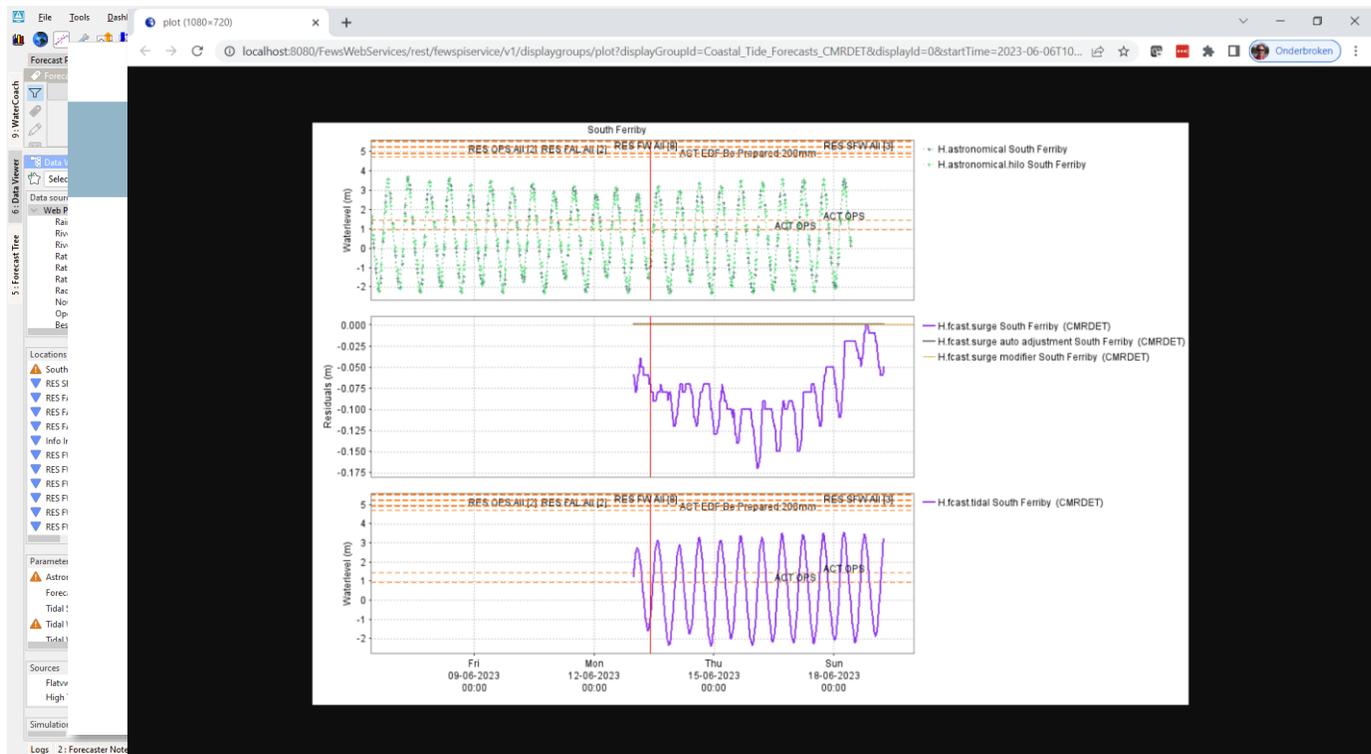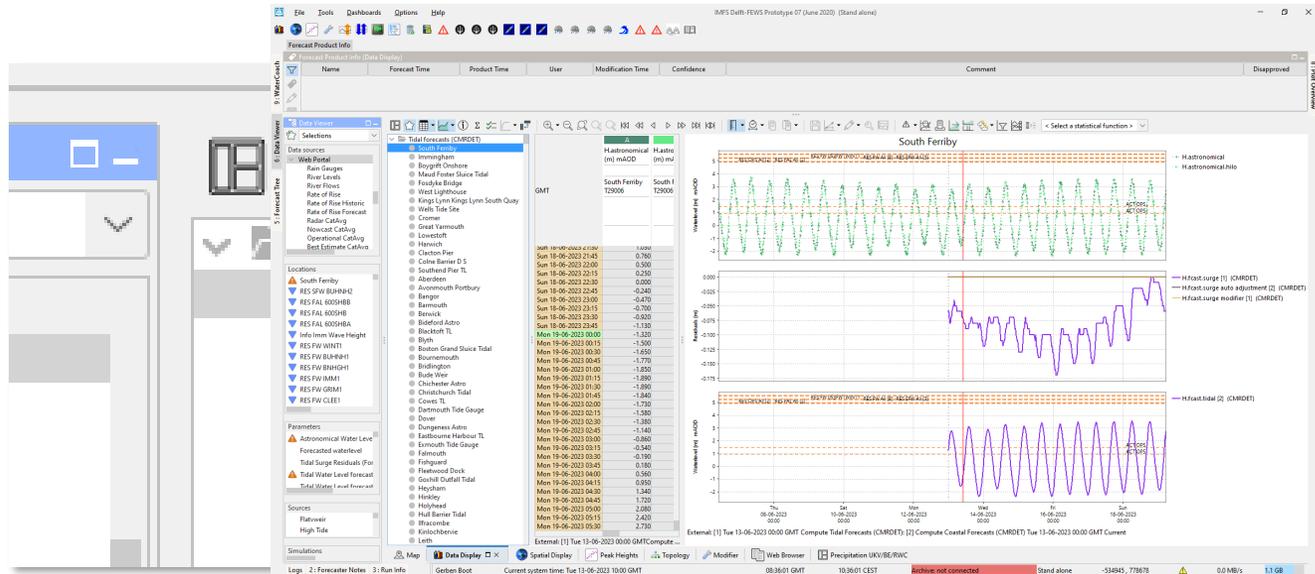
Web Feature Service (WFS) 1.0

- The FEWS Web Feature is the Delft-FEWS implementation of the **OpenGIS WFS 2.0 OGC** standard

- WFS complimentary to WMS service to provide **underlying vector data**

- It allows requesting **GML3** or **GeoJSON** data for plots that have been configured in the FEWS grid display.
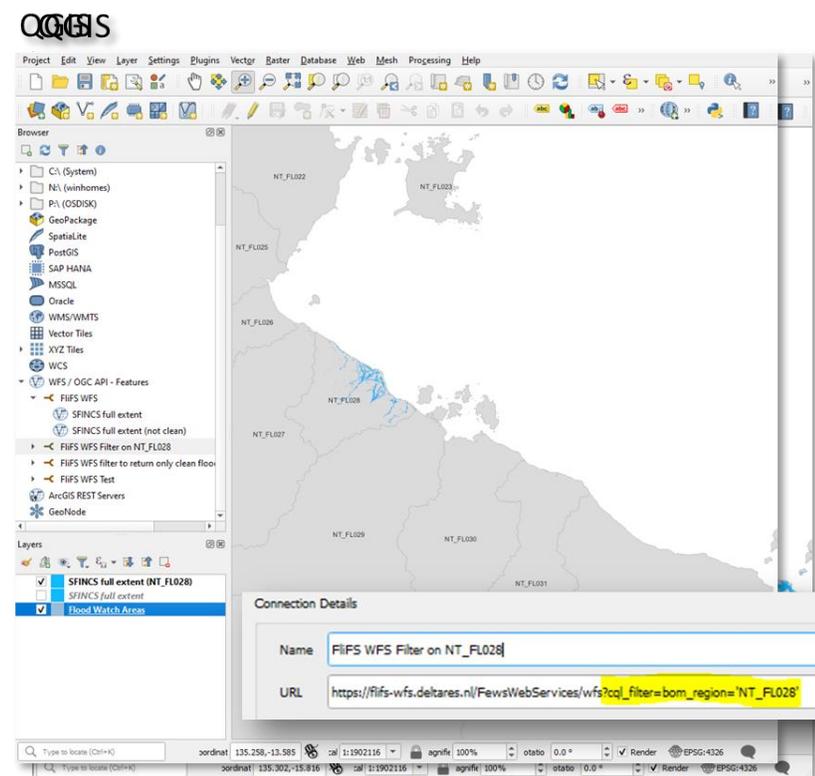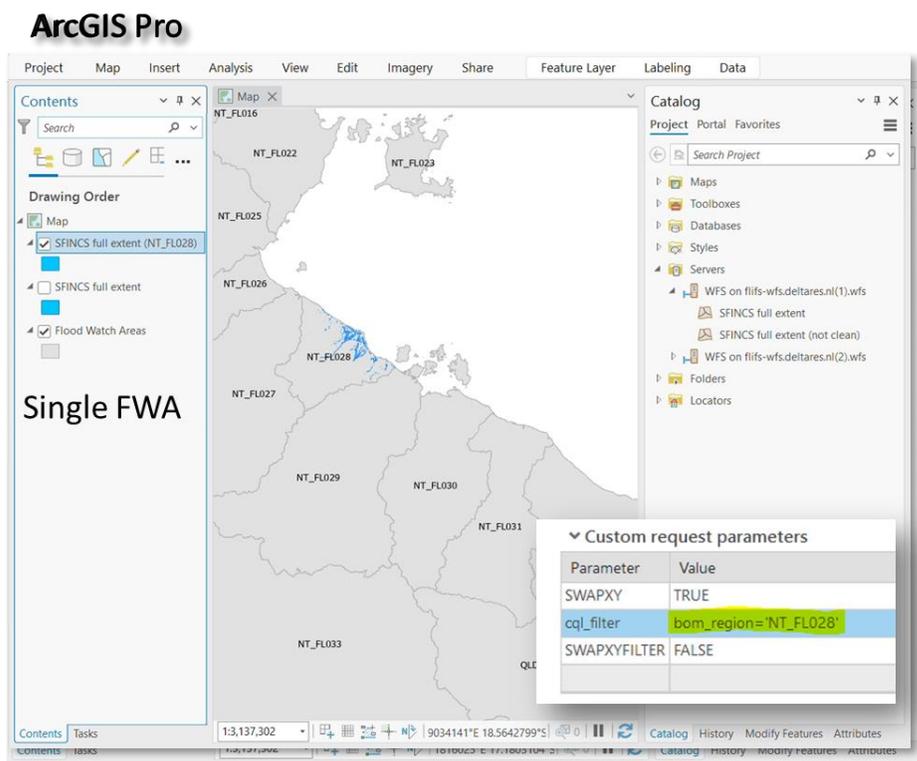
Web based Operator Client (why & what)

- **Easier deployment** (compared to Desktop OC)

- Increased **mobility** (fast access through browser, also from mobile devices)

- Improvements to **performance and security of Delft-FEWS web-services** in consequence of the development of a secure and performant Web OC

- The Web OC will serve **expert users, but a larger target audience than OCs in a organization**

- For the foreseeable future, the **Web OC and Desktop OC will be developed and used in parallel**. Data-viewing mainly, exploring data-editing possibilities

- The **Web OC can be hosted anywhere**, dependent on the client's preference (on-premise, the cloud, …)

- The Web OC will become an **integral part of the overall Delft-FEWS product**.

- An **open source, closed community** license model will apply (at least initially).

Deltares
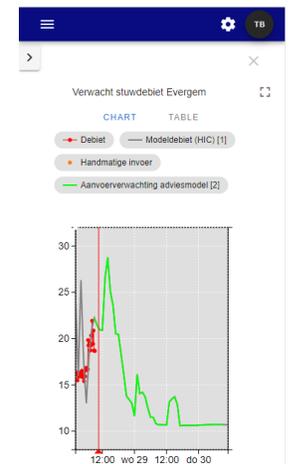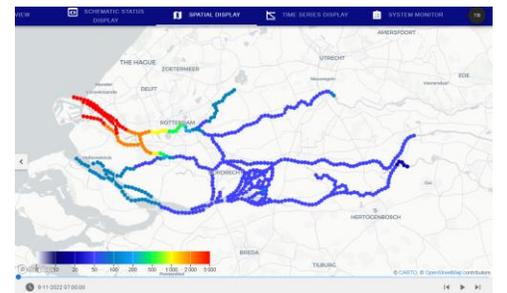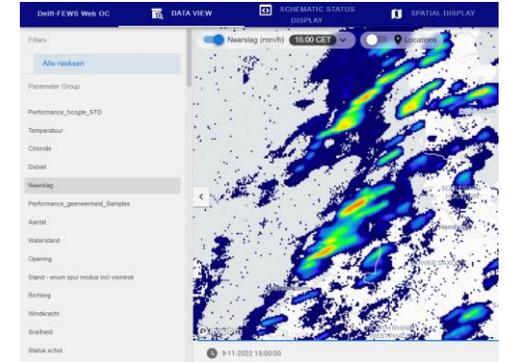
Web OC
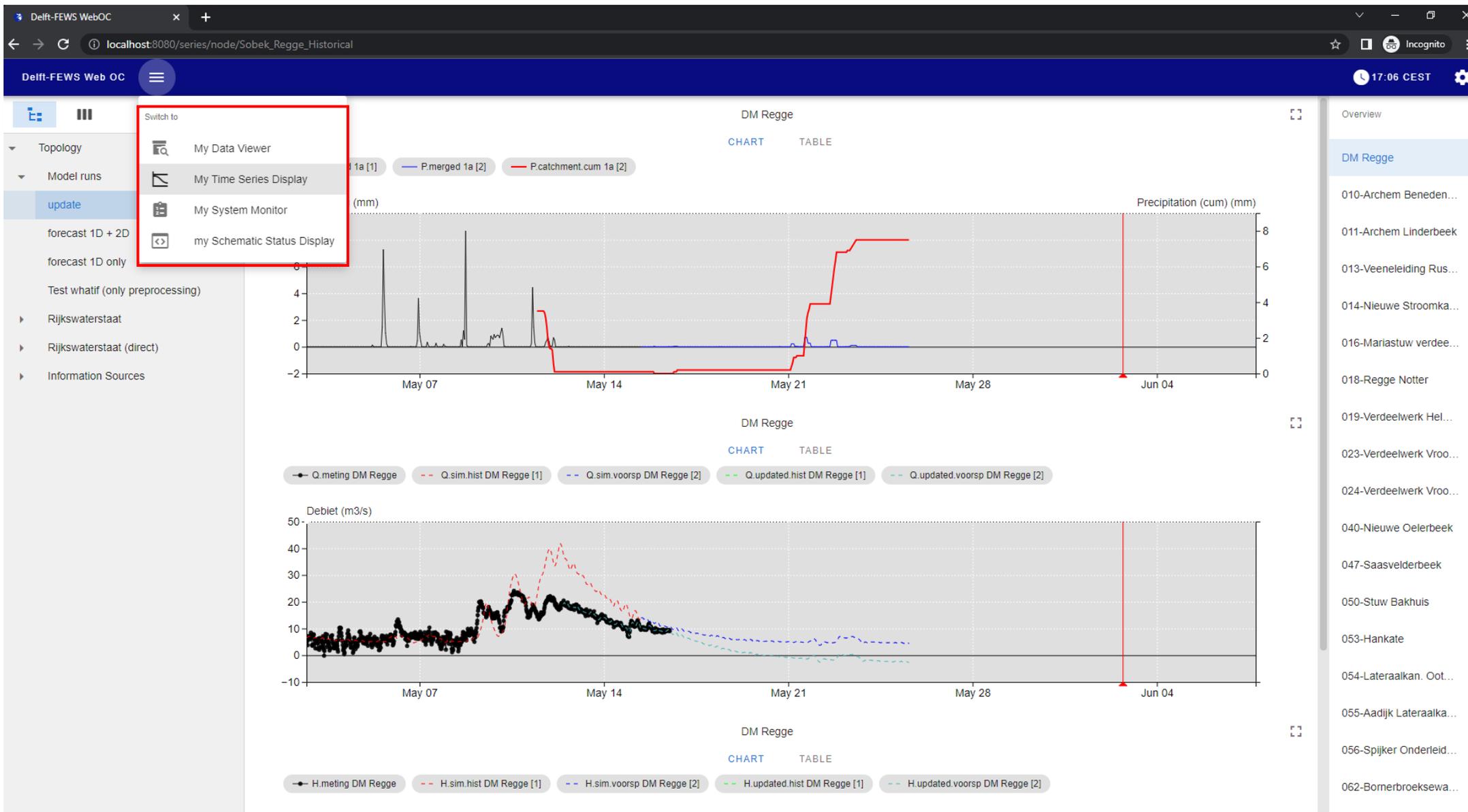
Report Module

- <u>THRESHOLDCROSSINGLABEL</u> function added → add threshold crossing information for the specific threshold.

- Add <u>custom class</u> to "RowPerLocation" table to define style/appearance

- <u>Legend</u> improved for ensemble series
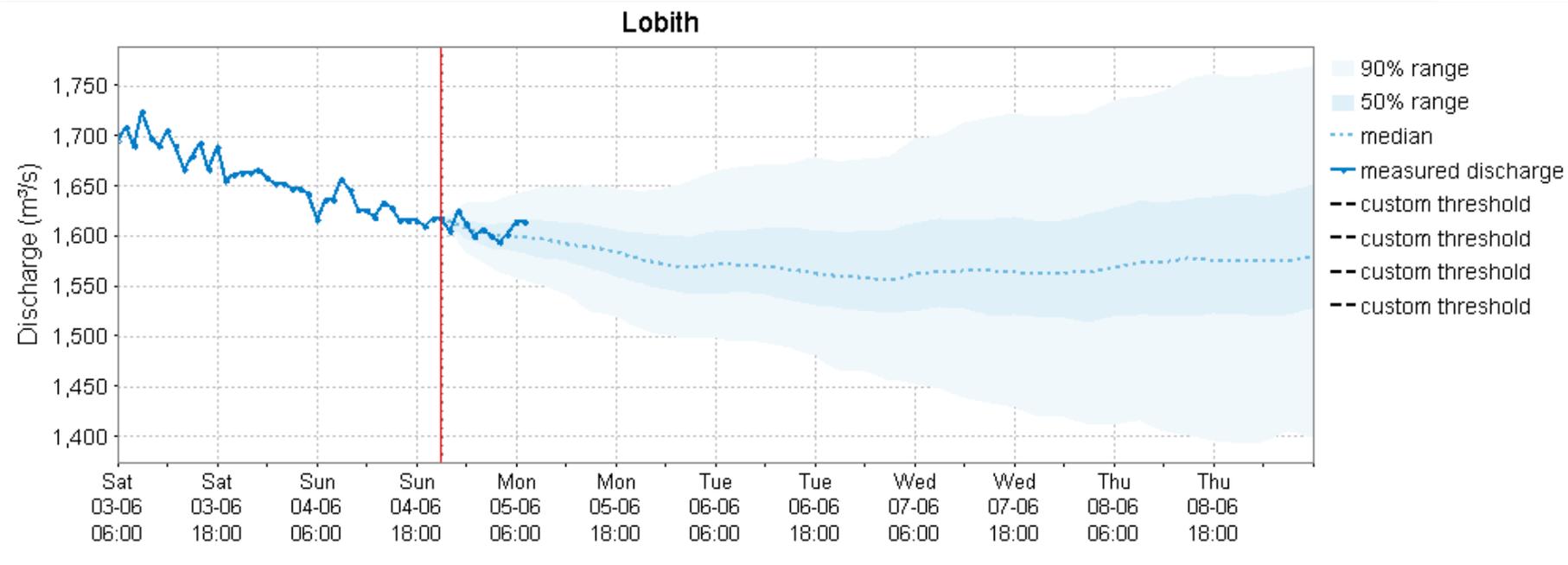
Data Imports/Exports

- [EFAS SOS Server](#) (DWD ICON, COSMO-LEPS, ECMWF-HRES & ECMWF-ENS ←

← try it out…

- Extension of [Landsat-HDF5](#) (parameter: DSSF-TOT)

- Extension of [Radolan](#) (Parameter YW + grid dimensions dynamically) ←

- Extension of [MeteoCanadaWCS](#) (authentication added and visualize hidden layers)

- Improved [GeoTIFF](#) import (support for all possible floats, integer and byte values)

- Import module now [ModuleInstance](#) aware.

- Improved [PI REST](#) import: chunking of URL path to avoid exceedance

Deltares

Community & (online) events

- Delft-FEWS User Days ([programmes and presentations](#))
  - Gebruikersdag Netherlands/Belgium: 6th of June 2023 (Delft, NL)
  - Anwendertreffen: 15th +16th of June 2023 (Aachen, D)
  - Australia: 23rd - 25th of August 2023 (Brisbane, QLD)
  - International Delft-FEWS User Days: 8th+9th of November 2023 (Delft, NL)

- Courses
  - Around User events
  - [Schedule](#)

- Online events (recordings via [portal](#))
  - Community Talks: next: 8th of June
  - Webinar: next: 14th of September

Delft-FEWS Users Meeting 2022

#4
WIS systems

2023.01 features

Deltares

Documentation, Tips & Tricks and Videos

- **Delft-FEWS WIKI** configuration, user guide (& client-server installation guide → login required)

- **FEWS Docs**: automatically generated documentation (schemas, release notes, APIs etc)

- **NEW**: Tips & Tricks for 'beginners' (new configurators)

- Video/recordings overview

| Webinar	Date	Topics + video link
Delft-FEWS in the cloud	07.02.2022	Delft-FEWS in the cloud
2021.01 Features	25.04.2022	How to apply auto-calibration (with OpenDA). (click breakpoint at 5:53) How to improve and polish your output in spatial/timeseries plots / how to make attractive GUI icons. (click breakpoint at 16:16) Spotlight: the Import module. (click breakpoint at 30:19) **e.g. grids as reference!!**
2022.01 Features	13.10.2022	Spatial Display and Spatial Transformations (click breakpoint at 6:45) Map and Explorer improvements (click breakpoint at 19:15) Spotlight on the Schematic Status Display (click breakpoint at 40:08)
2022.02 Features	23.03.2023	Running Workflows from Spatial Display (click breakpoint at 5:12) Running the FEWS web services locally (click breakpoint at 16:10) Delft-FEWS and the links to GIS systems (click breakpoint at 30: 48)

Outlook Developments 2023.02

- **Web OC** MVP (1) + enabling data edits (2)

- **Flood Warnings & Thresholds**: Generation AND dissemination (AUS)

- **Metadata** management tool (AUS)

- **Open Archive**: Create separate Vision (together with CSB)

- **Cloud**: High availability of the MasterController (without using dual MC)

- Make **web service patchable** (postponed from 2023.01)

- <mark>**Seamless integration** with (different, external) web services, like WISKI</mark>

- Improve **Import status page** and add **Export status page** to Admin Interface

- Improved **NetCDF** for **non-equidistant** timeseries (basis is already in 2023.01)

- <mark>**Co-creation** activity on **Scaling** of Forecasting Shell Servers.</mark>

- And more…(in proposals for GO-FEWS, RWS etc)

Delft-FEWS

2023.02

# Seamless integration with WISKI web service

- WISKI web service (KiWIS) as "a source of archived data" (**5th** type)
  - Know what data is in that source, but leave it at the source
  - Display (in Delft-FEWS) on request as temporary series (seamless integration)
- Pre-configured time series sets + idMapping (FEWS-WISKI)
- Plugin-structure for *web services* (mechanism could serve other examples)

type 1 - 4
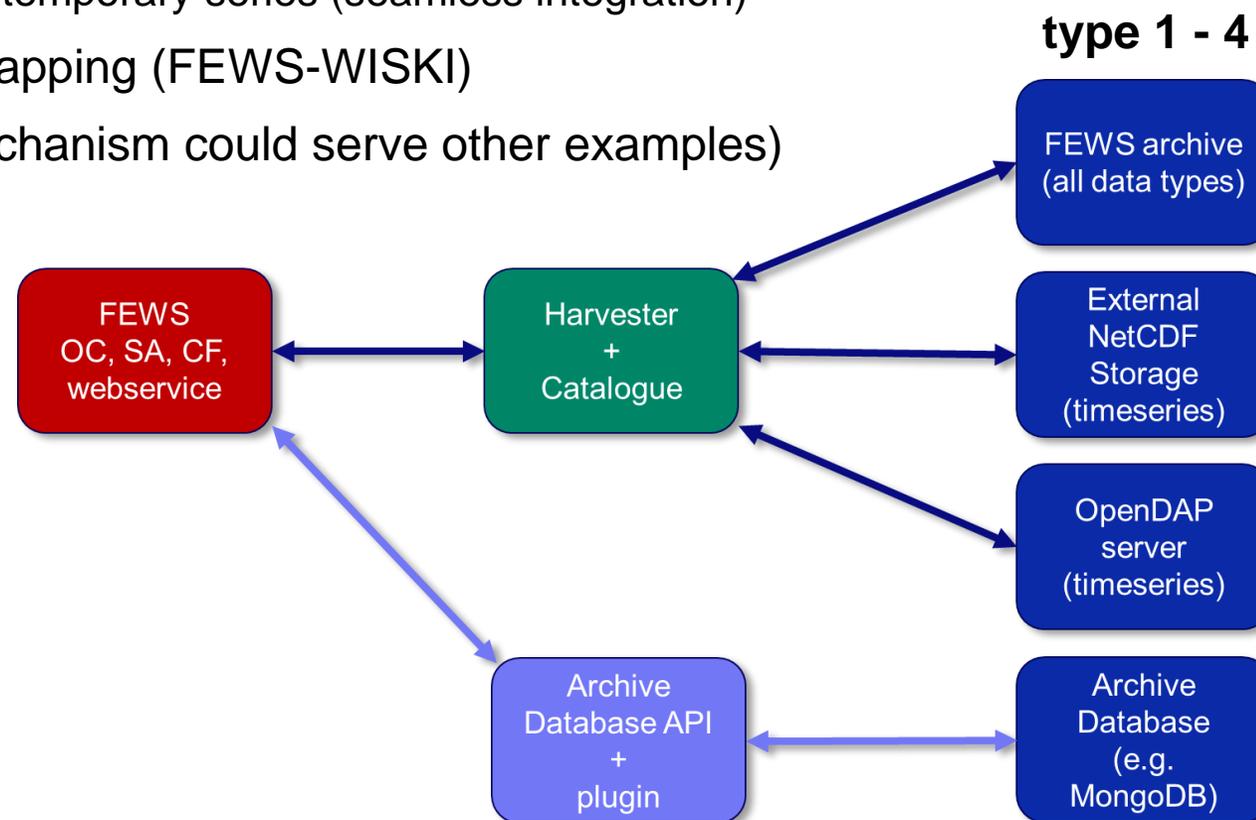
Design principles – FSS Scaling

- **Use case 1: Main concept change: new FSS status "hibernate"**

- Pre defined FSS (group) specs (VM)

- FSS group in ´hibernate´

- Workflow – FSS mapping enables to run only specific workflows on specific FSS groups

- Allocate/de-allocate principle (Azure)

- Cloud costs
    - Only storage costs when in ´hibernate´
    - Pay as you go (running workflows) → cpu costs

- Use-case 2: "One-off FSS" (Kubernetes)

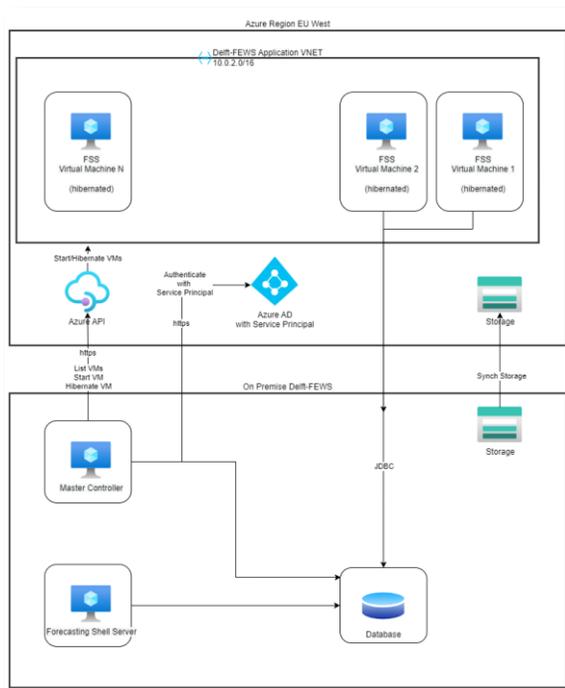- Co-creation with consultants, launching customers
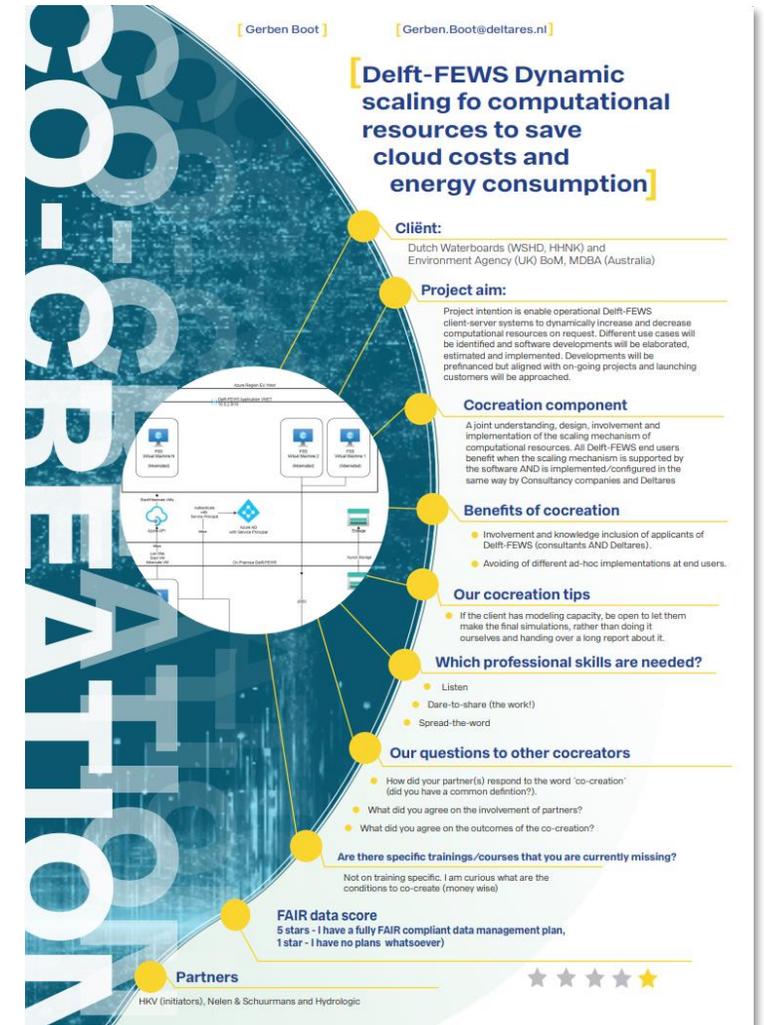
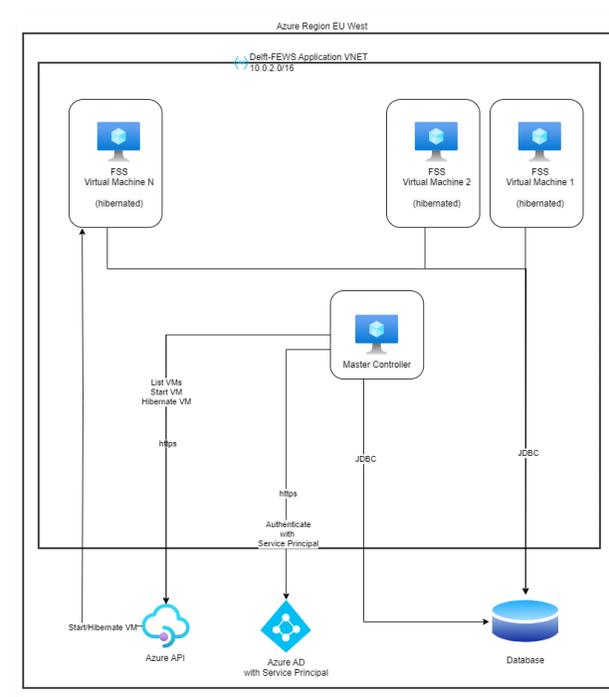# First implementation: FSS Scaling (Azure)

Main system on-premise, scale to cloud

- Typical use-case:
  - calculation intensive (CPU) workflows
  - Limited data usage

Main system in cloud AND scale to (same) cloud

- Typical use-case
  - Data intensive (I/O) workflows
  - Data is already in cloud (and stays there)

Contact

🏠 www.delft-fews.com

🐦 @DelftFEWS

in linkedin.com/company/deltares

✉ fews-pm@deltares.nl

📷 @deltares

f facebook.com/deltaresNL

Deltares