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enabling delta life

Delft-FEWS in Extreme Practice

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](#)

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Welcome on behalf of Delft-FEWS PM…

Deltares Software Support (1st line) & Delft-FEWS Support Team (2nd line)

piet   sonny

melvin   niels

Portal moderators, course leaders

Marcel

Department OWM, business & strategy

Nadine

Department of Operational Water Management

Support & Maintenance

Delft-FEWS PM

Developments

Community

Ilonka
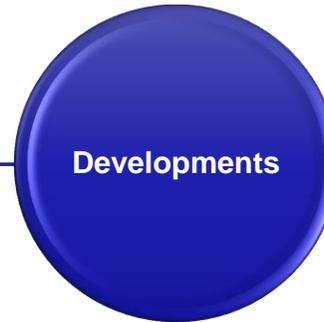
Gerben

Delft-FEWS Development Team

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

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

Gerben

Erik

Marcel

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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)
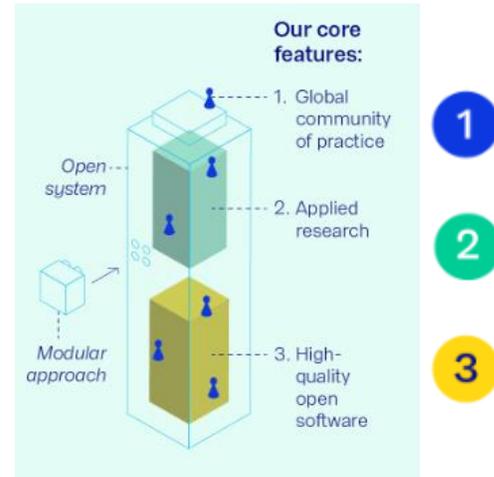
mongo DB

1 source/destination added to the open archive

1 new, consistent flat look & feel

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Delft-FEWS Vision 2025…

- Delft-FEWS Vision 2025 core features
  1. Global Community of Practice
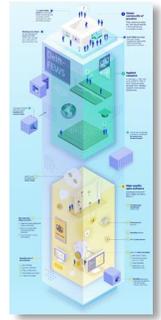 2. Applied Research
  3. High quality open software

- Show and tell…story, presentations and infographic
  - Delft-FEWS portal
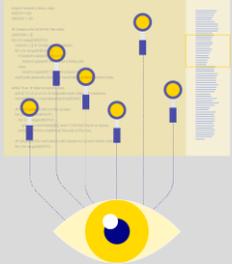 - Video
  - User Days / Events
  - Updates to the CSB

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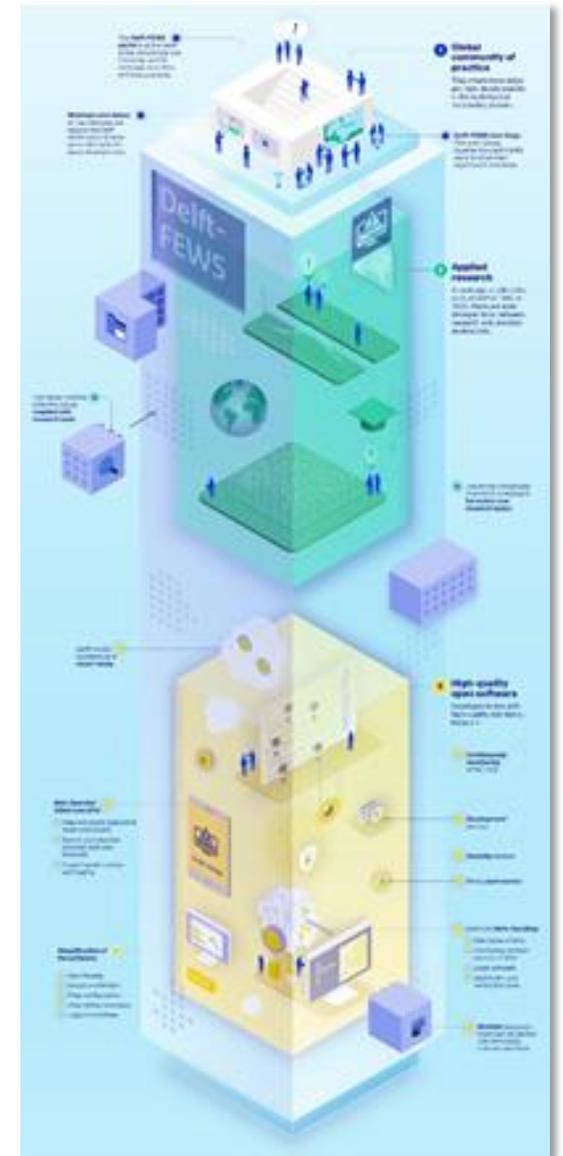
Delft-FEWS Vision 2025: timeline

DSD-INT
Nov 2019

**Delft-FEWS
Vision 2025**
Presented

*Delft-FEWS
2020.01*

**July
2020**

**Delft-FEWS
Vision 2025 + roadmap 2020**
Retrospective + outlook

**DSD-INT
Nov 2020**

*Delft-FEWS
2020.02*

**Jan
2021**

**Delft-FEWS
Vision 2025 + roadmap 2021**
Updates

**DFUDA
DSD-NL
Anwender-
treffen**
May - July
2021

**Delft-FEWS
2021.01**

now
**Delft-FEWS
Vision 2025 + roadmap 2021**
Retrospective + outlook

**DSD-INT
Nov 2021**

**Delft-FEWS
2021.02**

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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)

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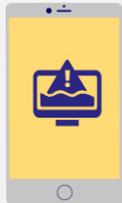
- Basic architecture available
- Components selection (dev. framework, map, table, graph)
- Requirements collected for a "Minimum Viable Product"
- First sprints

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)

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Documentation…

- [Documentation WIKI](#) issues → download alternative… **400+** ⬇

- **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!

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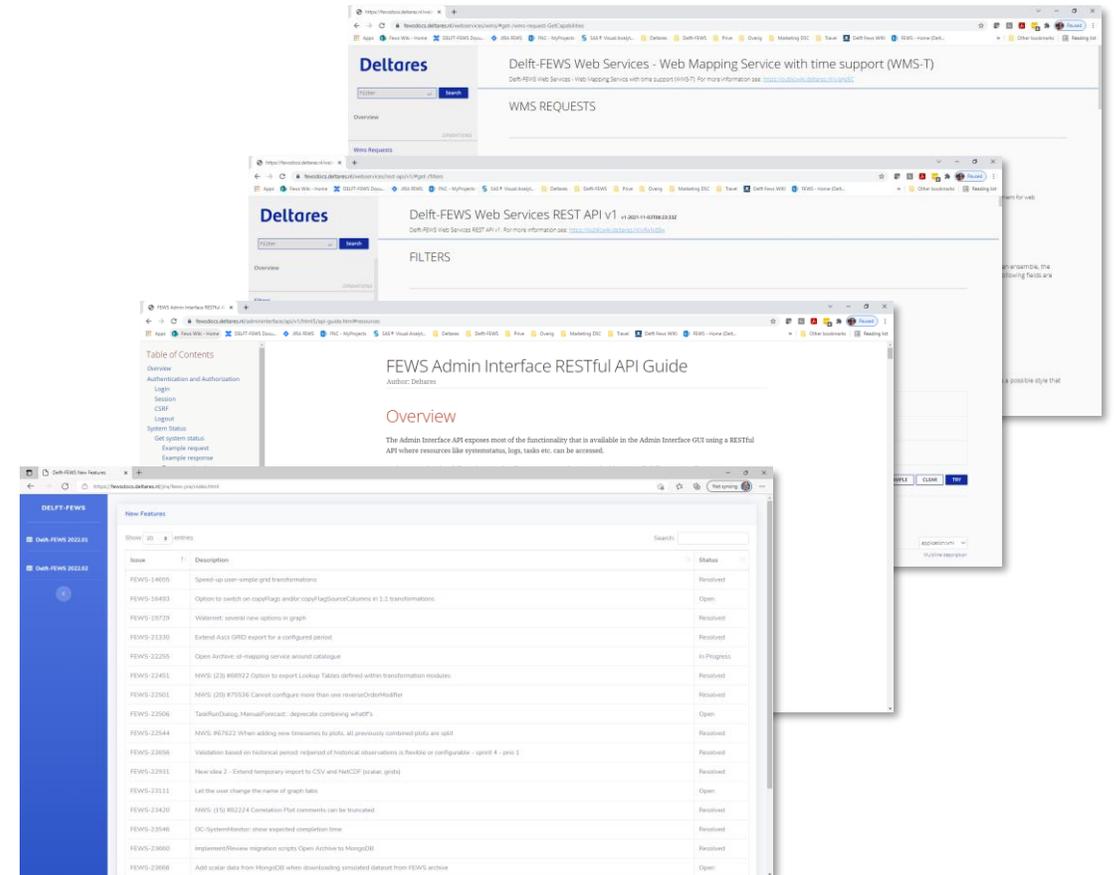
Web Operator Client

- 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** (15th of Nov)
  - UX/UI
  - Interactive break-out session

- More frequent updates via the Delft-FEWS Portal!
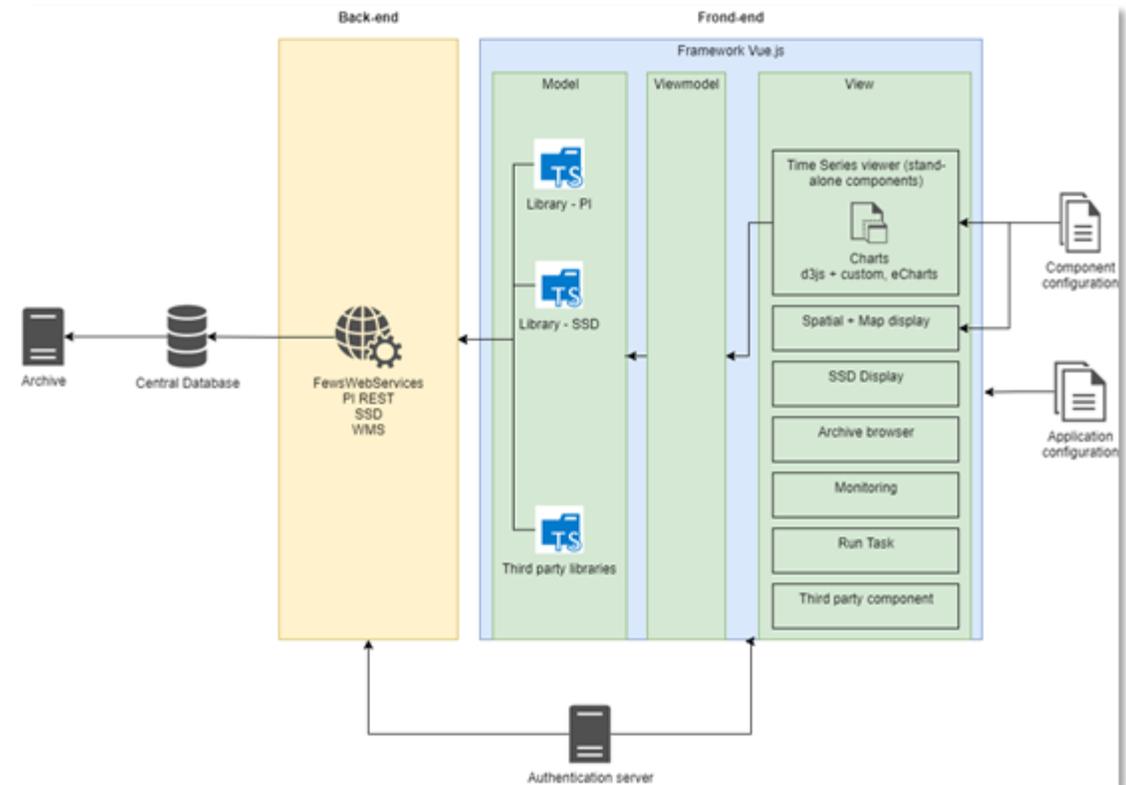
Outlook…

2022 developments

Delft-FEWS
2022.01

- Hooking up to national registers using webservices (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
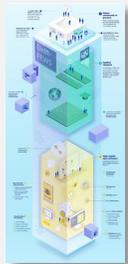
- (automated) FSS scaling, use of kubernetes
- For testing: generate client-server system from LDS (reverse-replicate)
- Patchable Admin Interface
- …

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…

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What's coming up…

Part	Theme	When	By	Covering…
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Gerben

Erik

Marcel

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Contact

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Thank you for your attention!

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End-users and operators

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

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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](#)

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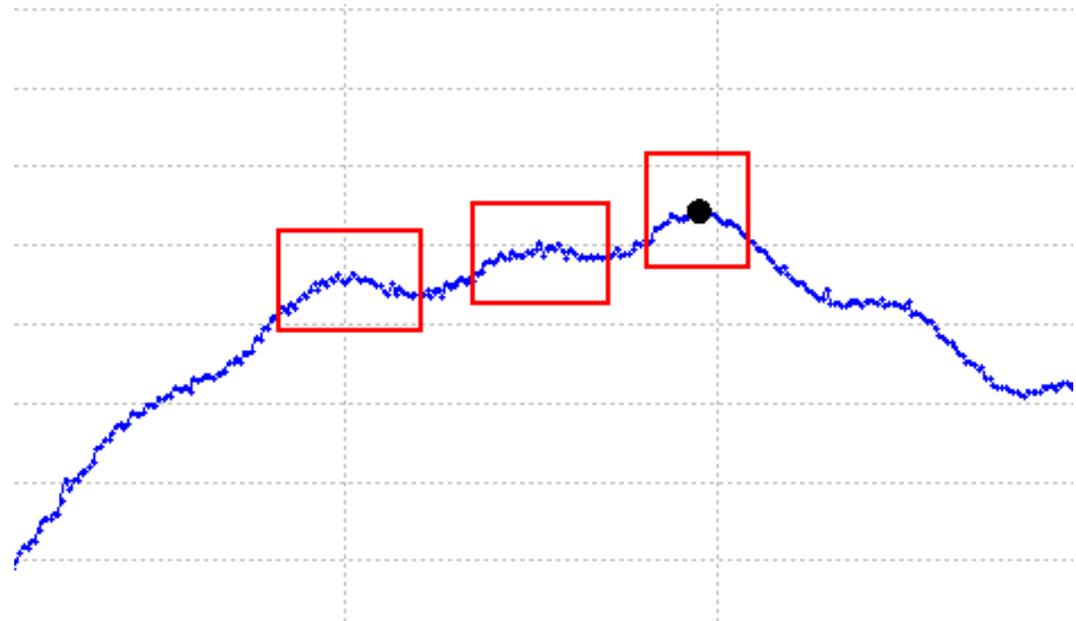
Verification Analysis Display

- 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		

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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](#)
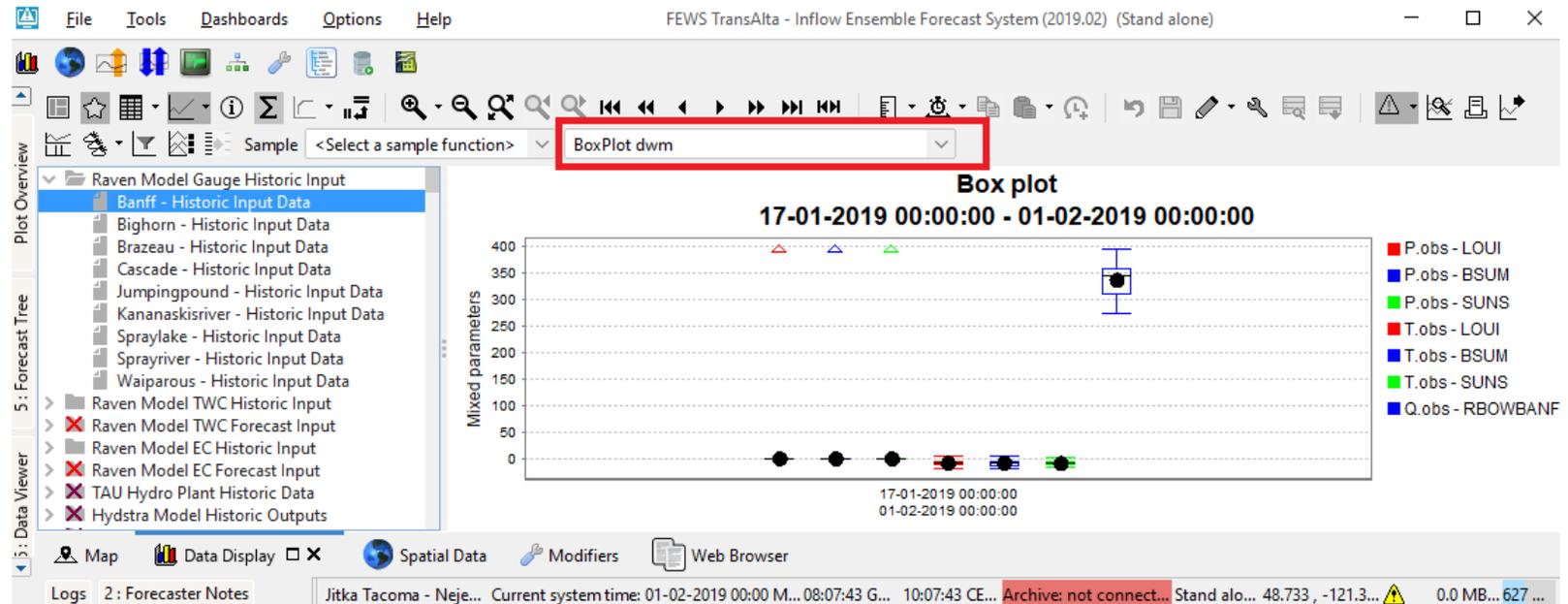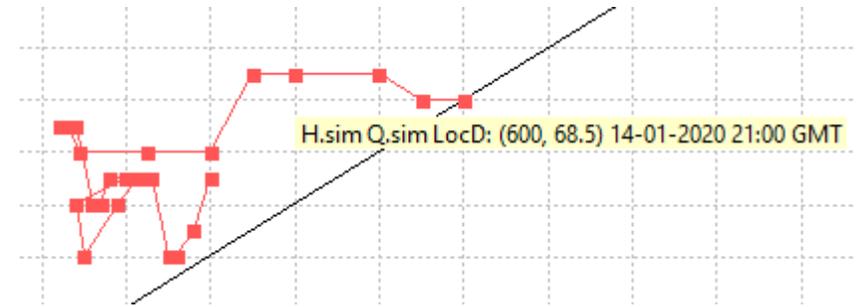
Auto Calibration via integrated OpenDA

- 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	**AC**
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
MBASE	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

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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

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 Gijsbers](#) and [Andre Grijze](#)

- [More information](#)

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 ∨	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 □ ✕

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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](#)

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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](#)

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Poll

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

Min. 10 participants!!

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

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Delft-FEWS International User Days 2020

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

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Technical Developments

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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

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Delft-FEWS International User Days 2021

Admin Interface (API)

Admin Interface (API)

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

Module Run Times

Delft-FEWS International User Days 2021

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

Config Manager

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))

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Webservices

Integration Open Archive with MongoDB

- MongoDB for scalar time series

- Combine with standard Open Archive

- Database API → plugin structure (other databases possible)
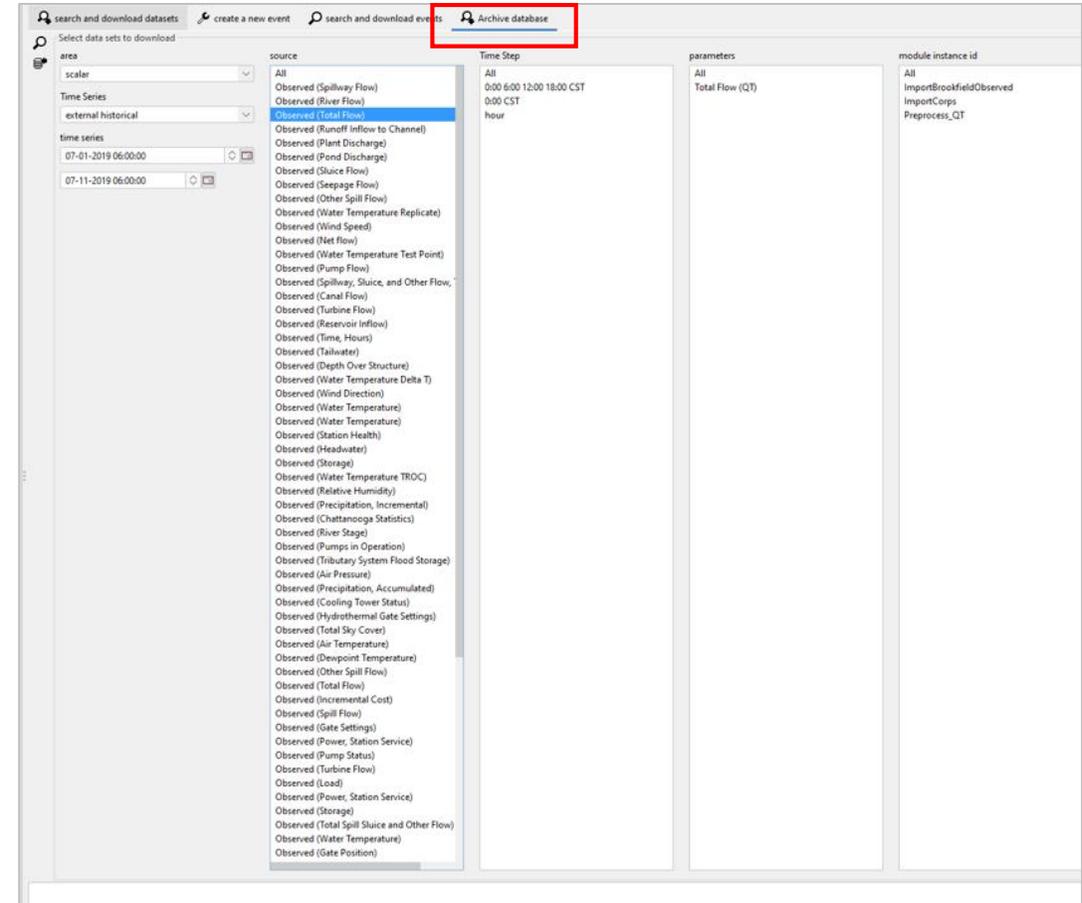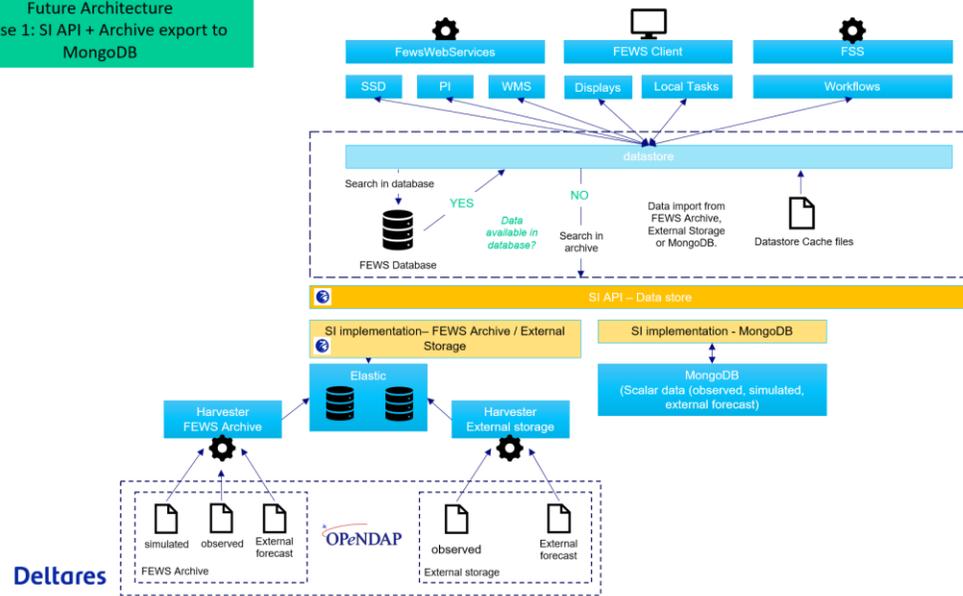
Poll

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

Min. 10 participants!!

Polly

Chat

11:28 👍 1
Admin Interface (API)

11:28 👍 1
Configuration Manager

11:28 👍 1
Delft-FEWS WMS webservice

11:28 👍 1
Delft-FEWS PI REST webservice

11:28 👍 1
Delft-FEWS Open Archive extension - MongoDB

11:28 👍 1
other: <TYPE A TOPIC>

my topic suggestion: Dashboarding ⊘

See chat: vote by pressing 'likes' / 'thumbs-up' for a topic or type a new topic!

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Questions ✋

Delft-FEWS International User Days 2021

Contact

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✉ fews-pm@deltares.nl   📷 @deltares   f facebook.com/deltaresNL

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