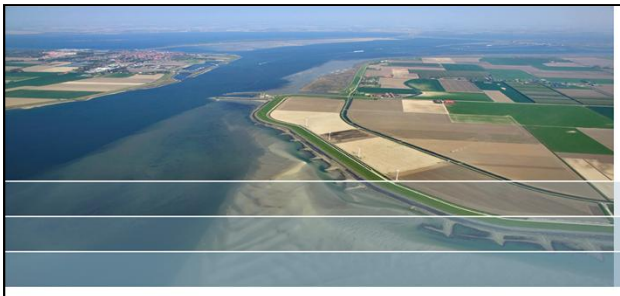
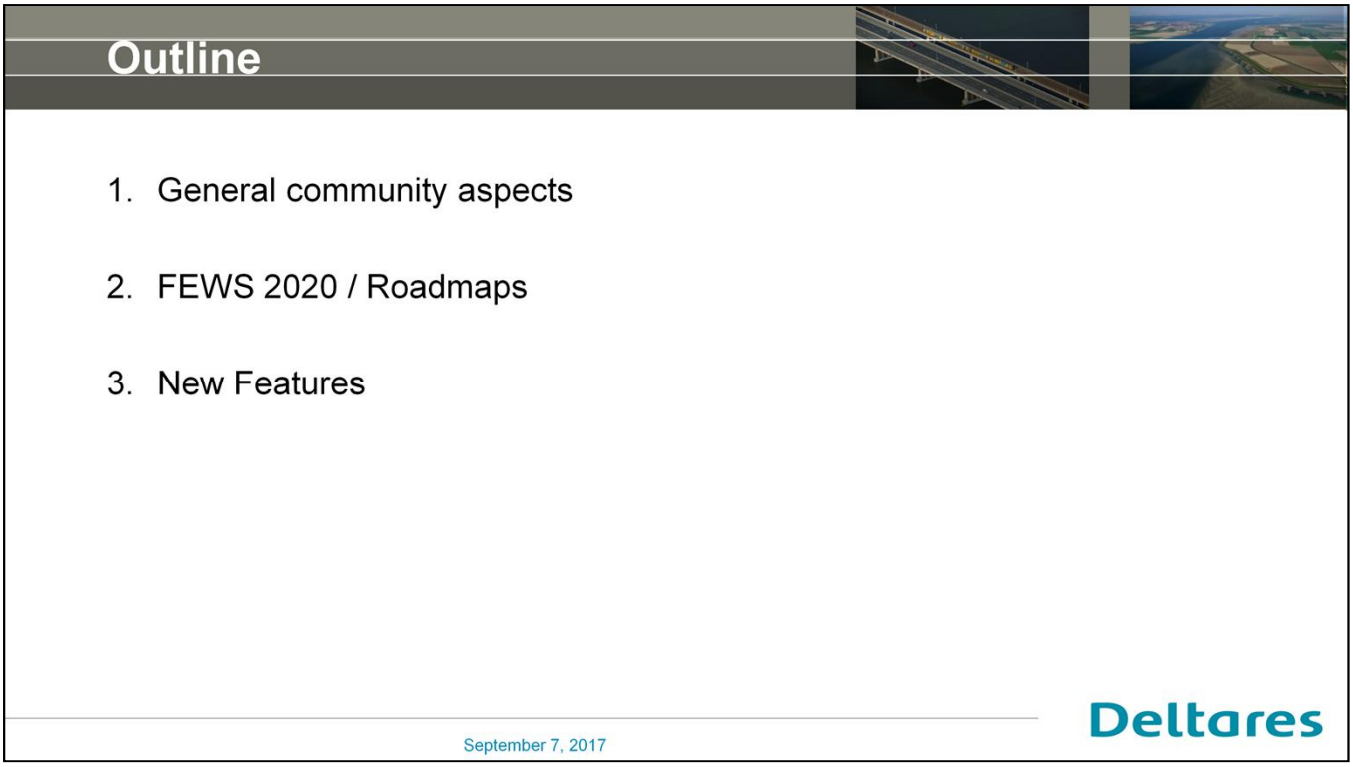


Deltares
Enabling Delta Life

Delft-FEWS – New developments & Development Roadmaps

Delft-FEWS Anwendertreffen 2017

September 7, 2017


Outline
1. General community aspects
2. FEWS 2020 / Roadmaps
3. New Features
September 7, 2017
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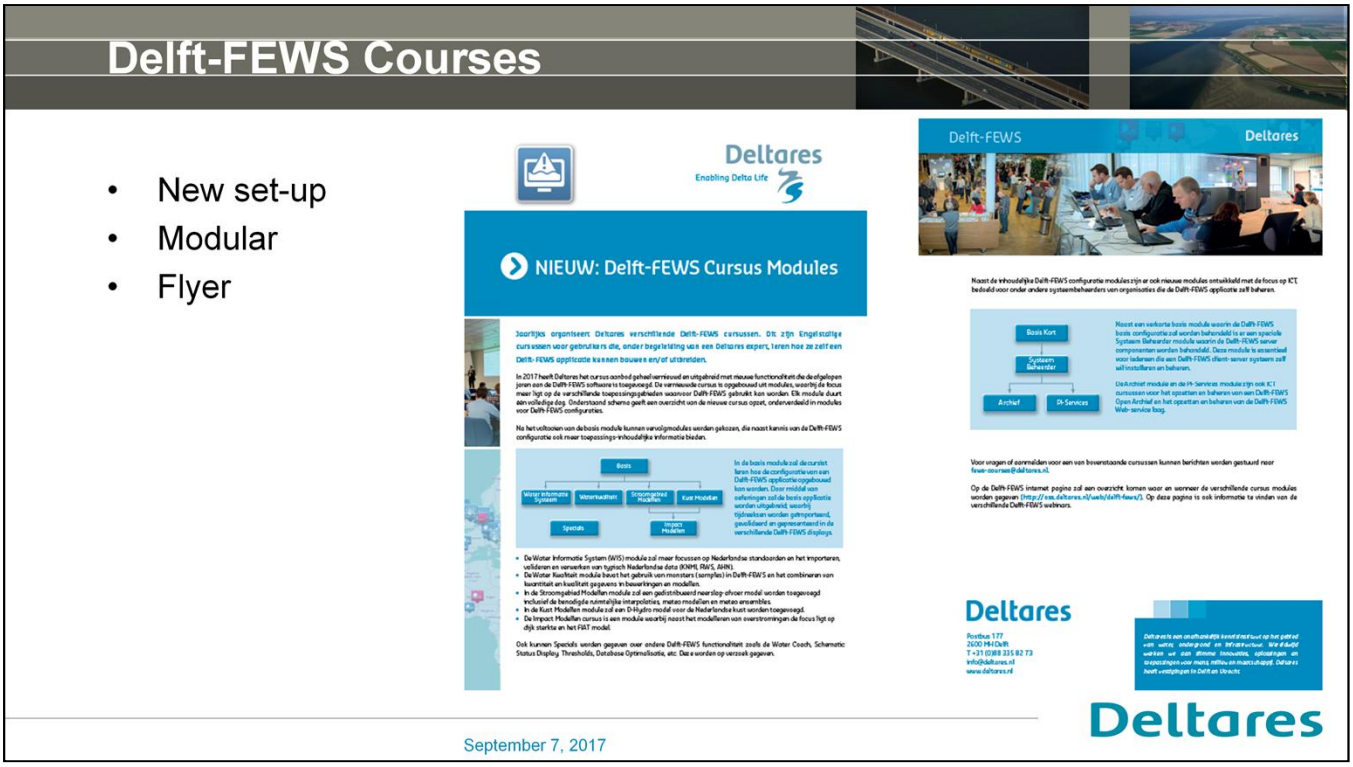
Other meetings…

4th Delft-FEWS User Days Australia (April 2017)

12th International Delft-FEWS User Days (October 2016)

11th national Delft-FEWS User Day (June 2017)

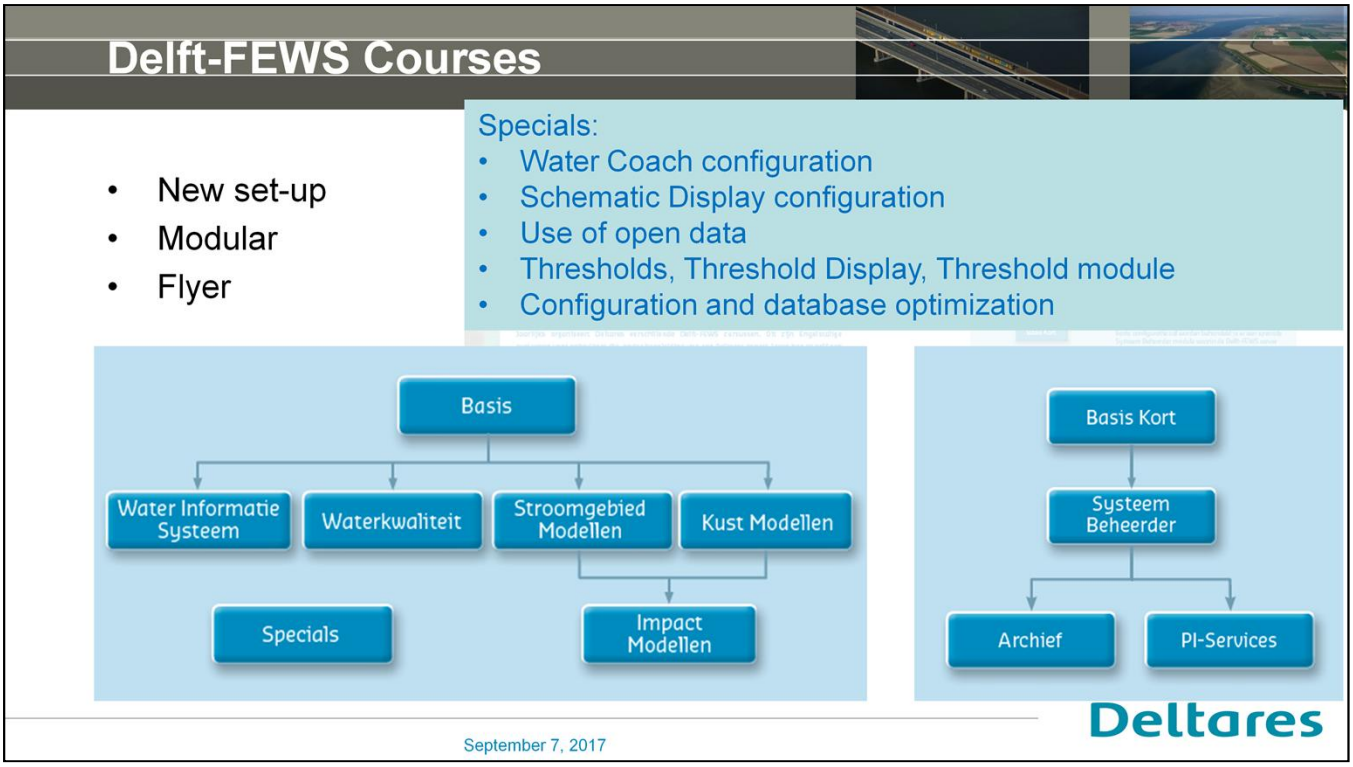
Three other meetings have taken place since the last regional meeting for the German speaking countries in July 2016



- New set-up of the Delft-FEWs Courses with a modular approach
- Courses mostly 0.5 -1 day in different modules

Specials:

- Archive development and configuration
- Water Coach configuration
- Schematic Status Display configuration
- Use of Open Data: Webservers and Thredds servers. Where to find good data?
- Thresholds, Threshold display, Threshold Module and action events
- Implement HEC-HMS and HEC-RAS
- Configuration and database optimization: how to keep my system healthy



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Community Strategy Board

Participation of some of our key users:

- Rijkswaterstaat in the Netherlands
- Representative of the Dutch waterboards
- Federal Office of the Environment, Switzerland
- National Weather Service, USA
- SEPA, UK
- Bureau of Meteorology, Australia
- Deltares USA

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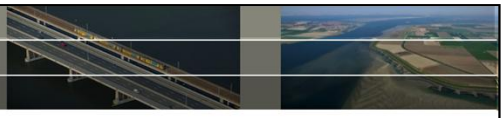
Strategic board of key users of Delft-FEWS that discuss and give advice on the future of Delft-FEWS

- CSB 4x a year (3x teleconference, 1x in Delft)
- Representatives→ internal communication

Community Strategy Board



Goal of **Delft-FEWS Community Strategy Board (CSB)**

- Think about long term-strategy
- Funding mechanisms and business models
- Exchange of experiences
- Representation of the community
- …

CSB meetings

Topics of meetings up to now:

1. Vision for future of Delft-FEWS
2. S&M and Services
3. Share information & costs for developments
4. Communication with community
5. Feedback Survey & Evaluation CSB

Data meetings & minutes on Delft-FEWS portal

(http://oss.deltares.nl/web/delft-fews/csb-meetings)

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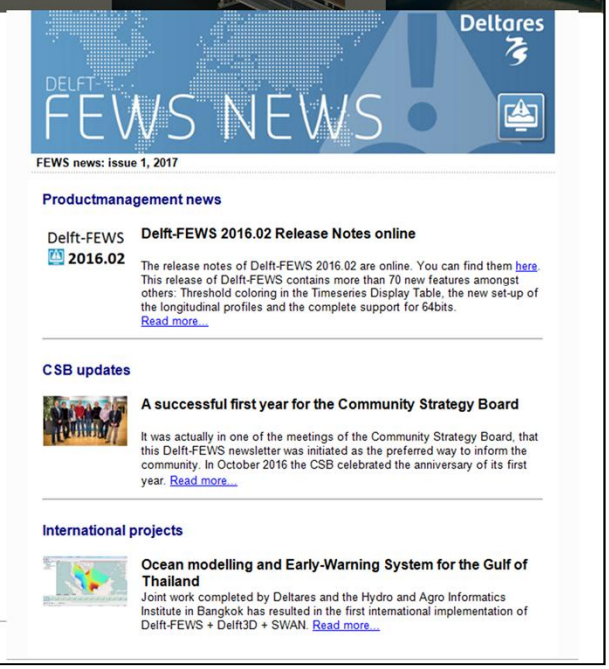
CSB discusses theme/topics on a strategic level

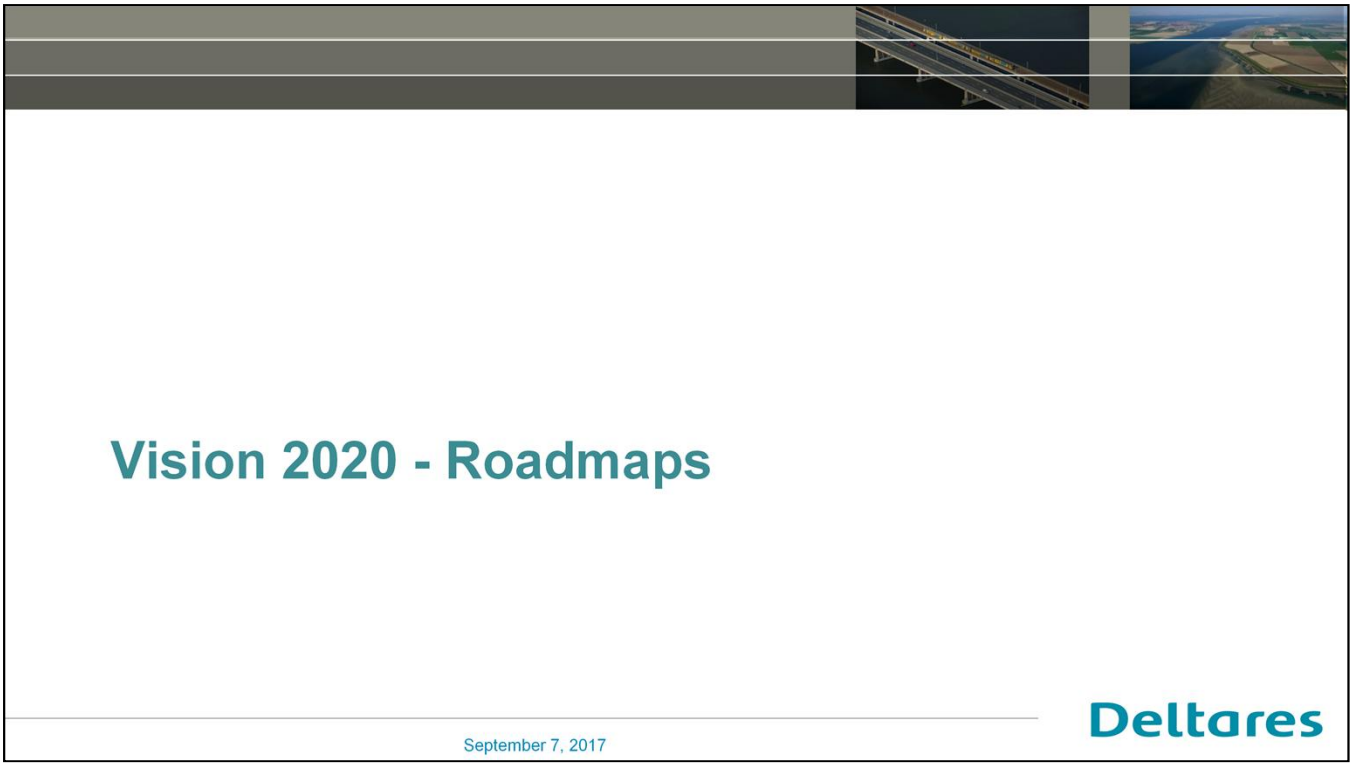
FEWS-NEWS

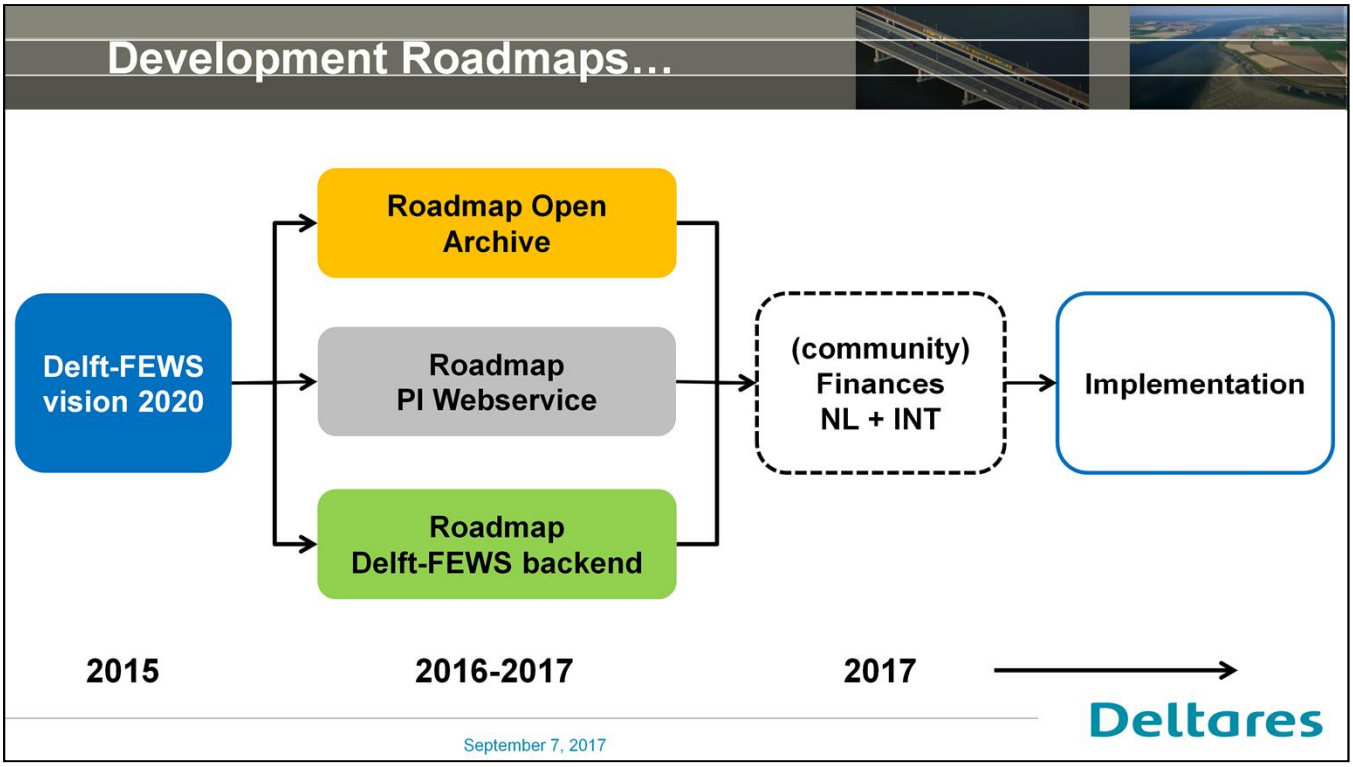
www.delft-fews.com > FEWS news

Mid September 2017: 4th edition

Subscription via: fews-news@deltares.nl




Vision 2020 - Roadmaps
September 7, 2017
Deltares



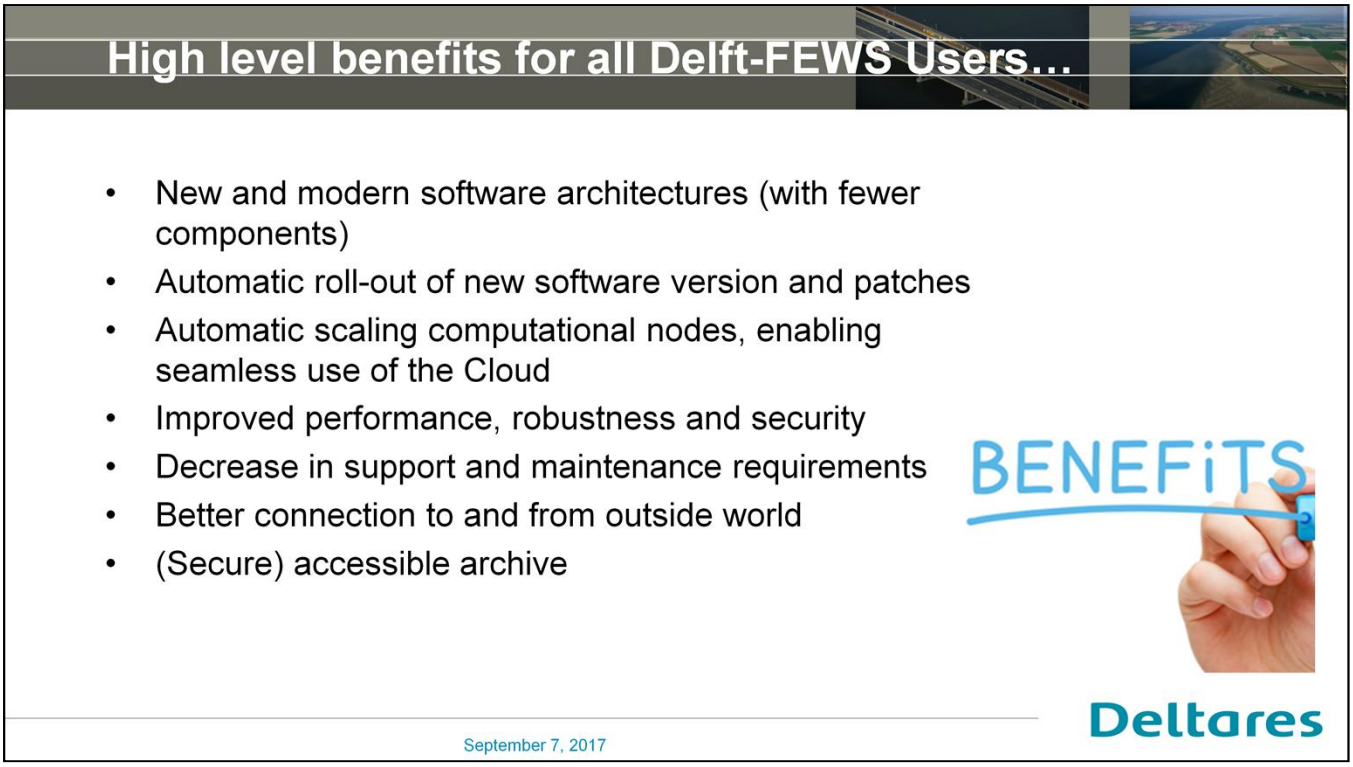
The current architecture of Delft-FEWS is mostly based on its initial design created in 2003. Since then, Delft-FEWS has been improved gradually to meet the users changing requirements. While in general the architecture is still a valid one, the current day fast-paced developments, the general tendency for applications to be more aware of their surroundings and the need to be able to fit within modern day IT landscapes, require an architectural redesign.

Besides, more and more (potential) clients have requirements for smaller scaled systems, virtualization of hardware, hosting in the cloud and publishing of information to the public. Using this knowledge Deltares developed a vision on what Delft-FEWS should look like in the year 2020. The first version of the Delft-FEWS 2020 vision was shared at the Deltares user days in October 2015 and with the International Community Strategy Board.

Since then, the plans for Delft-FEWS have evolved into three roadmaps, covering the most important developments. The roadmaps describe the technical details and an estimation of the costs and efforts for implementation.

The *roadmaps* are:

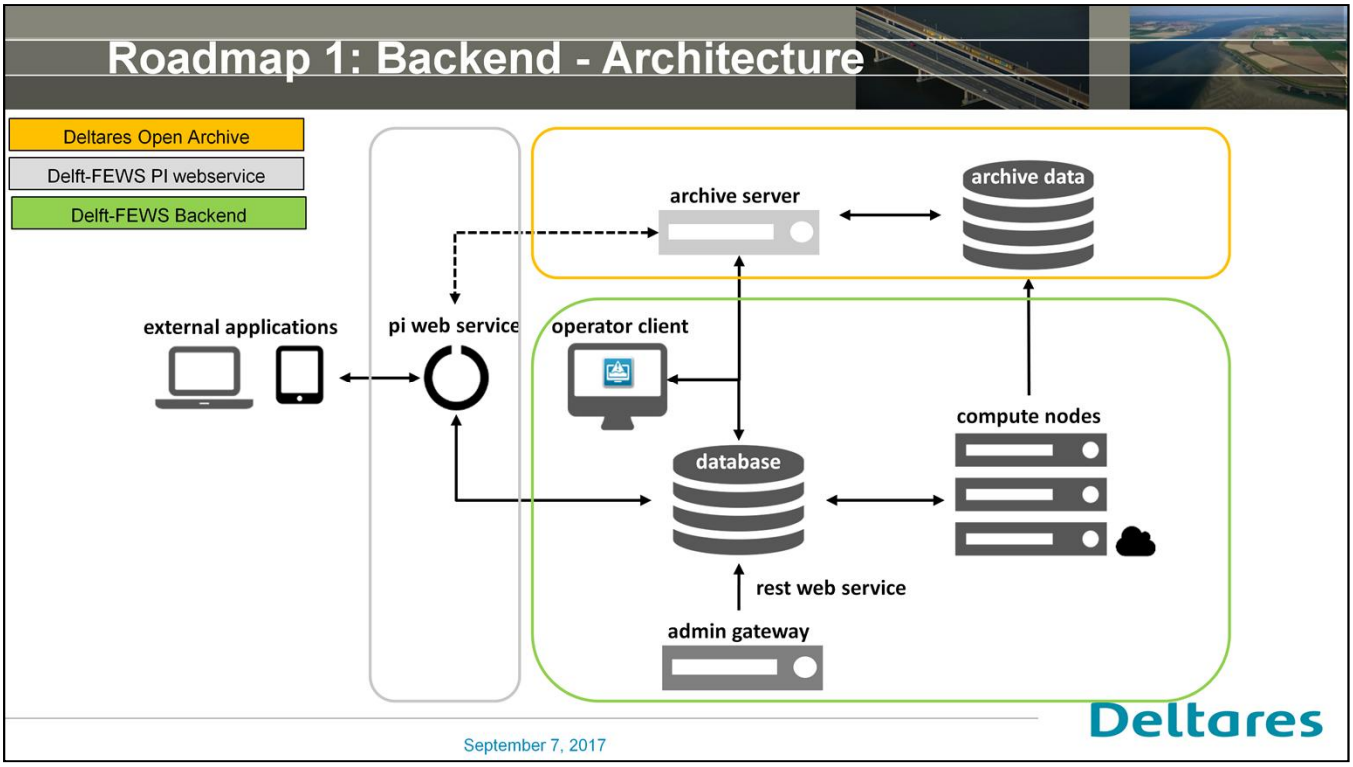
- Delft-FEWS Backend Simplification and Automation;
- Delft-FEWS PI web service;
- Deltares Open Archive.



What's in for the client(s) / organizations using Delft-FEWS?

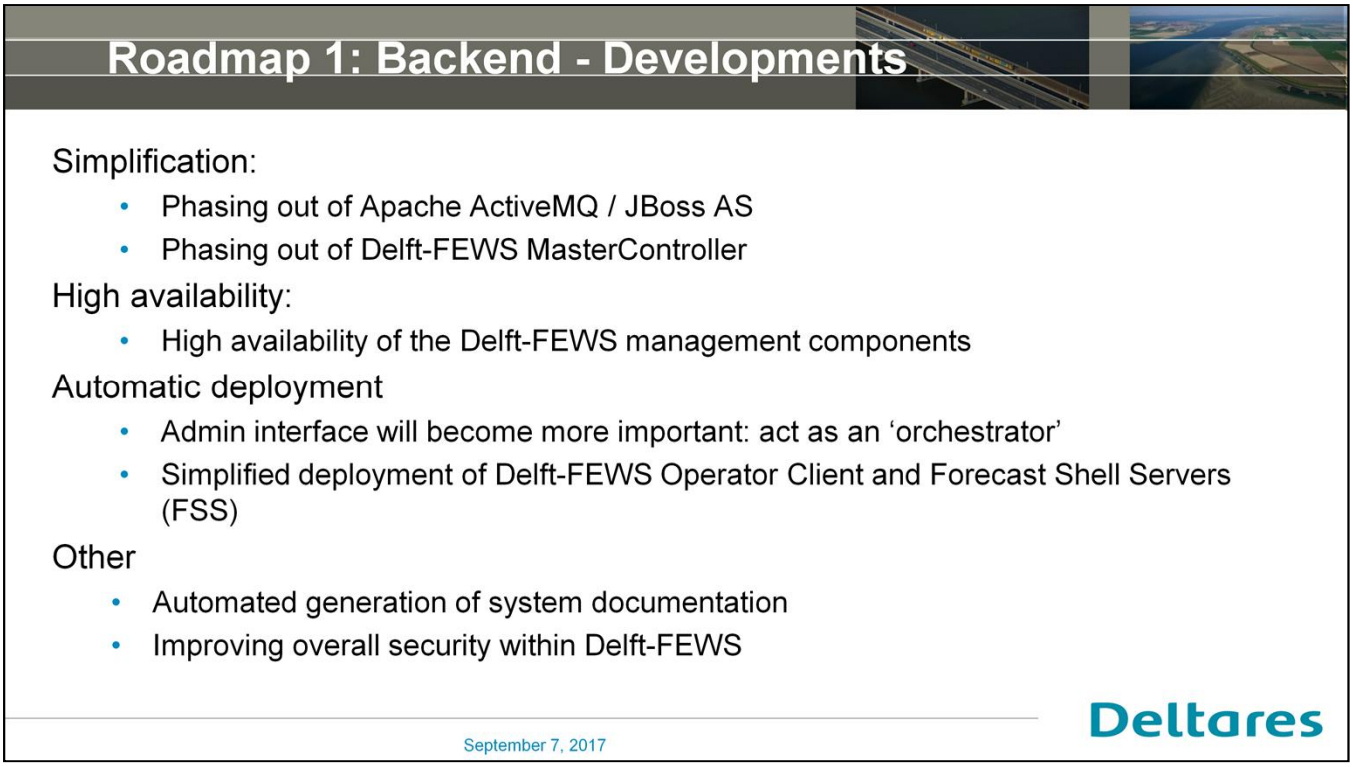
On the higher level, the following benefits can be mentioned.

- New architectures contain less components, meaning: less complexity and fewer components to install, fewer potential places where things could break, less S&M
- From a manual and labour intensive install and upgrade procedure to a fully automatic roll-out
- Scalable computational nodes (FSS) which means that during times of 'intensive forecasting' more FSSs could be automatically brought up (and brought down when the event is over). Scaling up to the cloud is also possible.
- Performance, security and robustness will be further improved
- Over time, it is expected that these new architectures will get less problems, so less S&M



New architecture for the Delft-FEWS backend (picture contains archive and PI webservice as well)

The backend architecture is displayed in green.



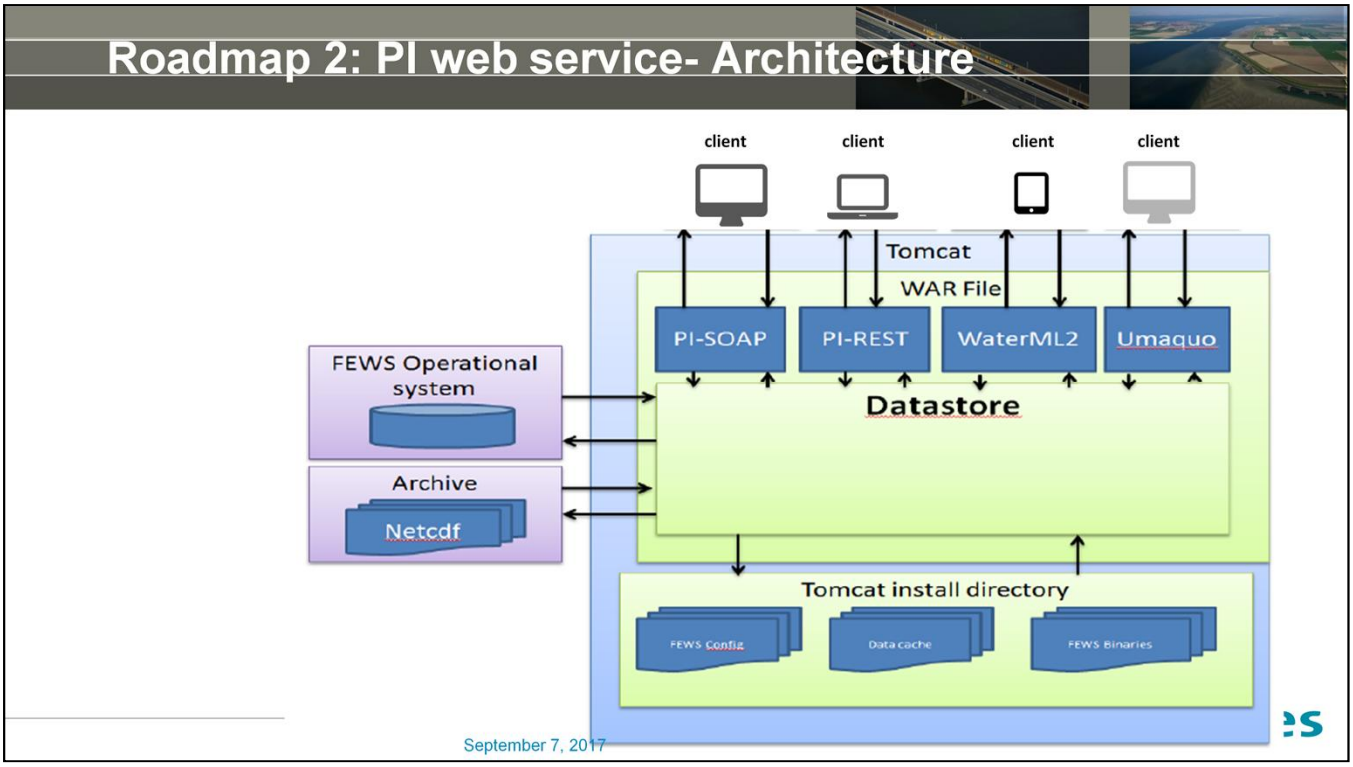
These roadmap's developments can be labeled as follows: Simplification, High-availability, Automatic Deployment and 'other'.

We have defined **Simplification** as: reducing the number of components (= reducing complexity). Certain roles will still be needed, but will be taken over by the Central Database. This means that the Central Database's role will become more important

High availability means that required components (like Tomcat, the Central Database etc.) should still be available on an outage. So using IT solutions to make sure that whenever 'a server' is down, the function is taken over by another server.

For **automatic deployment** the role of the (new) Admin Interface will become more important. This component is going to act as an 'orchestrator' which should be switched on and from there the backend system is installed and or upgraded. For an installation (or upgrade) of an OC or FSS, this client-package needs to be simplified and made 'self-installable'. A dedicated REST (REpresentational State Transfer) webservice will be created in order to access this 'orchestration' also from the outside using for example Puppet or Ansible. These tools are in use by many of the our clients for deploying applications within their own IT landscapes.

In the **Other** category we will focus on automatic generation of system documentation (which is currently a labor-intensive activity) and improving the overall security of Delft-FEWS

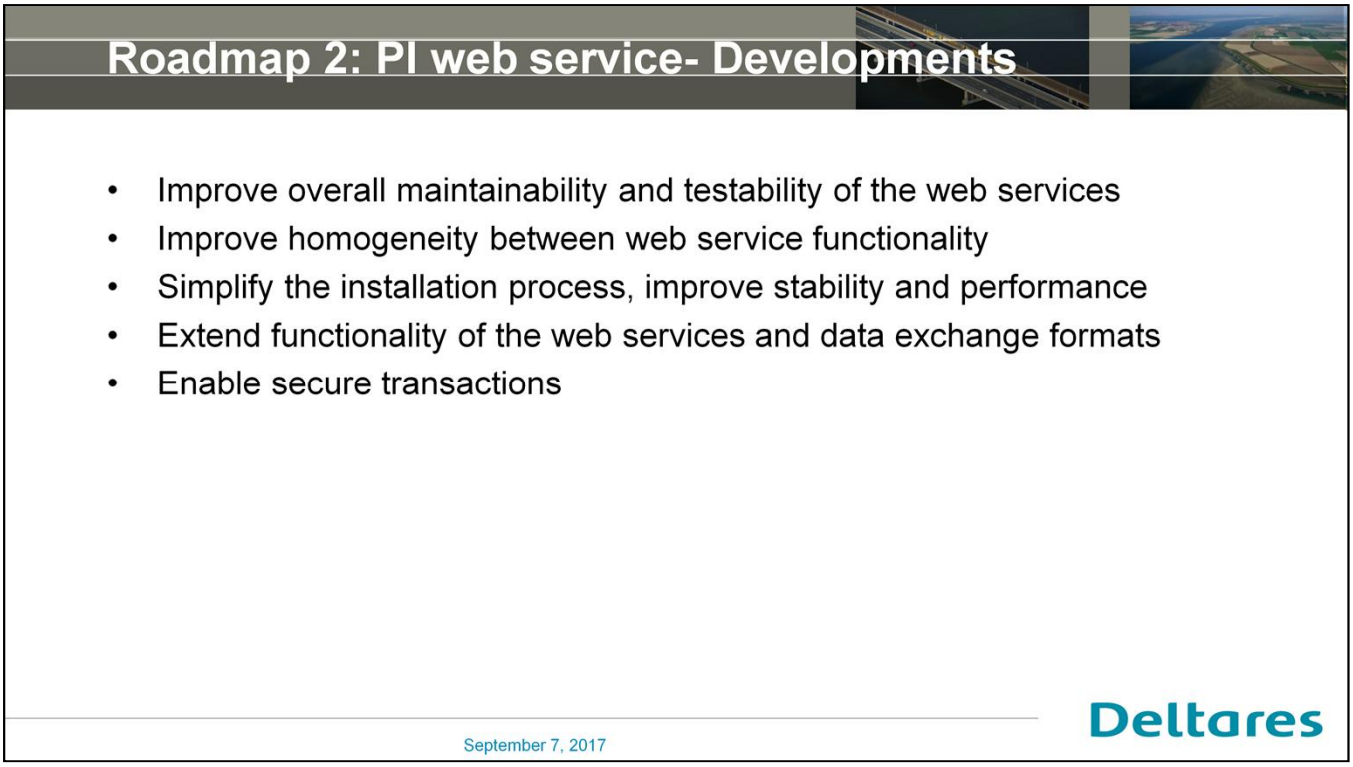


The PI web service is a 'machine to machine' mechanism to extract data from or put data in a Delft-FEWS system to and from 'third party' (=external) applications. For example, a external web-application might be website might be connected to a Delft-FEWS system in order to display the latest forecast and observed data on a map and in graphs.

The PI web service is more or less 'hidden' for the end user behind the Operator Client, but it is an important element for sharing data with the outside world.

The detailed new architecture of the PI web service is visualized here in which the following aspects are recognizable:

- Tomcat as the 'host' (application server) of the PI web service is still in place
- Different 'client' (external applications) will be able to 'connect'
- The file to install (a so-called WAR file, WAR stands for: **W**eb application **AR**chive) will contain all supported types (PI, WaterML, UM-AQUO) and protocols (SOAP and REST for the PI type)
- New types can be developed and added easily within this 'extendable' approach
- Both the operational (Delft-FEWS) database as well as the Archive Data will be using the same PI web service



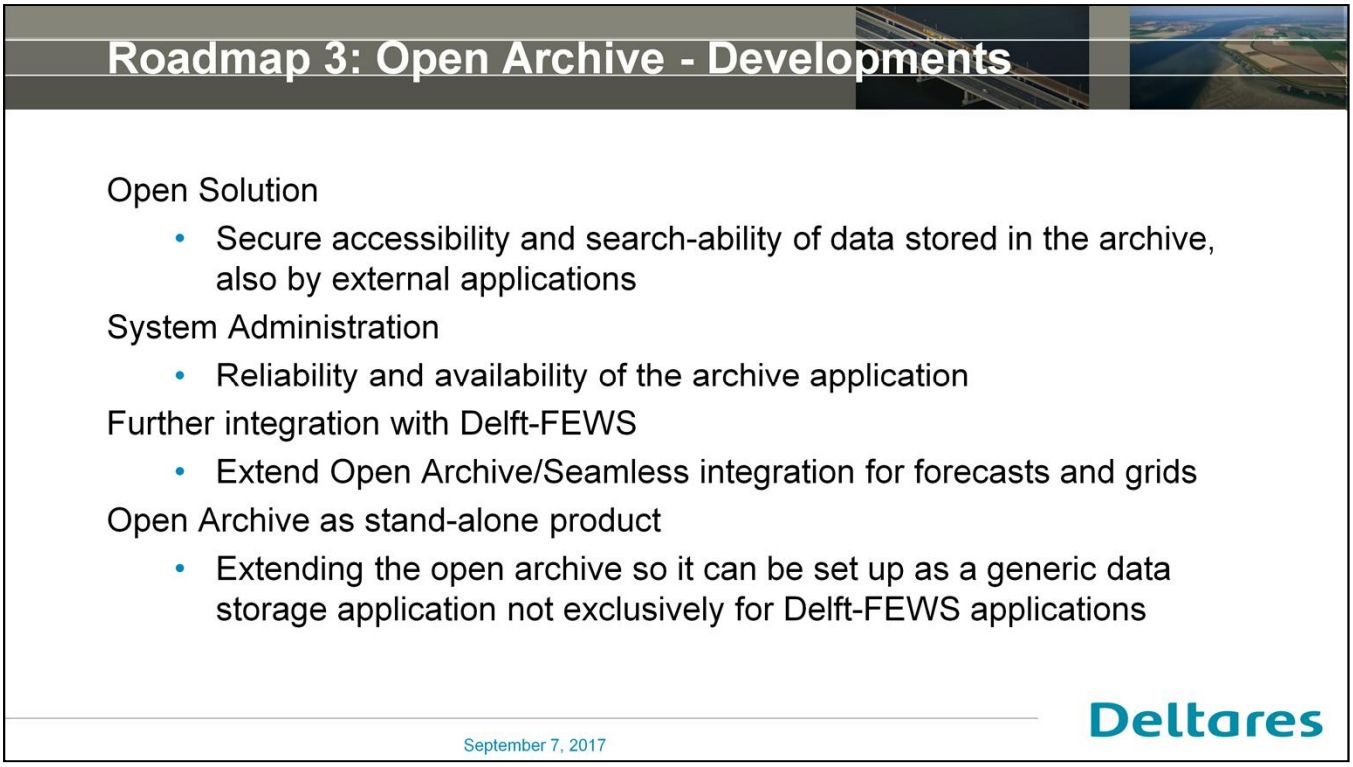
These roadmap's developments can be labeled as follows:

We would like to improve and restructure the **install package** in such a way that it is made **simpler** and **straightforward** to install. At the same time this enables the development team to **restructure the code** and improve the way developments are implemented and **tested**. By this restructuring we make sure that the **functionality stays consistent** amongst the different types and protocols which are supported.

An extension of the supported web services fits within this approach. Currently, it is mostly XML based (data structured in an XML file format is exchanged between 'machines') but an extension to a widely used **JSON format** is foreseen.

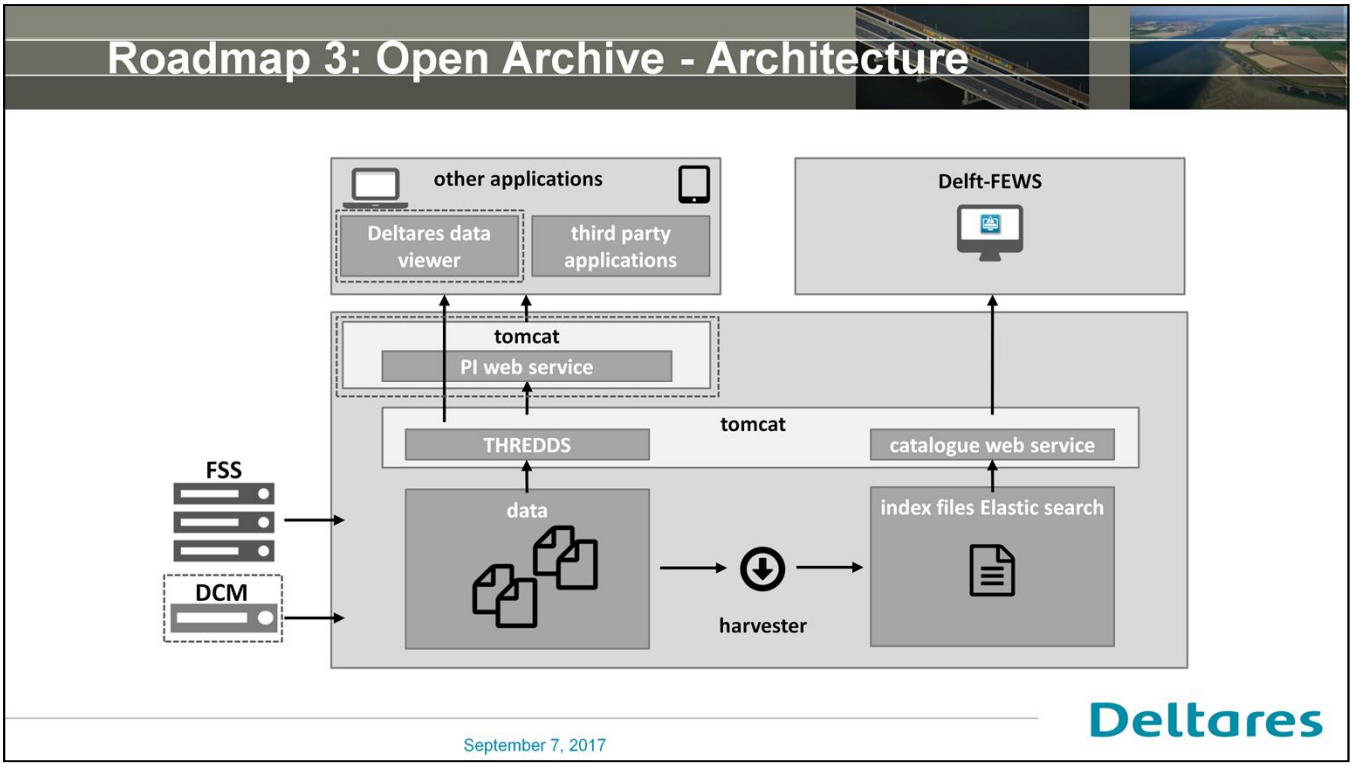
For supporting **gridded data**, this is foreseen as well. In this way, external applications could gather the 'images' from e.g. the GridDisplay on to a website. An way for storing these images (pictures of the GridDisplay) is a Web Mapping Service (WMS). It is foreseen to implement WMTS in which the 'T' stands for 'Tiling'. By tiling these images the storage and transport of these images is very efficient and only the necessary parts (only the map-extent which is visible on your screen) are transported.

And of course **security and performance aspects** are part of this roadmap as well.

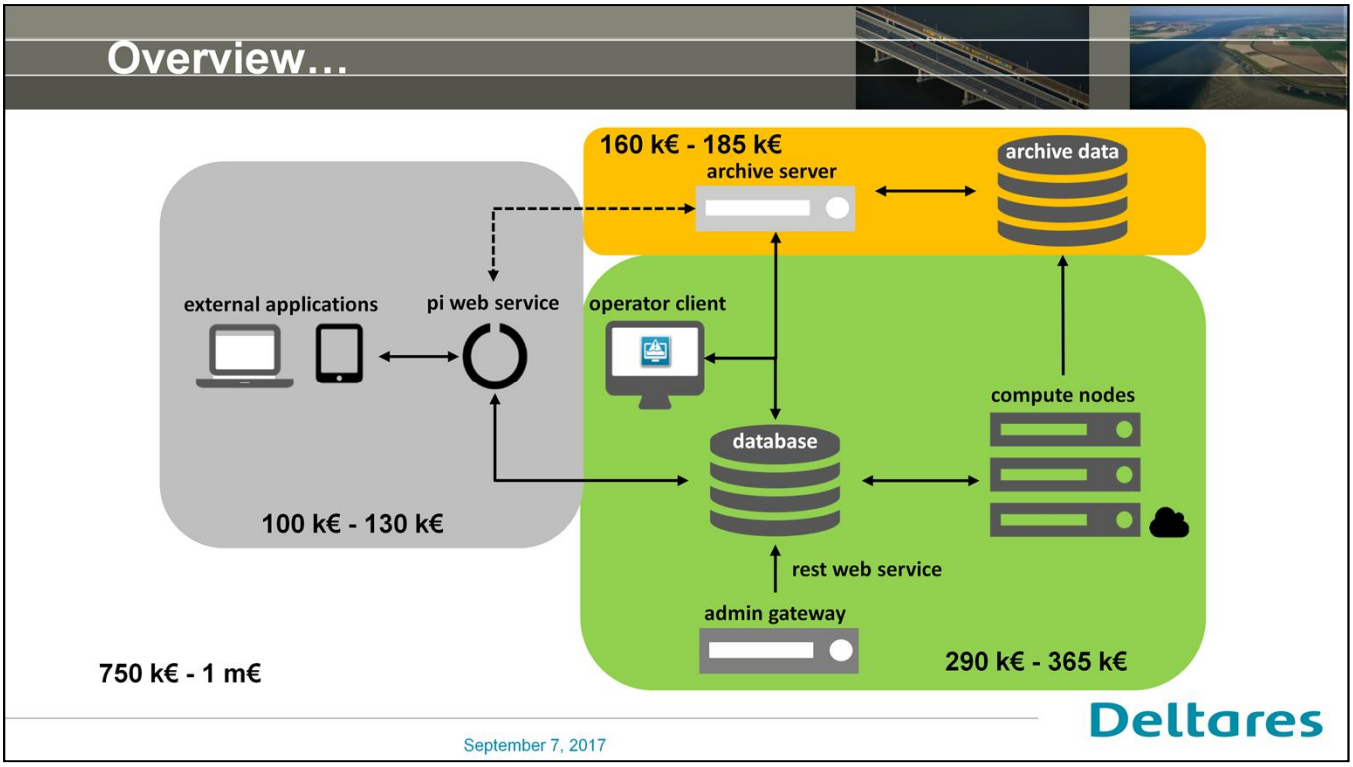


These roadmap's developments can be labeled as follows:

As explained in the previous slide, the topics are elaborated as such



The Open Archive is an existing, but optional component in the Delft-FEWS suite. That will remain as such, but it will be part of a standard roll-out in which it will be up to the end user to install it (or not). Currently, the Open Archive is already connected to Delft-FEWS. The Archive receives (outdated) forecasts and observations on a regular basis for permanent storage. By means of ‘seamless integration’ the Delft-FEWS user is able to – automatically – retrieve data when it is not available anymore in the ‘operational’ database.


Overview…
160 k€ - 185 k€
archive server
archive data
external applications
pi web service
operator client
compute nodes
database
rest web service
admin gateway
100 k€ - 130 k€
290 k€ - 365 k€
750 k€ - 1 m€
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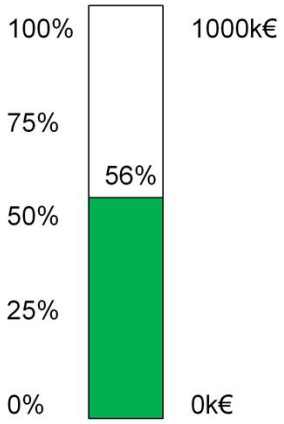
Finances: Results per 1/9/2017

Source	Contribute to Roadmap(s)	(k€)	Status
Rijkswaterstaat in the Netherlands (RWS)	Backend	50	guaranteed
Tennessee Valley Authority	Backend	70	intended
GO-FEWS (Dutch Waterboards)	all	160	guaranteed
National Weather Service (US)		77	guaranteed
Australian/SE-Asia users			Under discussion
UK, Swiss, AT, It, Germany			**Under discussion today / next week**
Deltares (internal, research, EU)	all	200	guaranteed
Total (Target is 1000 k€)		557	



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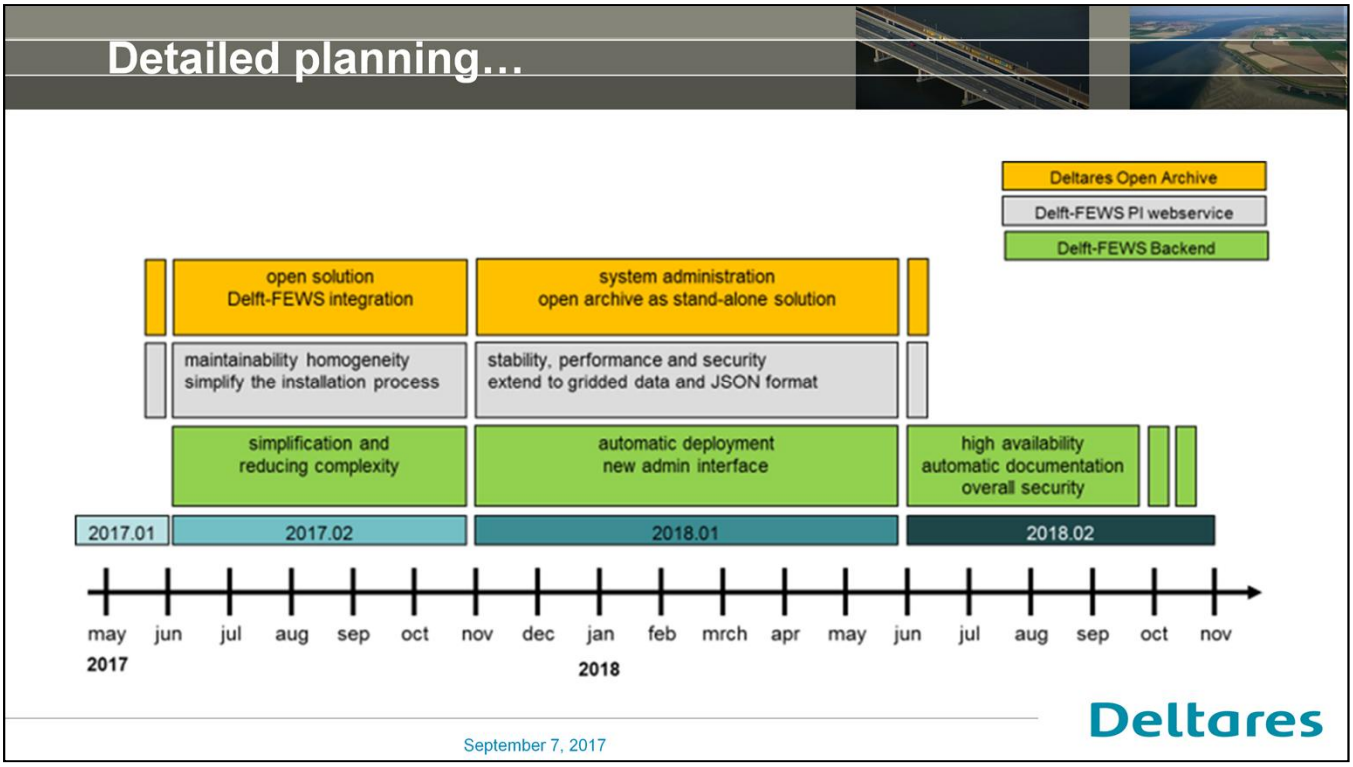
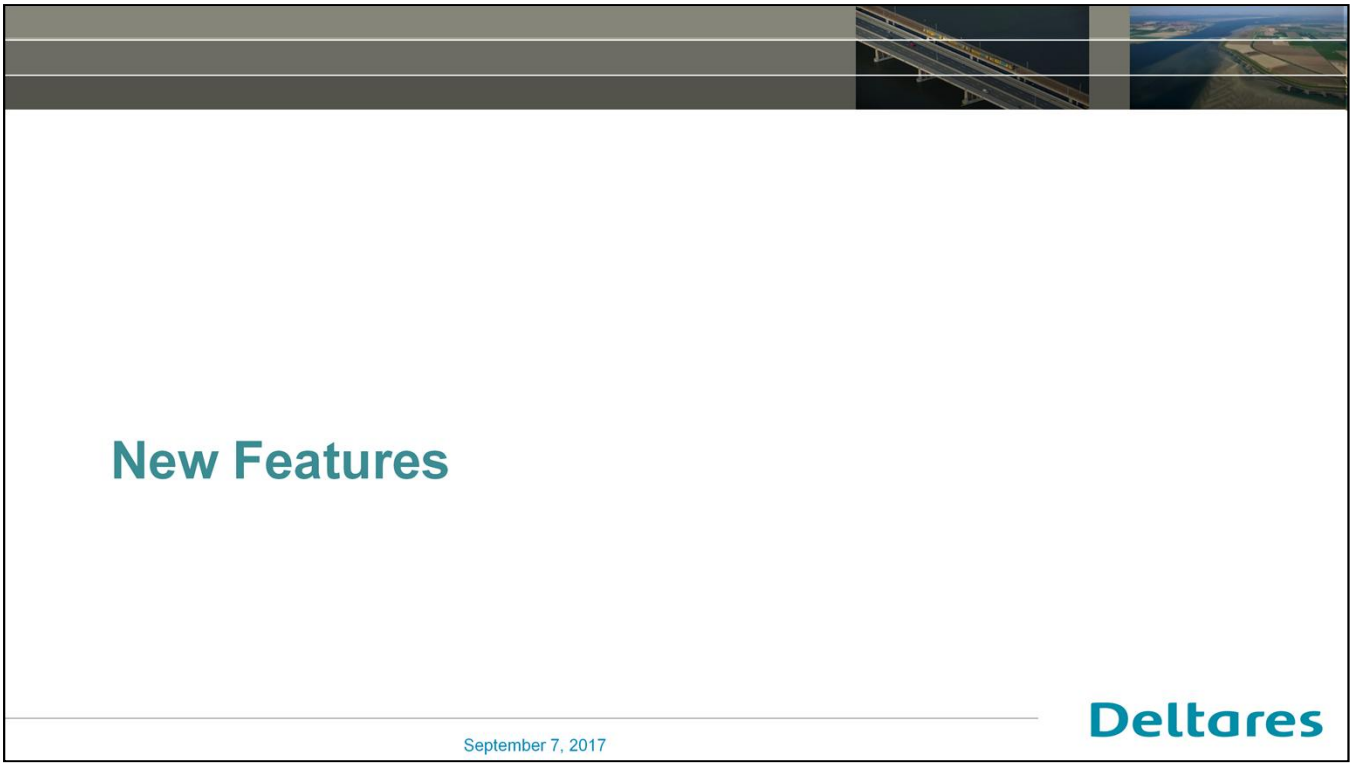
Since the Delft-FEWS system has a very strong community aspect, Deltares aims at contributions from all users.

The discussions with different clients about their contributions are in different stages. Some are ‘guaranteed’, others are ‘intensions’. Some discussions are on its way and some have to be started. The table provides an overview.


Detailed planning…
Deltares Open Archive
Delft-FEWS PI webservice
Delft-FEWS Backend
open solution
Delft-FEWS integration
system administration
open archive as stand-alone solution
maintainability homogeneity
simplify the installation process
stability, performance and security
extend to gridded data and JSON format
simplification and
reducing complexity
automatic deployment
new admin interface
high availability
automatic documentation
overall security
2017.01
2017.02
2018.01
2018.02
may jun jul aug sep oct nov dec jan feb mrch apr may jun jul aug sep oct nov
2017
2018
September 7, 2017
Deltares


New Features
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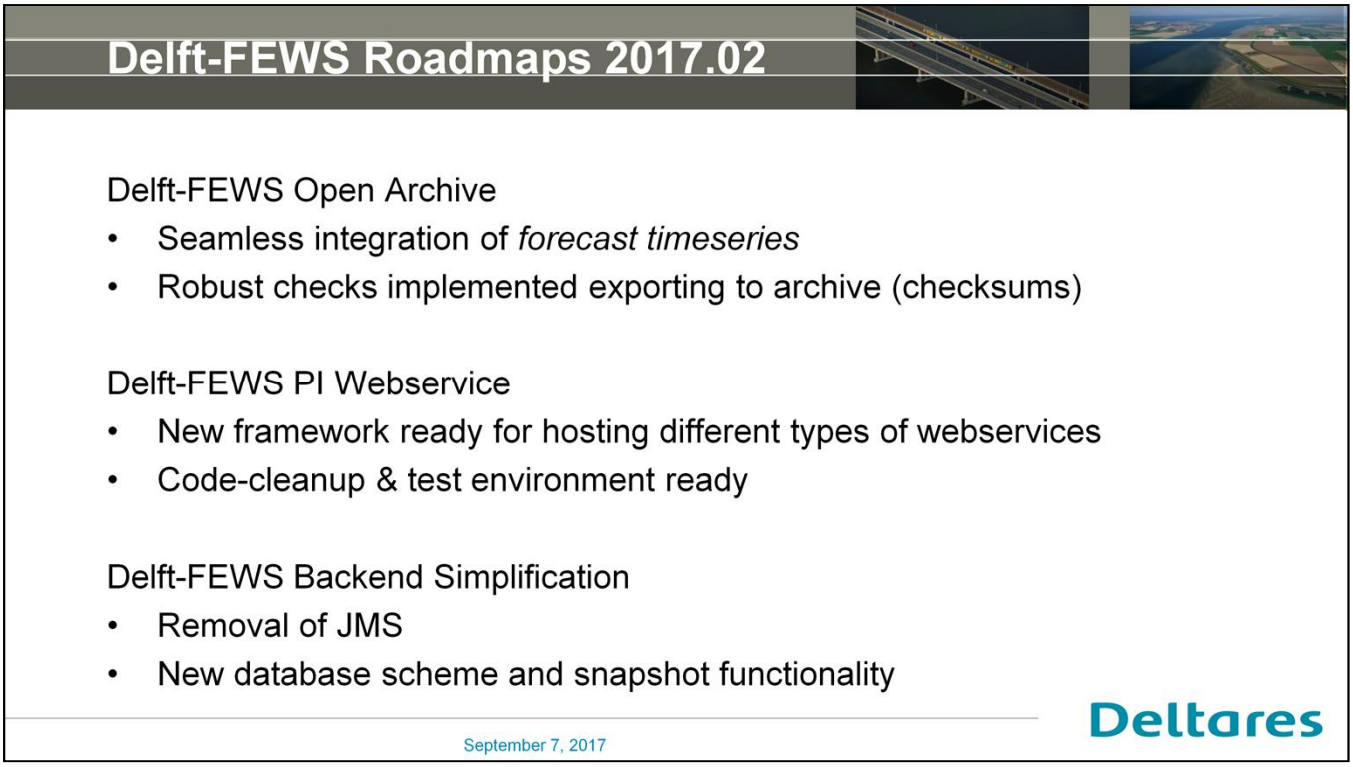
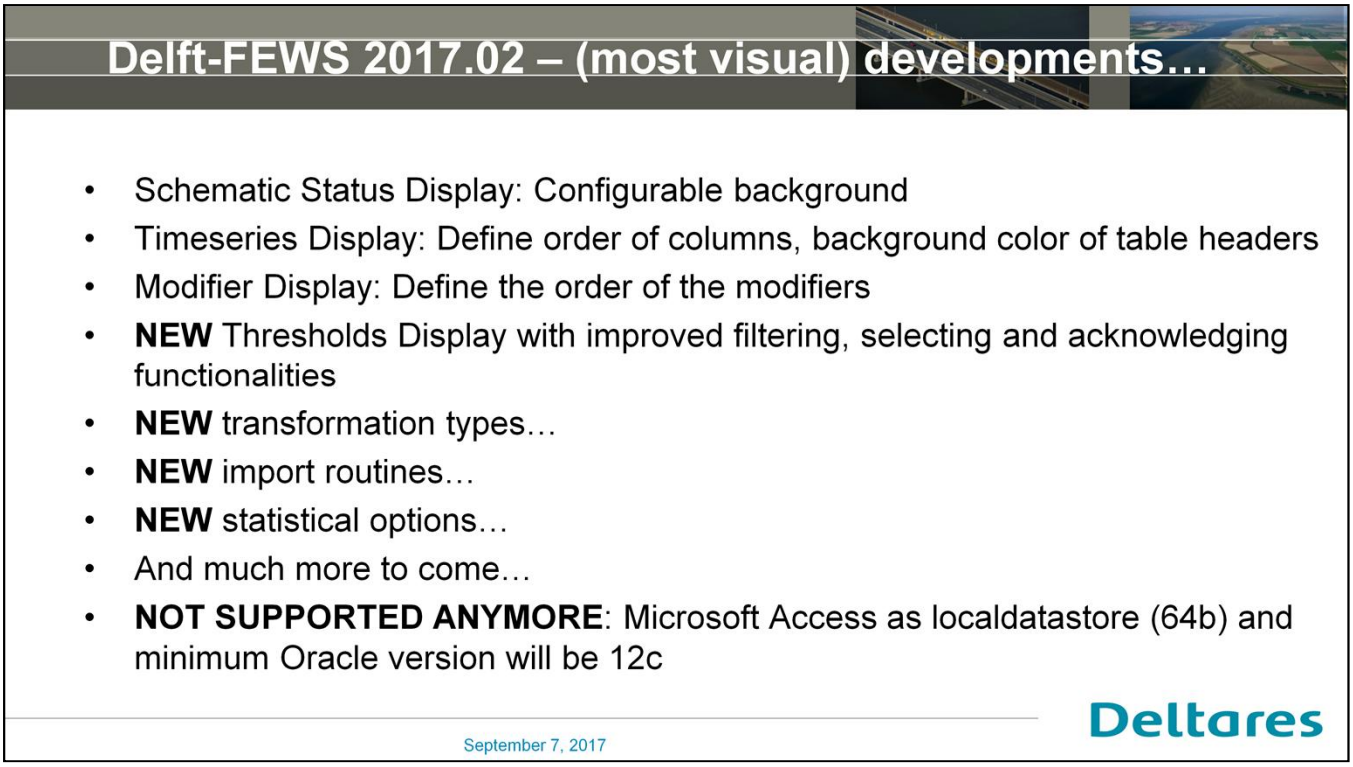


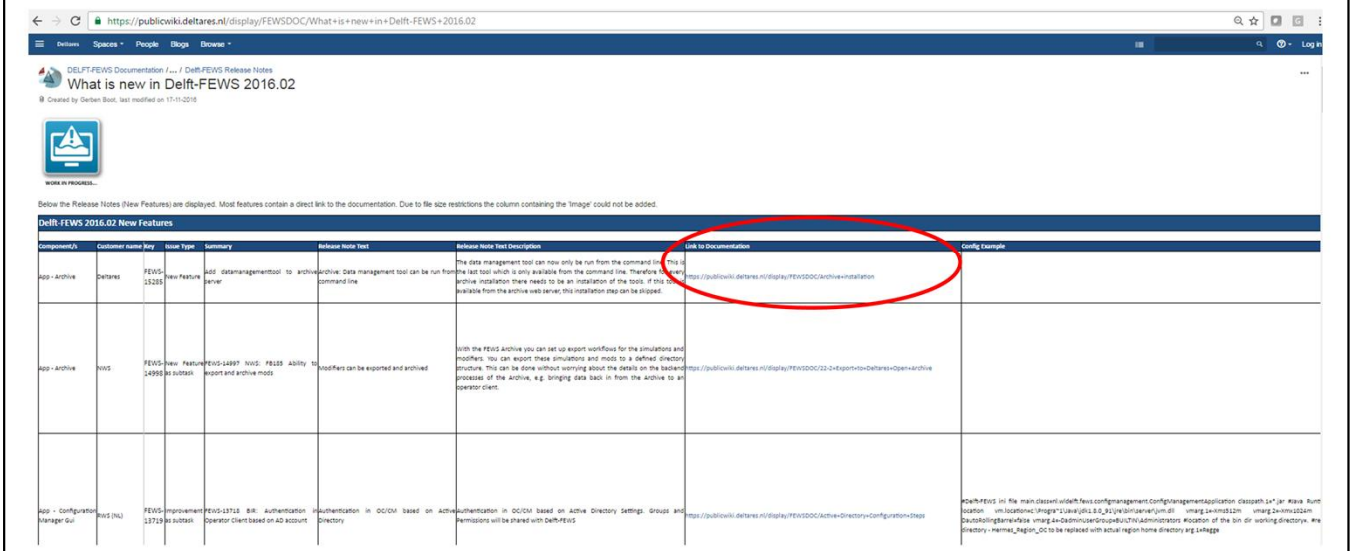
These are the developments that are described in the roadmaps and will be part of the release of 2017.02



High level developments in 2017.02

- Schematic Status Display: You can change the background color to something else than ‘white’.
- Timeseries Display
    - Freely define the order in which the columns appear and you can organise them by parameter group by coloring the complete table header for recognizability
- Modifier Display
    - You can now configure the order of the modifiers in the drop-down box.
- NEW thresholds display. A new thresholds display has been developed for quicker inspection of thresholds, corresponding actions and more possibilities to filter on certain events including acknowledging of messages about the thresholds.
- NEW import routines and statistical options
- Important to mention is that Microsoft Access localdatastores are not supported anymore on 2017.02 (64b) en minimum Oracle version is v12c.

Release Notes



https://publicwiki.deltares.nl/display/FEWSDOC/Delft-FEWS+Release+Notes

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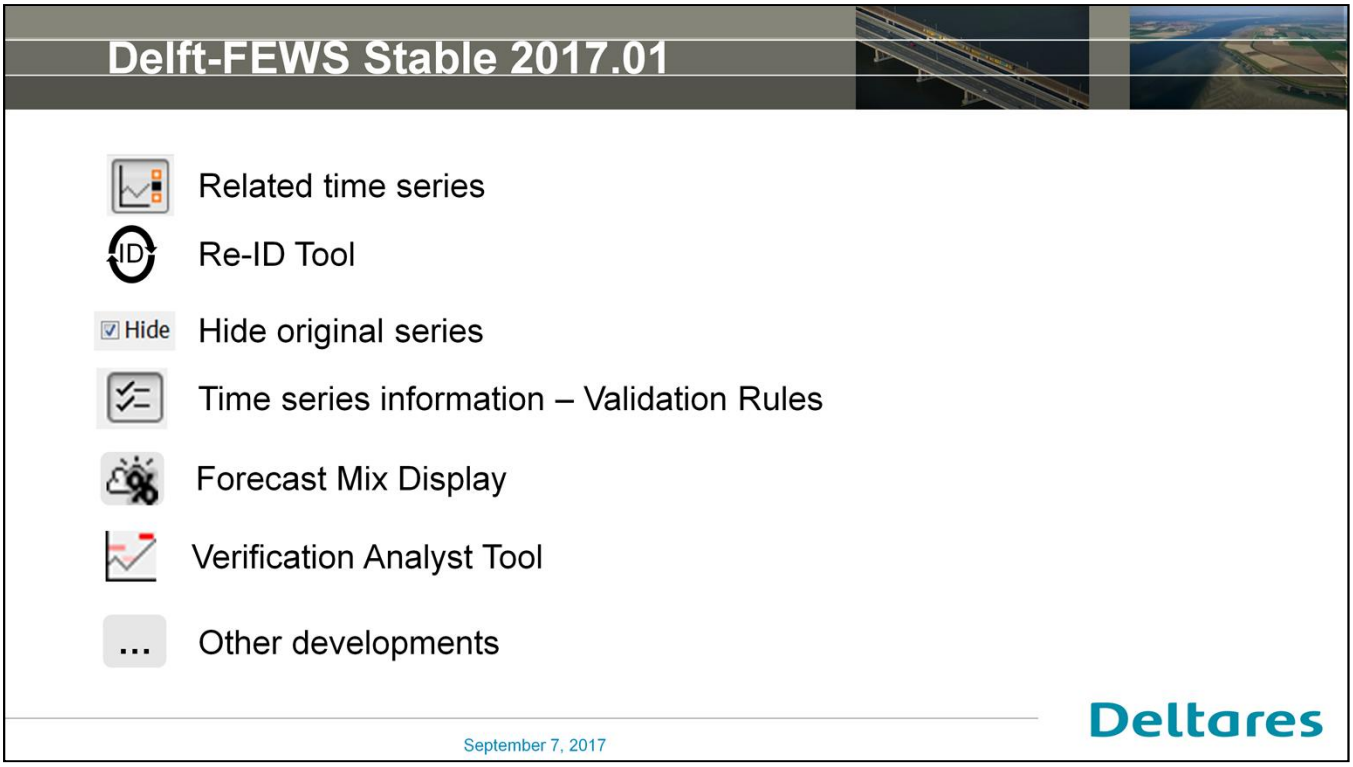
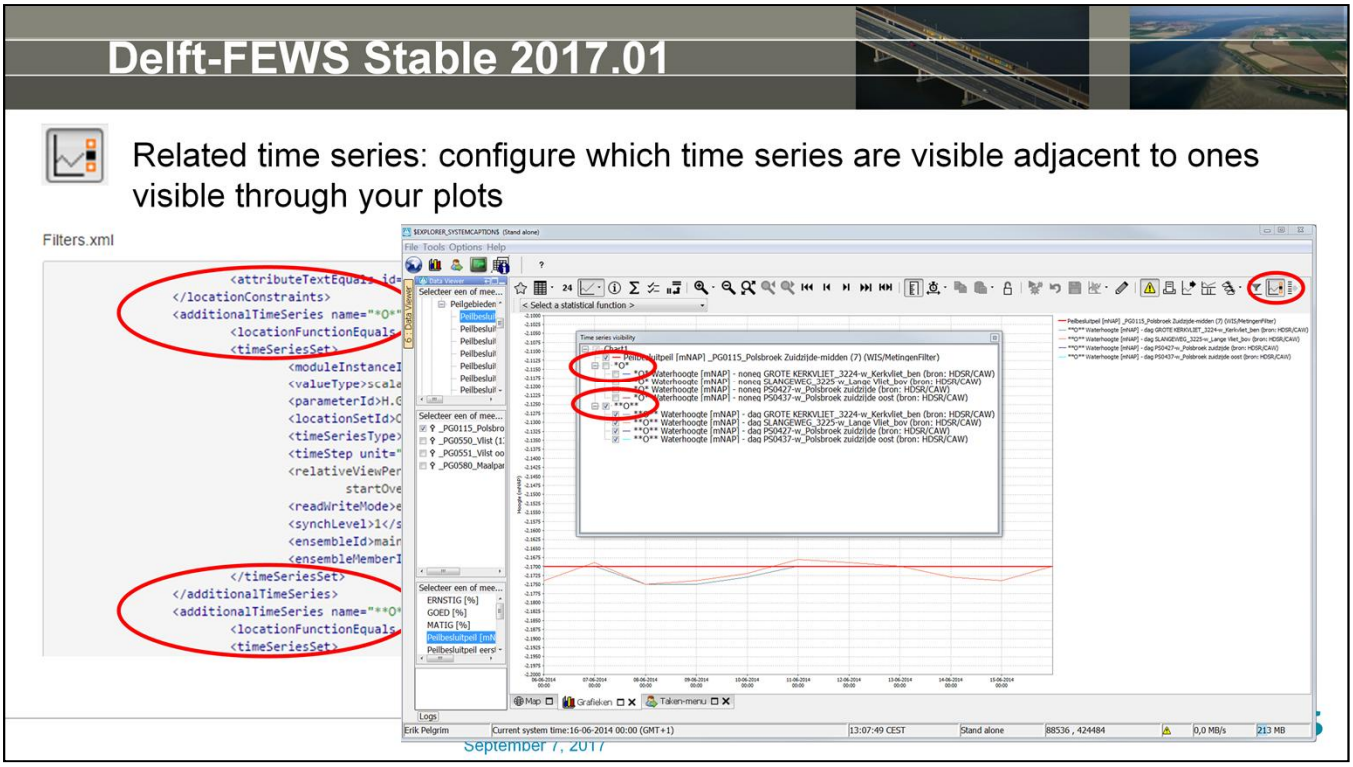


Gerben

Input voor ppt nieuwe functionaliteit.
2017.01:
https://issuetracker.deltares.nl/browse/FEWS-13719
https://issuetracker.deltares.nl/browse/FEWS-8003
https://issuetracker.deltares.nl/browse/FEWS-14055
https://issuetracker.deltares.nl/browse/FEWS-14439
https://issuetracker.deltares.nl/browse/FEWS-14563
https://issuetracker.deltares.nl/browse/FEWS-15041
https://issuetracker.deltares.nl/browse/FEWS-15623

Verification Analyst Tool
Forecast Mix Display



Related Timeseries in the TimeSeriesDisplay

You can configure which timeseries you would like to see adjacent to the ones which are visible through your plots.

In the TSD, a new button will show up in order to switch them on / off…

Re-Id Tool (aka Persistent-Id)

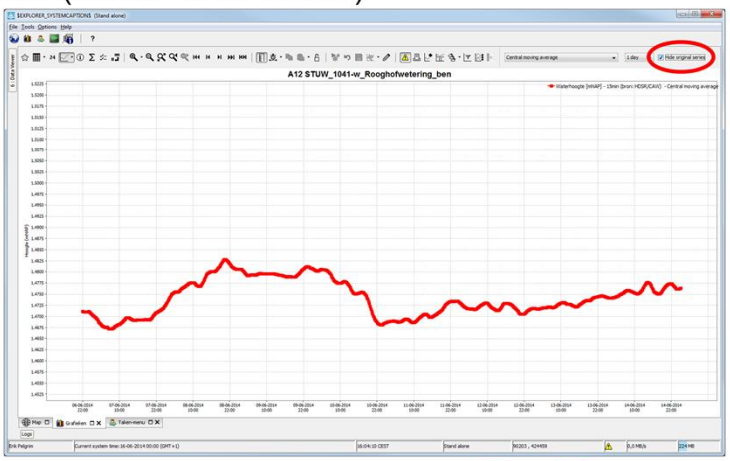
In case you would like to overrule an ID in your configuration a global CSV can be added which decribes the ‘new’ and the ‘old’ name.

ID’s might contain a typo or you would like to make your configuration consistent. The database itself is not touched/changed.

Delft-FEWS Stable 2017.01

☑ Hide Hide original series

- Checkbox for hiding original timeseries (statistical functions)
  - Differences
  - Duration exceedence
  - centralMovingAverage
  - movingAverage
  - accumulationAggregation
  - calendarAggregation
  - cumulative
  - relativeAggregation
  - accumulationInterval



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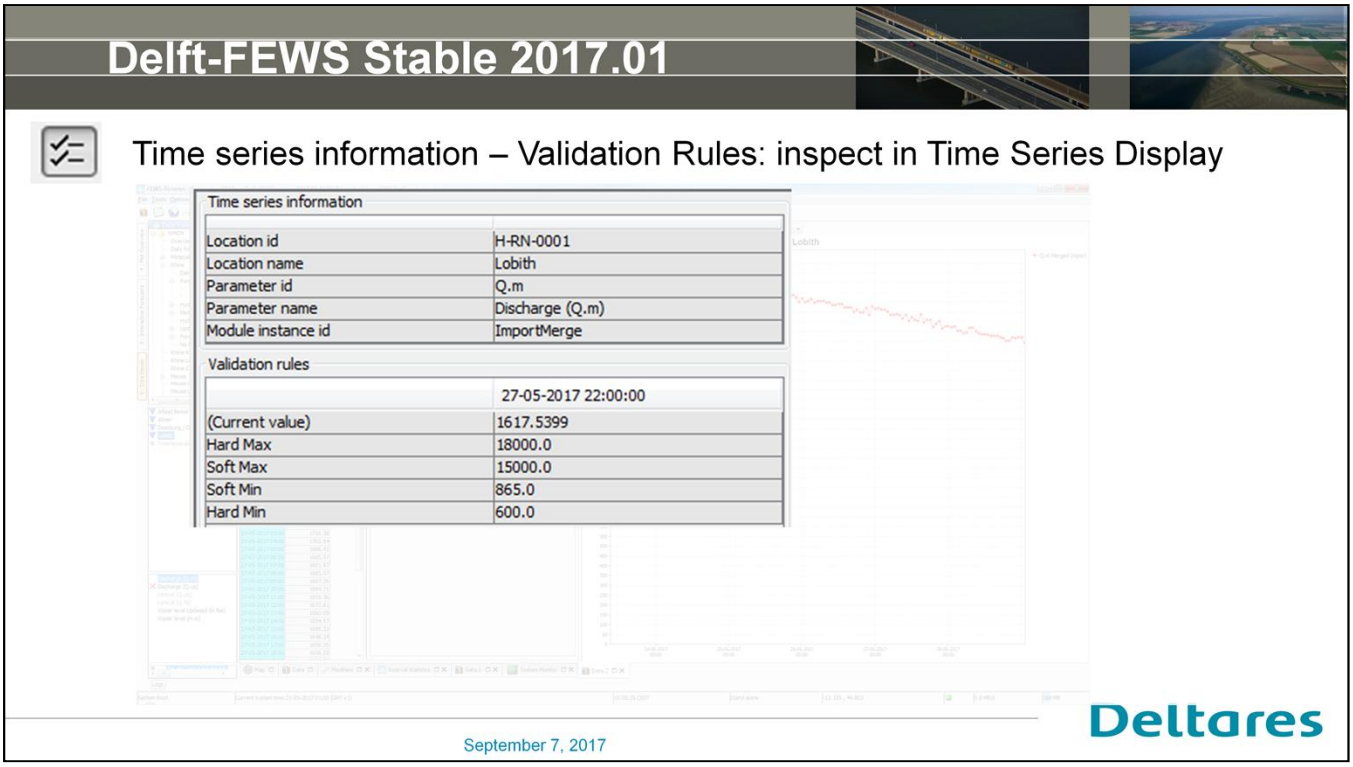
You can hide original timeseries when looking at derived/statistical series.

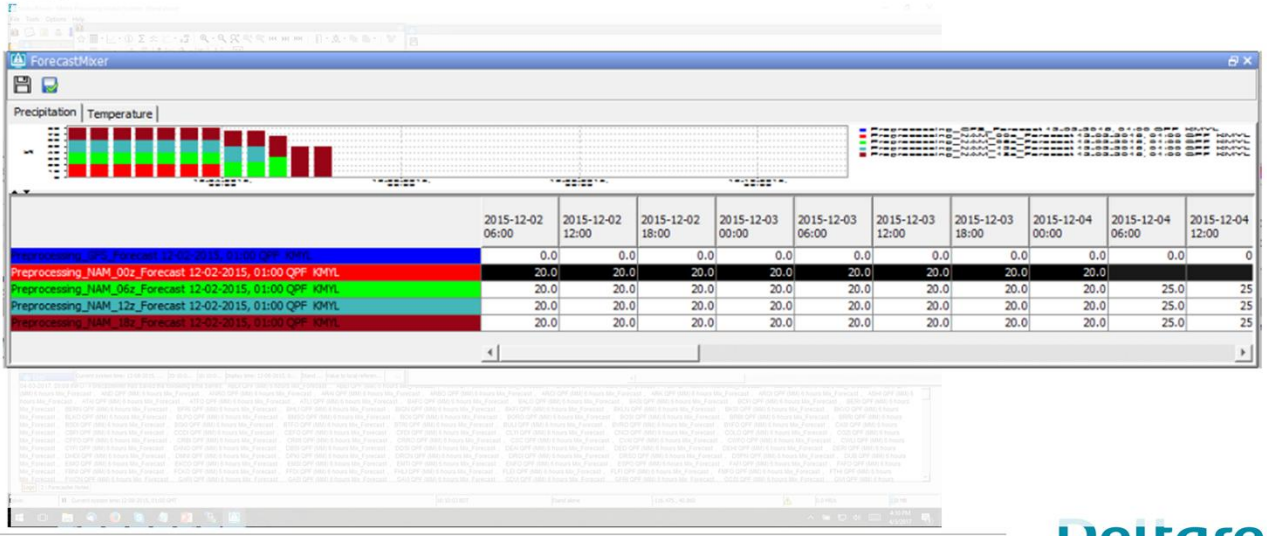
In this way the display is not cluttered up (original and derived series together) and you can focus on the statistical series.



When you have configured Validation Rules for a timeseries, you can now inspect them directly through the Timeseries Display.

Delft-FEWS Stable 2017.01

Forecast Mix Display: visual way of merging two or more forecasts



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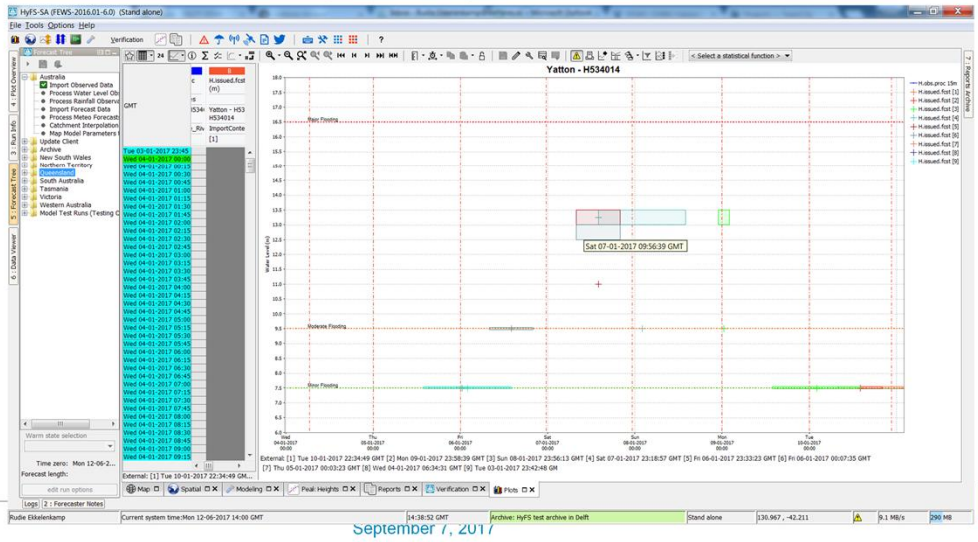
The Forecast Mix Display is a visual way of merging two or more forecasts by applying weights to them in order to generate a ‘new, blended’ forecast series…

Delft-FEWS Stable 2017.01

Verification Analyst Tool: focus on threshold crossings and generated warnings and indicate events graphically



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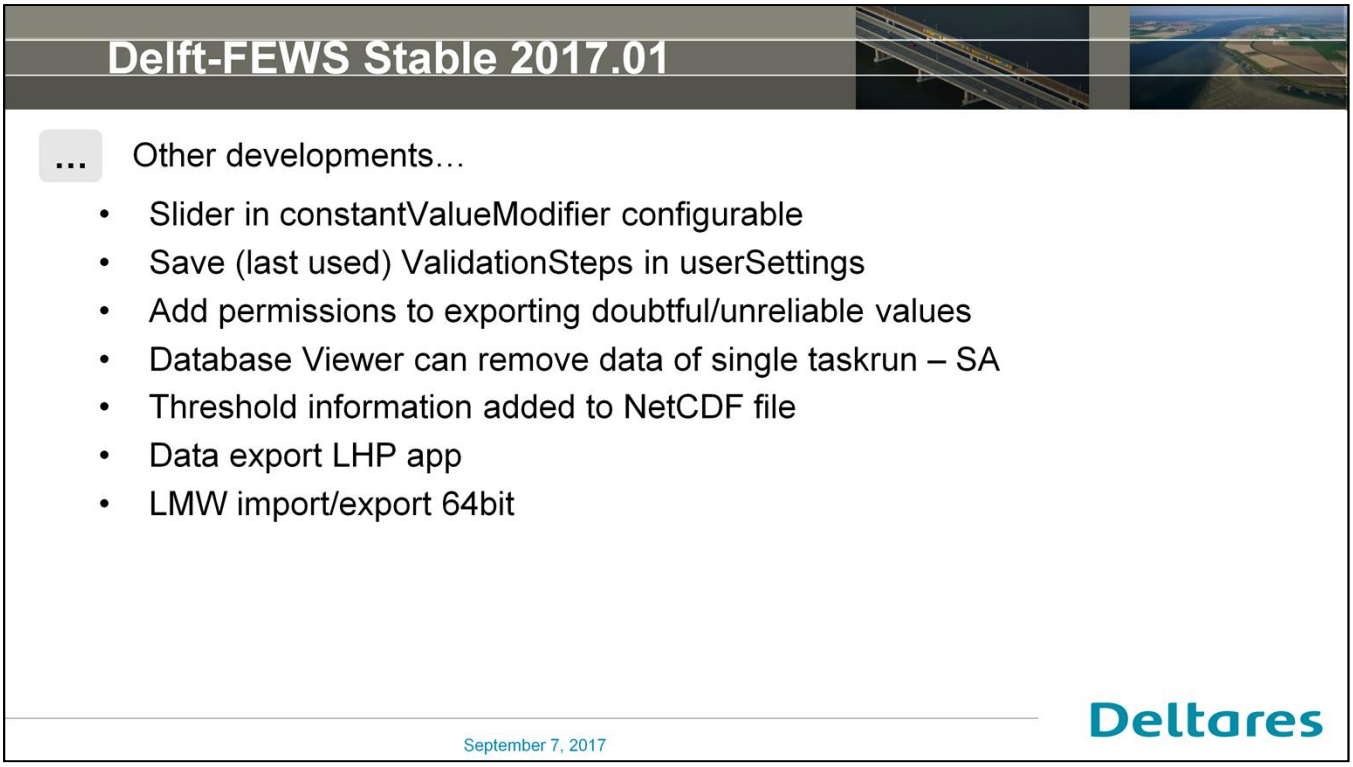
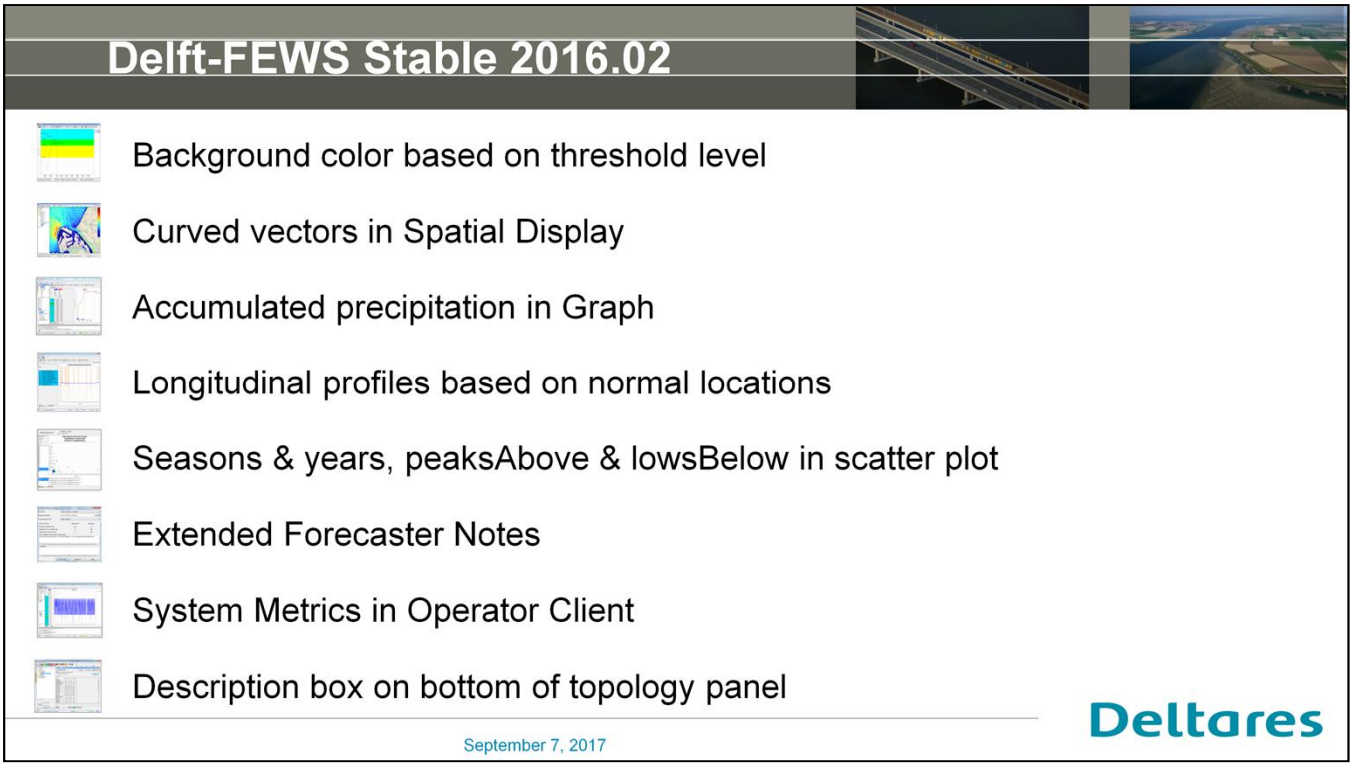
Verification Analyst Tool is a tool designed to focus on threshold crossings and generated warnings and indicate (extreme) events graphically. Users can specify ‘flood periods’ and ‘flood events’. Mostly used for post-event analysis.



Some other examples of 2017.01 developments, no further explanation needed

All release notes can be found on the wiki

https://publicwiki.deltares.nl/display/FEWSDOC/What+is+new+in+Delft-FEWS+2017.01



2016.02:

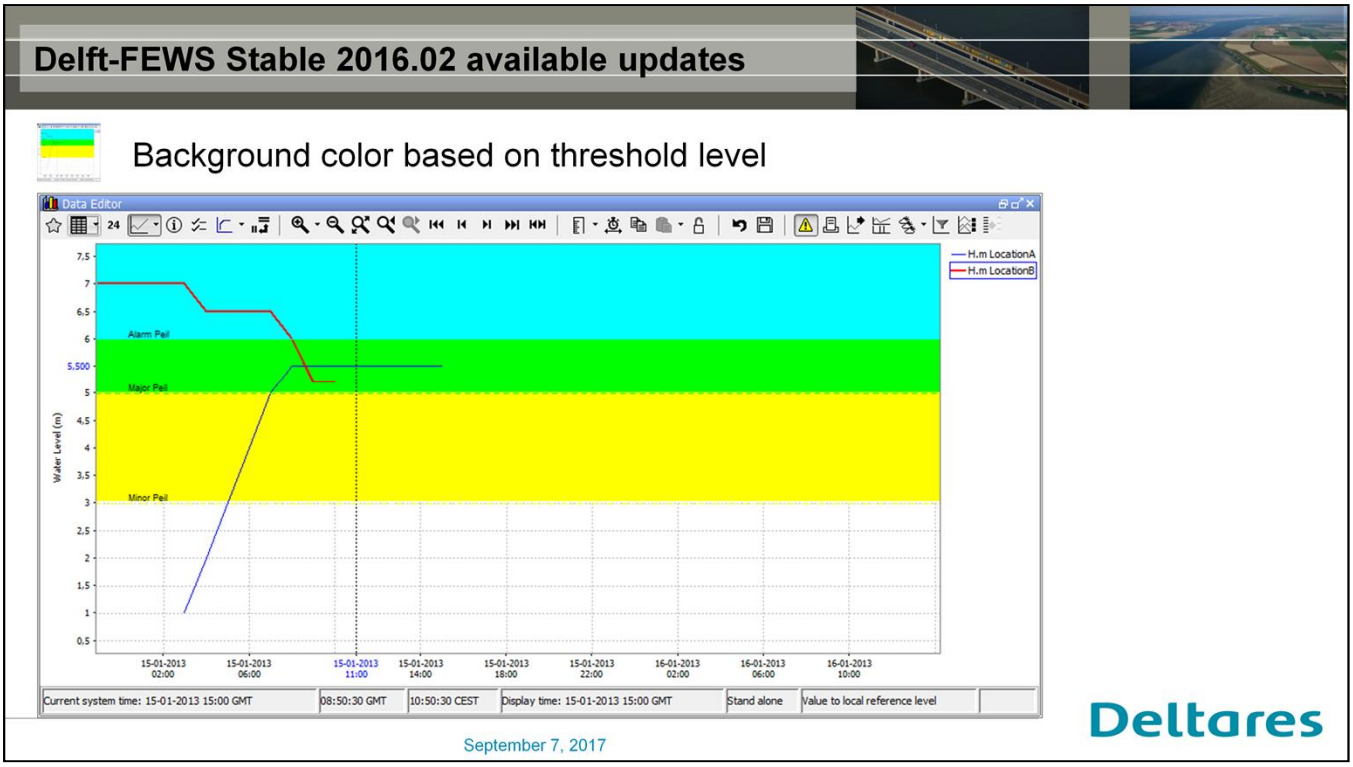
https://issuetracker.deltares.nl/browse/FEWS-14600
https://issuetracker.deltares.nl/browse/FEWS-14603
https://issuetracker.deltares.nl/browse/FEWS-14817
https://issuetracker.deltares.nl/browse/FEWS-15042

De volgende drie samen:

https://issuetracker.deltares.nl/browse/FEWS-15043
https://issuetracker.deltares.nl/browse/FEWS-15044
https://issuetracker.deltares.nl/browse/FEWS-15045
https://issuetracker.deltares.nl/browse/FEWS-15063
https://issuetracker.deltares.nl/browse/FEWS-15312
https://issuetracker.deltares.nl/browse/FEWS-15522

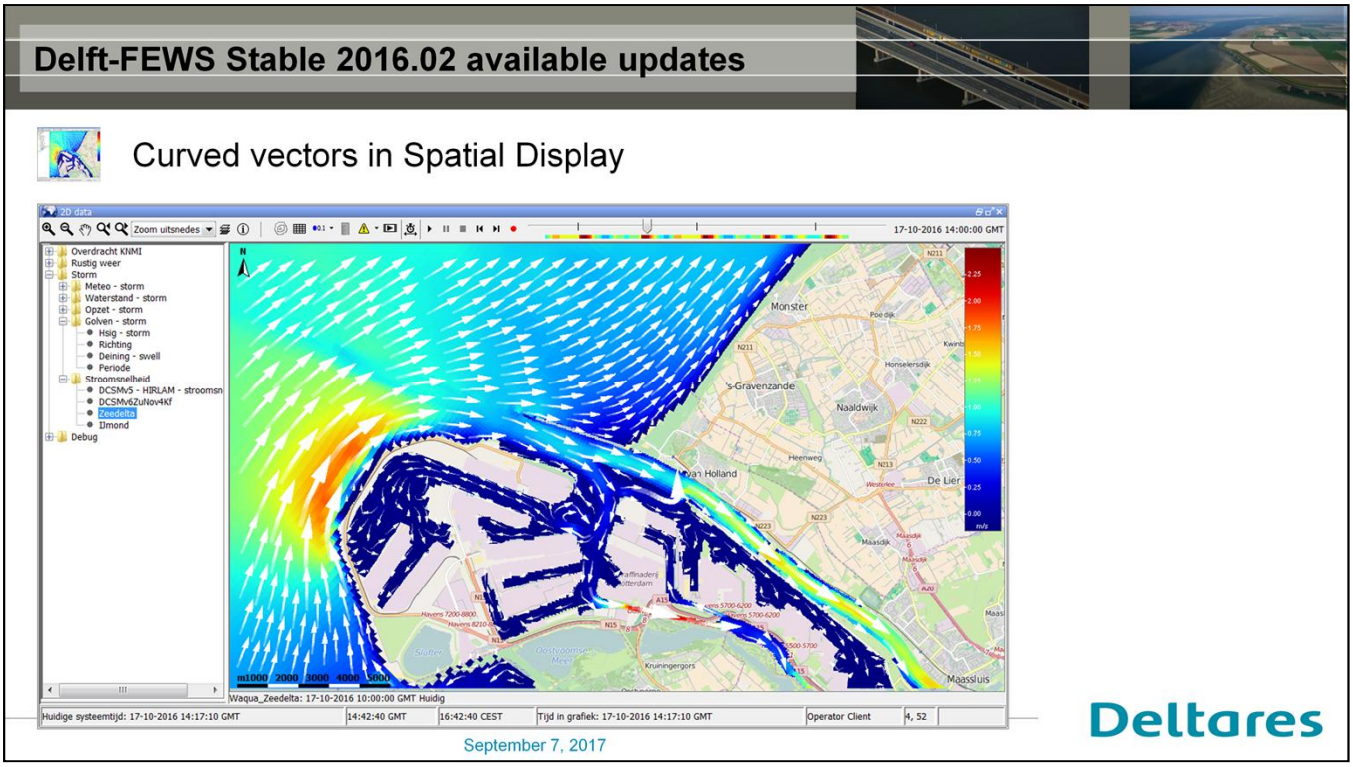
https://issuetracker.deltares.nl/browse/FEWS-14916 Adjustment PCOverslag adapter

https://issuetracker.deltares.nl/browse/FEWS-14917 LMW import export 64bit



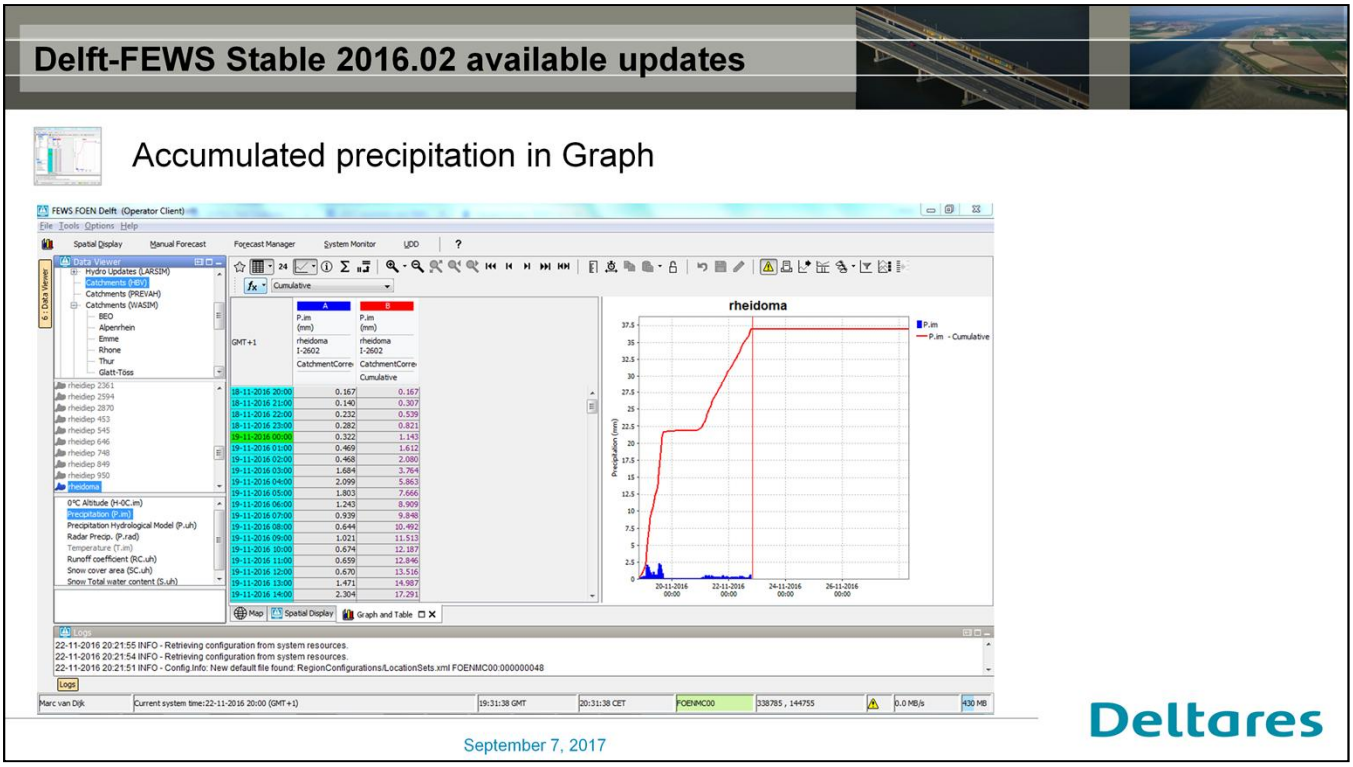
https://issuetracker.deltares.nl/browse/FEWS-14603

This option is available in Chart drop down menu.
When this option is switched on, and there are any thresholds visible in the plot , then the space between the separate threshold lines will be filled using the color of the relevant threshold.



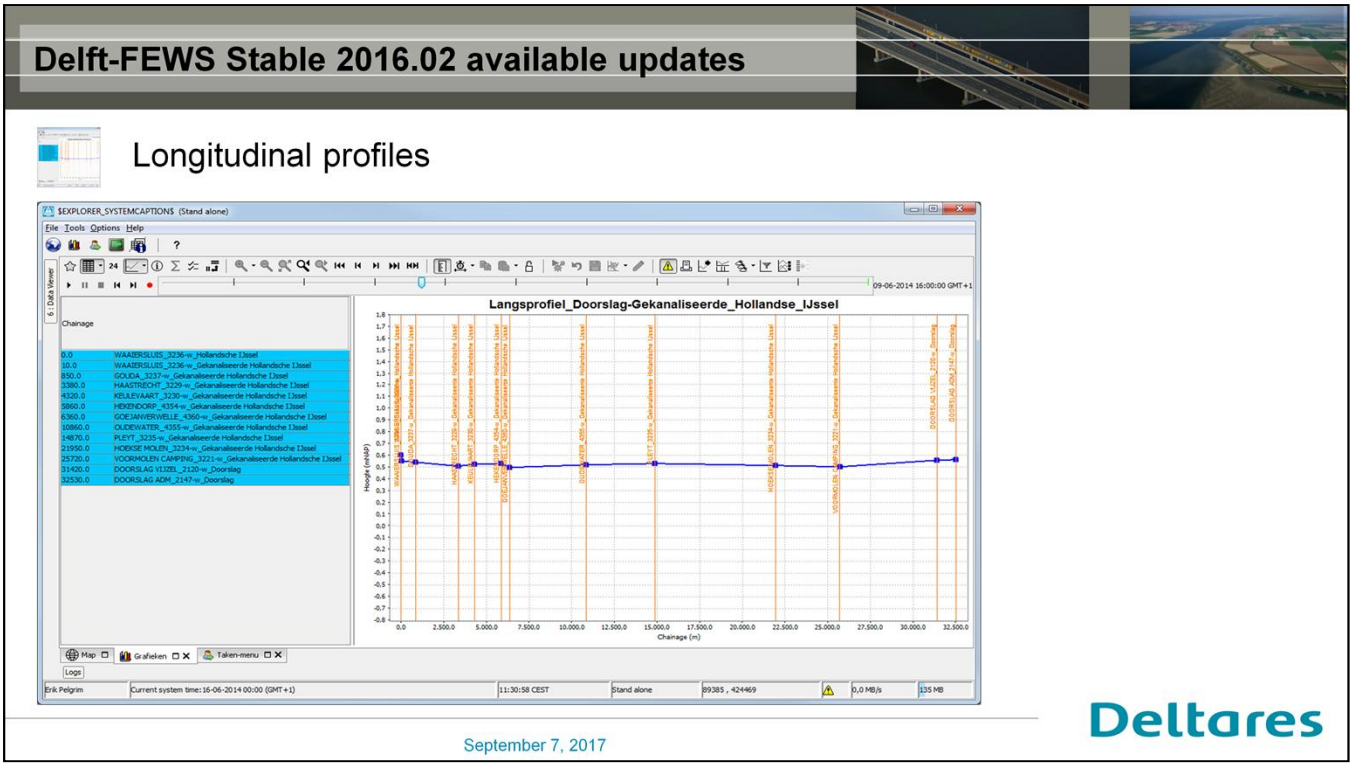
https://issuetracker.deltares.nl/browse/FEWS-14600

Vectors in spatial display are now also curved (if relevant) to show the flow patterns more realistically



https://issuetracker.deltares.nl/browse/FEWS-14817

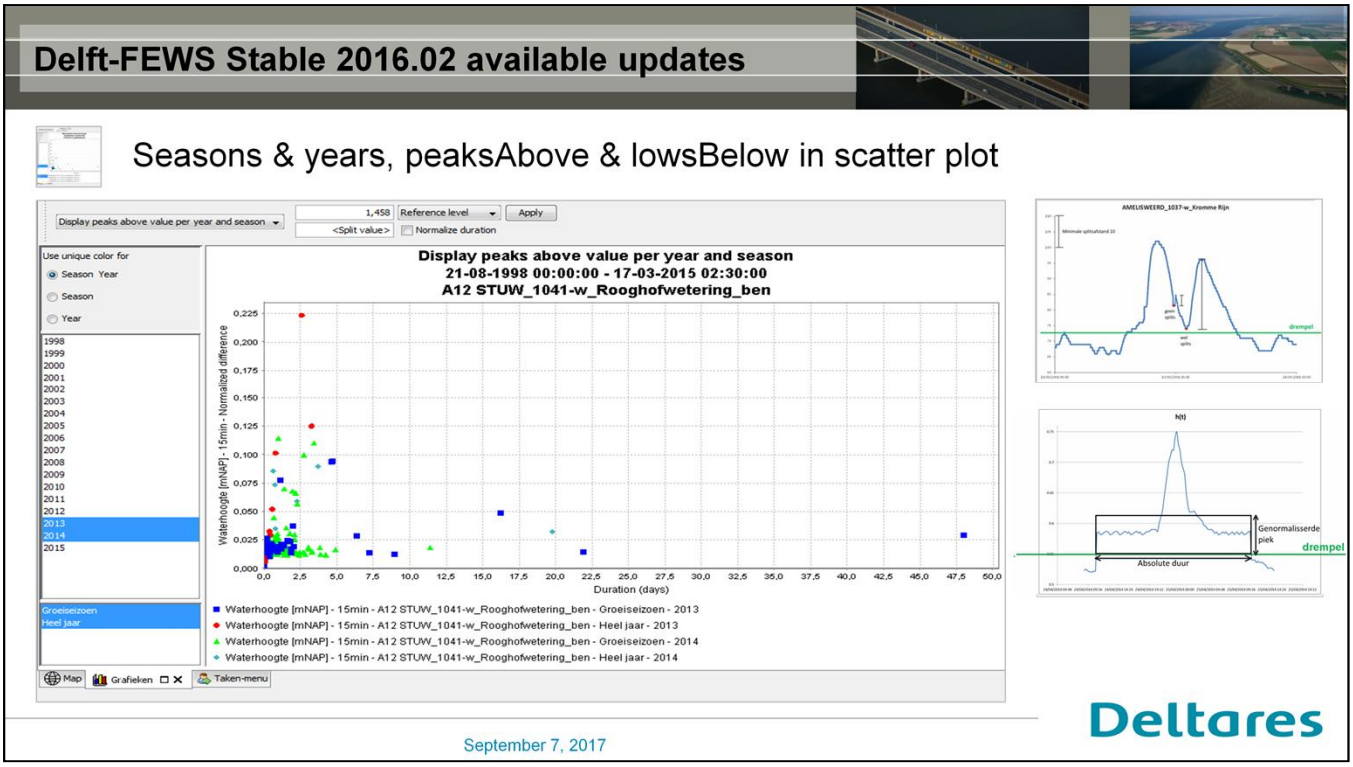
1. Forecaster selects one or more time series in the map or data viewer (for example 2 series).
2. Forecaster opens the Graph and Table display: table shows 2 columns with time series, graph shows 2 lines (or bars).
3. Forecaster selects cumulative function to compute the cumulative of the series in the table.
4. Table will show two new columns with the cumulative of series 1 and series 2 in the table.
5. Graph will show 2 new lines in the graph with cumulative of series 1 and 2. The line style (line or column) of the new series will be a line and not bars (bars is default for accumulative parameter-Types in FEWS).
6. When forecaster zooms out in the graph the new cumulative series will be updated to have cumulative series for the complete visible view period.



https://issuetracker.deltares.nl/browse/FEWS-15042

Possibility to view scalar time series for multiple locations as longitudinal profile.
Waterstanden van al beschikbare punten in database
This is read only, and so far just for viewing. There needs to be a separate locationset which refers to a location attribute which determine whether the location is part of the profiel and at which chainage.

Primair: zelfde display alleen afleiden vanuit bestaande locaties en waardes om dubbele opslag in de database op te lossen.
In csv wordt dit behaald door chainages als locations set met specifieke attributen te configureren



https://issuetracker.deltares.nl/browse/FEWS-15043

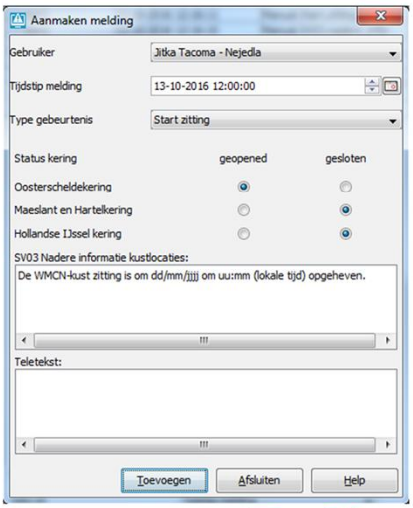
https://issuetracker.deltares.nl/browse/FEWS-15044

https://issuetracker.deltares.nl/browse/FEWS-15045

Delft-FEWS Stable 2016.02 available updates

Extended Forecaster Notes

- Store additional information with forecast
  - Status barrier
  - Text information for SV03
  - Text information to be published (Teletekst)
  - Time of message
  - Type of update
- Replacing existing BulletinBoard messages for SVSD



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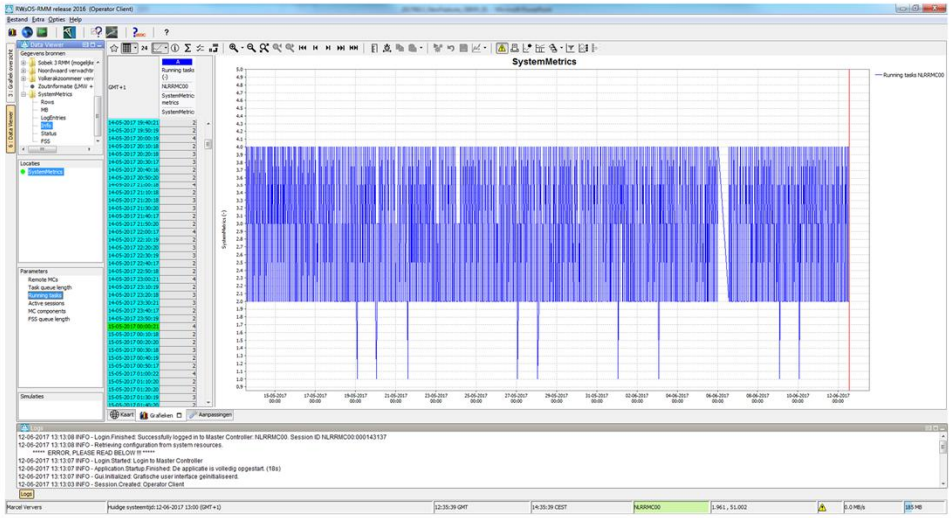
https://issuetracker.deltares.nl/browse/FEWS-15063

Replaces notes in bulletin board

Delft-FEWS Stable 2016.02 available updates

System Metrics in Operator Client



- Timeseries records
- Database records
- Database size (MB)
- Logentries
- Connected users
- FSS capacity usage

but also:

- MC / FSS status
- FSS queue length
- Size database tables
- Nr spec. eventcode

… for all MC's

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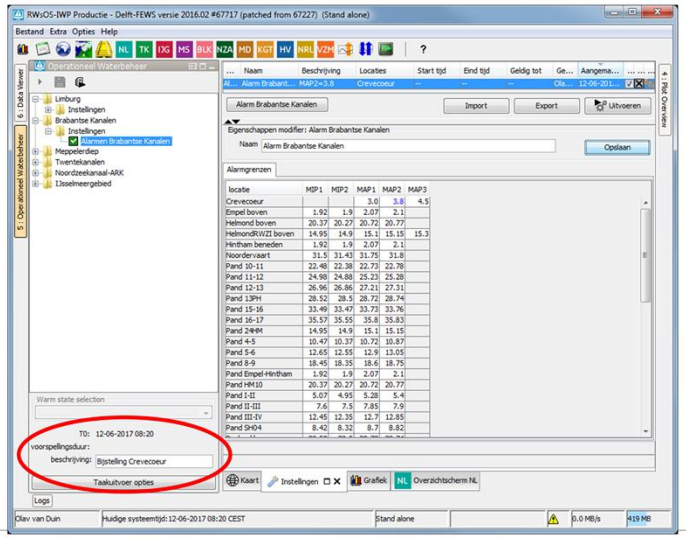
https://issuetracker.deltares.nl/browse/FEWS-15312

The new SystemMetrics module can store live system information.
1 the amount of records / rows and Mb in the database,
2. the amount of records / rows and Mb in individual tables.
3. Errors, warnings (all or matching a specific eventCode such as Config.Error),
4. MC status, such as the number of running tasks, amount of live components
5. individual MC components
6. FSS build number, down status and queue length.

Delft-FEWS Stable 2016.02 available updates

Description box on bottom of topology panel



Not necessary to open the “taskrun option”display

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https://issuetracker.deltares.nl/browse/FEWS-15522

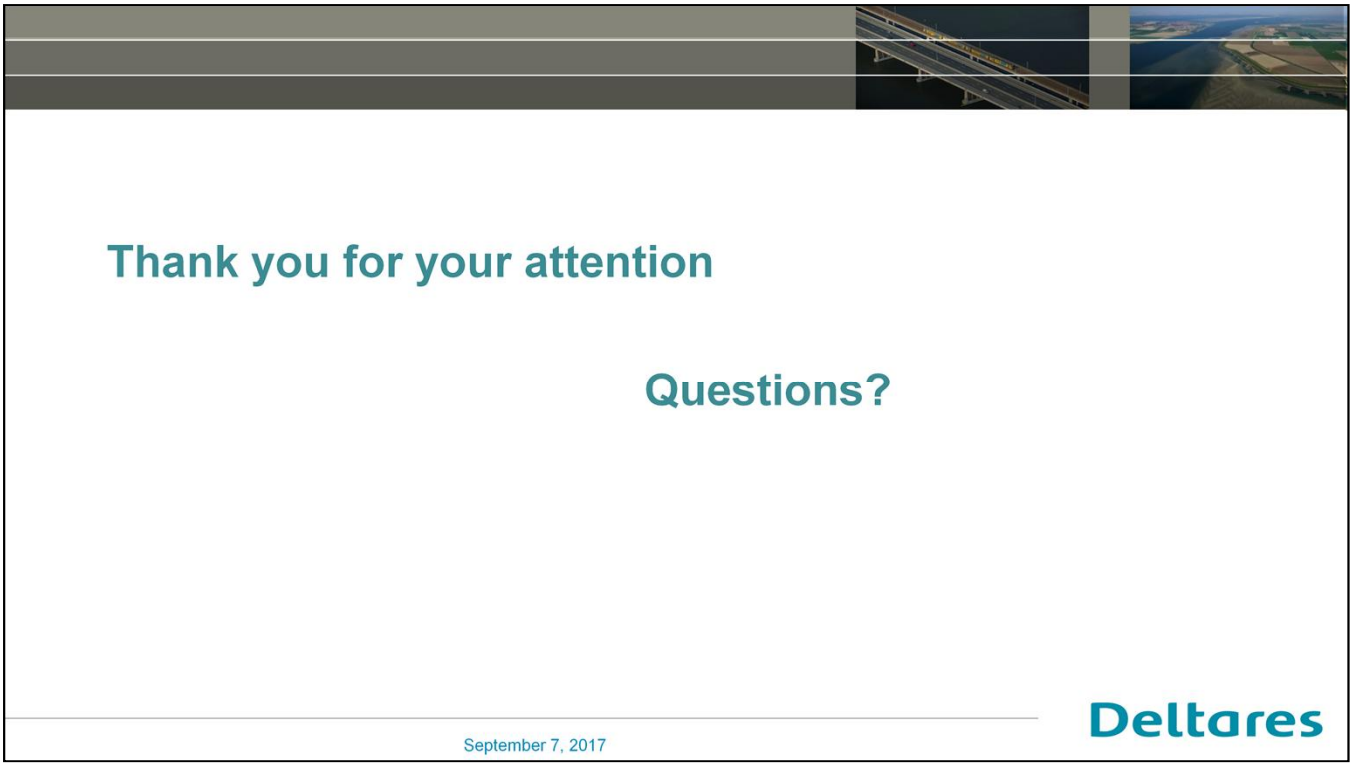
Add in the configuration the option to place a description box on the bottom of the topology panel, so that it is not necessary to open the "taskrun options" display

Developments: PI Webservice (2016.02/2017.01/2017.02)

- Threshold information can be retrieved through PI Webservice
- Manual edits can be retrieved through PI Webservice
- Forecast Taskrun information can be retrieved through PI Webservice
- Status Page added (for admin)
- Checks added if data synchronisation has completed
- Modifiers can shared through the PI Webservice

Developments: Archive (2016.02/2017.01/2017.02)

- Archive Admin page added
- Clean-up tools improved
- Export of modifiers to archive added
- Export of properties to archive added
- Seamless integration of *forecasts*
- Enabling exchange with 'external tools' for harvesting the catalogue
- Elastic Search Catalogue can be accessed through the PI Webservice


Thank you for your attention
Questions?
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