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Deltares

Delft-FEWS Stable Release 2022.02

Release Notes

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Release Notes

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Summary

This document contains the release notes for Delft-FEWS Stable Release 2022.02

Contents

1 Introduction

1.1 General

This document is the overall Release Notes Document for the Delft-FEWS Stable 2022.02 version which was released on xxth of December 2022 (planned date).

This release contains around 124 **new features** (paid by implementation projects, existing clients, internal funding etc) to the Delft-FEWS components: Operator Client, Forecasting Shell Server, Master Controller, Central database, Admin Interface as well as the Delft-FEWS webservices and the Open Archive.

1.2 Set-up of this document

Compared to previous versions of this (type of) document, the changes started in the 2022.01 Release Notes document are continued. Separate chapters are available for: the Delft-FEWS Vision 2025/Roadmap (2022), Security aspects and Documentation.

Like in previous documents describing any new Delft-FEWS version, underlined (and working) references to (new) WIKI pages have been included, like the installation page and upgrade page for this software version. Also the hardware and software requirements page has been updated for this version.

From now on, all new features are being published online (per version) on the Release Notes page. Please visit this page to select the version of your choice. Be aware that features might get backported to previous versions and will be visible in these overviews. These online release notes are generated once a day.

The complete overview of fixed bugs can be found in the appendix A.

2 Delft-FEWS 2022.02: Highlights of the new features and solved bugs

2.1 New features

The following new features are clear, relevant or important highlights of this release (ordered by component).

JIRA reference	Component	Title	Description - Explanation
FEWS-27288	Explorer	New GUI icons	More than 600 new icons in the GUI
FEWS-27078	Time Series Display	Scatterplot improvements	Better axis and improved overview
FEWS-24287		Graphical Editing	Fitting values and interpolations added
FEWS-26621	Grid Display	Plot labels	Visualize grid cell values
FEWS-27568		Workflow options added to Display	Running workflows from the grid display: specify details
FEWS-27054		Improved Sketch mode buttons	Enabling/disabling options for specific buttons
FEWS-27092	Transformation Module	Tide Tumbers	Add unique tidenumbers to high water time series
FEWS-27627		GridToPolygon	Use high resolution CTA/DEM layers to display model grid output
FEWS-24373	Database	Database content	Export option via <F12> to list all timeseries with all metadata to a csv file.
FEWS-27335 FEWS-26595 FEWS-26984	System Monitor	Forecasting Shell Panel Live System Status Panel Import Status Checker (module)	More/improved details of FSSs Host name is visible New module to log messages about data feeds

The up-to-date, automatically generated release notes of this version can be found here.

2.2 Solved Bugs

This selection of bugs is constructed based on the number of commits (10 or more) for issues classified as bugs (in JIRA).

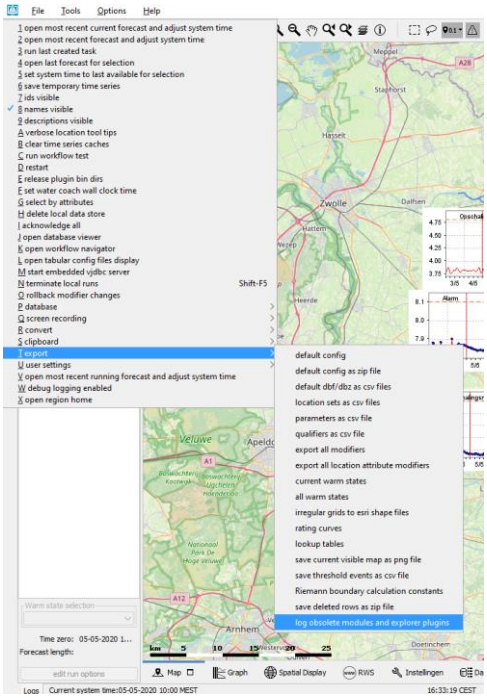
JIRA reference	Component	Description - Explanation	Nr of commits
FEWS-27197	Forecast Manager Dialog	Filter by selection gave no results	13
FEWS-27260	Transformation Module	Erratic behaviour in MeanToInstantaneous disaggregation	13
FEWS-27675	Central Database	Sql script to empty database	23

FEWS-27796	Time Series Modifier	Modifier display does not respond well to increased font sizes (200%)	11
FEWS-27821	PI REST web service	Embedded webservice does not start one-off task	12
FEWS-27825	Archive Module	MongoDB import error (on simulated historical data)	11
FEWS-27979	Seamless Integration	High memory usage	19
FEWS-28169	Admin Interface	Open ID connect	16

A complete list of solved bugs at time - of the release date – can be found in Appendix A.

2.3 Always recommended: Configuration check using <F12>

To assess if 'old' (outdated) or deprecated configuration is still applied in your configuration, it is strongly recommended to run the <F12> option under T + *Log obsolete modules and explorer plugins.* The log panel contains the findings of this analysis. Please have a look at this wiki page contains more explanation and details.



3 Delft-FEWS Vision 2025 – Roadmap 2022

3.1 Introduction

This Delft-FEWS version contains several features that have been implemented as part of the Delft-FEWS Vision 2025. This new vision is working with yearly roadmaps in which Delft-FEWS product management would like to include general improvements to the software and to its software development process which are of benefit to all our users. More information on the Delft-FEWS Vision 2025 and the yearly roadmaps can be found on the Delft-FEWS Community Portal.

3.2 Roadmap 2022 plans and results per theme

The highlights of the roadmap plans can be found here.

3.2.1 Code clean-up

To keep the code clean and maintainable, we have identified outdated and end-of-life modules and displays. A first inventory was made in 2021 and we continue this process in 2022. Our approach is to inform all our end users in time about this removal and we will not remove any module or display without having a new or more modern alternative in place. Last year, functionality was introduced to validate a configuration to assess if any obsolete modules or displays are configured. This check will be updated regularly to match the latest insights. To avoid any surprises when using a new version of Delft-FEWS it is recommended to run this <F12> function while testing new Delft-FEWS releases. This will give all users enough time to resolve backwards compatibility issues with end-of-life modules and displays. A wiki page is kept up-to-date to share our latest plans (what components are removed by when) and our progress. The <F12> check in your application is aligned with this WIKI page.

Expected effort in 2022: ±35 days

INSERT RESULTS – TO DO

3.2.2 Code quality

Our code quality is constantly monitored using SonarQube and all code commits are checked against the latest java coding rules. Automated tests using the latest (Docker) technology are part of our stack now and in 2022 we continue the pilot for a complete DevOps pipeline. We expect that this will pave the path towards a more DevOps (CI/CD) approach for more Delft-FEWS components.

We are intensifying the use of the SonarQube tool and will select packages to focus on to reach the (self-imposed) target for a minimum code coverage / unit-tests coverage of 80%. Besides that we will actively maintain the (newly structured) Delft-FEWS hard and software requirements page and will launch a Delft-FEWS update strategy page. The latter contains an overview of all supported versions of relevant operating systems, database types and third-party libraries, java and middleware like Tomcat per Delft-FEWS version and by when this will change.

Expected effort in 2022: ±40 days

INSERT RESULTS – TO DO

3.2.3 Security

In 2021 a security matrix was created to visualize all security options per Delft-FEWS component. For all 10 components (Forecasting Shell Server, Master Controller, Database, Admin Interface, Operator Client, Configuration Manager, Archive Server, Database Proxy, FEWS Web Service and Data-feeds) security aspects with respect to 5 domains were assessed and visualized.

The aspects are:

- Network Security (Encrypted Network Traffic, Port Security, Access to Delft-FEWS component)
- Access Management (MFA, Role Based Access, Access User, OpenID Connect options)
- Threat Protection (Access Audit Trail, Change Audit Trail, Session Time-out)
- Information Protection
- Data (Encrypted Storage)

The outcome of the assessment is that the majority of security aspects is already covered by the latest release of Delft-FEWS. To cover the security aspects which did not fully pass the assessment, small developments are planned for 2022.

We also respond quickly to our daily checks with respect to OWASP messages (OWASP=Open Web Application Security Project) which runs on our build & test environment (TeamCity) using the OWASP Dependency Check and ZAP tools.

In 2022, we continue learning from our ongoing cloud (migration) projects. These projects are focusing on the up- and downscaling of computational cores using docker containers and switching components on/off from a financial perspective. These external parallel projects are not managed from a roadmap perspective, but they explicitly contribute to our cloud knowledge and expertise. From a knowledge sharing perspective we will capture these experiences in our documentation WIKI and we will complete the documentation based on the material(s) we previously shared in the "Delft-FEWS in the cloud" webinar (from January 2022).

Expected effort in 2022: ±40 days.

INSERT RESULTS – TO DO

3.2.4 Automated (release) testing

We are continuously improving our release process to deliver high quality and well-tested releases. By adding a product risk analysis (PRA) prior to testing, we identify areas of the code that should be addressed in upcoming release testing. A release retrospective will provide useful feedback for future releases. Test scripts are being improved to make them easier to transfer and reuse. Our portfolio of automated tests is extended with pilots for automated client-server tests using Docker, with continuous integration tests focused on performance. The aim is to increase automated tests even further to reduce the number of manual tests.

Separating GUI code and business logic is also on our radar this year and we will further complete our Master Test Plan to easily derive our Release Specific Test Plans.

Expected effort in 2022: ±20 days

INSERT RESULTS – TO DO

3.2.5 Web Operator Client

End of 2021 and early 2022, a number of development & innovation sprints have been carried out. These sprints were meant to improve the underlying FEWS webservices, organize the development process and tooling and to investigate and experience how easily Web OC components for the Schematic Status Display and the Spatial Display could be integrated (in our test environment but also in other web-based systems).

Based on these results we continue our work in 2022. This year has one clear objective: to deliver a first prototype leading towards the MVP of the Delft-FEWS Web OC. Besides this focus, we will use this year to involve (potential and) interested end-users to be consulted for providing input for the Graphical User Interface (UI) and User Experience (UX) for the Web OC. The results of these interviews will be used to create a design and navigation aspects of the GUI. The development of this new component is really a collaborative effort in which we actively approach external partners for co-creation.

Expected effort in 2022: ±140 days

INSERT RESULTS – TO DO

3.2.6 Computational Framework

The Computational Framework is the mode of Delft-FEWS to run scenarios which are not strictly connected to the 'here & now' like in operational forecasting systems. You can define and run scenarios in the (far) past or future, visualize, compare and manage them.
These scenarios allow combination of properties with the existing modifiers concept to allow input changes in models, external boundary conditions, model/parameter settings etc. The scenarios are organized in the IFD-tree and can be managed in the new WhatIfEditor-display using the new what-if templates concept of Delft-FEWS. Scenario results can be viewed by selecting the scenario in the IFD-tree.
In 2022 we are focusing on the final developments creating, running and managing these scenarios, like:
Improved interaction of the Computation Framework with the Open Archive (to search and retrieve results-based scenario identification)
Exchange what-if scenarios between users
Extension of modifier options: multi-value attributes and typical profile modifier
Introducing this new what-if concept in a 'normal' operational, client-server forecasting system
Creation of configuration blueprints for Deltares models (Ribasim, wflow, delwaq) for quick integration into Delft-FEWS applications.

Expected effort in 2022: ±55 days

INSERT RESULTS – TO DO

3.3 Third party library upgrades

In this release we have put in a substantial amount of effort upgrading our third-party libraries in use. Not only from a security perspective (see next chapter) also from an 'age' and 'functionality' perspective.

The following libraries have removed:

Removed library
jdom.jar 1.1
Html2pdf

The following libraries have been upgraded:

library	jar	Old version	Current version	JIRA reference
primefaces	Primefaces	5.0/8.0	10	FEWS-24730
jdom2	jdom2	2.0.2	2.0.6.1	FEWS-25546
netty	netty-all	4.1.48	4.1.79	FEWS-26050
javax	javax.faces	2.3.1	2.4	FEWS-26645
lang	lang-mustache-client	6.4.3	6.8.23	FEWS-26646
spring	spring-core-	5.3.18	5.3.19	FEWS-27038
xmlgraphics	xmlgraphics-commons	2.2	2.7	FEWS-27039
Log4j	log4j-core	2.17.1	2.18	FEWS-27472
Elastic Search	elasticsearch-*	6.4.3	6.8.23	FEWS-27525
PostgreSQL	postgresql	42.3.3	42.4.1	FEWS-27632
NetCDF	Zlib.dll	1.2.8	1.2.13	FEWS-27692

4 Delft-FEWS 2022.02: Security aspects

4.1 Introduction

The security aspects will be described in a more prominent place in the Release Notes document from now on.

In the second half of 2022, no major 'zero-day' vulnerabilities occurred.

Based on earlier occurrences (e.g. log4J, Spring4Shell) Delft-FEWS PM implemented a more pro-active approach by:

- Finalising the Delft-FEWS security matrix (see Roadmap theme, chapter 3.2.3)
- Daily OWASP checks on the *build* environments on major branches
- Reporting on third partly library vulnerability assessments
- Maintaining an Upgrade and Update strategy

4.2 Daily OWASP checks, assessments and communication

On the TeamCity build & compile environments daily OWASP checks have been implemented for the Delft-FEWS branches: trunk, 2022.02, 2022.01 and 2021.02.

Outcomes will be discussed in the daily stand-up meetings and according to our procedures in place actions and communications will follow.

On a dedicated CVE issues page on our Delft-FEWS WIKI detected vulnerabilities, our analysis and status are reported.

4.3 Upgrade and update strategy

Delft-FEWS PM maintains an internal page for detailing out the Delft-FEWS upgrade/update strategy - per release - with respect to:

- Supported versions of (central) databases: Oracle, PostgreSQL and SQLServer;
- Supported versions of operating systems (linux, Windows);
- Java JDK;
- Important middleware: Tomcat, ElasticSearch, Thredds, JCEF;
- Important third party libraries (e.g. log4j);

On request Delft-FEWS PM can share this with end-users/organizations having a Support & Maintenance agreement in place.

5 Delft-FEWS 2022.01: Client-Server system

5.1 Introduction

An installation of or an upgrade to 2022.02 follows – in general - the new and simplified installation and upgrade steps described on the Delft-FEWS WIKI. Both procedures have a large overlap in terms of number/types of steps.

We strongly recommend following the special upgrade path pages (from a certain version to the next version). An overview can be found here: Upgrade paths – overview.

For the specific upgrade from 2022.01 to 2022.02 you can directly go here.

On the renewed Delft-FEWS Upgrade page you also find information (per version) about:

- What's new in the Installation process (general) and for 2022.02 in particular
- Database release notes for Database Administrators

Other relevant documentation (per version) can be found on the WIKI as well:

- Admin Manuals – 2022.02 version
- Connectivity Guides – 2022.02 version

On request, Linux RPMs or MS Windows MSIs can be provided. Some instructions may be required (by Deltares ICT). The following components are deployable via an RPM or MSI.

There are RPM and MSIs available for:

- Delft-FEWS Master Controller / FSS binaries (including launcher services). This RPM can also be used for installing the OC (remark: services can be left *disabled*)

And RPMs available only for:

- Tomcat9
- Delft-FEWS Admin Interface
- Delft-FEWS HTTPS Proxy
- Delft-FEWS Web services
- Delft-FEWS Open Archive

If you are interested in using RPMs (or MSIs), please contact fews.support@deltares.nl or fews-pm@deltares.nl

As a heads-up for the (near) future. Delft-FEWS PM is reconsidering and re-defining the strategy for usages of RPMs and MSIs due to external developments (e.g. Microsoft's end-of-life support for MSIs). Towards Delft-FEWS 2023.01 a new approach is foreseen.

5.2 What's new in the installation process

As mentioned in the introduction, the new steps in the installation process for Delft-FEWS 2022.02 can be found here.

5.3 Relevant new features and aspects

JIRA references	Delft-FEWS server side component	Description – Explanation
FEWS-27201 FEWS-26574 FEWS-25857	Admin Interface	AI not dependant on DB views Views dropped for TimeSeriesSizes and WarmstateSizes AI supports filtering on unacknowledged ERROR logs
FEWS-27634 FEWS-27284	DB Proxy	Major improvements to connection management and logging. Option added to configure authentication and authorisation via OpenID connect (AD).

The used JDK version for the backend is: 11.0.15.9.1. (Amazon Coretto 11 TLS).

Based on this (extracted) JDK package of 292 Mb, an optimized subset is being created for both linux and Windows Operating Systems (OS).

During compiling the Delft-FEWS binaries, this results in 62 Mb (unzipped) JRE folder for linux and a 50 Mb JRE folder for Windows as part of the binaries. After uploading these binaries via the Admin Interface, only the relevant OS-specific binaries and JRE folders are downloaded to the components (FSS, OCs) of the Delft-FEWS client-server system. This optimization is implemented to avoid unnecessary downloads since there's no need for linux SO files on Windows systems or Windows dll's on linux servers.

More details on the hardware and software requirements for this version can be found here.

6 Delft-FEWS 2022.01: Web services (API)

6.1 Introduction

The Delft-FEWS Web Services provide different webservice API's to exchange data with Delft-FEWS. Most commonly used variants are:

- FEWS PI REST Web Service
- FEWS WMS Web Service
- FEWS SSD Web Service
- WaterML2 Web Service

6.2 What's new in the installation process

The installation of the Delft-FEWS web services can be found here.

6.3 Relevant new features and aspects

Around 11 new features have been implemented for the Delft-FEWS Web Services.

JIRA references	Delft-FEWS Web Service	Description – Explanation
FEWS-26537 FEWS-26895 FEWS-27397 FEWS-27398	PI-REST	Open Archive related endpoints added for running the harvester, get and post methods for products
FEWS-27111	PI-REST	Run PI-REST web service embedded in SA and OC
FEWS-27153 FEWS-27154	PI-REST SSD	XML version of FewsPiService.properties (webservices.xml) Added option to FewsPiService.properties to allow SSD displaygroups
FEWS-25074 FEWS-26901	PI-REST	RunTask endpoint extended: Added Parallel run options RunTask endpoint extended: Add properties to workflow
FEWS-27720 FEWS-27014	PI-REST	GetTaskruns endpoint: Added JSON serializer GetTaskruns/GetTimeseries endpoint extended: Enabled option to access unapproved timeseries

Since 2021.02 The documentation about the Delft-FEWS web services is (also) provided in Open API specification format here.

Other hardware and software requirements for this version of the Delft-FEWS webservices can be found here.

7 Delft-FEWS 2022.02: Open Archive

7.1 Introduction

The Delft-FEWS Open Archive is the (optional) long term storage solution next to a Delft-FEWS Client-Server system. It consists of the following components

- Delft-FEWS Archive Server;
- Delft-FEWS Archive Admin GUI;
- Harvester based on ElasticSearch;
- Delft-FEWS Archive Display;
- Delft-FEWS Archive Export and Import workflows;

And the data can be in one or more of the below mentioned storages

- Delft-FEWS Open Archive file system;
- External NetCDF Storage;
- MongoDB database storage;

The landing page, installation and upgrade pages can be found by clicking the links.

7.2 What's new in the installation process

There are no new points of attention for installing the Open Archive. Remarks made about the previous version still apply. Details can be found here.

The hard and software requirements for the Open Archive can be found here.

7.3 Relevant new features and aspects

Below 8 main features/aspects have been implemented in this version.

JIRA references	Archive Component	Description – Explanation
FEWS-27291 FEWS-27288	Archive export	Added functionality to merge new and edited timeseries with existing archived NetCDF files and metadata
FEWS-27290	Archive Display	Extended the Archive Display with no tab to add new series to archive (in relation to FEWS-27291 and FEWS-27288)
FEWS-25760 FEWS-26972	Extended NetCDF Storage	Added event tagging Added setting intervals for harvester runs and aggregation tasks
FEWS-27287 FEWS-26537	Web service	Added functionality uploading new/edited data through web services Initiate harvester run via web service call
FEWS-23658	Mongo DB	Improved seamless integration to a plugin architecture and improved performance, installation and documentation

8 Documentation

8.1 Introduction

The Delft-FEWS WIKI is (still) growing and evolving and we are trying to keep it as up-to-date as possible. Main start page is here.

8.2 System administrator documentation

Early 2022, we have re-arranged some pages in the (restricted) System Installation Section. In several places we have introduced version specific installation or upgrade pages so that it is absolutely clear what needs to be done while installing or upgrading. This approach is available for:

- Installing Delft-FEWS (and many underlying steps)
- What's new in the installation process?
- Upgrading paths for Delft-FEWS

Also for the Hardware and Software requirements page this approach is chosen.

A new page (under construction) is the Delft-FEWS Upgrade Strategy page. This page is meant to provide a detailed insight until what Delft-FEWS version certain third-party libraries, Operating System versions and Database versions are supported.

8.3 Feature documentation

Most new features mentioned in the appendices have a link to the WIKI where you can find more details about the background, usage and – if applicable – how to configure that features.

Another, publicly accessible (and growing) source of documentation can be found under https://fewsdocs.deltares.nl/

You can find the following here:

- Latest XSD schemas
- Release Notes
- Granted features future releases
- Delft-FEWS Web service (Open API format)
    - REST web service
    - WMS web service
    - SSD web service
- Admin Interface API

A List of solved bugs

List of solved bugs can be found here (draft release notes – solved bugs – 22.12.2022)

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