

# **Delft-FEWS Stable Release 2023.01**

Release Notes



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### Release Notes

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#### Author(s)


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<b>Doc. version</b>	<b>Author</b>	<b>Reviewer</b>	<b>Approver</b>
0.1	Gerben Boot	Marcel Ververs	Nadine Sloopjes

# Summary

This document contains the release notes for Delft-FEWS Stable Release 2023.01

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# 1 Introduction

## 1.1 General

This document is the overall Release Notes Document for the Delft-FEWS Stable 2023.01 version which was released on 30<sup>th</sup> of June 2023.

This release contains around **109 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 (2023), 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 2023.01: 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). All new features can be found [here](#). New features for the server side, web services and open archive can be found in other chapters.

JIRA reference	Component	Description - Explanation
FEWS-28318	Explorer	Option to pin tab at startup (personal preference)
FEWS-28363	Web Operator Client	New config for visualizing Web OC and its components
FEWS-28767	Spatial Display	Option to configure multiple contour values, best one is picked
FEWS-28335 FEWS-27736	Topology	Option to open a dedicated grid plot directly from Topology Run from fixed cold state start time
FEWS-28016	What-if Editor	Many improvements running scenarios
FEWS-28618	Transformation	New spatial interpolation based on related locations
FEWS-24264	Dashboard	Aligning of panels made easier

### 2.2 Solved Bugs

This selection of bugs is constructed based on an analysis of the commit and comment activities in our issue tracking system (in JIRA).

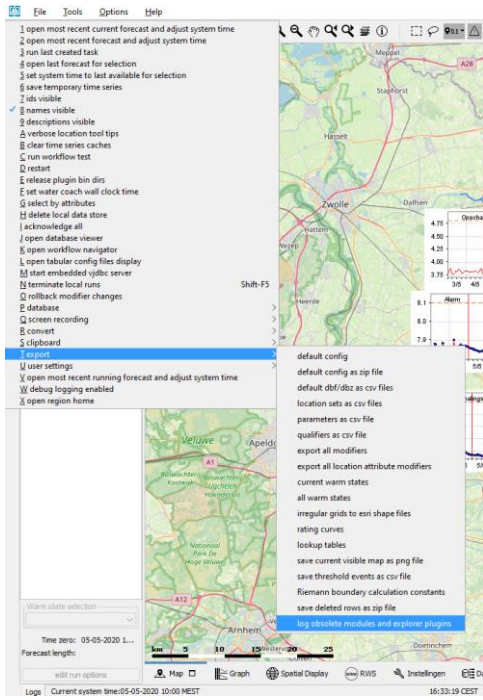
JIRA reference	Component	Description - Explanation
FEWS-29198	Embedded Webservice	False warnings of embedded tomcat are not logged anymore
FEWS-29195	Timeseries Display	DisplayGroups not properly loaded

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 2023

## 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](#).

2023 is the fourth (yearly) roadmap of implementing the Delft-FEWS 2025 Vision. Use the links below to review the original storylines, plans and ideas in this vision. This year's focus will be on continuation the major roadmap themes: Code quality, code and clean-up. In the theme around security and cloud we take next steps and we aim to establish our OWASP procedure and are co-creating around (automatic) up and downscaling of Forecasting Shell Servers. A new roadmap theme will be shaped around integrating Python into Delft-FEWS.

## 3.2 Roadmap 2023 plans per theme

The highlights of the roadmap plans can be found [here](#).

### 3.2.1 Code clean-up

A continuation of code clean-up activities will take place in 2023. The list containing functionalities which will be removed is kept up-to-date on this [page](#). Please check your configuration using the <F12> option to verify if you need to replace or upgrade configuration files. If you need support, please reach out to [fews.support@deltares.nl](mailto:fews.support@deltares.nl)

### 3.2.2 Code quality

SonarQube is monitoring our code commits on a daily basis. Since its introduction in May 2020 we adopted the approach to only add 'clean code', making sure all *traffic lights* on SonarQube's dashboard are green (bugs, security hotspots, code-smells). At the same time, we try to work our way back through the complete code base, repair where bugfixes are implemented and increasing the unit test coverage continuously.

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.

### 3.2.3 Security and cloud

Our OWASP procedure is available in draft and will be implemented structurally. This means that based on our daily OWASP checks, warning flags with respect to third party libraries are evaluated. When severity is high, we will launch a pro-active communication campaign. For less urgent (but required) version upgrades and how we dealt with these warnings, a separate WIKI [page](#) is maintained.

The security matrix and description will be ready and made available. Our end user organizations can contact Delft-FEWS product management to discuss the details and impact described in this security matrix. Furthermore, the release based Connectivity Guide and Admin Guide will contain additional information on the how-to create a secure Delft-FEWS environment.

#### **3.2.4 Release Test Automation**

Our release process will be improved even further. Plans for 2023 are to further automate manual tests and take the next step in bundling and consizing our release related documents.

#### **3.2.5 Python integration**

Running and using python more easily alongside Delft-FEWS is long standing wish. Although this is already possible via a loose coupling, integration is a next step. In the second half of 2023 a selection will be made for a java embedded python package. Firstly, we focus on running a general adapter workflow and secondly a user-developed python transformation is on our wish list.

#### **3.2.6 Other developments**

Other relevant developments are the more dynamic scaling of FSSs to the (Azure) cloud. A new FSS status (hibernate) will be introduced so that Virtual Machines hosting one or more FSS groups can be fully switched off and can be woken up once they are needed. In that way, these machines only take up resources (and energy) when running. This will save cloud costs and reduces energy consumption.

Another foreseen development is benefitting from cloud-services (Virtual Scale Sets) to spin-up Delft-FEWS components in another (Azure) availability zone once the primary component goes down. We will start with the Master Controller, but this applies to other components (like FSSs) as well. Azure Resource Manager (ARM) templates will be the basis and on top of that developments around health checks and interaction with the Azure Key Vault (credentials, security) are foreseen.

#### **3.2.7 Archive Vision**

In the second half of 2023, a boost will be given to drawing up a vision for the Open Archive together with an implementation roadmap. The current Open Archive deserves this attention since the importance, size and usage of this long-term storage solution is growing. The maturing of this component should not be based on *features-only*. Installing and upgrading more easily, robustness in usage, stability and easy maintenance are as important as its functionality. Delft-FEWS Product Management considers this attention as a boost towards bringing the Open Archive to the next level.

#### **3.2.8 Prepare for the next Delft-FEWS vision**

In 2023 we will start to prepare our next vision for our product suite. The current Delft-FEWS 2025 vision will end in 2024. The results will be evaluated and will be used in its successor. Drawing up a new (software) vision using a lot of internal and external input, requires proper preparation. This process will start in 2023.

### **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 been upgraded or removed:

Library/jar	CVE reference	Current version	JIRA reference
Commons-httpclient-3.0.1		removed	FEWS-26641
Simple XML library (FMI adapter)		removed	FEWS-27785
xalan.jar (for all adapters)		removed	FEWS-27625
Tar-2.5 (WTI adapter)		removed	FEWS-27786
Woodstox jaxws		removed	FEWS-28760
commons-fileupload-1.3.3p.jar	CVE-2023-24998	removed	FEWS-28856
Geotools	CVE-2022-24818	26.4	FEWS-27695
xercesImpl.jar (for all adapters)		2.12.2	FEWS-27788
PostgreSQL drive	CVE-2022-31197	42.5.3	FEWS-28737
NetCDF 4.6 (for all adapters)		5.5.2	FEWS-27784
Spring Boot	CVE-2018-1258 CVE-2023-20883	3.0.7	FEWS-29191
Jquery-datatables		1.10.25	FEWS-29392
bootstrap-select.js	CVE-2019-20921		FEWS-29467
JCEF package (web browser display)		109.1.11	FEWS-28638

# 4 Delft-FEWS 2023.01: 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 first half of 2023, no major 'zero-day' vulnerabilities occurred.

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

- Having a Delft-FEWS security matrix and description in place (see Roadmap theme, chapter **Error! Reference source not found.**)
- Daily OWASP checks on the *build* environments on major branches
- Reporting on third party library vulnerability assessments
- Maintaining an Upgrade and Update strategy

Relevant to mention here is that in Delft-FEWS 2023.01 support for tomcat 10 and java 17 have been introduced.

## 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, 2023.01, 2022.02, 2022.01 and 2021.02.

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

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, OpenSearch, 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. Please contact [fews.support@deltares.nl](mailto:fews.support@deltares.nl).

# 5 Delft-FEWS 2023.01 Client-Server System

## 5.1 Introduction

An installation of or an upgrade to 2023.01 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 2022.02 to 2023.01 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 [2023.01](#) in particular
- [Database release notes for Database Administrators](#)

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

- [Admin Manuals – 2023.01 version](#)
- [Connectivity Guides – 2023.01 version](#)

On request, Linux RPMs can be provided. Some instructions may be required (by Deltares ICT). For this version, for Windows, we are in the process of supporting installing Delft-FEWS components using PowerShell scripts. This is beta-functionality at this moment. Please contact us for more information on this topic (e-mail, see below). Rationale for this shift to PowerShell scripts is the EoL policy of MSI support by Microsoft.

RPMs are 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*)
- Tomcat10
- Delft-FEWS Admin Interface
- Delft-FEWS HTTPS Proxy
- Delft-FEWS Web services
- Delft-FEWS Open Archive

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

## 5.2 What's new in the installation process

As mentioned in the introduction, the new steps in the installation process for Delft-FEWS 2023.02 can be found [here](#).

## 5.3 Relevant new features and aspects

Below most relevant system improvements in this version are mentioned. All new features can be found [here](#).

JIRA references	Delft-FEWS server side component	Description – Explanation
-----------------	----------------------------------	---------------------------

FEWS-28112	Master Controller	Improved scheduling based on aligning multiple T0's
FEWS-28737	Central Database	Upgrade to PostgreSQL 42.5 drive
FEWS-28477	Admin Interface System Monitor (OC)	History of workflows visible after Amalgamate
FEWS-25786	System	Upgrade to Java 17
FEWS-26465	Continuous Deployment	Pilot: pipeline for deployment and launching projects

The used JDK version for the backend is: 17.0.5 (Amazon Corretto 17 TLS).

Based on this (extracted) JDK package of 300 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 2023.01: 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 15 new features have been implemented for the Delft-FEWS Web Services. Most relevant features are mentioned below.

JIRA references	Delft-FEWS Web Service	Description – Explanation
FEWS-27962 FEWS-28617 FEWS-27965	REST	New endpoints for rating curves, get plots, cold/warm states, ensembleMemberIds
FEWS-28616	REST	GeoJSON support for polygons
FEWS-28646	SSD	Sorting of GetCapabilities by name
FEWS-27610	WFS	OpenGIS WFS 2.0 compliant service implemented

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 2023.01: 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 OpenSearch (new in this version);
- 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

Around 12 new features have been implemented in this version. Most relevant features are listed below.

JIRA references	Archive Component	Description – Explanation
FEWS-29324	Harvester	Implementation of/ migration to OpenSearch (instead of Elastic)
FEWS-28738	Archive module	Knowledge in NetCDF if it contains grid or scalar data
FEWS-25761	Archive Display	Connects to both Open Archive as well as External NetCDF storage
FEWS-28539	Archive – Watercoach-on-the-fly	Option added to import grids as references
FEWS-28192	Archive – Seamless Integration	Made simpler in the GUI (buttons removed)

# 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.

An internal page 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 the 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](#) for 2022.01 and higher
- [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 ([final release notes – solved bugs – 30.06.2023](#))



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