STARS 4 Water

STARS4Water Metadata Portal:

Third release

Deliverable: D2.7

September 2025

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Work Package	WP2: Unlocking and improving data services
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Lead beneficiary	VanderSat
Lead author(s)	Joost Beckers (VanderSat)
Contributors	Gert-Jan Schotmeijer (Deltares), Gerrit Hendriksen (Deltares)

Dissemination Level		
PU	Public	X
SEN	Confidential, only for members of the consortium and the granting authority (including other EU institutions and bodies)	
CI	Classified, as referred to EU Decision 2015/444 and its implementing rules	

Version log			
Version	Date	Released by	Nature of Change
0.7	Sept 5	Joost Beckers	First draft
0.8	Sept 17	Michiel Blind	Second draft
0.9	Sept 19	Joost Beckers	Final draft for internal review
1.0	Sept 29	Harm Duel	Approval final version

Summary

Following the first and second release of the STARS4Water Metadata Portal in respectively September 2023 and September 2024, this report introduces the third release of the STARS4Water Metadata Portal. The changes and additions relative to the first and second release are described in this report, as well as plans for further development. The fourth and final release of the STARS4Water Metadata Portal is scheduled for September 2026.

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1. Introduction

1.1. The STARS4Water project

The project STARS4Water (Horizon Europe No 101059372) aims to improve the understanding of climate change impacts on water resources availability and the vulnerabilities for ecosystems, society, and economic sectors at river basin scale. The project is developing new data services and data-driven models for better supporting the decision making for adaptive, resilient, and sustainable management of freshwater resources.

Many global and local datasets are already used by river basin authorities to understand and manage their system. However, the STARS4Water project team believes that data utilisation can be improved. A vast amount of public geophysical, hydro-meteorological, and various other spatial data is produced each year, and river basin authorities often do not have the time to keep track of all new data sources and developments. Some available datasets remain unknown to river basin authorities, some are difficult to access, and some may be difficult to apply to the scale of the river basin. STARS4Water will unlock existing data sets and data services from earth observations initiatives (Copernicus, GEOSS), JRC activities and earlier EU research projects that are underexploited by public and private stakeholders in water resources planning.

Moreover, data science techniques like machine learning have resulted in new modelling approaches and ways to combine data and generate new insights. STARS4Water builds upon these new technologies to develop data services and data-driven models, particularly with respect to water use by economic sectors and the impacts on water resources availability for ecosystems and water quality.

STARS4Water is developing data services and modelling tools in close consultation and collaboration with stakeholders from seven river basin hubs to meet their needs and to promote uptake of data services beyond the lifetime of the project. The river basin hubs serve as living labs for co-creation of data services and tools with stakeholder communities and as accelerators for further upscaling of these services and tools to other river basins worldwide.

1.2. WP2: Unlocking and improving data services

Work Package 2: "Unlocking and improving data-services" is dedicated to collecting, managing, and providing access to existing and newly developed datasets.

To this end, the work package has developed a Metadata Portal, to facilitate access to global and regional data services for water resources management and to stimulate uptake by river basin authorities. Work Package 2 will also develop new data services in the form of climate indicators that help to assess climate change risks and impacts for ecosystems, society and water depending economic sectors.

1.3.   This report

The purpose of the Metadata Portal is to unlock existing data services and information sources for water resources management, including new developments at EU and global level and lessons learnt from previous studies on data collection, data standards and unlocking data. Over the course of the STARS4Water project, more and more datasets have been added to the portal to add to its value as a central hub for finding relevant data for water resources management.

The STARS4Water Metadata Portal is accessible through the STARS4Water website: Stars4Water

A first version of the Metadata Portal was released in September 2023 (Schotmeijer et al, 2023). This first version contained information about 200 global and local datasets. The second release in September 2024 included about 400 datasets (Beckers et al, 2024). The next chapter describes the third release and the changes to the portal relative to the second release. We also discuss plans for further development of the portal.

2. The updates of the Metadata Portal

2.1. Functional changes to the Metadata Portal

The functionality of the STARS4Water Metadata Portal has not be changed since the first release. The design of the portal is therefore not repeated here. The functionality of the STARS4Water Metadata Portal is documented by Schotmeijer et al (2023).

2.2. Current content of the Metadata Catalogue

Release 1 of the Metadata Portal contained about 200 existing data sources that were collected in task WP2.1 (Beckers, 2023). The second release in September 2024 included about 430 datasets. The current third release contains 490 datasets. Datasets that were added are:

- Datasets that were generated by the STARS4Water project, such as the WP2 tier1 climate risk indicators. These are scenarios for climate and socio-economic data for each river basin or subcatchment, derived from existing Copernicus data.

- Metadata that were collected by the STARS4Water 'sister project' SOS Water. SOS Water made a similar inventory of global data that are relevant to water resources management. The results of that inventory were shared with the STARS4Water project team and several datasets that were missing in the STARS4Water inventory were added to the portal.

Metadata of the third collection of the river basin specific data sets (Scrieciu and Toma, 2025) and metadata of datasets underpinning publications have not yet been included in the Metadata Portal.

2.3. Procedure for uploading new metadata

The procedure for uploading metadata to the portal by project partners has been formalized. The procedure is as follows:

1. First, the data itself needs to be made available online, for example on Zenodo. To create a Zenodo account, navigate to https://zenodo.org/ and register. Then follow the instructions to upload your dataset.
2. Collect the digital object identifier (doi) and other metadata in a Microsoft Excel file, using a template (see Appendix 1). The template contains instructions under the 'Readme' tab.
3. Collate metadata from all datasets that are generated by your organization.
4. Store the file under a recognizable name including the name of your organization in the folder 'Metadata collections' on the shared STARS4Water drive
5. The STARS4Water Data Manager will check the metadata file. After uploading the data, request the data to be included in the STARS4Water community. Datasets not related to publications are first discussed during a STARS4Water Steering Committee meeting.

2.4. Plans for further development and population of metadata

Migration to alternative data platform

The STARS4Water Metadata Portal will be maintained by Deltares after the lifetime of the project. To enable efficient maintenance the current platform, based on the Geonetwork catalog application, has limitations as it not integrated in the Deltares data platform. To facilitate the integration of the STARS4Water Metadata Portal into the Deltares data platform infrastructure, the STARS4Water Metadata Portal will be migrated to an alternative data platform technology called STAC (Spatio-Temporal Asset Catalogs). STAC is a common language to describe geospatial information, so it can more easily be worked with, indexed, and discovered. For more information, see https://stacspec.org/. As part of this transition, all current content will be carefully migrated, preserving metadata and maintaining findability of data.

The migration will take place in the upcoming months. It will ensure that the platform can be maintained and will remain available beyond the lifetime of the STARS4Water project.

Adding metadata of new datasets

The metadata of the datasets generated by the project will be made accessible via the STARS4Water Metadata Portal. To ensure accurate and complete metadata entry a dedicated template has been developed. Project partners have received a brief introduction and training in 2024, which will be repeated in fall 2025. Additionally, a tutorial on how to input data into the Metadata Portal will be made available through the STARS4Water Academy. This will support proper inclusion of the metadata of project output data and data used in publications

The metadata for the fourth collection of river basin datasets will also be added to the portal.

3. Conclusions and next steps

The third release of the STARS4Water Metadata Portal was presented at the STARS4Water all partners meeting in Drammen, Norway on September 23, 2025. Additionally, a session was held with contributors to WP3 and WP4 to explain in detail the procedure for uploading new datasets to Zenodo and to the portal. Contributors to work packages 3 and 4 were encouraged to add all datasets that are used in their modelling and ML work to the Metadata Portal.

The further development of the portal as described in the section 2.4 will take place in the upcoming months. The fourth and final release of the portal is scheduled for September 2026.

References

Beckers, J. (2023): Review of existing observational systems. Horizon Europe project STARS4Water. Deliverable D2.1.

J. Beckers, Schotmeijer, G.J., and G. Hendriksen (2024): Second release of the STARS4Water Metadata Portal. Horizon Europe project STARS4Water. Deliverable D2.4

Schotmeijer, G.J., J. Beckers and G. Hendriksen (2023): First release of the STARS4Water Metadata Portal. Horizon Europe project STARS4Water. Deliverable D2.2

Scrieciu, A. and A. Toma (2025): River basin specific data sets: third collection.

Appendix 1 – Metadata template

Category	specified category	mandatory (V = yes, C = conditional)
Information about the source	Title of the source	V
	Date of the source	V
	Date type of the source	V
	Unique Identifier of the source.	C
	Summary	V
	Status	V
	Language of the source	V
	Subject	V
Responsible organization source	Organization	V
	E-mail	V
	Roll	V
Keywords	Keyword	V
Limitations	Legal access restrictions	V
	Usage restrictions	V
Spatial information source	Spatial schedule	C
	Resolution	C
	Spatial reference system	V
	Contiguous rectangle	V
	West	C
	East	C
	North	C
	South	C
Distribution format	Version	C
Distribution	URL	C
Quality information	Level quality description	V
	General description origin	V
Information about the metadata	Metadata unique identifier	V
	Metadata date	V
	Language of the metadata	V
	Hierarch level	V
Responsible organization metadata	Organization	V
	E-mail	V
	Roll	V
Metadata standard	Name metadata standard	V
	Version metadata standard	V
Below not ISO but applicable to S4W (from S4W data management plan)	Alternate Identifier (with type sub-property)	C
	Related Identifier (with type and relation type sub-properties)	C
	Related Identifier Type	C
	Format	C
	Cite as	C
	Data update frequency	C