STARS 4 Water

Dissemination and Communication Strategy Plan (3rd release)

Deliverable D6.5

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STARS4Water Dissemination and Communication Strategy Plan

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Summary

This document is the third version of the Dissemination and Communication Strategy Plan (DCSP) of the STARS4Water project, aiming to ensure the coherent streamlining of the project outputs into targeted high-quality dissemination products, and their dissemination to specific target audiences.

Section 2 presents the pillars and the objectives of the STARS4Water Dissemination and Communication (D&C) strategy, while Section 3 details the five key target audience categories, namely: the river basin stakeholders, river basin organisation and related networks; the scientific and research community; the high-level policy community (including environmental agencies and non-governmental organisations and networks); the business community (SMEs, consultants, starts-ups) and economic sectors; and the general public.

The research and dissemination products of the STARS4Water expand in five broad directions: (i) the interaction with stakeholders of river basin organisations and/or the river basin organisations themselves for the integration of the project's results (services, tools, methods, guidelines) in their decision support systems; (ii) the communication of the project results and scientific advances to the scientific and research community, the general ERA (European Research Area) and the RTD sector; (iii) the interfacing with policy in order to inform and support the EU policy needs, bridge relevant gaps, and provide tailored-made tools; (iv) market-oriented activities to enhance the commercial potential of the results, and the uptake of the developed products by SMEs that can further capitalize on them; (v) raising awareness of the general public. As such, the different dissemination and communication products and activities target a range of groups and will be tailored to their identified information needs. These are presented in detail in Section 4, along with a detailed time plan in Section 5.

The communication and dissemination processes is closely monitored, and periodic evaluations will be held to assess the impact of the various activities and timely redesign (if deemed necessary) elements of the implemented approach which needs strengthening. A set of Key Performance Indicators (KPIs) is used for this purpose as presented in Chapter 6. Finally, Chapter 7 discusses the dissemination products' quality control and standards.

The third release of the Dissemination and Communication Strategy Plan differs from previous versions in that it is no longer focused on awareness-raising and engagement, but on **uptake and impact**. In the final year, the emphasis is on:

- **Policy uptake**: delivering targeted policy briefs, organising a joint STARS4Water–SOS-Water policy event in Brussels, and ensuring integration of results into CIS WGs and Member State processes.
- **Stakeholder uptake**: supporting the River Basin Hubs to adopt the developed tools (models, dashboards, indicators) and potentially integrate the developed scenarios into their upcoming River Basin Management Plans.
- **Scientific impact**: finalising and publishing the Special Issue and ensuring all data, models, and tutorials are deposited in open repositories (Zenodo, Metadata Portal, STARS4Water Academy).

- **Business exploitation**: launching the Future Exploitation Plan with defined service packages for river basin stakeholders, SMEs, consultants.
- **Public impact**: releasing and disseminating the river basins storymaps, the documentary and layman's report to communicate outcomes to wider society.

This updated plan therefore **shifts from process to outcome**, ensuring that dissemination activities are directly aligned with uptake pathways and measurable impacts.

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1. Introduction

The STARS4Water project aims to improve the understanding of climate change impacts on water resources availability and the vulnerabilities for ecosystems, society and the economy at river basin scale, including two distinctive elements: first, the need for an international stakeholder community to address their specific needs and requirements. Second, the development and application of innovative data services, models, tools. These new data services and data driven models will support better decision-making planning actions for adaptive, resilient and sustainable management of freshwater resources, and will be co-designed with stakeholders to meet their needs, ensuring their relevance and uptake beyond the lifetime of the project. Following a process of co-creation the projects aims to capacitate stakeholders with next generation river basin tools and build a strong Community of Practice.

Dissemination and communication play an important role in the STARS4Water project. For this purpose, a dedicated workpackage (WP6) has been specifically designed to allow the development of adequate mechanisms and tools to ensure the effective and targeted dissemination of all project results. Within its early tasks is the drafting of the current STARS4Water Dissemination and Communication Strategy Plan (DSP), subject to review and update along the course of the project, in order to further strengthen the close cooperation among all the project workpackages (WPs), ensure the coherent streamlining of their findings and results into targeted and high-quality dissemination products, to pave the way from research to services' implementation, to policy and decision-making, and to business creation/market opportunities. The different dissemination and communication products target a range of audiences: (1) River basin stakeholders (including both stakeholders in the hubs and (international) river basin organisations and networks outside the hubs); (2) Policy community (including high-level policy stakeholders, environmental agencies, NGOs and networks); (3) Business and economic sectors and networks (including SMEs and consultants); (4) Scientific and research communities; (5) General public. Special attention will be given to gender and young professionals, which are cross-cutting across these target audiences.

STARS4Water is building the next generation river basin tools and services that support decision-making on water resources management in 7 River Basin Hubs. These river basin hubs serve as living labs for co-creation of data services and tools with stakeholder communities and as accelerators for further up-scaling of these services and tools to other river basins worldwide. The 7 river basin hubs represent a regionally diverse portfolio of climate vulnerabilities and adaptation needs across sectors and include the basins of: Drammen (NO), East Anglia (UK), Rhine (international), Danube (international), Seine (FR), Duero (ES), Messara (GR). Each river basin hub has a direct beneficiary River Basin organisation (RBO) that will be the primary user of the products and services of the project (but not limited to them) and who has strong institutional connections and relationships with other governmental organisations, non-governmental organisations (e.g. water utilities, nature conservation organisations, civil society organisations) and private sector organisations (e.g. farmers associations, food and beverage industry, energy sector), who can also become users of the products and services when interested. Due to this integral role of the river basin organisations as stakeholder partners in co-designing and co-developing the STARS4Water data services and data-driven models and tools, they are also central to effectively communicating and disseminating the project's results, especially within their regional and local stakeholder communities. The stakeholder partners are therefore contributing the dissemination and communication actions resulting from this plan. Besides

the communication channels from the project they are also using the specific communication channels within their organisations. Consequently, the stakeholder partners are responsible for the execution and mainstreaming of the communication and dissemination activities within the 7 river basin hubs of the STARS4Water.

The Dissemination and Communication Strategy Plan (DCSP) has been regularly updated during the course of the project, as feedback from the monitoring and evaluation of the dissemination activities is collected. This document is the third version of the of the STARS4Water project DCSP, focusing on **uptake and impact**, shifting from process to outcome to ensure that dissemination activities are directly aligned with uptake pathways and measurable impacts. As such, in the final year of the project the emphasis is on:

- **Policy uptake**: delivering targeted policy briefs, organising a joint STARS4Water–SOS-Water policy event in Brussels, and ensuring integration of results into CIS WGs and Member State processes.
- **Stakeholder uptake**: supporting the River Basin Hubs to adopt the developed tools (models, dashboards, indicators) and potentially integrate the developed scenarios into their upcoming River Basin Management Plans.
- **Scientific impact**: finalising and publishing the Special Issue and ensuring all data, models, and tutorials are deposited in open repositories (Zenodo, Metadata Portal, STARS4Water Academy).
- **Business exploitation**: launching the Future Exploitation Plan with defined service packages for river basin stakeholders, SMEs, consultants.
- **Public impact**: releasing and disseminating the river basins storymaps, the documentary and layman's report to communicate outcomes to wider society.

2. The Dissemination and Communication Strategy

STARS4Water is contributing to Europe's destiny concerning climate action on land, oceans and water, aiming to attribute to the following overarching impacts: (1) Improve tools and technologies for efficient monitoring, assessment and projections related to climate change impacts; (2) Advanced understanding and science to support adaptation and resilience of natural and managed ecosystems, water and soil systems and economic sectors in the context of the changing climate. To maximise the project impact, the STARS4Water Dissemination and Communication (D&C) strategy is based on four main pillars:

1. **raising awareness** on the future Europe's water resources under a changing climate and socio-economic scenarios,
2. **reaching the right audience** to promote the use and uptake of the STARS4Water results, data services and tools,
3. **providing guidance and capacity building** for climate resilient water resources planning and river basin management, and
4. **advocating and promoting policy recommendations** on strengthening EU water related policies.

The D&C strategy components include (Figure 1):

- Definition of D&C objectives
- Identification of the targeted audiences and the specific objectives for each audience
- Development of the D&C activities, mechanisms and tools
- Monitoring and evaluation of the impact of the D&C activities

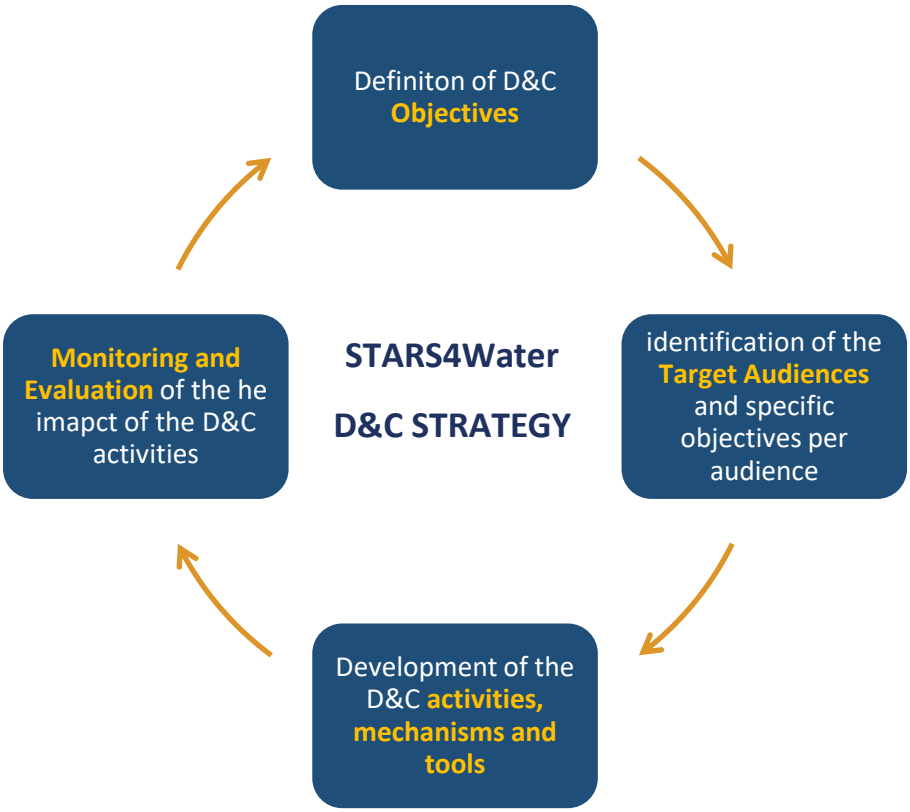

Figure 1. Components of the STARS4Water dissemination and communication strategy.

2.1. Objectives of the dissemination and communication strategy

The STARS4Water C&D strategy objectives have been defined with the goal to maximise the project impact, ensuring that relevant information and key outputs of the project are relayed to the suitable target audience via the most appropriate channels. The objectives of the C&D Strategy are:

1. Produce quality-assured dissemination products and ensure timely distribution to the different target audiences.
2. Exploit the full potentiality of dissemination media (social media, networks, etc.).
3. Develop and use innovative tools which facilitate diffusion of the results and further support stakeholders' interaction and exchange (tailored to the end-users).
4. Build capacity of targeted groups, develop stakeholders communities in the river basin hub networks and EU-wide alliances, and maximize the involvement of citizens, end-users and stakeholders in water management.
5. Design and implement educational activities.
6. Link research and innovation to the regional and EU policy.
7. Develop an Exploitation Plan (including IPR) addressing the uptake and commercialization of the foreground.

While these objectives guide our C&D Strategy, our specific focus for the final year is to put emphasis on three **measurable impact pathways**:

- **From research to policy:** Policy briefs and presentations will feed directly into EU policy cycles (WFD, CIS Water Scarcity and Drought, climate adaptation). An event for policy makers will also be organized.
- **From tools to practice:** River basin organisations will test, use and adopt the developed tools (models, co-designed dashboards, Metadata Portal, Impact Reporter) targeting more than 20 RBOs. The Future Exploitation Plan will define concrete service packages for different target groups.
- **From project to community:** The Impact Reporter will remain operational beyond the project, providing a sustained platform for event reporting and adaptation learning. The StoryMaps will communicate outcomes to the wider society in an easy and attractive way. The project website will remain online making the project outputs accessible beyond the end of the project. Open access to all data and models via Zenodo will be achieved, and a complete curriculum of approximately 40 tutorials/webinars will be delivered.

2.2. Specific goals for the River Basin Hubs' stakeholders

The STARS4Water project is built around 7 River Basin Hubs (RBHs) where next generation river basin tools and services that support decision-making on water resources will be built through a co-creation process with their stakeholders, tailored to their needs. These river basin hubs serve as living labs for co-creation of data services and tools with stakeholder communities on one-hand, and as accelerators for further up-scaling of these services and tools to other river basins worldwide on the other hand (Figure 2). The co-creation processes is designed geared towards long-term commitment to

collaboration and information exchange. Depending on the local setting such commitments may be formalised. Thus, the stakeholder communities of the 7 RBHs are given a special attention when it comes to communication, dissemination and capacity building, with escalating specific goals (depending on the different user interests in the river basin), starting from increasing the awareness (push-communication), to gaining their acceptance (pull-communication), to engagement in co-development and uptake, to commitment and development of a critical mass (Community of Practice), and finally to mainstreaming of the tools in their operational management and further capitalisation. Within the first year of the project we have worked on the first two levels of stakeholders' engagement in the 7 RBHs (i.e. awareness and acceptance), and are currently actively engaging with them in co-developing STARS4Water tools (narratives, scenarios, modeling tools, dashboards). During the third year we have initiated discussions on the uptake and continued use of the developed data, models and tools by the stakeholders at various levels and for various purposes. This effort will continue into the fourth year through targeted activities for enhancing their familiarity and ease in using these data, models and tools. More specifically, we are planning to have:

- **Targeted workshops** in each hub (final round) to demonstrate dashboards, indicators, scenarios, etc., and to co-design, where possible, their integration into their operations.
- **Capacity-building sessions** via the STARS4Water Academy tailored for basin managers, focusing on hands-on use of the tools.
- **Impact Reporter** promotion to encourage reporting of events and sharing of adaptation measures, building a wider evidence base.
- **Basin-level communication products** (short videos, translated brochures, hub "run weeks" on LinkedIn) to showcase local relevance and successes.
- **Follow-up discussions or agreements** (where feasible) with "stakeholder champions" to secure their role in continuing the use of project outputs after project end.

These actions ensure that river basin stakeholders are not just informed, but they are equipped and committed to apply STARS4Water results in operational practice.

It is recognised that the level of uptake of the developed models and tools may vary across the River Basin Hubs. In our discussions with the stakeholders so far, the following have been identified:

Drammen: Drammen stakeholders (NVE) have been directly involved in the development of the RIBASIM model for Drammen. The use of this model will continue beyond the end of the project based on the specific needs of the basin. More training on the use of the model will also be provided to the NVE staff. A new modeling chain is set up for the basin providing higher resolution hydrological information to the energy market modeling, an update that can be further used to estimate future. The Drammen Dashboard will be uptaken by NVE and its operation will continue.

Rhine: The Wflow model developed for Rhine will remain operational after the end of the project as there is a specific request/ mandate with governmental authorities for the use of this model. Specific training is also planned to be provided to the ICPR and CHR scientist for uptaking the RIBASIM model. The Eflows tool and the Dashboard are also already presented to the stakeholders and their use is promoted.

Danube: The RIBASIM model has been presented to the ICPDR and Via Donau. Further activities for promoting the use of the model will be pursued in 2026.

Drammen: Drammen stakeholders (NVE) have been directly involved in the development of the RIBASIM model for Drammen. The use of this model will continue beyond the end of the project based on the specific needs of the basin. More training on the use of the model will also be provided to the NVE staff. The Drammen Dashboard will be uptaken by NVE and its operation will continue.

Seine: The integration of the reservoir operation curves in the hydrological model was validated with the EPTB Seine Grands Lacs (river basin territorial public entity). The output of the risk analysis was evaluated and will be presented to other local water managers and stakeholders in the river basin. The Eflows framework has also been applied. It will be fine-tuned to local conditions to serve as a diagnostic tool in support to low flow management.

East Anglia: The Eflows model and the MLMaper have presented to the stakeholders (which ones?) and validated with them. Training activities on these models will be implemented in 2026.

Messara: The RIBASIM model has been validated with the stakeholders. Training of staff of the Region of Crete on the model functionalities is planned to take place in 2026 so that they are able to uptake and use the model after the completion of the project.

Duero: The Duero basin models developed have beem presented to the Duero River Basin Authority and validated with them (Modflow, MLMaper). It is planned to present the data-driven groundwater storage model in the beginning of 2026. Further exchanges are planned to explore the potential of the process based model (Modflow) to devise strategies to improve the environmental status of surface water bodies through the recovery of depleted water tables.

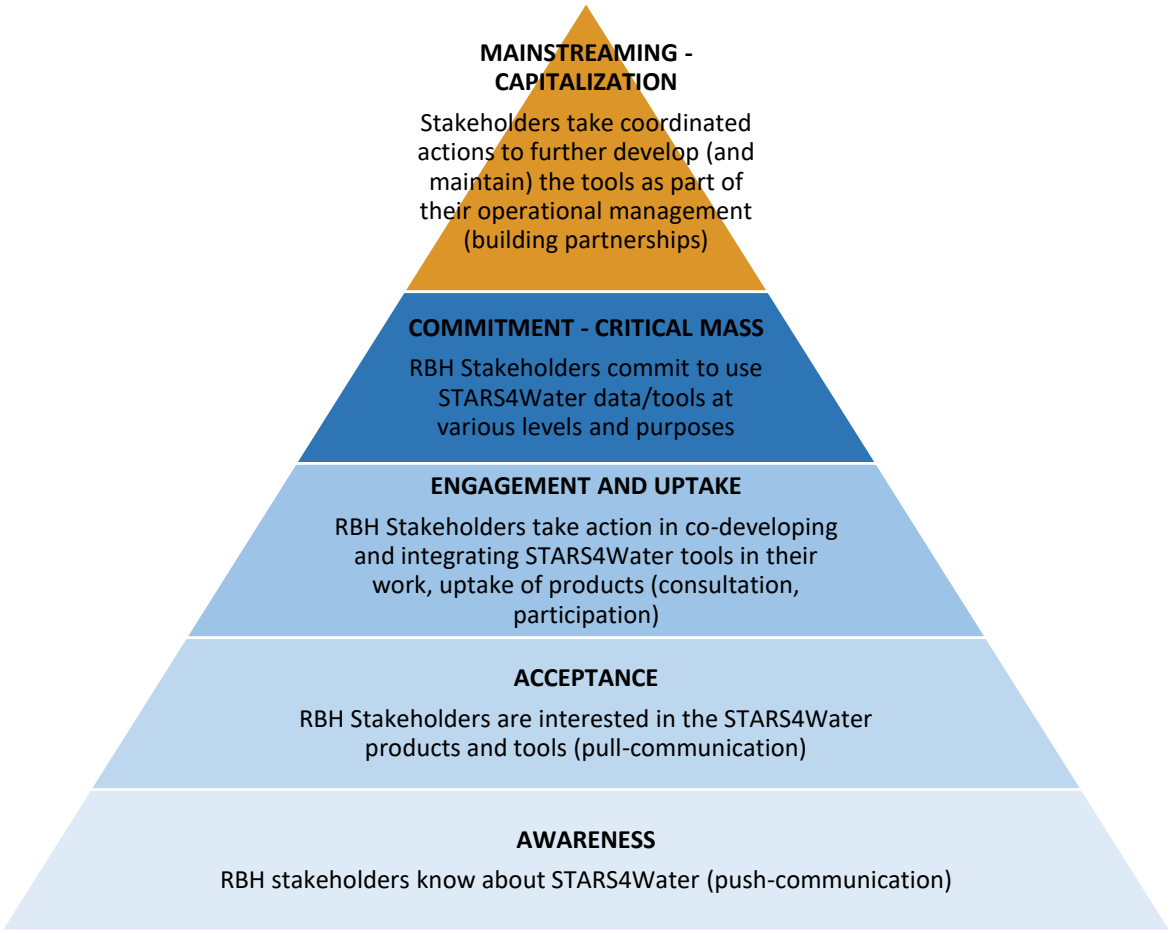

Figure 2. Levels of RBH stakeholders' engagement in the use of STARS4Water products and tools

3. The Target Audience

Given the nature of the STARS4Water project, cutting across the scientific themes of climate change and water resources management, there is a variety of interesting topics to be communicated. Furthermore, the research and dissemination products to be developed expand in five broad directions: (i) the interaction with stakeholders of river basin organisations for the integration of the project's results (services, tools, methods, guidelines) in their decision support systems; (ii) the communication of the project results and scientific advances to the scientific and research community, the general ERA (European Research Area) and the RTD sector; (iii) the interfacing with policy in order to inform and support the EU policy needs, bridge relevant gaps, and provide tailored-made tools; (iv) market-oriented activities to enhance the commercial potential of the results, and the uptake of the developed products by SMEs that can further capitalize on them; (v) raising awareness of the general public. As such, the different products are targeted to a range of groups (Figure 3) and are tailored to their identified information needs. Special attention is given to gender groups and young professionals, which are cross-cutting across these target audiences.

Figure 3. Dissemination and communication target audience

Dissemination and communication has assessed the information needs of the target groups (as presented in the following sections (i.e. scientific, policy and business communities, etc.), including when the information is most needed and is likely to serve as an "agent of change". For example, policy makers may find certain information from an evaluation particularly useful in making critical

policy decisions. When planning for a dissemination activity, the STARS4Water team is aware when a window of opportunity for decision making arises and makes the information available in a manner that is appropriate for the technical and functional needs of the target audience.

The following target audiences A1-A5 have been defined, along with specific D&C objectives per audience, as presented in Table 1. The dissemination of the STARS4Water results has been targeting these groups, using messages linked to their values, interests and motivations to ensure knowledge transfer and uptake of the services and tools developed.

Table 1. Dissemination and communication target audiences and relevant objectives per audience

Target Audience (A)	D&C Specific Objectives per target audience
A1a: River basin hub stakeholders - River basin managers - Local and national governments - Water utilities - Economic water use sectors - Environmental protection agencies and nature protection organisations - Societal organisations **A1b: River basin organisations and networks outside the hubs** - International river commissions (e.g. ICPDR) - River management networks (e.g. INBO, ECRR)	- Raise awareness on climate change impacts and risks related to water resources in their river basin - Promote and uptake of the project's results: services, tools, methods, guidelines - Enable best practices - Capacity building
A2: Science and research community - Research communities in water resources and river basin management, and climate research (e.g. World Large Rivers, HIS, CHR) - Researchers in related projects and initiatives - Universities - Young professionals' networks	- Sustained use and development of open data services and open source tools - Exploitation of results in future scientific projects - Building network among data service and tools developers and researchers - Building curriculum at universities; academic education and training
A3a: High-level Policy stakeholders - National governments (ministries) - European Commission (e.g. DG Environment, DG Climate, DG Agriculture, CIS WFD, CIS FD, EG WS&D) -Members of European Parliament - UNFCCC - UN Water (and Integrated Monitoring Initiative on SDG6) **A3b: Environmental agencies and non-governmental organisations and networks** - European Environment Agency, EIONET, European Drought Observatory, Copernicus - International organisations for water and climate (WMO, UNESCO-IHP, HELP, Water and Climate	- Implementation of STARS4Water policy recommendations in EU and at national level; - Awareness raising about climate change impacts on Europe's fresh water resources and consequences for society, environment and economic sectors - Raising awareness on climate change impacts and risks related to water resources - Promoting project's results: services, tools, methods, guidelines - Spreading the message on policy recommendations

Coalition, Global Adaptation Centre, WWAP, AGWA) - International environmental organisations (e.g. WWF, IUCN, Wetlands International)	- Enable best practices - Capacity building
A4a: Consultants, SMEs, Practitioners, Start-ups - Involved with water resources modelling applications - Involved with climate change assessments - Involved with floods and droughts prediction and forecasting - Involved with water resources management - Involved with Earth Observation data applications, data assimilation, monitoring - Involved in science-policy interfacing and applications for operational decision making/decision support systems' development	- Exploitation of results: application of data-services and tools in water resources planning projects
A4b: Economic sector stakeholders - Agriculture - Food and beverage sector - Energy sector - Water utility sector - Tourism sector - Industry sector - Inland navigation	- Raising awareness on climate change impacts and risks related to water resources availability - Enable best practices - Exploitation of results: application of data-services and tools for specific purposes in their sector - Capacity building
A5: General public	- Raising awareness

3.1. River basin stakeholders (A1)

A1a. Shareholders and Stakeholders of the River Basin Hubs (RBHs)

The River Basin Hubs' stakeholder communities represent different user interests in the river basin, and include river basin managers, governmental organizations, representatives from economic sectors, etc., as well as societal and environmental organizations. The stakeholder communities have been kept informed on the progress in STARS4Water (via newsletters, the website, the social media, the stakeholders' forum, etc.), have been invited to participate in the STARS4Water local workshops, and have been invited to participate in testing of products when suitable.

The River Basin Hubs' stakeholder communities include:

- River basin managers and planners: key actors for monitoring, assessments, adaptive integrated water resources planning at river basin scale, and implementation of measures to manage water resources under a changing climate, and main users of the services and tools provided STARS4Water.
- Local and national governments: enhance adaptation of water resources management and water users to climate change through policies, master planning and regulations, in the context of achieving the goals, objectives and requirements of European Green Deal and EU-water related policies.
- Water utilities: responsible for the safe and timely distribution of water and other related services, such as wastewater treatment.

- Private sector and Economic water use sectors: economic sectors, such as agriculture and hydropower depend largely on water resources availability and are impacted by water-related extreme events. By engaging economic sectors, strategic water resources planning could benefit by creating a wider solution space, leveraging additional financing and obtaining wider support for decisions. The local private sector can grow and expand developing downstream business and services.
- Environmental protection agencies and nature protection organisations: ecosystems and communities are vulnerable to changes in water resources availability and changes in magnitude and frequency of extreme water-related events. Through the process of integrated water resources management, which also considers the hydrological requirements for ecosystems and society, resilience of ecosystems and society to changes in water resources availability under changing climate will be enhanced. As a result, the social welfare is promoted in an equitable manner and the sustainability of water-depended ecosystems and the services and good these ecosystems provide for society is supported.
- Civil society organisations: citizens input on one hand, and increased awareness on the other hand, can act as drivers of change towards better adaptive management and increase the resilience of the community.

Each river basin hub has a direct beneficiary River Basin organisation (RBO) that: (i) has interest in supporting the co-design and application of the STARS4Water tools and services, (ii) will be a primary user of the products and services of the project (but not limited to them), and (iii) has strong institutional connections and relationships with other governmental organisations, non-governmental organisations (e.g. water utilities, nature conservation organisations, civil society organisations) and private sector organisations (e.g. farmers associations, food and beverage industry, energy sector). The latter can also become users of the products and services when interested. To support effective stakeholder engagement and to create co-ownership with the stakeholders, each river basin hub has a dedicated "shareholder" (partner or associated partner) in STARS4Water. Shareholders are "owners" of the project, having a "share" in the tools and services the project develops. Shareholders have a leading role in engaging the stakeholder communities to facilitate the co-design activities (identification of the user needs for data services and modelling tools, information requirements, co-development and validating of the new data services and data-driven tools, etc.). Shareholders also have a leading role in the communication and dissemination towards the river basin hub stakeholder communities or even country-scale.

It is acknowledged that the different above-mentioned stakeholder categories of the RBH communities have different levels of interest and influence related to the STARS4Water products, tools and services. The dissemination and communication efforts are thus targeted and optimised accordingly, with basic information for awareness and acceptance raising provided in the "low influence, low interest" stakeholders, to detailed information and capacity development provided in the "high influence, high interest" stakeholders in order to boost uptake, mainstreaming and capitalisation of the STARS4Water foreground (Figure 4). Finally, we have also identified in each RBH the "stakeholder champions" (within the Deliverable D1.1 Stakeholder engagement plan[1]), who are in a more influential position when it comes to future challenges or conflicts within the RBH, and with whom we collaborate more closely also regarding the D&C activities. The stakeholder champions are hence in the category with high influence and high interest in the Figure 4.

[1] Hegdahl, T.J., ter Maat, J., Kruijshoop, J. & Hisdal, H. (Eds.) (2023): Stakeholder engagement work plan. Horizon Europe project STARS4Water. Deliverable D1.1.

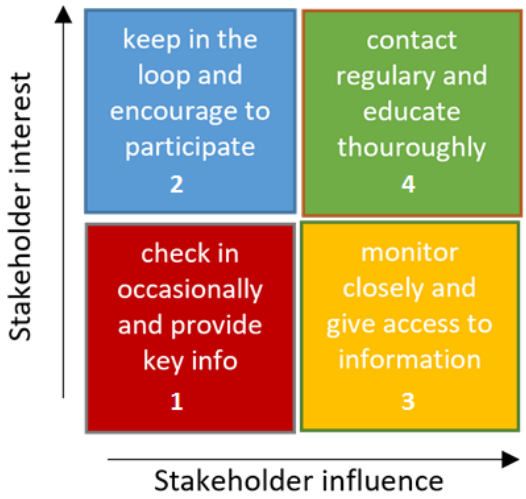

Figure 4. Dissemination and communication efforts based on the RBH stakeholders influence and interest. Source: STARS4Water Deliverable D1.1[1]

A detailed identification of all the organisations in the stakeholder communities for each RBH is presented the STARS4Water Deliverable D1.1[1]. Here we present the key ones, i.e. the "stakeholder champions" per RBH, with whom we are engaging in more extensive communication, dissemination and exploitation activities (Table 2).

Table 2. Identified "stakeholder champions" in each River Basin Hub for targeted D&C activities.

River Basin Hub	Organization	Theme
Drammen (Norway)	Regulerings samarbeider for Drammensvassdraget (RSD)	Hydropower
	Norwegian water resources and energy directorate (NVE)	Governmental
	River basin district board (Vannregion-område ansvarlig)	Governmental
	Glitre vann	Water supply
East Anglia (United Kingdom)	Water Resources East	Water resources planning
	Essex and Suffolk Water	Water supply
	Environment Agency	Governmental
Rhine (International)	CHR - International Commission for the Hydrology of the Rhine basin	Scientific research related to climate change & hydrology, morphology & sediments, socio-economics and water use
	ICPR - International Commission for the Protection of the Rhine	Harmonizing many interests of use and protection of the Rhine area by transboundary cooperation
	CCR - Central Commission for the navigation of the Rhine	Rhine river and inland navigation

Danube (International)	ICPDR - International Commission for the Protection of the Danube River	Transboundary Commission; River Management
	Danube Commission	Transboundary Commission; Navigation
	WWF Danube-Carpathian	Ecology
	International Association for Danube Research	Water management and environmental issues
Seine (France)	Agence de l'Eau Seine Normandie (AESN)	Water resources management
	EPTB Seine Grand Lac (EPTB SGL)	Water management, flood protection, low flow support
Duero (Spain)	Water supply Junta de Castilla y León	Urban supplies
	Waters of Valladolid	Urban supplies
	Ferduero	Irrigations
Messara (Greece)	Region of Crete – Directorate of Environment and Spatial Planning – Department of Hydroeconomy	Protection and management of water resources
	Local Land Reclamation Organizations (TOEB of Zone B of Messara, TOEB of Zone C of Messara, TOEB of Vassilikon-Anogion)	Irrigation management and irrigation water works

A1b. River Basin organisations and networks outside the Hubs

Besides the stakeholders from the river basin hubs, the dissemination activities will reach out to European River Basin Organisations (RBOs) and River Basin Authorities of the WFD. We are targeting to disseminate the STARS4Water products and tools to 25 European RBOs opting for their use (of the new data services, tools and/or indicators) in their next round of planning for the Water Framework Directive and/or Flood Directive. We also target to involve at least 20 river basins in sharing of information on the STARS4Water Online Impact Reporter related with biophysical and socio-economic impacts, changes in vulnerability and risk, and ex-post evaluations of applied adaptation measures related to climate change. The RBOs to reach out will be selected from the available WFD Implementation Reports and Member State Assessments, also considering existing networks and partnerships of the STARS4Water consortium partners. Additionally, we will disseminate the project results (on a fit-for-purpose basis) to international RBOs and networks, such as the ones listed below:

INBO – International Network of Basin Organizations

MENBO – Mediterranean of Basin Organizations

IDPM-CEE – Integrated Drought Management Program for Central and Eastern Europe

ICPER – International Commission for the Protection of the Elbe River

IMC – International Meuse Commission

ECRR – European Centre for River Restoration

EDO – European Drought Observatory

GWP – SDG6 IWRM Support Programme

WCRP GEWEX – The Global Energy and Water Exchanges (GEWEX)

EUMETSAT H-SAF Network – Support to Operational Hydrology and Water Management

WES – Water and Environment Support in the ENI Southern Neighbourhood region

UN-ECE – UN Economic Commission for Europe

3.2. Scientific and research community (A2)

One of the main target groups of the STARS4Water dissemination activities is the European Research Area (ERA) and the wider global research community. The fact that the project itself involves many partners, each one of them having established networks, has secured the selection of the proper scientific audience to address. The research community has been sensitised on the project activities through international events, the organization of workshops and sessions dedicated to specific scientific issues of the project (e.g. Data-driven hydrology and machine learning algorithms for water management and risk assessment, Data and information for climate change adaptation in basins, Stakeholder driven unlocking of data for river basin management, etc.)etc.), the various targeted publications in journals (ref. our publications section in the STARS4Water website, and the e-learning platform "STARS4Water Academy" where tutorials/ webinars are available for a range of outputs/ products developed by the project. Table 3 presents a list of indicative scientific projects and initiatives of relevance to the STARS4Water that we have/will be networking with and disseminating the STARS4Water scientific advances.

Table 3. List of indicative scientific projects and initiatives of relevance to the STARS4Water dissemination of the research foreground and scientific networking

Acronym	Title
SOS-Water	Water Resources System Safe Operating Space in a Changing Climate and Society
EurAqua	Network of European freshwater research institutes
WMO HydroSOS initiative	Global Hydrological Status and Outlook System (HydroSOS)
Copernicus Climate Change Service (C3S) and related Demonstrator Projects	Operational service for the water sector of the Copernicus Climate Change Service (C3S)
European hydrology and climate data explorer	The interactive web application "European hydrology and climate data explorer" provides easy access to a range of climate impact indicators for water quantity, water quality and relevant meteorological climate impact indicators
European hydrology seasonal forecast explorer	The interactive web application "Hydrological seasonal forecast explorer" presents monthly hydrological seasonal forecasts of river discharge from a hydrological ensemble using the SEAS5 seasonal forecasting system
EcoAdvance	Advancing freshwater restoration
C3S - Sectoral applications of decadal predictions	Sectoral applications of decadal predictions for: agriculture, energy, infrastructure, insurance
WISE Freshwater	Water Information System for Europe (information and data on the state of Europe's rivers, lakes, groundwaters, on the pressures

	affecting them, on the measures and actions taken to protect and conserve the aquatic environment)
JPI Water	Joint Programming Initative on “Water challenges for a changing world”
JPI Climate	Joint Programming Initiative "Connecting Climate Knowledge for Europe"
Water4All	Water Security for the Planet (Co-funded European Partnership)
UAWOS	Unmanned Airborne Water Observing System
MuSe-BDA	Multi-Sensor Bayesian Data Assimilation for Large-Scale Drought Monitoring System
TRANSCEND	Transformational and robust adaptation to water scarcity and climate change under deep uncertainty
Climateurope2	Supporting and standardizing climate services in Europe and beyond
TEMBO Africa	Transformative Environmental Monitoring to Boost Observations in Africa
MAGDA	Meteorological assimilation for accurate weather forecasting and efficient irrigation
DANUBE4All	Restoration of the danube river basin waters for ecosystems and people from mountains to coast
DALIA	Danube Region Water Lighthouse Action
InnWATER	Promoting social INNovation to renew multi-level and cross sector WATER governance
B-WEX	Balancing clean Water and Energy provision under changing climate and extremes
RETOUCH NEXUS	Resilient water governance under climate change within the WEFE NEXUS
ULYSSES	A global and multi-model hydrological prediction system
TransformAr	Accelerating and upscaling transformational adaptation in Europe: demonstration of water-related innovation packages
ICT4Water Cluster	Community of EU funded projects aiming to boost the digital transformation of the water sector, scoping at a more efficient and sustainable use of water resources
FIP	Freshwater Information Platfrom
Danubius-RI	Research Infrastructure to facilitate and contribute excellent science on the continuum from river source to sea
EartH2Observe Water Cycle Integrator (E2O WCI)	Global Earth Observation for Integrated Water Resource Assessment Water Cycle Integrator

CERTO	Copernicus Evolution: Research for harmonised Transitional water Observation
GEOEssentials	GEOEssential Variables workflows for resource efficiency and environmental management
ClimXtreme	A research network on climate change and extreme events
REXUS	Managing Resilient Nexus Systems through Participatory Systems Dynamics Modelling
RADAR	Reviewing Approaches for communicating drought status and risk
ISIMIP	Inter-Sectoral Impact Model Intercomparison Project
REACHOUT	Resilience in Europe through activating city hubs reaching out to users with triple-a climate adaptation tools
TACTIC	Tools for Assessment of Climate change Impact on Groundwater and Adaptation Strategies
CIPRHES	Integrated chain for Hydrometeorological Prediction of low levels and droughts
LIFE LOGOS 4 WATER	Integrated application of innovative water management methods at river basin by coordination of local governments

3.3. High-level Policy community (A3)

Among the STARS4Waters objectives is to improve Member States' preparedness for climate change impacts with respect to floods and droughts and support more accurate decision making and policy for flood and drought risk reduction and response, as well as to provide improved knowledge on ecological flows in the context of the Water Framework Directive. It is thus clear that the policy community can benefit from the project findings and experience and is in this sense a valuable end-user and target audience. The fact that the projects itself involves stakeholders and partners involved in the science-policy interfacing processes, each one of them having established networks, will secure the selection of the proper policy audience to address. The following entities and actors have been identified:

A3a: High-level Policy stakeholders

- National governments (ministries)
- European Commission (e.g. DG Environment, DG Climate, DG Agriculture)
- Common Implementation Strategy Working Groups (CIS WFD, CIS Floods, CIS Groundwater, EG Water Scarcity & Drought, etc.)
- Members of European Parliament
- United Nations Framework Convention on Climate Change (UNFCCC)
- UN Water (and IMI on SDG6)
- ICPDR (International Commission for Protection of the Danube River)
- ICPR (International Commission for Protection of the Rhine river)

A3b: Environmental agencies and non-governmental organisations and networks

- European Environment Agency (EEA)

- European Environment Information and Observation Network (EIONET)
- Copernicus, Group on Earth Observation (GEO)
- WMO Water and Climate Coalition
- UNESCO-IHP
- World's Large Rivers Initiative
- High Level Experts and Leaders Panel on Water and Disasters (HELP)
- Water and Climate Coalition
- Global Adaptation Centre
- UNESCO World Water Assessment Programme (WWAP)
- Alliance for Global Water Adaptation (AGWA)
- International environmental organisations (e.g. WWF, IUCN, Wetlands International)

The policy community is being sensitized on the project activities through the transnational dissemination events, the organization of a one-day policy event dedicated to specific policy and decision making related issues and the usability of the STARS4Water services and products at different scales (local, regional, pan-European), etc., but also through the various targeted publications, the story maps on impact of climate change on the future of Europe's freshwater resources, the project documentary, and the policy briefs with direct relevance for the implementation of the EU Adaptation Strategy (as one of the pillars of the EU Green Deal) and EU water related policies. STAR4Water is in communication with the CIS EG on Water Scarcity and Drought to pitch in our project policy-relevant results. Regarding the one-day policy event we are aiming to having a joint event with our sister project SOS-Water and invite representatives from the High-level Policy community (A3) to attend.

3.4. Business community and economic sectors (A4)

STARS4Water produces exploitable results at multiple levels, including for the wider business community. Open source data, services and tools for efficient monitoring, assessment and projections related to climate change impact, new modeling tools for water resources management benchmarked against comparative evaluation criteria, and new data-driven modeling techniques, will be delivered and accompanied by publications, guidelines and training material. These data services and tools can be capitalized by SMEs, Consultants, start-ups and the various economic sectors in water resources planning projects and/or in the development of downstream applications, services and tools. The following entities have been identified:

A4a: Consultants, SMEs, Practitioners, Start-ups

- Involved with water resources modelling applications
- Involved with climate change assessments
- Involved with floods and droughts prediction and forecasting
- Involved with water resources management

- Involved with Earth Observation data applications, data assimilation, monitoring

- Involved in science-policy interfacing and applications for operational decision making/decision support systems' development

A4b: Economic sector stakeholders

- Agriculture

- Food and beverage sector

- Energy sector

- Water utility sector

- Tourism sector

- Industry sector

- Inland navigation

Among the project's goals is to evaluate opportunities arising for new business and job creation matching the STARS4Water products with innovative ideas for capitalization through a dedicated Future Exploitation Plan (ExP). This will help local consultants (who are typically SMEs) to improve and develop services and products in the domain of water-and-climate change assessment and monitoring using new data and tools and enhance their competitiveness. The fact that the projects itself involves SMEs as partners, each one of them having established networks, will secure the selection of the proper business audience to address. The business community is being sensitized on the project activities through the transnational dissemination events, the social media, but also through the various targeted publications/communication material, the webinars (STARS4Water Academy) and the Final Conference.

3.5. General public (A5)

Reaching out to general public is pursued within the project. STARS4Water communications follow unified central messaging, but with respect to also adapting to the general public communication channels and styles. Essential messages are thus tailored to the general public and the civil society organisations to allow for easy understanding and awareness raising. The messages are disseminated through the STARS4Water website, social media, and citizens-oriented informational material.

3.6. Priorities in relation to the Target Audiences in the final year of the project

In the final year, our dissemination and communication priorities will be differentiated **by target audience, with a clear focus on uptake and impact:**

- **River Basin Stakeholders (A1):** final workshops, capacity-building on utilizing the data services (Impact Reporter, Metadata Portal) , and direct support for integrating the STARS4Water models

and tools (e.g. dashboards) into basin planning. **Priority = mainstreaming results into water management plans and operational water management** practices at basin scale

- **Scientific and Research Community (A2):** publication of the Special Issue, open data/model release on Zenodo, and delivery of approximately 40 Academy tutorials. **Priority = ensuring long-term scientific visibility, re-use of results, and integration into future projects and curricula.**
- **Policy Community (A3):** targeted policy briefs, joint policy seminar with SOS-Water, and engagement with CIS WGs and EU Water Resilience Strategy processes. **Priority = translating and feeding project results into active EU and national policy cycles**.
- **Business and Economic Sectors (A4):** publication of the Future Exploitation Plan and tailored outreach to SMEs/consultants. **Priority = positioning STARS4Water outputs as exploitable services for the market and operational sectors, piloting uptake of services for commercial and operational applications**.
- **General Public (A5):** release of the StoryMaps, Layman's report and documentary, supported by amplified social media campaigns. **Priority = raising public awareness of climate-water challenges and communicating the real-life relevance of project outcomes**.

This prioritization ensures that each audience is reached with fit-for-purpose activities designed to secure measurable uptake in the project's final year.

4. Dissemination and Communication Activities, Mechanisms & Tools

The different dissemination and communication activities, mechanisms tools deployed are analytically described in the following sections and summarized in Table 4. Targeted mechanisms are mobilized and the activities are implemented in a stepwise process in order to achieve the objectives of the dissemination strategy, subject to review and updating along the course of the project to maintain a dynamic process, and maximize the intended impact. Three main channels are being used to deliver the various products: "web-based", "print-based", "person-based". All dissemination products acknowledge the funding received by the EU Commission, follow the publicity rules set by H2020, and are compliant with the relevant dissemination rules and guidelines.

Table 4. Overview of the D&C activities, mechanisms and tools, and their relevance per target audience.

D&C Activities, Mechanisms and Tools	**Target Audience (see Table 1)**					
	A1a	A1b	A2	A3	A4	A5
Portfolio of dissemination products addressed to all audiences/communities						
STARS4Water website	√	√	√	√	√	√
Social media pages	√	√	√	√	√	√
General promotional/informational material (leaflets, brochures, presentations, posters, articles)	√	√	√	√	√	√
E-Newsletters	√	√	√	√	√	√
STARS4Water Final Conference	√	√	√	√	√	√
Outreach, interaction and capacity building of the river basin practitioner communities						
Participatory Workshops in the 7 river basin hubs with the river basin communities	√		√	√	√	√
Training & capacity building activities (through the STARS4Water Academy) - curricula for river basin managers	√	√				
Interactive Stakeholders' Forum and Online Impact Reporter	√	√		√	√	√
Webinars targeting stakeholders across and outside the 7 hubs	√	√				
Dissemination to the Scientific and Research Community						
Scientific publications in peer-reviewed journals	√		√		√	
Presentations/posters in international conferences	√	√	√	√	√	
Training of researchers and students (through the STARS4Water Academy) - curricula for the scientific community			√		√	
Linking Science and Innovation to the Decision and Policy-Making function						
One-day seminar for policy-makers	√	√		√		
Policy Briefs	√	√	√	√	√	√
Layman's Report	√	√	√	√	√	√
STARS4Water Documentary	√	√	√	√	√	√
Networking with relevant initiatives (EU Green Deal, the CIS WGs, International agencies and organisations, etc.) including face-to-face briefings when deemed effective		√		√		

Future exploitation and sustainability						
Customized communication material for SMEs, NGOs, CSOs, the general public					√	√
STARS4Water Future Exploitation Plan (ExP)	√	√	√	√	√	√

4.1. D&C-4-all: Portfolio of dissemination products and tools addressed to all audiences/communities

A wide range on web-based and printed dissemination products and tools are developed to support the timely and up-to-date diffusion of information and improved communication addressed to all target audiences/ communities, as presented below:

- STARS4Water website (www.stars4water.eu): to be maintained for 5 more years after the project ends, it is used to disseminate updates on activities, deliverables, interesting news/posts, events, etc. A search engine optimisation (SEO) strategy will be implemented in order to increase the outreach.
- Social media pages (e.g. Facebook, Twitter, LinkedIn, RSS feeds, blogs). The STARS4Water LinkedIn Group (launched in October 2022, https://www.linkedin.com/groups/9243555/) has currently 86 members. There is a plan to develop "hub runbooks" via "dedicated weeks" for each hub, where information, short movies, mini-interviews with stakeholders, etc. will be posted on LinkedIn.
- General promotional/informational material (leaflets, brochures, presentations, posters, articles). The main presentations and brochures are translated into several languages (including all the languages of the case studies) to reach a wider audience. Relevant existing online dissemination platforms are also reached (e.g. the Freshwater Information Platform).
- E-Newsletters (every 6 months, aligned with interesting updates and project deliverable) updating on the progress and disseminating news. The 1st Newsletter has been distributed in November 2023, the 2nd Newsletter has been released in November 2024, and the 3rd Newsletter has been distributed in June 2025. The 4th Newsletter will be released at the end of September 2025, while a 5th one in planned for December 2025. There is plan to also to promote out Newsletter via the newsletters of other initiatives (e.g. EMWIS, IMBO, JPI-Water)
- The STARS4Water Final Conference, attached to a main regional event to maximise impact.
- Customised communication material for the general public, in an easy and understandable language to raise awareness.
- Joint dissemination activities with the sister project SOS-Water: to maximise the impact of the STARS4Water dissemination and outreach, we will develop, jointly with SOS-Water, a portfolio of results that are relevant for joint dissemination, and a comprehensive mapping of the relevant stakeholders/target audience for each particular portfolio. For this purpose we will take advantage of the Horizon Results Booster services, and we plan to submit a joint proposal with SOS-Water to the Horizon Results Booster/ Module A for Identifying and creating the portfolio of R&I project results in July 2024. A joint event targeting the high-level policy audience is also under planning.

The STARS4Water Project Website (www.starts4water.eu) plays an important role in a two-way communication with interested stakeholders. It is used for presenting the project description and deliverables, informing on the activities and outputs. All the public results are posted and available on this site. A dedicated section for the media is visible and easily accessible containing brief articles, newsletters, alerts on upcoming events and regular news posts on water resources, water scarcity,

drought management, climate change impacts on water resources, etc. In more detail, the STARS4Water website is active and dynamic and contains the following sections:

- HOME: This page is the homepage/landing of the project, containing direct links to all the other tabs, displaying some general info on the project, and selected news and events. The home page follows the STARS4Water corporate design.
- PROJECT: This section provides detailed information on the project, its objectives, the state-of-the-art and policy context, as well as an overview of the workplan and workpackages and their interconnection.
- 7 HUBS: This section provides the basic information for each hub, along with the identified challenges. Each hub has, for that purpose, a dedicated webpage, which will evolve as new information and products are available through the project (webinar outputs, story maps, etc.). The hub's pages are planned to be updated in 2025 with the new information obtained from the stakeholders' workshops and project outputs (e.g. on narrative and scenarios).
- PARTNERS: This section introduces the project partners, and provides some basic info/facts on each partner.
- ACADEMY: This section offers an open access structured series of webinars and tutorials designed to share methods, processes, models and tools developed within the projects with researchers, practitioners, and policymakers. OUTPUT: This section is dedicated to downloaded material made available by the project, under 3 main categories: public deliverables, project presentation, publication
- NEWS: This section is dedicated to brief articles, newsletters, posts on related topics, etc. This information is screened and selected by the partners with the goal to being up-to-date and serving as an important trigger to the readers. We are roughly posting a new item every 7-10 days.
- EVENTS: This section is used to inform the public on interesting upcoming events (either organised by the STARS4Water project or other context-relevant events). The events are listed in chronological order, while the past events are kept in archive.
- CONTACT: This section in the entry point to allow for contacting the project team. Emails are possible using a predefined format with "subject" options to allow the quick allocation of the enquiries among the partners. The General Data Protection Regulation is taken into consideration.

4.2. D&C-4-RBOs: Outreach, interaction and capacity building of the river basin practitioners communities

The outreach and capacity building of the river basin communities is a central goal of the STARS4Water dissemination, closely related to the STARS4Water WP1 and WP5, and is dedicated to pursuing end-users' engagement, consultation and participation. The objective is three-fold: (a) interact with the river basins community and collect input and feedback for various STARS4Water products-to-be-developed through a participatory process in synergy with WP1, (b) disseminate the relevant outputs in customized ways so that they are well-perceived, and (c) build capacity of the river basin communities end-users by providing tailored training and building a Community of Practice (CoP) that can uptake and further exploit the STARS4Water product and services. Women are also targeted here as an end-user group having a significant role in participatory water management. Activities foreseen:

- Participatory Workshops in the 7 river basin hubs with the river basin communities (4 per hub) to fortify the co-development/co-creation process on one-hand (linked to WP1, WP2, WP3, WP4) and

the update and usability of the STARS4Water products and services at the local/national scale (in synergy with WP5).

- Training & capacity building activities: this will be offered through the STARS4Water Academy as an open access structured series of webinars and tutorials designed to share methods, processes, models and tools developed within the projects. The capacity building needs of the hubs' stakeholders will be communicated to the project through the hub leaders in order to formulate relevant topics.
- Building stakeholder communities: Networking with relevant local initiatives and stakeholders in support of participatory exchanges among the river basin organisations (as primary users, but not limited to them) in order to facilitate their exchanges (in close collaboration with WP1 and WP5).
  A dynamic component for information exchange among the stakeholder communities is the STARS4Water Impact Reporter (https://ir.stars4water.eu/). This online open-access application is designed to document, analyse, and share insights on the impacts of historic flood, drought, storm, and heatwave events (Table 5). It provides a comprehensive platform to report biophysical, social and cultural, economic, and health-related impacts of these events, fostering knowledge exchange among stakeholders. Additionally, the application highlights applied mitigation and adaptation measures, enabling communities and decision-makers to learn from past experiences. This information is crucial and currently lacking at a harmonised and easily accessible format. By consolidating critical data and facilitating collaboration, the Impact Reporter supports vulnerability and risk analysis, empowering stakeholders to make informed decisions and enhance resilience in planning for future climatic challenges. Its added value lies in bridging the knowledge gap and making impact data accessible, actionable, and collaborative, which can in turn inform actionable strategies for risk reduction and sustainable adaptation.
  The Impact Reporter is open-access when it comes to viewing the recorded events and it will be well publicized with the vision of remaining a functional and operational infrastructure after the end of the project (this will be addressed within the exploitation plan). The reporting on a new event requires a registration and access is provided by the project for screened users.

Table 5. Main features on the STARS4Water Impact Reporter.

Online Impact Reporter (IR)	**Event-based historical information of past events (floods, droughts, storms, heatwaves)**
Scope	• Dissemination of information on the observed impacts (biophysical, socio-economic) of important events • Exchange of practices and information on the performance (ex-post) of mitigation and adaptation measures to cope with the event, strengthen CoP
Input provided by	RBAs and/or other WFD RBMP key stakeholders using specific online templates
End-users	RBAs, policy makers, general public, researchers
Reporting fields	- Event (title, location, date, characterisation) - Impacted sector(s) - Impacts (environmental, societal and cultural, economic, health) – predefined list provided - Impacts' metrics and significance - Measures implemented (for emergency response, mitigation, long-term adaptation) - Additional info

Search mechanism	Map-based or text-based search - by event category (WR availability - drought, flood) - by sector impacted (agriculture, energy, tourism, etc.) - by scale and location (city, region, country) - by date (specific date, year, season…)

Within the last year of the project Impact Reporter will be promoted beyond our hubs' stakeholder communities to additional river basin organisations (aiming for 20 river basins in total) to encourage reporting of events and sharing of adaptation measures, building thus a wider evidence base.

To expand the use of the Impact Reporter beyond our hubs' stakeholder communities, a focused promotion plan for the final year will be implemented:

1. **Targeted outreach to RBOs:**
    - Identify around 20 priority river basin organisations through existing partners; networks and EU networks (e.g. INBO, ECRR, ICPDR, ICPR, MENBO, EurAqua).
    - Use partner connections (NVE, Deltares, RWS, INBO, ICPDR) to directly approach these organisations with tailored invitations to test and contribute.
2. **Capacity-building and onboarding:**
    - Organise **2–3 dedicated webinars** for external RBOs on how to use the Reporter, with step-by-step demonstrations and Q&A.
    - Develop a **short user guide and video tutorial** explaining reporting procedures and benefits, in English and translated into selected hub languages.
3. **Showcasing value:**
    - Present Impact Reporter outputs (maps, event comparisons, adaptation examples) at the **Final Conference** and at policy/scientific events, demonstrating how the tool can feed into RBMPs, adaptation planning, and EU reporting.
    - **Demonstrate cross-basin comparisons:** Use the Reporter to generate comparative insights (e.g. drought impacts in Southern vs Northern Europe, or different adaptation measures for floods across basins) and present these. This highlights the added value of pooling data across basins, not just reporting single cases.
4. **Incentivising participation:**
    - Highlight visibility benefits for contributors: contributions will be showcased on the website and in newsletters, giving credit to participating organisations.
    - Engage "stakeholder champions" to act as ambassadors and promote adoption among their networks.
5. **Sustainability beyond the project:**
    - Identify 1–2 European-level organisations (e.g. ICPDR, INBO, EEA) to act as custodians for continued promotion and hosting (to be explored within the Future Exploitation Plan)
    - Ensure the platform remains open-access and supported under the Exploitation Plan.

By focusing on a manageable list of 20 additional RBOs and offering practical onboarding plus visibility incentives, we aspire to secure active contributions from at least 10–12 RBOs in the final year, while establishing pathways for further expansion post-project.

- Webinars targeting stakeholders across and outside the 7 hubs (local, national and international) to interpret the STARS4Water outputs (data services, improved data-driven modelling suites, projections and forecasts, etc.), discuss scenario planning, risk management and definitions of safe operating spaces under climate change, etc. (linked to WPs 4, 5). These webinars cover various thematic areas (e.g. how to build narratives and scenarios relevant for assessing future vulnerabilities, methodology for assessing e-flow, etc.), and are part of the STARS4Water Academy

4.3. D&C-4-science: Dissemination to the Scientific and Research Community

As an R&I project STARS4Water is producing important outputs marking its contributions to science in the ERA and beyond. Dissemination products and activities foreseen:

- Scientific publications in peer-reviewed journals: Open access (gold and green) papers, complying with the strategy of the EC. Also a Special STARS4Water Issue in a scientific journal. All publications are available on our website publications section and on the Zenodo STARS4Water Community. All produced data are also available on Zenodo.
- Presentations/posters in international conferences. Sessions in Conferences (e.g. EGU, FAO, WMO, WaterNet) are organized, and the STARS4Water Final Conference.
- Training of researchers and students: The STARS4Water Academy is built up as an open-source Learning Management System and addresses different user communities with different courses. We will develop three different curricula: for river basin managers, for water resources users and for the scientific community with a focus on students and young professionals. Training tutorials of the Academy include webinars of various topics accessible for users at any time. The developed tutorials will remain accessible after the project's end through adopting selected contents of the Academy by the project partners. We are targeting a total of about 40 tutorials, covering various themes and learning depths (from introductory to more advanced levels). These are presented in detail in Deliverable 5.1. The video tutorials are organized along the underlying structure of the project: a shared perception layer and shared science layer with strong focus on co-creation with each three phases. In each phase tutorials are foreseen. These can be general tutorials, explaining for example the general purpose of a model, example tutorials in which a specific model is demonstrated, and 'how-to' tutorials, supporting adaptation of a mode for own needs.
  A list of the tutorials/ webinars included so far in the Academy is presented below:
    - The STARS4Water in a nutshell
    - Local data collection: Approach and lessons learned
    - Local data collection: practical approaches to local water metadata
    - Indicators for assessing climate risks and impacts on integrated water resources system
    - STARS4Water Impact Reporter: Part 1 – Overview and Navigation
    - RIBASIM – Water resources model to support resilient and sustainable water management in complex basins
    - The RIBASIM Rhine model – modelling water use and allocation in times of low flows and water scarcity
    - RIBASIM – Water resources model to support resilient and sustainable water management in complex basins

- The RIBASIM Rhine model – modelling water use and allocation in times of low flows and water
- Calibration and Validation
- MLMapper – data driven predictions in space
- Machine Learning model for reservoir storage forecasting
- Large scale models – Water resources model tools to support resilient and sustainable water management over continental scale
- Methodology for assessing the quantitative status of groundwater – Application to the groundwater bodies of the Spanish Duero River Basin

Besides the STARS4Water Academy, in-person training for researchers and students have been foreseen, such as the workshop on Machine Learning which took place at INRAE premises in April 2024 (24th-25th of April). A training course on the RIBASIM software was also held at DELTARES premises in May 2024, where users from the hubs were trained hands-on on the latest version of RIBASIM.

4.4. D&C-4-policy: Linking Science and Innovation to the Decision and Policy-Making function

Science-policy interfacing activities aim at facilitating the "transfer of improved data and information from the observation and modelling systems into the decision-making function". The target audience includes high-level policy-makers and decision-makers within the key affiliated economic sectors. As these actors support different elements of the policy cycles and economic development decisions, and at different levels of the value chain, a prioritization will be made as to the most relevant for STARS4Water. The foreseen dissemination products and activities include:

- For policy-makers: Dedicated event in Brussels, co-organised with our sister project SOS-Water on the usability of the STARS4Water services and products at different scales to support policy aspects. The event will be hybrid to allow participation of national policy makers and stakeholders from river basin hubs, and wider audiences
- Policy Briefs and a Layman's Report (~50 pp., precise, addressed to a non-technical audience). The following topics have been defined for the policy briefs: unlocking global data for EU water policies, climate change impacts on water resources in EU basins, STARS4Water Guiding principles for EU Policy Development
- STARS4Water short video and stinger
- STARS4Water Documentary: production of a short documentary (also available on YouTube) on STARS4Water policy-relevant findings (e.g. form Tasks 4.4, 5.4) and new services, including interviews with key stakeholders, information on the future climate risks and impacts on water resources, and attractive visual material.
- Networking with relevant initiatives of the EU Green Deal, the CIS WGs, International agencies and organisations (e.g. EEA, EDO, WMO, UNESCO IHP, WWAP, HELP, Water and Climate Leaders Panel), Copernicus, etc., including face-to-face briefings when deemed effective.

4.5. D&C-4-business: Future exploitation and sustainability

A set of exploitation activities are foreseen in order to identify and pursue opportunities for the exploitation of the project foreground, opting the uptake of the project results by the business community (SMEs, consultants, Associations, start-ups, young professionals, NGOs, etc.), the matching with innovative ideas that can help SMEs to develop services and products, and the increased involvement of the citizens/general public. Special emphasis will be placed on empowering women. The planned activities include:

- Communication material for SMEs, NGOs, CSOs, the general public (i.e. CitizensLink on the website).
- STARS4Water Future Exploitation Plan (ExP): the ExP will draft a strategy for the follow-up of the project, will identify potential exploitation and commercialization activities, as well as further products, applications and services that can be built on the basis of the STARS4Water outputs.

5. Detailed Plan: timing and responsibilities

5.1. Timeplan of the dissemination and communication activities

The time plan of the dissemination and communication activities is presented in the Table 6.

Table 6. Detailed time plan of the STARS4Water dissemination and communication activities during the 4th year of the project

D&C Activities	2025 Q3	2025 Q4	2026 Q1	2026 Q2	2026 Q3
STARS4Water website			Update HUBs' pages		
Social media pages		Migrate to an "open group"			
General promotional/informational material (leaflets, brochures, presentations, posters, articles)			Pitch presentation/ fact sheet of Hubs processes (why (needs), what (which tools), how (stepwise process)	Hubs' StoryMaps	
E-Newsletters	Newsletter #4 (September 2025)	Newsletter #5 (December 2025)	Newsletter #6	Newsletter #7	Newsletter #8
STARS4Water Final Conference					MS12
Participatory Workshops in the 7 river basin hubs with the river basin communities			W#4		W#5
Training & capacity building activities (through the STARS4Water Academy) - curricula for river basin managers	Launch		Additional modules	Additional modules	
Online Impact Reporter	Launch	Targeted outreach to 20 RBOs			
Webinars targeting stakeholders across and outside the 7 hubs			Stakeholder workshop on uptake and transferability	Stakeholder meeting (sharing results)	
Scientific publications in peer-reviewed journals			Manuscripts submission deadline for the Special Issue	Special Issue D6.9	
Presentations/posters in international conferences		Abstract submission for EGU26	EGU 2025	EGU26 Conference, 3-8 May, 2026 Joint Session with SOS-Water on safe-operating space	

D&C Activities	2025 Q3	2025 Q4	2026 Q1	2026 Q2	2026 Q3
Training of researchers and students (through the STARS4Water Academy) - curricula for the scientific community			Additional modules	Additional modules	
One-day seminar for policy-makers	D6.6 – Policy Brief #2		Presentation at the CIS WG Water Scarcity on Droughts – March 2026, Barcelona	Policy event in Brussels (hybrid) - June 2026 Co-convened with SOS-Water Hosted by NL Ministry IWM office in Brussels	D6.8 - Policy Brief #3
Policy Briefs	D6.6				
Layman's Report					D6.11
STARS4Water Documentary				LaunchD6.7	
Networking with relevant initiatives (EU Green Deal, the CIS WGs, International agencies and organisations, etc.) including face-to-face briefings when deemed effective					
Customised communication material for SMEs, NGOs, CSOs, the general public					
STARS4Water Future Exploitation Plan (ExP)					D6.12
*D: denoted a project deliverable **MS: denotes a project milestone					

5.2. Database of end-users and recipients

To organize the data concerning the recipients of the STARS4Water communication and dissemination products a Database of dissemination recipients/groups will be developed, including the relevant networks to link to, taking into consideration the General Data Protection Regulation (Regulation EU 2016/679[2]) and the privacy policy. This database includes people who have contacted us via the social media, or who have directly subscribed in our newsletter/communication list via the STARS4Water website. This will secure the easy communication as information will be properly classified, as well as the establishment of selected groups upon request (based on specific context). Relevant electronic mailing lists will be also created to facilitate the communication, e.g.: Stakeholders' list (all stakeholders, grouped by categories if necessary); SMEs' list (all SMEs contacts); Forum's participants lists (all registered users in our forum), etc.

[2] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

6. Monitoring and Evaluation

6.1. Monitoring and feedback on the activities

The communication and dissemination processes are closely monitored, and annual evaluations are held to assess the impact of the various activities and timely redesign (if deemed necessary) elements of the implemented approach which needs strengthening.

Within the consortium, and for keeping good track of all the activities (and thus identifying geographical spread on content related gaps), a high level of internal information exchange has been established, where partners report on their communication and publicity activities to the appointed Dissemination Officer, based on a pre-defined template, who gathers, merge and transfer these reports to the Project Coordinator. An online form has been developed for this purpose (Figure 5).

STARS 4 Water

SUPPORTING STAKEHOLDERS FOR ADAPTIVE, RESILIENT AND SUSTAINABLE WATER MANAGEMENT

Template for reporting the dissemination and communication activities

Type of activities *(please select from the drop-down list)*	Choose an item.	Choose an item. Webpage Social media page Leaflet / brochure / flyer Scientific Publication General publication Organisation of Workshop/ Event Organisation of Webinar Organisation of Conference/ side session Presentation in a scientific event / conference Presentation in Workshop / Event Poster Exhibition Articles published in the popular press Oral presentation to a wider public Media briefing Press release Video Interview Thesis Documentary/ Film TV clip
Name of Partner leading the activity		
Other partners involved in this activity		
Title of the activity (or title of the publication)		
Title of the event (if applicable) *e.g. title of Conference*		
Location of the event (if applicable) *e.g. Conference venue*		
Date (dd/mm/yyyy)		
Type of target audience *(please mark with X)* *For a detailed description of the Target Audience please see Table 1 below*		A1a: River basin hub stakeholders
		A1b: River basin organisations and networks outside the hubs
		A2: Science and research community
		A3a: High-level Policy stakeholders
		A3b: Environmental agencies and non-governmental organisations and networks
		A4a: Consultants, SMEs
		A4b: Economic sector stakeholders
		- Agriculture
		- Food and beverage sector
		- Energy sector
		- Water utility sector
		- Tourism sector
		- Industry sector
		A5: General public
Size of audience		
Countries addressed		
Brief Description of the activity		

Figure 5. Template for reporting the dissemination and communication activities.

6.2. Key Performance Indicators (KPIs)

For the evaluation of the dissemination and communication activities a set of Key Performance Indicators (KPIs) will be used as presented in Table 7.

Table 7. Key Performance Indicators (KPIs) for the dissemination and communication activities plan

D&C Activities	KPIs
STARS4Water website	*Based on google analytics:* > 5,000 visitors > 20,000 pageviews > 50% new sessions > 40% bounce rate
Social media pages	> 60 followers > 40 post > 200 likes
General promotional/informational material (leaflets, brochures, presentations, posters, articles)	> 200 recipients > 1,000 leaflets/brochures > 3 articles in press
E-Newsletters	> 7 E-newsletters > 200 recipients
STARS4Water Final Conference	~ 25 European RBOs at the Final Conference > 150 participants
Participatory Workshops in the 7 river basin hubs with the river basin communities	> 21 workshops > 200 participants
Training & capacity building activities (through the STARS4Water Academy) - curricula for river basin managers Webinars targeting stakeholders across and outside the 7 hubs	> 100 participants in the STARS4Water Academy webinars > 100 active users of the dashboards > 7 river basins are trained and are using co-designed dashboards to support their planning processes in next planning cycle, and 14 in the following planning cycle > 20 RBOs use the new data services, tools and/or indicators in their next round of planning for the WFD and/or Flood Directive
Interactive Stakeholders' Forum and Online Impact Reporter	> 100 participants in the Interactive Stakeholders' Forum > 25 RBOs besides the river basin hubs participating in the forum > 20 river basins report information on the Online Impact Reporter
Scientific publications in peer-reviewed journals	> 10 publications in peer-reviewed journals 1 special issue in a high-quality journal

D&C Activities	KPIs
Presentations/posters in international conferences	> 15 presentations in conferences
Training of researchers and students (through the STARS4Water Academy) - curricula for the scientific community	> 1,000 users/downloads of the data services, indicators > 100 users of the modelling tools ~ 250 participants in the STARS4Water Academy webinars
One-day seminar for policy-makers	> 50 stakeholders from national and EU policy level
Policy Briefs	Minimum 3 policy briefs > 100 recipients for each policy brief 1 dedicated policy brief on the ecological flow indicators to be send to the relevant CIS WG 1 presentation of STARS4Water results on the ecological flow indicators at one of the CIS meetings > 3 EU communications referencing STARS4Water key messages, tools and services
Layman's Report	1 Layman's Report > 500 recipients
STARS4Water Documentary	1 Documentary > 500 views
Networking with relevant initiatives (EU Green Deal, the CIS WGs, International agencies and organisations, etc.) including face-to-face briefings when deemed effective	> 10 initiatives
Customised communication material for SMEs, NGOs, CSOs, the general public	> 200 recipients
STARS4Water Future Exploitation Plan (ExP)	1 ExP > 100 recipients

Besides the monitoring and evaluation of dissemination and communication activities a special effort will be put into evaluation of the overall project impact. Within the last quarter of the project, the selected STARS4Water target audiences will be questioned about:

- Rating the accessibility to knowledge around (and related to the findings and results of) the STARS4Water project
- Rating the opportunity provided by the project to be involved in the STARS4Water community, the interaction with them as stakeholders during the implementation phase, the feedback loops.
- Rating the opportunity provided by the STARS4Water project for interaction with other end-users and exchange of knowledge.

From this feedback it will be possible to draw conclusions on the direct effects of the dissemination activities, although the real impact can only be evaluated in the longer term.

6.3. Annual evaluation of the activities and KPIs (after year 1)

After the 3rd year of project implementation the following dissemination and communication activities have been completed (Table 8):

Table 8. Overview of the D&C activities (up to date).

D&C Activities, Mechanisms and Tools	Progress / Status
D&C-4-all: Portfolio of dissemination products addressed to all audiences/communities	
STARS4Water website	Website launched: www.stars4water.eu
Social media pages	LinkedIn STARS4Water group launched: https://www.linkedin.com/groups/9243555/
General promotional/informational material (leaflets, brochures, presentations, posters, articles)	• Project Leaflet distributed • Project Leaflet in Spanish distributed • Project presentation developed and presented in different events • Project presentation targeting the ESA Hydrology Science Cluster developed and disseminated • Poster presentation for the Rhine hub developed and disseminated • Project presentation on the concept of the Safe Operating Space (SOS) developed and disseminated • Plan to submit a joint proposal with SOS-Water to the Horizon Results Booster/ Module A in July 2024
E-Newsletters	Newsletter No.1 distributed Newsletter No.2 distributed Newsletter No.3 distributed
D&C-4-RBOs: Outreach, interaction and capacity building of the river basin practitioners communities	
Participatory Workshops in the 7 river basin hubs with the river basin communities	• 7 Workshops on needs' assessment (one in each hub) • 5 Workshops on future scenarios and indicators • 7 Workshops/meetings on model validation and discussion of the SOS concepts • Climate Adaption workshop is updating the Adaptation Strategy 2015 of the International Commission for the Protection of the Rhine (ICPR) • STARS4Water Stakeholders Online Meeting (across all river basin hubs, March 2025). Over 50 participants (30 of which were stakeholders)

	discussed the STARS4Water initiative and its co-creation process • 2 Meetings for customised dashboards' developed
Training & capacity building activities (through the STARS4Water Academy) - curricula for river basin managers	• RIBASIM training at Deltares (mid-2024) • Video on Duero River Basin (content design: main characteristics, status of water bodies, basin issues and challenges related to water management today and in the near future) • Survey on the Duero River Basin regarding the main water management challenges in the future (101 respondents) • STARS4Water Academy launched: https://stars4water.eu/the-stars4water-academy/ • STARS4Water with INBO organized session 4B on "Data and information for climate change adaptation in basins" for representatives from river basins around the world and other stakeholders during the 12th World General Assembly of INBO (October 2024)
Interactive Stakeholders' Forum and Online Impact Reporter (OIR)	Impact Reporter launched: https://ir.stars4water.eu/
D&C-4-science: Dissemination to the Scientific and Research Community	
Scientific publications in peer-reviewed journals	• Agreement about publishing a Special Issue "*From Data to Decision: Stakeholder-Driven Approaches for a Resilient Water Future"* on the International Journal for River Basin Management (IJRBM) Article topics - Data-driven and process-driven models in water management, potentially including interactions between both approaches. - Methodologies for engaging stakeholders in the co-design of water monitoring systems, models, and management strategies. - Development and application of tools (e.g., dashboards, scenario planning, serious games) that support stakeholder involvement in real-time water management. - Case studies on institutional innovations that enable collaborative water governance and resilient management. - Exploring hybrid approaches that bring together scientific and traditional knowledge systems in water decision-making. - Best practices for conveying probabilistic and scenario-based water data to policymakers and community stakeholders. - Frameworks and metrics for assessing the outcomes of participatory approaches on policy, infrastructure, and ecological resilience. - Definition of indicators for resilient water management.

	• 5 publications[3,4,5,6,7]
Presentations/posters in international conferences	• EGU Vienna, April 2023[8] • Global FRIEND Water 2023 Int.Conf. • EurAqua Annual Meeting, Oslo, June 2023 • STARS4Water Special Session on "Stakeholder-driven unlocking of data for river basin management" at the 40th IAHR World Congress, Vienna, August 2023 • IAH 50th Worldwide Groundwater Congress, Cape Town, South Africa, September 2023[9] • UNECE Global Workshop on Droughts in Transboundary Basins, Geneva, February 2024 • EGU Vienna, April 2024[10,11,12,13] • 15th International Conference on Hydroinformatics HIC 2024, 27-31 May 2024, Beijing - China[14,15] • Stockholm World Water Week, August 2024 (Transboundary water management: tools and

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[5] Avila, L., de Lavenne, A., Ramos, M.-H., and Kollet, S.: Estimation of Monthly Water Table Depth Anomalies Based on the Integration of GRACE and ERA5-Land with Large-Scale Simulations Using Random Forest and LSTM Networks, Water Resour. Manage., https://doi.org/10.1007/s11269-025-04097-7, 2025.

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[7] Purnamasari, D., Teuling, A. J., and Weerts, A. H.: Identifying irrigated areas using land surface temperature and hydrological modelling: application to the Rhine basin, Hydrol. Earth Syst. Sci., 29, 1483–1503, https://doi.org/10.5194/hess-29-1483-2025, 2025.

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[10] Hsu, S.-C., de Lavenne, A., Andréassian, V., Rabah, A., and Ramos, M.-H.: Better mapping of groundwater-surface water exchanges over the Seine River catchment in a surface hydrological model. EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-15833, https://doi.org/10.5194/egusphere-egu24-15833, 2024.

[11] Gómez-Escalonilla, V., Martínez-Santos, P., Pacios, D., Ruíz-Álvarez, L., Díaz-Alcaide, S., Montero-González, E., Martín-Loeches, M., and De la Hera-Portillo, Á.: Nitrate spatial predictions by means of machine learning to improve groundwater monitoring networks, EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024, EGU24-10066, https://doi.org/10.5194/egusphere-egu24-10066, 2024.

[12] Miaari, S., and Kollet, S. J.: Temporal Scaling Laws for Wetting and Drying in Variably Saturated Soils, AGU 2024, 9-13 December 2024, Washington D.C., https://agu.confex.com/agu/agu24/meetingapp.cgi/Paper/1612443, 2024.

[13] Avila, L., Kollet, S., de Lavenne, A., and Ramos, M.-H.: Integrating GRACE and ERA5-Land with simulations to estimate monthly groundwater table depth anomalies based on Random Forest and LSTM networks over the Seine River Basin, AGU 2024, 9-13 December 2024, Washington D.C., https://agu.confex.com/agu/agu24/meetingapp.cgi/Paper/1610809, 2024.

[14] Gómez-Escalonilla V, Martínez-Santos P, De la Hera-Portillo A, Díaz-Alcaide S, Montero E, Martín-Loeches M. (2024). A machine learning application for the development of groundwater vulnerability studies. 15th International Conference on Hydroinformatics HIC 2024, 27-31 May 2024, Beijing, China.

[15] Gómez-Escalonilla V, Martínez-Santos P, Díaz-Alcaide S, Montero-González E, Martín-Loeches M (2024). A Surrogate Approach to Model Groundwater Level in Time and Space Based on Tree Regressors. 15th International Conference on Hydroinformatics HIC 2024, 27-31 May 2024, Beijing, China.

	approaches supporting cooperation and peace, Session ID 12065). • WMO-IDMP Drought Resilience +10 Conference, 30 September – 02 October 2024, Geneva Switzerland[16] • 12th World General Assembly of INBO 2024, 9 October 2024, Bordeaux France. STARS4Water with INBO organized session 4B on "Data and information for climate change adaptation in basins" for representatives from river basins around the world and other stakeholders. • ESA Hydrology Science Cluster collocation meeting, 25-27 November 2024[17] • STARS4Water pitch at the Virtual Exchange on "Artificial Intelligence for Integrated Drought Risk Management", 26 November 2024 • STARS4Water contribution in AGU24 Annual Meeting, 9-13 December 2024, Washington D.C. USA[18] • STARS4Water contribution at the Rhine conference on CC adaptation strategy, 19-20 March 2025 • XIII Iberian Congress on Water Management and Planning, Salamanca Spain, 24-26 April 2025 • STARS4Water at the EGU25 General Assembly, 27 April - 2 May 2025, Vienna[19,20,21,22,23,24] • ICPDR, IKSD; 61st RBM Expert Group Meeting (6-7 May 2025), BOKU River Laboratory, Am Brigittenauer Sporn 3, 1200 Vienna, Austria[25]

[16] Judith ter Maat, Tatjana Edler, Esmée Mes, Femke Schasfoort, Jan Kruijshoop, Enno Nilson, Roel Burgers, Adrian Schmid-Breton, Jörg Belz, Kai Kempmann (2024). Shared strategic drought risk management in the transboundary Rhine River basin. WMO-IDMP Drought Resilience +10 Conference, 30 September – 02 October 2024, Geneva Switzerland.

[17] STARS4Water project was presented during the "Session 1: ESA and EC Hydrology Science projects – Lightning talks".

[18] FZJ and INRAE presented the STARS4Water project with two posters.

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[20] Collignan, J., Ramos, M.-H., de Lavenne, A., Barbé, C., and Riboust, P.: Assessing water management vulnerability under future climate scenarios: the case of the reservoirs in the Seine River basin, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-8618, https://doi.org/10.5194/egusphere-egu25-8618, 2025.

[21] Engeland, K., Gelati, E., Hegdahl, T. J., Huang, S., and Veie, C. A.: Climate change impacts on reservoir operations and water availability – a case study from Drammen river basin in Norway , EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-15110, https://doi.org/10.5194/egusphere-egu25-15110, 2025.

[22] Graf, T., Glas, M., Monji, F., Klösch, M., Preiml, M., ter Maat, J., Toma, A., Scrieciu, A., and Habersack, H.: RIBASIM Danube: Modeling water allocation in the Danube Basin with a focus on low-flow conditions, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-6640, https://doi.org/10.5194/egusphere-egu25-6640, 2025.

[23] Scrieciu, A. and Toma, A.: Monitoring Long-Term Land Cover Transformations in the Danube Delta using Landsat Satellite Imagery, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-16549, https://doi.org/10.5194/egusphere-egu25-16549, 2025.

[24] Rabah, A., de Lavenne, A., and Ramos, M.-H.: Toward understanding transport and chloride dynamics at the catchment scale by combining StorAge Selection functions and a hydrological model, EGU General Assembly 2025, Vienna, Austria, 27 Apr–2 May 2025, EGU25-16549, https://doi.org/10.5194/egusphere-egu25-9559, 2025.

[25] BOKU presented modeling activities in the Danube hub (invited presentation).

	• STARS4Water Poster presentation at ICPR 75yrs jubilee conference in the Rhine Hub, Dusseldorf, 3 July 2025 • WaterEUROPE launchinng event CoP Smart River Basin Management, Warsaw (online participation) • Nordic Hydrology Conference, 3-5 June 2025, Reykjavik, Iceland[26,27,28,29] • Meeting with Ouranos, a collaborative innovation hub in Quebec, Canada, on climate change adaptation[30]
Training of researchers and students (through the STARS4Water Academy) - curricula for the scientific community	• STARS4Water and DRHYM projects Workshop on "Data-driven hydrology and machine learning algorithms for water management and risk assessment", 24-25 April 2024, INRAE, Antony – France • RIBASIM training at Deltares (mid-2024)
D&C-4-policy: Linking Science and Innovation to the Decision and Policy-Making function	
Networking with relevant initiatives (EU Green Deal, the CIS WGs, International agencies and organisations, etc.) including face-to-face briefings when deemed effective	• Synergies with SOS-Water established • Synergies with EcoAdvace established • Exchanges with MERLIN • Exchanges with LIFE IRIS • Collaboration with JRC • Links with the CIS EG Water Scarcity and Drought established
D&C-4-business: Future exploitation and sustainability	
STARS4Water Future Exploitation Plan (ExP)	• Plan to submit a joint proposal with SOS-Water to the Horizon Results Booster/ Module A in July 2024 • Plan for inclusiveness: gender dimension and young professionals under development

The dissemination and communication activities' Key Performance Indicators (KPIs) that have been reached up to date are presented in Table 9.

[26] INRAE presented on the SOS concept and its implementation in STARS4Water (Keynote speaker).

[27] Hegdahl, T. J., Engeland, K., Huang, S., Gelati, E., Veie, C.A. (2025). The impact of Climate change on Water stress in a highly regulated River: Sensitivity to Changes in ENergy Demand, Water Use and Regulations. Oral presentation at the Nordic Hydrological Conference 2025

[28] Monji, F., Engeland, K., Gijsbers, P., Hegdahl, T.J., Kucharski, J., Visser, M., de Koning, B., Pronk. M., ter Maart, J., Duel, H., Hisdal, H. (2025). Enhancing Ribasim for reservoir operations: validating a new version with Canteen and expanding to the Drammen basin. Oral presentation at the Nordic Hydrological Conference 2025

[29] Ter Maat, J., Monji, F., Hermawan, V., Duel, H., Hegdahl, T.J., Engeland, K., Hisdal, H. (2025). Supporting informed decision making by co-creation of a policy dashboard for the Drammen river basin. Oral presentation at the Nordic Hydrological Conference 2025

[30] INRAE presented on the SOS concept and its implementation in the Seine river basin hub (invited presentation).

Table 9. Key Performance Indicators (KPIs) for the dissemination and communication activities (values reached up to date).

D&C Activities	KPIs
STARS4Water website	*Based on google analytics[31]:* 4,332 users 16,237 views 61.18% new sessions 46.64% bounce rate
Social media pages	86 members on the LinkedIN STARS4Water Group 45 posts 320 Reactions 4,983 Views 6,464 Impressions
General promotional/informational material (leaflets, brochures, presentations, posters, articles)	2 Leaflets (wide distribution though website, LinkenIn, emails)
E-Newsletters	3 e-Newsletter > 500 recipients
Participatory Workshops in the 7 river basin hubs with the river basin communities	14 workshops > 120 participants
Scientific publications in peer-reviewed journals	5 publications in peer-reviewed journals
Presentations/posters in international conferences	22 presentations in conferences
Networking with relevant initiatives (EU Green Deal, the CIS WGs, International agencies and organisations, etc.) including face-to-face briefings when deemed effective	7 Initiatives and projects: 1. SOS-Water 2. Collaboration with JRC 3. International Commission for the Hydrology of the Rhine basin (CHR) 4. International Commission for the Protection of the Rhine (ICPR) 5. Central Commission for the Navigation of the Rhine (CCNR) 6. European Network of Freshwater Research Organisations (EurAqua) 7. BIOEAST Initiative - Thematic Working Group on Freshwater-based bioeconomy / Fresh Water Net 8. EcoAdvace 9. MERLIN 10. LIFE IRIS 11. CIS EG Water Scarcity and Drought

[31] For definitions see Table 9 below

The specific performance metrics for the STARS4Water website and LinkedIn Groups reached up to date are presented in Tables 10, 11 and 12.

Table 10. STARS4Water website metrics (up to date) (Source: Google Analytics). Benchmark values are provided in the footnotes. A colour coding has been used to mark performance status (where feasible): green denotes a high performance, yellow is satisfactory, and orange denotes a low performance.

Website Metrics	Definition	Value
Users	*The number of distinct active users who visited the STARS4Water website. An active user is any user who has an engaged session or when Analytics collects the first visit event or engagement time msec parameter from a website*	4,332[32]
New users	*The number of users who interacted with your site or launched your app for the first time (event triggered: first_open)*	4,325
Returning users	*The number of unique users who initiated at least one previous session, regardless of whether or not the previous session was an engaged session, in the specified date range.*	710
Average engagement time	*Average engagement time per active user for the time period selected.*	1m 17sec
Sessions	*The number of sessions that began on the website*	7,069
New sessions rate	*Percentage of sessions that are generated by new users who have not previously visited the website (% new sessions: new users / total sessions)*	61.18%[33]
Average session duration	*The average duration (in seconds) of users' sessions*	3m 51sec[34]
Engaged sessions	*The number of sessions that lasted longer than 10 seconds, or had a conversion event, or had 2 or more screen or page views*	3,772
Engagement rate	*The percentage of engaged sessions (*Engaged sessions *divided by* Sessions*)*	53.36%[35]
Bounce rate	*The percentage of sessions that were not engaged sessions*	46.64%[36]
Sessions per user	*The average number of sessions per user*	1.63
Engaged sessions per user	*The average number of engaged sessions per user*	0.87
Average engagement time per session	*The average engagement time (i.e. time that the STARS4Water website was in focus in a user's browser) per session for active users*	0m 47sec

[32] **86.6% of the target set at the end of the project is already reached**

[33] A good site will have a healthy mix of new and returning site visitors, and this mix will vary depending on the site goals, business and industry. A range of 45% - 75% is often encountered (Source: https://www.spinutech.com/digital-marketing/analytics/analysis/7-website-analytics-that-matter-most/). Our target was set at 50% and so far it has been reached

[34] For a good average session duration, the industry standard is 2-3 minutes (Source: https://www.spinutech.com/digital-marketing/analytics/analysis/7-website-analytics-that-matter-most/). Average session duration benchmark values by industry type: engineering 3 mins, environmental services 2 mins 41 sec, software development 2 mins 38sec (Source: https://firstpagesage.com/reports/average-session-duration-by-industry/). Based on Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023, the median average session duration was 2min 38sec

[35] Based on Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023, the median engagement rate across different industries was 56.23%

[36] The average bounce rate ranges between 26% and 70% regardless of the industry (Source: https://www.webfx.com/analytics/glossary/what-is-bounce-rate/). According to BusinessDIT, the average bounce rate regardless of industry is 55.43%. According to a study by Statista, the average bounce rate for websites is 47% (Source: https://www.businessdit.com/bounce-rate-benchmarks/#source). A bounce rate between 26% and 40% is considered very good (Source: https://capturly.com/blog/average-bounce-rate-by-industry-2023-benchmark/). Based on Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023, the median bounce rate across different industries was 44.82%.

Website Metrics	Definition	Value
Views	*The number of webpages the users saw. Repeated views of a single page are counted*	16,237[37]
Views per session	*The number of webpages the users viewed per session. Repeated views of a single page are counted*	2.3[38]
Views per user	*The average number of webpages viewed per user*	3.75
Event count	*The number of times users triggered an event*	43,874
Events per session	*The average number of events per session*	6.21
Events per user	*The average number of events per user*	10.13
First visits	*The number of times your users opened your website for the first time*	4,325
Event count: file_download	*The number of times users triggered the specific event "file_dowload" (public deliverable, project presentations, publications)*	734

Table 11. STARS4Water website traffic: up to date country demographics from the 15 countries with the most users (Source: Google Analytics).

#	Country name	Users	Returning users	Sessions	Engaged sessions	Engagement rate	Bounce rate	Engaged sessions per user	Average engagement time	Views	Views per user
1	Netherlands	696	142	1334	701	52.55%	47.45%	1.01	1m 00s	2509	3.60
2	United States	586	13	609	209	34.32%	65.68%	0.36	1m 27s	802	1.37
3	France	313	76	589	314	53.31%	46.69%	1.00	1m 18s	1122	3.58
4	Ireland	271	3	278	71	25.54%	74.46%	0.26	8s	398	1.47
5	United Kingdom	251	65	410	207	50.49%	49.51%	0.82	57s	772	3.08
6	Norway	232	48	444	234	52.7%	47.3%	1.01	1m 07s	832	3.59
7	Germany	220	57	350	207	59.14%	40.86%	0.94	52s	700	3.18
8	Austria	209	40	383	186	48.56%	51.44%	0.89	1m 14s	816	3.90
9	Spain	184	52	357	219	61.34%	38.66%	1.19	2m 03s	852	4.63
10	Greece	167	42	785	578	73.63%	26.37%	3.46	7m 45s	4683	28.04
11	Finland	162	12	193	61	31.61%	68.39%	0.38	9s	241	1.49
12	Italy	122	18	180	112	62.22%	37.78%	0.92	1m 07s	350	2.87
13	Poland	86	27	151	88	58.28%	41.72%	1.02	1m 25s	299	3.48
14	China	68	3	70	3	4.29%	95.71%	0.04	2s	58	0.85
15	Sweden	61	9	86	48	55.81%	44.19%	0.79	40s	118	1.93

Table 12. STARS4Water website traffic: the 20 most visited pages at the end of year 1 (Source: Google Analytics).

#	STARS4Water Webpage	Views	Users
1	/home	5,947	2,746
2	/about/	1,246	782
3	/partners/	968	633
4	/our-7-hubs/	846	455
5	/news/	674	152

[37] **81.2% of the target set at the end of the project is already reached**

[38] The unofficial industry standard is 2 pages per session (Source: https://www.spinutech.com/digital-marketing/analytics/analysis/7-website-analytics-that-matter-most/)

#	STARS4Water Webpage	Views	Users
6	/output/public-deliverables/	520	265
7	/events/	431	132
8	/contact/	308	243
9	/stars4water-metadata-portal/	308	164
10	/event/world-water-week-2025-water-for-climate-action-stockholm-sweden/	269	230
11	/stakeholder-forum/	258	212
12	/output/	234	173
13	/output/project-presentations/	229	129
14	/news-and-events/	228	138
15	/our-7-hubs/drammen-river-basin-hub/	198	112
16	/academy/	188	145
17	/our-7-hubs/rhine-river-basin-hub/	182	124
18	/event/nordic-hydrological-conference-on-water-and-climate-change-impacts-and-adaptation-reykjavik-iceland/	177	138
19	/output/publications/	165	100
20	/event/14th-symposium-for-european-freshwater-sciences-sefs-14-bolu-turkey/	149	115

To evaluate the success of our website timeseries of metrics that provide insights into user acquisition, engagement, and behavior trends have been used. These metrics include monhtly growth metrics and engagement metrics.

- Growth Metrics

Cumulative New Users: The total number of new users acquired. up to each month. Tracking this on a month-to-month basis shows the growth trend of our user base. The current growth trend is 141 new users per month on average, which is considered a good growth rate. The monthly growth is presented in Figure 6 below.

Monthly New Users Growth Rate: Measures the month-over-month percentage increase in new users. This metric helps assess how quickly we're attracting new users. [*Formula: (NewUsersCurrentMonth−NewUsersPreviousMonth)/NewUsersPreviousMonth)×100].* As with many metrics, website traffic growth will vary widely based on website stage and audience and industry. However, a monthly growth rate of 10-20% is generally considered a good benchmark (Source: Geckoboard KPI examples). Month-over-month (MoM) growth rates of 5% to 10% can be considered healthy for early-stage websites. Established sites might aim for 2% to 5% growth. During its 3 years of operation, the STARS4Water website average monthly growth rate is 15%, ranging from 5% (i.e. in August 2025) up to 59% (i.e. in April 2023).

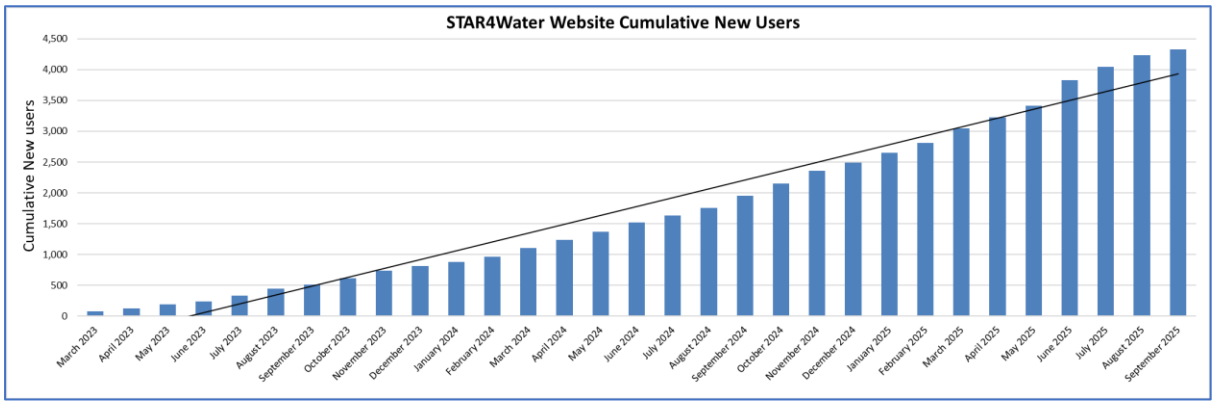

Figure 6. Cumulative new users of the STARS4Water website, for the period Match 2023 to March 2024.

- Engagement Metrics

User Retention Rate: The percentage of new users who return to the website after their first visit. [Formula: (Users_who returned in the following month / NewUsers_in the base month)×100]. This is crucial for understanding long-term engagement. During its 3 years of operation, the STARS4Water website average user return rate is 27.9%, ranging from 8.7% (i.e. in July 2025) up to 48.2% (i.e. in March 2024) (see Figure 7).

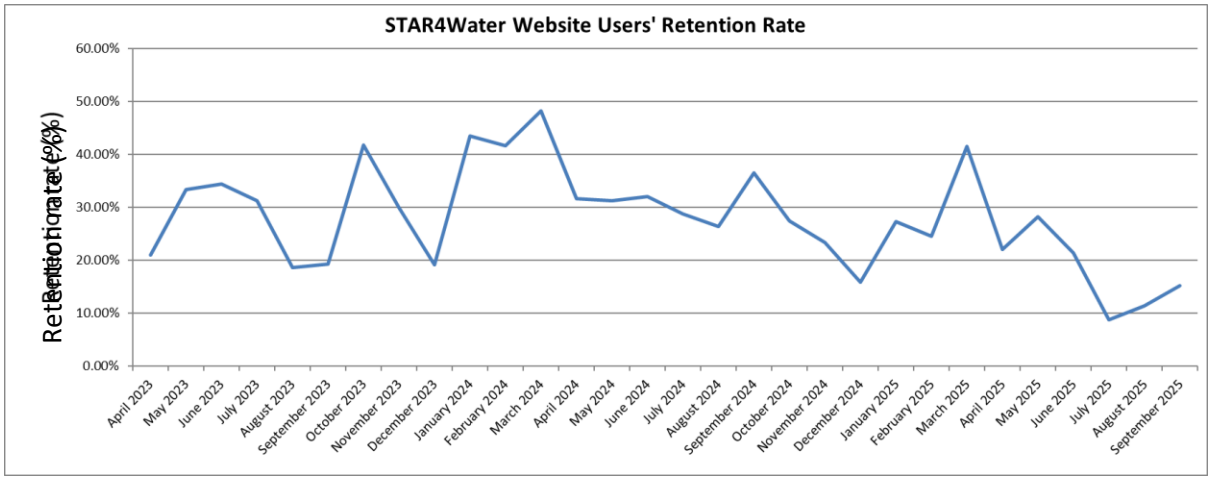

Figure 7. STARS4Water website users' retention rate (per month), for the period Match 2023 to March.

Engagement rate: The percentage of engaged session. An engaged session is defined as a session that lasted longer than 10 seconds, or had a conversion event, or had 2 or more screen or page views. Higher the engagement rates mean that the users found interesting content on the website that triggered them to stay longer and/or navigate through more than 2 pages. "Good" engagement rate varies based on the nature of the product or service, the ultimate business goals, the industry type, and the target audience. Based on Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023, the median engagement rate across different industries was 56.23%. Specific inductries: Consulting & Professional Services 52.43%, Information Technology & Services 52.64%, Technology 54,71%. During its 3 years of operation, the STARS4Water website average engagement rate is 53.36%. Some pages have exceptionally good engagement rates: the "events page" has an engagement rate of 95%, the "news page" has an engagement rate of 91%, the "/stars4water-

newsletter-2 page" has 83.3%, the "/stars4water-newsletter-2 page" has 81.8%, the "public deliverable page" has 69.5%.

Bounce rate: A bounce is a single-page session on the website. In Google Analytics, a bounce is calculated specifically as a session that triggers only a single request to the Analytics server, such as when a user opens a single page on the site and then exits without triggering any other requests to the Analytics server during that session. The average bounce rate ranges between 26% and 70% regardless of the industry (Source: https://www.webfx.com/analytics/glossary/what-is-bounce-rate/). According to BusinessDIT, the average bounce rate regardless of industry is 55.43%. According to a study by Statista, the average bounce rate for websites is 47% (Source: https://www.businessdit.com/bounce-rate-benchmarks/#source). A bounce rate between 26% and 40% is considered very good (Source. https://capturly.com/blog/average-bounce-rate-by-industry-2023-benchmark/). Based on Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023, the median bounce rate across different industries was 44.82%. Specific inductries: Consulting & Professional Services 49.47%, Information Technology & Services 48.22%, Technology 48.02%. During its 3 years of operation, the STARS4Water website average bounce rate is 46.64%. Some specific STARS4Water pages had exceptionally good bounce rates: /news 9%, /event 9.2%, /homepage 37.3%.

Average Session Duration: The average duration (in seconds) of users' sessions. Higher durations usually denote an engaging content and/or user interest. For a good average session duration, the industry standard is 2-3 minutes (Source: https://www.spinutech.com/digital-marketing/analytics/analysis/7-website-analytics-that-matter-most/). Average session duration benchmark values range by industry type: engineering 3 mins, environmental services 2 mins 41 sec, software development 2 mins 38sec (Source: https://firstpagesage.com/reports/average-session-duration-by-industry/). Based on Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023, the median average session duration was 2min 38sec. Specific inductries: Consulting & Professional Services 2min 35sec, Information Technology & Services 2min 42sec Technology 2min 46sec. During its 3 years of operation, the STARS4Water website average session duration is 3mins 51sec.

The LinkedIn STARS4Water Group has currently 71 members, which has already exceeded our project target of 60 members (i.e. 143% achieved so far). To evaluate the relevance of our LinkedIn STARS4Water Group audience, the members' demographics have been analysed as presented per affiliation category, work field, gender (Tables 13, 14 and 15, respectively). The members' affiliations are deemed very relevant to the STARS4Water project verifying that the correct target audience has been reached (i.e. 57% work on water resources and hydrology). A fair gender balance is also achieved, yet needs to be further improved (currently 37.2% females, 62.8% males). The present female representation in two most dominant affiliation of "Director/ Research Manager / Project Manager" and "Scientist / Researcher / Modeler" is very satisfactory (i.e. 44% in each one, 88% in total on both).

Table 13. LinkedIn STARS4Water Group members' demographics: per title/ affiliation category

Title/ Affiliation category	%
Director/ Research Manager / Project Manager	38.4%
Scientist / Researcher / Modeler	34.9%
Expert / Advisor	10.5%
Professor/ Lecturer	8.1%
Engineer	4.7%
Economist	2.3%
Consultant	1.2%

Table 14. LinkedIn STARS4Water Group members' demographics: per industry/ work field.

Industry / Work Field	%[39]
Water Resources/ Hydrology	57.0%
Environment/ Ecology	8.1%
Computer science/ Data science / AI	5.8%
Water Policy / Policy	4.7%
Stakeholders Engagement / Facilitation	4.7%
Climate / Meteorology	3.5%
Geology	2.3%
Natural Sciences	2.3%
Energy	2.3%
Remote Sensing	2.3%
Information and Technology/ Information Systems/ Monitoring Systems	2.3%
Social Sciences	2.3%
Natural Resources	1.2%
Marine and Coastal Engineer	1.2%
Agriculture	0.0%

Table 15. LinkedIn STARS4Water Group members' demographics: per gender.

Gender group	%
Female	37.2%
Male	62.8%

[39] Note: the sum of all categories may be more than 100% as some members are working in more than one relevant fields

7. Dissemination products' Quality and Standards

This section only concerns outcome datasets such as modelling results.

7.1. Corporate design, Identity

STARS4Water has adopted a corporate identity which to the appearance and visibility of a project towards the outside. The benefit is a clear visibility, identification and association of the project with certain (positive) properties, transparency of its objectives, etc. Corporate behaviour in the framework of our project facilitates the development of the STARS4Water into a quality label and makes it visible to the outside.

The following corporate elements have been developed (or are underway):

- Logo applications (in different colours and formats) for newsletters, brochures, reports, presentations, and other dissemination materials (Figure 8)
- A ppt-template (Figure 9)
- A Report template (Figure 10)

All communication tools and materials (e.g. website, brochures, folders, reports, briefs etc.) are developed according to the STARS4Water Corporate Design. All partners will adhere to the given design and will use it for all applied dissemination activities. This corporate design creates a strong and clear image. As a consequence, target groups as well as the general public are less likely to forget the project.

Figure 8. The STARS4Water logo

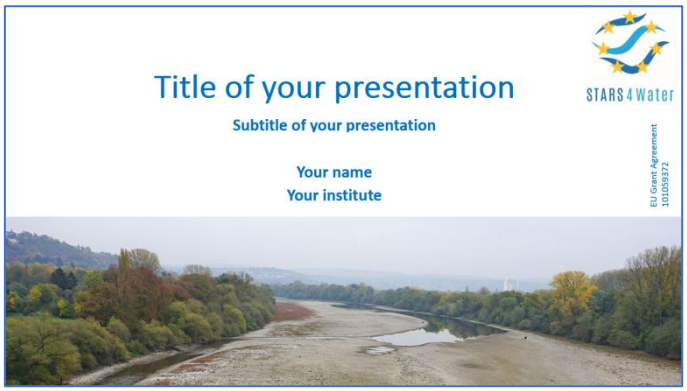

Figure 9. The STARS4Water ppt template.

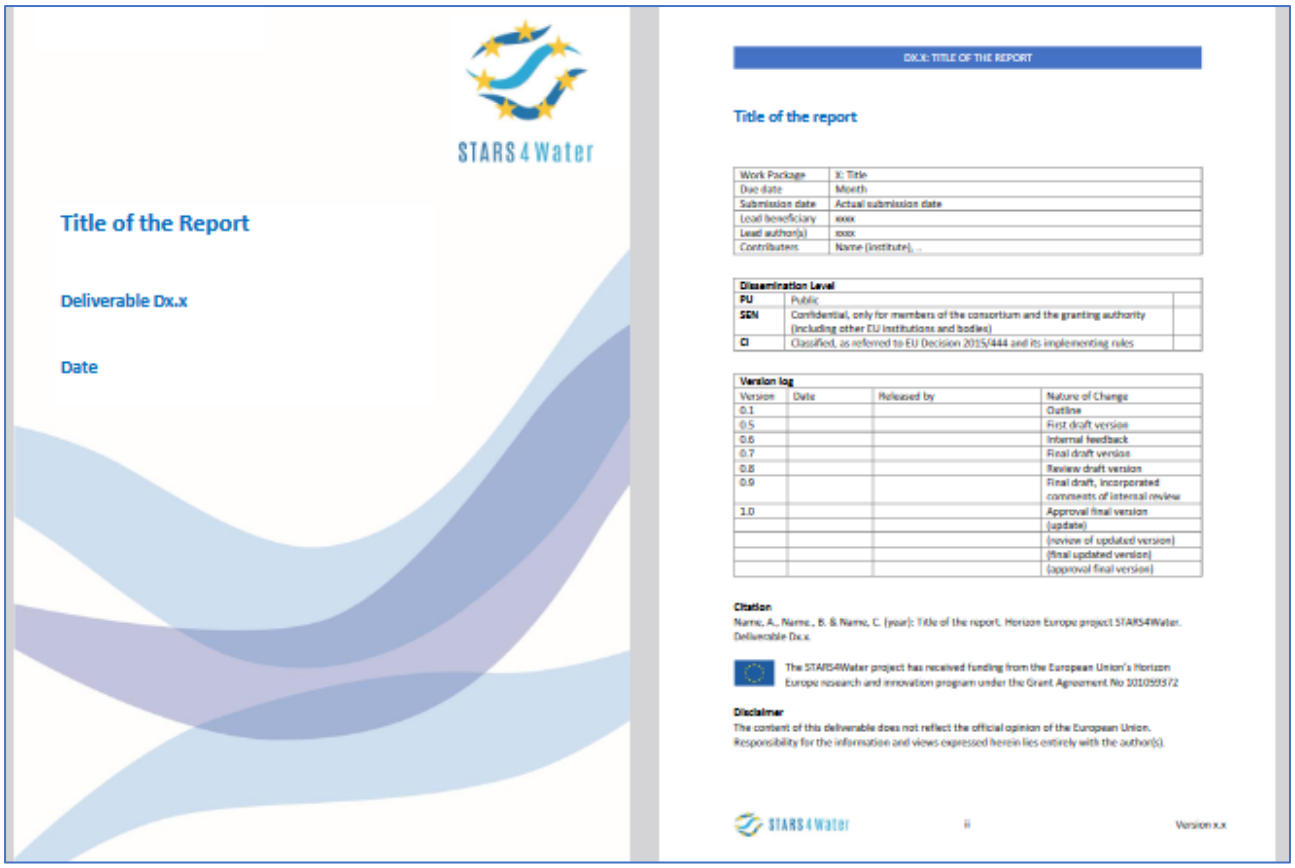

Figure 10. The STARS4Water report template.

7.2. Quality control

To ensure that all dissemination products are of high quality some minimum standards have been set. The basic standard is to ensure and maximize the Quality, Objectivity, Utility, and Integrity of the information disseminated by the STARS4Water. Objectivity involves both the presentation and substance. Objective presentation entails that the information is presented within a proper context to ensure an accurate, clear, complete, and unbiased presentation. Objective substance means that the data, the analytical process, and the resulting reports are accurate, reliable, and unbiased. The utility of information refers to its usefulness for the intended users. Integrity refers to the security of

information, i.e. the protection of information from unauthorized access or revision. Integrity helps ensure that the information is not compromised through unauthorized revision, falsification, corruption, and intentional or inadvertent destruction.

The following guidelines have been set:

- Adopt the basic standard of quality (including objectivity, utility, and integrity) as a performance goal for all information that is disseminated.
- Review the quality of information before dissemination, with appropriate oversight by the Dissemination Officer. Internal peer will be used for that purpose, with at least 1 additional person been involved as reviewer.
- Proper citation and referencing is always required. Since dissemination products may integrate news, posts, etc., originating for various sources, referencing rules are strict.
- Always seek up-to-date information that will trigger the target audience, as a general principle.
- Appearance should comply with the STARS4Watre corporate design.
- Allow and facilitate audiences' review: recipients may seek and obtain, where appropriate, timely correction of information maintained and disseminated. Their enquiry should be sent in via email.

7.3. Acknowledgements

All dissemination products acknowledge the funding received by EU Commission, follow the publicity rules set by H2020, and are compliant with the relevant dissemination rules and guidelines. Additional acknowledgements, where applicable, are clear and visible.

8. References

European Commission. Quick guide and tools for Communication, Dissemination and Exploitation https://ec.europa.eu/research/participants/docs/h2020-funding-guide/imgs/quick-guide_diss-expl_en.pdf

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Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

Websites:

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Firstpagesage: https://firstpagesage.com/reports/average-session-duration-by-industry/

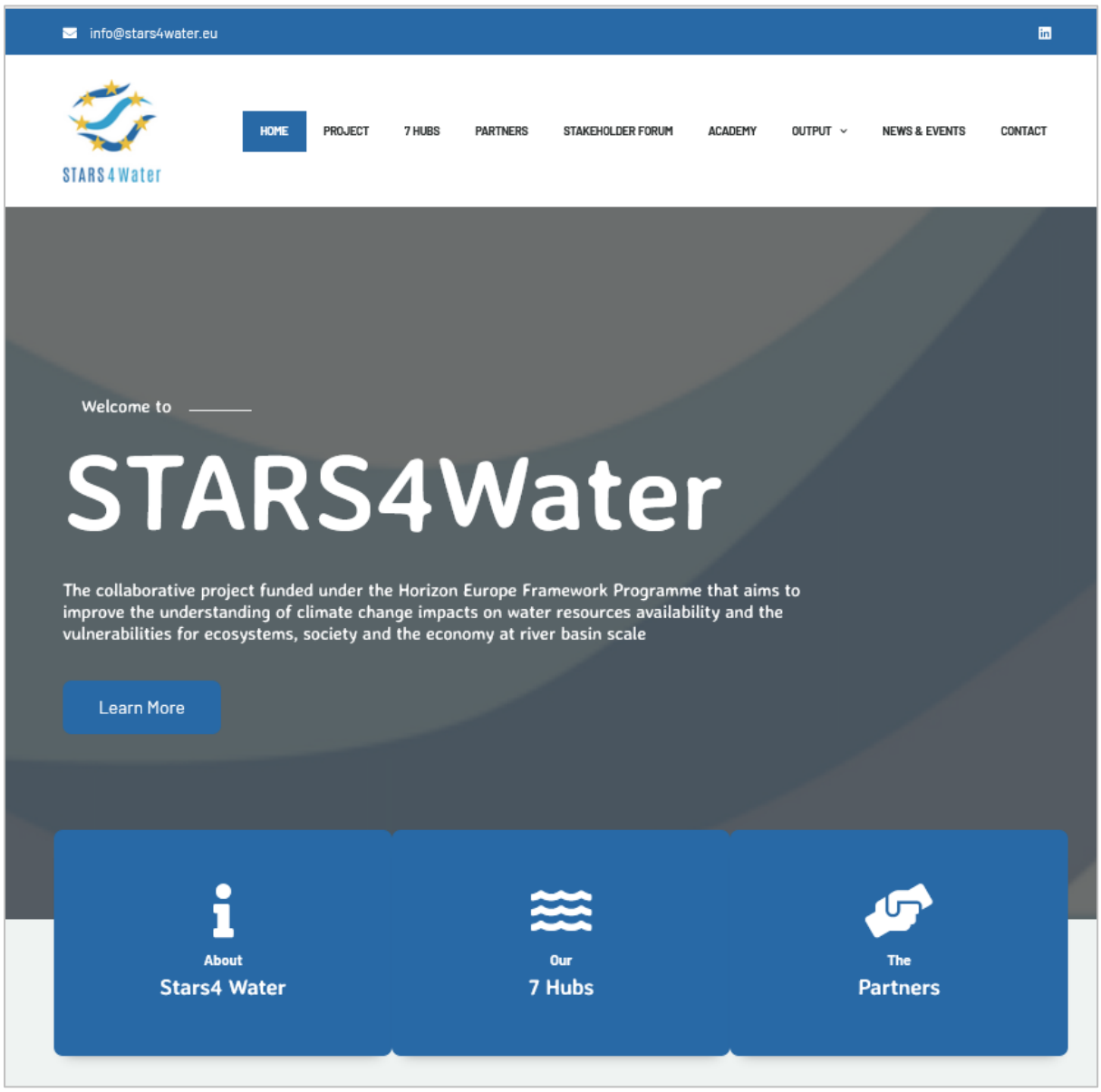
Databox: Databox's Benchmark Groups - Google Analytics 4 Industry Benchmarks for 2023

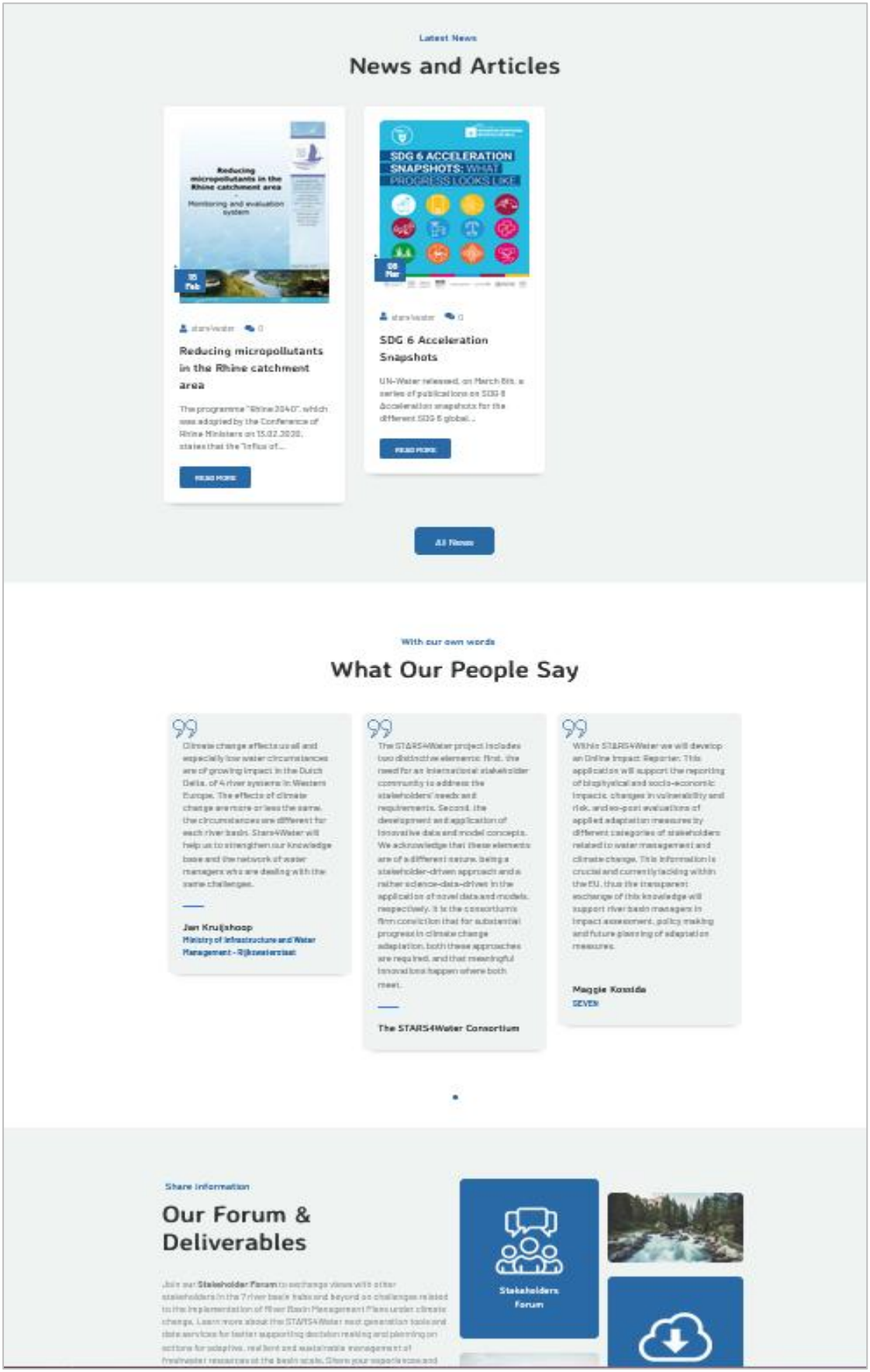
Webfx: https://www.webfx.com/analytics/glossary/what-is-bounce-rate/

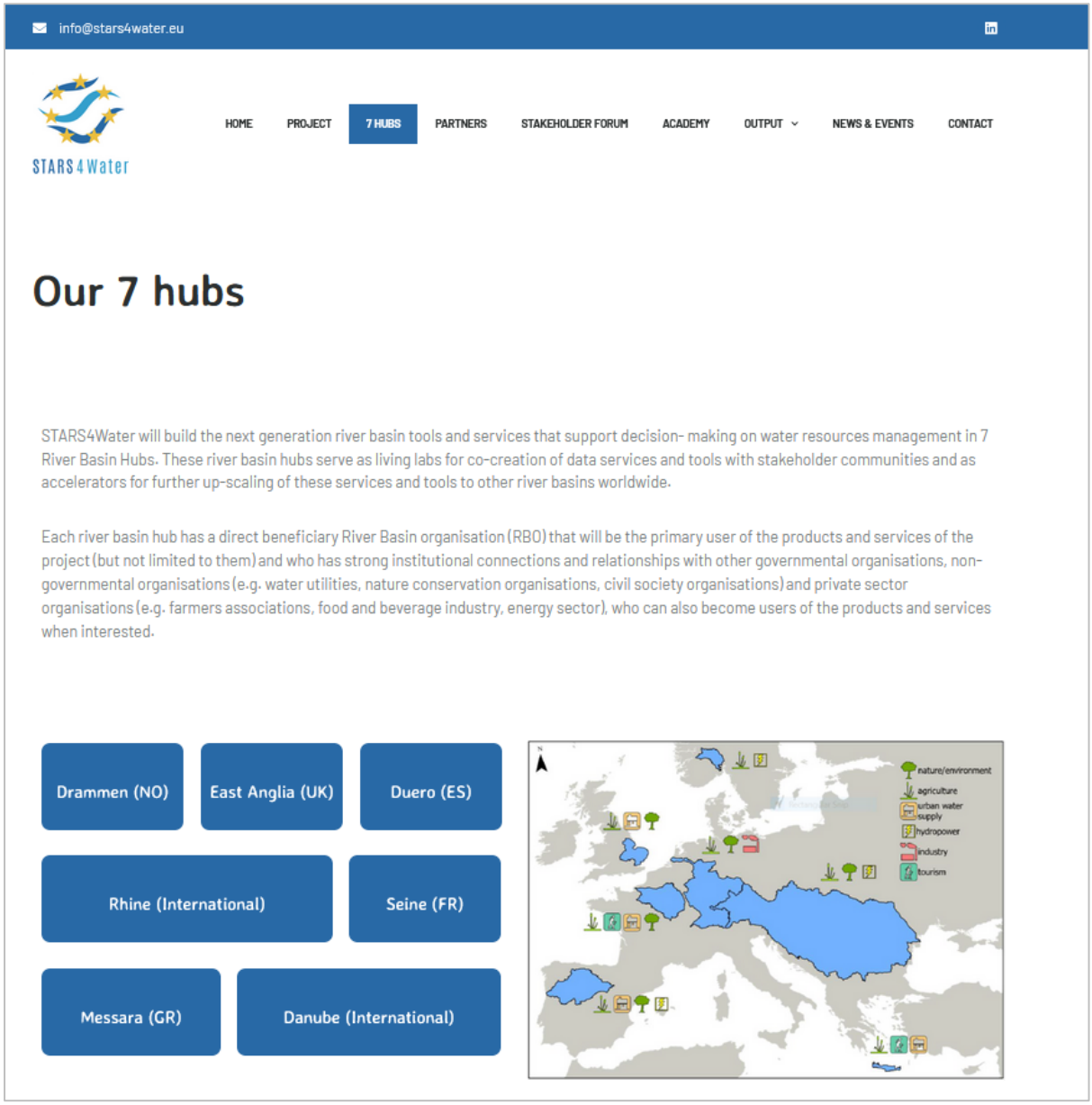
BusinessDIT: https://www.businessdit.com/bounce-rate-benchmarks/ ; https://www.businessdit.com/bounce-rate-benchmarks/#source

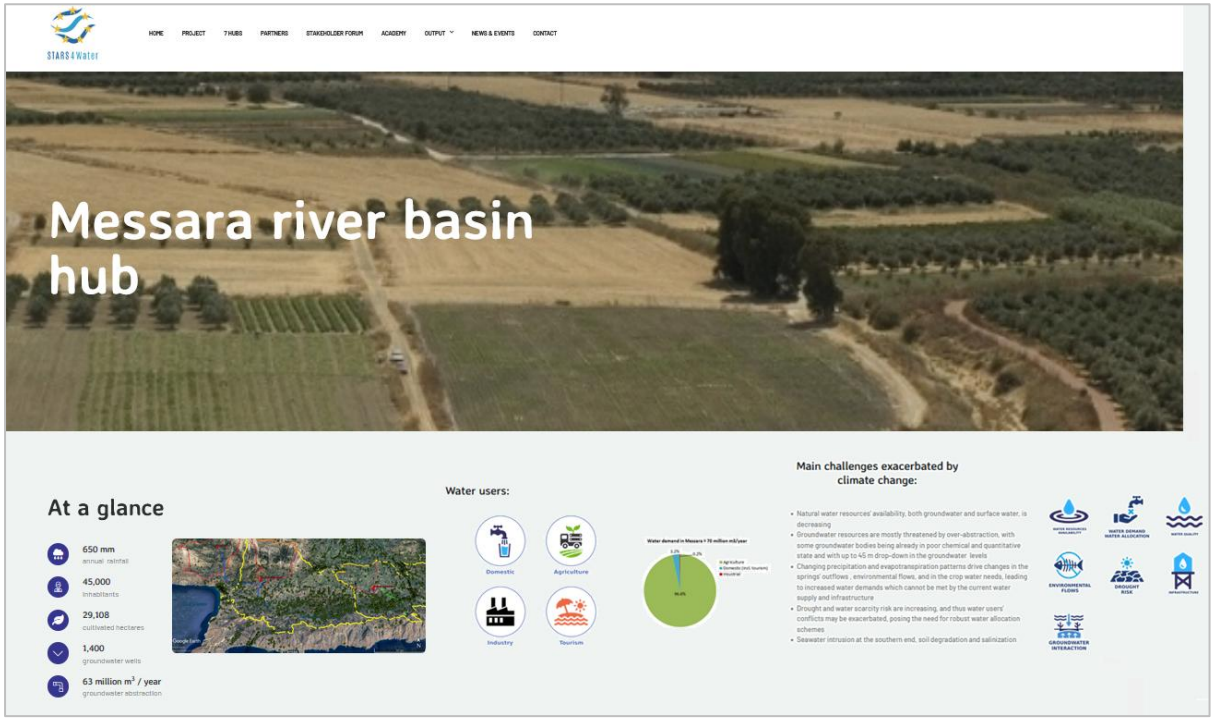
Capturly: https://capturly.com/blog/average-bounce-rate-by-industry-2023-benchmark/

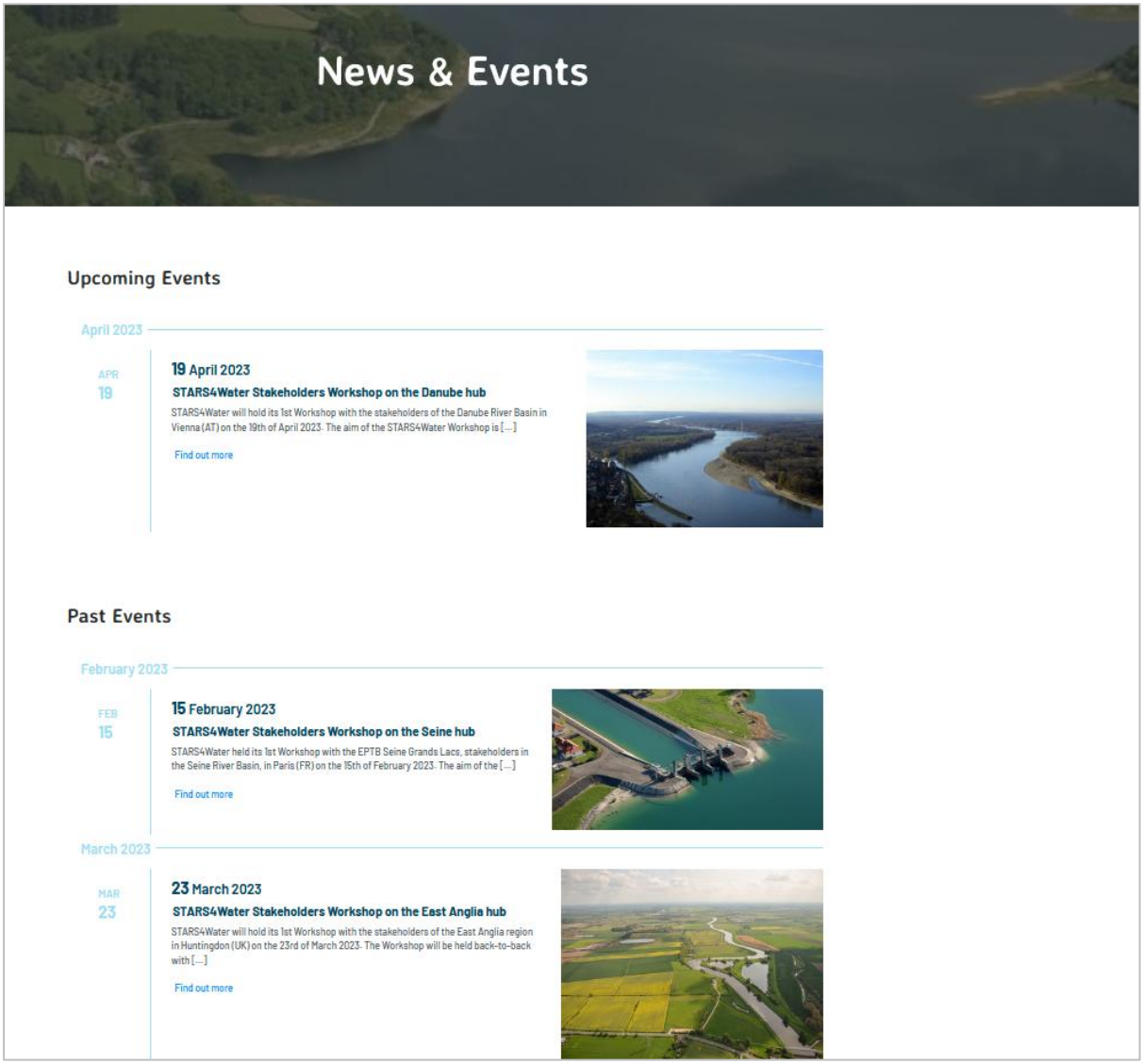
ANNEX 1: Snapshots of the STARS4Water website




Latest News
News and Articles
Reducing micropollutants in the Rhine catchment area
Monitoring and evaluation system
Reducing micropollutants in the Rhine catchment area
SDG 6 ACCELERATION SNAPSHOTS: WHAT PROGRESS LOOKS LIKE
SDG 6 Acceleration Snapshots
With our own words
What Our People Say
Jan Kruijshoop
Ministry of Infrastructure and Water Management - Rijkswaterstaat
The STARS4Water Consortium
Maggie Kossida
SEVEN
Share information
Our Forum & Deliverables
Stakeholders Forum


info@stars4water.eu
STARS 4 Water
HOME
PROJECT
7 HUBS
PARTNERS
STAKEHOLDER FORUM
ACADEMY
OUTPUT
NEWS & EVENTS
CONTACT
Our 7 hubs
STARS4Water will build the next generation river basin tools and services that support decision- making on water resources management in 7 River Basin Hubs. These river basin hubs serve as living labs for co-creation of data services and tools with stakeholder communities and as accelerators for further up-scaling of these services and tools to other river basins worldwide.
Each river basin hub has a direct beneficiary River Basin organisation (RBO) that will be the primary user of the products and services of the project (but not limited to them) and who has strong institutional connections and relationships with other governmental organisations, non-governmental organisations (e.g. water utilities, nature conservation organisations, civil society organisations) and private sector organisations (e.g. farmers associations, food and beverage industry, energy sector), who can also become users of the products and services when interested.
Drammen (NO)
East Anglia (UK)
Duero (ES)
Rhine (International)
Seine (FR)
Messara (GR)
Danube (International)
nature/environment
agriculture
urban water supply
hydropower
industry
tourism


STARS4Water
HOME
PROJECT
7 HUBS
PARTNERS
STAKEHOLDER FORUM
ACADEMY
OUTPUT
NEWS & EVENTS
CONTACT
Messara river basin hub
At a glance
650 mm
annual rainfall
45,000
inhabitants
29,108
cultivated hectares
1,400
groundwater wells
63 million m³ / year
groundwater abstraction
Water users:
Domestic
Agriculture
Industry
Tourism
Main challenges exacerbated by climate change:
Natural water resources' availability, both groundwater and surface water, is decreasing
Groundwater resources are mostly threatened by over-abstraction, with some groundwater bodies being already in poor chemical and quantitative state and with up to 45 m drop-down in the groundwater levels
Changing precipitation and evapotranspiration patterns drive changes in the springs' outflows , environmental flows, and in the crop water needs, leading to increased water demands which cannot be met by the current water supply and infrastructure
Drought and water scarcity risk are increasing, and thus water users' conflicts may be exacerbated, posing the need for robust water allocation schemes
Seawater intrusion at the southern end, soil degradation and salinization


News & Events
Upcoming Events
April 2023
APR
19
19 April 2023
STARS4Water Stakeholders Workshop on the Danube hub
STARS4Water will hold its 1st Workshop with the stakeholders of the Danube River Basin in Vienna (AT) on the 19th of April 2023. The aim of the STARS4Water Workshop is [...]
Find out more
Past Events
February 2023
FEB
15
15 February 2023
STARS4Water Stakeholders Workshop on the Seine hub
STARS4Water held its 1st Workshop with the EPTB Seine Grands Lacs, stakeholders in the Seine River Basin, in Paris (FR) on the 15th of February 2023. The aim of the [...]
Find out more
March 2023
MAR
23
23 March 2023
STARS4Water Stakeholders Workshop on the East Anglia hub
STARS4Water will hold its 1st Workshop with the stakeholders of the East Anglia region in Huntingdon (UK) on the 23rd of March 2023. The Workshop will be held back-to-back with [...]
Find out more

ANNEX 2: STARS4Water Leaflet

STARS 4 Water

SUPPORTING STAKEHOLDERS FOR ADAPTIVE, RESILIENT AND SUSTAINABLE WATER MANAGEMENT

THE PROJECT AT A GLANCE

Title: SUPPORTING STAKEHOLDERS FOR ADAPTIVE, RESILIENT AND SUSTAINABLE WATER MANAGEMENT (STARS4WATER)
Instrument: HORIZON-CL6-2021-CLIMATE-01 , EUROPEAN RESEARCH EXECUTIVE AGENCY
Total Cost: 4,584,730 €
EC Contribution: 4,580,979 €
Duration: 48 MONTHS
Start Date: October 1st, 2022
Consortium: 21 partners from 10 countries
Project Coordinator: Stichting Deltares
Project Web Site: www.stars4water.eu (*under construction*); https://cordis.europa.eu/project/id/101059372
Key Words: *Water resources, Catchment scale water management, Climate change adaptation, Water-climate interactions, Risk and vulnerabilities assessment, Data-driven models, Decision making tools, Information systems, Stakeholders engagement, River Basin Organisation. Living-lab approach*

THE CHALLENGE

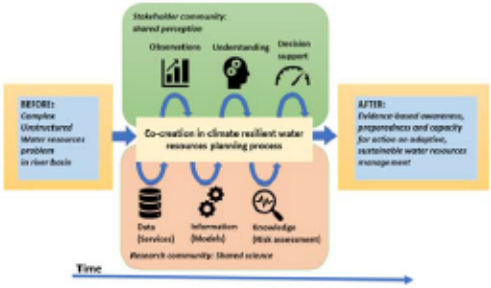
Worldwide freshwater resources are under increasing pressures of rapidly intensifying climate change effects, putting the availability and quality of water resources and socio-economic developments at risk. Better quantitative assessments and projections of the impacts and water-related risks for society, ecology and economic sectors are needed. River basin organisations need to be prepared!

New datasets and models offer possibilities for improved understanding and projections on water resources availability and vulnerabilities, while the new insights on the links between water, nature, and society call for a broader set of tools to be used for decision-making on water management. Recent advancements have opened new approaches in modelling, combining process-based or empirical modelling with new data techniques, like machine learning discovery techniques, resulting in hybrid approaches. Recent global observation studies and data collections, in cooperation with relevant EU earth observation initiatives, have created new climate data services and provide significant potential for improving the accuracy and spatial resolution of models. Yet, it is noted that these advancements are mainly still in the scientific domain. These novel tools (data-driven models, advanced data services, digital dashboards, etc.) are not yet fully matured and integrated in the current river basin management tools and decision-making processes. Their uptake and use by water resources planners and the stakeholders at the basin level are underexploited, even in frontrunner basins like the Rhine or Danube.

THE STARS4WATER CONTRIBUTION

STARS4Water aims to improve the understanding of climate change impacts on water resources availability and the vulnerabilities for ecosystems, society and the economy at river basin scale, including two distinctive elements: first, the need for an international stakeholder community to address their specific needs and requirements. Second, the development and application of innovative data services, models, tools.

STARS4Water will develop and deliver new data services and data driven models for better decision-making support on planning actions for adaptive, resilient and sustainable management of fresh water resources, which will be co-designed with stakeholders to meet their needs, ensuring their relevance and uptake beyond the lifetime of the project. Following a process of co-creation we aim to capacitate stakeholders with next generation river basin tools and build a strong Community of Practice.



1

STARS4WATER SPECIFIC OBJECTIVES

STARS4Water will build the next generation river basin tools and services that support decision- making on water resources management in **7 River Basin Hubs**. These river basin hubs serve as living labs for co-creation of data services and tools with stakeholder communities and as accelerators for further up-scaling of these services and tools to other river basins worldwide.

The 7 river basin hubs represent a regionally diverse portfolio of climate vulnerabilities and adaptation needs across sectors and include the basins of: Drammen (NO), East Anglia (UK), Rhine (international), Danube (international), Seine (FR), Duero (ES), Messara (GR). Each river basin hub has a direct beneficiary River Basin organisation (RBO) that will be the primary user of the products and services of the project (but not limited to them) and who has strong institutional connections and relationships with other governmental organisations, non-governmental organisations (e.g. water utilities, nature conservation organisations, civil society organisations) and private sector organisations (e.g. farmers associations, food and beverage industry, energy sector), who can also become users of the products and services when interested.

The STARS4Water has 5 Specific Objectives:

1. Provide stakeholders with **new generation data services and data-driven models tailored** to their needs and requirements	▪ New data services and data-driven models will be developed in the 7 river Basin hubs, advanced to TRL 5-6. Each of the new data services and modeling tools will be validated in at least one of the River Basin hubs
2. Improve accuracy and resolution of **regional-scale projections** of water resources availability, from 10 to 1 km^2 grids	▪ Application of data science techniques, using the full potential of data from existing monitoring and observation frameworks. The improved future projections will be made available through a portal of a metadata platform
3. Enhance the **knowledge base** and the scientific underpinning of climate risks and impacts, in various **scenarios and time horizons**	▪ The new data services and tools will be applied in projections of climate and socio-economic changes under 3 scenarios (2030-2050). The projections will be used to define the safe operating space for water availability and ecological requirements, enabling the stakeholders to define actions for sustainable management and climate resilience
4. Improve **stakeholders' decision-making** through the development of dashboards: **co-designed & co-developed information systems**	▪ The dashboards will present climate impacts on water resources and hydrological extremes at river basin scale, to support stakeholders in better assessments of strategies by incorporating decision-support indicators on safe operating space, extreme events, water-energy-food nexus, water supply impacts
5. Promote **uptake and transferability of the data services & tools** through guidance documents and capacity building activities	▪ Uptake will be achieved through establishing a network of water planners and practitioners (Community of Practice) and data service platforms, starting from the 7 river hubs. Complemented by the STARS4Water Academy and Stakeholders Forum

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EXPECTED OUTCOMES AND PROJECT IMPACT

The project will have substantial impact on the following expected outcomes:

i) Enhancement of the knowledge base regarding water related climate change impacts, vulnerability, risk and adaptation assessments in Europe and abroad;

ii) Improved understanding of future water vulnerabilities, including both water quantity and quality aspects, by better considering the interactions among climate change and variability, land surface and groundwater hydrology, water engineering, and human systems, including societal adaptations to water scarcity;

iii) Supporting decision makers defining the safe operating space in terms of water quantity and availability, i.e., defining sustainable water management and climate change adaptation measures, meeting growing water supply, food, and energy needs, and controlling the high inter-annual variability in water availability;

iv) Improving Member States' preparedness for climate change impacts with respect to floods and droughts and support more accurate decision making for flood and drought risk reduction and response;

v) Improved knowledge of ecological flows in the context of the Water Framework Directive and especially of the impacts of management, infrastructure and climate on ecological flows; improve prediction of drought events and water scarcity and enhance the assessment of the impacts of drought on water quality and biodiversity;

vi) Foster commitments between climate change and water scientists, monitoring services, industry, water utilities and other socioeconomic communities to collect, standardize, and widely disseminate information on water use in different sectors;

vii) Minimise the disparities associated with data collection and reporting between researchers and data agencies, enhance the interoperability, in particular through the mainstreaming of community-accepted standards, metadata schemas, and data management best practices in line with the FAIR principles, between data providers and data users and strengthen coordination among various monitoring services.

❖ **THE CONSORTIUM:** The project consortium consists of 21 partners representing 10 EU countries from 4 continents.

Stichting Deltares (Deltares) – Coordinator	
SEVEN Engineering Consultants G.P.	Norges Vassdrags- og Energidirektorat (NVE)
Institut National de Recherche pour l' Agriculture, l' Alimentation et l' Environnement (INRAE)	Szkola Glowna Gospodarstwa Wiejskiego (SGGW)
VANDERSAT BV	Region of Kriti
Universitaet fuer Bodenkultur Wien (BOKU)	Anglian Water Services Ltd (AWS)
Agencia Estatal Consejo Superior de Investigaciones Cientificas (GSIC-IGME)	Bundesanstalt fuer Gewaesserkunde (BfG)
Universidad Complutense de Madrid (UCM)	Directorate for Protection and Management of Aquatic Environment of the Hellenic Ministry of Environment & Energy (HMEE)
Institutul National de Cercetaredezvoltare Pentru Geologie si Geoecologie Marina (GEOECOMAR)	Syndicat mixte de l'Etablissement Public territorial de Bassin Seine Grands Lacs (EPTB)
Ministerie van Infrastructuur en Waterstaat (RWS)	Regia Autonoma Administratia Fluviala a Dunarii de Jos Galati (LDRA)
Forschungszentrum Julich Gmbh (FZJ)	Confederation Hidrografica del Duero (CHD)
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ANNEX 3: Snapshots of the STARS4Water Academy

Conceptual structuring of the webinars/ tutorials

This classification is based on the content type and function within the STARS4Water knowledge chain

0. Overarching, general

1. Shared perception
1.1 Observations
1.2 Understanding
1.3 Decision support

2. Shared science
2.1 Data (services)
2.2 Information (models)
2.3 Knowledge (risk assessment)

Webinars/ tutorials layering (pedagogical structuring)

This classification annotates the tutorial depth and audience learning pathway

- Level 1: What / general – introduces the tool or service, target purpose, and main messages.
- Level 2: Examples – demonstrates its use and project-relevant applications.
- Level 3: How / edits – step-by-step operational guidance, showing users how to interact, adopt or customize.

Sub-components

All | 0 Overarching, general | 1.1 Shared perception - Observations | 1.2 Shared perception - Understanding | 1.3 Shared perception - Decision support | 2.1 Shared science - Data (services) | 2.2 Shared science - Information (models) | 2.3 Shared science - Knowledge (risk assessment)

STARS4Water project in a nutshell

ID: 0/01-A | Category:0 | Level: 1

Local data collection: Approaches and lessons learned

ID: 1.1/02-A | Category: 1.1 | Level: 1

Local data collection: practical approaches to local water metadata

ID: 1.1/02-B | Category: 1.1 | Level: 2

Indicators for assessing climate risks and impacts on integrated water resources system

ID: 2.1/02-A | Category: 2.1 | Level: 1

STARS4Water Impact Reporter: Part 1 – Overview and Navigation

ID: 2.1/03-A | Category: 2.1 | Level: 1

RIBASIM – Water resources model to support resilient and sustainable water management in complex basins

ID: 2.2/01-A | Category: 2.2 | Level: 1

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STARS4Water

HOME PROJECT 7 HUBS PARTNERS STAKEHOLDER FORUM ACADEMY OUTPUT NEWS EVENTS CONTACT

Indicators for assessing climate risks and impacts on integrated water resources system

ID: 0/01.A

< Back to the STARS4Water Academy

Climate change is a major challenge for water resources management. Global datasets can be used to derive relevant information and indicators for water resources management at the basin scale. This webinar presents how we can derive practical indicators at the river basin scale using global datasets. It presents example results from the application in the STARS4Water river basins, and how to easily access them via the developed STARS4Water Metadata Portal and generic Dashboard.

Learning Objectives

- What are climate risk indicators?
- Which indicators are available and how did we derive them?

Target Audience

- water resources managers and stakeholders in the river basin

Keywords

climate risk, indicators, basin scale, global data, metadata portal, dashboard

Related Resources

- Deliverable 2.3: Defining indicators for assessing climate risks
- Deliverable 2.6: Next generation water resources data services
- STARS4Water Metadata Portal
- STARS4Water generic Dashboard

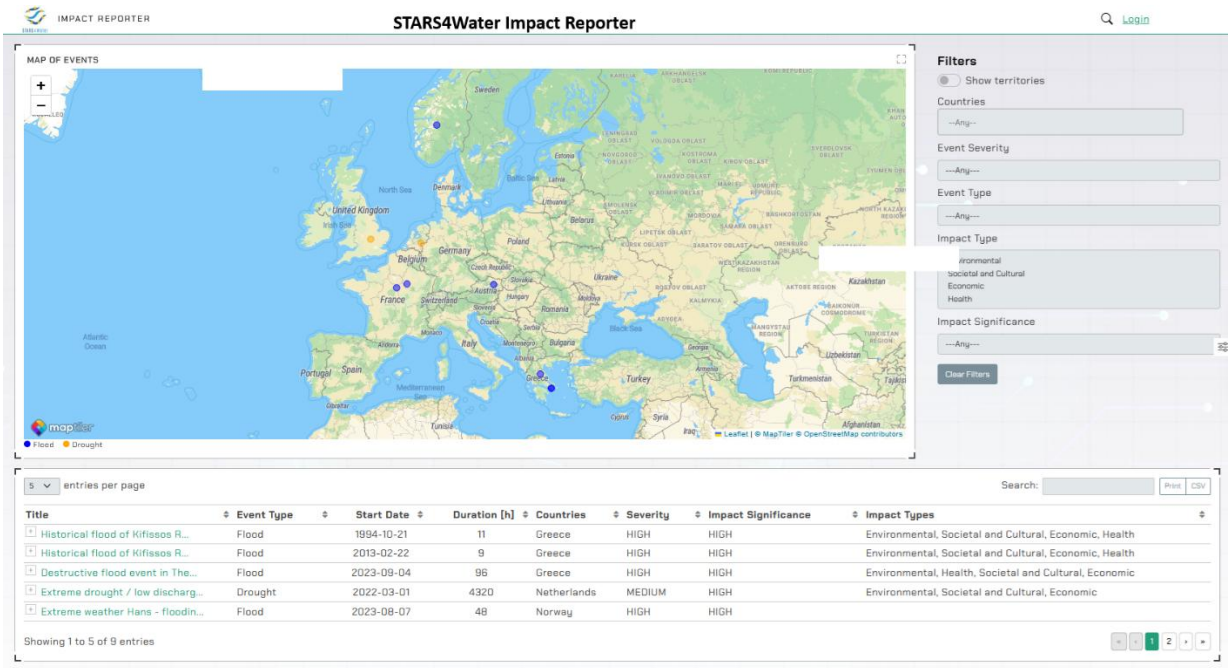
[Category: 0 / Level: 1]

Presenter:

Dr. Joost Beckers, VanderSat

For further questions please contact us via this form https://stars4water.eu/contact/

ANNEX 4: Snapshots of the STARS4Water Impact Reporter

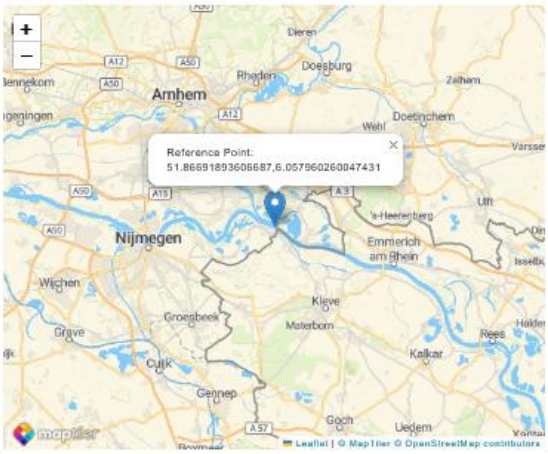


EVENTS LIST / EVENT FACTSHEET

Extreme drought / low discharges 2022 in the Netherlands

EVENT IMAGE

MAP OF THE EVENT



Event Type
Drought

Start Date
1 Mar 2022

Countries
- Netherlands

NUTS
- Nederland (NL)

RBD
- Netherlands - MAAS (NLMS)
- Netherlands - RIJN (NLRN)

Duration (hours)
4320

Event severity
MEDIUM

Return period of the event
100.0 years

Event extent
41850.0 km^2

Event Severity Assessment Method
A comparison was made to other drought years, especially 2018, which was another extreme drought recently occurring in Europe. The drought of 2022 was of the same severity as the 2018 drought, and had an even higher precipitation deficit already in Spring and an even lower snow cover in the Alps leading up to the event. It had some different characteristics, for example the trend in precipitation deficit, but was in many aspects of the same magnitude as the 2018 drought. The most extreme drought recorded is, however, the 1976 drought, which was even more extreme . The precipitation deficit reached almost 400 mm/year during Summer and stayed above 300 mm for approximately 3 months. Because this drought was even more extreme, the 2018 severity is categorized as medium. The return period of the 2022 drought where the Meuse discharges drop to 130 m3/s for 225 days at Monsin has a return period of approximately 110 years. The return period of the 2022 drought where the Rhine discharges drop to 1020 m3/s for 60 days at Lobith has a return period of approximately 95 years. Hence, the return period is set to 100 years.

Impact Significance
HIGH

Impact Assessment Methods
The impact has been categorized as high, but not very high, as it had an impact, but crucial functions (hence priority 1 in the Dutch water allocation scheme) could still be ensured. Additionally, the drinking water supply could still be ensured, although there were some hesitations if this was the case at one point in time. Impact 1. Reduced surface water availability is high, which is indicated by the combination of low river discharges and a large precipitation deficit. The Rijkswaterstaat Waterinfo website gives information on the river discharges in the Netherlands based on monitoring data. When looking at the low river discharges occurring in 2022