

WATER4ALL
PARTNERSHIP

Funded projects - FAIR for Water workshop

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2025-09-17

Workshop plan

- FAIR for Water
- Discussion about Water4all funded projects' Data Management Plans, data, workflow/processes
- *10' - Break*
- How can projects contribute to the Water4all FAIR Sharing platform and vice versa ?
- Q & A

Overall workshop plan

- FAIR for Water workshop to [JTC2022](#) & [JTC2023](#) projects : we are here
- Platform Use workshop #1: Fall 2025 / early 2026

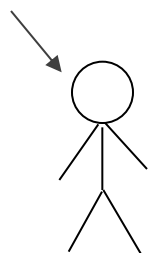
- FAIR for Water workshop to [JTC2024](#) > after JTC2024 kick-off
- Platform Use workshop #2:
- FAIR for Water workshop to [JTC2025](#)
- Etc...

- In between : feel free to contact us

- Targeted profiles : good to have FAIR focal points identified in each project (linked with DataManagementPlan requirement)

Why FAIR – example 1

Hydro Jack



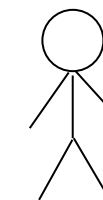
Need flow data!

Hmm maybe Don can help...

RING RING

Hi Don, I need some upper Derwent flow readings for my geochemical model. Any ideas?

Don

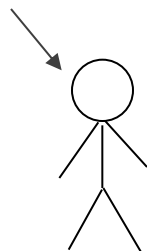


Hmm, I've got one site. I'll send it through...

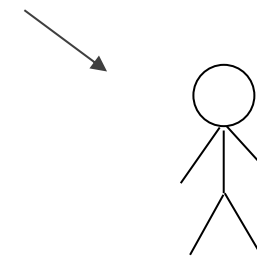


Why FAIR – example 1

Hydro Jack



Don



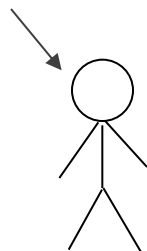
10 minutes...



To: Jack
01/02/09, 3.2, 3, 1
01/02/09, 3.1, 3, 1

Why FAIR – example 1

Hydro Jack



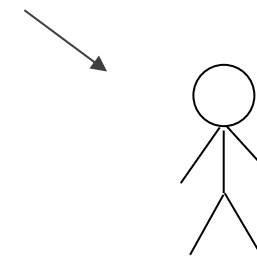
10 minutes...

RING RING

Ok. Got the data.
Where is the site
located?



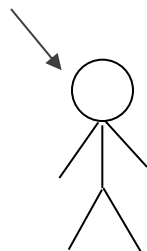
Don



Oh, it's at laughing jack bridge.

Why FAIR – example 1

Hydro Jack



10 minutes...

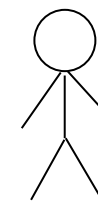
RING RING

Coordinates?

What reference
system??



Don

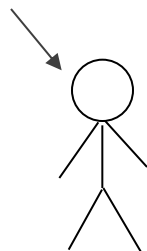


Ummm. (papers shuffle)
147.123 -41.588

I think it's GDA94

Why FAIR – example 1

Hydro Jack



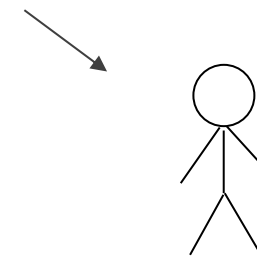
10 minutes...

RING RING

Ok. What sensor is used?



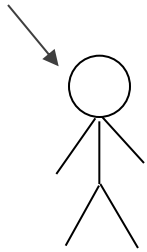
Don



It's calculated from the stream gauge reading using a rating curve..

Why FAIR – example 1

Hydro Jack



10 minutes...

Oh...how accurate is that?

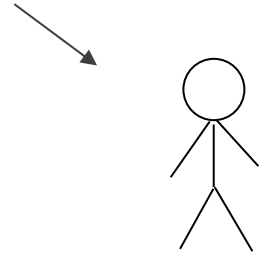


Umm.....

CLICK

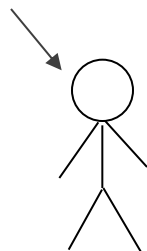
DON?

Don



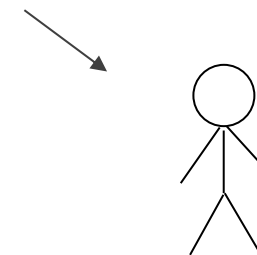
Why FAIR – example 1

Hydro Jack



10 minutes...

Don



*How often have you been Hydro Jack
(or Don) ?*

Umm.....

CLICK

DON?

Why FAIR – example 2

Sensor Metadata!

WIREID Nov. 10, 1999: Metric Math Mistake Muffed Mars Meteorology Mission

LSA_GROSSMAN 11-10-99 07:06 AM

NOV. 10, 1999: METRIC MATH MISTAKE MUFFED MARS METEOROLOGY MISSION



BBC ONLINE NETWORK [HOMEPAGE](#) | [SITEMAP](#) | [SCHEDULES](#) | [BBC INFORMATION](#) | [BBC EDUCATION](#) | [BBC WORLD SERVICE](#)

BBC NEWS

News in Audio News in Video Newyddion Новости Noticias أخبار 国际新闻 粵語廣播

Thursday, September 30, 1999 Published at 18:53 GMT 19:53 UK

Sci/Tech
Confusion leads to Mars failure

The Mars Climate Orbiter: Now in pieces on the planet's surface

The Mars Climate Orbiter Spacecraft was lost because one Nasa team used imperial units while another used metric units for a key spacecraft operation.

Sci/Tech Contents

Relevant Stories

- 24 Sep 99 | Sci/Tech [Scientist fights Mars setback](#)
- 23 Sep 99 | Sci/Tech [Mars probe feared destroyed](#)
- 23 Sep 99 | Sci/Tech [What the loss of Mars Climate Orbiter means](#)
- 17 Jul 99 | Sci/Tech [Astronauts call for Mars mission](#)

Internet Links

[Mars Climate Orbiter](#)

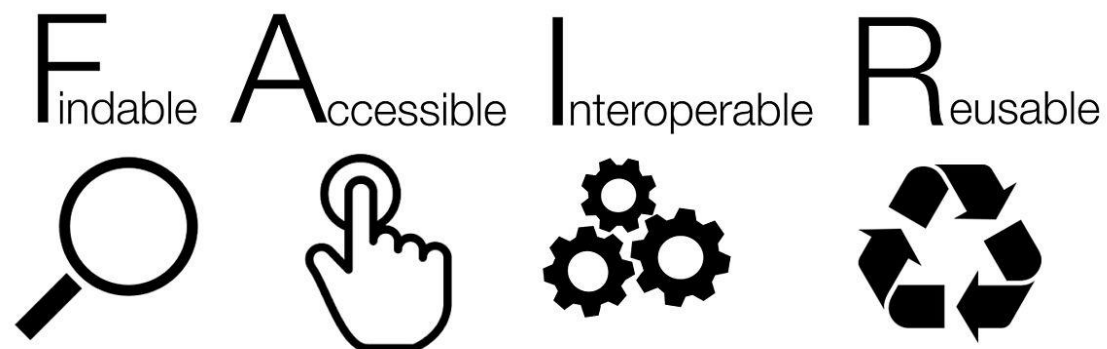
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A vision

Open Science, research dynamics defined the following guiding principles to handle (research) data so that they are

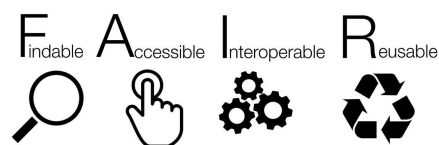
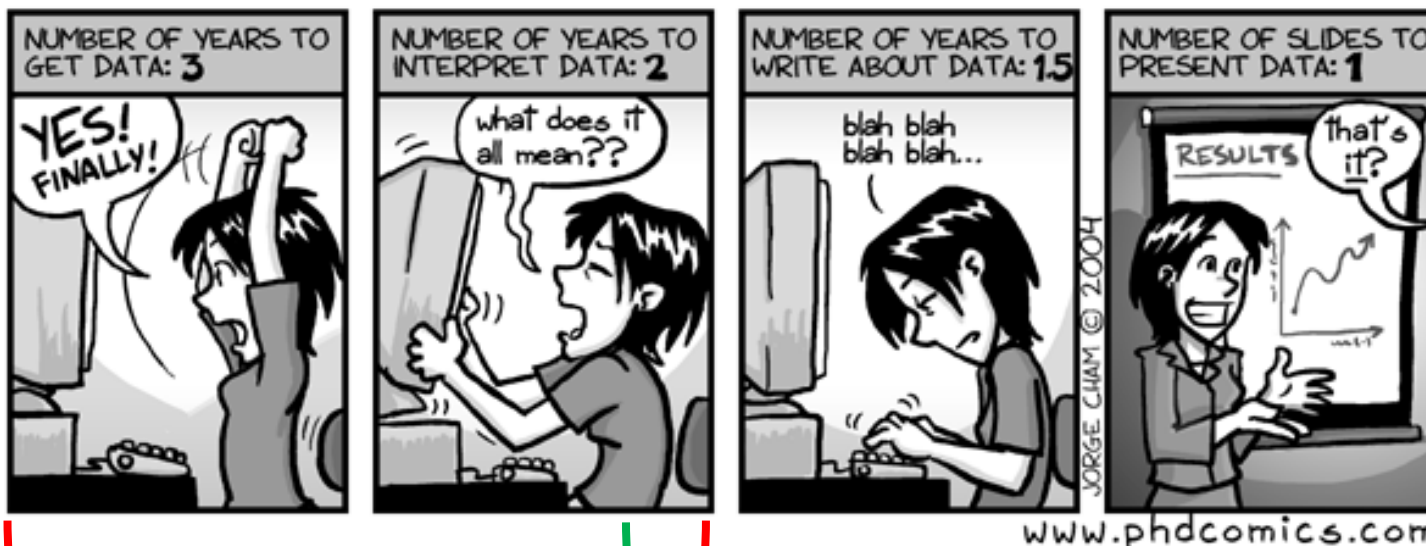


for both human AND machines

<https://www.go-fair.org/fair-principles/>

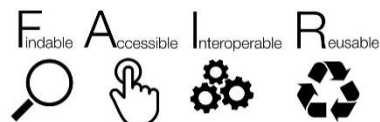
A vision

DATA: BY THE NUMBERS



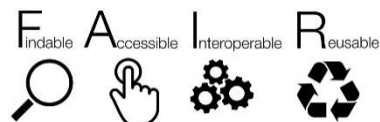
for our domain colleagues do to their real work

A vision



- Science: **research reproducibility**, discovery, access, reuse of data & code
- Public monitoring: enable **cross boundaries work** (international > continent > country > and below, between organizations)
- IT: not reinventing standards (*ex: how to exchange a timeseries*)
 - ⇒ Rationalization of technologies (less technical debt), methods, recruited profiles and training
 - ⇒ **Save of time & money, coherence**
 - ⇒ Enterprise Architecture

A vision








- Science: **research reproducibility**, discovery, access, reuse of data & code
- Public monitoring: enable **cross boundaries work** (international > continent > country > and below, between organizations)
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 - ⇒ **Save of time & money, coherence**
 - ⇒ Enterprise Architecture

- Inconsistencies in data & code exchange approaches > **silos**
 - Within & between administrative levels
 - Also withing organizations information system parts
- ⇒ Many barriers to F.A.I.R.
- ⇒ Risks of **miss-interpretations** thus un-informed decisions
- ⇒ Need for **tons of converters accross systems**
- ⇒ **Loss of time and money (often hidden costs)**
- ⇒ No Virtual Research Environment, Digital Twins/Shadows, AI, Data Spaces dynamically connected to data*
 - * *unless one wants to spend a lot of money for each reinvention of standards*

A vision

FAIR principles have to be translated into practical IT practices

OpenData dynamics (EU INSPIRE then High Value Dataset) were precursors. The target is the same. Let's build on it.

Foster FAIR Water data exchange using well known and already deployed interoperability standards and practices ( ,  ,  , INSPIRE  , ) enriching them when needed

A vision

Corresponding to activities going on between/within many organizations and projects



A vision

Set up international FAIR water practices
building on interoperability standards and
practices



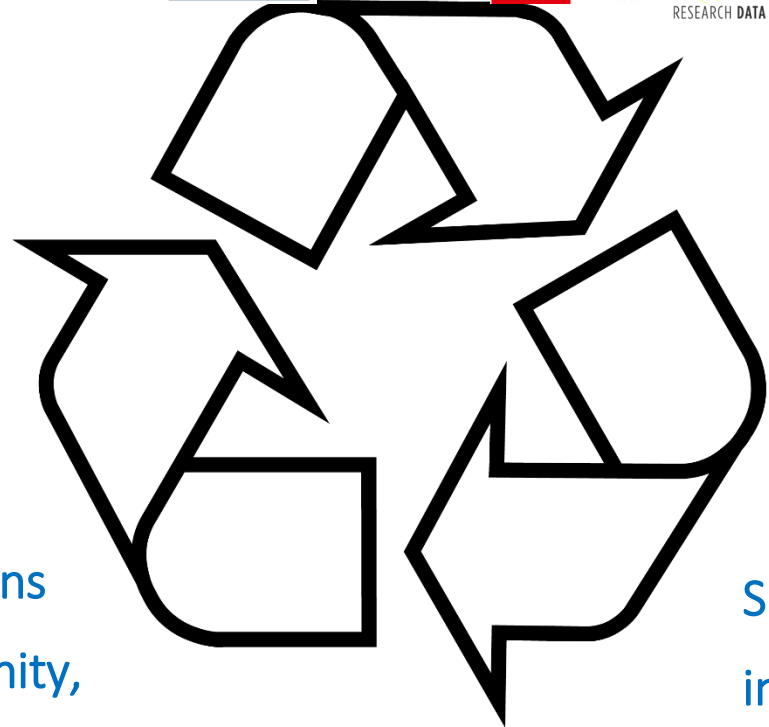
Deploy solutions
in the community,
test, train, promote

Support IT solutions
in implementing them

A vision designed to last

Set up international FAIR water practices

building on interoperability standards and practices



Deploy solutions
in the community,
test, train, promote

Support IT solutions
in implementing them

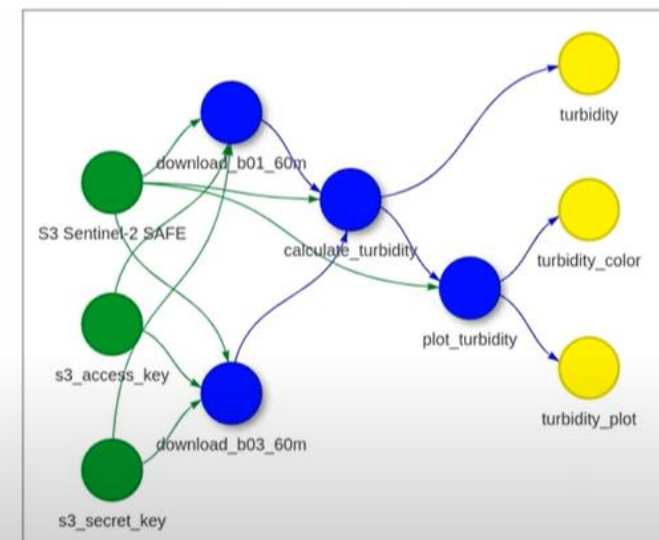
A shared vision

- One example : ESA – NASA – OGC Open Science Persistent Demonstrator
 - Context : <https://www.ogc.org/initiatives/open-science/>
 - Demo: <https://www.youtube.com/watch?v=rE2bOM2vgs>
 - The 1st Use Case ? A water one

Use Case – Algae Bloom for Water Quality Assessment Workflow Definition

- Each matched data product **Scattered** ([S] process) performs:

- Process `download-sentinel2-product-safe` (2x)
band = [B01/B02/B03/B04] (for the relevant calculation)
resolution = [10m/60m] (for the relevant calculation)
- Process `calculate-band`
calc = *band math* for [chlorophyll-a, cyanobacteria, turbidity]
- Process `plot-image`
data = *computed* [chlorophyll-a, cyanobacteria, turbidity]



A vision we consolidate in Water4All pillar C

- Involving key actors at national < EU < international levels regarding water data exchange

- Topics we work on

- Laying down the international best practice on sharing water quantity/quality observations (surface or ground water)
- Pushing the standards baseline (WaterML2.0)

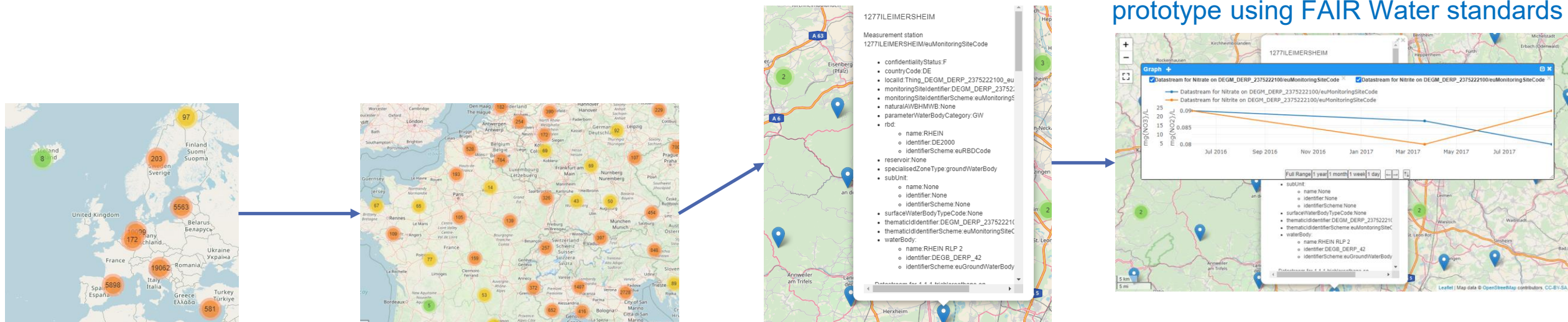


- Funding/supporting on open-source tools for the water community to expose and reuse data shared using FAIR standards
- Help share and align water related vocabularies

A vision we consolidate in Water4All pillar C






- Topics we work on
 - Testing with the EU bodies handling water data

It works : WISE-6 SoE reporting prototype using FAIR Water standards

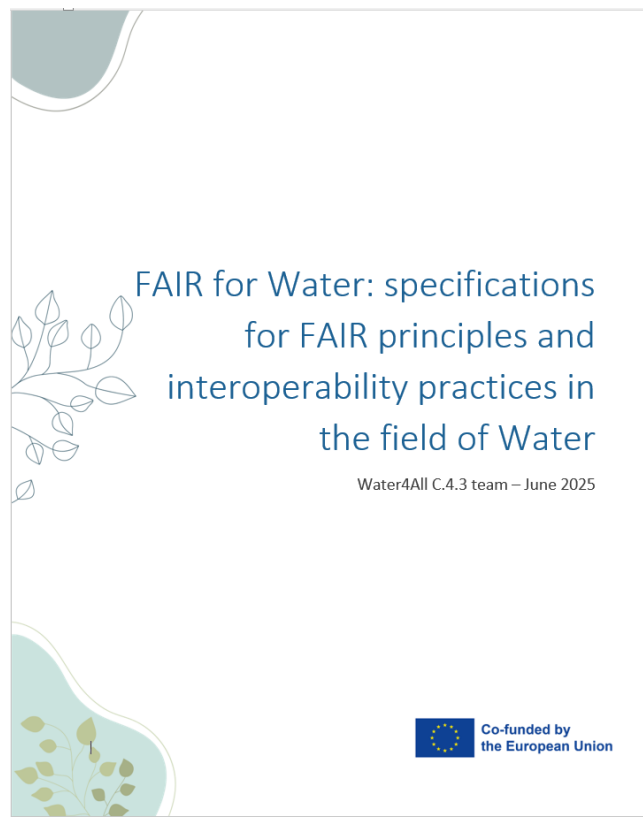


- Inventory of existing catalogues of water data in EU
- A training programme on FAIR for Water
- A whitepaper on best practices in water data management

FAIR for Water ?

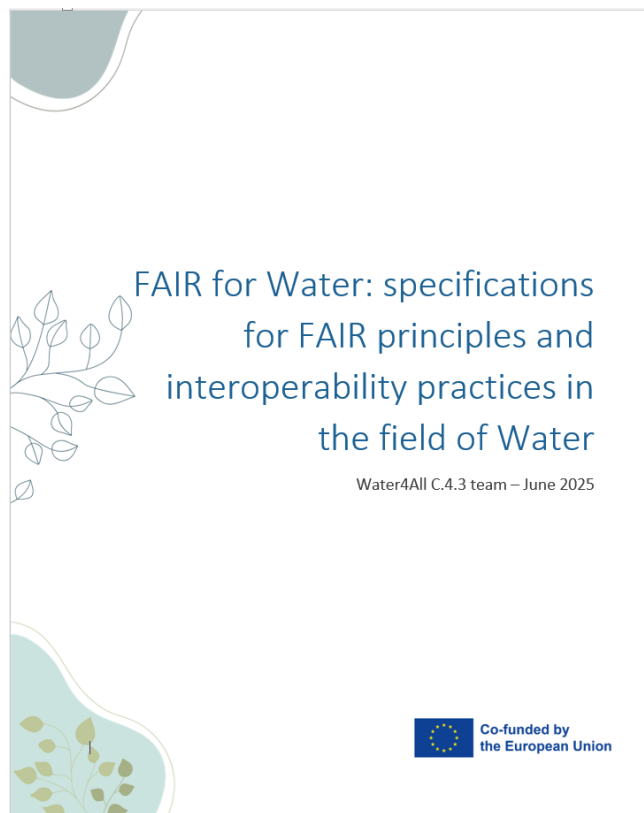
Re, Foster FAIR Water data exchange using well known and already deployed interoperability standards and practices ( ,  ,  ,  , ) enriching them when needed

=>



will be shared with the projects in the coming weeks

FAIR for Water ? > some examples

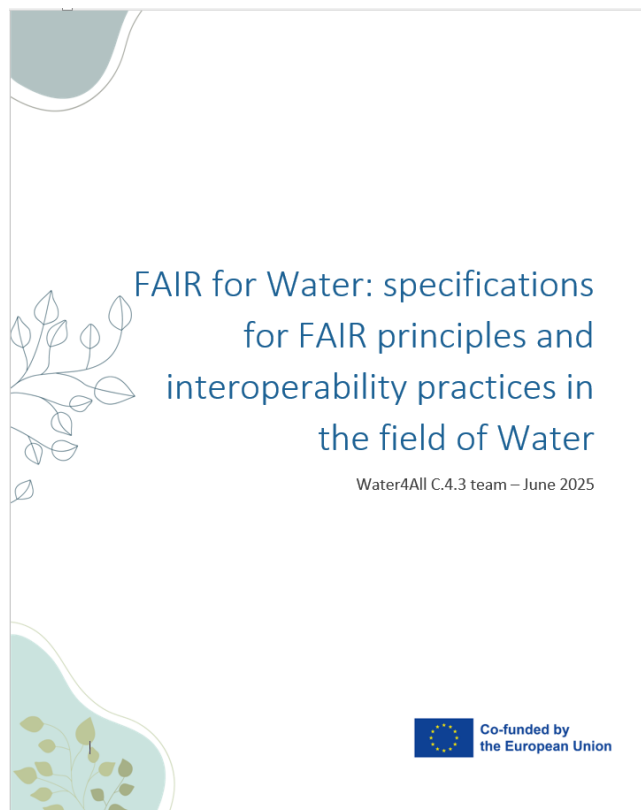


F2. DATA ARE DESCRIBED WITH RICH METADATA

Water4all recommendations

- Metadata describing the dataset => ISO 19115 or W3C:DCAT
- Documenting the dataset itself => data models (UML, ontology)
- Scientific metadata such as documenting observations
=> ISO 19156/OGC Observations, Measurements and Samples or W3C:SSN/SOSA

FAIR for Water ? > some examples



A1. METADATA AND DATA ARE RETRIEVABLE BY THEIR IDENTIFIER USING A STANDARDISED COMMUNICATIONS PROTOCOL

Water4all recommendations

- Protocol read as exchanges of data in the software application layer on the Internet => HTTP Protocol
- RESTful FAIR APIs defined by international standards and best practices (e.g. OGC APIs). In each case, described in accordance with international best practices (e.g. OpenAPI, OData).
 - Previous OGC services are still valid
 - Avoid ad'hoc/home made APIs

FAIR for Water ? > some examples



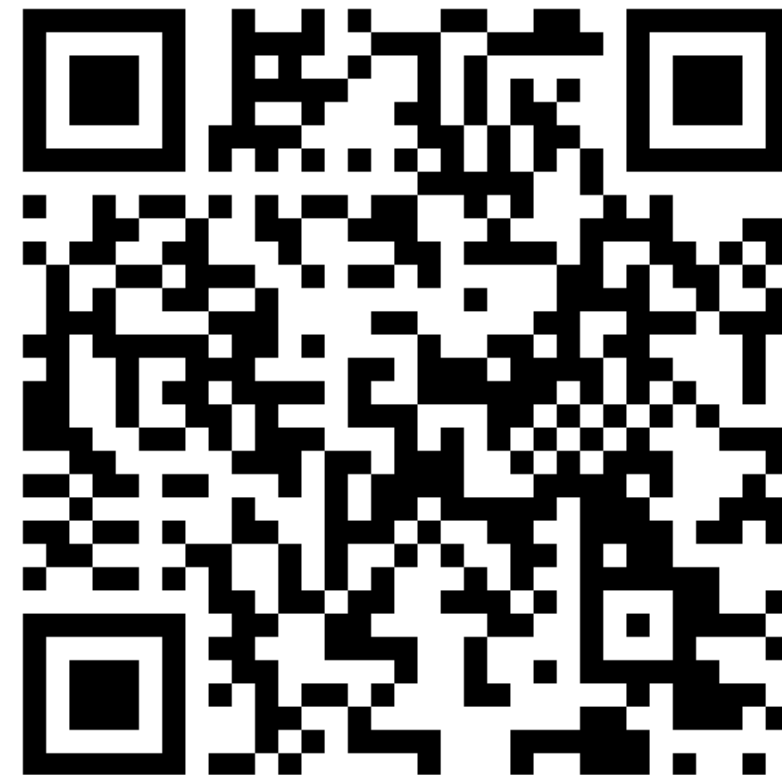
12. METADATA AND DATA USE VOCABULARIES THAT FOLLOW FAIR PRINCIPLES

Water4all recommendations

- Contribute to the drive to make pre-existing standards FAIR within Water4All area of activity (water and the models concerned),
- Shared vocabularies (codeLists) using FAIR practices (ex : "Ten simple rules for making a vocabulary FAIR")
- Identify controlled vocabularies that meet the needs expressed in Water4all projects and tasks, help bring those that are not FAIR into compliance and create new vocabularies if a need arises in an area that is not already covered.

Data, scientific processes and funded projects

- Let's discuss about
 - The data you need
 - The data you will generate
 - The water-related algorithm(s) you would like to use in a common environment
 - and how could Water4All assist you in all this

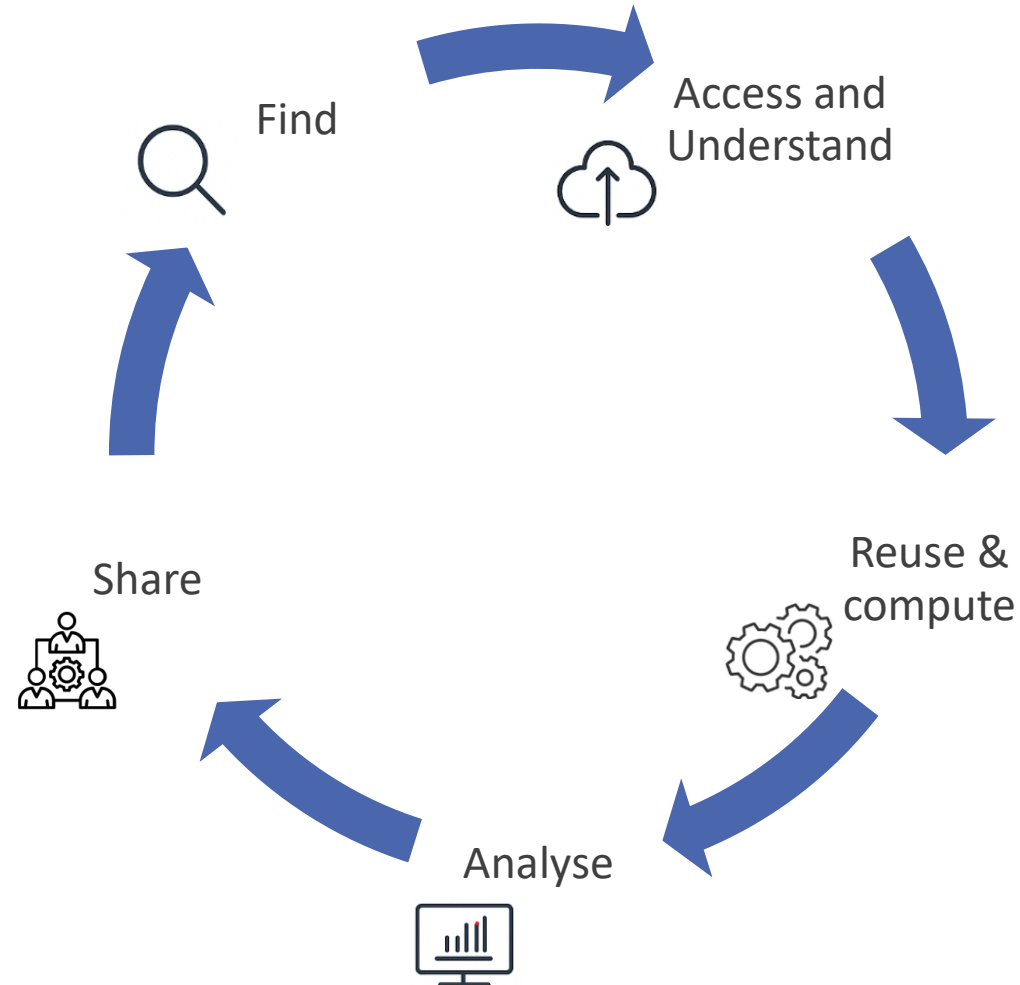


Please go there : <https://app.wooclap.com/events/TUZALN/live-session>

And have an explicit 'UserName' so that we can exchange on your contribution

Break : we'll reconnect at 11:10

How can projects contribute to the Water4all FAIR Sharing platform and vice versa ?



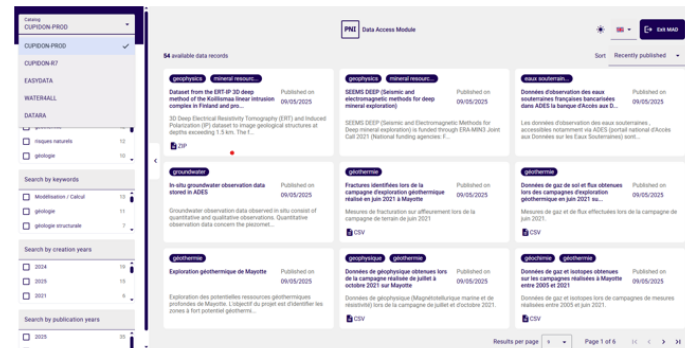
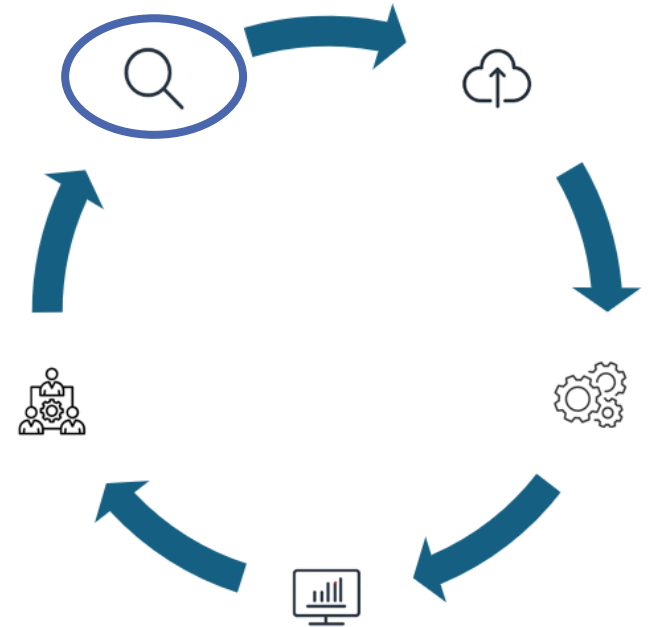
Find

How?

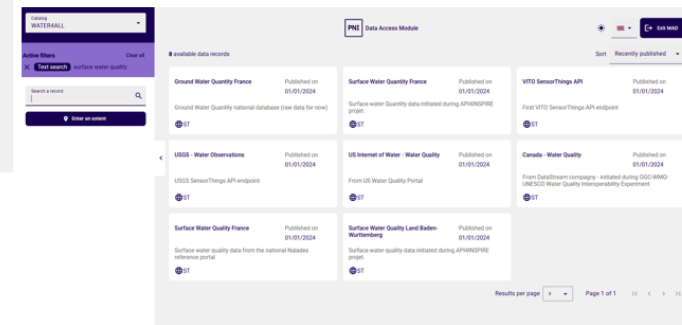
- You have a simple question: “*What data is available on river quality in my region?*”
- You go to the platform and use a **simple search interface**
- Water4all catalogue will be connected to EU catalogues public & research water data
- You can then find datasets thanks to **clear descriptions (metadata)**, keywords, and filters.

Benefit

- No need to search across many fragmented sources — everything is in one place



Search across various catalogues



Search for datasets based on criterias
Ex : water quality data services

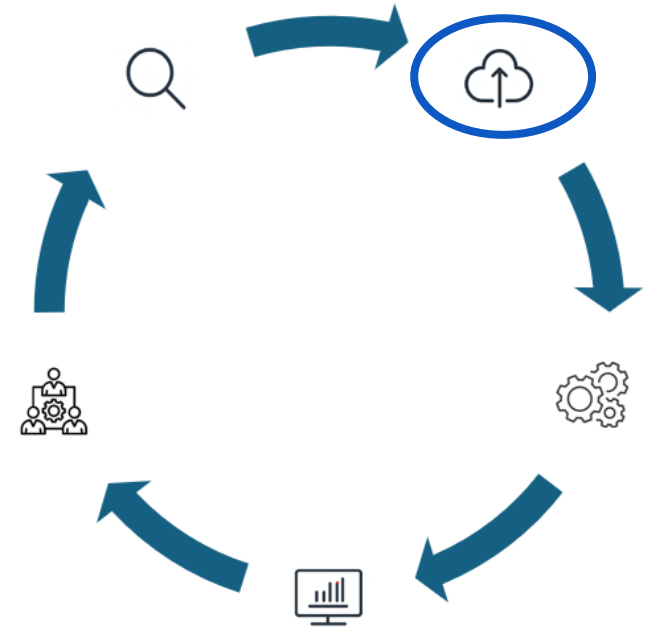
Access & understand

How?

- From the search answer you open a dataset page (metadata)
- You can see **who produced it, when, how it was collected, and whether it's up to date**
- Data **that** is available thanks to **FAIR standards** can be **more easily reused** by the platform

Benefit

- Simplified data subsetting for reuse in projects and workflows



PN1 Module d'accès aux données FR - Quitter MAD Retour

Emprise

Informations données

Jeu de données du réseau hydrographique français métropolitain exposés selon le respect des critères FAIR définis dans le cadre du PEPR OneWater

Résumé Traçabilité

La BD CarTHAgE® (Base de Données sur la CARtographie THématique des Agences de l'eau et du ministère chargé de l'environnement) est le fruit de la volonté nationale de disposer d'un système de repérage spatial des milieux aquatiques superficiels pour la France. Elle est produite par les Agences de l'eau à partir de la base de données cartographiques BD CARTO® de l'IGN qui décrit sous forme numérique l'ensemble des informations présentes sur le territoire national. Jusqu'en 2017, elle est mise à jour annuellement pour la métropole selon un cycle impliquant les agences de l'eau et l'IGN et ponctuellement pour les DOM.

Mots clés Cours d'eau

Thématiques Eau

Dates

Création	15/07/2024	Identifiant URI	-
Révision	15/07/2024	Identifiant HTTPS	-
Publication	01/08/2024	Contraintes légales	etalab-2.0

Accès aux données

▼ Webservice WMS, WFS et WCS (4)

- Service WMS du réseau hydrographique français métropolitain version 2017
- Service WMS des cours d'eau français métropolitains version 2017
- Service WFS du réseau hydrographique français métropolitain version 2017
- Service WFS des cours d'eau français métropolitains version 2017

mardi 16 septembre 2025

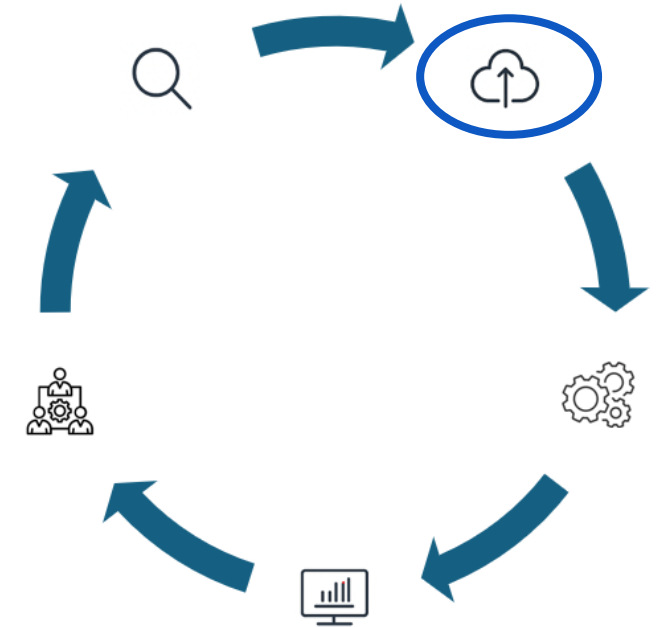
Metadata describing the French river network dataset. FAIR access standards used are detected

Access & understand

The screenshot shows the 'Module d'accès aux données' interface. The 'Emprise' section contains a map of France. The 'Informations données' section displays 'Jeu de données du réseau hydrographique français métropolitain exposés selon le respect des critères FAIR définis dans le cadre du PEPR OneWater'. The 'Accès aux données' section shows 'Webservice WMS, WFS et WCS (4)'. Below, the 'Type de service : WMS' section includes a 'Construction de la requête' table and a 'Prévisualisation' map of France with a blue overlay.

Service de données	Nom	Titre
https://data.onewater.fr/api/surfacewater/ty-g/ows?service=WMS&request=GetCapabilities		
<input checked="" type="checkbox"/>	Watercourse	Watercourse

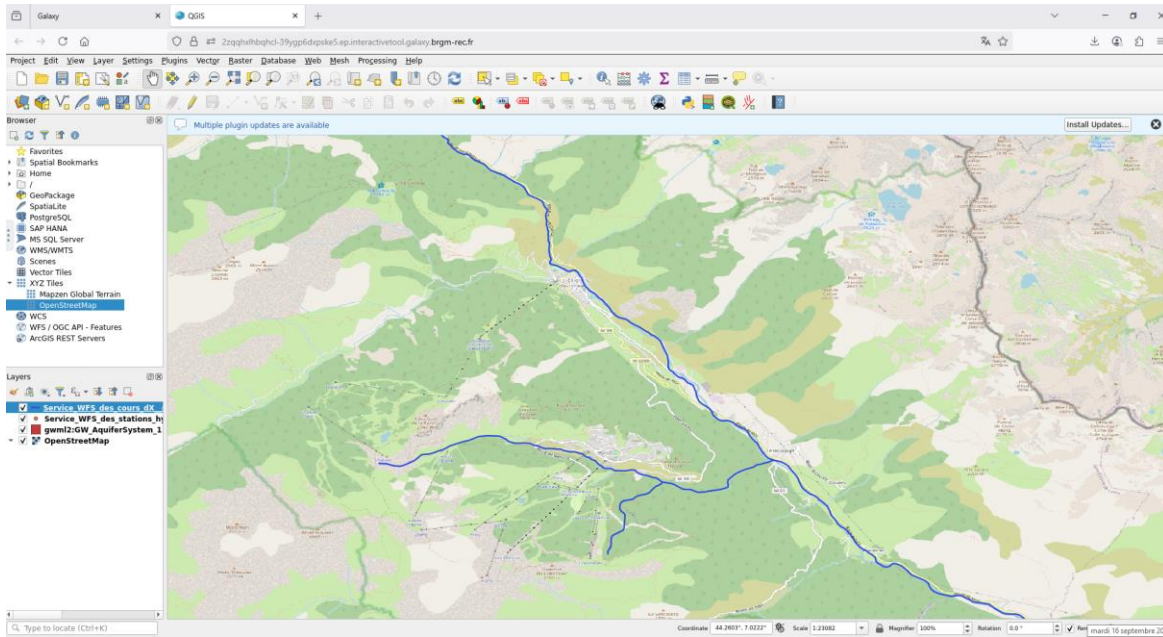
French River Network preview



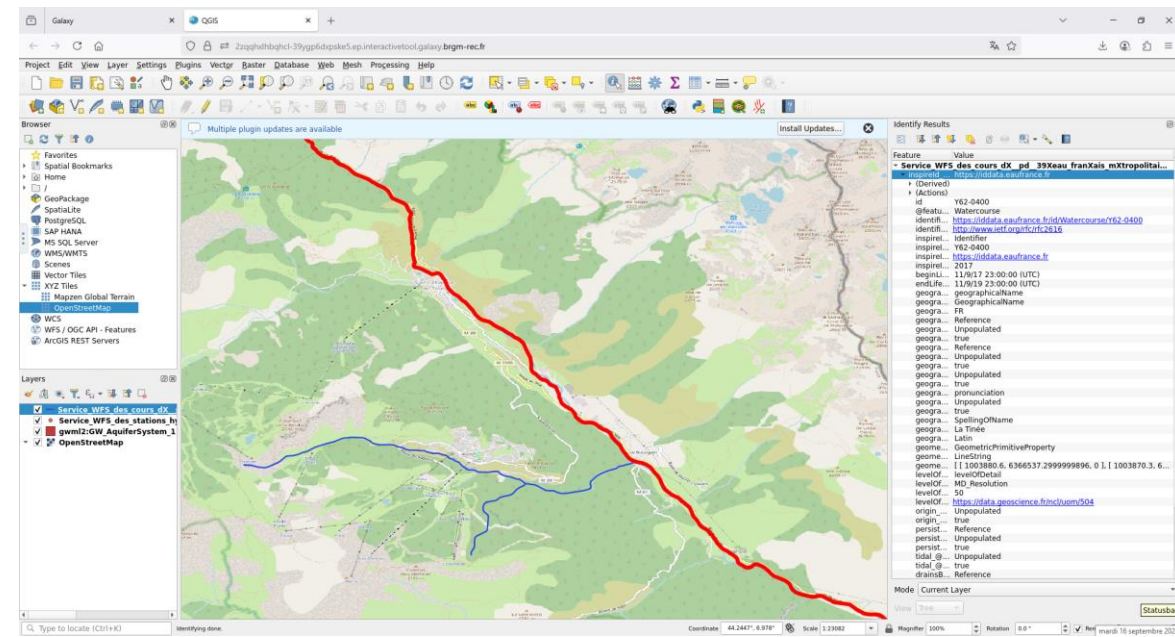
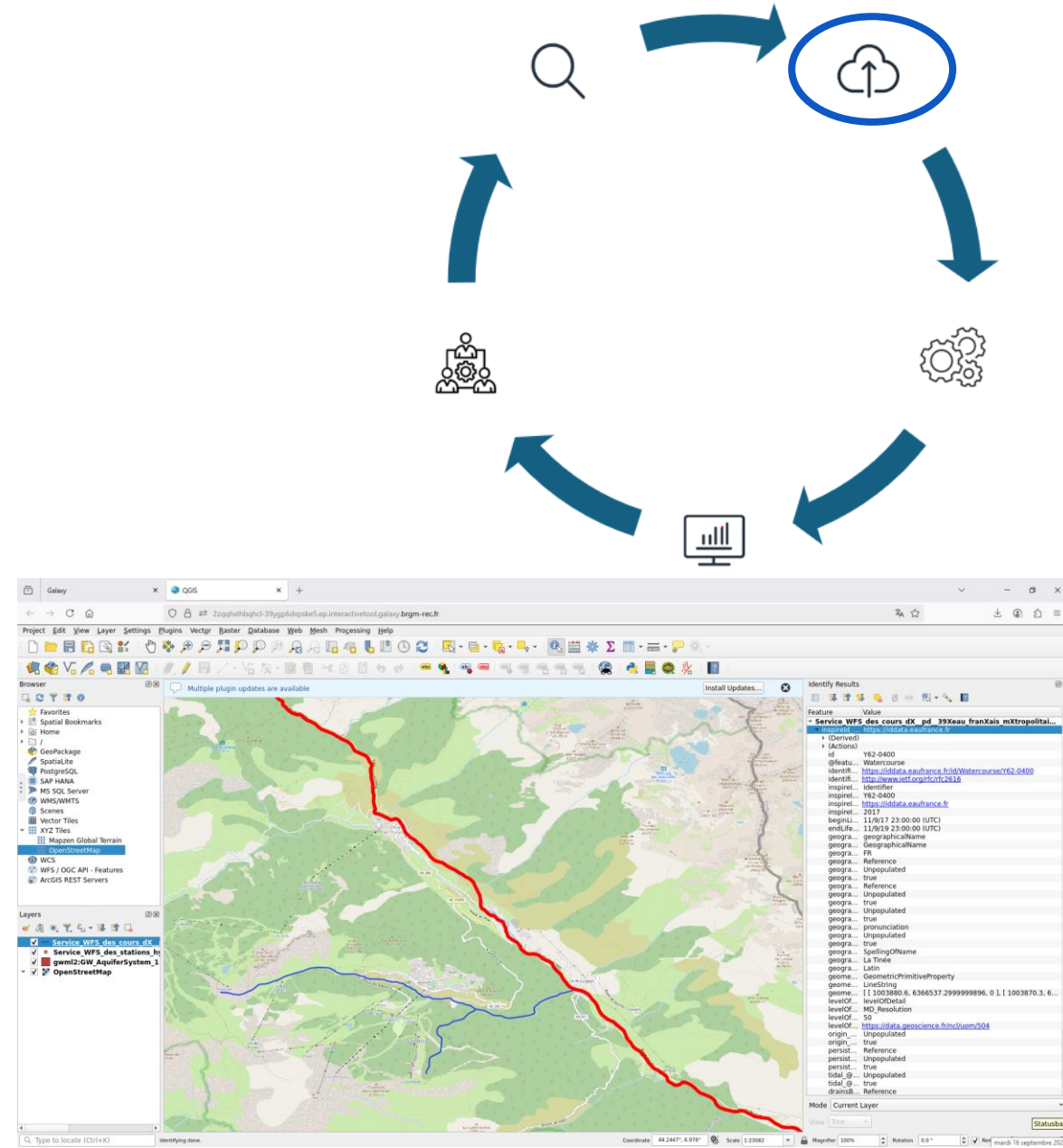
The screenshot shows the 'Module d'accès aux données' interface with the 'Type de service : WFS' section. The 'Construction de la requête' section shows the URL 'https://data.onewater.fr/api/surfacewater/'. The 'Attributs disponibles' section lists 'gml.boundedBy'. The 'Attributs sélectionnés' section shows 'gml.boundedBy'. The 'Informations données' section displays a detailed map of a river network with a blue dashed polygon overlay. The 'Accès aux données' section shows 'Webservice WMS, WFS et WCS (4)'.

Ex : French River Network spatial features extraction

Access & understand

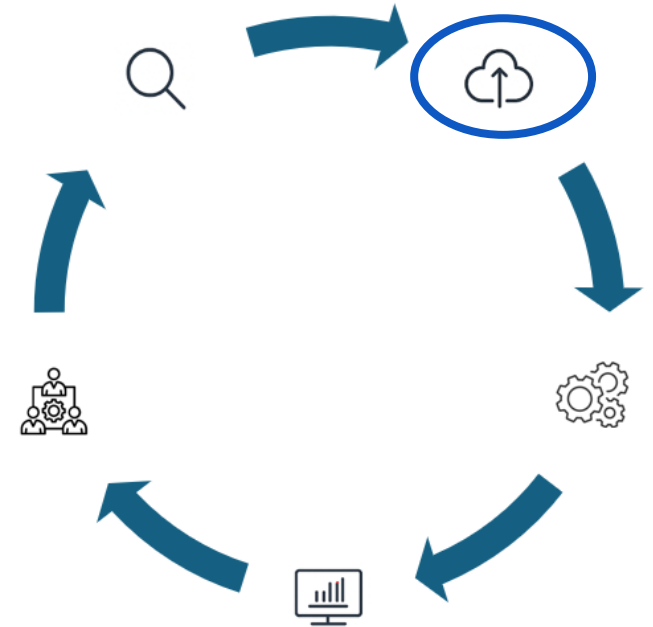


Extracted features accessible in the QGIS instance running on the platform



Spatial feature can be interrogated, attributes info are available

Access & understand



← Retour PNI Module d'accès aux données

Informations données

Mots-clés : Pas de données Thématiques : Pas de données

US Internet of Water - Water Quality

Résumé From US Water Quality Portal

Accès aux données

Données à télécharger (0) Aucune donnée disponible

Webservice WMS, WFS et WCS (0) Aucun service disponible

Type de service : SensorThings API

Construction de la requête

Service de données
https://wqp.wqle.internetofwater.app/FROST-Server/v1.1

Things*
ANIMAS RIVER AT 29TH STREET

Observed Properties*
Alkalinity, total
Chlorophyll a
Conductivity
Conductivity
Count

Sensors*

Début de la période
jj/mm/aaaa

Fin de la période
jj/mm/aaaa

Filtre
\$filter=Datastream/Thing/id eq '21COL001_WQX-9424B'

Annuler Prévisualiser Transférer

Example Water Quality observation data extraction

← Retour PNI Module d'accès aux données

Informations données

Mots-clés : forage forage profond géothermie modèle profil sismique Thématiques : géologie géologie des bassins géophysique géothermie réservoir géoth.

Accès aux données

Données à télécharger (13)

Type de service : WMS

Construction de la requête

Service de données
https://services.lgrb-bw.de/index.phtml?VERSION=1.1.1&SERVICE=WMS&SERVICE_NAME=lgrb_georg_basisc_de&request=GetCapab

<input type="checkbox"/>	Nom	Titre	Description
<input type="checkbox"/>	g_area	Projektgebiet	Die Karte zeigt die Lage und Ausdehnung der Modellierungszonen und definierter Teilgebiete des GeORG-Projekts.
<input checked="" type="checkbox"/>	g_welp	Bohrungen	Die Karte zeigt die Lage von Bohrdaten, die im GeORG-Projekt zur Interpretation und geologischen 3D-Modellierung verwendet wurden.
<input type="checkbox"/>	g_sesurvl	Seismische Profile	Die Karte zeigt den Profilverlauf seismischer 2D-Daten, die im GeORG-Projekt zur Interpretation und geologischen 3D-Modellierung verwendet wurden.
<input type="checkbox"/>	g_geol	Geologische Karte	Die Karte zeigt die Verbreitung der im GeORG-Projekt harmonisierten Modelleinheiten und den Verlauf von Störungen an der Endoberfläche.
<input checked="" type="checkbox"/>	g_tec	Tektonische Übersichtskarte	Die Karte zeigt die Gliederung des Oberhaingrabens in Becken und Schwellenbereiche, den Verlauf von Haupt- und Nebenstörungen und die Abgrenzung tektonischer Regionen. Details siehe Abschlussbericht zum INTERREG IV-Projekt 'GeORG'.

Prévisualisation

Annuler

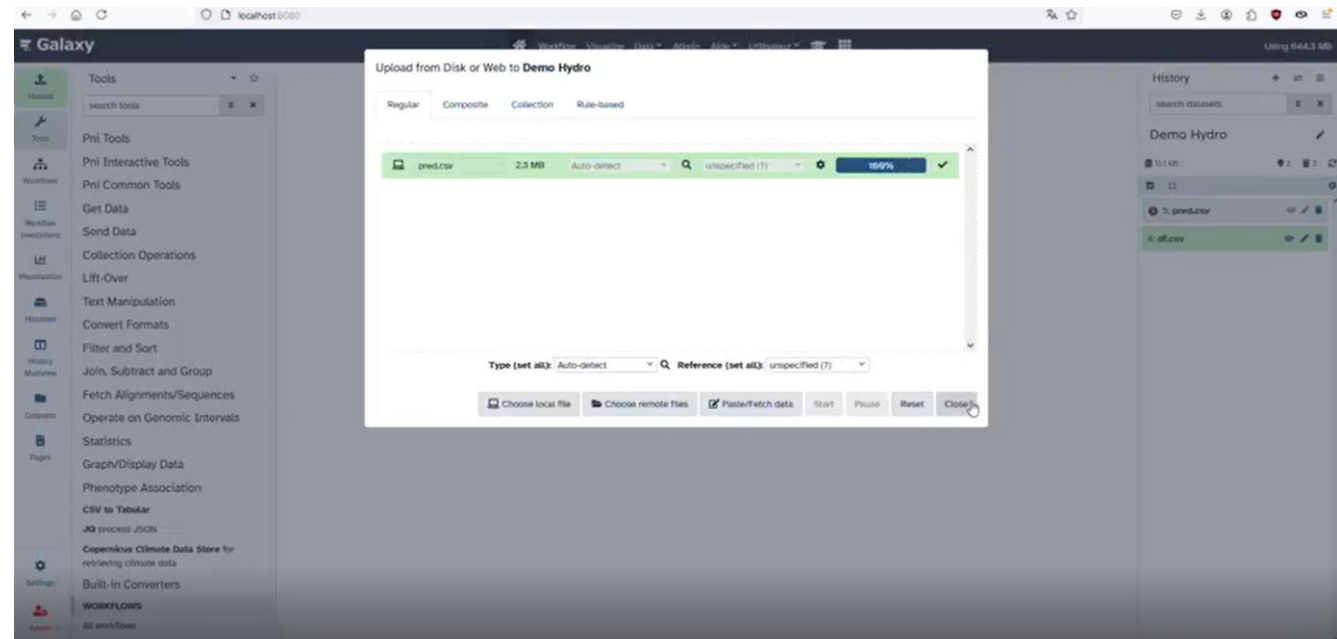
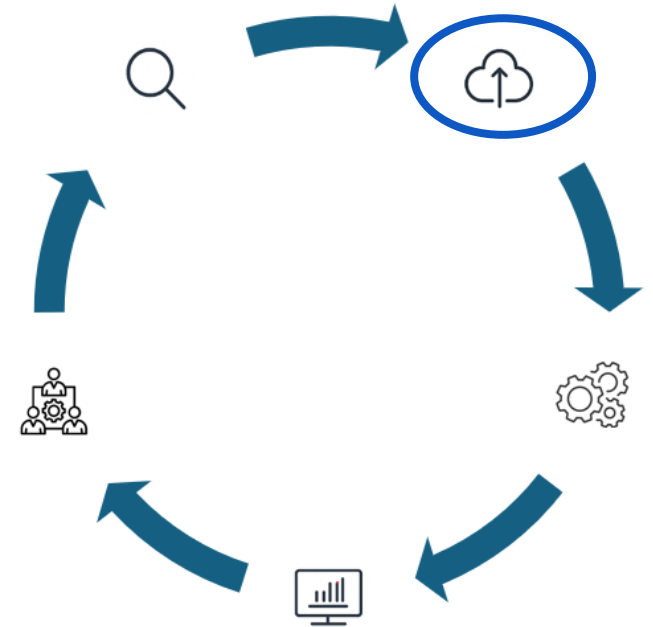
Example underground data preview

Access & understand

- “But I want to share data with my project team to work on it through the platform And/Or use the platform data computing capacity using community workflow/process on my data”

and that data is not yet in a catalogue

⇒ This is also possible : Capacity to exchange data with partners through a data-oriented tool and not yet another cloud-based file sharing one 😊



Transforme & Compute

■ How?

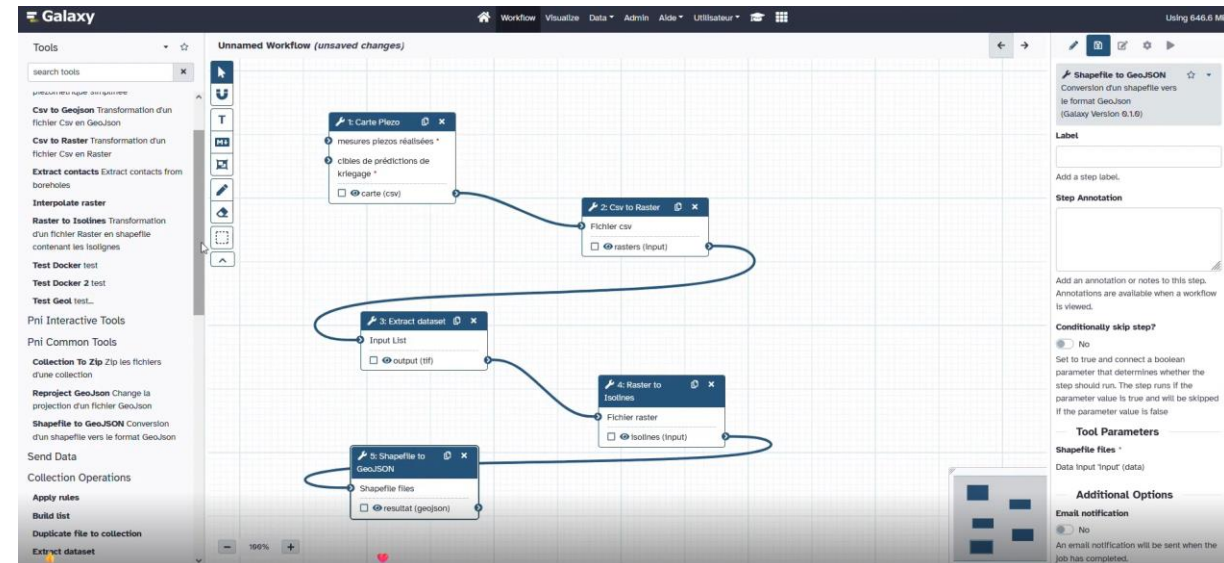
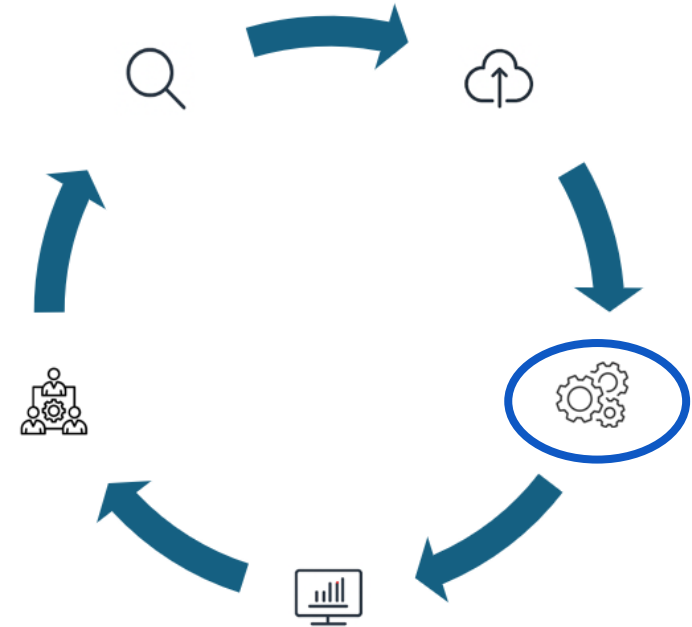
- The platform doesn't just access data: it provides **processing and transformation tools from/to the community**

E.g: user can aggregate daily values into monthly averages, clean missing values, generate indicators, do geospatial processing => **No advanced coding** required

- Data can be **combined with other datasets** (e.g. hydrology + climate + land use)

■ Benefit

- Saves time — you don't need to manually prepare data elsewhere
- Enable sharing a scientific workflow with the community and redo it (scientific reproducibility)



Ex : groundwater level isolines

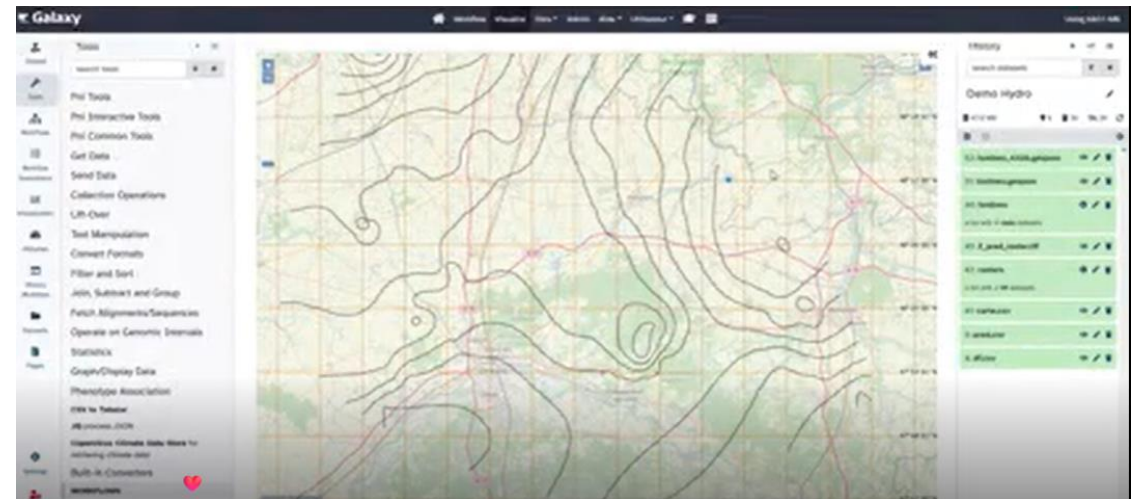
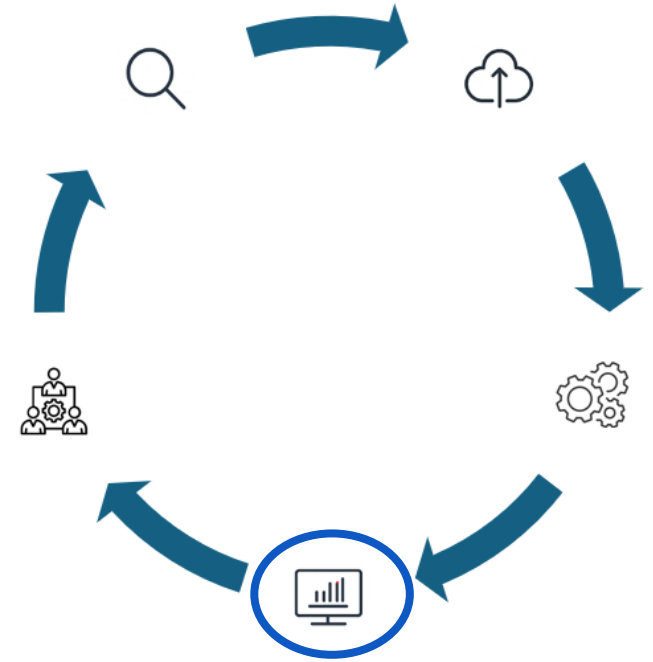
Analyse

■ How?

- You run a scientific analysis or model directly within the platform environment.
- Outputs: graphs, maps, or summary statistics.
- Results can be **saved, shared, and cited**.
- Data generated by a workflow/process is associated with its metadata (lineage, provenance)

■ *Benefit:*

- End-to-end workflow — from data discovery to scientific insights, all in one ecosystem



Workflow/process results can be visualised

Share

■ How?

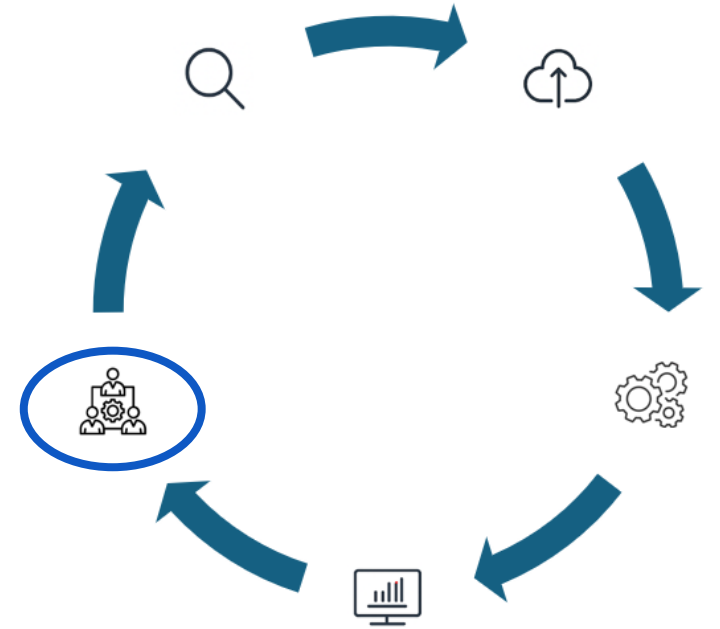
- The user can share their processed dataset back into the platform catalogue

History, analysis results and workflows can be shared **with colleagues in a project and, when deemed mature enough, with the broader community through Water4all catalogue**

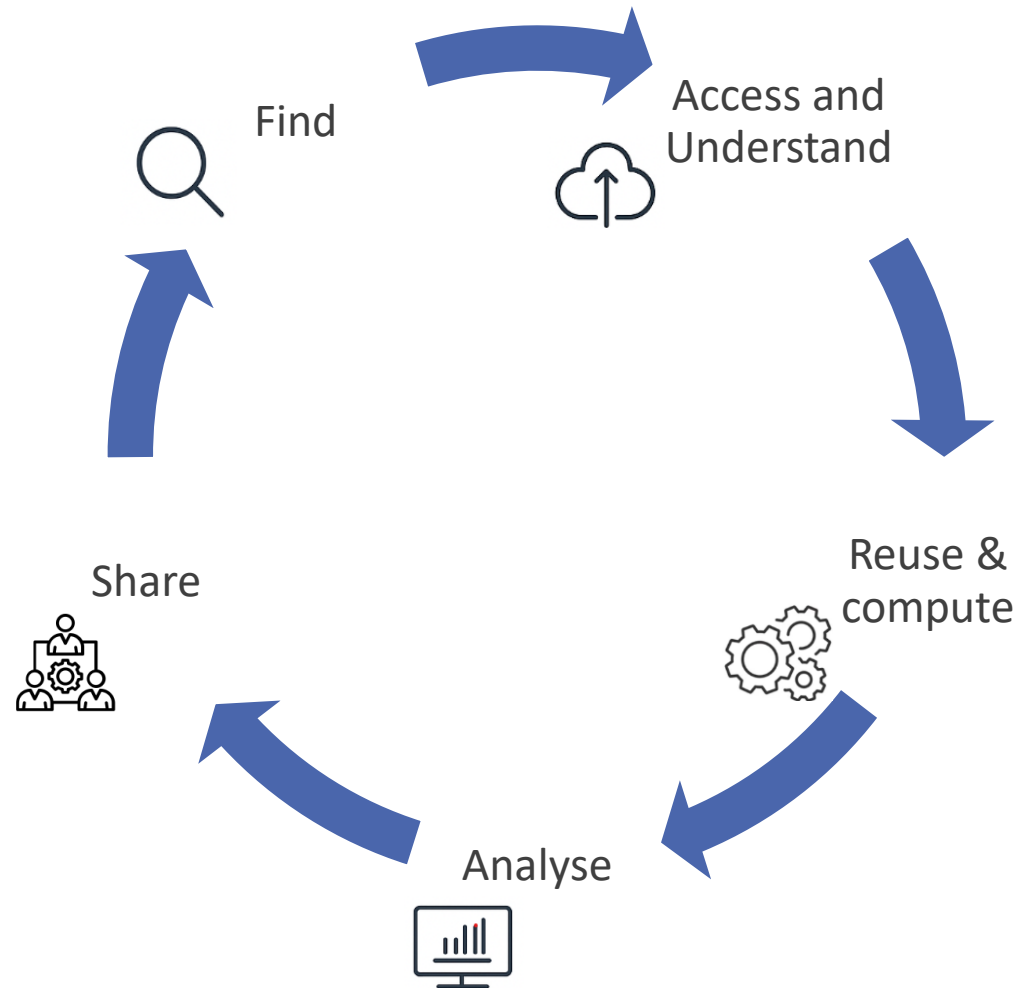
- No lock-in: data is compatible with other tools and platforms using FAIR standards

■ *Benefit*

- Creating a **cycle of reuse and enrichment**
- This will strengthen the **community around water data**



Let's ...



... research and public monitoring data/algorithms using the same paradigm shift other scientific communities (bio informatics, biodiversity, oceanography, ...) and some Research Infrastructures are doing

Thank you
> Any question ?



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