

GRDC: Facilitator between data providers and data users

Key Activities and Future Plans

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Copernicus In-Situ Component workshop
Online, EEA, 11-12 September 2024



BfG Federal Institute
of Hydrology



WORLD
METEOROLOGICAL
ORGANIZATION

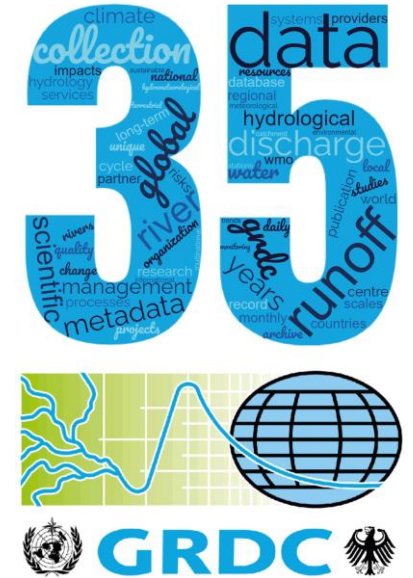


Contents

- GRDC introduction and statistics
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Global Runoff Data Centre

- Established more than 35 years ago in 1988. Operates under the auspices of WMO at the German Federal Institute of Hydrology (BfG)
- Provide long-term support of the international scientific community and research on global and climate change, with a focus on integrated water resources management
- Holds the most substantive collection of quality assured river discharge data on a global scale



Under the auspices of the World Meteorological Organisation (WMO)

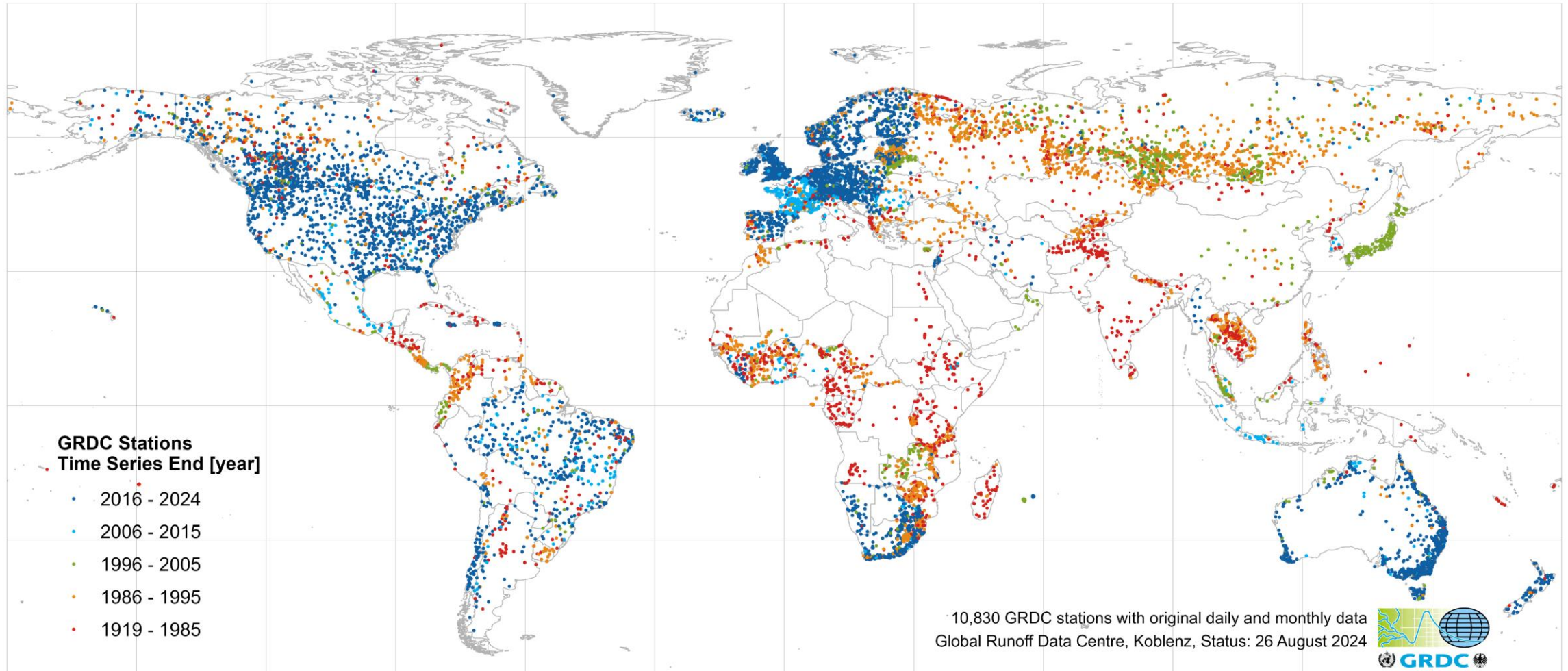


Financed by funds from the Federal Republic of Germany



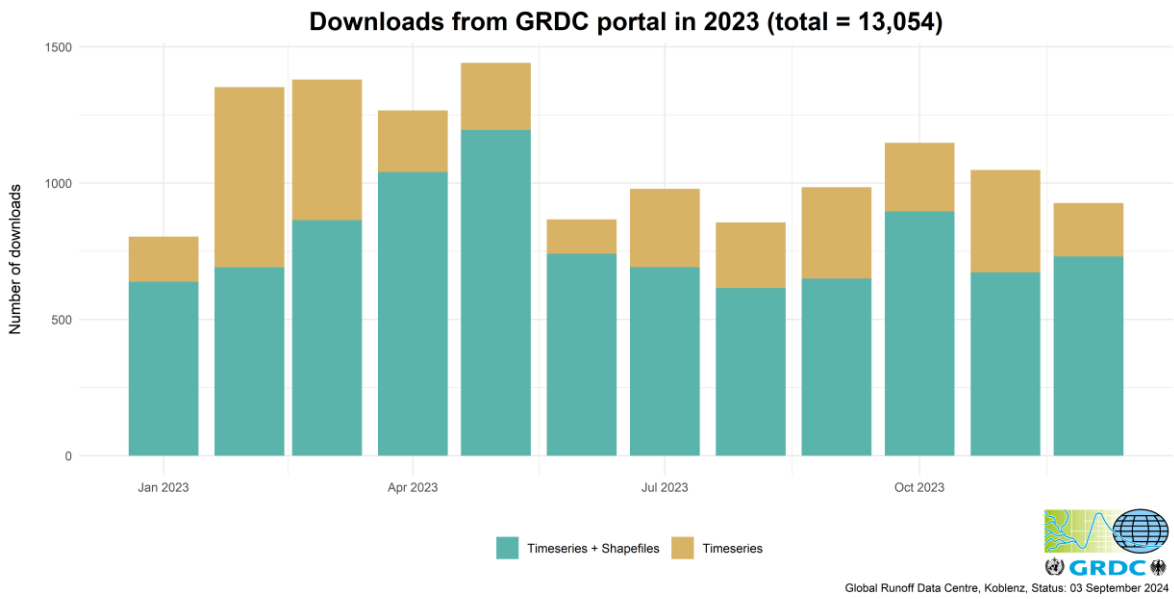
Located at the German Federal Institute of Hydrology (BfG)

Global Runoff Database – Short Update

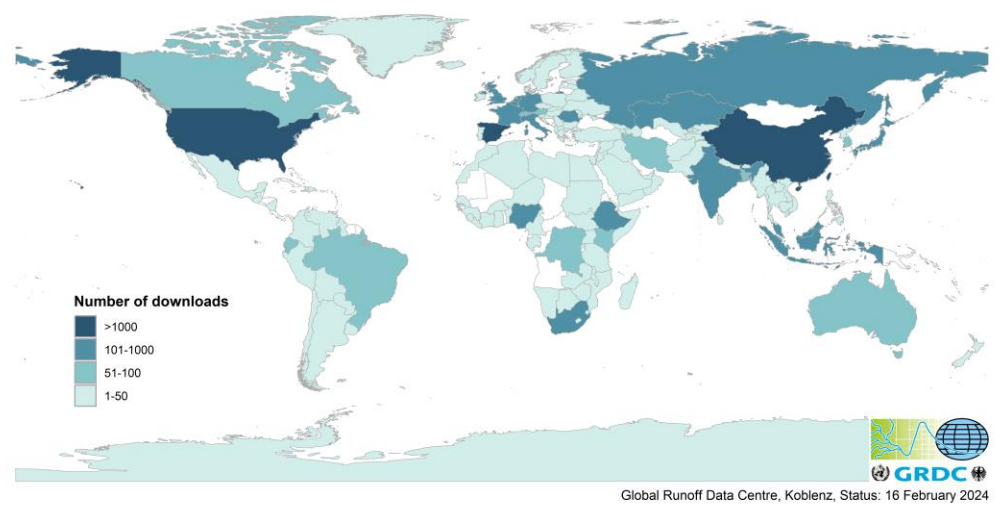


August 2024:
10,830 stations
160 countries

GRDC – Statistics from 2023



Country of users in 2023



Einfügen von Data Portal Slide

GRDC – Data Portal

COLWICK

Country: United King... Latitude: 52.95344 Daily End: 2022
River Name: RIVER TRENT Longitude: -1.07846 Monthly Start: 1965
Area (km²): 7,486 Daily Start: 1958 Monthly End: 1984

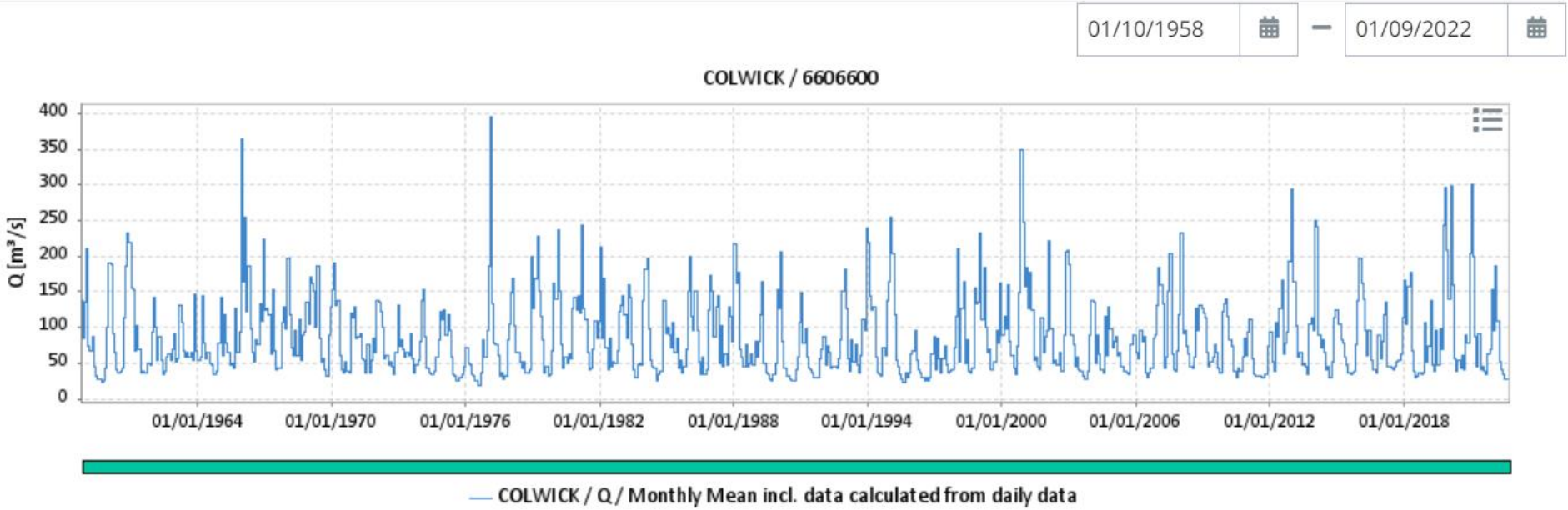
Monthly Missing (%): 37.5



Daily Data

Monthly Data

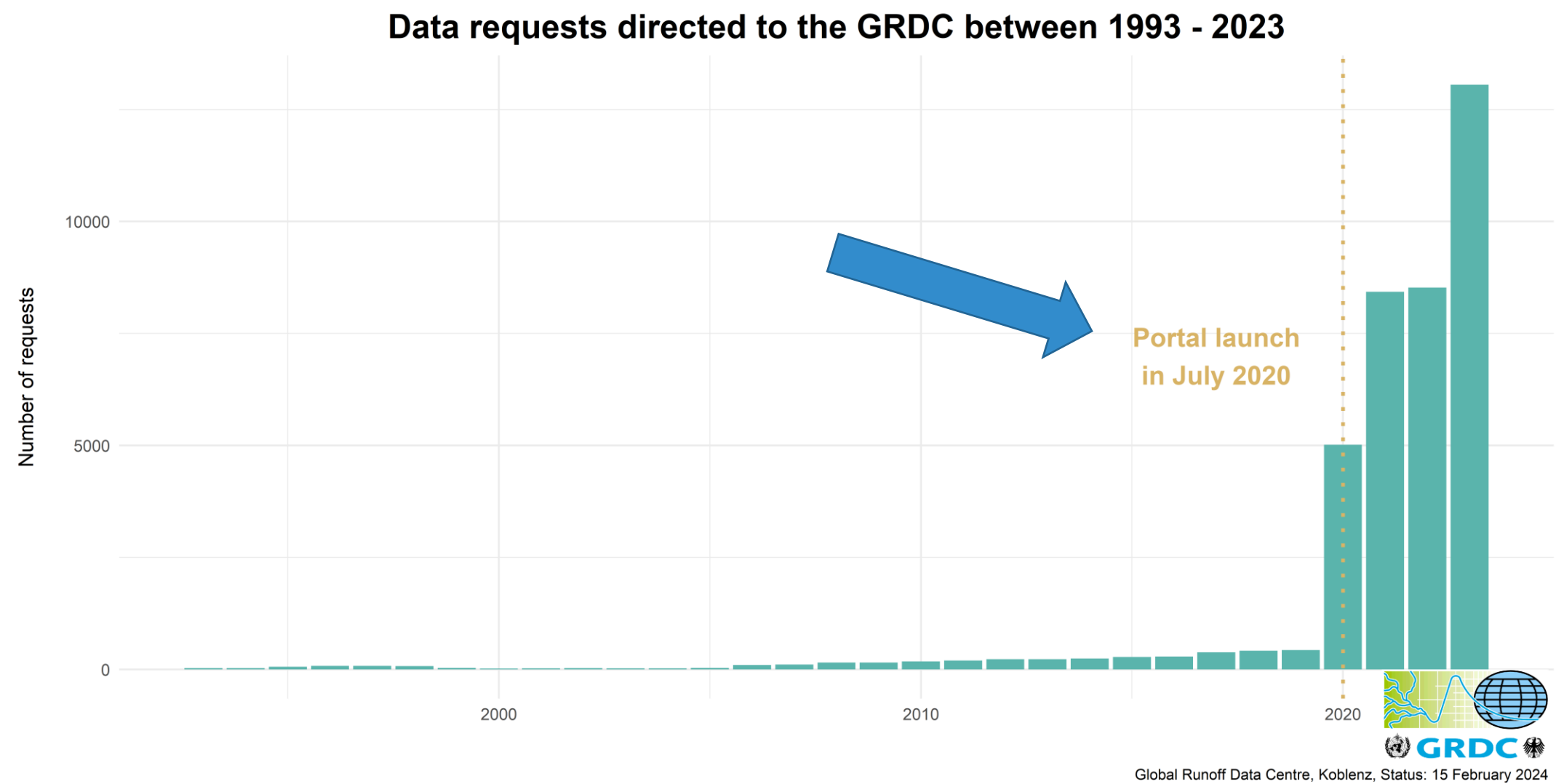
Monthly Data



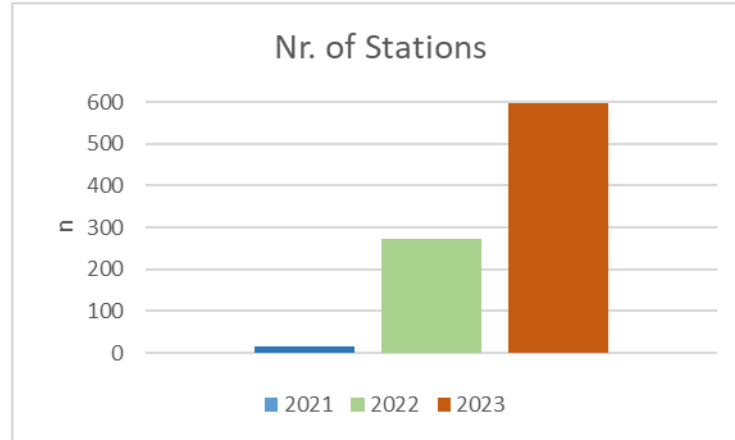
Global Runoff Data Centre | Generated at: 06/09/2024 07:31

<https://portal.grdc.bafg.de/>

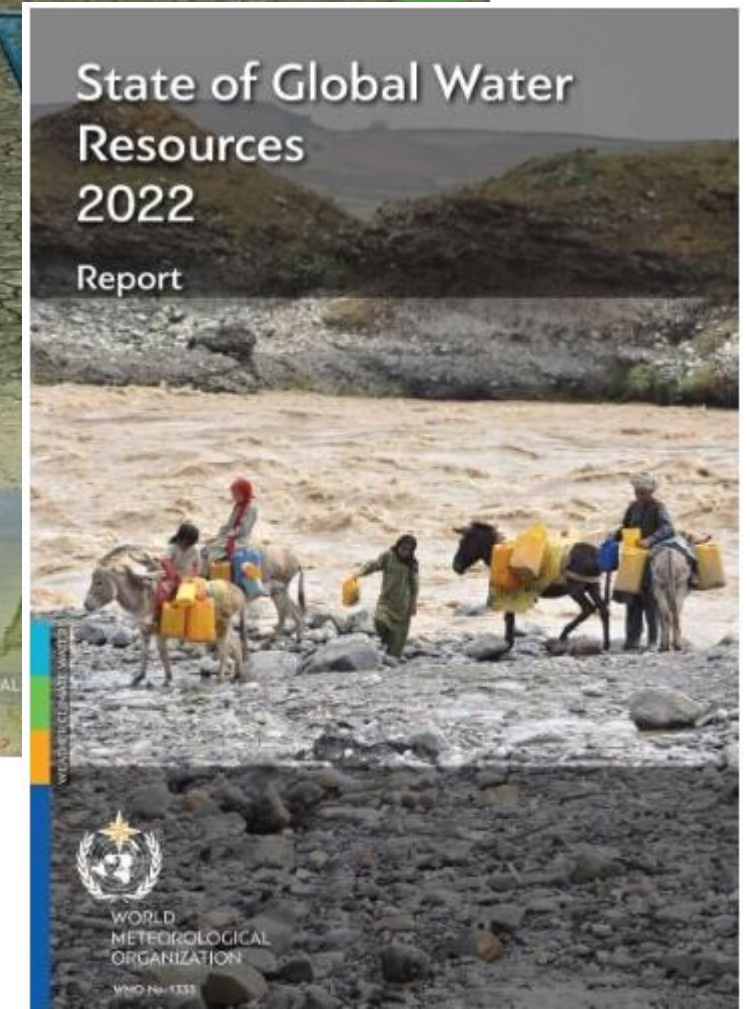
GRDC – Portal Success



GRDC – Contribution to WMO report

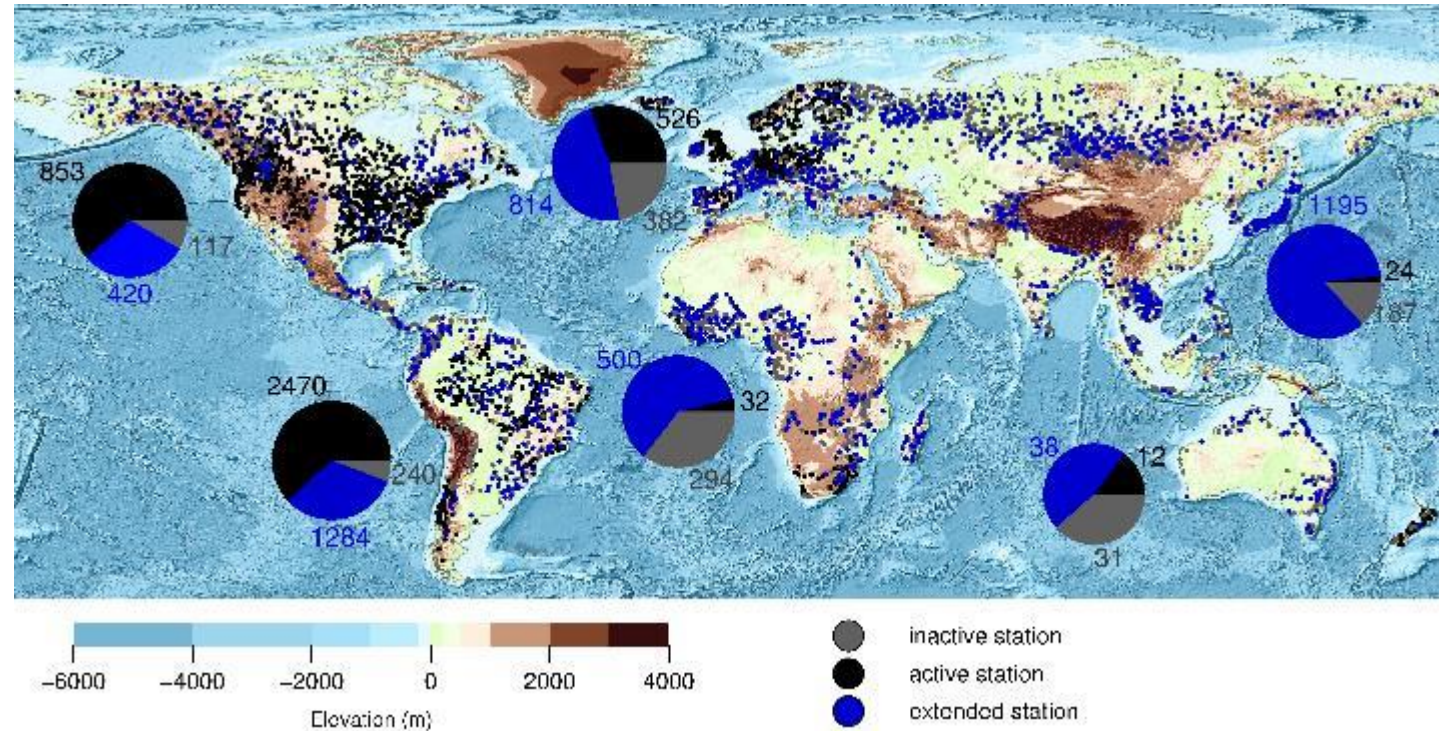


- Increasing number of GRDC stations
- Directly requested at NMHS (manually updated)
- Obtained via API (automatically updated)



GRDC – Contribution to WMO report

- In collaboration with University of Stuttgart using remote sensing techniques 839 stations with monthly data could be contributed to the report
- In total, more than 4,200 GRDC stations could be extended



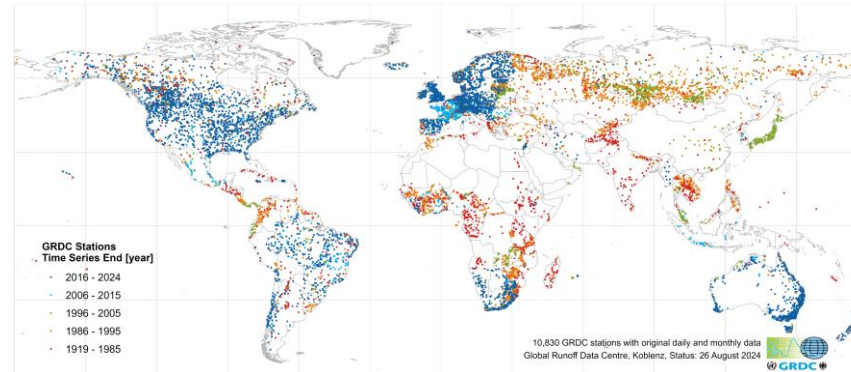
Location of the GRDC stations with a mean discharge larger than $10 \text{ m}^3/\text{s}$. The GRDC stations that are active in 2015 are presented in black, the inactive stations are in grey. The stations with discharge records extended through remote sensing data are shown in blue. The pie charts' area illustrates the river discharge on a logarithmic scale measured by active (black), inactive (grey) and extended (blue) GRDC gauges by continent. The numbers indicate the accumulated discharge over stations in km^3/month

Datasets of River Discharge

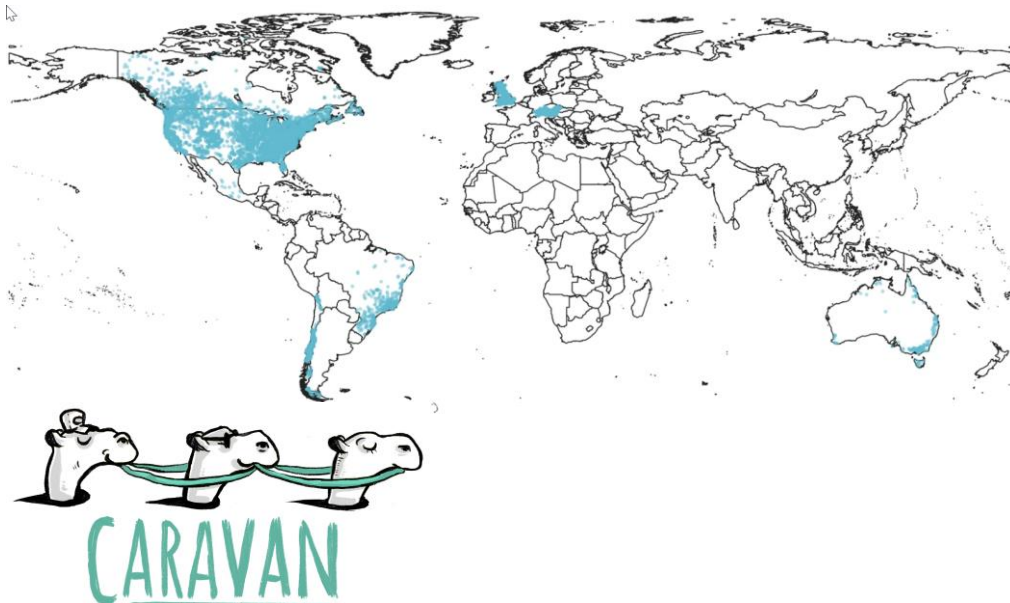
GRDC: 10,830 stations

Similarity:

All 3 datasets operate globally



CARAVAN with GRDC Extension: 6,830 stations



ROBIN: >3,000 stations



Differences

- **GRDC:** river discharge including Climate Sensitive Stations
- **CARAVAN:** streamflow with meteorological forcing and static catchment attributes (geophysical, sociological, climatological)
- **ROBIN:** stations mainly undisturbed by human impact to detect climate-driven changes

Collaboration

Long-term support for CARAVAN and ROBIN planned by GRDC:

Provide a platform for specific catalogues

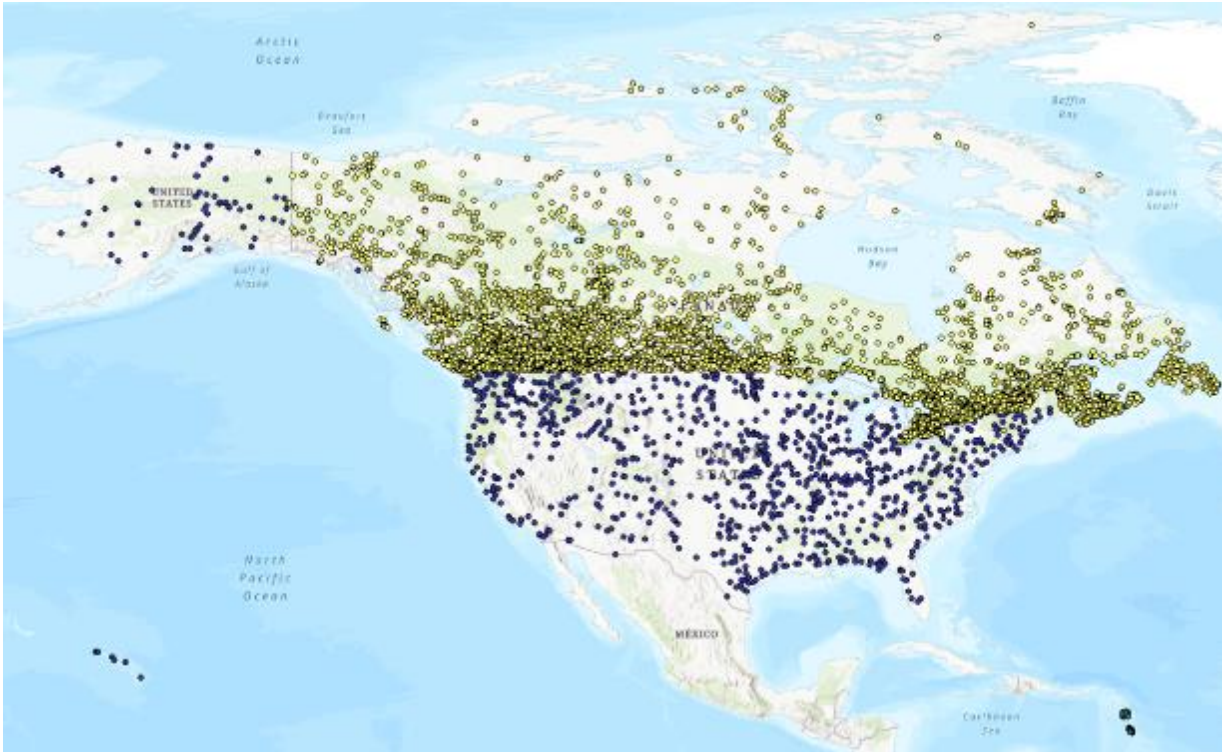
Future Plans

- Increase data collection
- Facilitate data provision
- Close data gaps

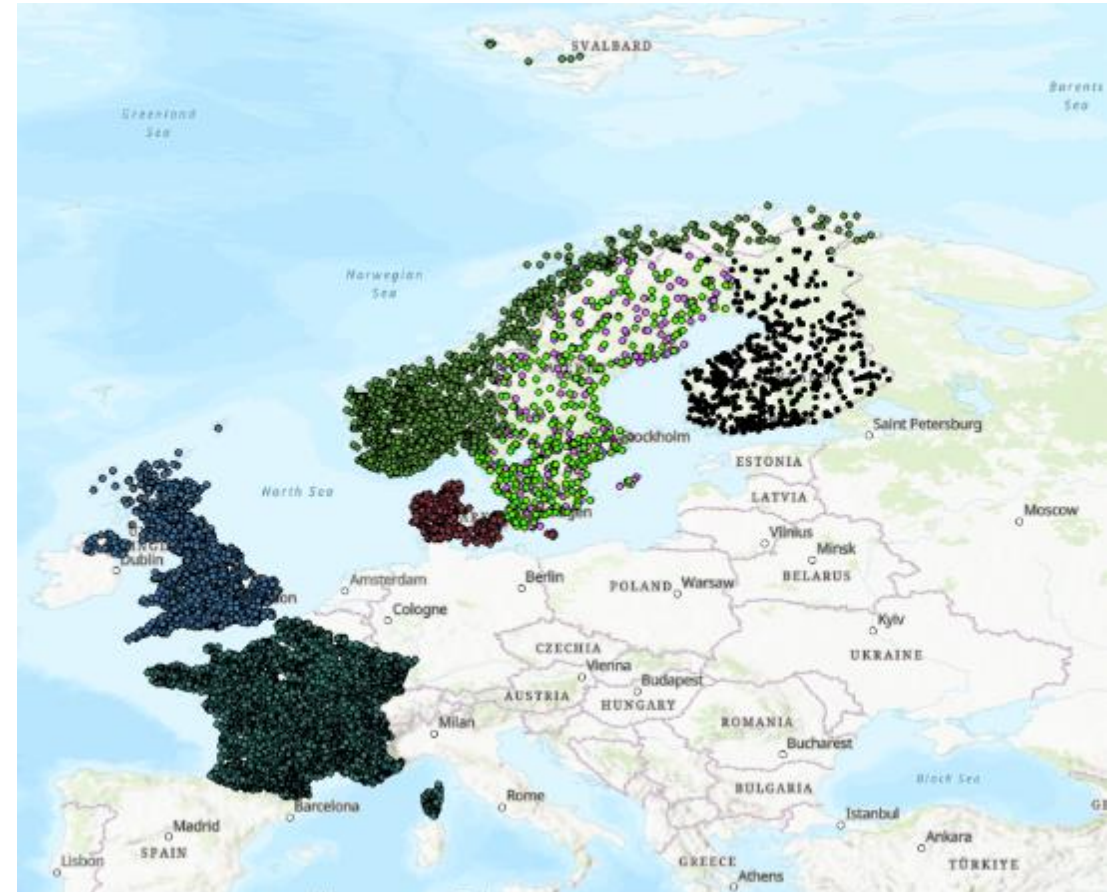


GRDC – Data Collection via API

- Huge amount of data available
- First task: GRDC updates what is already in the database
- More stations to be included



US and Canadian stations provided by API



European stations provided by API

GRDC – Data Provision

Data provider of
quality-assured data:
NMHS of the countries

Data delivery:
manually
→ quality-checked
→ 2-5 year gap

Data delivery:
via API
→ quality flagged
→ NRT available

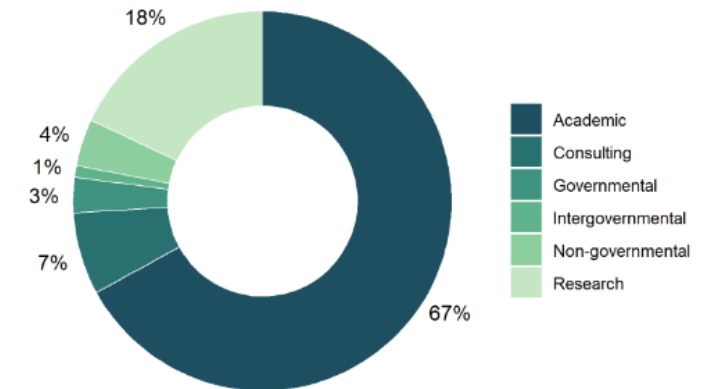


GRDC portal

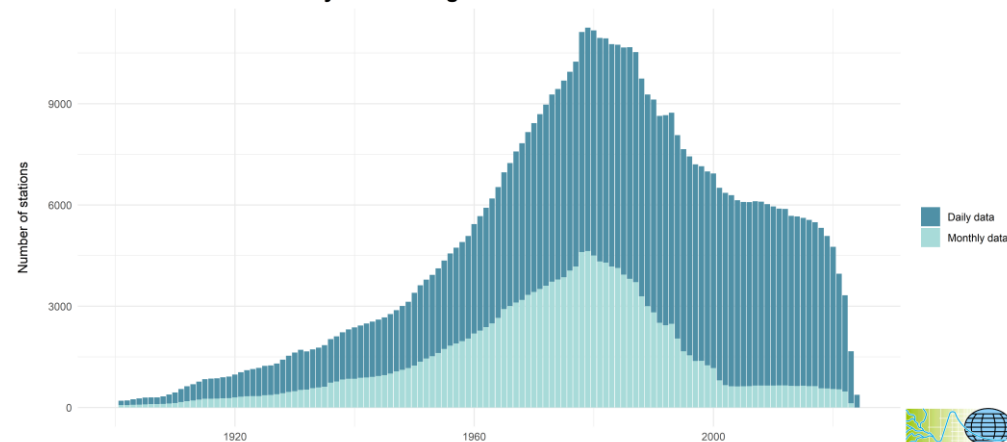
via API

Users

Working sector of users



Availability of discharge data in the GRDC database



Global Runoff Data Centre, Koblenz, Status: 10 September 2024

Global Runoff Database – Gaps

Data gaps:

Spatial coverage is limited

Sharing of timeseries is limited

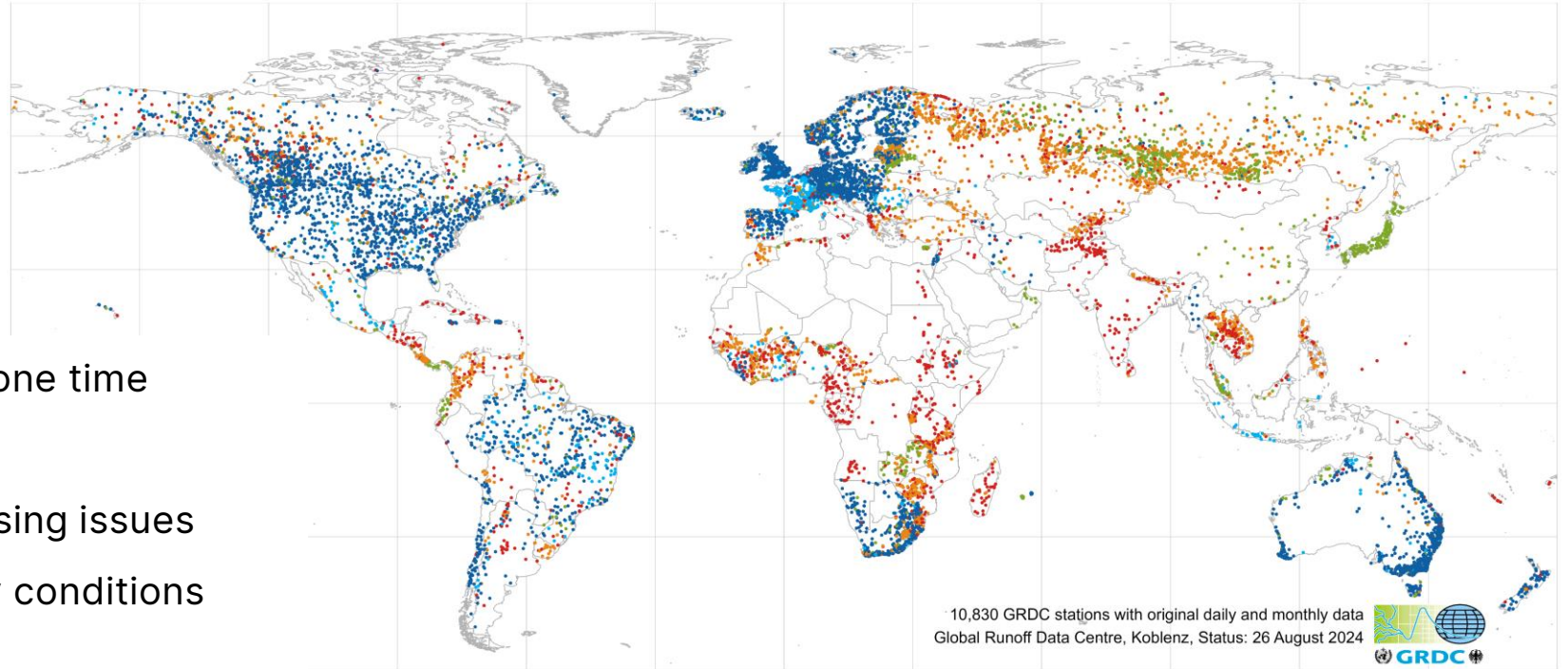
Reasons:

Countries participate with GRDC only one time

Data sharing is monetized

Data sharing is prohibited due to licensing issues

Political decisions: e.g., transboundary conditions



Near-real time data:

Only possible if countries provide access to this service

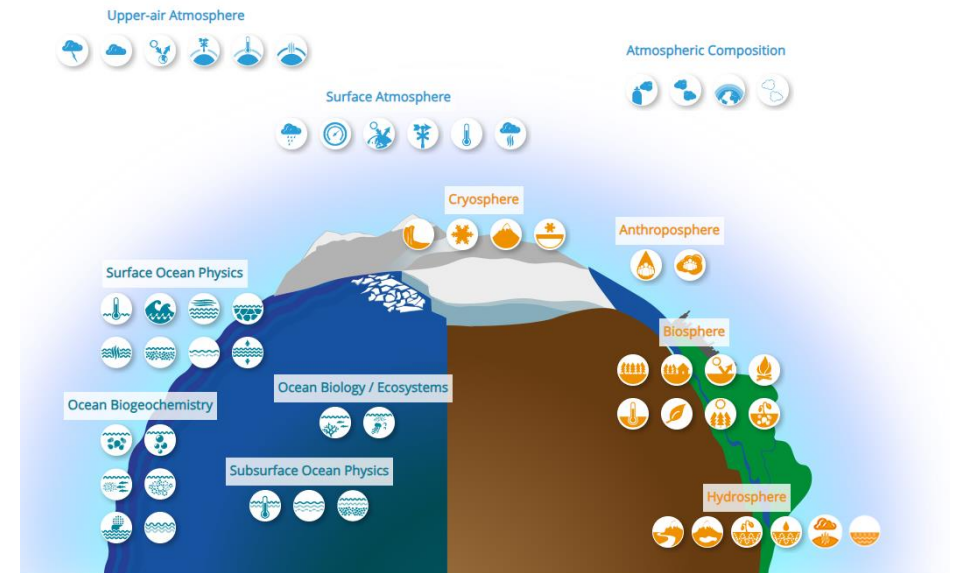
Next Steps

ECV 7.3: River → River Discharge
River Water Level

Aim: Every ECV should be covered by a data centre

GRDC → River discharge and Water Level

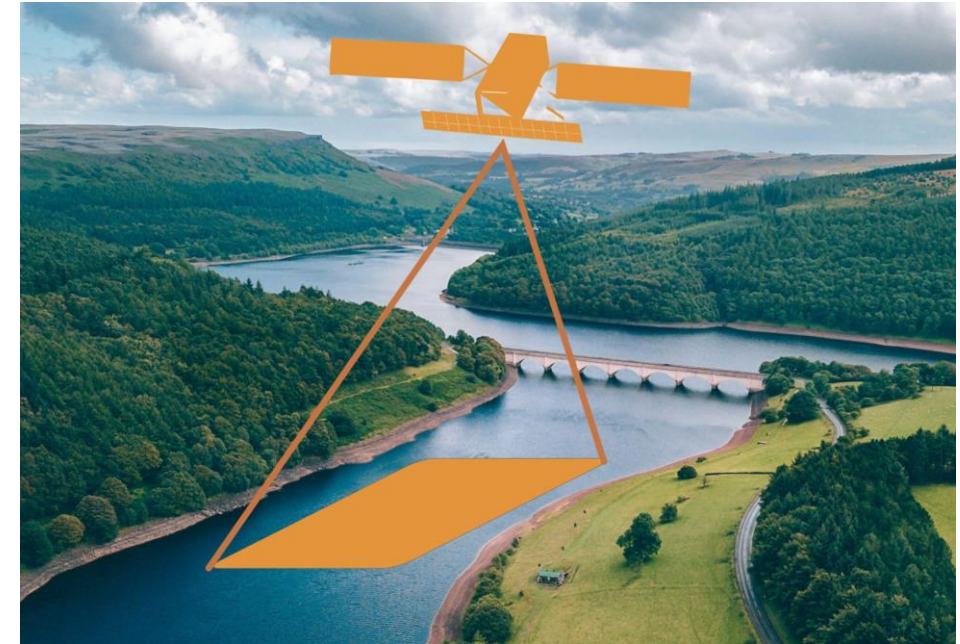
Update and provide open data → overcome licensing issues



Conclusion

- Continue data collection and provision of quality-assured river discharge data
- Include river water level
- Collaborate with research projects:
 - EO community
 - Modelling community
 - GEWEX RivEx
 - etc.

Suggestions are welcome



<https://business.esa.int/>

Thank you for your attention

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