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# Copernicus In Situ and hydrology

**Water-ForCE workshop**

17th May 2021

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# Copernicus In Situ: overview

*“The Copernicus In Situ Component maps the landscape of in situ data availability, identifies data access gaps or bottlenecks, supports the provision of cross-cutting data and manages partnerships with data providers to improve access and use conditions.”*

<https://insitu.copernicus.eu/>

- EEA lead Copernicus component, consortium led by EUMETNET
- Covering all areas of in situ data, supporting better access
- Hydrology work started September 2018
- Covering all hydro-related areas of Copernicus: river flows, river levels, lake and river water quality, lake levels, soil moisture
- 1<sup>st</sup> phase report, following input by services, published in December 2019

<https://insitu.copernicus.eu/library/reports/Hydrologyinsitodataavailabilityreport1.0.pdf>

- New framework started 2020



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# Hydrology Data Project: overview

Many databases of historical data maintained under WMO umbrella –  
GTN-H: Global Terrestrial Network – Hydrology

Issues with use of data from some of these, including:

- Data not kept up to date
- Licensing issues
- Measurement approaches not suitable for satellite product cal/val
- Generally limited consideration of use of this data for satellite product development

For many products, additional data sources identified, some of which are real-time.

Often this has involved bespoke data collation by a single service, not shared across services.



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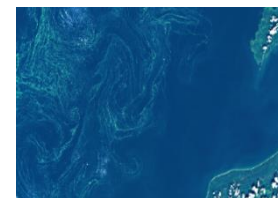


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# Copernicus In Situ Component – Hydrology Data Project

Reporting on:

1. Products and requirements
2. Review in situ data in use, and limitations
3. Consider other sources of data
4. Assess gaps and potential solutions
5. Propose some activities to address these





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## River flows : requirements

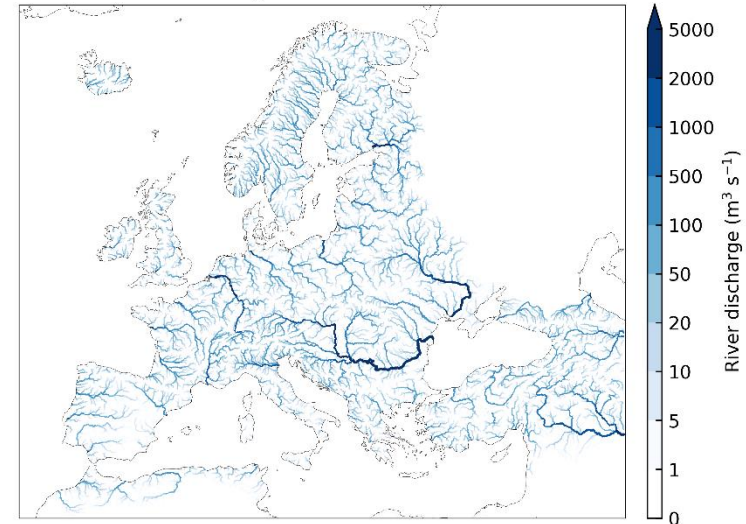
- Copernicus Emergency Management Service is principal user through European Flood Awareness System (EFAS) and more recently GloFAS
- Historic data for model calibration / validation
- Real-time data for validation

Also used for ocean inputs  
(volumes and nutrient dilution, etc.)

New coastal products upcoming

Copernicus evolution projects (Lambda)

Mean river discharge from 1991 to 2019 for EFAS 4.0

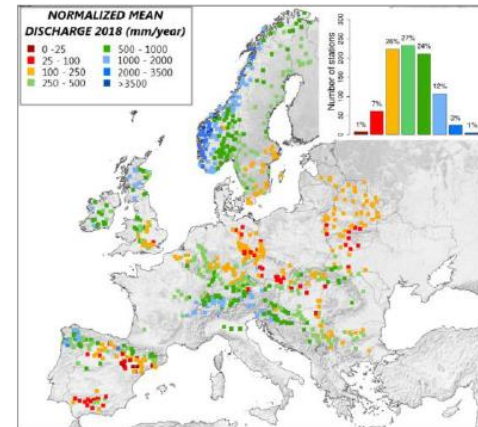
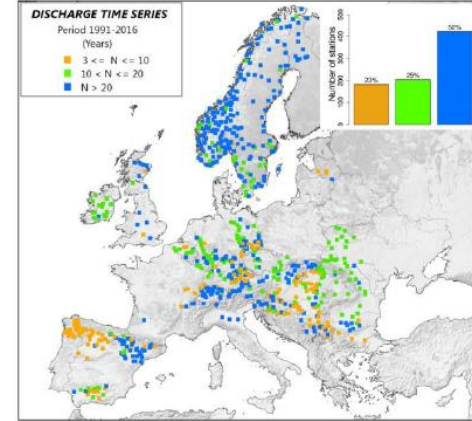




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# River flows : conclusions & activities

- EFAS runs a Hydrological Data Collection Centre (HDCC)
- HDCC represents excellent source of real-time river levels and flows for Europe
- Other projects and services are also collating data to lesser extent
- HDCC data would be of use to CMEMS, CGLS, LAMBDA project
- New licence agreement in place
- CEMS (JRC) happy to share data, but practicalities to work out
- Globally, data access is limited to daily data from WMO GRDC database – not focussed on requirements of EO product development
- Copernicus In Situ has reviewed data available from National Hydrological Services
- Will work with WMO WHOS to promote the need for better national services to support satellite product development





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## River / lake levels: conclusions & activities

- Copernicus Global Land Service product for inland water level requires water levels for validation, ideally real time
- Need for levels near to “Virtual stations” where altimetry track meets rivers  $> \sim 50\text{m}$  wide (flows also useful)
- Data collation is largely a manual activity
- Could make good use of HDCC data for large European rivers
- Our review of global data shows some data (e.g. US, Australia, Argentina) is available online in real time
- Proposed ESA altimetry in situ project (S3TART)



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# Hydrology Data Project: activities

## Ongoing / future activities:

- Continue to identify requirements (CIS<sup>2</sup> database)
- Work with services, esp CEMS, on data licensing. Potential for open data licence?
- Work with CEMS and other services on data sharing
- Publish review of globally available data
- Work with WMO WHOS to promote Copernicus requirements for hydrological data
- Other areas (lake water quality, soil moisture, etc.)



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Thanks

