

Hydrological Status and Outlook System (HydroSOS)



What is HydroSOS?

HydroSOS is the link between monitoring and decision making



What will HydroSOS provide?



An overview of the current hydrological status

including groundwater, river flow and soil moisture



An appraisal of where the current status is significantly different from 'normal'

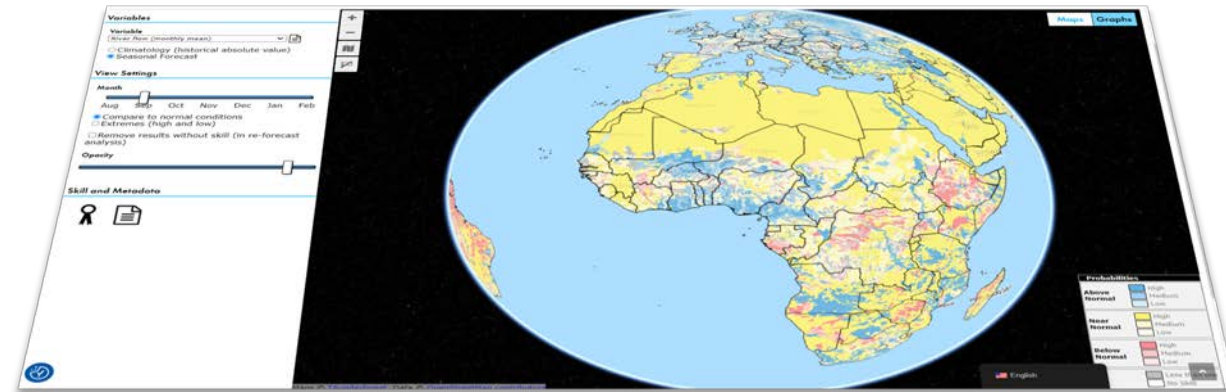
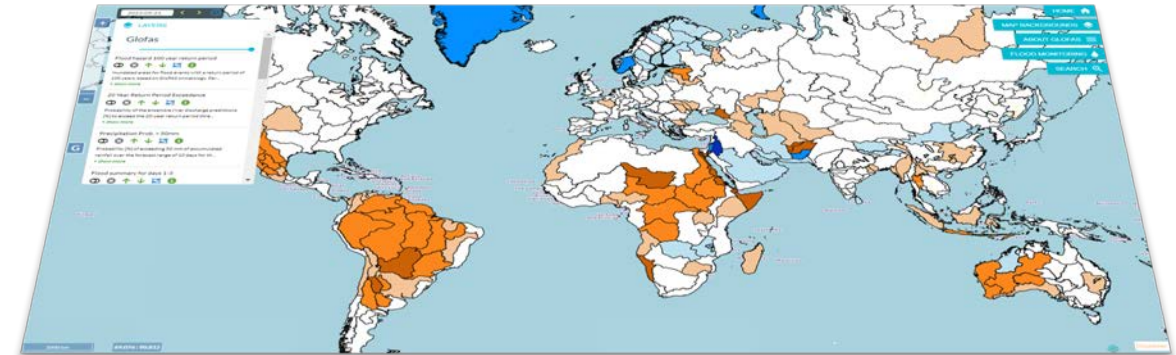
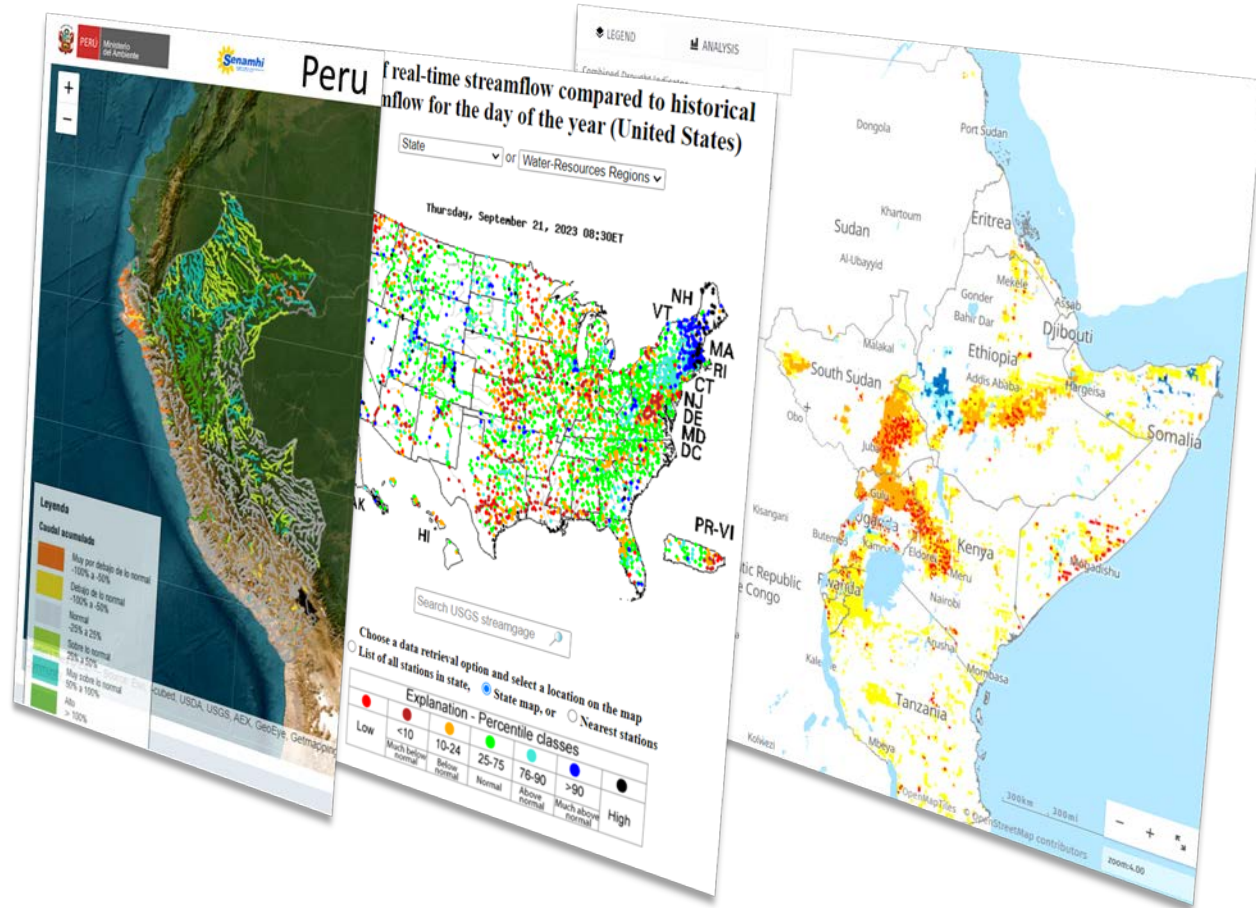
For example indicating drought and flood susceptibility



An assessment of whether this is likely to get better or worse

over coming weeks and months

Doesn't that already exist?

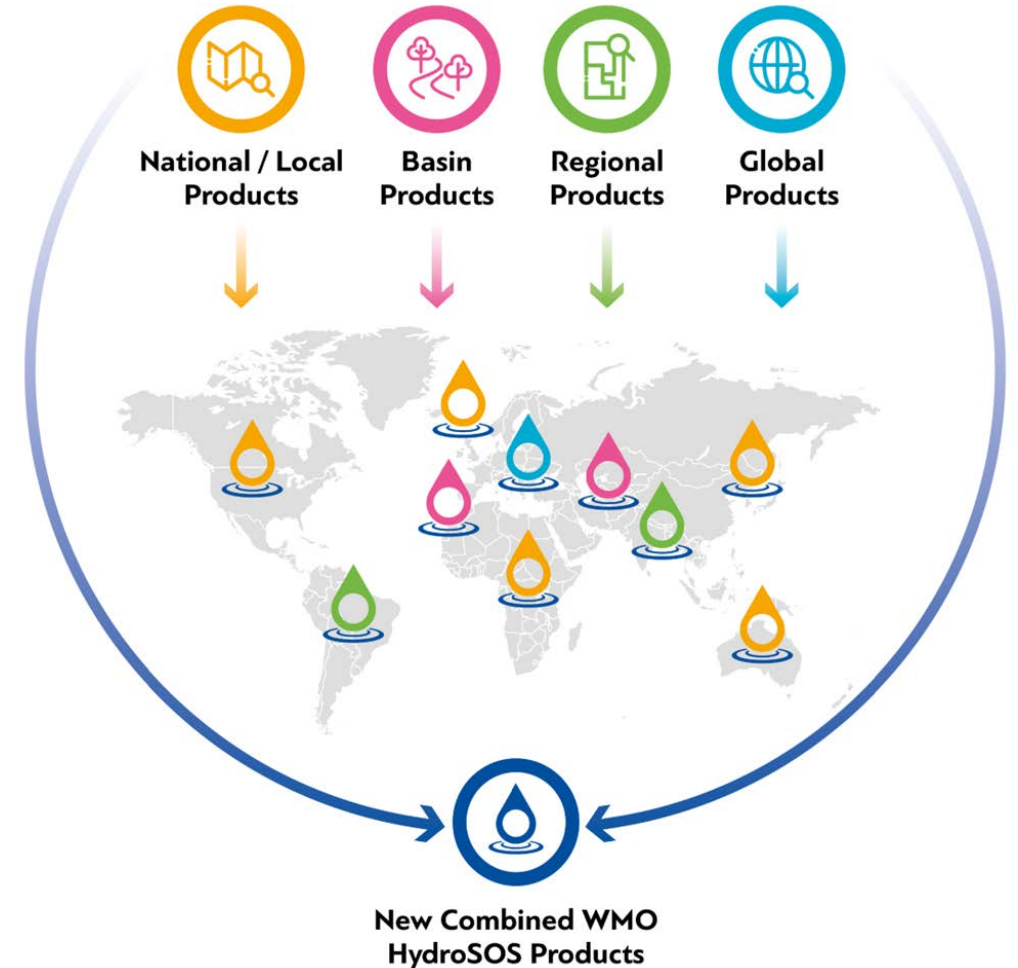


Connecting products across scales

The disconnect between top-down and bottom-up approaches is an impediment to action



HydroSOS will help enhance services at national, basin, regional and global scales and unite them in a coherent framework



HydroSOS Progress



From Pilot to Phase to Implementation

December 2016: Approval of the development of a pilot WMO Global Hydrological Status and Outlook System (HydroSOS) during the 15th Session of the WMO Commission for Hydrology (CHy).

June 2019: the 18th World Meteorological Congress recognized the HydroSOS initiative as a fundamental component of the WMO Strategic Plan Resolution 25 (Cg-18). HydroSOS supports the eight Long-Term Ambitions for an operational hydrological community (Resolution 24 (Cg-18)).

2020-2021: WMO Regional Associations task their Hydrological Bodies to "develop a regional implementation plan for HydroSOS".

October 2021: the Extraordinary World Meteorological Congress confirms end of the HydroSOS pilot phase and requests to move on to implementation.

May 2023: the 19th World Meteorological Congress called for Regional Advisors, Infrastructure Committee, Service Committee and Secretariat to progress, strengthen and support the implementation of HydroSOS (Resolution 9 (Cg-19))



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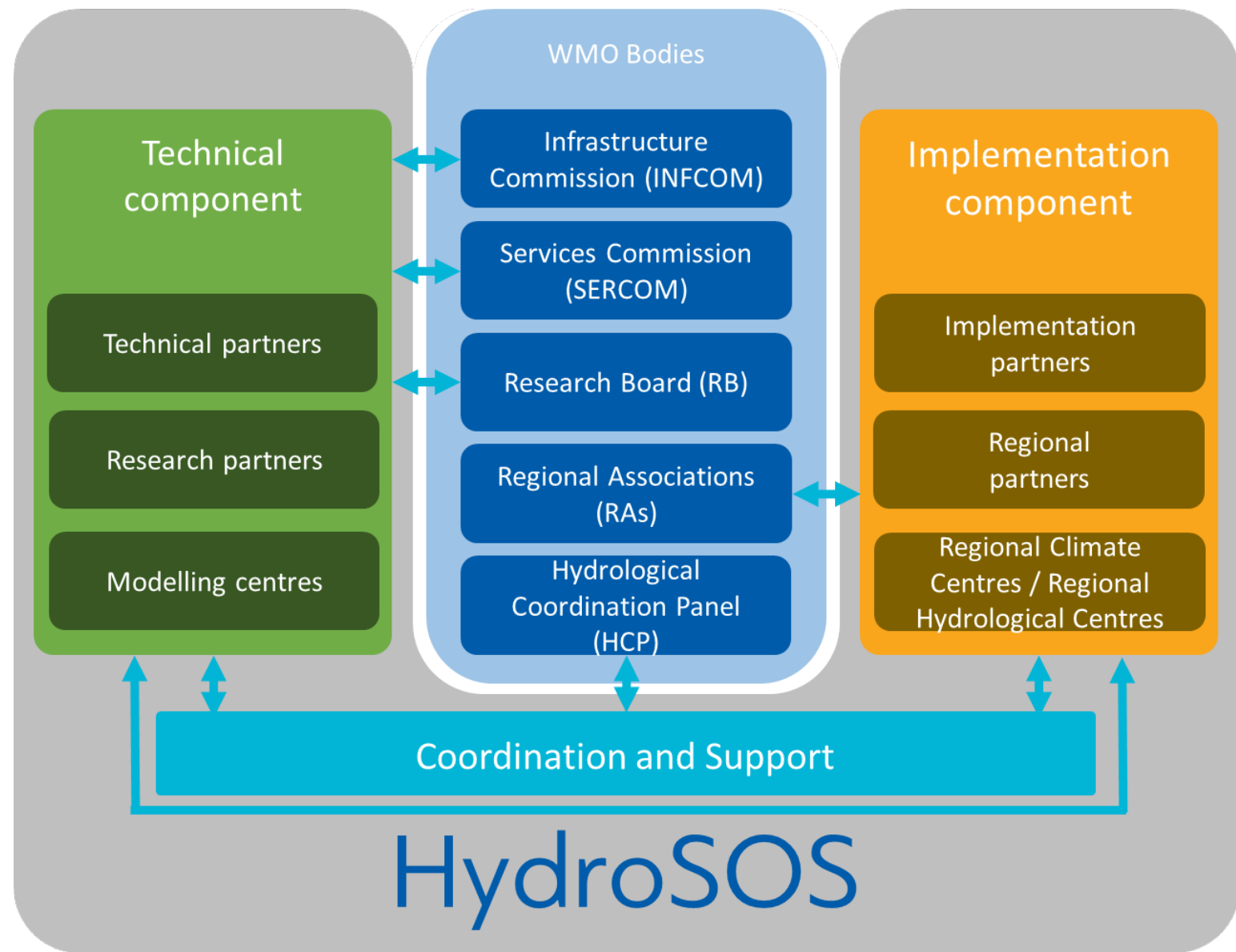
Governance

The Hydrological Coordination Panel (HCP) of WMO coordinates and guides the initiative.

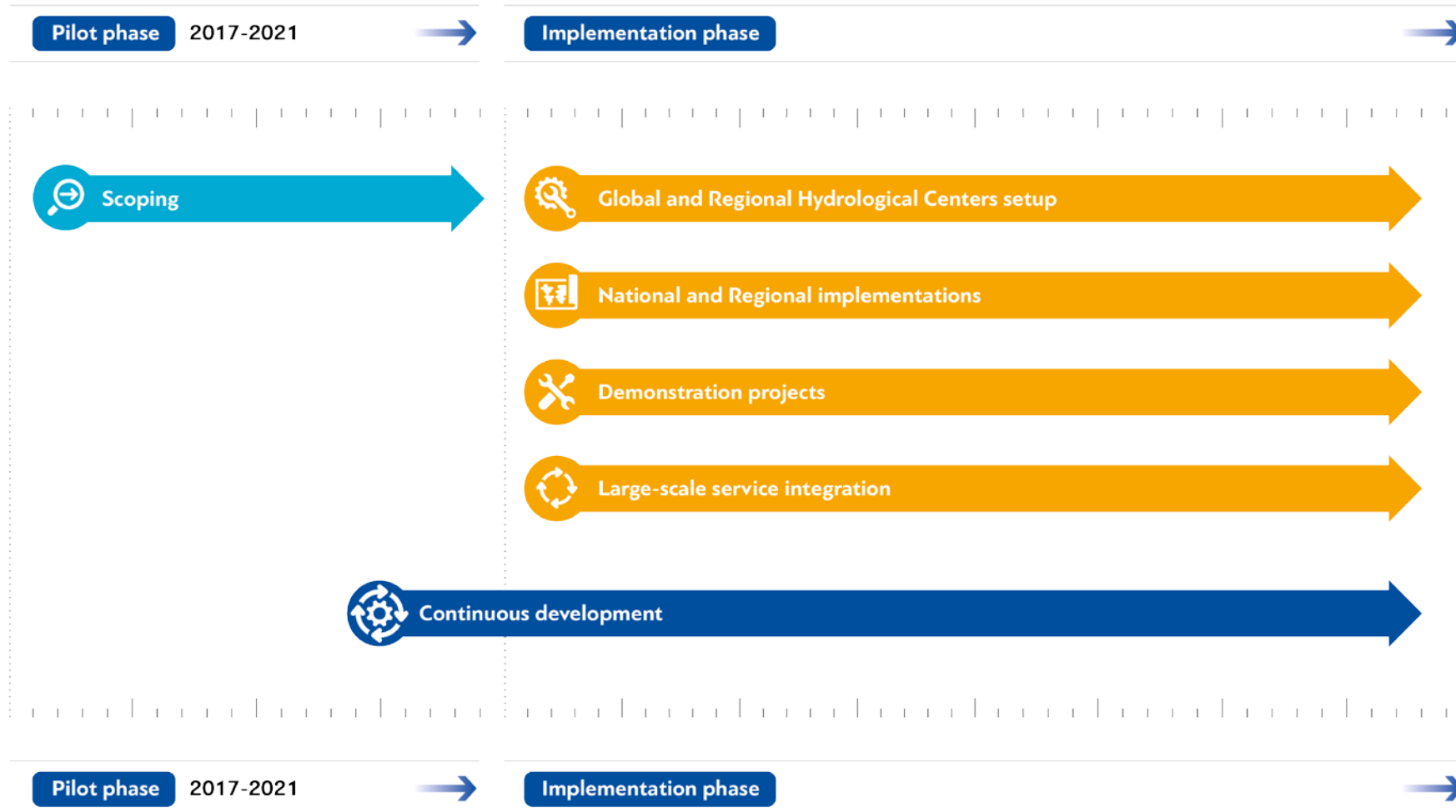
Oversight by the Hydrological Assembly ensures appropriate engagement with WMO's Members and their National Hydrological Services.

Advisory for individual HydroSOS projects will be provided by specific Steering Committees established for each transboundary and basin implementation.

The interaction with WMO is as presented in the adjacent figure



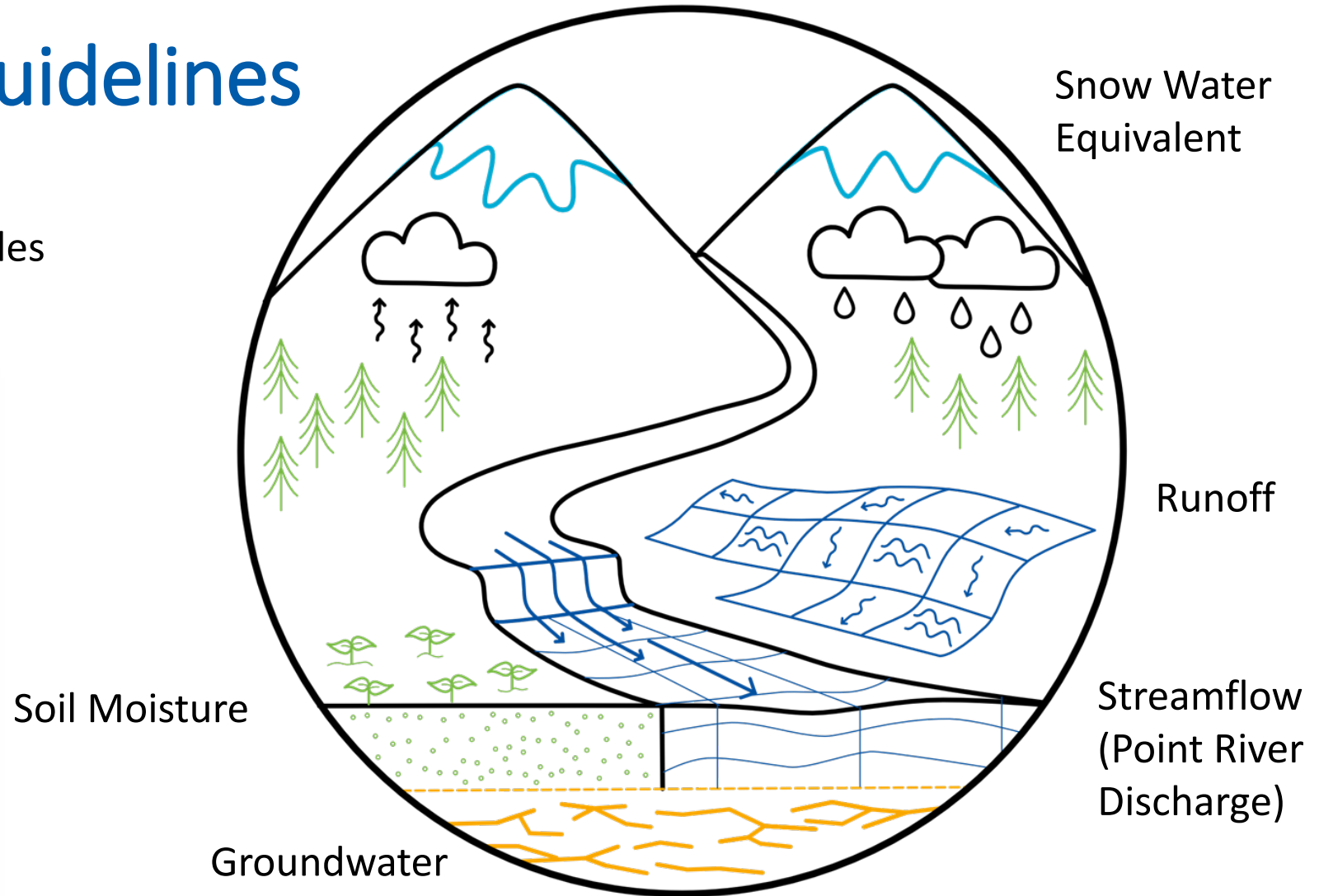
Where we are



HydroSOS Product Guidelines

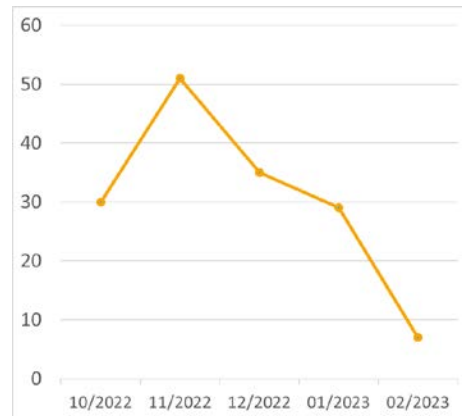
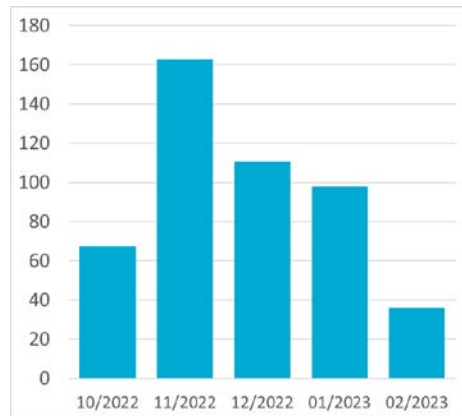
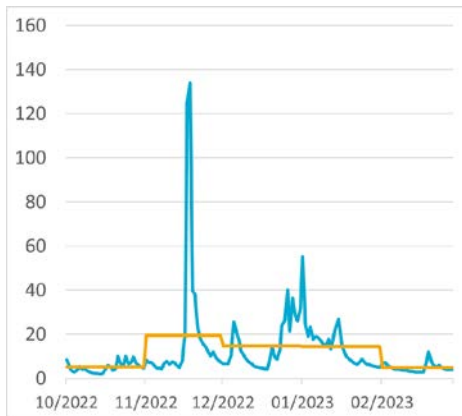
5 Key starting variables

HydroSOS Product Guidelines		
HydroSOS variable: Streamflow (River Discharge)		
Product Name: Streamflow Percentiles		
Version: February 2023		
Specification	Description	Notes
Overview	<ul style="list-style-type: none"> Streamflow (river discharge) Point scale observational or modelled products Global modelled products 	
Metric / Indicator & Calculation Method	<p>Product should be derived using percentiles estimated using a Weibull plotting position (default)</p> <p>Minimum: Category e.g. defined using terciles or quintiles</p> <p>Optimal: Absolute value of streamflow/river discharge</p> <p>Optional: Percentage of average and percentile</p>	<p>Other robust/unbiased methods also acceptable</p> <p>Documentation required</p> <p>An odd number of categories should be utilised to allow for a central 'normal' category</p>



Methods Guidance

Calculating HydroSOS Products



High					
Above Normal					
Normal					
Below Normal					
Low					
	10/22	11/22	12/22	1/23	2/23

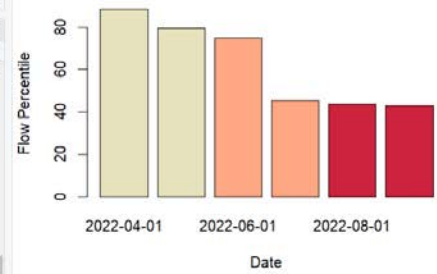
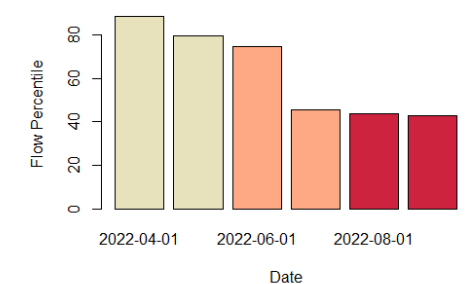
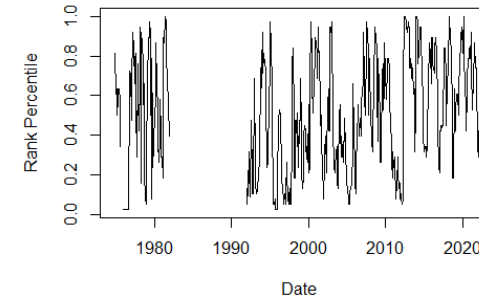
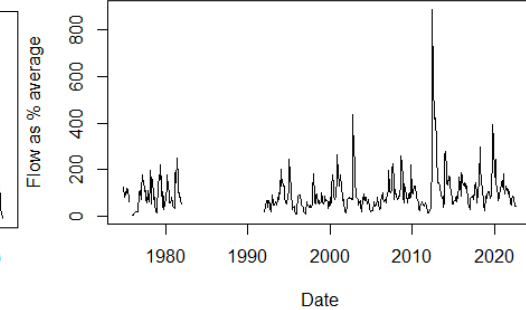
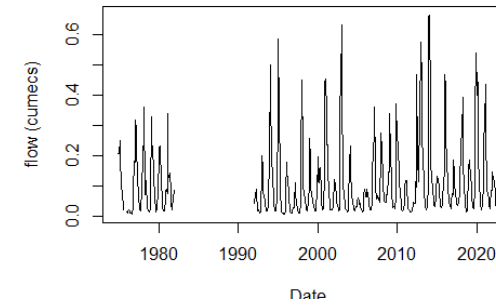
Methods Guidance

Calculating HydroSOS Products – Status R code

```

1 # HYDROSOS LAKE VICTORIA BASIN WORKSHOP
2 # script to calculate hydrological status from flow data
3 # Katie Facer-Childs 15-08-2023
4
5 ### PARTICIPANTS WILL NEED TO EDIT LINES 8, 14, (possibly 24 & 71), 83-84, (142-143)
6
7 # set working directory (you'll need to replace \ with / if you copy the path)
8 setwd("~/WMO-HydroSOS/Implementation Projects/LVB/Aug23_LVB_workshop/")
9
10 ##### PREPARATION #####
11
12 # read in catchment list
13 stations<-read.csv("stations.csv")
14 stationid<-44008
15
16 # read in Flow data
17 flowdata<-read.csv(paste0(stationid, ".csv"))
18
19 #set the column names
20 colnames(flowdata)<-c("date", "flow")
21 # format the date column (this might cause difficulties, please look at the
22 # date as it appears in the column and amend the format accordingly
23 # e.g. 1991-02-30 would be "%Y-%m-%d")
24 flowdata$date<-as.Date(flowdata$date, format="%d/%m/%Y")
25
26 ### check the timeseries is complete (sequential) - we need missing data to be
27 ### set as NA, not missing from the dataset
28
29 # if (length(flowdata$date)!=as.numeric(max(flowdata$date)-min(flowdata$date))){
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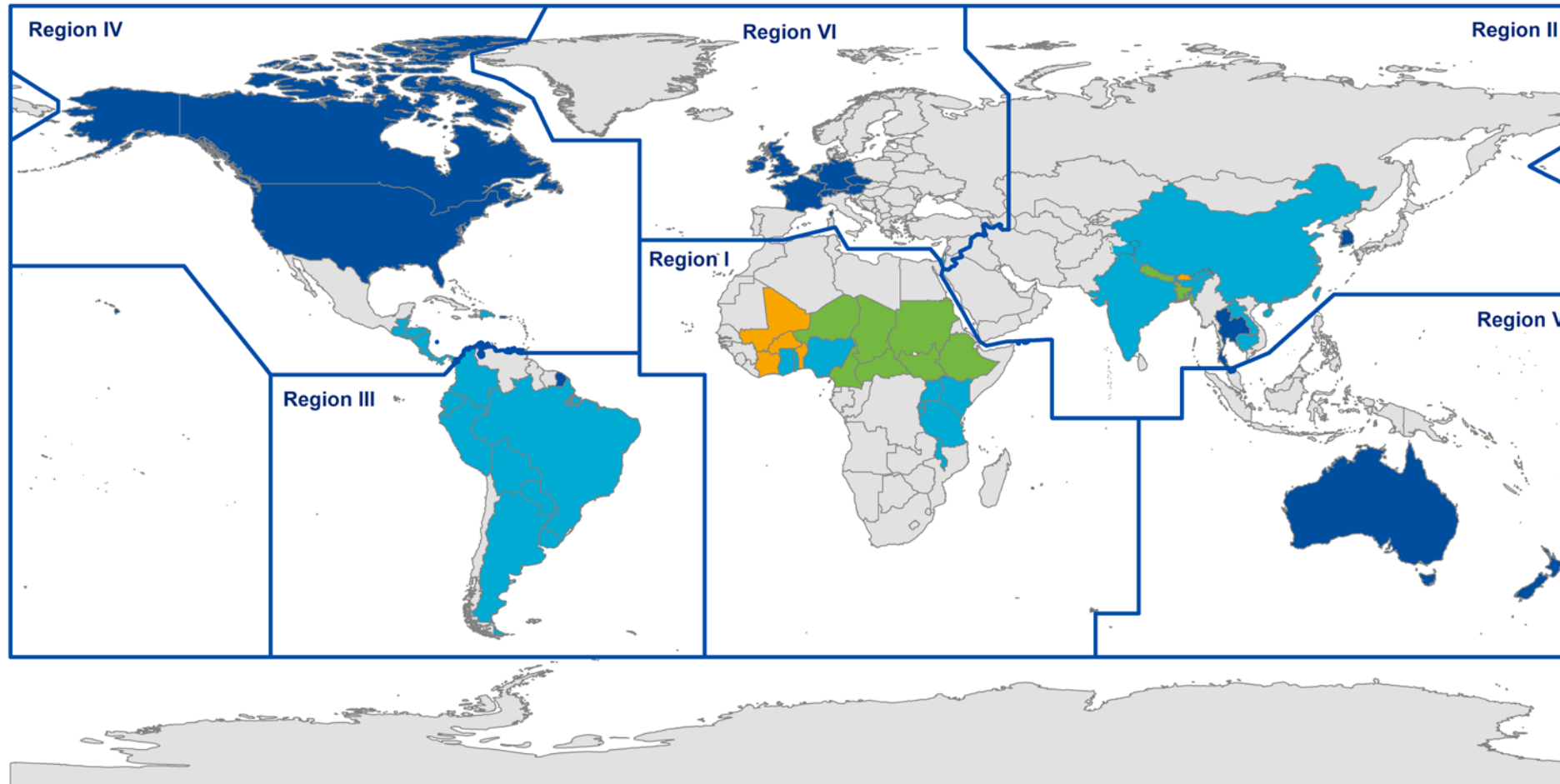


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Implementation Projects



HydroSOS Implementation Status: May 2023



Legend

- WMO Regional Associations
- Coast & Boundaries
- Disputed Boundaries
- No existing, no known or no planned HydroSOS products
- Ongoing development of HydroSOS products
- HydroSOS product development due to start
- HydroSOS products planned
- Existing operational products similar to HydroSOS

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NOTE: Countries are shaded in totality even when certain parts of them have HydroSOS being implemented. The list on future projects and existing products are to the best of our information.

Lake Victoria Basin Workshop

eip.ceh.ac.uk/hydrology/HydroSOS/case-studies/lvb.html

Nairobi - August 2023

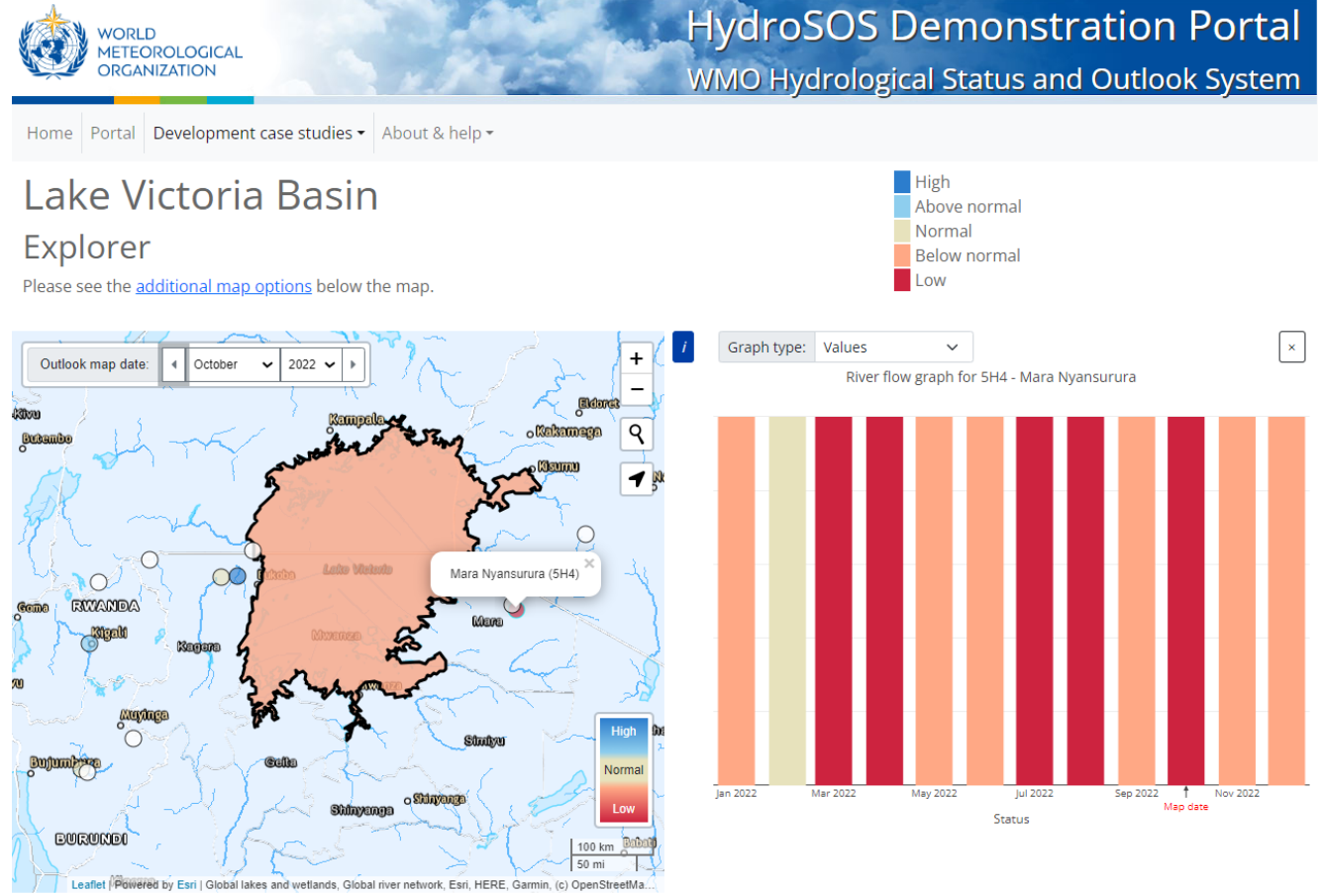
Participants used code developed by the Technical Team to calculate hydrological status



*HydroSOS
Nairobi Workshop*



*HydroSOS
Nairobi Workshop*

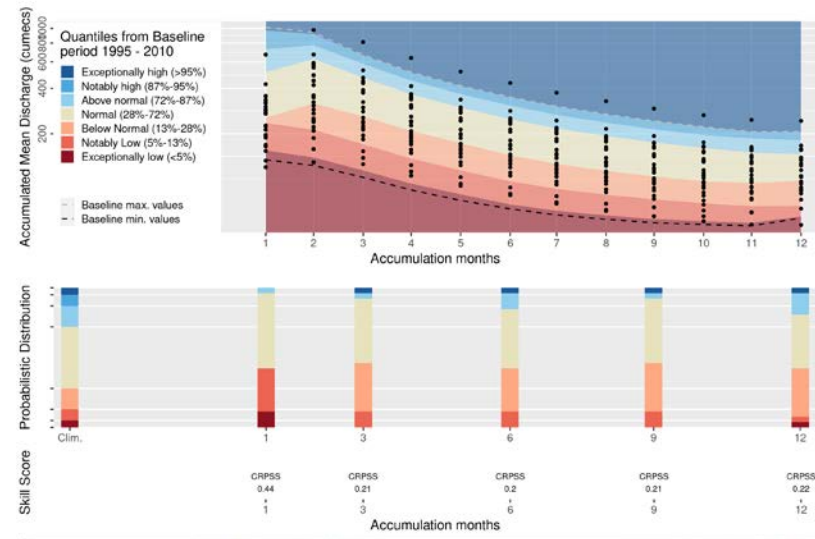
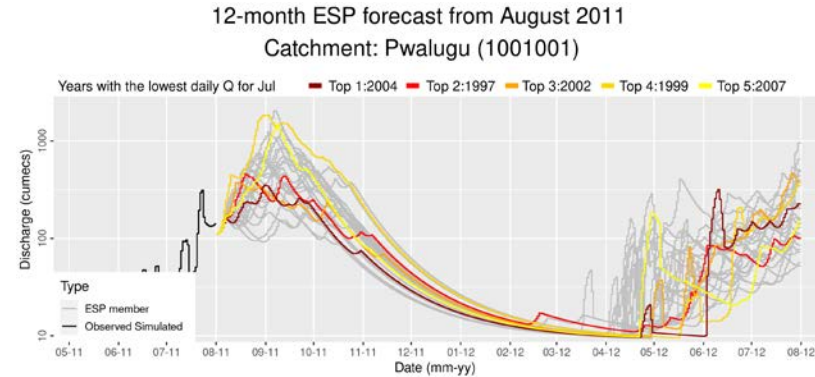
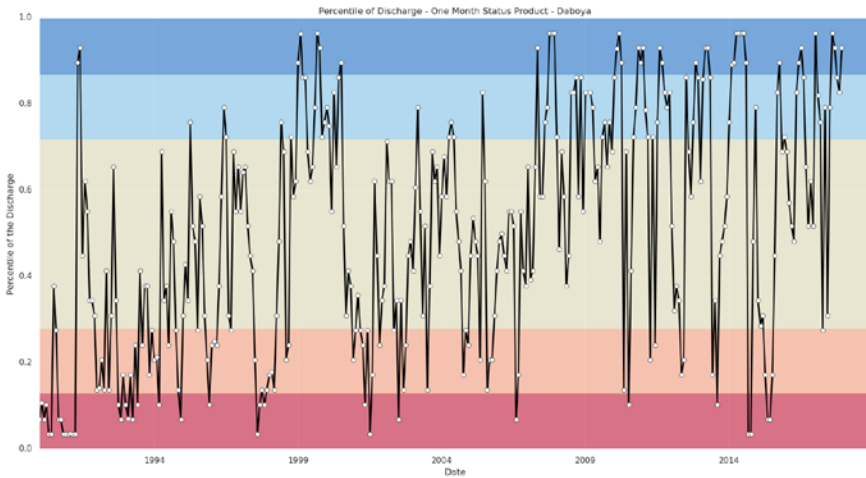


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Ghana Workshop

Wallingford - March 2023

Participants co-developed code to quantify hydrological status, and to run ESP for stations in Ghana, and produce visualisations



HydrosOS Ghana Workshop



HydrosOS Ghana Workshop



UK Centre for Ecology & Hydrology

Global Pilot

eip.ceh.ac.uk/hydrology/HydroSOS/

SMHI Global forecasts aggregated over catchment or administrative boundaries

WORLD METEOROLOGICAL ORGANIZATION

HydroSOS Demonstration Portal

WMO Hydrological Status and Outlook System

Home | Portal | Development case studies | About & help

This portal is set to demonstrate a global portal for May 2020, with outlooks starting in June 2020. Some of our [development case studies](#) explore the use of live products.

Products | Standard view | Detailed view | Global tools

Status map date: May 2020

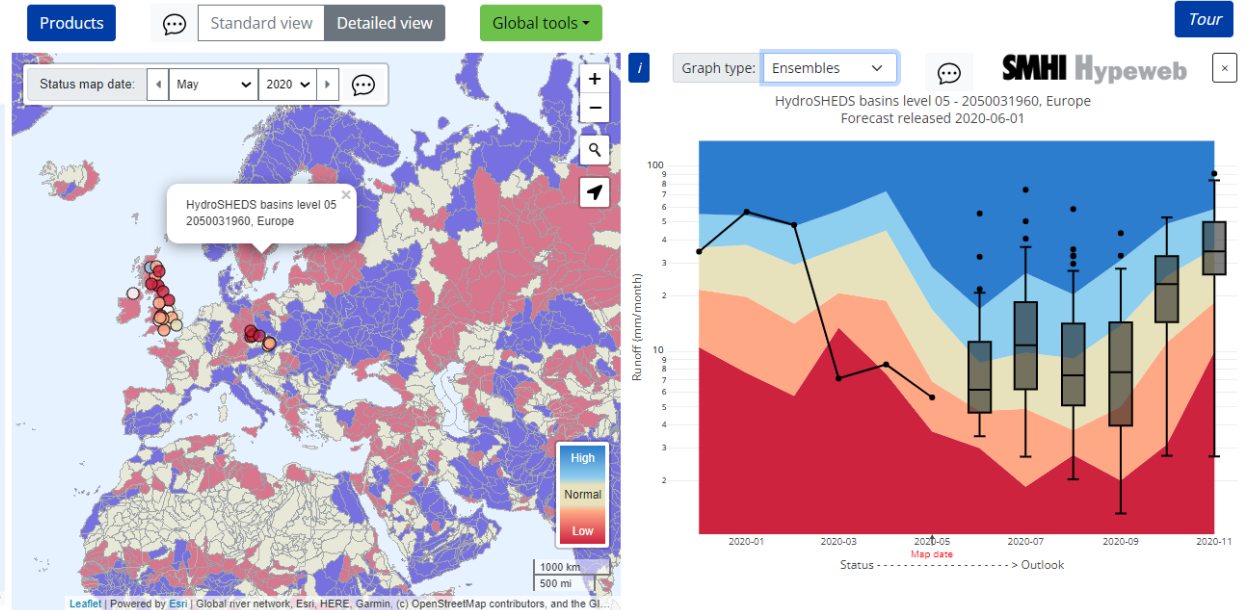
High Normal Low

3000 km 1000 mi

Leaflet | Powered by Esri | Global river network, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

This demonstration portal was developed by: UK Centre for Ecology & Hydrology | NCAR

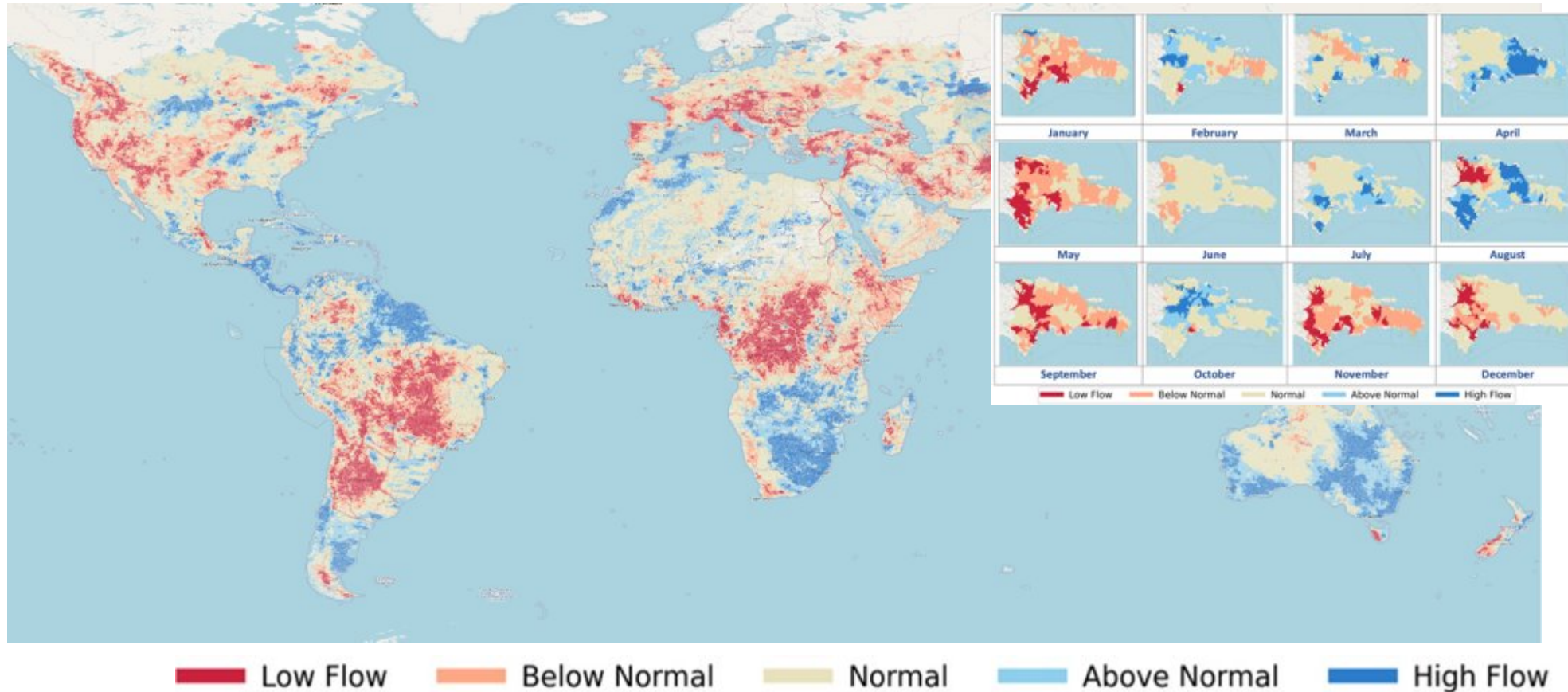
[Privacy notice](#) | [Terms of use](#)



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GEOGloWS

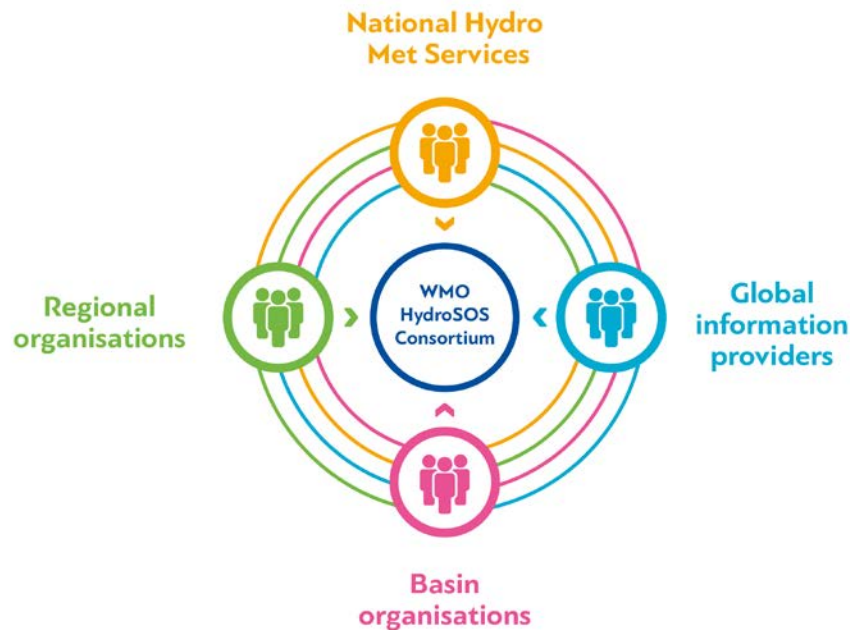
Processing global scale status and outlooks systems into the HydroSOS categorisation system



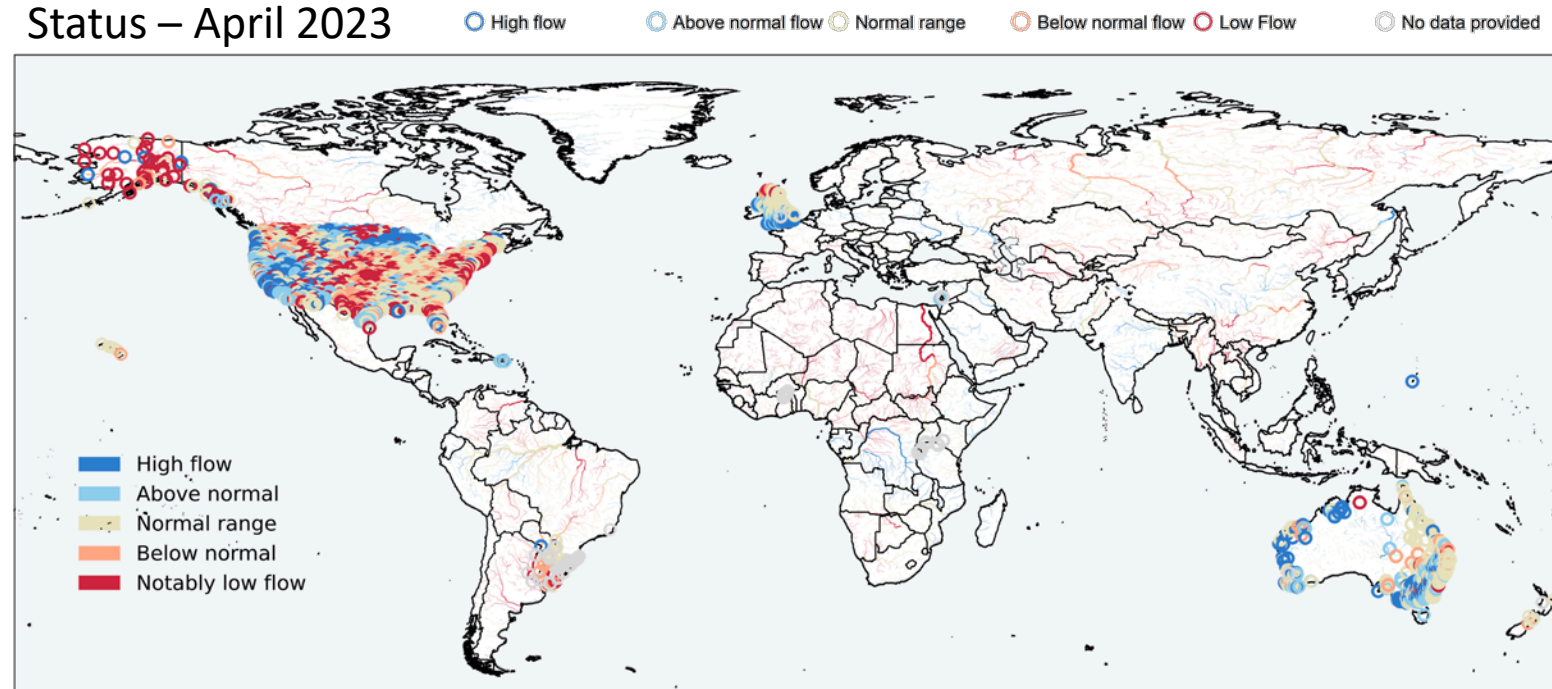
Provides bias corrected outputs at local and regional scales

Next Steps

- Developing more implementation projects worldwide
- Developing outlooks products
- Combining national and regional status products into a global overview, and blending global products
- Infrastructure development – WHOS connectivity



Status – April 2023



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Next Steps – Priority Outputs

Note these are needed for status and outlooks, for all variables, at all scales:

Services and Research

- Quality control methods
- Data Rescue/reconstruction/infilling methods
- Modelling methods/review of open access models suitable for outlooks
- Forecasting methods guidance, inc. skill assessment
- Blending global products / blending across scales

Data Management and Infrastructure

- Data processing and storage systems (WHOS system linkages)
- Global portal design
- Regional/National Portal design and implementation

Implementation, capacity development, and cross-scale coordination

- Technical support at implementation meetings
- Feedback on local requirements

Cross-cutting

- Tools/Scripts for implementation of research guidance (e.g. status calculation, outlooks methods, skill assessment, quality control)



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THANK YOU

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