

Region VI Capacity Building 29 January 2024 (online) WHOS latest advancements

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Washington Otieno – WMO Secretariat

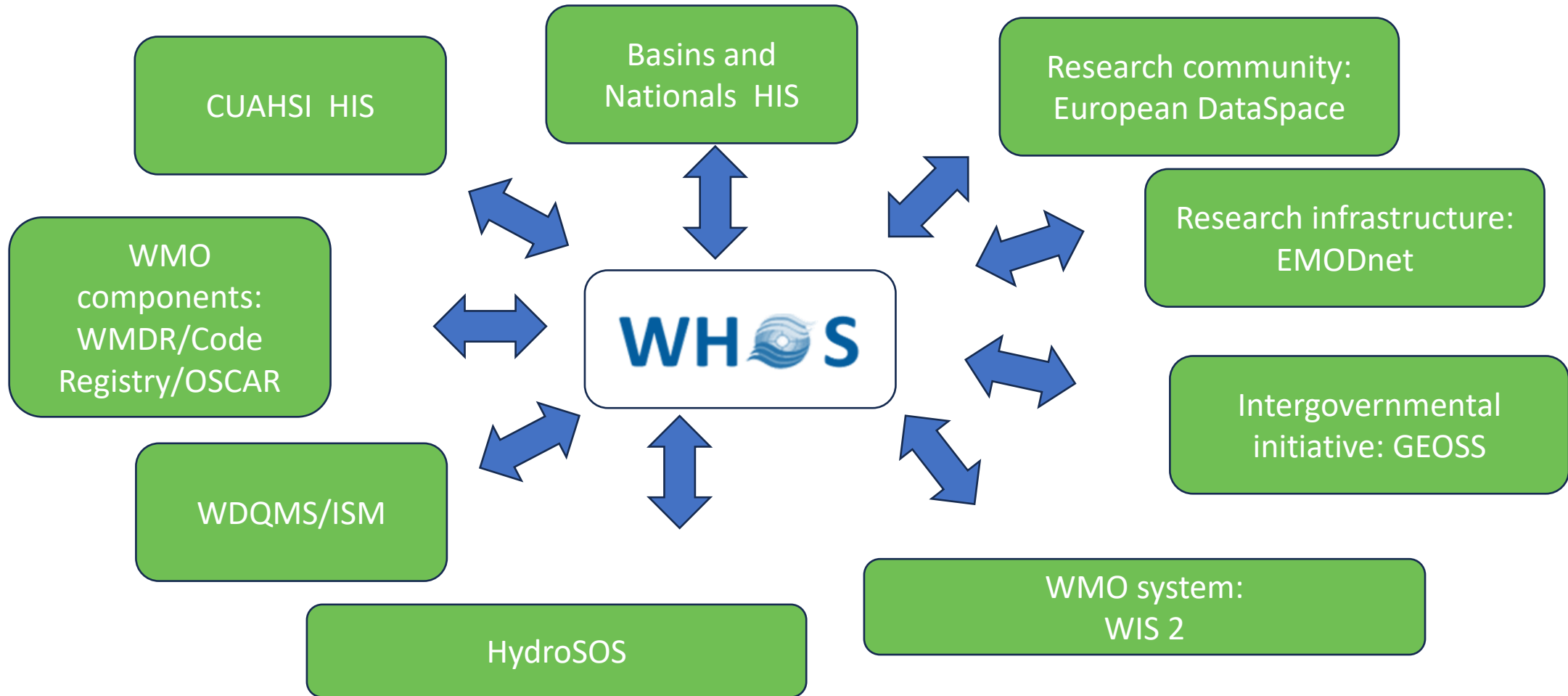


WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

Thanks to its brokering approach, interoperability with different tools is eased.
Different communities can easily contribute to WHOS.
WHOS data can be disseminated to other communities.





CUAHSI Hydrological Information System (CUAHSI-HIS)

- (USA) Consortium of Universities for the Advancement of Hydrologic Science, Inc.
- 102 originator organizations
- 3,892,000 time series



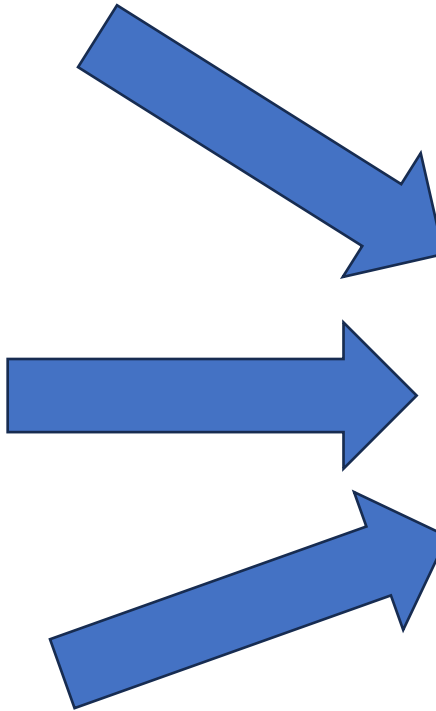
OGC SensorThings services

- IOT ready
- Many initiatives and data providers are implementing it
 - BRGM
 - HydroServer 2



GRDC

- OGC SOS v.2.0
- Global run-off data center
- Historical data



CUAHSI Hydrological Information System (CUAHSI-HIS)



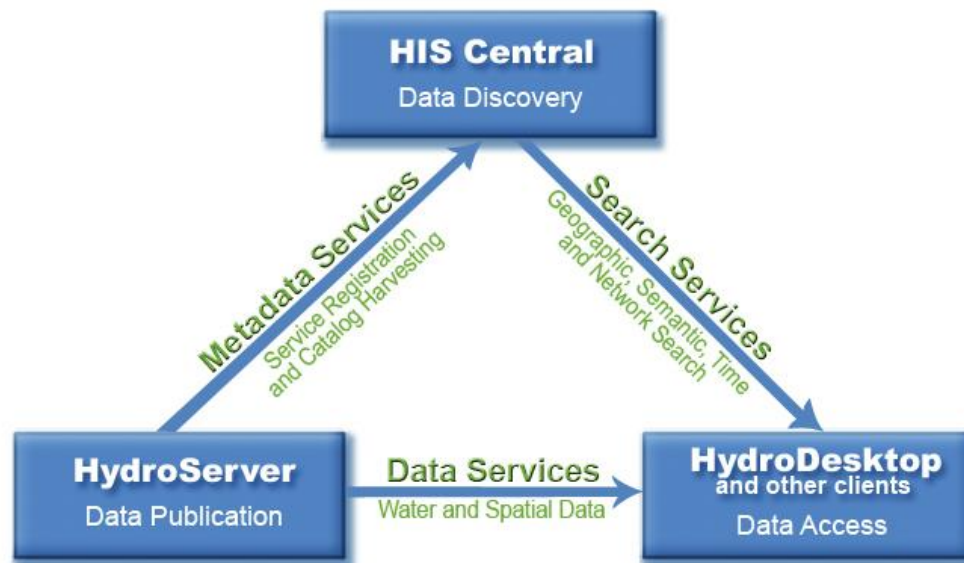
- (USA) Consortium of Universities for the Advancement of Hydrologic Science, Inc.
- 102 originator organizations
- 3,892,000 time series



An organization representing more than one hundred United States universities, receives support from the National Science Foundation to develop infrastructure and services for the advancement of hydrologic science and education in the U.S.

HIS = Hydrologic Information System

CUAHSI HIS WaterOneFlow Services

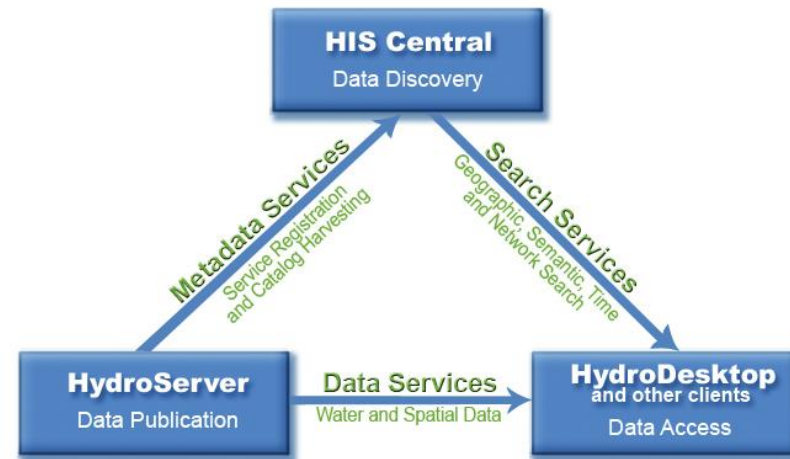


- Water data** from a variety of sources are:
- **hosted** on servers (**HydroServers**)
 - **cataloged** into a central metadata database (**HIS Catalog**)
 - **discoverable** through the use of client applications (such as **HydroDesktop**).

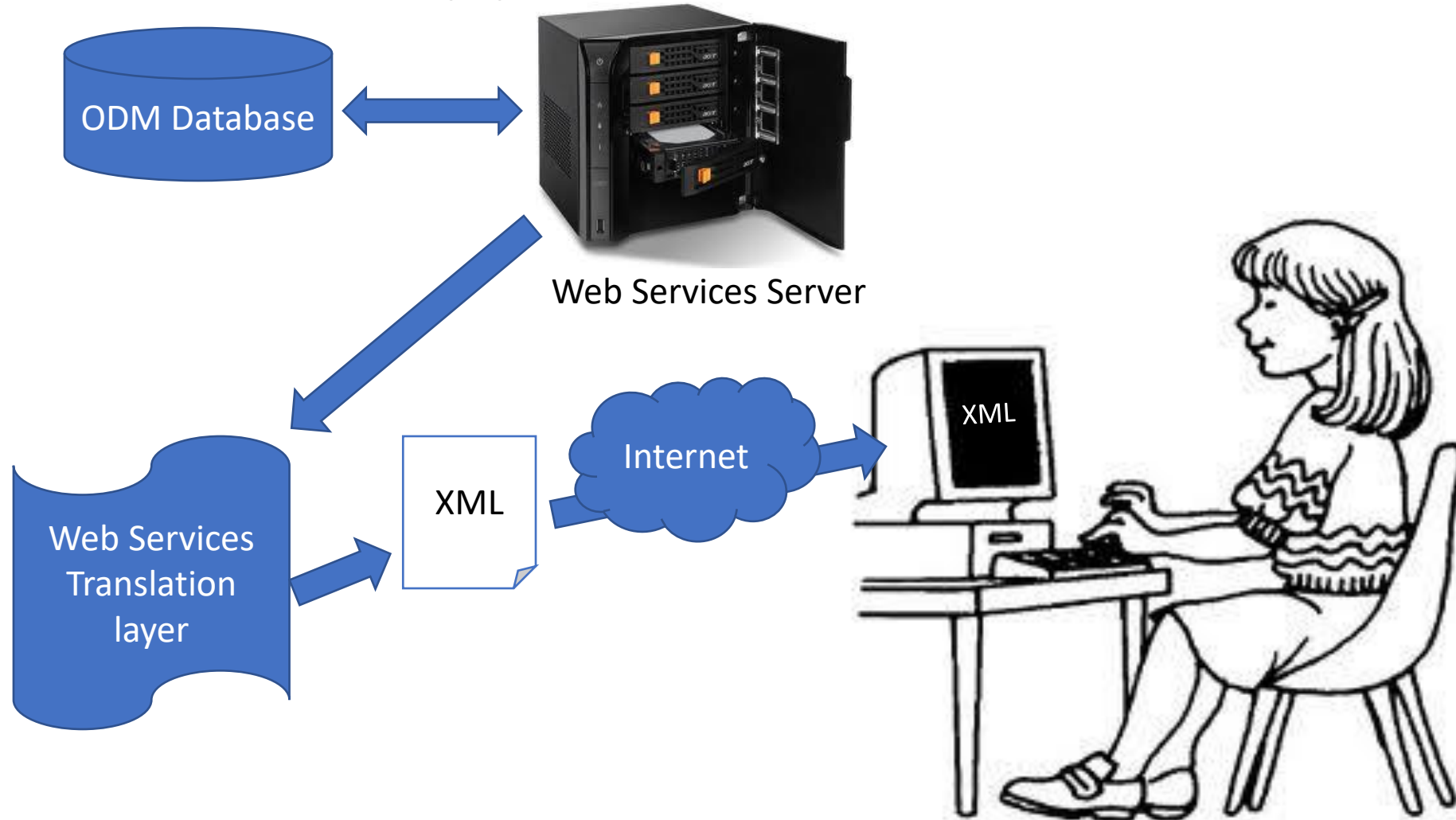
CUAHSI HIS



- **Federated architecture:** all the data providers must install HydroServer and register to the HIS Central registry
- User search for data providers on the HIS Central, then bind to the matching HydroServer to download the data

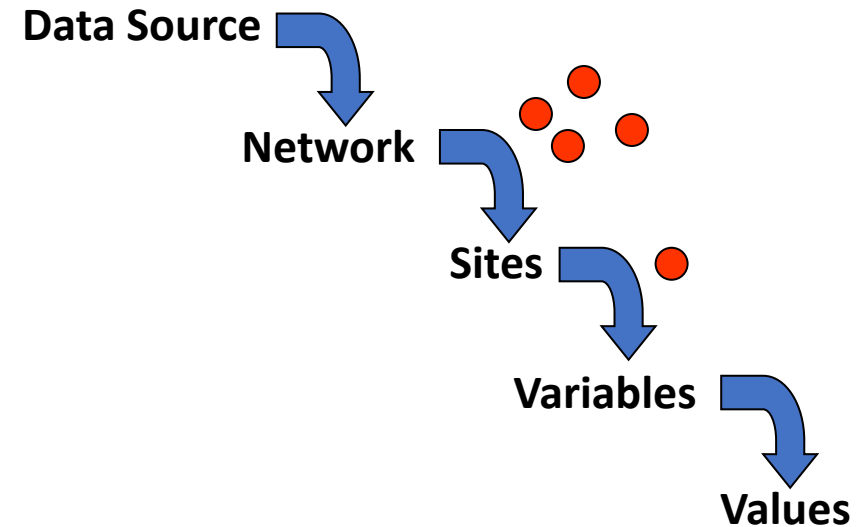


HydroServer Approach



WaterOneFlow web service

- Set of **query** functions
 - Get Sites
 - Get Site Info
 - Get Variable Info
 - Get Values
- returns data in **WaterML**



For example: to get a site, send this “SOAP” request to the server:

```
POST /wateroneflow/NWIS/UnitValues.asmx HTTP/1.1
Host: river.sdsc.edu
Content-Type: text/xml; charset=utf-8
Content-Length: length
SOAPAction: "http://www.cuahsi.org/his/1.0/ws/GetSiteInfo"

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-in
  <soap:Body>
    <GetSiteInfo xmlns="http://www.cuahsi.org/his/1.0/ws/">
      <site>string</site>
      <authToken>string</authToken>
    </GetSiteInfo>
  </soap:Body>
</soap:Envelope>
```

Specify the site and an optional authorization token

Get this response:

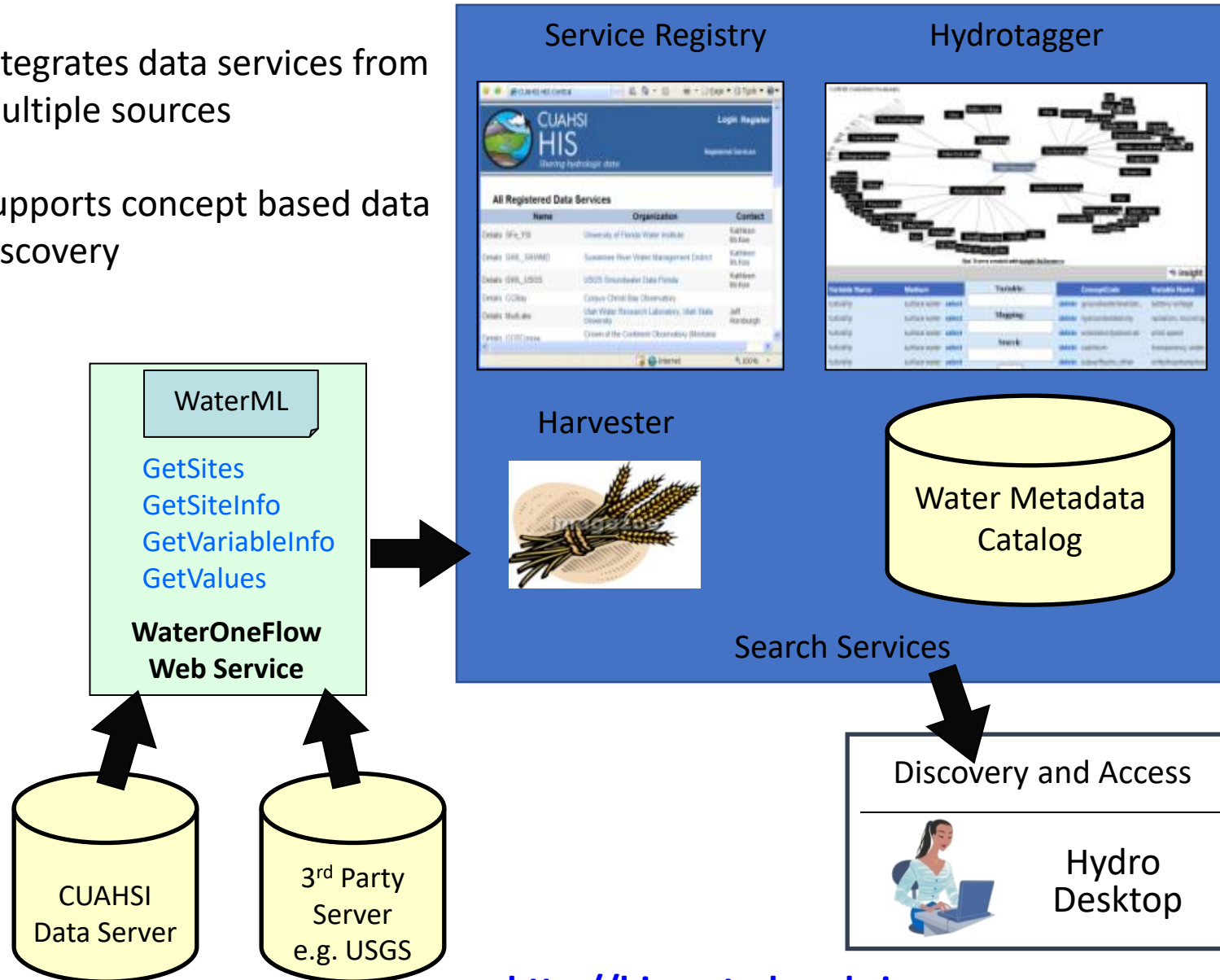
```
HTTP/1.1 200 OK
Content-Type: text/xml; charset=utf-8
Content-Length: length

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema"
  <soap:Body>
    <GetSiteInfoResponse xmlns="http://www.cuahsi.org"
      <GetSiteInfoResult>string</GetSiteInfoResult>
    </GetSiteInfoResponse>
  </soap:Body>
</soap:Envelope>
```

Result returns in this string.

HIS Central Catalog

- Integrates data services from multiple sources
- Supports concept based data discovery



HIS Central *Web Service*

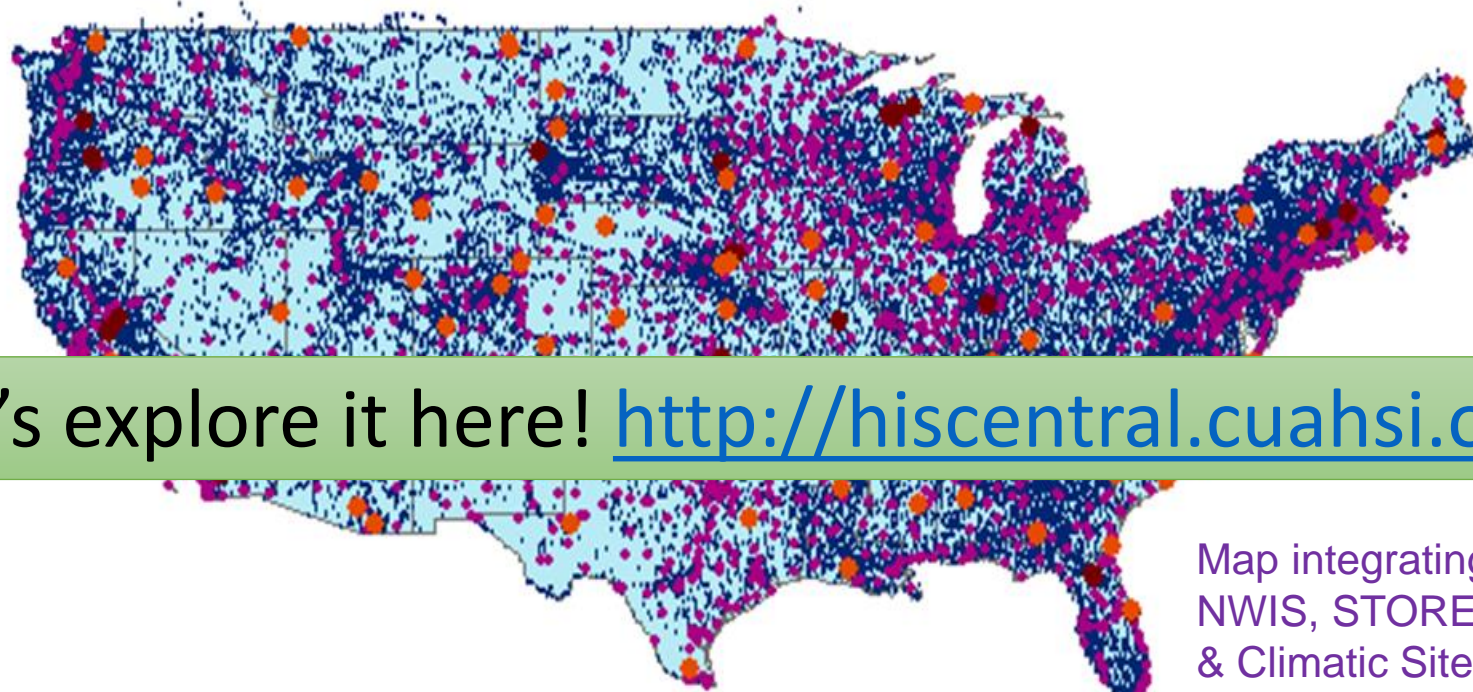
- Programmatic methods to query the national metadata catalog
- Search by:
 - Location
 - Variable
 - Date Range
 - Data source

hiscentral

The following operations are supported. For a formal definition, please review the [Service Description](#).

- [GetMappedVariables](#)
- [GetMappedVariables2](#)
- [GetSearchableConcepts](#)
- [GetSeriesCatalogForBox](#)
- [GetSeriesCatalogForBox2](#)
- [GetServicesInBox](#)
- [GetServicesInBox2](#)
- [GetSitesInBox](#)
- [GetSitesInBox2](#)
- [GetWaterOneFlowServiceInfo](#)
- [GetWordList](#)
- [getOntologyTree](#)
- [getSearchablePaths](#)
- [getSeriesCatalogInBoxPaged](#)

HIS Central Content



Let's explore it here! <http://hiscentral.cuahsi.org>

Map integrating
NWIS, STORET,
& Climatic Sites

- **>100 public services**
- **>32,400 variables** *Available via HISCentral discovery services*
- **>2.79 million sites**
- **>33.9 million series**
- **>Referencing 18 billion data values** *Available via GetValues requests*
- **>15,500+ download requests per day**

Integration results in the GI-portal

<https://whos.geodab.eu/gs-service/search?view=cuahsi&token=...>

The screenshot displays the search results interface of the GI-portal. The top navigation bar includes a search bar with the term "discharge" and filters for "Start time", "End time", and "Advanced". Logos for CC-BY, ECHO4CLIMATE, ECHOSS, and ESSI Lab are visible in the top right.

The main content area is divided into two sections. On the left, a list of search results is shown, each with a thumbnail (marked "IMAGE NOT FOUND"), a title, a description, and start/end times. The results include:

- DRAINAGE DITCH TO TRIB TO SANDY RUN NR LIZZIE, NC - Discharge, cubic feet per second - Unknown** (Start time: 1999-03-19 04:00:00, End time: 2002-09-29 04:00:00)
- Hughes Spring near Zack - Discharge, cubic feet per second - MEAN** (Start time: 2000-10-07 00:00:00, End time: 2002-12-18 00:00:00)
- Hughes Spring near Zack**
- U.S. Geological Survey (USGS)**
- Discharge, cubic feet per second**
- SALT RIVER NEAR NORTH BRADLEY, MI - Discharge, cubic feet per second - MEAN** (Start time: 1934-06-01 00:00:00, End time: 1971-09-30 00:00:00)
- LITTLE PITMAN CREEK NEAR CAMPBELLVILLE, KY - Discharge, cubic feet per second - Instantaneous** (Start time: 1990-08-10 04:00:00, End time: 1995-10-05 04:00:00)

On the right, a world map is displayed with several red location markers in North America. A bounding box tool is overlaid on the map, showing fields for South, West, North, and East coordinates, a location search bar, and options for "CONTAINS" and "OVERLAPS". A "DRAW BOUNDING BOX" button is also present. The map includes zoom controls and a scale bar at the bottom right.

CUAHSI HydroServer 2



Based on OGC SensorThings API



A screenshot of the HydroServer web interface. The top navigation bar includes "BROWSE MONITORING SITES", "MY SITES", "DATA MANAGEMENT", and "CONTACT US". Below this is a "Browse Data Collection Sites" section with a search bar for "Filter by Organizations" and a "FILTER" button. A "Site Types" dropdown menu is also visible. The main area is a map showing the United States and Canada, with several red location pins and a blue circular marker. The map is titled "Map" and "Satellite".

A screenshot of the "Site Information" page. It features a table with the following data:

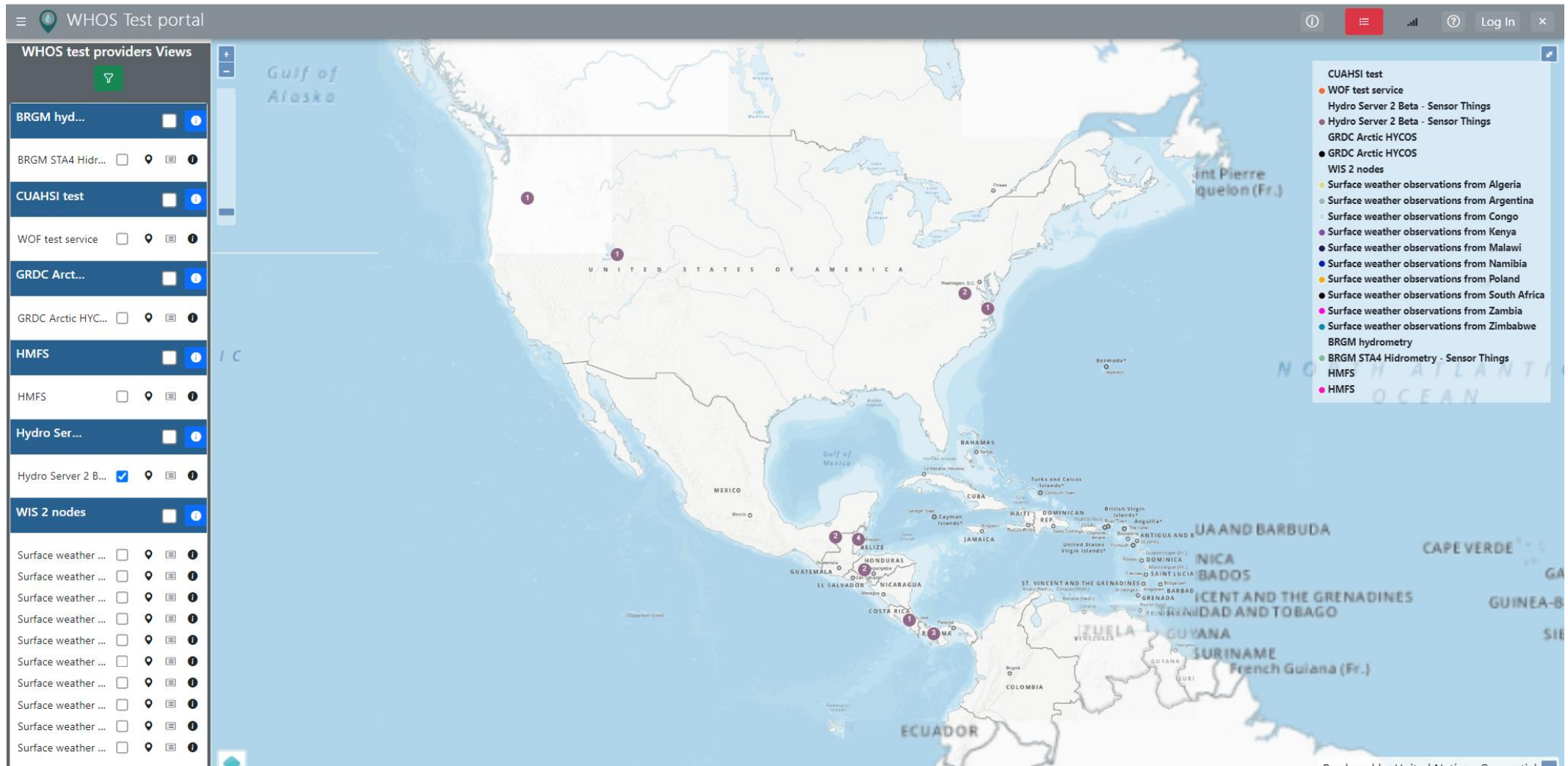
ID	e33ec9ae-8f55-4307-88ae-b9fd732da7dc
Site Code	TEST
Latitude	44.877304
Longitude	-120.610352
Elevation	1181
Description	Test Site
Site Type	Land
State/Province/Region	OR
County/District	Wasco County
Country	
Privacy	Public
Site Owners	Ken Lippold (No Organization)
Additional Metadata	Test Value

Below the table is a section titled "Datastreams Available at this Site". It includes a "DataStream Info" table and a chart titled "Observations (Last 72 Hours)".

Observed Property: Temperature	
Identifier: Dbe26175-fb5c-4cc4-8cb6-59bdf876e49d	
Processing Level: 0	
Sampled Medium: Soil	
Sensor: Test: Test	

<https://beta.hydroserver2.org/>

Integration results in the WHOS test portal



<https://testwde.hydro.geodab.eu/apps/water-data-explorer-whos/>

Integration results in the WHOS test portal

The screenshot displays the WHOS Test portal interface. At the top, the title bar reads "WHOS Test portal" with a search icon and a "Log In" button. The main area features a map of the Americas with several test sites marked by colored dots and numbered 1 through 6. A legend on the right side of the map lists various test providers and their corresponding colors: CUAHSI test (green), WOF test service (orange), Hydro Server 2 Beta - Sensor Things (purple), GRDC Arctic HYCOS (pink), WIS 2 nodes (yellow), and Surface weather observations from various countries (Algeria, Argentina, Congo, Kenya, Malawi, Namibia, Poland, South Africa, Zambia, Zimbabwe).

On the left side, a sidebar titled "WHOS test providers Views" contains a list of providers with checkboxes and icons. The providers listed are: BRGM hyd..., BRGM STA4 Hidr..., CUAHSI test, WOF test service, GRDC Arct..., GRDC Arctic HYC..., HMFS, Hydro Ser..., and WIS 2 nodes. The "Hydro Server 2 B..." provider is checked.

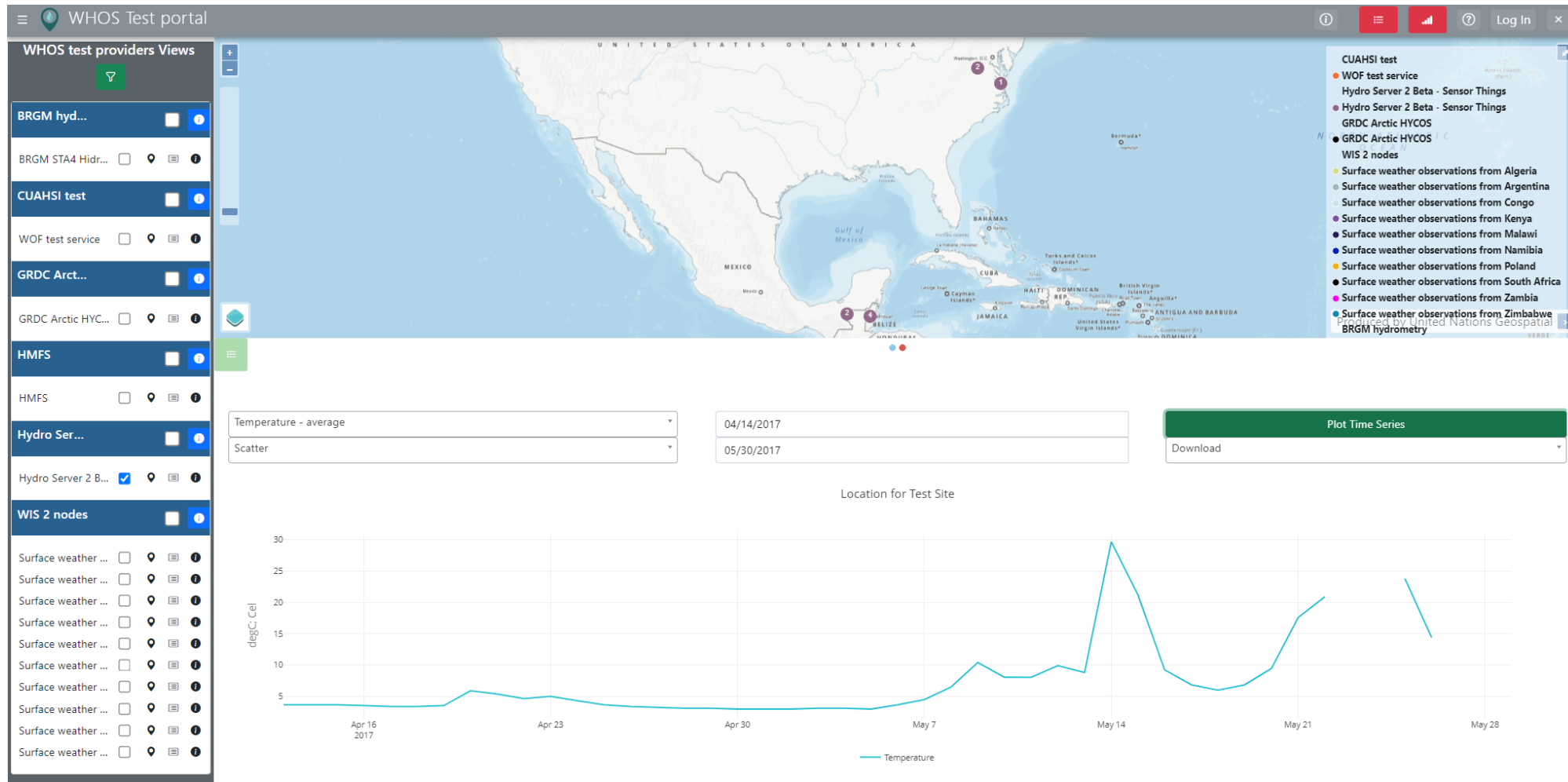
Below the map, the following metadata is displayed:

- Station/Platform Name:** Location for Test Site
- Territory of origin of data:** No Data was Provided
- Supervising Organization:** NaN
- Geospatial Location:** lat: 44°52'38" lon: 120°36'37"

A "Table of Variables" section is also present, showing the following data:

Observed Variables	Unit	Aggregation Period	Interpolation Type
Temperature	degC, Cel	15 minutes	average

Integration results in the WHOS test portal



Integration results in the GI-portal

- <https://whos.geodab.eu/gs-service/search?view=whos-sensorthingshydro2&token=...>

SEARCH

Search terms Start time End time Advanced

RESULTS FILTERS SOURCES BROWSING

Matching results: 34

Number of valid samples at Elizabeth River at the ODU Sailing Center Start time 2023-11-01 21:26:19

Number of valid samples at Elizabeth River at the ODU Sailing Center - 0 End time 2023-11-15 00:35:48

Battery voltage at Meadow Creek at Greenbrier Park Start time 2023-10-20 18:58:14

Battery voltage at Meadow Creek at Greenbrier Park - 0 End time 2023-11-15 00:37:48

Decentfab: Decentfab DL-PR26

Location for Meadow Creek at Greenbrier Park

Battery voltage

Discharge at Freetown Sibun Start time 1981-06-01 00:00:00

Discharge at Freetown Sibun - -9999 End time 2008-10-16 00:00:00

Discharge at Sitio Desvio Start time 1994-01-01 00:00:00

Discharge at Sitio Desvio - -9999 End time 2018-12-31 00:00:00

Water level at San Ignacio Start time

French Polynesia

Map Satellite

BOUNディング BOX

South

West

North

East

Location

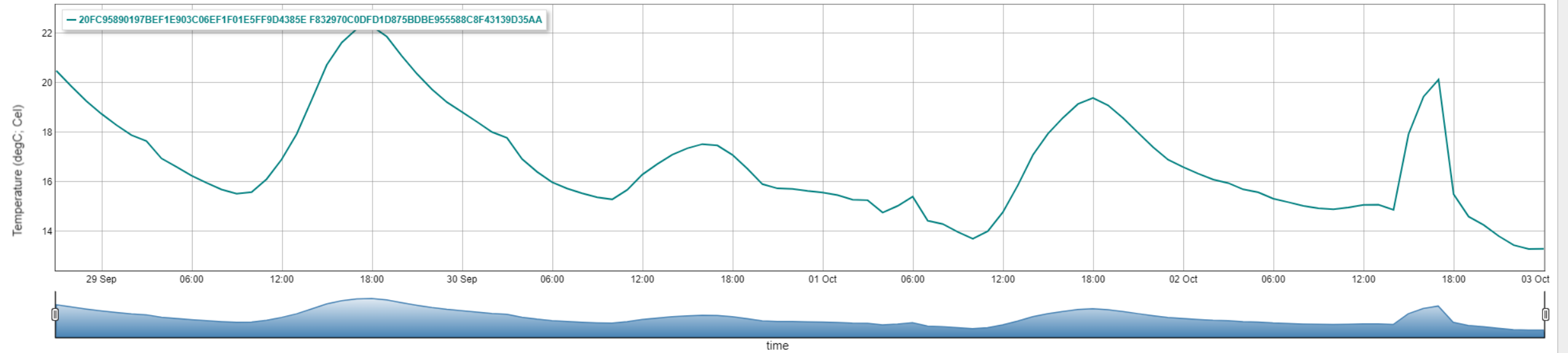
CONTAINS OVERLAPS

DRAW BOUNDING BOX

Google

Integration results in the GI-portal

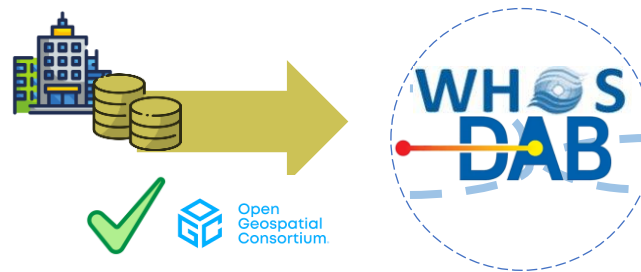
Temperature at Location for STATE CANAL 100FT AB S Davis N WWTP



Some preliminary results on BRGM service

- Endpoint URL: <https://sta4hydrometry.brgm-rec.fr/FROST-Server/>

Being based on a **standard communication protocol**, it was very easy to test and integrate to WHOS in the way to the workshop!



Description of the service and some suggestions are reported after preliminary integration tests in the next slides, with the **aim of further improving the connection** to WHOS.



Things

HTTP GET request: <https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Things>

```
{
  "@iot.selfLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Things(1)",
  "@iot.id": 1,
  "name": "[Barbotteau] à Petit-Bourg - Barbotteau",
  "description": "Implantation station 2m avant prise d'eau Conseil Général",
  "properties": {
    "id": "https://iddata.eaufrance.fr/id/HydroStation/1011000101",
    "Commune": {
      "@type": "http://data.ign.fr/def/geofla#commune",
      "@id": "http://id.insee.fr/geo/commune/97118"
    },
    "relatedTo": [
      {
        "href": "http://iddata.eaufrance.fr/id/watershed/1011",
        "title": "Watershed"
      }
    ]
  },
  "Locations@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v",
  "HistoricalLocations@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROS",
  "Datastreams@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server"
}
```

Metadata elements

- Name
- Description
- Id
- Municipality
- Related concept

Some missing elements to consider

- Contacts and responsible party, for example detailed in:
 - Responsible organization name
 - Responsible organization role
 - Responsible organization e-mail
- A datestamp could be put in the properties, to indicate the last update of the object(s) metadata

Locations

<https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Locations>

```
{
  "@iot.selfLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Locations(1)",
  "@iot.id": 1,
  "name": "[Barbotteau] à Petit-Bourg - Barbotteau",
  "description": "[Barbotteau] à Petit-Bourg - Barbotteau",
  "encodingType": "application/vnd.geo+json",
  "location": {
    "type": "Point",
    "coordinates": [
      -61.658989597,
      16.189402472
    ]
  },
  "HistoricalLocations@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Locations(1)/HistoricalLocations",
  "Things@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Locations(1)/Things",
}
```

Metadata elements

- Name
- Description
- Encoding type
- Location type (e.g., Point)
- Latitude
- Longitude

Some missing elements to consider

- Country information, expressed for example with ISO country codes (two or three digits), such as it, us, fr, etc.
- Elevation, expressed in metres

Sensors

HTTP GET request: <https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Sensors>

```
{
  "@iot.selfLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Sensors(1)",
  "@iot.id": 1,
  "name": "Hydrometry depth measurement by electronic probe",
  "description": "Hydrometry depth measurement by electronic probe",
  "encodingType": "http://www.opengis.net/doc/IS/SensorML/2.0",
  "metadata": "http://id.eaufrance.fr/nsa/519#2",
  "Datastreams@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Sensors(1)/Datastreams"
},
```

Metadata elements:

- Sensor name
- Sensor description
- Sensor encoding type

Note: SensorML metadata link seems unreachable now (<http://id.eaufrance.fr/nsa/519#2>)

Datastreams

HTTP GET request: <https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datastreams>

```
{
  "@iot.selfLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datastreams(1)",
  "@iot.id": 1,
  "name": "Hydrometry depth at [Barbotteau] à Petit-Bourg - Barbotteau with method Hydrometry dep",
  "description": "Hydrometry depth at [Barbotteau] à Petit-Bourg - Barbotteau with method Hydrom",
  "observationType": "http://www.opengis.net/def/observationType/OGC-OM/2.0/OM_Measurement",
  "unitOfMeasurement": {
    "name": "millimeters",
    "symbol": "mm",
    "definition": "https://data.geoscience.fr/nc1/uom/491"
  },
  "properties": {
    "relatedTo.FeaturesOfInterest@iot.id": 1
  },
  "ObservedProperty@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Da",
  "Sensor@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datastreams",
  "Thing@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datastreams(1",
  "Observations@iot.navigationLink": "https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datast",
}
```

Metadata elements

- Name
- Description
- Observation type
- Uom name
- Uom symbol
- Uom definition

Some missing elements to consider

- Interpolation type (e.g., continuous, average, maximum, etc.)
- Aggregation period in ISO 8601 (e.g., P1D for daily, PT1H for hourly)
- Intended observation spacing (e.g., P1D for daily, PT1H for hourly)

Observed property

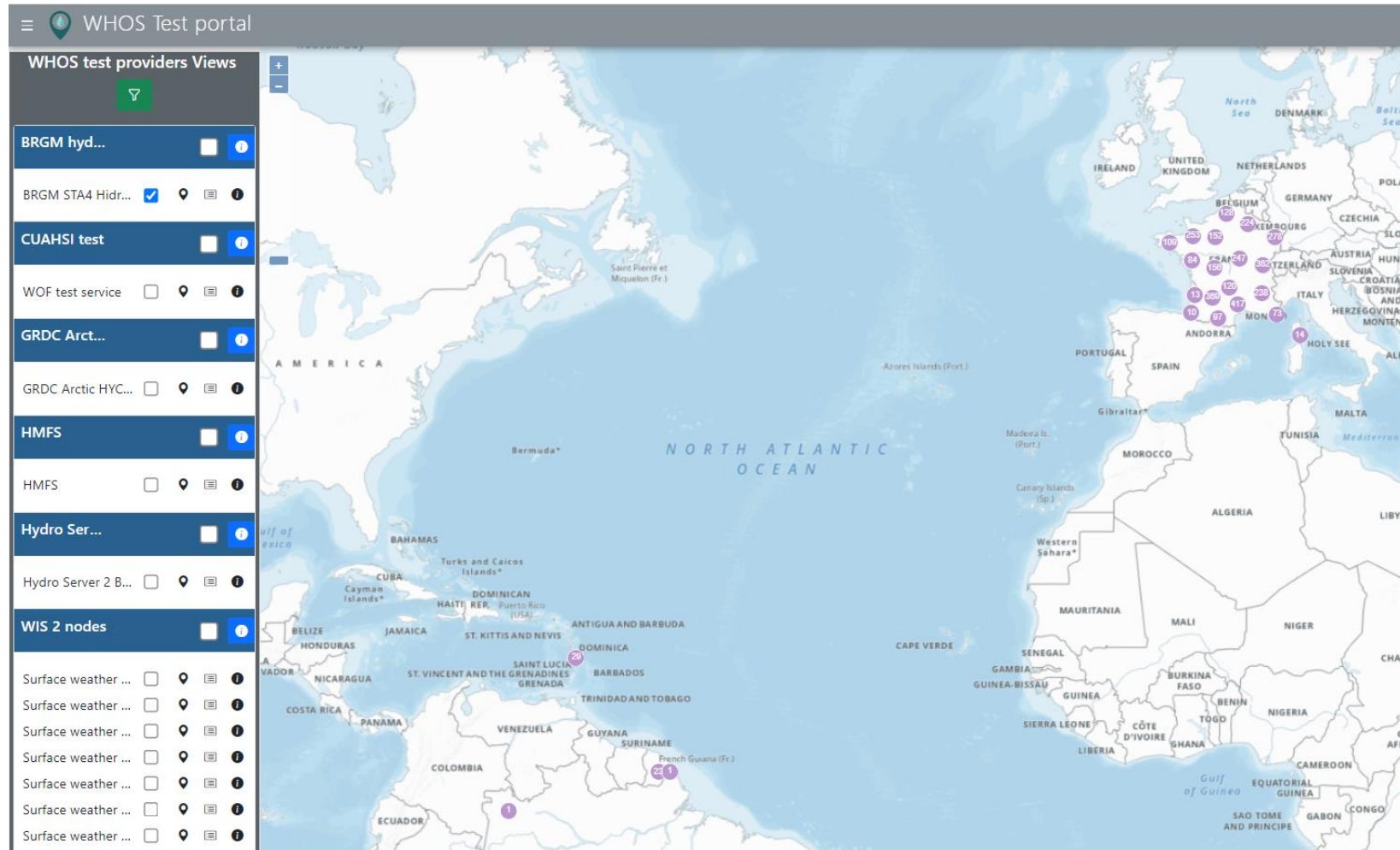
HTTP GET request: [https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datastreams\(1\)/ObservedProperty](https://sta4hydrometry.brgm-rec.fr/FROST-Server/v1.1/Datastreams(1)/ObservedProperty)

```
{
  "@iot.selfLink": "https://sta4hydrometry.brgm-rec.fr/FRC
  "@iot.id": 1,
  "name": "Hydrometry depth",
  "definition": "http://id.eaufrance.fr/nsa/520#H",
  "description": "Hydrometry depth",
  "Datastreams@iot.navigationLink": "https://sta4hydrometr
  Server/v1.1/ObservedProperties(1)/Datastreams"
}
```

Metadata elements

- Name
- Definition
- Description

Integration results in the WHOS test portal



<https://testwde.hydro.geodab.eu/apps/water-data-explorer-whos/>

Integration results in the WHOS test portal

The screenshot displays the WHOS Test portal interface. The top navigation bar includes a menu icon, the title 'WHOS Test portal', and utility icons for help, settings, signal strength, and a 'Log In' button. The main area is divided into three sections:

- Left Sidebar (WHOS test providers Views):** A list of providers with checkboxes and status icons. The 'HMFS' provider is currently selected.
- Map:** A satellite-style map of France with numerous purple circular markers representing sensor locations. A red dot indicates the selected station location near Paris.
- Right Sidebar (Legend):** A list of data sources and their corresponding colors:
 - CUAHSI test
 - WOF test service
 - GRDC Arctic HYCOS
 - GRDC Arctic HYCOS
 - Hydro Server 2 Beta - Sensor Things
 - Hydro Server 2 Beta - Sensor Things
 - HMFS
 - HMFS
 - WIS 2 nodes
 - Surface weather observations from Algeria
 - Surface weather observations from Argentina
 - Surface weather observations from Congo
 - Surface weather observations from Kenya
 - Surface weather observations from Malawi
 - Surface weather observations from Namibia
 - Surface weather observations from Poland
 - Surface weather observations from South Africa
 - Surface weather observations from Zambia

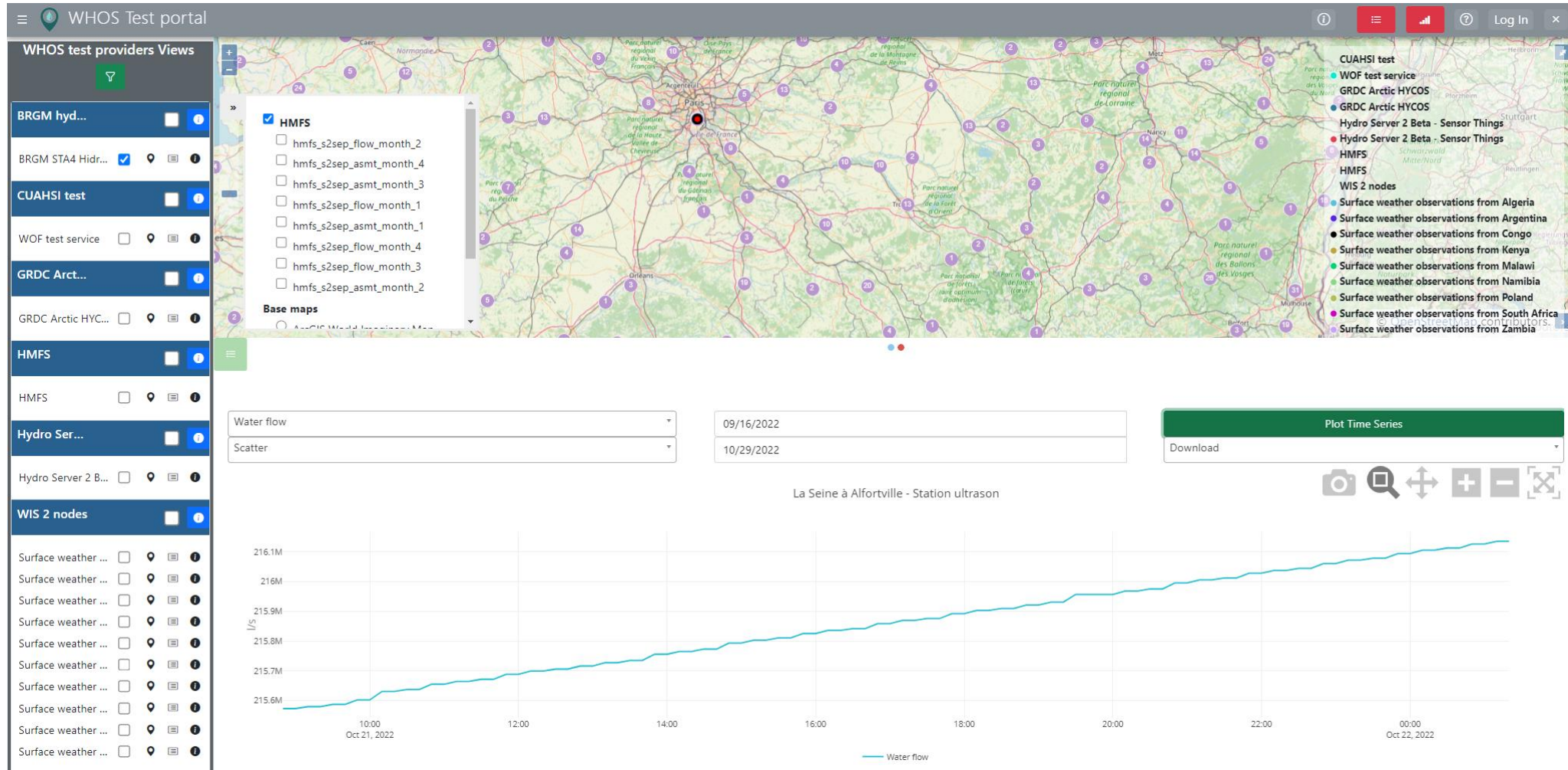
Below the map, a detailed view for the selected station is shown:

- Station/Platform Name:** La Seine à Alfortville - Station ultrason
- Territory of origin of data:** No Data was Provided
- Supervising Organization:**
- Geospatial Location:** lat: 48°46'48" Ion: 2°25'5"

A **Table of Variables** is displayed below the location information:

Observed Variables	Unit	Aggregation Period	Interpolation Type
Hydrometry depth	mm	NaN	
Water flow	l/s	NaN	

Integration results in the WHOS test portal



Integration results in the GI-portal

- <https://whos.geodab.eu/gs-service/search?view=whos-fra-brgm-hydrometry&token=...>

The screenshot displays the Whos Geodab portal search results for hydrometry data in France. The interface includes a search bar at the top with the text "SEARCH" and "Search terms". Below the search bar, there are tabs for "RESULTS", "FILTERS", "SOURCES", and "BROWSING". The search results are displayed in a list format, showing matching results (1, 2, 3, 4, 5) and a total of 1,313 results. The results are organized into five rows, each representing a different hydrometry measurement location and method. Each row includes a thumbnail image (labeled "IMAGE NOT FOUND"), a description of the measurement, the start and end times, and a "CLEAR BOUNDING BOX" button. The map on the right shows the geographical location of the measurements in France, with a bounding box around the Paris region. The map also includes a "BOUNING BOX" panel with coordinates (South: 45.395, West: -0.215, North: 48.915, East: 3.535) and a "Location" search bar. The map is labeled with various countries and cities, and includes a "Map" and "Satellite" toggle.

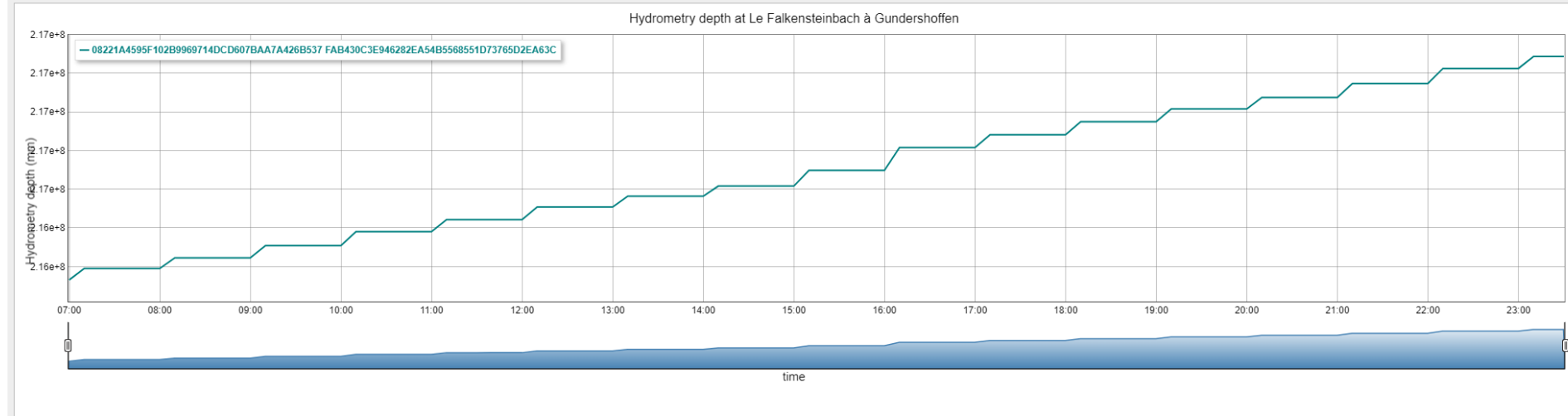
Location	Method	Start time	End time
Water flow at La Guyonne à Mareil-le-Guyon	Water flow measurement by electronic probe	2020-09-22 08:30:00	2021-09-26 23:00:00
Hydrometry depth at Le Beuvron à Montrieux-en-Sologne - Bois Olympe	Hydrometry depth measurement by electronic probe	2020-09-16 12:45:00	2021-09-28 22:00:00
Water flow at La Touvre [résurgence] à Gond-Pontouvre [Foulpougne]	Water flow measurement by electronic probe	2020-09-16 13:20:00	2022-10-24 15:00:00
Water flow at [Fontaine salée] à Chastreix [La Morangie]	Water flow measurement by electronic probe	2020-09-16 14:30:00	2021-09-28 22:00:00
Water flow at Le Thouet à Missé [Missé]	Water flow measurement by electronic probe	2020-09-16 13:10:00	2022-10-24 15:00:00

Integration results in the GI-portal

- <https://whos.geodab.eu/gs-service/search?view=whos-fra-brgm-hydrometry&token=...>

Recent data plot

The graph shows Hydrometry depth observations from the last 7 days (if available) acquired at station Le Falkensteinbach à Gundershoffen.



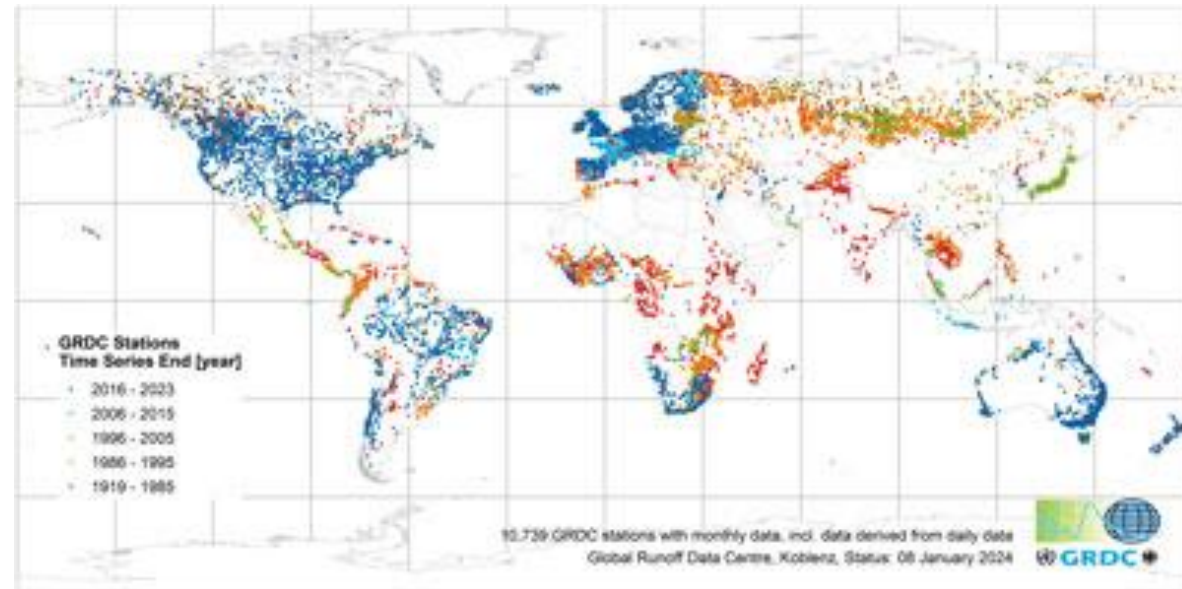
The plot is powered by the USGS GWIS JS API, please refer to [USGS GWIS JS API documentation](#) for customizing this page.

GRDC



GRDC

- OGC SOS v.2.0
- Global run-off data center
- Historical data



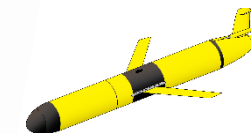
Service endpoint URL: <https://portal.grdc.bafg.de/KiWIS/KiWIS?datasource=1>

SOS Goal



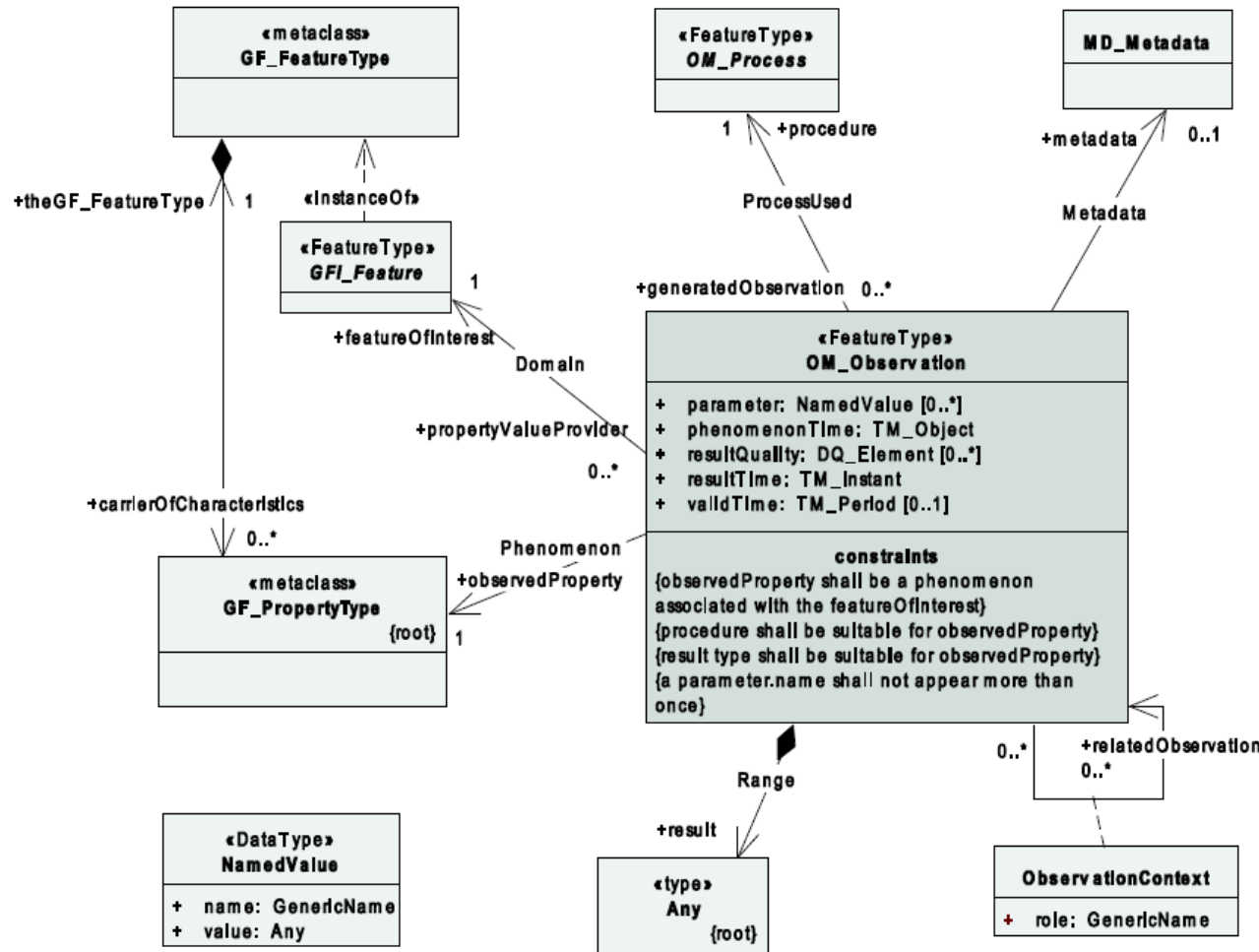
To provide **access to observations from sensors and sensor systems in a standard way** that is consistent for all sensor systems including:

- **Remote** sensors (e.g. satellite acquisitions)
- In situ **fixed** sensors (e.g. meteorological station)
- In situ **mobile** sensors (e.g. sea glider)





Observations and measurements



An **observation** is an action whose result is an estimate of the value of some **properties of interest**, obtained using a specified **procedure**.

Observation Offerings

Observation Offerings are collections of observations produced by one **procedure** (e.g. **sensor + algorithm**)



Observation Offering for:
Precipitation - Cumulative

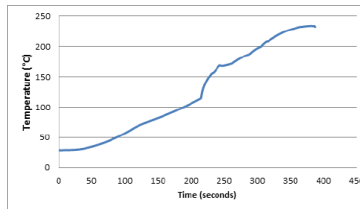
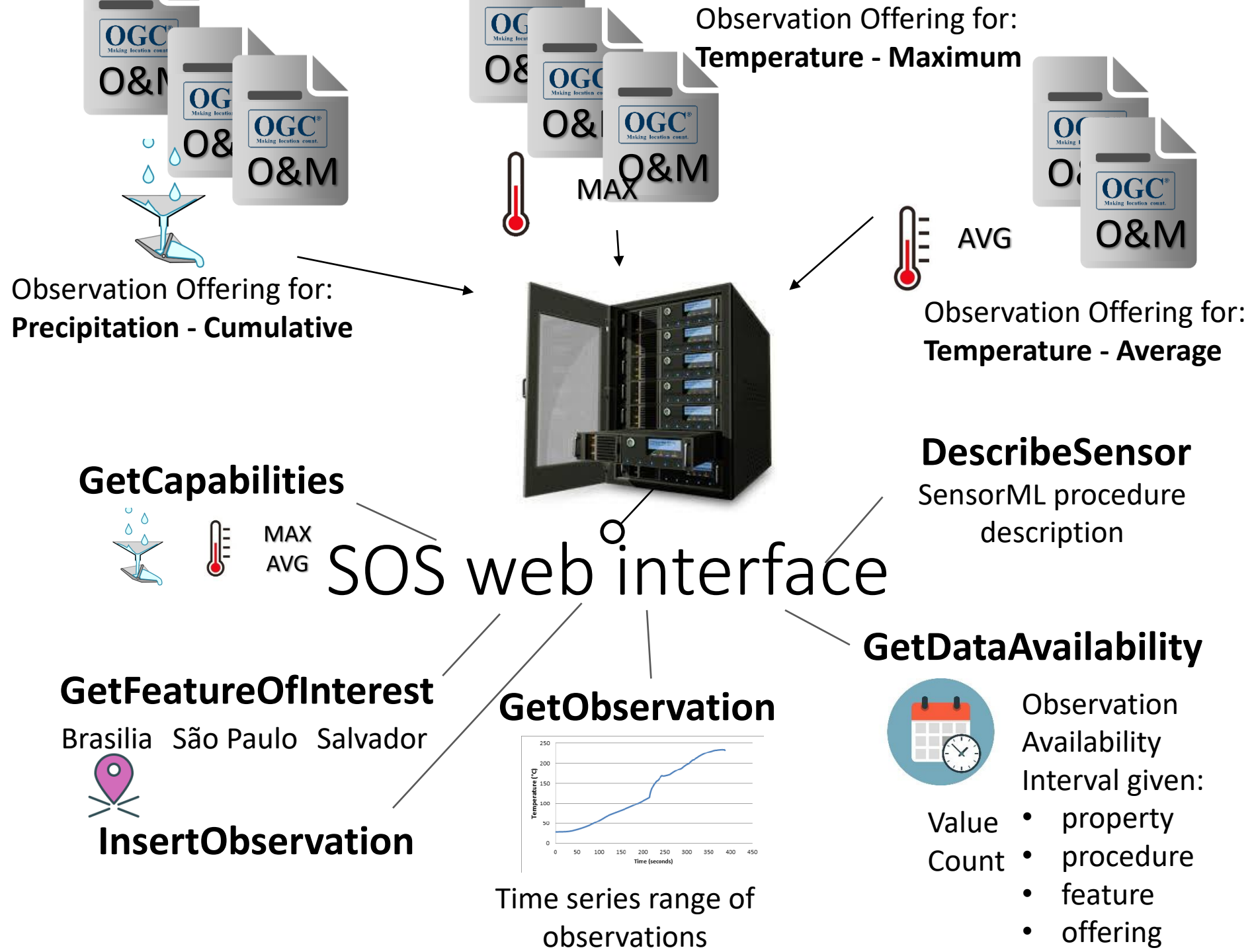


Observation Offering for:
Temperature - Maximum



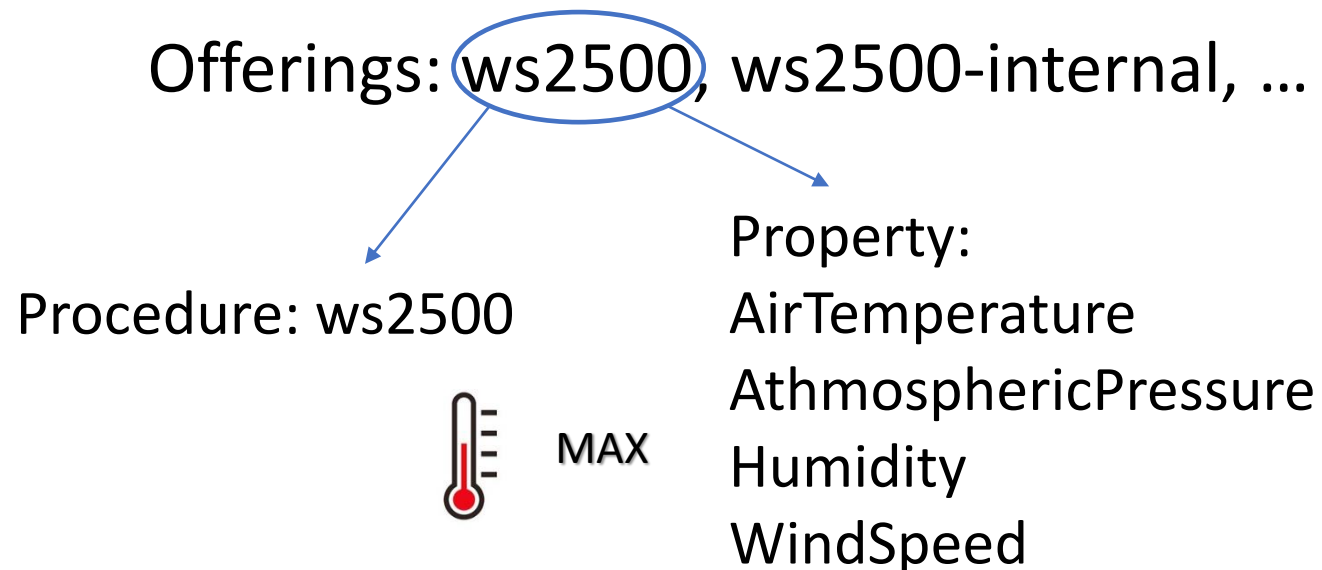
Observation Offering for:
Temperature - Average





SOS HTTP-GET sample requests

- GetCapabilities
- <https://portal.grdc.bafg.de/KiWIS/KiWIS?datasource=1&SERVICE=SOS&VERSION=2.0.0&REQUEST=GetCapabilities>



SOS HTTP-GET sample requests

- GetFeatureOfInterest

<https://portal.grdc.bafg.de/KiWIS/KiWIS?datasource=1&SERVICE=SOS&VERSION=2.0.0&REQUEST=GetFeatureOfInterest&procedure=https://portal.grdc.bafg.de/tstypes/Year.Max>

Feature: elv-ws2500

Name: ELV WS2500

GML Point:

51.934814453125 7.652428150177



To retrieve the list of sites

SOS HTTP-GET sample requests

- DescribeSensor

<https://portal.grdc.bafg.de/KiWIS/KiWIS?datasource=1&SERVICE=SOS&VERSION=2.0.0&REQUEST=DescribeSensor&procedure=https://portal.grdc.bafg.de/tstypes/Year.Max&procedureDescriptionFormat=http://www.opengis.net/waterml/2.0/observationProcess>

Deployment date:

2015-05-18T14:05:00Z

Description:

ELV WS 2500 Weather station
maintained at 52N office.



Contact Info:

52°North GmbH

SOS HTTP-GET sample requests

- GetDataAvailability

<https://portal.grdc.bafg.de/KiWIS/KiWIS?datasource=1&SERVICE=SOS&VERSION=2.0.0&REQUEST=GetDataAvailability&procedure=https://portal.grdc.bafg.de/tstypes/Year.Max&featureOfInterest=https://portal.grdc.bafg.de/stations/2999910>

Begin time position:

2018-03-01T00:30:00.000Z

End time position:

2018-03-28T23:45:00.000Z



SOS HTTP-GET sample requests

- GetObservation

<https://portal.grdc.bafg.de/KiWIS/KiWIS?datasource=1&SERVICE=OS&VERSION=2.0.0&REQUEST=GetObservation&procedure=https://portal.grdc.bafg.de/tstypes/Year.Max&featureOfInterest=https://portal.grdc.bafg.de/stations/2999910&temporalFilter=om:phenomenonTime,2008-03-01T00:30:00Z/2010-03-02T11:00:00Z>

2009

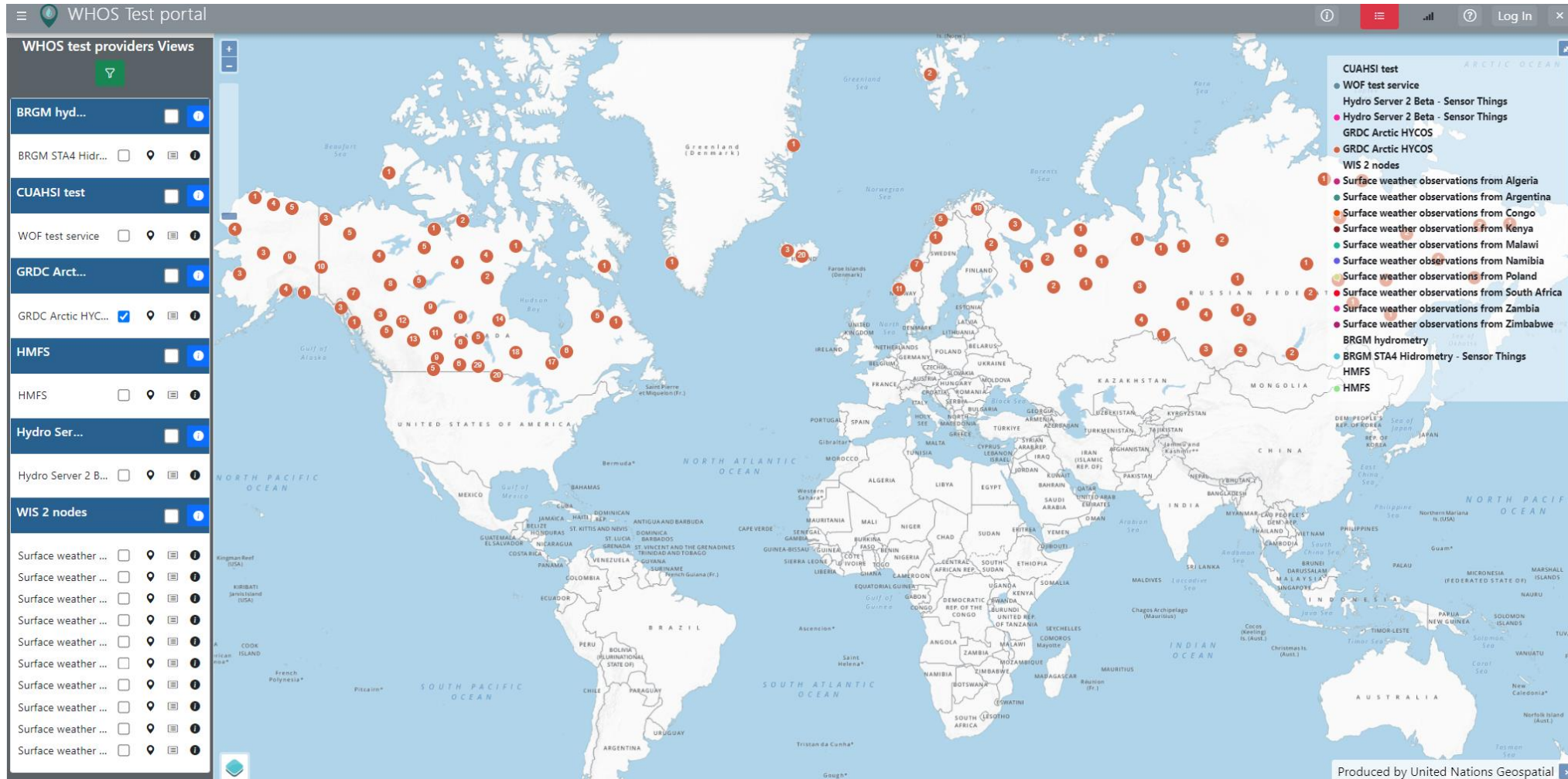
9890 m³/s

2010

13400 m³/s

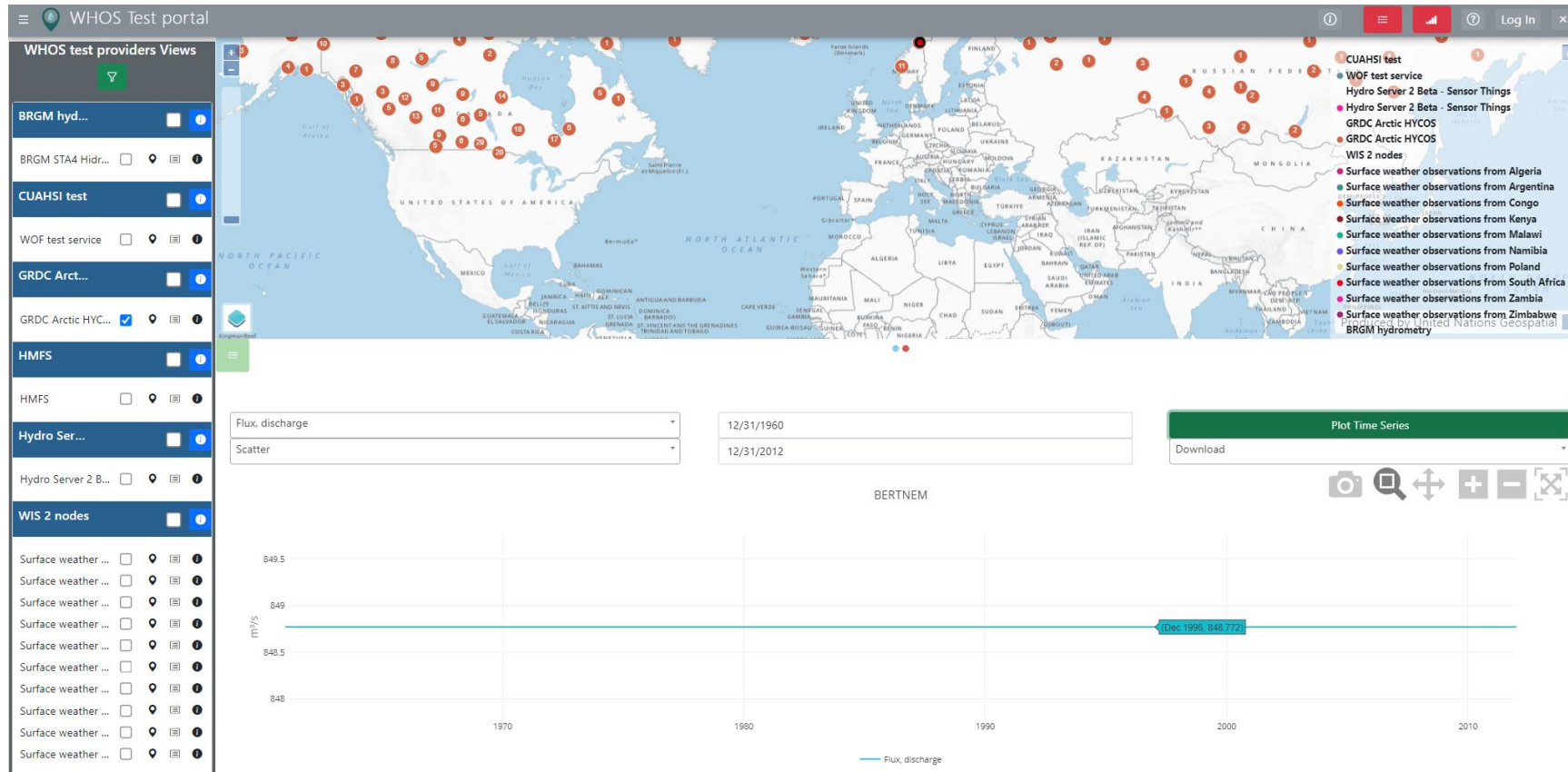
...

Integration results in the WHOS test portal



<https://testwde.hydro.geodab.eu/apps/water-data-explorer-whos/>

Integration results in the WHOS test portal



<https://testwde.hydro.geodab.eu/apps/water-data-explorer-whos/>

Integration results in the GI-portal

<https://whos.geodab.eu/gs-service/search?view=grdc-arctic-hycos&token=...>

The screenshot displays a web application interface for searching sensor observation data. The interface is divided into a left sidebar and a main map area.

Search Interface:

- SEARCH:** Search terms, Start time, End time, and Advanced options.
- RESULTS:** Matching results: 11,338. Navigation buttons (1-5) and a 'Booster' button.
- Logos:** EIP API, EOSS, EuroGEOSS, and TSN Lab.

Search Results (Left Sidebar):

Station/Platform	Observed Property	Sensor Description	Start time	End time
EAGLE AK	Q	133 - YearMean (Daily)	1950-01-01 05:00:00	2022-01-01 05:00:00
NEAR WESTHOPE, ND	Q	135 - YearMax (Daily)	1929-01-01 05:00:00	2018-01-01 05:00:00
ONNELANSUVANTO	Q	20 - MonthlyMean	1992-12-31 22:00:00	2001-11-30 22:00:00
NEAR HAY RIVER	Q	175 - LTV_HDM	1963-06-01 05:00:00	2020-12-01 05:00:00
YENISEYSK	Q	10 - DailyMean	1966-12-31 21:00:00	1993-12-30 21:00:00
LOWER CROSSING	Q		1944-07-01 05:00:00	

Map Area:

- Map/Satellite:** Toggle buttons for Map and Satellite views.
- Map:** A world map showing the locations of the sensor stations marked with red pins. The pins are concentrated in the Arctic region, specifically in North America (Alaska, Canada) and Northern Eurasia (Russia).
- Map Controls:** Zoom in (+), zoom out (-), and full screen (⌂) buttons.
- Footer:** Keyboard shortcuts, Map data ©2024 Imagery ©2024 NASA, TerraMetrics | 200 km | Terms

A person's hands are shown holding a smartphone. The screen displays a world map with a network of white dots and lines connecting them, symbolizing global connectivity. The background is a blurred blue and green color.

**Thank You
Merci**

[VISIT WHOS Site: Link to WHOS Site](#)

Contact Us: whos@wmo.int