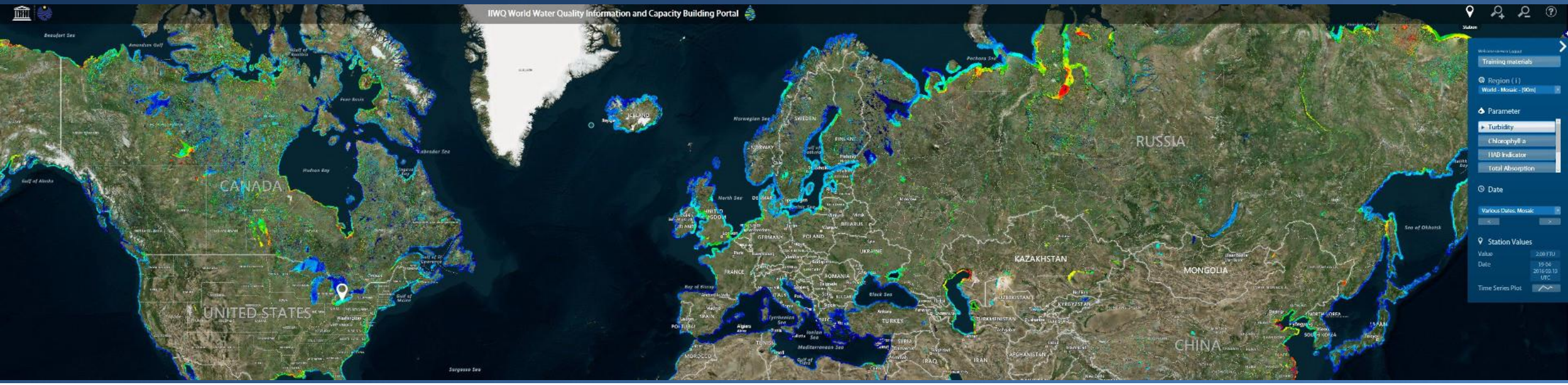
Global water quality portal for UNESCO

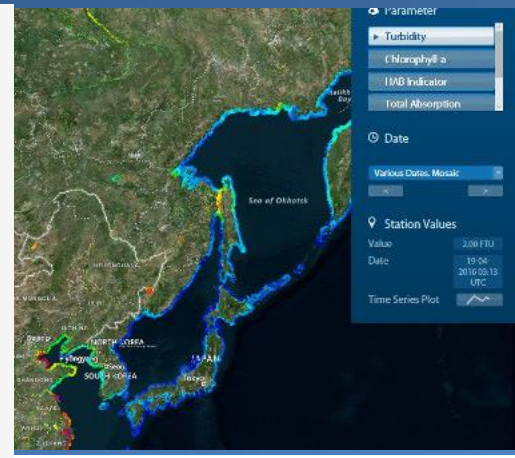
Dr. Thomas Heege, CEO
EOMAP GmbH & Co.KG



About: www.worldwaterquality.org

- Initiative of UNESCO-IHP-IIWQ and EOMAP
- **Global water quality information** for lakes and rivers: Online available
- Tool for **monitoring, reporting, understanding** water interlinkages and impacts
- **Capacity building** for policy makers, agencies and water industry
- **Supporting SDG's:** 3,6,12: Health, Water, Production& Consumpt.



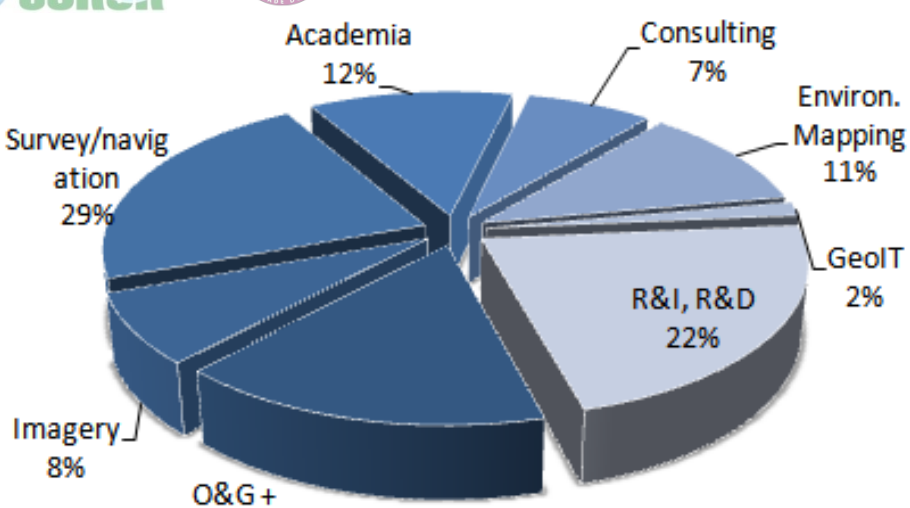
About EOMAP

- Service provider to coastal and offshore industry, academia and governmental entities
- High-tech EO company
  - In-house physics-based multi-sensor production chain, +20 yrs MIP
  - For WQ: focus on globally harmonized data generation






EOMAP global markets and client groups

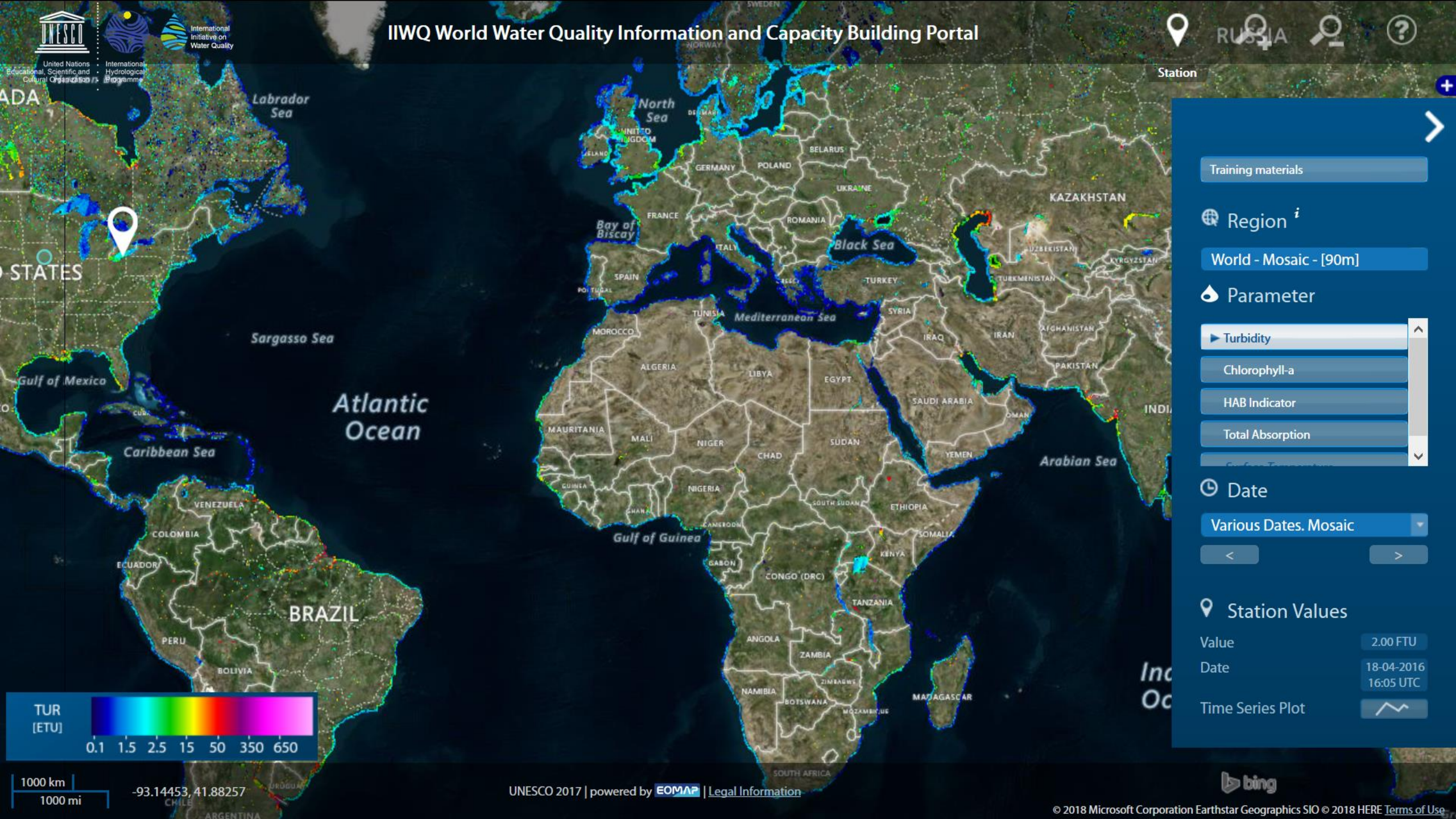


JAMES COOK UNIVERSITY AUSTRALIA · CSIRO · COMMISSION DE L'OCÉAN INDIEN · FOLEY HOAG LLP · CONABIO · UPR Universidad de Puerto Rico · GSI · PROTEUS · INTERNATIONAL MAPPING · KISR Kuwait Institute for Scientific Research · CAU · giz · NOAA · CSRSR · Australian Government Geoscience Australia · bfg Bundesanstalt für Gewässerkunde · USGS science for a changing world · BSH Bundesamt für Seeschiffahrt und Hydrographie · THE UNITED KINGDOM HYDROGRAPHIC OFFICE · movab d · Environment Agency ABU DHABI · Dolphin geophysical · DILLON CONSULTING · BAW · amec foster wheeler · ATLAS ELEKTRONIK A joint company of ThyssenKrupp and EADS · Cardno Shaping the Future · THE WORLD BANK · HLF CONSULTING ENGINEERS · Van Marine ingenuity · BMT WBM · esa European Space Agency · bp · ABP mer marine environmental research · RioTinto · brand MARINE CONSULTANTS · FUGRO · Proes an ECG Company · woodside · Shell · INPEX INPEX CORPORATION

EOMAP

UNESCO-contract

- Technical elements:
  - Landsat-8, Sentinel-2, most data from 2016
  - 90m global, 30m multi-temporal regional data layers
  - Simplified global SIOP-version, partly-flexible SIOP‘s only for time-series
  - Simplified flagging&QC
- Geodata server + modified eoApp-1 web application
- Capacity-building documents


IIWQ World Water Quality Information and Capacity Building Portal
United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme
International Initiative on Water Quality
Station
Training materials
Region
World - Mosaic - [90m]
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
Date
Various Dates. Mosaic
Station Values
Value 2.00 FTU
Date 18-04-2016 16:05 UTC
Time Series Plot
TUR [ETU]
0.1 1.5 2.5 15 50 350 650
1000 km
1000 mi
-93.14453, 41.88257
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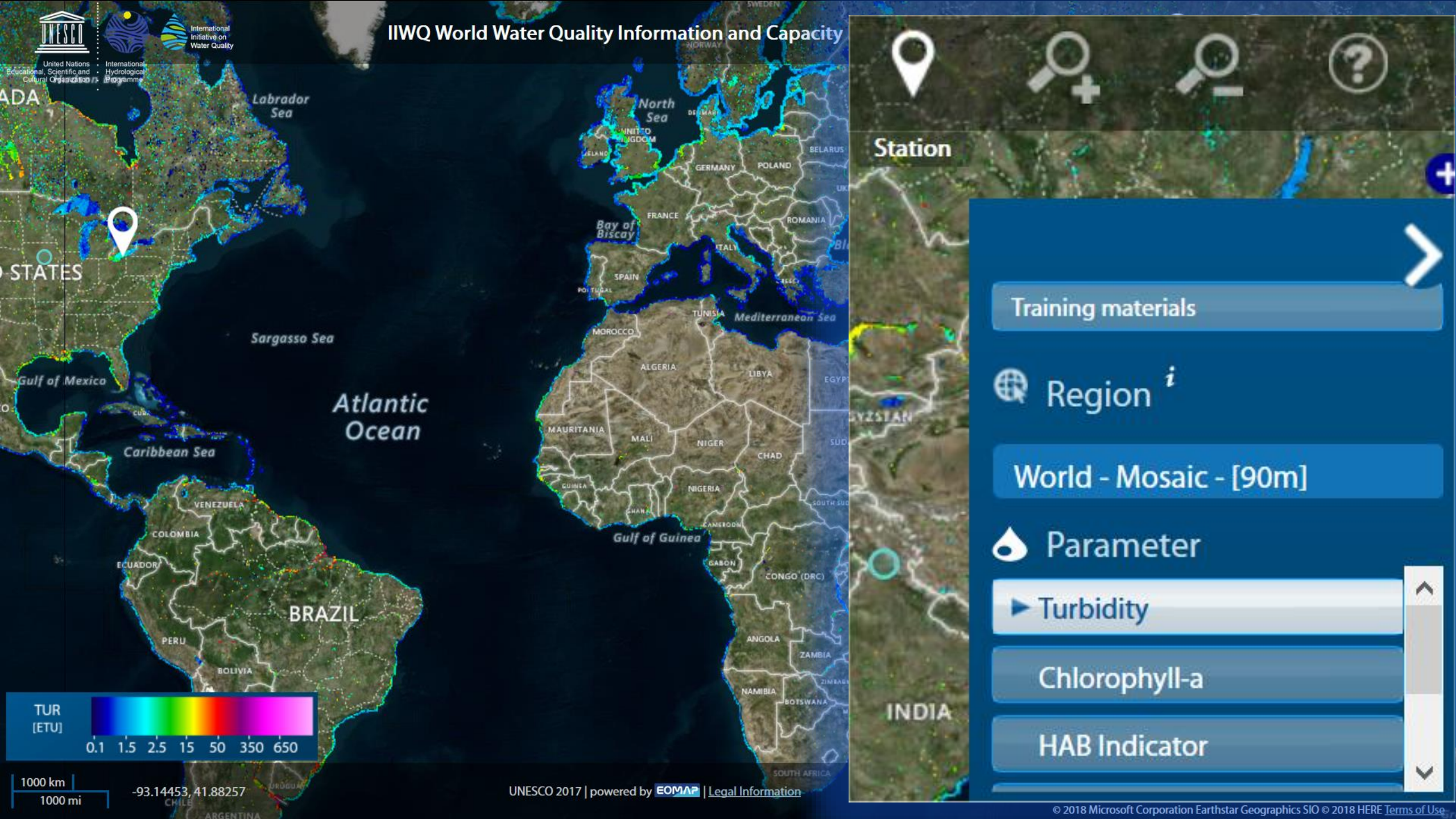
Atlantic Ocean
Mediterranean Sea
Black Sea
Caribbean Sea
Gulf of Mexico
Gulf of Guinea
Sargasso Sea
Arabian Sea
Labrador Sea
North Sea
Bay of Biscay
BRAZIL
KAZAKHSTAN
RUSSIA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1000 km
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Labrador Sea
North Sea
Bay of Biscay
Sargasso Sea
Gulf of Mexico
Atlantic Ocean
Caribbean Sea
Mediterranean Sea
Gulf of Guinea
BRAZIL
INDIA
FRANCE
SPAIN
GERMANY
POLAND
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
CHAD
NIGERIA
VENEZUELA
COLOMBIA
ECUADOR
PERU
BOLIVIA
ANGOLA
ZAMBIA
NAMIBIA
BOTSWANA
CONGO (DRC)
GABON
MOROCCO
TUNISIA
ROMANIA
BELARUS

IIWQ World Water Quality Information and Capacity Building Portal

Introduction

Welcome to UNESCO WaterQualityApp, a free online visualiser for global water quality products of all inland and coastal waters worldwide.

The online platform provides you with water quality based information for all continents including a merged global set of parameters in 90m resolution. You can also access time series products in 30m sampling resolution, for selected regions in each continent, covering the year 2016.

This application allows you to interactively browse the water quality products. Use the features on the right hand side to select your region of interest, select various water quality parameters, set any desired virtual sampling stations, gather values and time series information. A quick information guide gives a summary of how to use this portal, see also below.

To download an information booklet on these products, click Information Booklet Water Quality Monitoring

To download a training handbook covering main practical questions of using satellite based information products, click Training handbook

How to use this Portal

Basic map tools for interacting with the map are provided on the right hand side of the top bar. Basic map tools include zooming and placing a virtual measuring station. A computer mouse can be used for panning and zooming or alternatively, interact on the touch screen of a mobile device. Virtual stations are created with a tap on the map and map sections can be moved by dragging the fingers across the screen.

The blue function bar includes the following:

- Select regions to explore individual dates and time series in 2016 or full world mosaic layers.
- Select water quality parameters (turbidity, chlorophyll-a, the harmfull algae bloom indicator HAB, organic absorption or surface temperature).
- Once virtual station is set, a parameter value is shown in the value section. If you have selected the World Mosaic layer, you can view also the record date below the parameter value.

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The IIWQ World Water Quality Portal

- Whitepaper -

UNESCO International Initiative on Water Quality

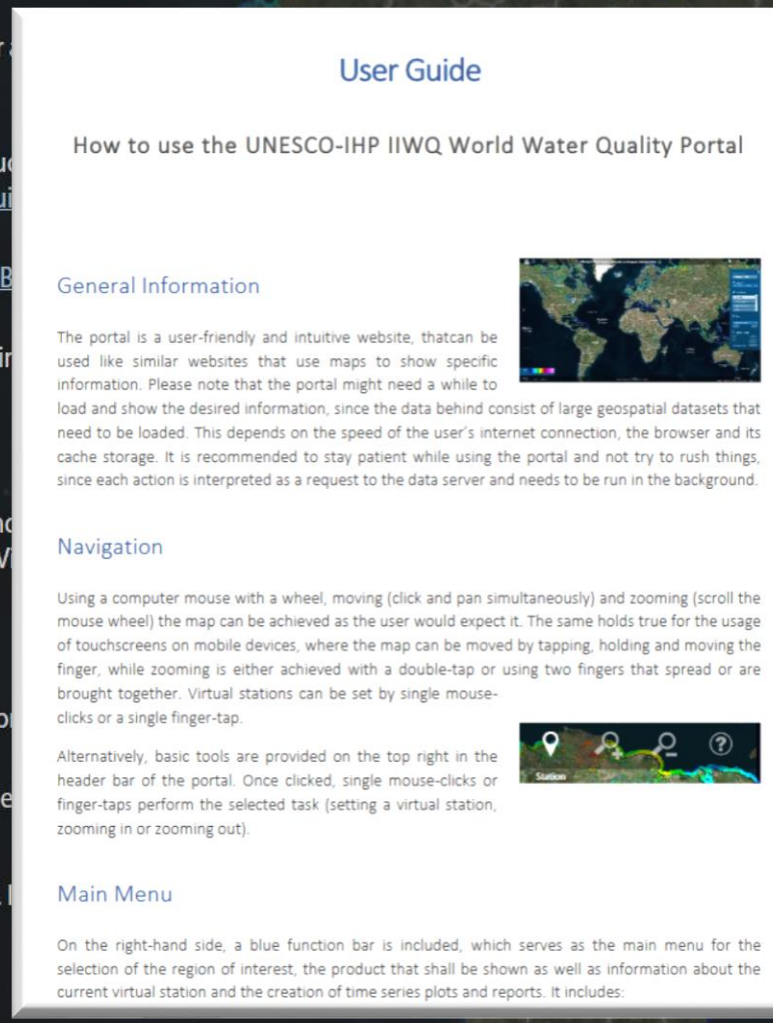
This document is accessible through the UNESCO IIWQ World Water QualityPortal.

This brochure was prepared under the coordination of Dr. SarantuyaaZandaryaa, Programme Specialist for Water Quality, Division of Water Sciences, UNESCO.

Supported by: EOMAP GmbH & Co.KG, Seefeld / Germany

Errors and technical modification subject to change

22 January 2018



User Guide

How to use the UNESCO-IHP IIWQ World Water Quality Portal

General Information

The portal is a user-friendly and intuitive website, thatcan be used like similar websites that use maps to show specific information. Please note that the portal might need a while to load and show the desired information, since the data behind consist of large geospatial datasets that need to be loaded. This depends on the speed of the user's internet connection, the browser and its cache storage. It is recommended to stay patient while using the portal and not try to rush things, since each action is interpreted as a request to the data server and needs to be run in the background.

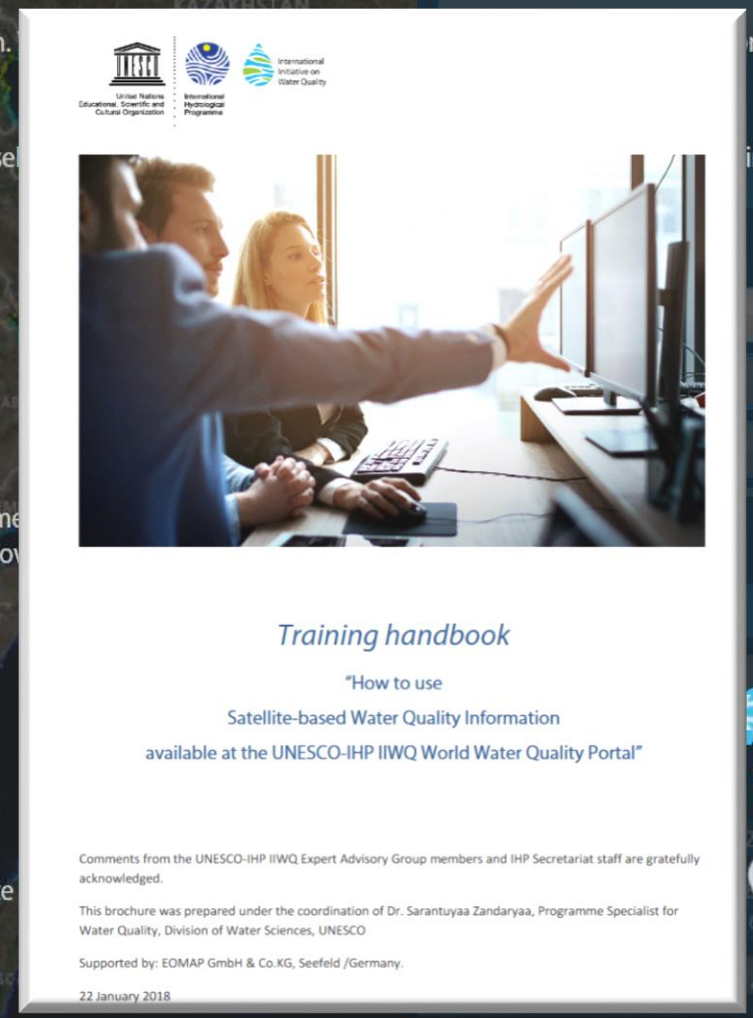
Navigation

Using a computer mouse with a wheel, moving (click and pan simultaneously) and zooming (scroll the mouse wheel) the map can be achieved as the user would expect it. The same holds true for the usage of touchscreens on mobile devices, where the map can be moved by tapping, holding and moving the finger, while zooming is either achieved with a double-tap or using two fingers that spread or are brought together. Virtual stations can be set by single mouse-clicks or a single finger-tap.

Alternatively, basic tools are provided on the top right in the header bar of the portal. Once clicked, single mouse-clicks or finger-taps perform the selected task (setting a virtual station, zooming in or zooming out).

Main Menu

On the right-hand side, a blue function bar is included, which serves as the main menu for the selection of the region of interest, the product that shall be shown as well as information about the current virtual station and the creation of time series plots and reports. It includes:



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Training handbook

"How to use

Satellite-based Water Quality Information

available at the UNESCO-IHP IIWQ World Water Quality Portal"

Comments from the UNESCO-IHP IIWQ Expert Advisory Group members and IHP Secretariat staff are gratefully acknowledged.

This brochure was prepared under the coordination of Dr. Sarantuyaa Zandaryaa, Programme Specialist for Water Quality, Division of Water Sciences, UNESCO

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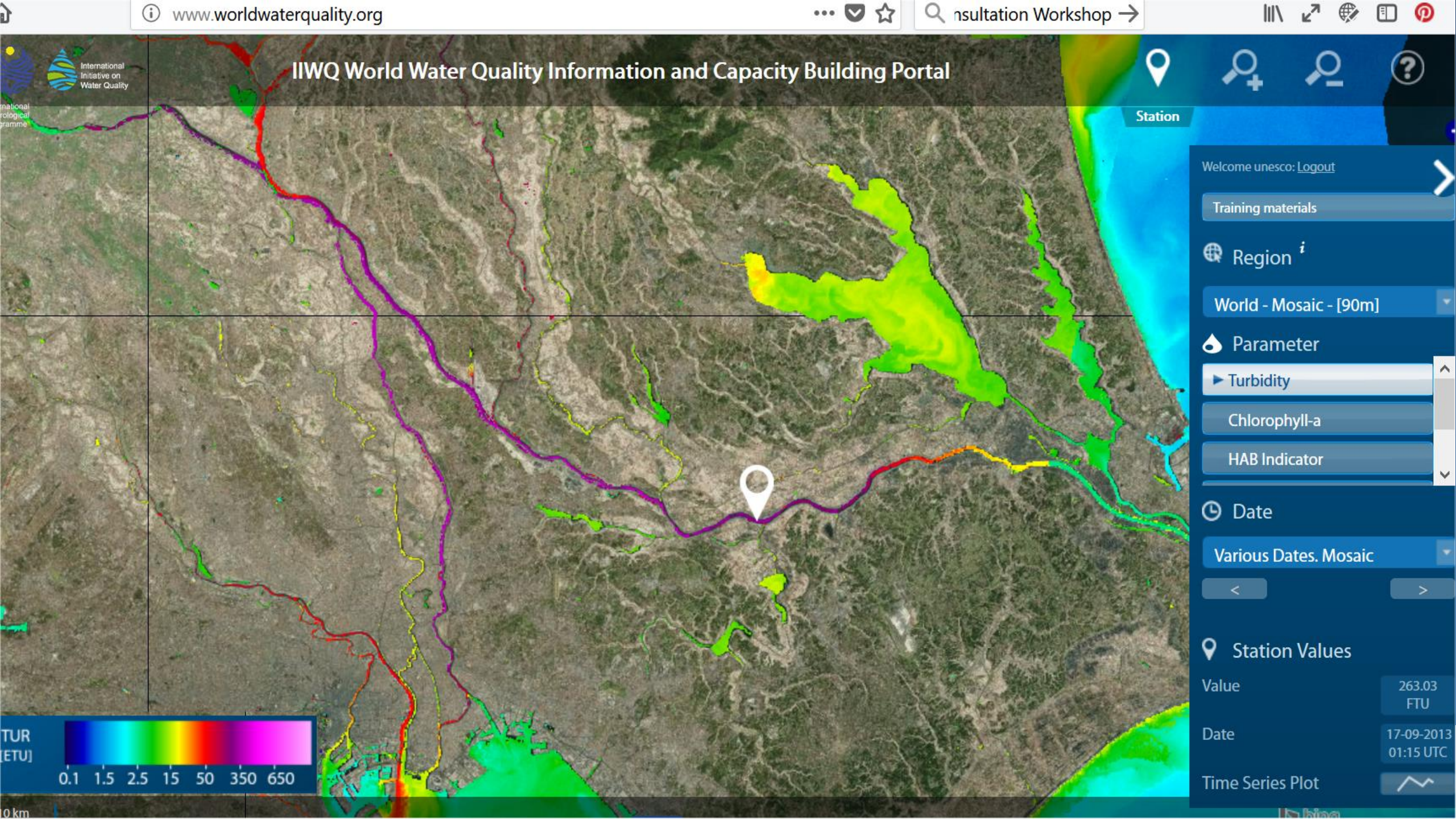
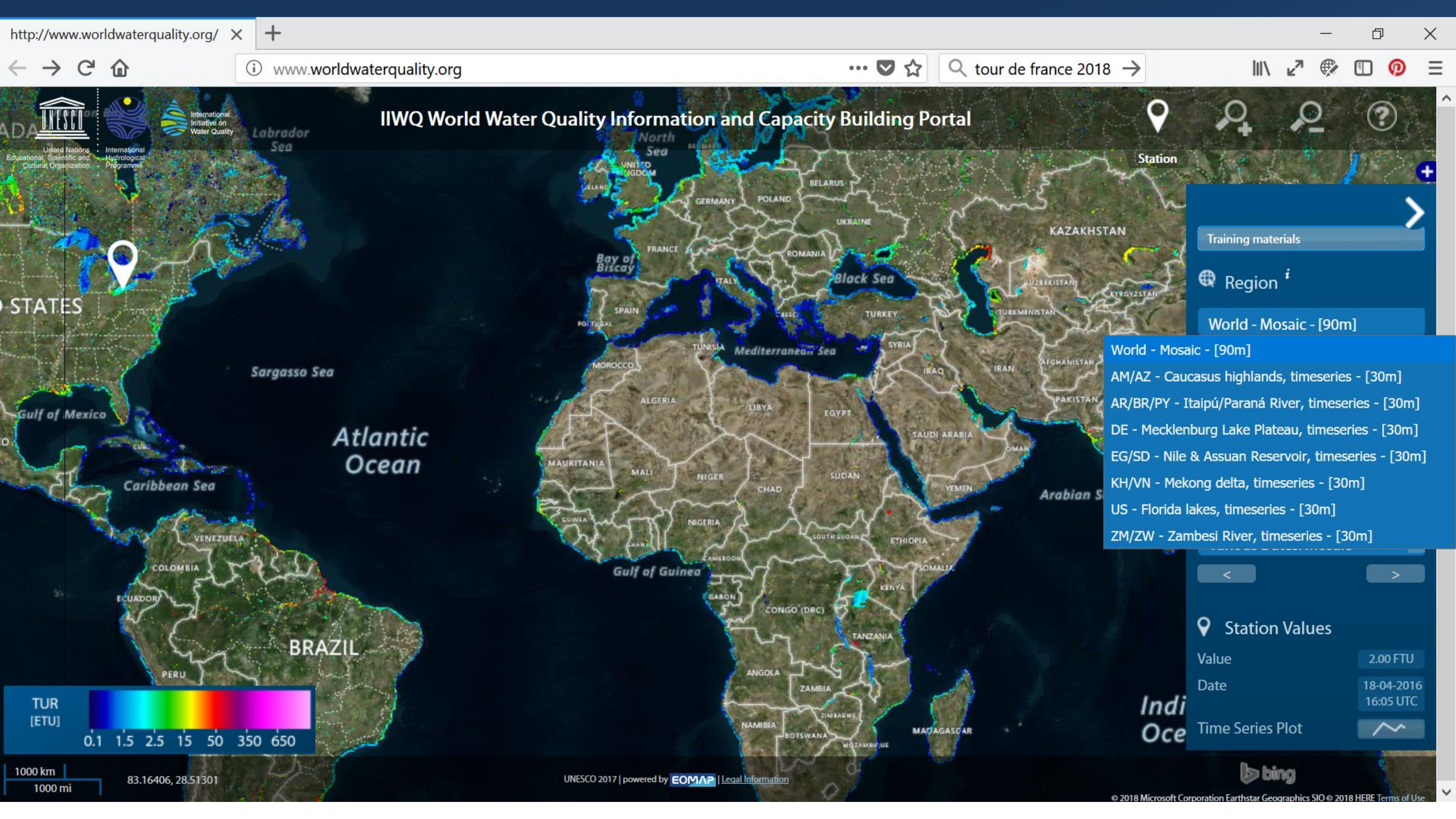
22 January 2018


www.worldwaterquality.org
nsultation Workshop
International Initiative on Water Quality
IIWQ World Water Quality Information and Capacity Building Portal
Station
Welcome unesco: Logout
Training materials
Region
World - Mosaic - [90m]
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Date
Various Dates. Mosaic
<
>
Station Values
Value
263.03 FTU
Date
17-09-2013 01:15 UTC
Time Series Plot
TUR [ETU]
0.1 1.5 2.5 15 50 350 650
0 km


http://www.worldwaterquality.org/
www.worldwaterquality.org
tour de france 2018
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International Hydrological Programme
International Initiative on Water Quality
Station
Training materials
Region
World - Mosaic - [90m]
World - Mosaic - [90m]
AM/AZ - Caucasus highlands, timeseries - [30m]
AR/BR/PY - Itaipú/Paraná River, timeseries - [30m]
DE - Mecklenburg Lake Plateau, timeseries - [30m]
EG/SD - Nile & Assuan Reservoir, timeseries - [30m]
KH/VN - Mekong delta, timeseries - [30m]
US - Florida lakes, timeseries - [30m]
ZM/ZW - Zambesi River, timeseries - [30m]
Station Values
Value
2.00 FTU
Date
18-04-2016 16:05 UTC
Time Series Plot
TUR [ETU]
0.1 1.5 2.5 15 50 350 650
1000 km
1000 mi
83.16406, 28.51301
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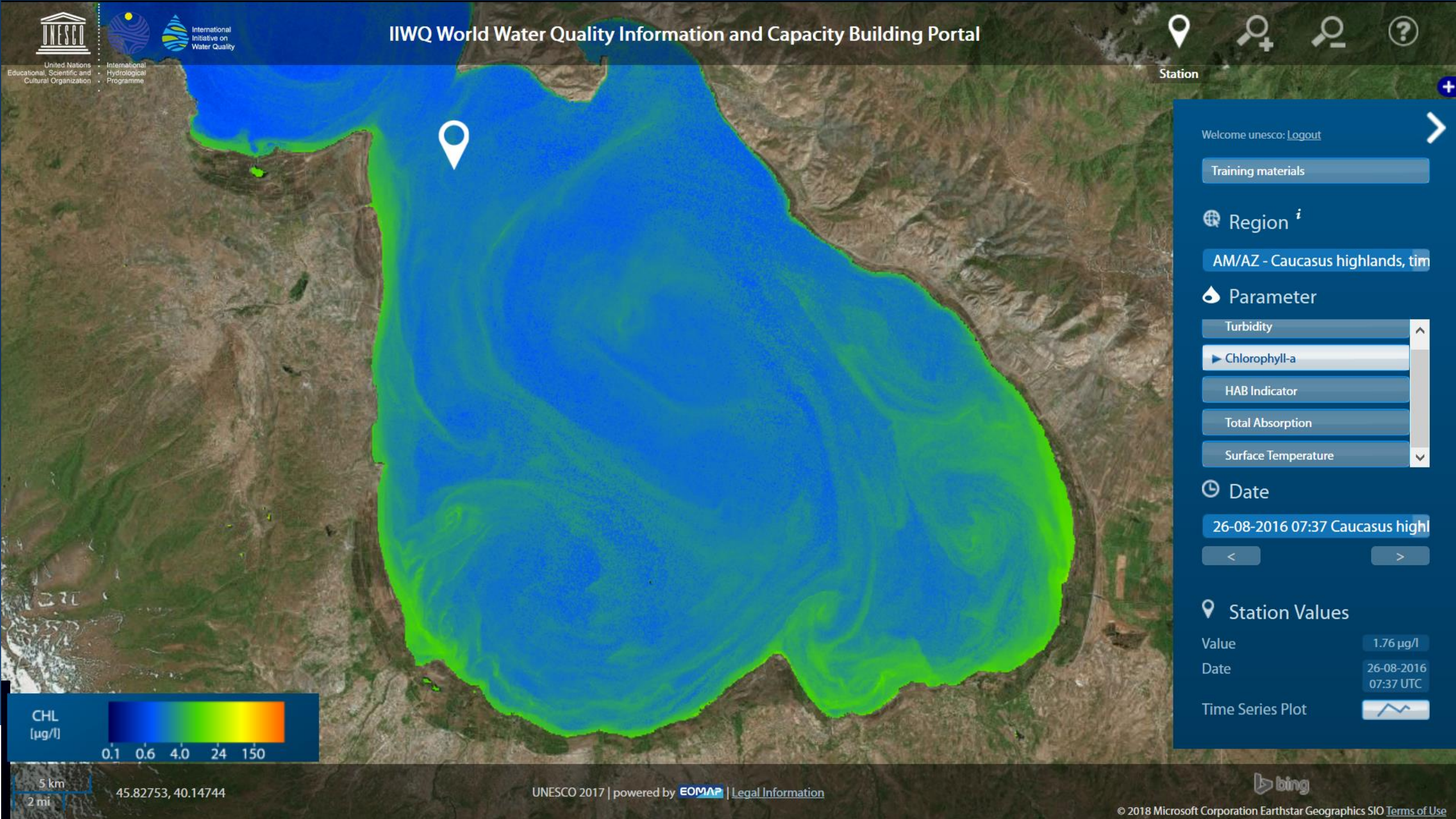
Atlantic Ocean
Sargasso Sea
Gulf of Mexico
Caribbean Sea
Mediterranean Sea
Black Sea
Bay of Biscay
North Sea
Labrador Sea
Gulf of Guinea
Arabian Sea
BRAZIL
KAZAKHSTAN


United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme
International Initiative on Water Quality
IIWQ World Water Quality Information and Capacity Building Portal
Station
Welcome unesco: Logout
Training materials
Region
AM/AZ - Caucasus highlands, tim
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
Surface Temperature
Date
26-08-2016 07:37 Caucasus highl
<
>
Station Values
Value
1.76 µg/l
Date
26-08-2016 07:37 UTC
Time Series Plot
CHL [µg/l]
0.1 0.6 4.0 24 150
5 km
2 mi
45.82753, 40.14744
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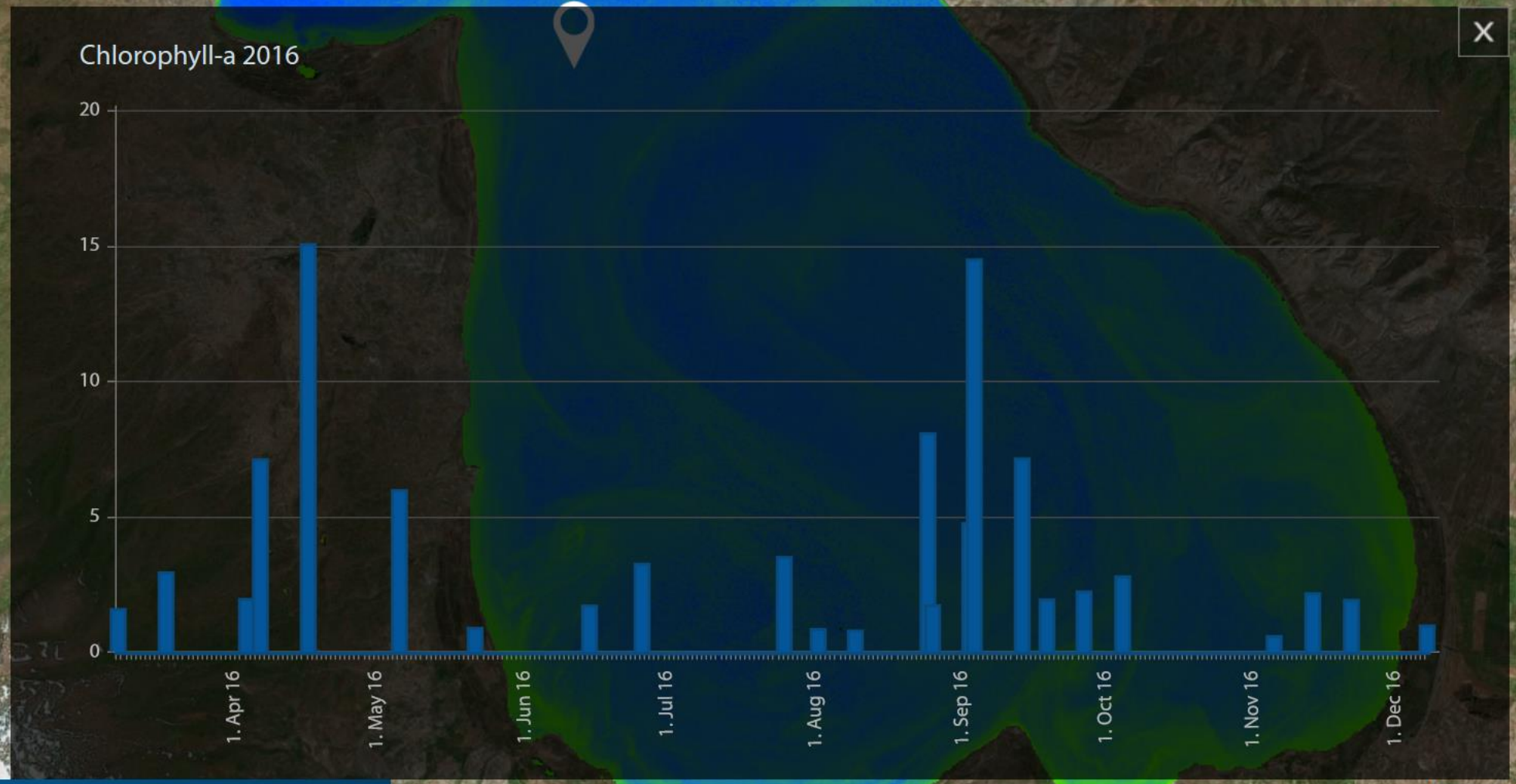
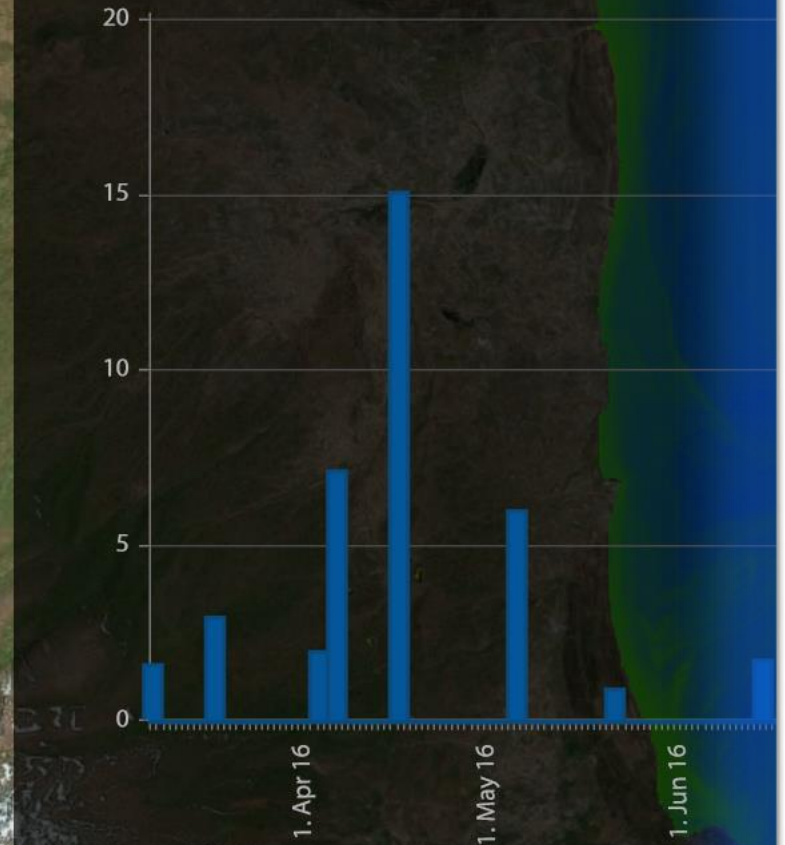


Welcome unesco: Logout
Training materials
Region
AM/AZ - Caucasus highlands, tim
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
Surface Temperature
Date
26-08-2016 07:37 Caucasus highl
< >
Station Values
Value 1.76 µg/l
Date 26-08-2016 07:37 UTC
Time Series Plot
Click here to generate a time series plot.
Report

CHL [µg/l]
0.1 0.6 4.0 24 150

5 km
2 mi
45.80624, 40.14691



WATER QUALITY REPORT

Generated at: 2018-01-21 Time 17:41:40
Parameter: Chlorophyll-a
Unit: µg/l
Product: eoWater (satellite based)

Region: AM/AZ - Caucasus highlands, timeseries - [30m]
Station lat/lon: 40.41433 / 45.26688
Year: 2016
Median: 2.24
Mean: 3.97
Minimum value: 0.62
Bottom quintile: 1.38
Top quintile: 6.46
Maximum value: 15.09

Trophic State Index (according to Carlson 1977): Oligotrophic
Oligotrophic: 54.17%
Mesotrophic: 33.33%
Eutrophic: 12.50%

Report

Welcome unesco: Logout

Training materials

Region

AM/AZ - Caucasus highlands, tim

Parameter

Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
Surface Temperature

Date

26-08-2016 07:37 Caucasus highl

< >

Station Values

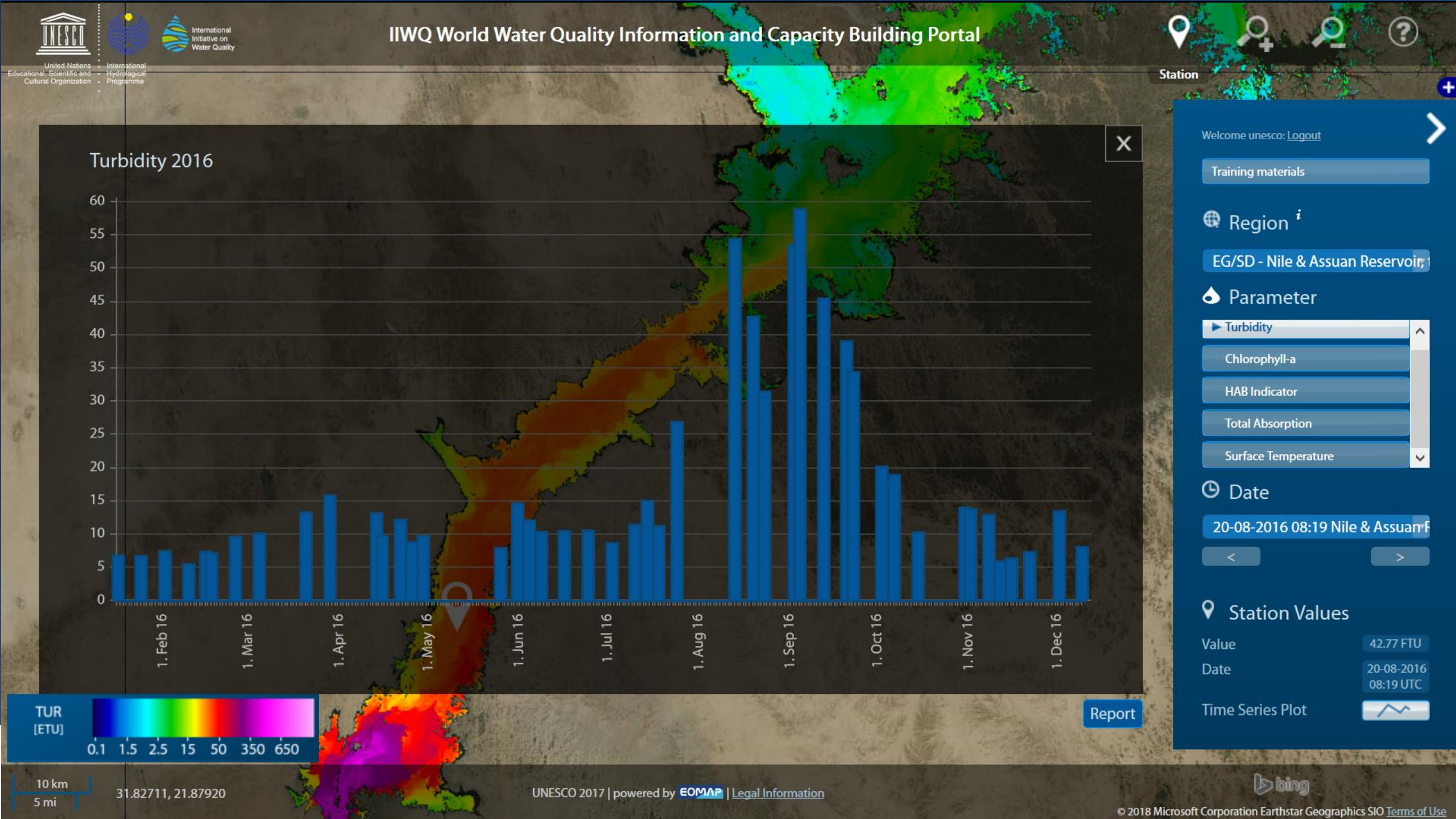
Value 1.76 µg/l
Date 26-08-2016 07:37 UTC
Time Series Plot

Click here to generate a time series plot.

CHL [µg/l]
0.1 0.6 4.0 24 150

5 km
2 mi

45.80624, 40.14691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International Hydrological Programme
International Initiative on Water Quality
Station
Turbidity 2016
60
55
50
45
40
35
30
25
20
15
10
5
0
1. Feb 16
1. Mar 16
1. Apr 16
1. May 16
1. Jun 16
1. Jul 16
1. Aug 16
1. Sep 16
1. Oct 16
1. Nov 16
1. Dec 16
Welcome unesco: Logout
Training materials
Region
EG/SD - Nile & Assuan Reservoir
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
Surface Temperature
Date
20-08-2016 08:19 Nile & Assuan R
Station Values
Value 42.77 FTU
Date 20-08-2016 08:19 UTC
Time Series Plot
Report
TUR [ETU]
0.1 1.5 2.5 15 50 350 650
10 km
5 mi
31.82711, 21.87920
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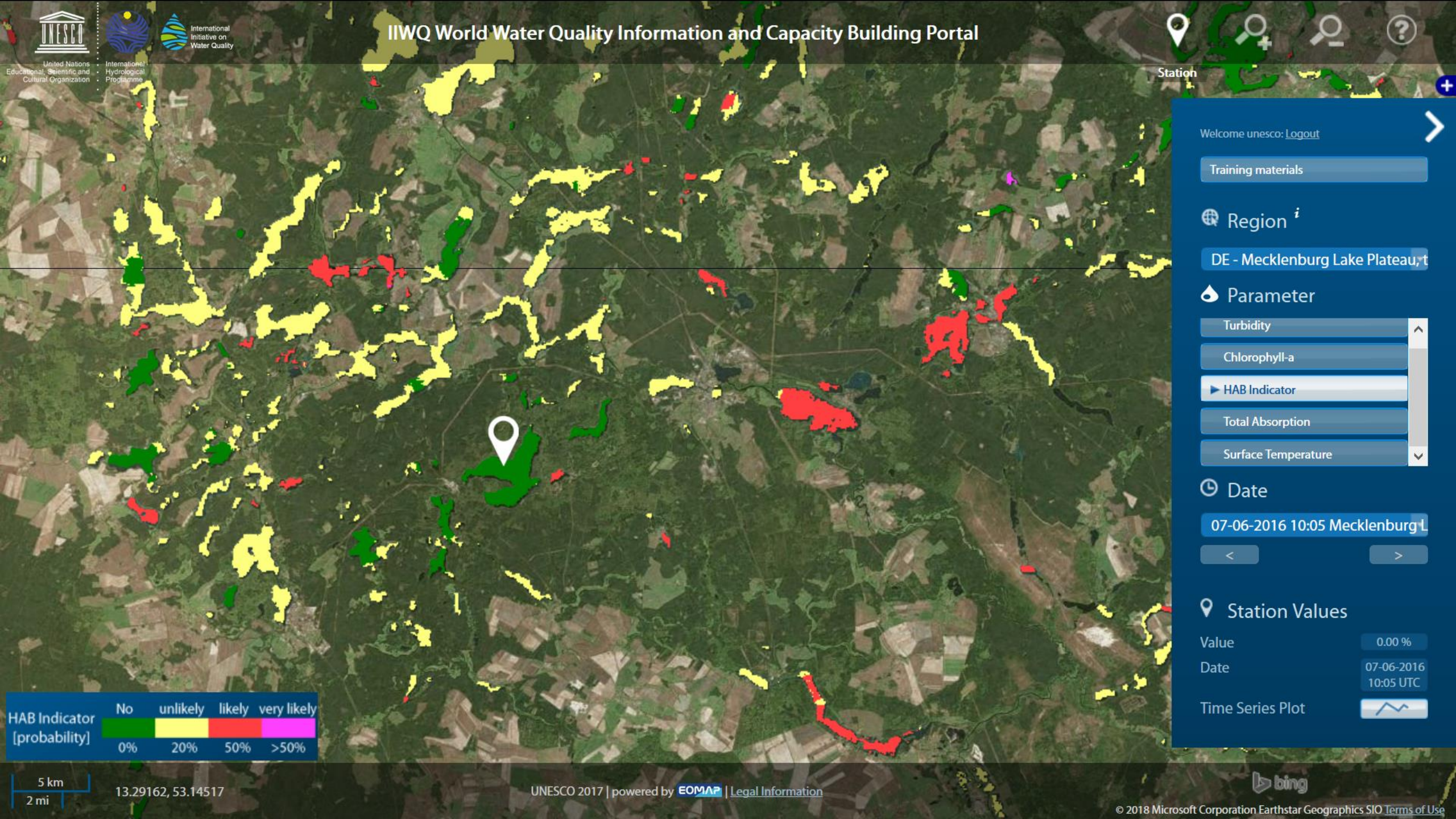
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International Hydrological Programme
International Initiative on Water Quality
IIWQ World Water Quality Information and Capacity Building Portal
Station
Welcome unesco: Logout
Training materials
Region
DE - Mecklenburg Lake Plateau,t
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
Surface Temperature
Date
07-06-2016 10:05 Mecklenburg L
<
>
Station Values
Value
0.00 %
Date
07-06-2016 10:05 UTC
Time Series Plot
HAB Indicator [probability]
No
unlikely
likely
very likely
0%
20%
50%
>50%
5 km
2 mi
13.29162, 53.14517
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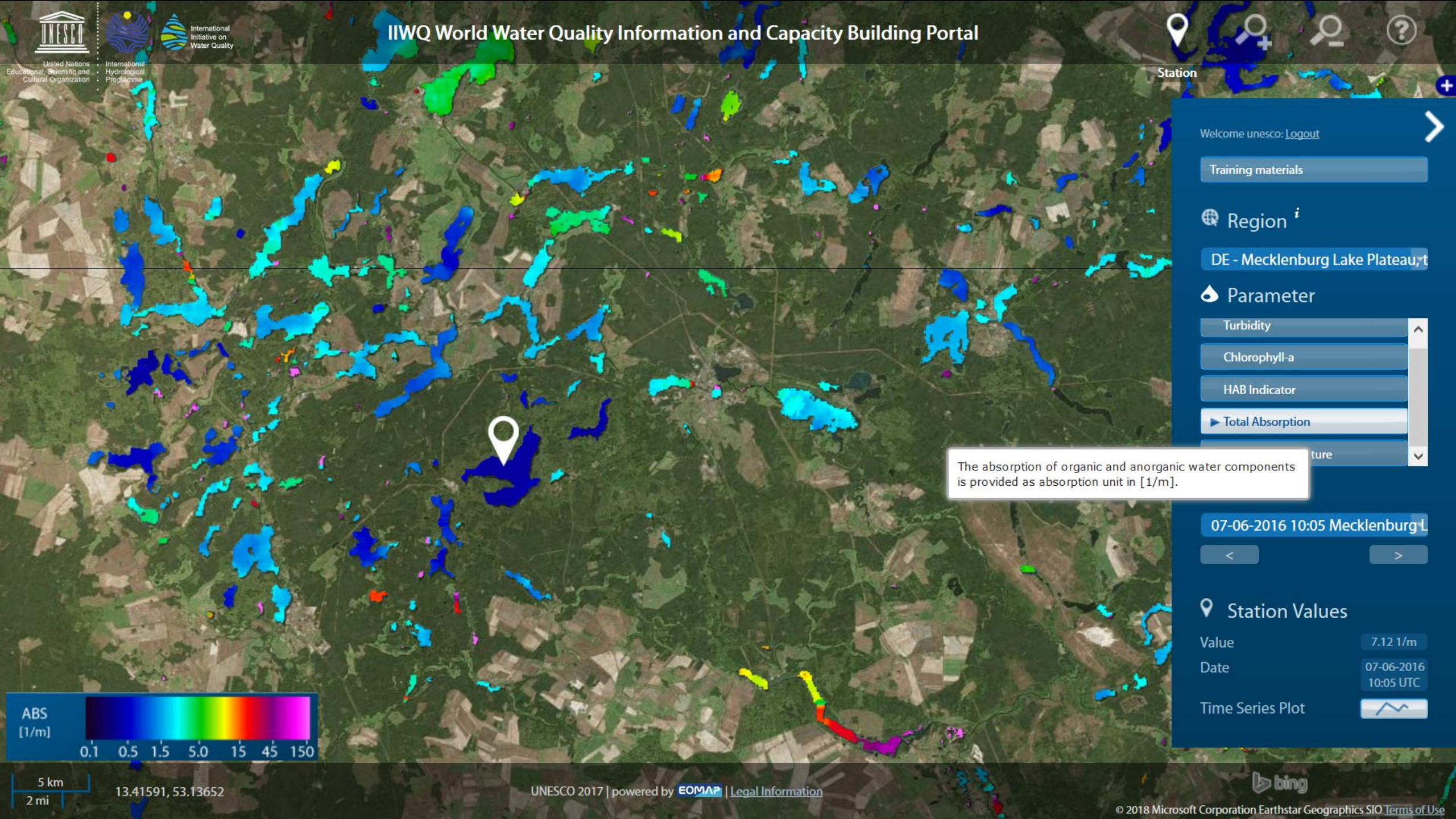
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Welcome unesco: Logout
Training materials
Region
DE - Mecklenburg Lake Plateau,t
Parameter
Turbidity
Chlorophyll-a
HAB Indicator
Total Absorption
ture
The absorption of organic and anorganic water components is provided as absorption unit in [1/m].
07-06-2016 10:05 Mecklenburg L
<
>
Station Values
Value
7.12 1/m
Date
07-06-2016 10:05 UTC
Time Series Plot
ABS [1/m]
0.1 0.5 1.5 5.0 15 45 150
5 km
2 mi
13.41591, 53.13652
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Key drivers to exploit the use of EO

Innovate & practical use of new environmental analytics

- ✓ **Awareness**, capacity building, marketing, e.g. global flagship showcases
- ✓ **Exchange/access to public financed data:** e.g. GEOSS, worldwaterquality portal, …
- ✓ **Alignment** to demand

=> Reliable, cost-efficient and quality assured products and services

=> Push on further innovation: Market driven rather then institutional driven!

=> Push on global comparability, standards, QC

Roles & strength

- Public/commercial users
- Service industry
- Research institutions
- Space-Agencies
- Policy makers
- UN institutions

Demand driver

Innovation driver

Service-designer

Efficiency driver

Contractor

Basic research

Capacity building

Basic data provider

Pilot studies

Policy frame

International cooperation concept

THANK YOU

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EOMAP HQ near Munich

EOMAP HQ
Schloss Seefeld, DE