

# EOMAP

## WATER QUALITY MAPPING FOR EMERGENCY APPLICATION IN DRINKING WATERS USING HIGH AND VERY HIGH RESOLUTION SATELLITE DATA

26.05.2022 | Dr. Thomas Heege, Philipp Bauer, Karin Schenk, Laurent Pouget



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# WHO IS EOMAP?



Private high-tech company



Focusing on satellite data analytics and SaaS solutions



Specialised on aquatic & marine environments, +1000 contracts



Serving engineering companies, governments, and academia



+30 employees  
+40% turnover growth in 2021



HQ in Germany  
with offices in USA,  
Australia, Indonesia,  
Dubai

# Why Water Quality from Space

**The challenge:** Sampling is *local, time and cost intensive*

More & affordable data for better decisions required

Holistic economic and ecological assessments

E.g. data on

Susp. Sediments

Eutrophication

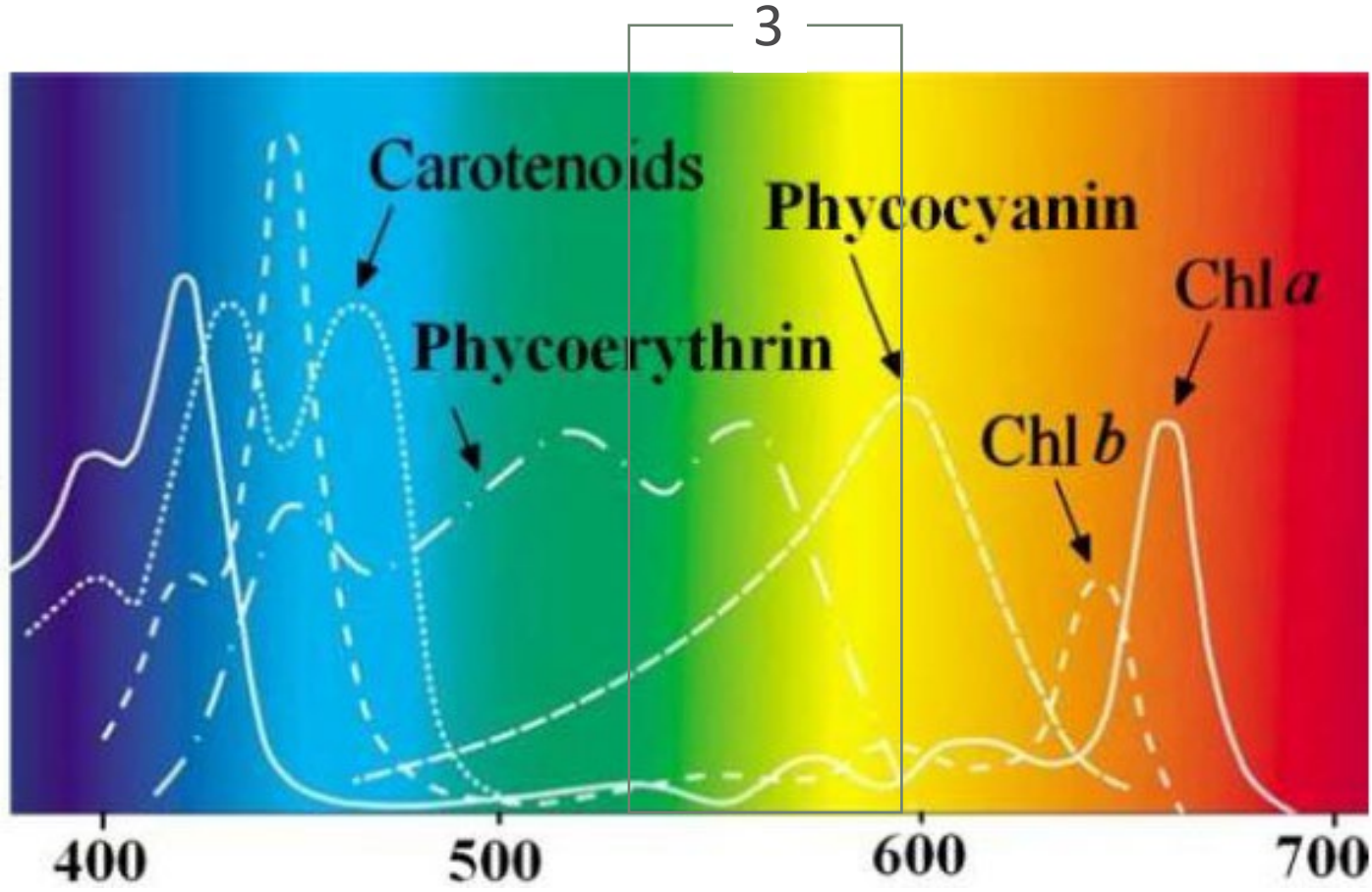
**Toxic Algae Blooms**



# How to detect Cyanobacteria

Specific spectral absorption

Sensor-generic detection and quantification approach



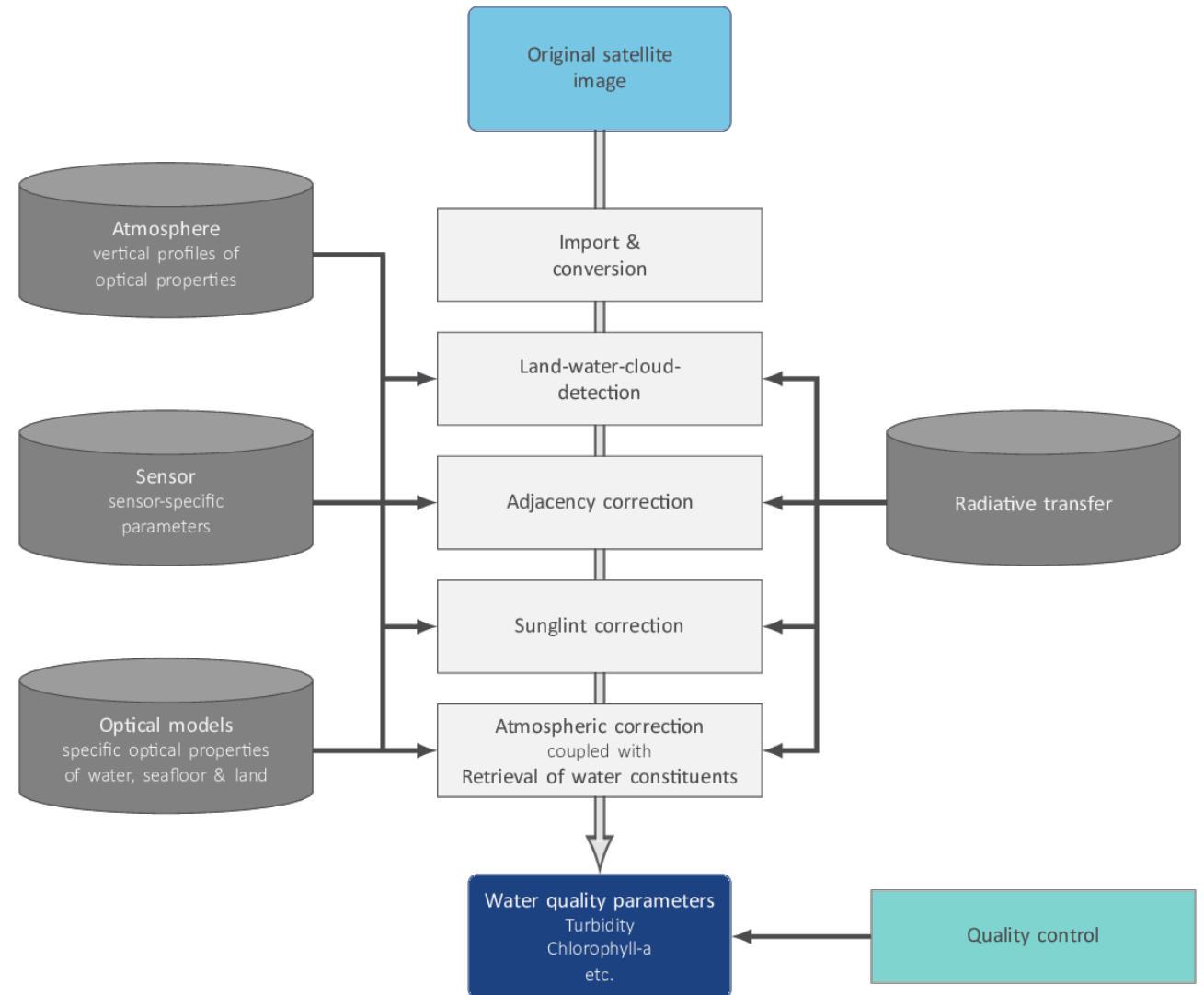
From: <https://www.wageningenur.nl/en/show/Natural-food-colorants-from-microalgae-1.htm>  
after: Zimmermann 1991, modified

# EOMAP data analytics

Fully sensor-agnostic

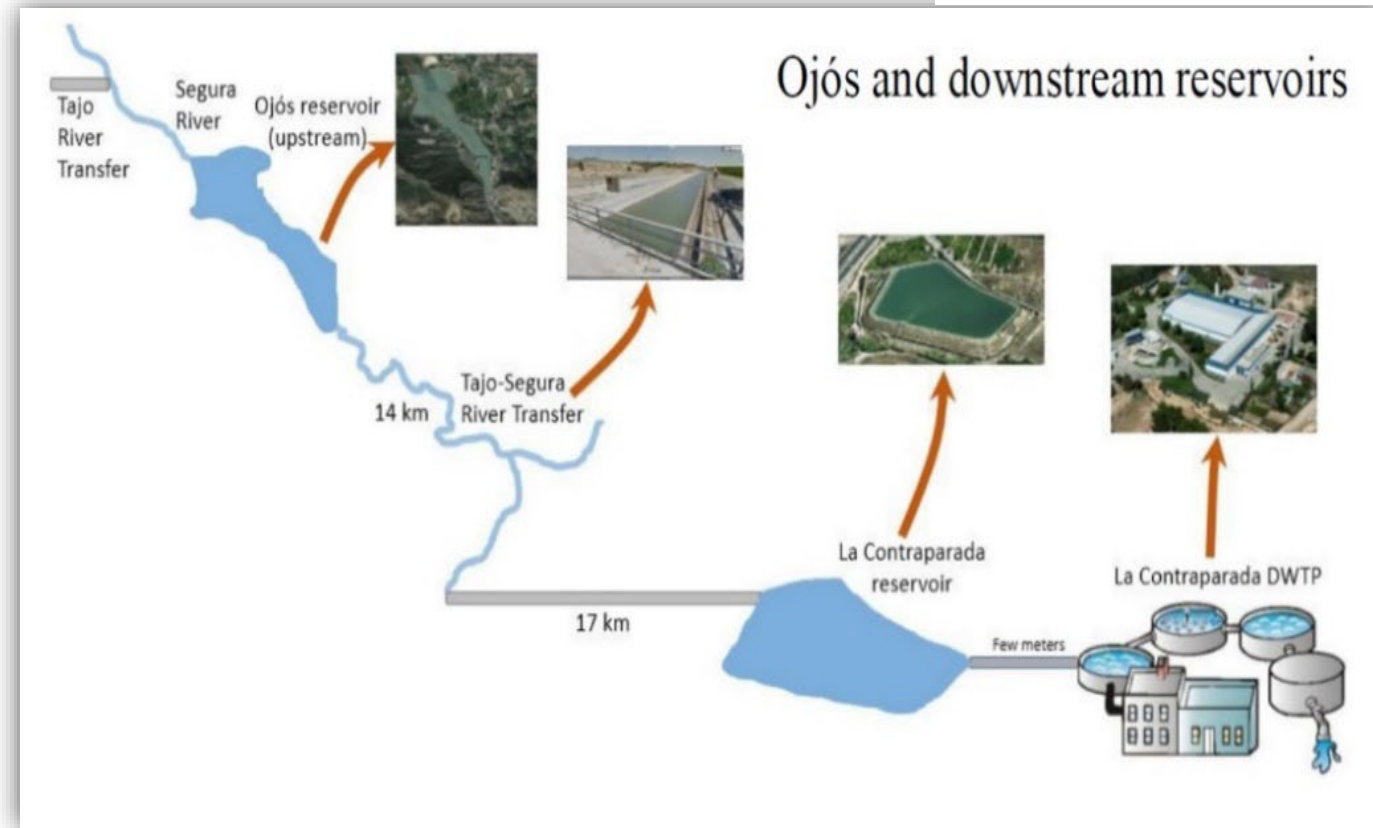
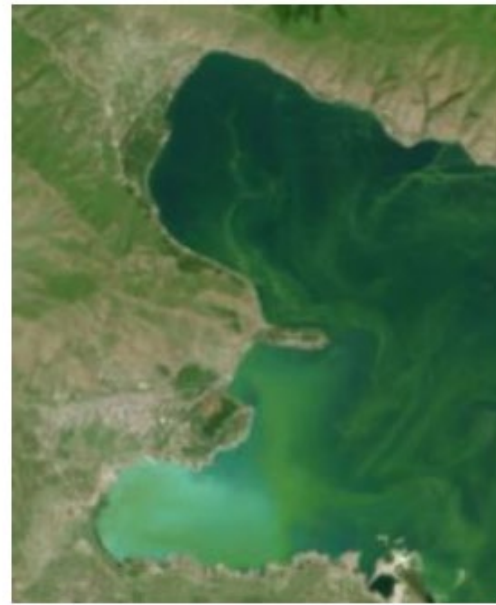
Fully physics-based

In commercial routine operations since 2006

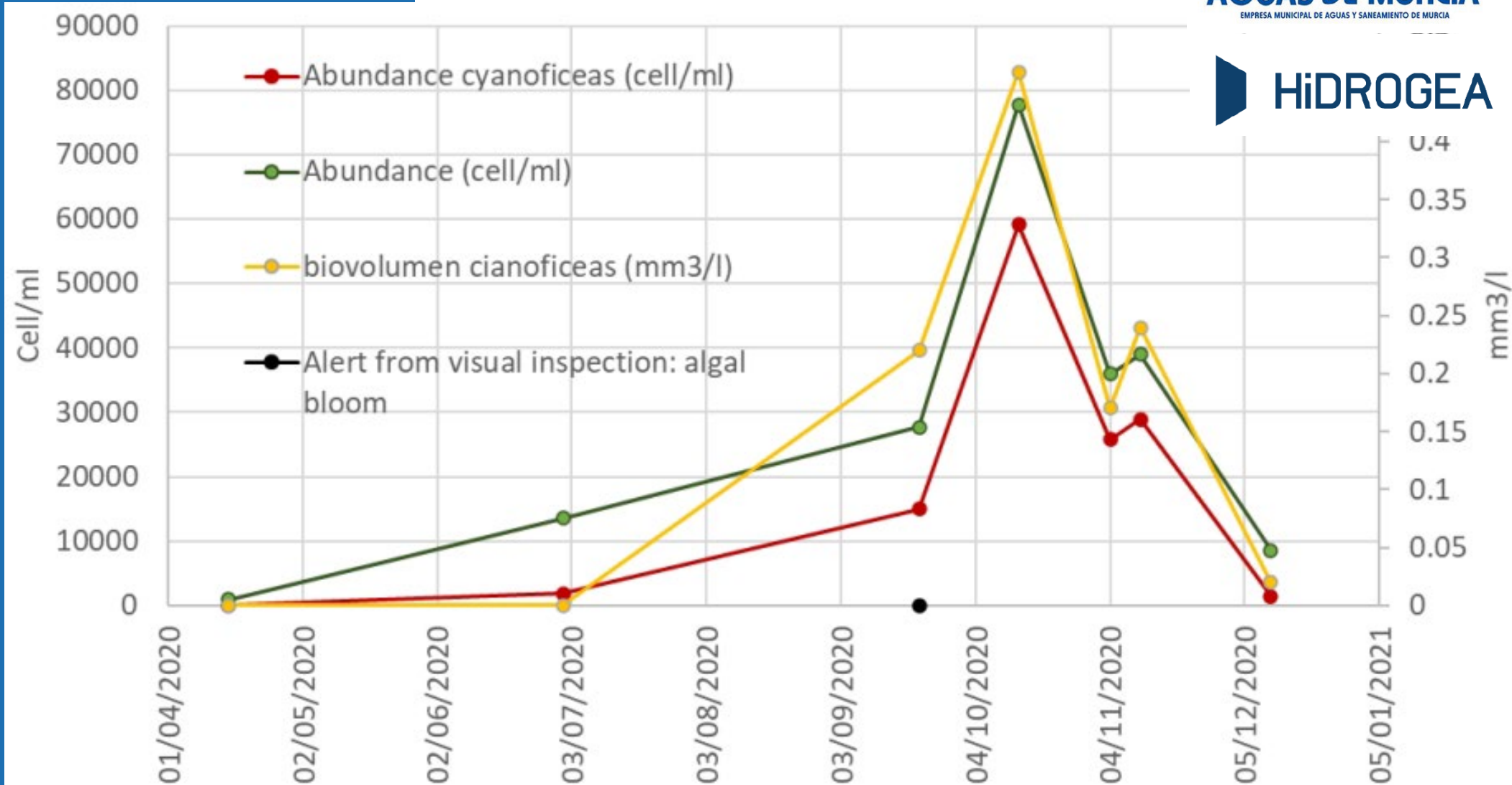


# USE CASE OJÓS AND DOWNSTREAM RESERVOIRS

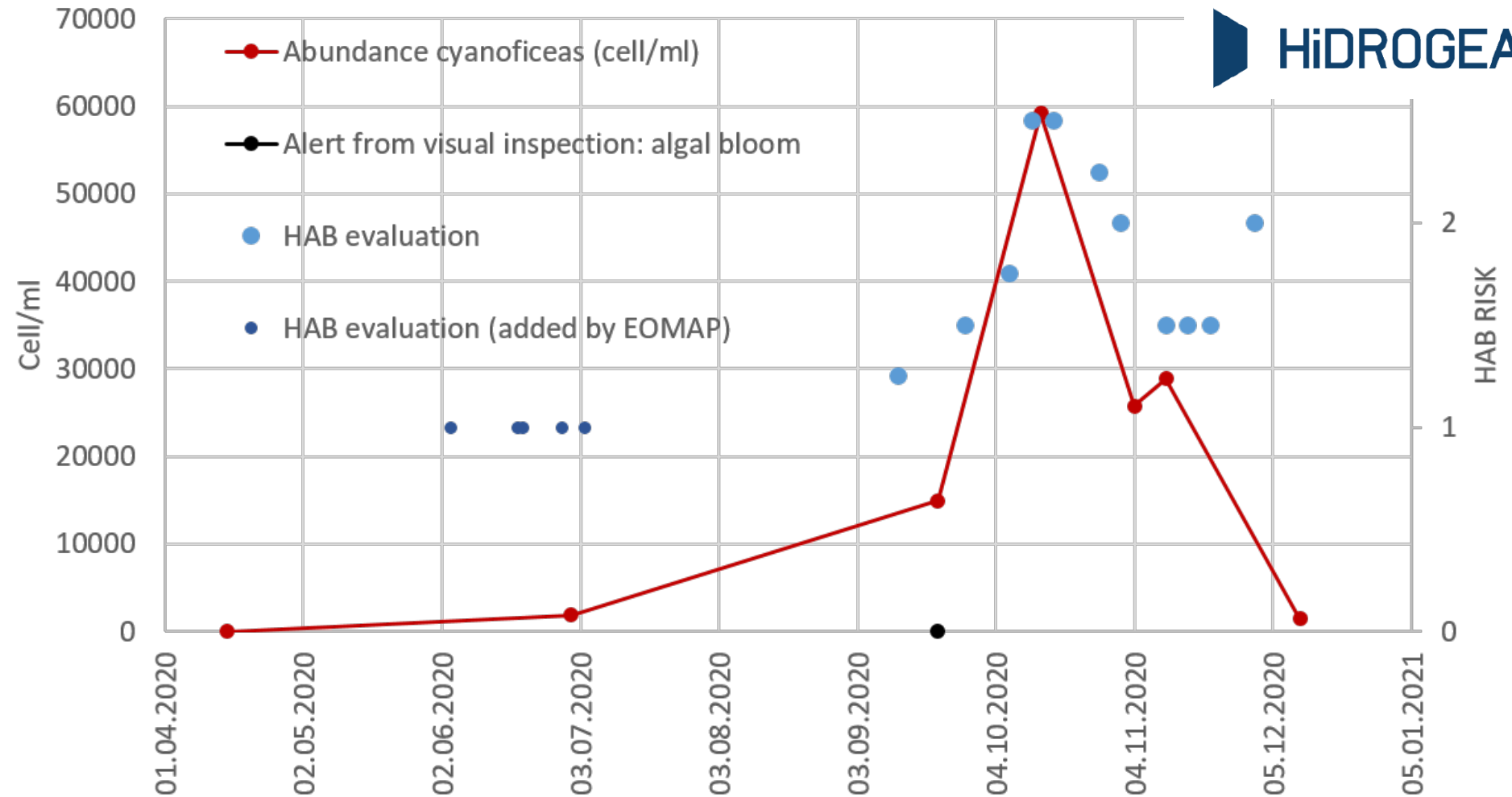
## SURFACE WATER SUPPLY FOR MURCIA METROPOLITAN REGION



# How does EO match?

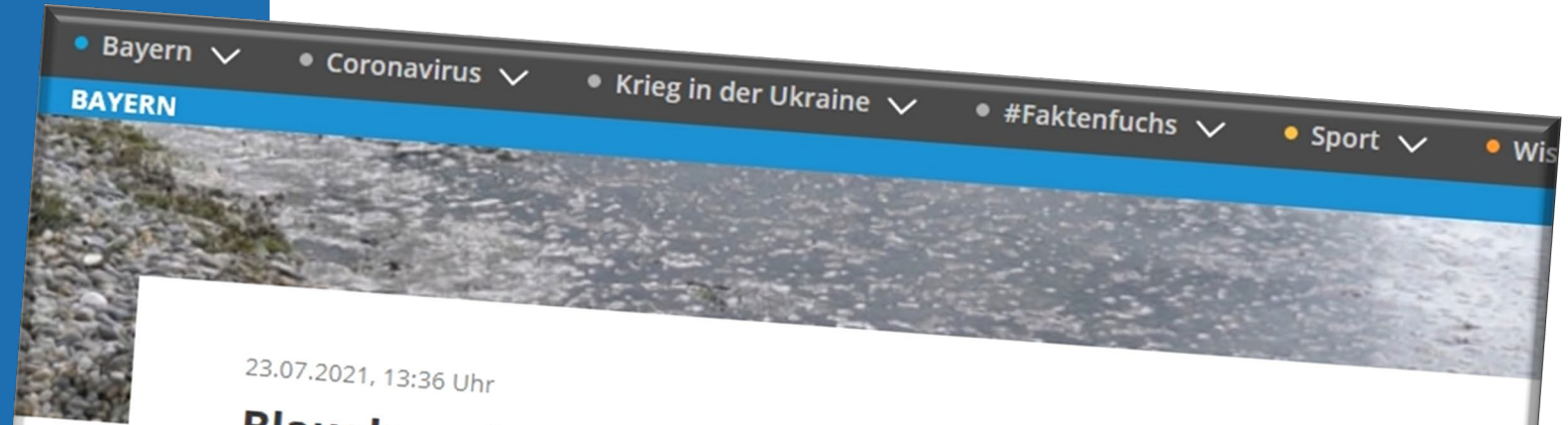


# How does EO match?






# EOMAP data of practical help?



23.07.2021, 13:36 Uhr

## Blualgen: Hund stirbt nach Bad im Mandichosee

Nach einem Aufenthalt im Merchinger Mandichosee ist ein Hund gestorben. Ursache: Vermutlich eine Blualgen-Vergiftung. Schon vor zwei Jahren war dort die für Kleinkinder und Hunde manchmal gefährliche Gattung "Tychonema" festgestellt worden.

Von  Matthias Lauer

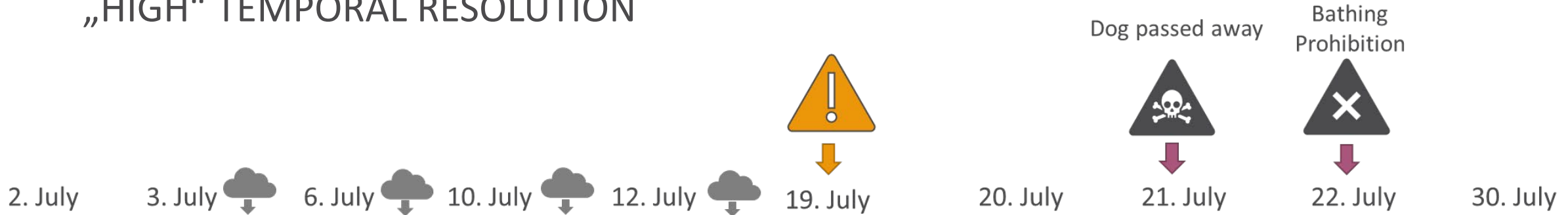
Im Mandichosee in Landkreis Aichach-Friedberg wurde vor zwei Jahren die eher seltene Blualgengattung "Tychonema" festgestellt. Seitdem stehen große Informationstafeln am See. Das Verschlucken einer größeren Menge an Blualgen kann gefährlich sein, insbesondere für Hunde und Kleinkinder.

### Wasserprobe bestätigt Blualgen

Am Mittwoch (21.07.21) erreichte das Gesundheitsamt die Meldung, dass ein Hund nach einem

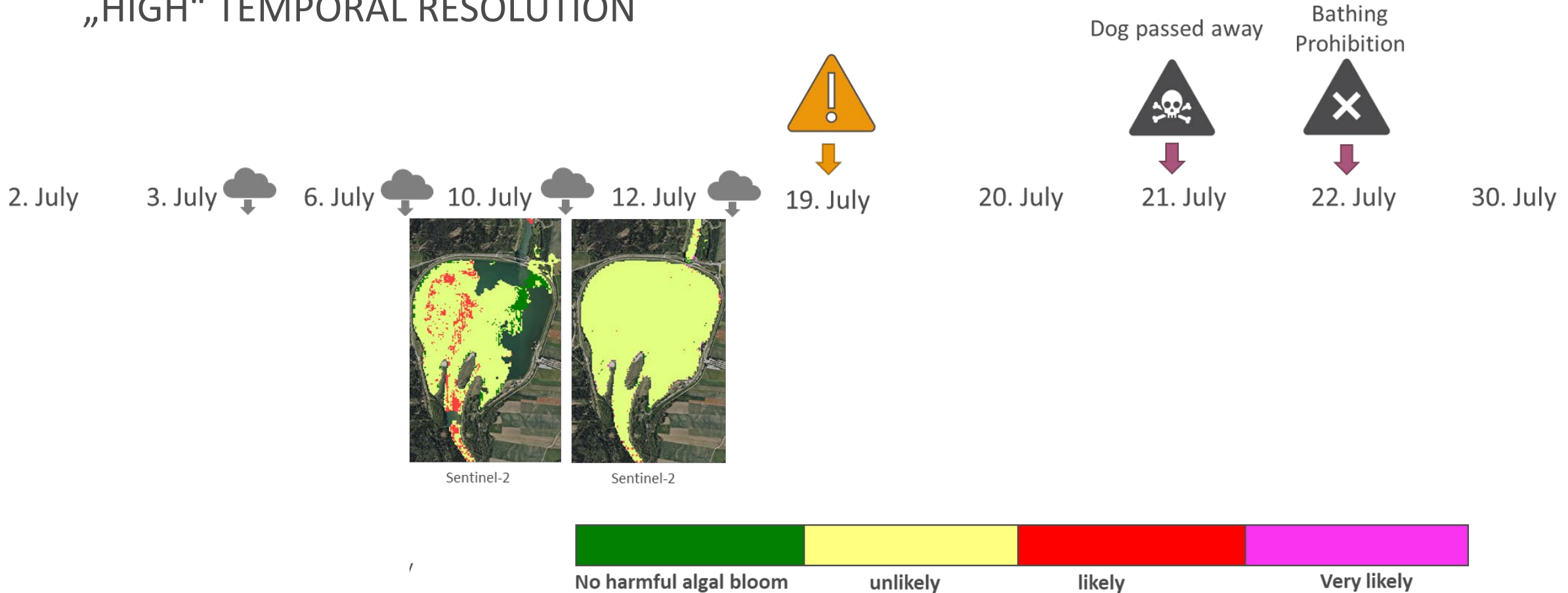
# HARMFUL ALGAL MONITORING MANDICHOSEE

„HIGH“ TEMPORAL RESOLUTION



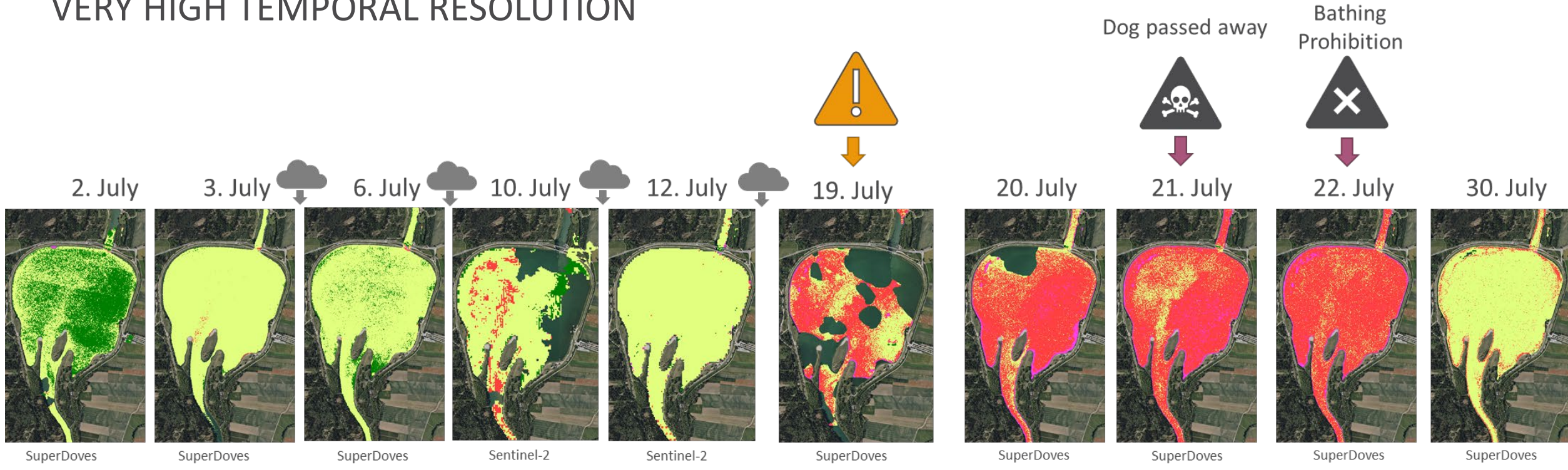
# HARMFUL ALGAL MONITORING MANDICHOSEE

„HIGH“ TEMPORAL RESOLUTION



# HARMFUL ALGAL MONITORING MANDICHOSEE

## VERY HIGH TEMPORAL RESOLUTION



### Data Sources:

PlanetLabs SuperDoves, 3m spatial, daily  
Sentinel-2A/B, 10m spatial, every 5 days



# Routine operations:

Env. Agency Rhineland-Palatinate

The screenshot shows the EOMAP web application interface. The browser address bar displays 'eoportal.de/#/'. The page header includes 'eoPortal', navigation icons, 'WELCOME THOMAS', and the EOMAP logo with the tagline 'detect more.'. The main interface is divided into a left sidebar and a central content area.

**Left Sidebar (Visualize):**

- Selected Region: Nördliche Vorderpfalz - DEU
- Gridded EO Products
- Layer: Algenblütenindikator
- Temporal Resolution: All
- Date/time of displayed layer: 2022-05-14 10:36:52
- Add RGB Background Layer
- In-Situ and Model Data
- Virtual Stations
- Plot Preview

**Central Content Area:**

The map shows a lake area with a yellow and red color-coded overlay representing the Algenblütenindikator (Algal Bloom Indicator). The legend below the map indicates four classes: 1 (No, green), 2 (Unlikely, yellow), 3 (Likely, red), and 4 (Very likely, pink).

**Right Panel (Line Graph):**

The line graph displays B1 Chlorophyll concentration in  $\mu\text{g/l}$  over time from May 2021 to October 2021. The legend identifies three data series:

- Station: Hinterer Altrhein B1 Chlorophyll [ $\mu\text{g/l}$ ] [ $\mu\text{g/l}$ ] (Blue line)
- Station: Roxheimer Altrhein W (Bades) B1 Chlorophyll [ $\mu\text{g/l}$ ] [ $\mu\text{g/l}$ ] (Orange line)
- Station: Roxheimer Altrhein W B1 Chlorophyll [ $\mu\text{g/l}$ ] [ $\mu\text{g/l}$ ] (Green line)

The blue line shows a significant peak in late June/early July 2021, reaching approximately 105  $\mu\text{g/l}$ . The other two lines remain relatively low, mostly below 20  $\mu\text{g/l}$ .

**Bottom Panel:**

Buttons for 'CREATE REPORT', 'EXPORT DATA', and 'RESET DATA' are visible. A scale bar indicates 1 km. The footer contains the EOMAP logo, contact information (EOMAP GmbH & Co. KG | Schlosshof 4a | D-82229 Seefeld | info@eomap.de | Legal Notice), and map data attribution (© Mapbox © OpenStreetMap Improve this map).

# Routine operations:

## Cahora Bassa CHB Mozambique

The screenshot displays the eoPortal | EOMAP web interface. The browser address bar shows `eoportal.de/#/`. The page header includes the logo, a user greeting "WELCOME THOMAS", and the EOMAP logo with the tagline "detect more.". The main content area is divided into a left sidebar and a main map area.

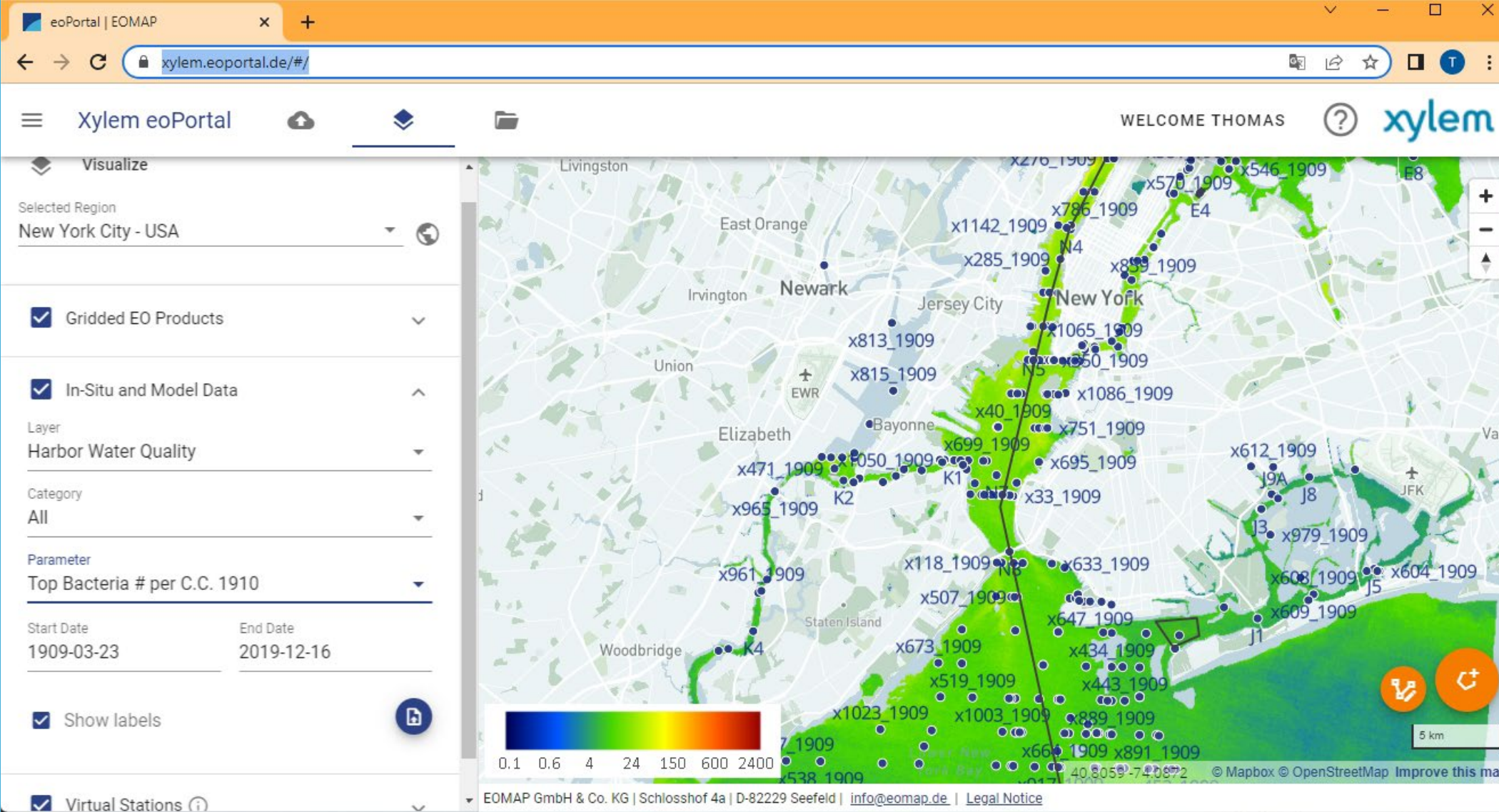
**Left Sidebar:**

- Gridded EO Products
- Layer: Harmful Algal Bloom
- Temporal Resolution: All
- Date/time of displayed layer: 2021-12-05 07:59:53
- Plot Preview: A line graph showing data from 2020 to 2022. The y-axis ranges from 0 to 400. The graph shows several peaks, with the highest reaching approximately 380 in early 2022.

**Main Map Area:**

- Map of Cahora Bassa, Mozambique, showing a grid of colored cells representing HAB likelihood.
- Legend: A color scale from green to pink, labeled "Class: 1 2 3 4". The categories are: No (green), Unlikely (yellow), Likely (red), and Very likely (pink).
- Map controls: Zoom in (+), zoom out (-), and a 10 km scale bar.
- Footer: "© Mapbox © OpenStreetMap Improve this map" and "EOMAP GmbH & Co. KG | Schlosshof 4a | D-82229 Seefeld | info@eoman.de | Legal Notice".

# How to integrate & scale up?



# Emergency? High-Res?



Daily high-res at global level



Accurate, timely, affordable



User self-adapted



Easy access, scalable



**EnMAP**  
30m  
27 days  
2022

**Landsat 9**  
30m (15m)  
8 days  
2021

**PRISMA**  
30m (15m)  
29 days  
2019

**Sentinel-3**  
300m  
daily  
2016

**Sentinel-2**  
10m  
5 days  
2015

**Planet Doves/SkySat**  
3m/1m (0.5m)  
daily (multiple)  
2014

**Landsat 8**  
30m (15m)  
16 days  
2013

**WorldView 2/3**  
2m (0.5m)  
daily  
2009

**MODIS-Terra/Aqua**  
250m  
daily  
1999/2002

**Landsat 5**  
30m  
16 days  
1984

**Landsat 7**  
30m (15m)  
16 days  
1999



**Global need** for water-related data  
& solutions

**Data on- & to demand** (self-scalable)

**Industry driven** process to further  
innovate and scale

**Market acceptance** and growth now

Open positions 2022: [eomap.com/jobs](https://eomap.com/jobs)



EOMAP HQ in castle Seefeld near Munich

# Contact us



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