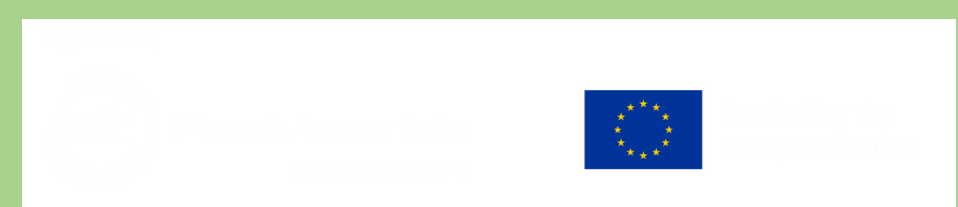


# Environmental study of Varna Lake based on chemical analysis of lake bed samples

***Todor Ganchev***, Valentina Markova, Angel Marinov & Tamer Abu-Alam



# Introduction

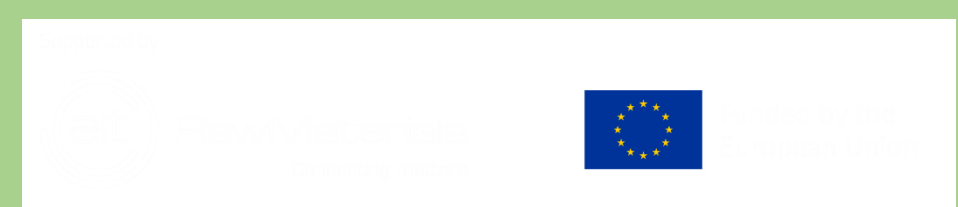
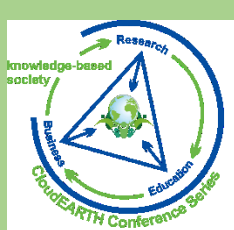
- The presentation outlines environmental analysis of Varna Lake, Bulgaria.
- The environmental analysis is based on a collection of samples from the bed of the lake.
- The analysis of the samples provides information about the accumulation of various toxic elements and their distribution
- Methodology and specific approaches used for the sample collection, the results of their chemical analysis will be presented.
- The presented study is part of the KnowWAT project, coordinated by TU-Varna.



# Varna Lake



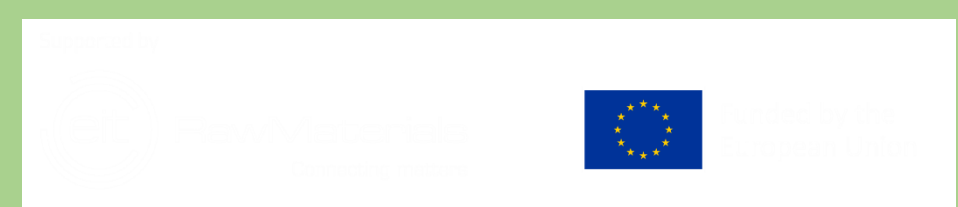
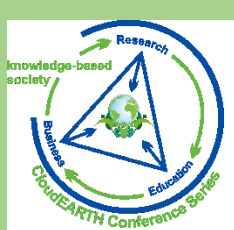
Varna Lake is an artificial body of water located in one of the biggest port cities in Bulgaria – Varna. The lake connects to the Black sea and has a major industrial and transportation significance to the city of Varna and Bulgaria in general. As the lake is surrounded by heavily urbanized and tourist-related areas its environmental and ecological properties have substantial importance.



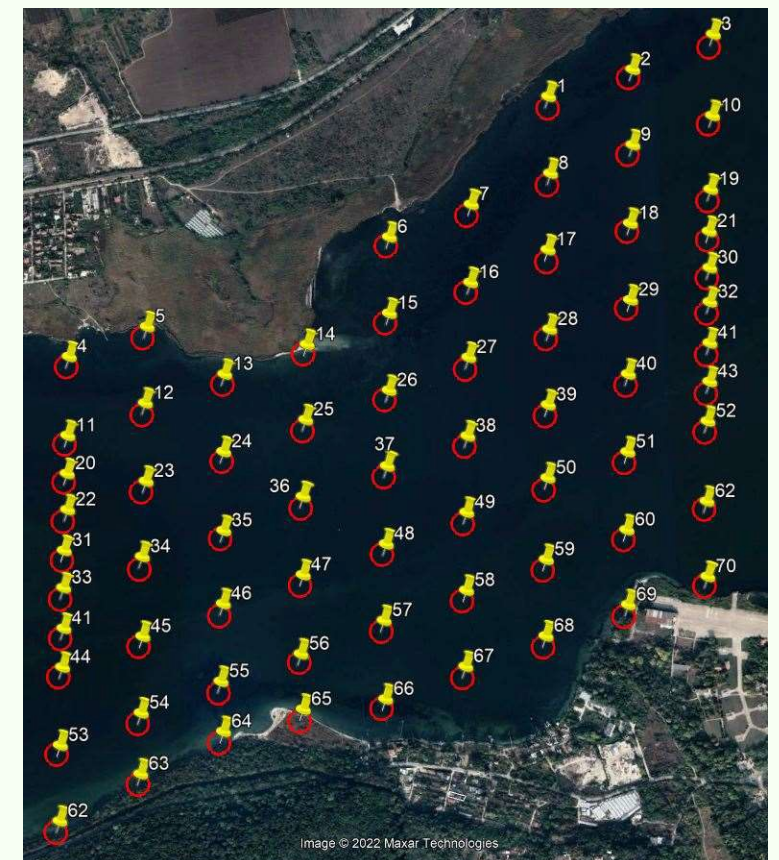
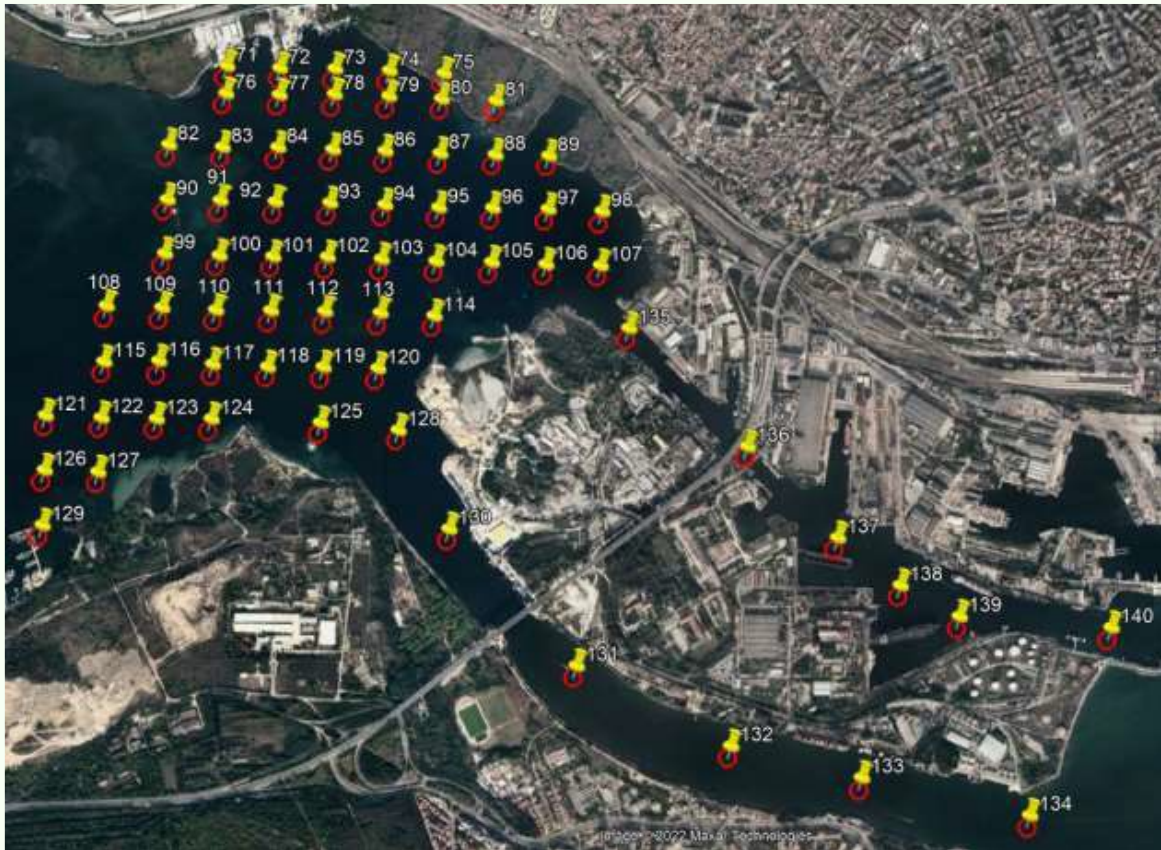
# Zones of Interest

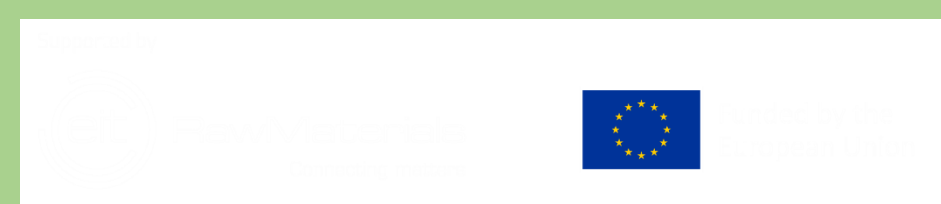
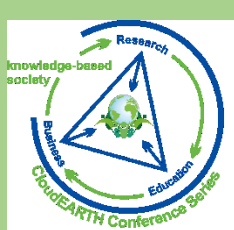




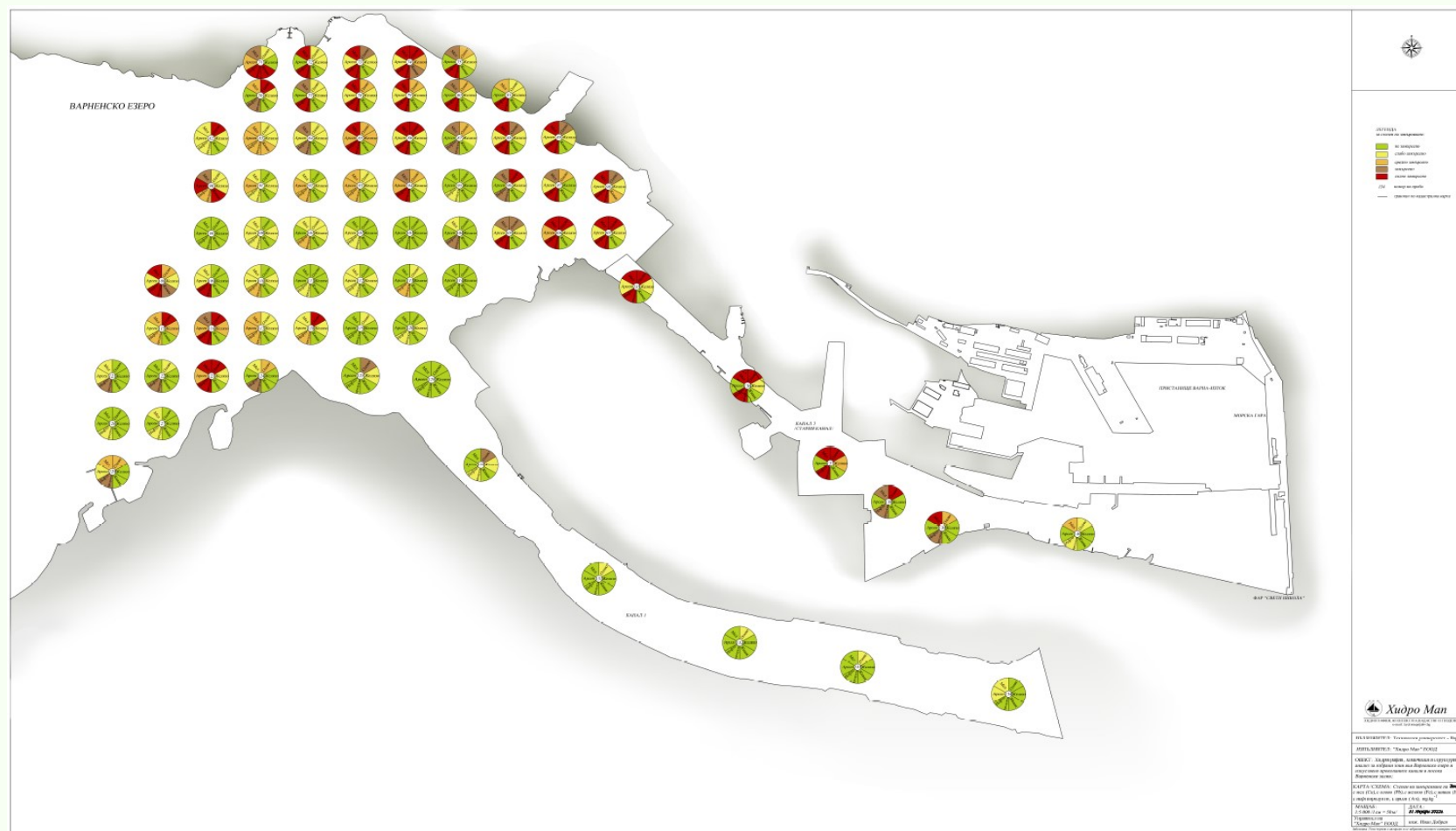


# Samples taken





# Results Zone 1

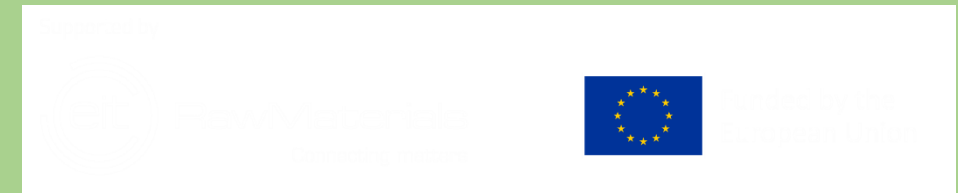


## Measured components

Iron/Fe,  
Lead/Pb,  
Arsenic/As,  
Copper/Cu,  
Mercury/Hg  
Oil products.

Predominant pollutants are  
copper, lead and oil products





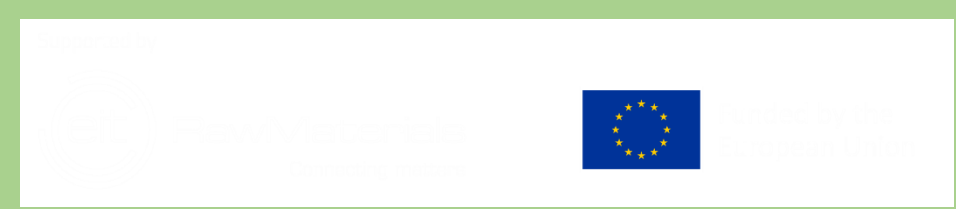
## Results Zone 2



## Measured components

Iron/Fe,  
Lead/Pb,  
Arsenic/As,  
Copper/Cu,  
Mercury/Hg  
Oil products.

Predominant pollutants are oil products, mercury and copper



# Conclusions

- ✓ The study was complemented by survey of illegal waste water connection to the lake as possible source of pollutants.
- ✓ One of the main sources of pollution was identified as related to dredging of the bed of the lake.
- ✓ The measurement results prompt the requirement of additional analysis so sources can be indentified and their effect minimized.
- ✓ Based on areal phjotography several unregistered shipweckes were located. Those have to be further studied as a potential source of pollutant.