PROJECT PROPOSAL

„GREEN ISLAND” EQUIPPED WITH WATER QUALITY MONITORING SYSTEM

Prof. Dr. Gyula ZÁRAY

Eötvös Loránd University, Budapest

Danube Research Istitute, Centre of Ecological Research, Budapest

9th Steering Group Meeting of PA4 – to Restore and Maintain the Quality of Waters – of the EUSDR

9th June, 2015, Budapest

Introduction of „Green Island”

The floating dock was planned in Hungary in 2011/2012, built in Komarno (Slovakia) in 2013 and installed in Budapest in 2014 by the TankerPort Environmental Technology and Innovation Ltd.

Aims of this construction were the followings

- to reduce the water pollution generated by shipping including freighters or passanger liners
- to introduce the „one-stop” principle to shipping reducing the time demand of transportation by combined services

Available services

- **takeover of wastewater**
- **takeover of kitchen waste (used frying oil, water polluted with chemicals, solid waste)**
- **takeover of spent oil**
- **takeover of bilge water**
- fuel supply
- supply of drinking water
- sale of engine oil
- sale of hydraulic oil

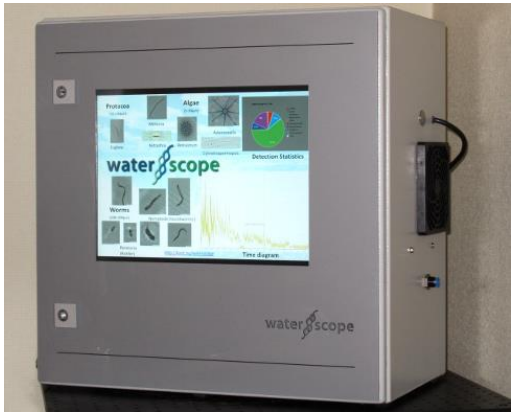
Pilot project for development of „Green Island”

Aim: to extend its capability for on-line monitoring of water quality because this stable and safe platform makes possible to install chemical and biological sensors in fix positions, the analytical information can simply be followed by internet and the personnel can regularly carry out the maintenance of sensors

The on-line monitored parameters are the followings

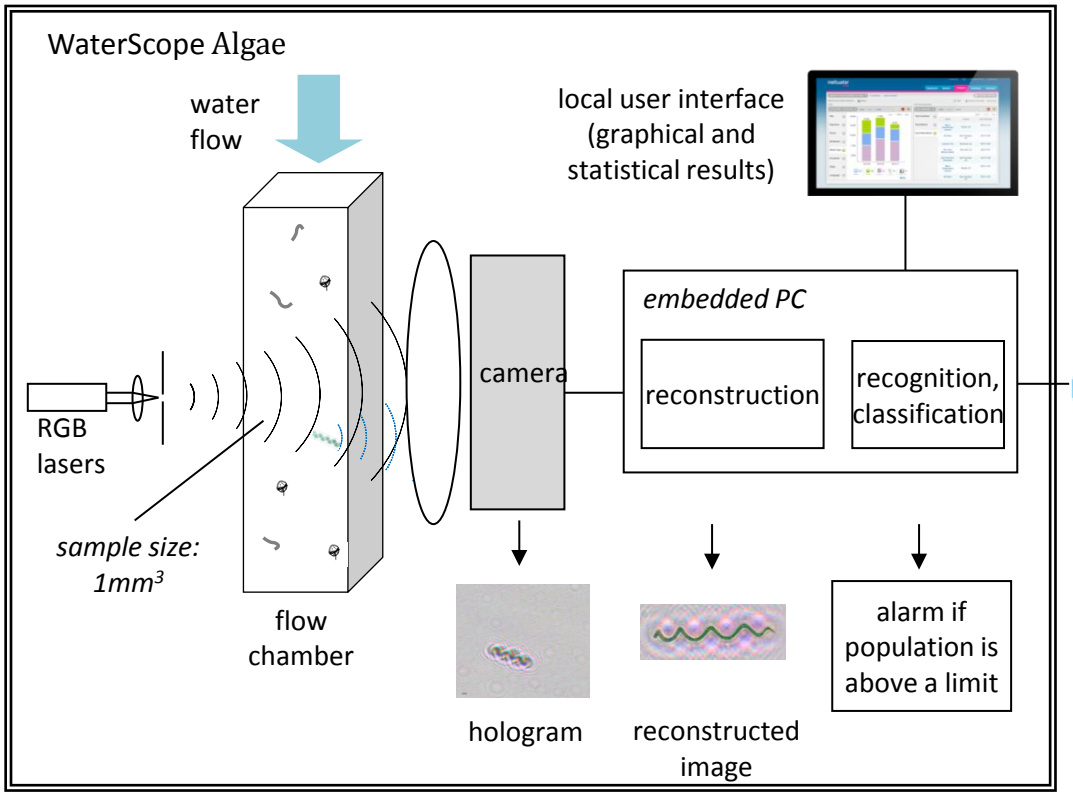
- pH and temperature
- redox-potential
- electric conductivity
- dissolved oxigen
- dissolved organic matter
- turbidity (TSS)
- nitrate concentration
- BBE algae analyzer
- PAR quantum sensor
- water scope equipment

WaterScope

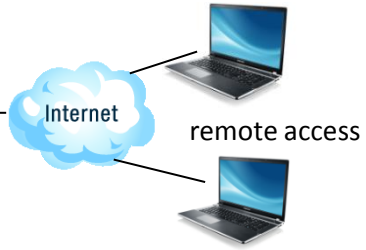


Microbiological on-site device which can detect, classify and quantify the concentration of free- living microscopic organisms (algae, protozoa etc.) in the water, based on a patented technology of automated, three-dimensional, digital holographic microscope system aiming at the continuous monitoring of different waters.

Operating principle:



The analytical results can be displayed on a user friendly web-based interface. Users have access to the individual elements of classified statistical results in 1-30 minutes after the sample has been taken, and continuously onwards.



Depending on the water quality, as many as 400-500 records can be taken based on statistical analyses of 72 samples daily. If needed, records can be accessed remotely.

Possibility for detailed investigations, specification

- In addition an automatic sampler will also belong to the monitoring system. If any of the measured parameters passed the selected upper or lower limit values, the sampler switches on
- The collected samples will be transported to the local laboratories for detailed analysis of inorganic compounds by ICP-MS and IC, as well as organic compounds (e.g. pharmaceutical residues, pesticides, oils etc.) by GC-MS/MS and LC-MS/MS systems

Further plans

- On basis of our experiences and observations the monitoring system could be further developed and finalized for an efficient and reliable water quality control
- Considering the double functions (prevention and monitoring) of „Green Island (GI)” it would be useful to install more „GI”-s along the Danube from Kelheim to Izmail

Thanks for your attention!