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BLUE GROWTH CONFERENCE & BROKERAGE EVENT
19-20 September 2016 | Gdańsk, Poland

Multifuncional Cleaning Floating Islands (MCFI) for water quality of coastal waters

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www.ncp-biohorizon.net

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Faculty of Environmental Sciences in University of Warmia and Mazury activities include education and research in the fields of ecology, biology, biotechnology and environmental engineering. The Faculty maintains nationally and internationally recognized research projects that address several aspects of environmental engineering, biotechnology, fisheries and aquaculture. Team of Prof. Marek Kruk focuses its efforts on the development and application of hydrobiological and biogeochemical research to assess the quality of inland and estuarine waters with a view to their sustainable management and protection of their biodiversity. Studies on nutrient cycling and ecology of macrophytes, phytoplankton, zooplankton and zoobenthos are conducted using innovative approaches as numerical methods, satellite remote sensing monitoring calibration and mathematical modeling.

Topic: BG-07-2017: Blue green innovation for clean coasts and seas

The objectives of the project:

General aim: Developing a Multifunctional Cleaning Floating Islands (MCFI) technology for cleaning and protection of estuarine waters from particles, debris, nutrients, harmful algae and bacteriae

- Adaptation of MCFI construction into estuary conditions: material suitable for plant seedling, changeable size of platform composed by modules, sufficient draught, ties between modules, resistance on wave action, sufficient anchoring
- Elaboration of particles and debris MCFIcatchment system: mechanical catch and sorbing material
- Construction and application into MCFI platform of wind energy system for aerating water beneath the island
- Elaboration of procedures of seedling and harvesting common reed in MCFI platform
- Elaboration of modeling tools for the most effective location and parameters of MCFI in relation to pollution effluents, nutrient flow, hydrodynamic and wave action on the estuarine waters
- Monitoring of effectiveness of MCFI in nutrient removal from estuarine waters in different environmental conditions
- Monitoring and evaluation of the impact of MCFI on estuarine biocenosis biodiversity
- Demonstration and feasibility study of MCFI in selected estuarine locations
- Socio-economical analysis of the feasibility of the MCFI and estimation of benefits for fishery and recreation

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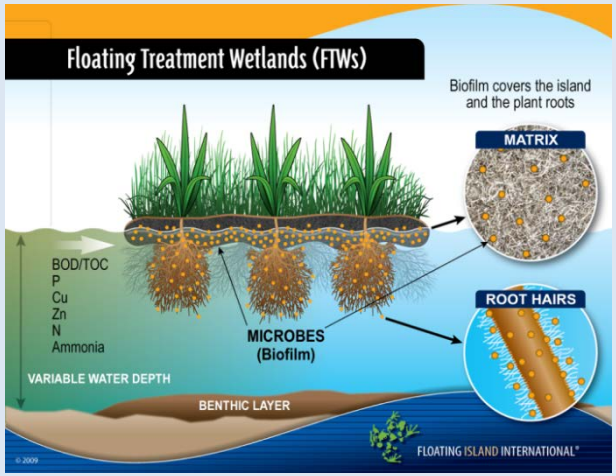
UNIWERSYTET WARMIŃSKO-MAZURSKI W OLSZTYNIE



Basic technological ideas

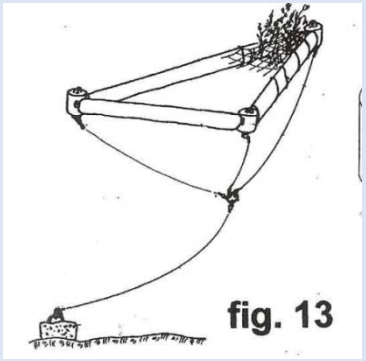


Photo and fig 13: HYDROLECH Sp. z o.o.

Project innovations beyond basic technology and state-of-the-art:

- ❑Adaptation for wave action: modifications of construction of floating platform and system on anchoring.
- ❑Particles and debris catchment system
- ❑Co-adaptation of wind energy system for aerating water beneath the MCFI island
- ❑Use of modeling (hydrodynamic, water quality) studies for effective location and estimation of reduction of pollution
- ❑To attain market conditions for the industrialization of FWT considering environmental and socio-economic effects.

Blue-green approach in the project :

- •Eco-technological approach in construction of floating platform,
- •Bio-retention and recirculation approach in pollution economy,
- •Carbon sequestration approach in artificial island functioning,
- •Only natural sources of energy (hydrodynamic, wind)

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An indication of the existing partnership/consortium:

University of Warmia and Mazury in Olsztyn, POLAND (UWM)
University of Helsinki, FINLAND (UHel)
University of Latvia, LATVIA (ULat)
SocEco Analysis & Education, SWEDEN (SocEco) – SME
DHI, POLAND (DHI) – Big Enterprice
Hydrolech sp. Z o.o., Poland – SME

The requirements for additional partner(s):

Research institutions and companies interested in development the MCFI technology in the differential coastal conditions/locations in West (North Sea/Atlantic) and South (Meditreanean) Europe

Involvement in previous/ongoing projects in the area:

1999 -2000 – Researcher in the project of EU (IV FP) NICOLAS "Nitrogen Control by Landscape Structures in Agricultural Environments", (ENV4-CT97-0395)
2006 – 2007 Scientific Coordinator of the project of the EU Programme INERREG III a 2006/296 „Monitoring of water quality in coastal waters of trans-border areas on the support of satellite remote sensing" (budget 70 000 Euro)
2007 – 2015 Leader of university research project in UWM „Hydrobiological and biogeochemical conditions for sustainable management of water ecosystems"
2008 – 2011 Coordinator of Polish-Norwegian Research Fund project 82 – A – I – 1/07 "System of the environmental and spatial information as the background for the sustainable management of the Vistula Lagoon ecosystem (VISLA). (budget 504 630 Euro)

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