BaltCoast

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Leibniz-Institute for Baltic Sea Research (IOW)
Warnemünde, Germany

WP5 Task 5.2

Shipping and economic development - the Vistula Lagoon

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BONUS

Task 5.2 Shipping and economic development - the Vistula Lagoon

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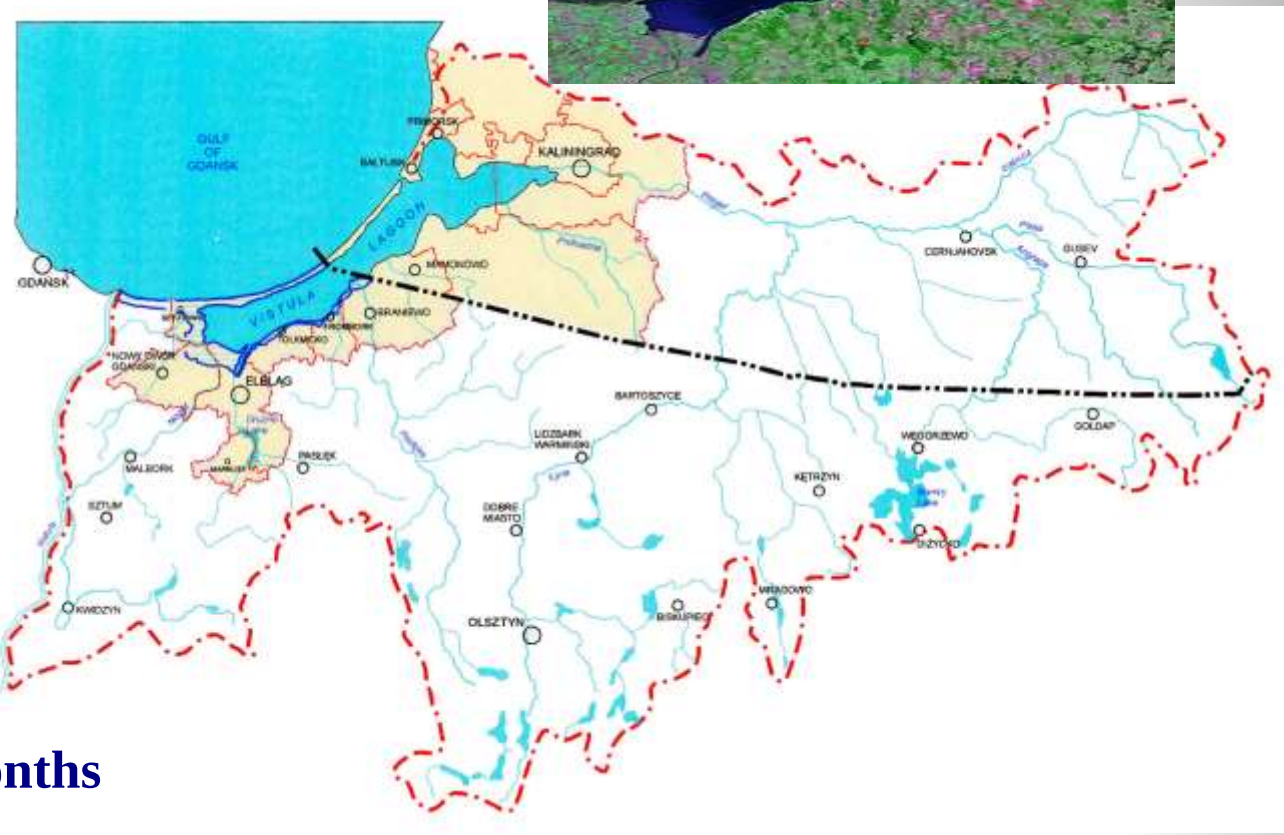
2nd largest lagoon in the Baltic Sea

Vistula Lagoon

- **Area: 838 km^2 (Russia 56%, Poland 44%)**
- **Length: 90 km**
- **Width: 10-19 km**
- **Avr. depth: 2.7 m**
- **Total drainage area: 23,871 km^2**
- **Salinity: 0.1 - 4.5 PSU**
- **Water volume: 2.3 km^3**
- **Avr. retention time: 6 months**



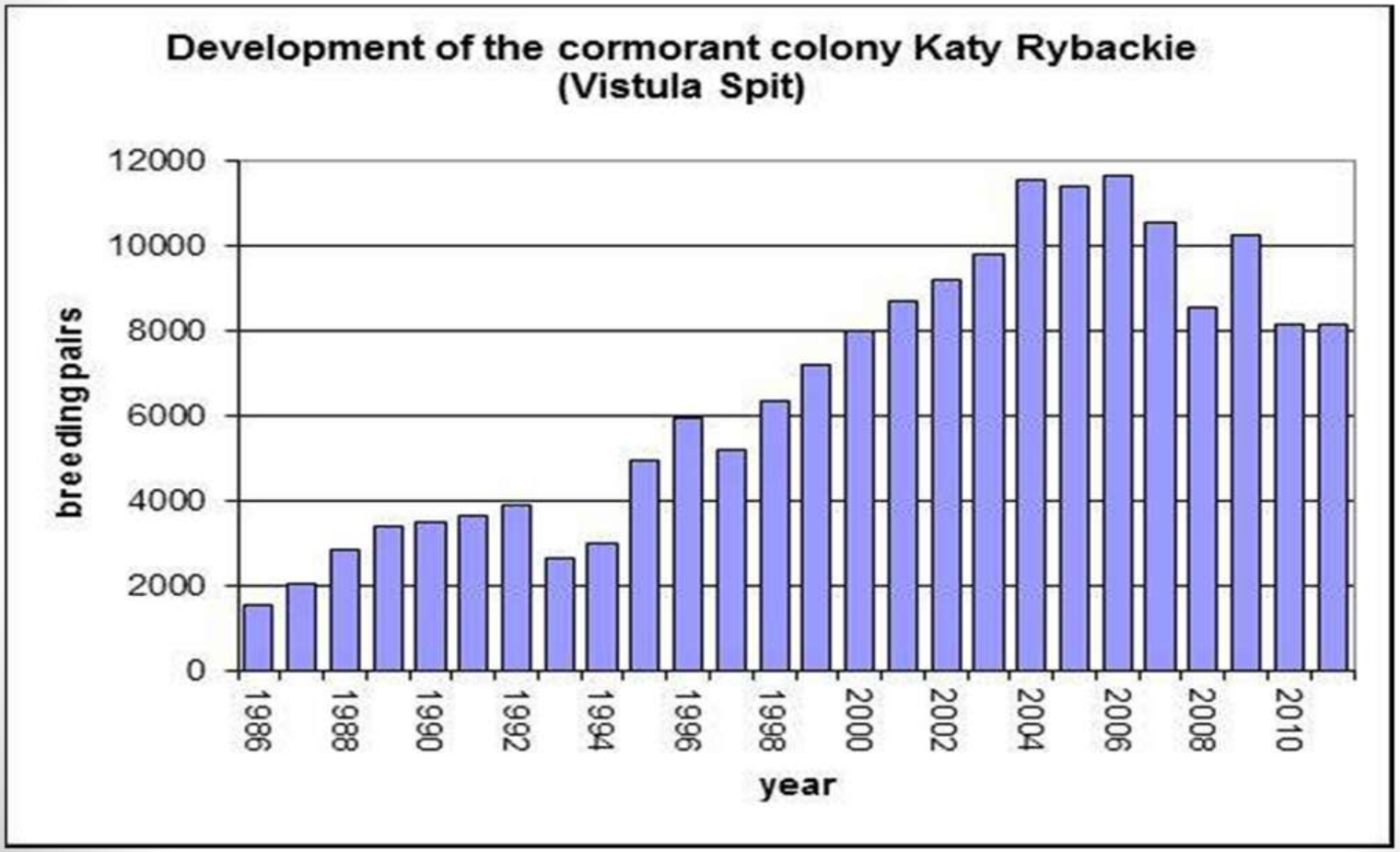
- **Largest rivers** within the drainage area: Pregola, Prokhladnaya, Elbląg, Pasłęka, Nogat, Bauda
- **Connection with the Gulf of Gdańsk**: narrow, dredged channel near Baltiysk (Russia)

Problems in the area

- The Lagoon is an important component of European ecology: the Polish part belongs entirely to **Natura 2000** regions.
- **Eutrophication** is the major ecological problem despite waste water treatment; probable source: recycling nutrients from sediments.
- **Fisheries problems** - difficult to harmonize,
- **Inadequate and unsynchronized monitoring** of physical and chemical/environmental parameters persists,

Cormorants: a pressing issue

- Almost extinct before, nowadays the Lagoon hosts the largest colony of cormorants in Europe.



Cormorants: a pressing issue

- Damage to juvenile fish and forests is done by excessive number of cormorants.
- There is a need for setting a threshold for cormorants.

Problems in the area

- High unemployment, low population density, isolation of Polish part are the major socio-economic and political problems.
- For the Polish and Russian governments the lagoon is of low priority.
- Cooperation between the Spit and southern coast in PL is faulty: there is little common interest as Spit residents base life on the Baltic Sea related tourism.

- Vistula Lagoon is an area of **high economic potential**: due to touristic values (historical cities, beautiful landscape, lots of options for recreation: sailing, windsurfing, swimming, hiking, biking, etc.)

Frombork

Kąty Rybackie

- But **poor management** of the area, low investment, local conflicts, bureaucracy, long decision making process, nature protection regulations, isolation, decreasing population prevent its sustainable development.

Projects in the area

FP 7 cooperating projects:

with common activities focused on stakeholders participation – joint workshops – contributing to socio-economic impact analysis (**LAGOON**S) and development of Management Plan (**ARCH**).

LT-PL-RU Cross-border Cooperation Programme 2007-2013 **VILA** project:

„The common benefits of the Vistula Lagoon potential development"

South Baltic Programme **ARTWEI** project

Focus Groups to identify most accute problems of the area from a perspective of local communities.

Frombork:

Fishermen, hotel and gastronomy operators, teachers,

Piaski:

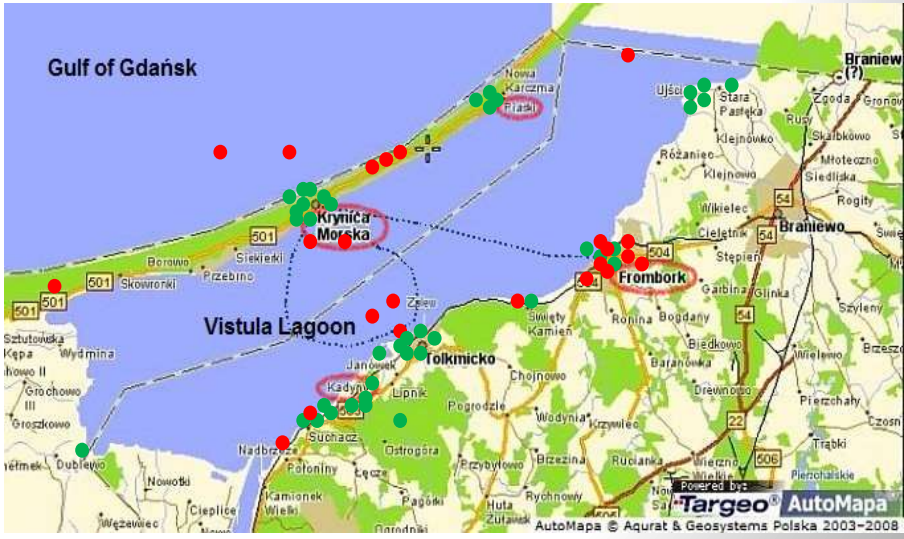
Fishermen and hotel operators

Kadyny:

Citizens and local authority

Krynica Morska:

Fishermen

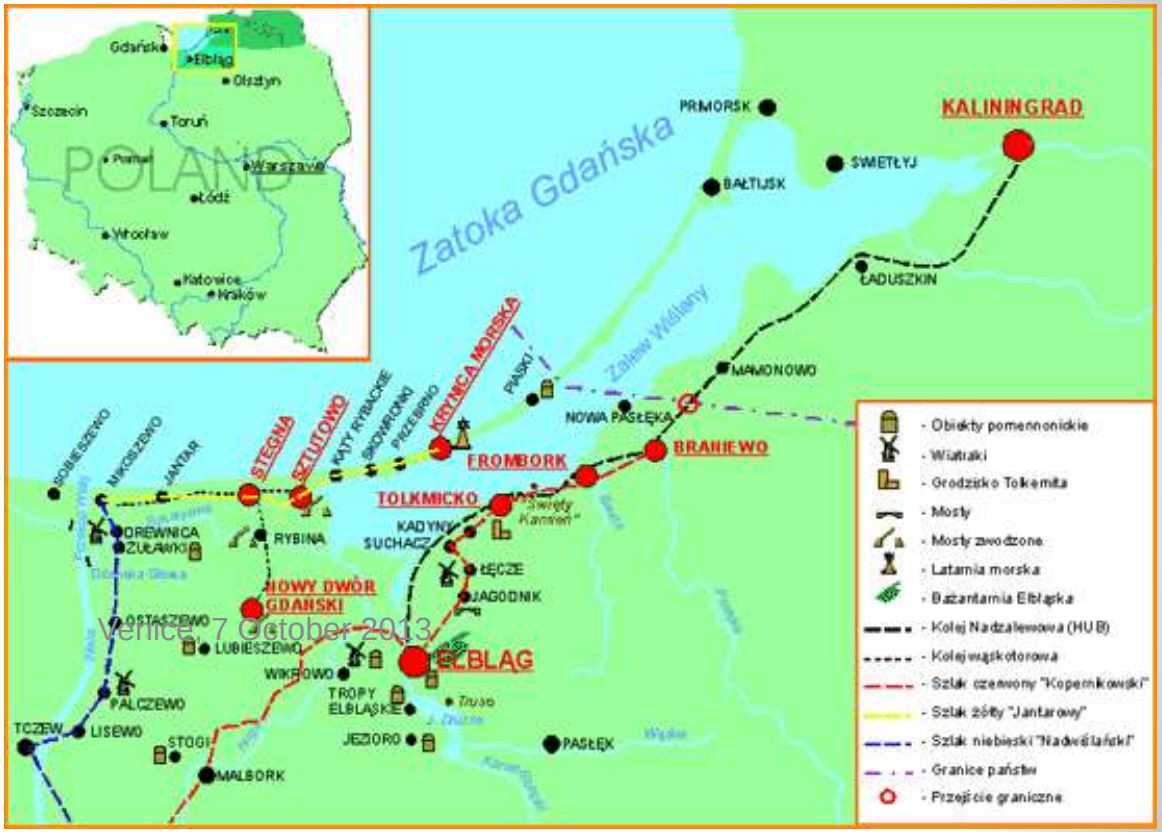


Result: combined map indicating „best" and „worst" areas.

Citizens Jury as a next step allowing to refine insights and to formulate **recommendations** and **scenario of future lagoon development**.

Jurors from:

- *Krynica Morska*
- *Piaski*
- *Braniewo*
- *Frombork*
- *Kadyny*

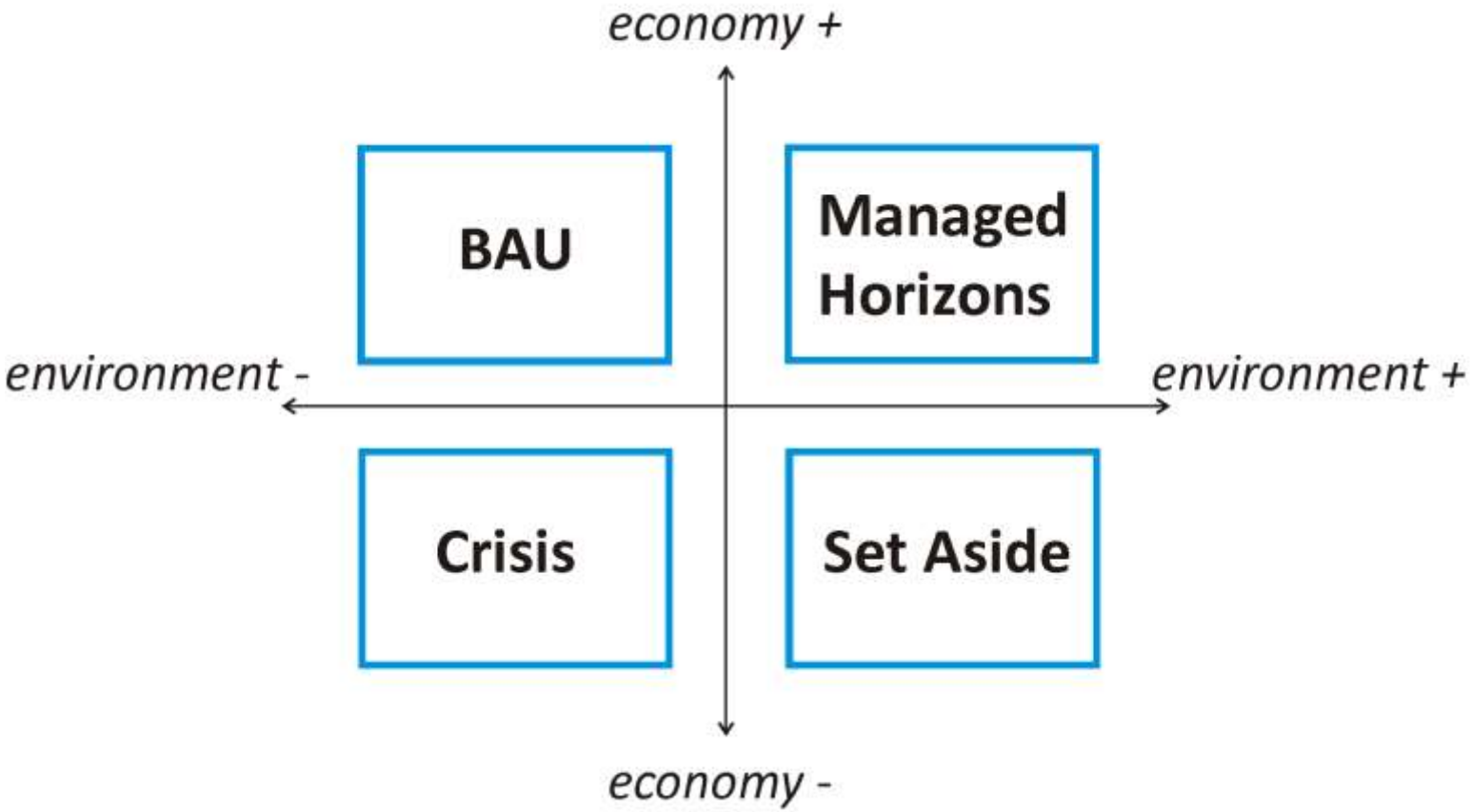


Experts:

- *Quality of the Vistula Lagoon environment*
- *Problems of the Vistula Lagoon fisheries,*
- *Problems of agriculture in the Vistula Lagoon region,*
- *Regulations and management in the Vistula Lagoon region,*
- *Transport and infrastructure in the Vistula Lagoon (maritime aspects),*
- *Environmental protection of the Vistula Lagoon,*
- *Tourism and recreation in the Vistula Lagoon region.*

Based on Focus Groups and Citizen Jury results 4 main socio-economic scenarios

have been developed and incorporated into numerical models of the catchment and the lagoon



economy +

environment -

environment +

economy -

BAU

GDP (PPS)	74%
Population	0%
Tourism	33%
Agriculture	1%
Forests	-3%

MH

GDP (PPS)	85%
Population	5%
Tourism	55%
Agriculture	2%
Forests	5%

Crisis

GDP (PPS)	-5%
Population	-33%
Tourism	-30%
Agriculture	-10%
Forests	-22%

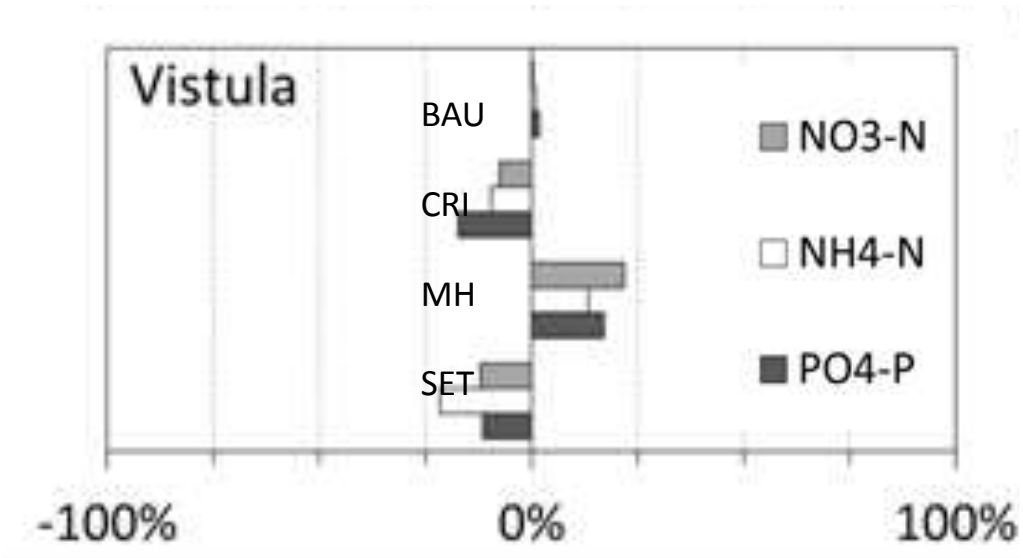
SET

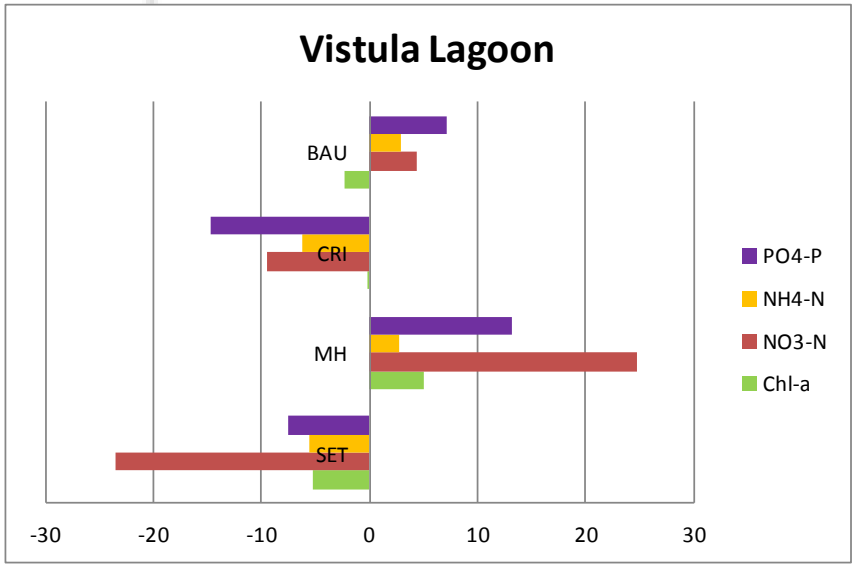
GDP (PPS)	80%
Population	-20%
Tourism	33%
Agriculture	-50%
Forests	-25%

Lagoons

Relative changes of total NO_3-N, NH_4-N and PO_4-P loads to the lagoon under each of the four scenarios and impact on the lagoon

Catchment → **Lagoon**





Results

- **BAU** and **MH** predict increases in nutrient inputs and concentrations – not very desirable scenarios.
- The cumulative effect of increased nutrient inputs may accelerate the appearance of eutrophication and aggravate its consequences.
- In order to avoid it more effective management measures are necessary:

✓ better fertilization management,

✓ more comprehensive wastewater treatment.

Results

- **CRI** predicts a reduction in NO3-N – not reflected in an immediate improvement of water quality.

  Changes in socio-economic activities and land uses not sufficient to effectively reduce the amount of nutrients entering the lagoon.

- **SET** scenario - the most desirable scenario.

  Predicts a substantial reduction in nutrient inputs, water quality in the lagoon displays a slight improvement.

Main directions of further development

- **Tourism as a main factor to boost the region's economical development.**

- **Harbor and sailing infrastructure development** (dredging of navigational channels will follow)**.**

- **Development of alternative transportation connections to the current major routes** – ferry connection from Tolkmicko to Krynica Morska (dredging of navigational channels will follow)**,**

Main directions of further development

- **Construction of the cross-cut through the Spit** as a possibility for economical improvement and navigational independence, however final decision is uncertain.

- **Actions to improve water quality of the Lagoon**
  1. proper management of the dredged sediment,
  2. more comprehensive wastewater treatment
  3. development of ecological agriculture and agro-tourism,
  4. improvement of fertilization and agricultural production control and inspection.

- **Improvement of cooperation** between residents and authorities, decision makers and other interest groups.

Planned activities within the BaltCoast

- All projects indicated need for comprehensive management plan supporting sustainable economic development.
- Tourism and harbours development need to be strengthened as they are key elements for further development of the area.
- This requires dredging of shipping channels in the lagoon and dredged sediment needs to be deposited.
- Dredging and new coastal constructions have also impact on hydrodynamics and water quality.

Planned activities within the BaltCoast

- Few scenarios of possible dredging and construction options will be proposed and the impact of these activities on the lagoon will be assessed with use of hydrodynamic modelling.
- Special focus will be paid to channels siltation processes and assessment of possible methods for sediment utilization and management.
- Sediment sampling is forseen to determine its quality and accordingly propose appropriate methods of its utilization.
- In addition studies will be performed to assess costs of the proposed methods and their economic effectivity.
- Results will be compared with and the approach will be transferred to the Szczecin Lagoon.

THANK YOU!


HALS LADY