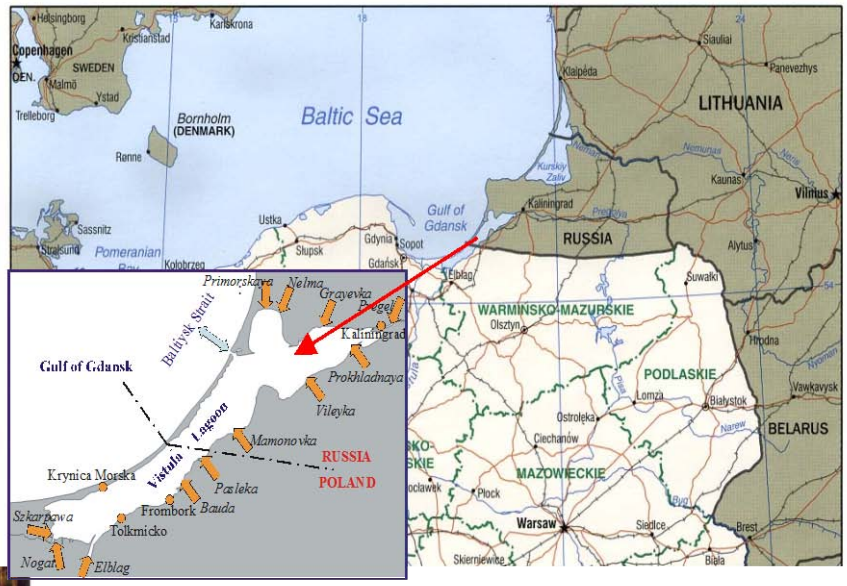



# LAGOONS project

# including specific tasks in the Vistula Lagoon


## Małgorzata Bielecka

# „Integrated water resources and coastal zone management in European lagoons in the context of climate change”

- **Grant agreement no: 283157**
- **Instrument: FP7, Collaborative Project - Small or medium-scale focused research project**
- **Coordinated by: Ana Isabel Lillebø** - University of Aveiro
  **Per Stalnacke** - Bioforsk

# PROJECT PARTNERS

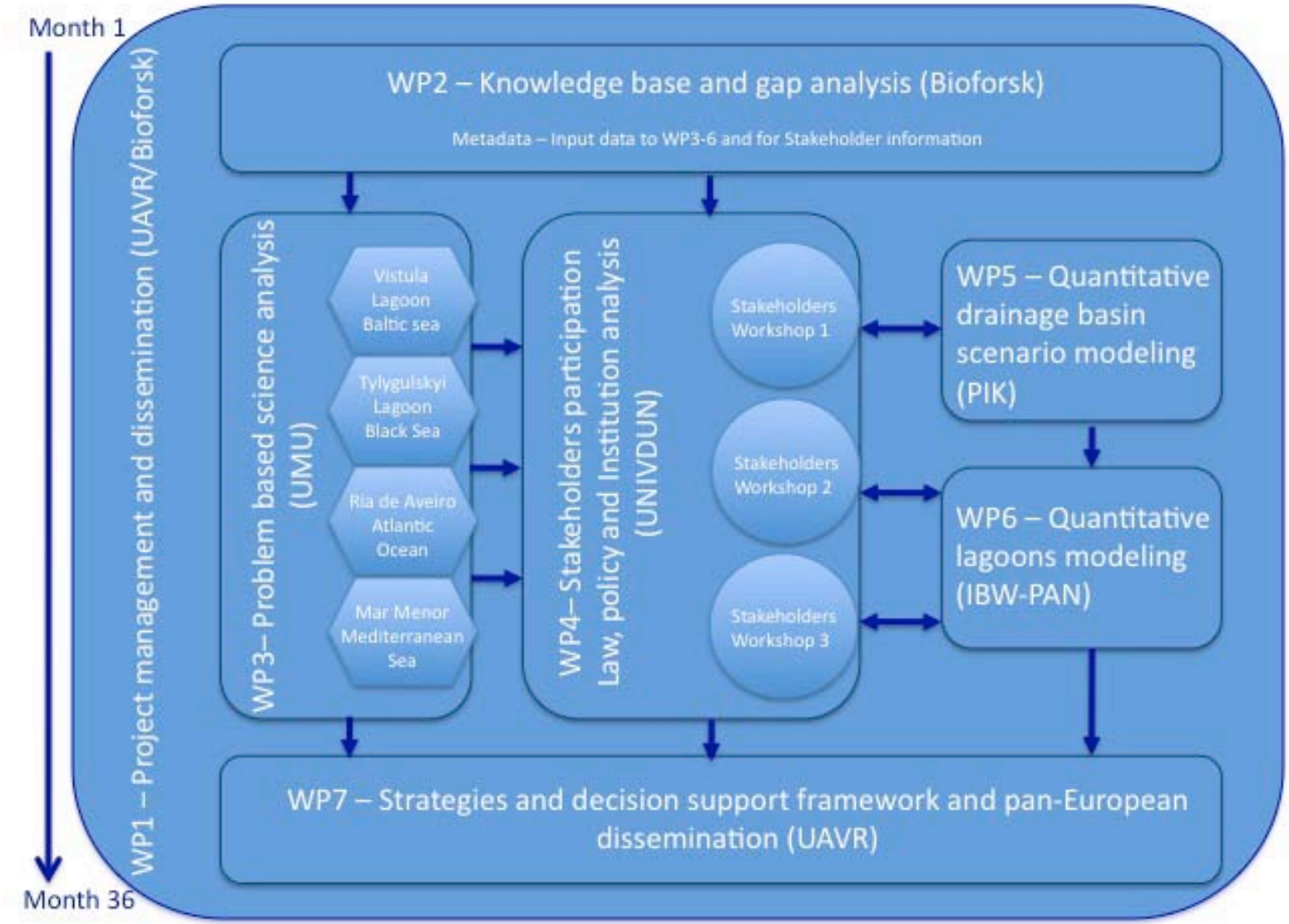
- University of Aveiro (PT)
- Bioforsk- Norwegian Institute for Agricultural and Environmental Researc(NO)
- Institute of Hydro-Engineering of the Polish Academy of Sciences (PL)
- Atlantic Branch of P. P. Shirshov Institute of Oceanology of Russian Academy of Sciences (RU)
- Sea Fisheries Institute in Gdynia (PL)
- University of Dundee (UK)
- Odessa State Environmental University (UA)
- Potsdam Institute for Climate Impact Research (DE)
- University of Murcia (ES)


Station «Odessa»: solar radiation (2003-2007 years)

Stationary station «Yuzhne», observations every 6 hours: sea level, salinity and temperature of water temperature of air, wind, cloudiness, humidity of air (2000-2011 years).

# PROJECT OBJECTIVE

- The main and overall objective of the LAGOONS project is to **develop science-based strategies and decision support frameworks for the integrated management of lagoons**, based on an increased understanding of land-sea linkages processes and the science-policy-stakeholder interface. To this end, the project will seek to contribute to interface between the EU Water Framework Directive, the Habitat Directive, the EU's Integrated Coastal Zone Management (ICZM) Recommendation, and the EU Marine Strategy Directive.


Month 1
WP1 – Project management and dissemination (UAVR/Bioforsk)
WP2 – Knowledge base and gap analysis (Bioforsk)
Metadata – Input data to WP3-6 and for Stakeholder information
WP3– Problem based science analysis (UMU)
Vistula Lagoon Baltic sea
Tylygulskyi Lagoon Black Sea
Ria de Aveiro Atlantic Ocean
Mar Menor Mediterranean Sea
WP4– Stakeholders participation Law, policy and Institution analysis (UNIVDUN)
Stakeholders Workshop 1
Stakeholders Workshop 2
Stakeholders Workshop 3
WP5 – Quantitative drainage basin scenario modeling (PIK)
WP6 – Quantitative lagoons modeling (IBW-PAN)
WP7 – Strategies and decision support framework and pan-European dissemination (UAVR)
Month 36

# WP1 - Project management

- Task 1.1: LAGOONS Partner Meetings (Months: 1, 13, 18, 25, 28, 36)
- Task 1.2: Cross WP Coordination (Months: 1-36)
- Task 1.3: Web communication (Months: 1-36)
- Task 1.4: LAGOONS Advisory board meetings (Months: 9, 21, 34)
- Task 1.5: Special issue (Months: 30-35)

# WP2 - Knowledge base and gap analysis

- **Task 2.1: Data and info channels (Months: 1-2)**
- Establish procedures and/or strengthen channels to data and information holders in all lagoons and its drainage basin

- **Task 2.2: Natural science data (Months: 1-9)**
- Compile and perform a preliminary assessment of existing natural science knowledge, data and information. This task also includes a river basin and lagoon data quality assurance.

- **Task 2.3: Socio-economic and livelihood data (Months 1-9)**
- Review the available literature and data related to socio-economic issues and livelihood patterns in relation to water use and needs within each lagoon.

- **Task 2.4: Institutions, laws rights and conflicts (Months 1-9)**
- Review and document the existing knowledge related to institutional arrangements for water management, existing water use rights and laws, stakeholders situation data, water use conflicts (transboundary and sectoral) and local collective institutions within each lagoon case basin. Identify management (water and natural resource) strategies and approaches already existing and lessons learned from these.

# GIS knowledge base

- Collecting and sharing digital maps, documentation, and metadata

- Demo version demonstrating the framework with possible functions

# Layout

http://webgis.no/lagoons

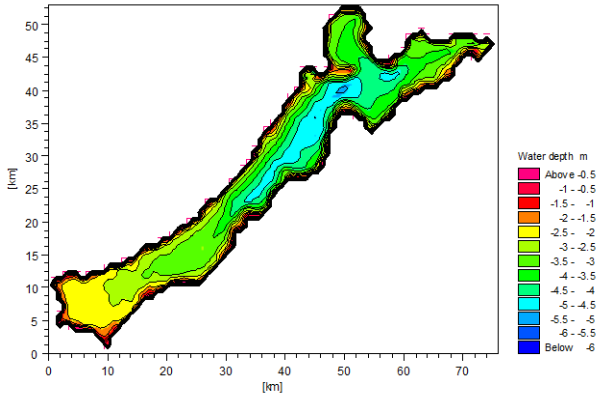
# WP3 - Problem based science analysis

- **Task 3.1: Definition of case study methodology (Month: 6)**
- Case studies on the 4 coastal lagoons will be performed, using established methodology, but with a special focus on the environmental and biological key indicators, i.e., the processes that support ecosystems services. The inventory phase will be adjusted to include data needed to perform the quantitative lagoons modelling (WP6) and drainage basin modelling (WP5). The case studies are chosen to facilitate evaluations of all threshold response to different environmental conditions and pressures of European coastal lagoons, and also to support the need to quantify tradeoffs among ecosystem services.

- **Task 3.2: Case study: Vistula Lagoon in Baltic Sea (Poland/Russia) (Months: 6-24)**
- **Work will focus on gaps related to the climate change impact on lagoon conditions with the special emphasis on hydrological regimes, nutrient loads, biota including fish assemblages as well as on fisheries**. Data from fishery statistics, such as quotas, spawning biomass, fishing mortality will be used in combination with seafloor habitat maps combined with fishing effort data from fishery authorities. In addition, biological data, hydrological regimes, nutrient loads will be gathered from literature.
- **Task 3.3: Case study: Tylygulskyi Lagoon in Black Sea (Ukraine)**
- **Task 3.4: Case study: Ria de Aveiro Lagoon in Atlantic Ocean (Portugal)**
- **Task 3.5: Case study: Mar Menor Lagoon in the Mediterranean Sea (Spain)**

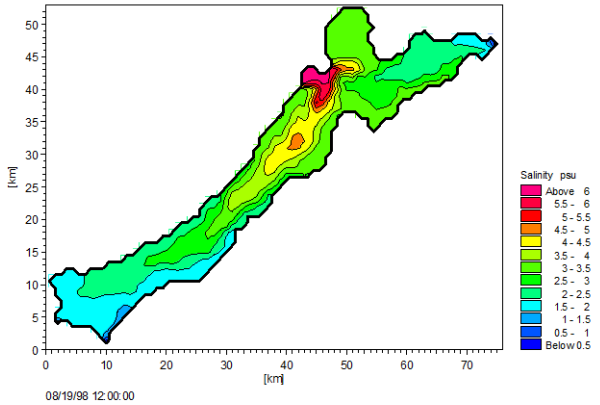
# Problems analyzed in the Vistula Lagoon

- Modelling of changes in water quality and eutrophication level due to different climate change and socio-economic scenarios.




***Bathymetry***

- Evaluation of salinization level in the Vistula Lagoon as an effect of expected water level rise and intensification of water exchange with the Gulf of Gdansk based on proposed scenarios.




***Salinity***

# Problems analyzed in the Vistula Lagoon

- Evaluation of possible increase of low-lying areas flooding risk due to climate change based on proposed scenarios.

- Evaluation of possible increase of salt intrusions upstream the Pregola River due to climate change based on proposed scenarios.

- Consequences of selected scenarios on fish assemblages as well as on fisheries activities will be evaluated.

*Pasłęka River; author: P.Margoński, Morski Instytut Rybacki*

# WP4 - Stakeholder participation; qualitative scenarios (incl CC)

- **Task 4.1: Conduct preliminary stakeholder and social group mapping** in order to collect data and identify key stakeholder groups within each case study area, such as fisheries groups, community-based organisations, farmer associations, industry representatives etc. Categorise existing knowledge of the interests of the main stakeholders, institutions, social and cultural groups. Conduct a first identification of the groups to be engaged in the project process within each case area. This exercise will begin from the outset, prior to the stakeholder workshops and focus groups, and form part of the WP2 Knowledge Database creation. Output: Preliminary assessment of groups and interests.
-

- **Task 4.2: 1st stakeholder workshops, selection of stakeholder panel, conduct interviews with panel members in each case basin** regarding the different institutional mechanisms and organisations involved in areas affecting water management. These will identify relevant issues, conflicts, concerns and existing responses to change within each case area. Crucially, these workshops and panel meetings will also constitute the initial means of engaging local and regional stakeholders with the project.

- **Task 4.3: Categorise results** from first stakeholder workshops on perceptions of threats and opportunities for integrated coastal zone management.

- **Task 4.4: Conduct initial stakeholder analysis based upon the knowledge gained in tasks 4.1 and 4.2.**
- The task will analyze relative power, influence and interests of stakeholders, power structures of the political and economic systems, and identify potential conflicts between stakeholder, institutional and social groups. Output: preliminary stakeholder report for each lagoon and first versions of the preliminary scenarios for natural resource management with a 10-15 year perspective

- **Task 4.5: 2nd stakeholder workshops and stakeholder panel meetings within all four case areas** to discuss first draft of integrated scenarios based on combined findings from WPs 5 and 6, preliminary stakeholder report for each case area from 4.4, and governance findings from WP 2. Output: preliminary stakeholder based scenarios for a 10-15 year perspective.

- **Task 4.6: 3rd and final stakeholder workshops and stakeholder panel meetings** to discuss revised integrated scenarios that incorporate both the feedback from 4.5 workshops and panel meetings, and the outcomes of WPs 3, 5 and 6.

- **Task 4.7: Finalise scenarios based on stakeholder feedback in Task 4.6**, with output into WP 7 formulation of strategies and decision-support framework development.

# WP5 - Quantitative drainage basin scenario modelling in the context of climate and land use change

- Task 5.1 Specific modeling objectives for CSs and data collection (Months 1-6)
- Task 5.2 Calibration and validation of SWIM for drainage basins (Months 3-14)
- Task 5.3 Climate impact assessment (Months 11-24)
- Task 5.4 Combined climate and land use change impact assessment (Months 19-30)
- Task 5.5 Uncertainty analysis (Months 21-34)

# WP 6 – Quantitative lagoons modeling (climate and hydrobiogeochemistry)

- **Task 6.1 Selection of mathematical models (Months: 1-2)**
- **Task 6.2 Models set up (Months: 3-6)**
- **Task 6.3 Calibration of models (Months: 7 – 14)**
- **Task 6.4 Estimation of the lagoons response to climate change scenarios (Months: 15 – 24)**
- Basing on proposed scenarios in WP4 and the qualitative scenario results for drainage basins in WP5: water discharges and nutrient inputs from drainage basin as well as climate information the lagoons' response to the selected scenarios will be evaluated. In addition, the impact of the lagoons' response on the coastal zone will be assessed (e.g. impact of sea level and lagoon water level on coastal areas – possible flooding or drying of coastal regions during extreme weather events). **Month 30.**

# WP 7 - Strategies and decision support framework and pan-European dissemination

- WP7 aims to promote the integration and dissemination of the project outcomes resulted from the R&D activities carried out in WP2-WP6. It plays an important part in the whole project when the knowledge and understanding is implemented in practice.
- **Task 7.1: Integrated strategies of sustainable development of the case study lagoons in the climate change context (Months: 18-30)**
- This task will explicitly support the objectives of the call, i.e., to contribute to a science-based strategy - in an integrated and coordinated manner - of the management of lagoons seen under the land-sea and science-policy-stakeholder interface. Based on the four selected lagoons, we will adopt a bottom-up analysis, focus on the examples and generalize for a pan-European view.

- **Task 7.2: Science-based innovative methodologies for endangered lagoons (Months 24-36)**
- This task will use the experiences from the project in combination with such frameworks as DPSIR and SWOT, **to arrive at innovative and adaptive management methodologies for lagoons endangered by environmental changes (land use and climate).** By integrating the gathered data (in previous WPs: 2 to 6) in the different elements (Please see Fig. 3.1.1) of DPSIR framework, a better comprehension of the complex relationships between the driving forces and their impacts on coastal lagoons, and the responses of society to them, will be promoted. Furthermore, the SWOT approach will allow identifying and evaluating changes in the state of coastal lagoons, impacts from anthropogenic activities and climate changes, and potential policy responses, thus, endorsing the identification of relevant impacts to be assessed and selection of the most appropriate indicators for the risk assessment process.

- The described methodology will enhance:

(i) eco-efficiency; by integrating economic, ecological, and social progress, within a perspective of ecosystems tradeoffs;

(ii) eco-innovation, by applicating the aquired knowledge to elicit ecological improvements,

(iii) capacity building, by enhancing the connectivity between the different actors, and promoting their ability to identify and meet managment challenges;

(iv) “triple interface” involvement, that will bring greater social and cultural acceptance, and, finally, will entail tools for the risk assessment of future predicted scenarios.

- **Task 7.3: Dissemination at the final workshop (Months 24-36)**
- Integrate the achieved results to disseminate the project outcomes and provide with recommendations to end-users, academics representing each case study lagoon in the project and representatives of international and regional organizations.

- **Task 7.4: Final report (Months 24-36)**
- Writing a multi-language report with the summary of the outcomes of the project with Strategies and decision support framework in a Pan-European perspective.

# Where we are now?

1. After 1st consortium meeting in November 2011, Aveiro, Portugal

# Where we are now?

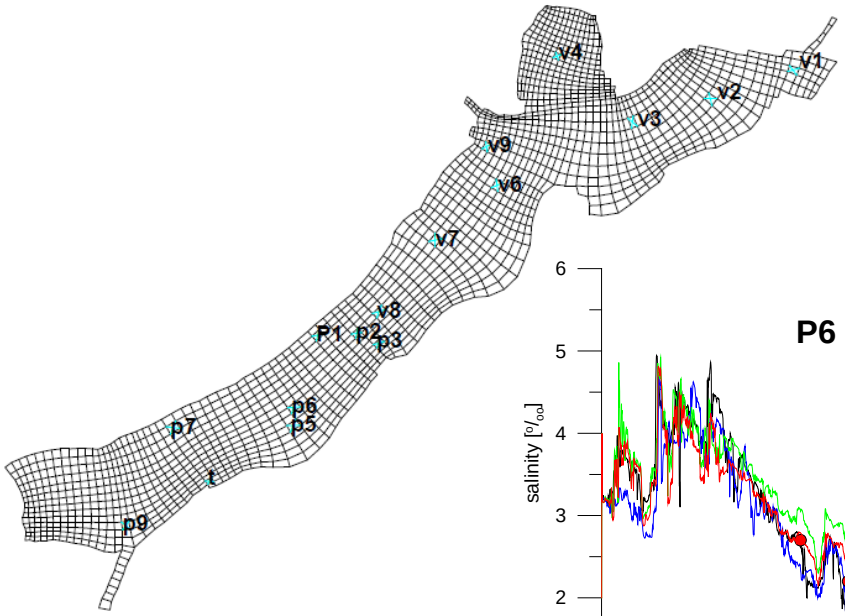
2. 1st Stakeholders meeting for Vistula Lagoon

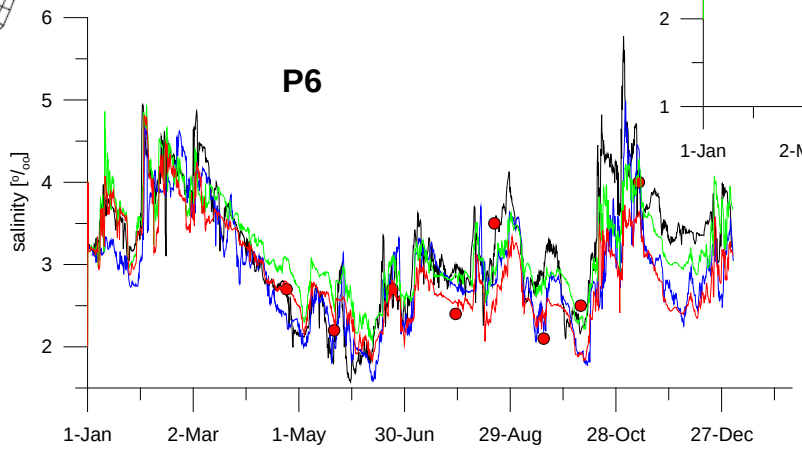
   23 April 2012, Gdańsk and focus groups in all CSAs

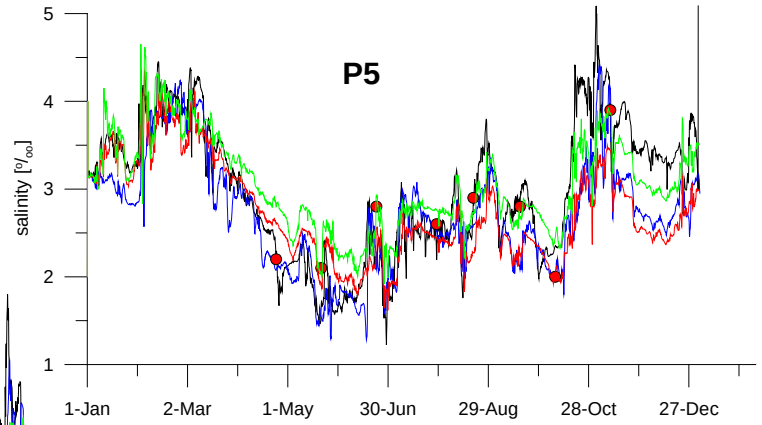
3. After 2nd consortium meeting in 24 – 26 April 2012, Gdańsk, Poland,

# Where we are now?

3. Data collection for WP5 and WP6,
4. SWIM, HD and WQ models set up and calibration.



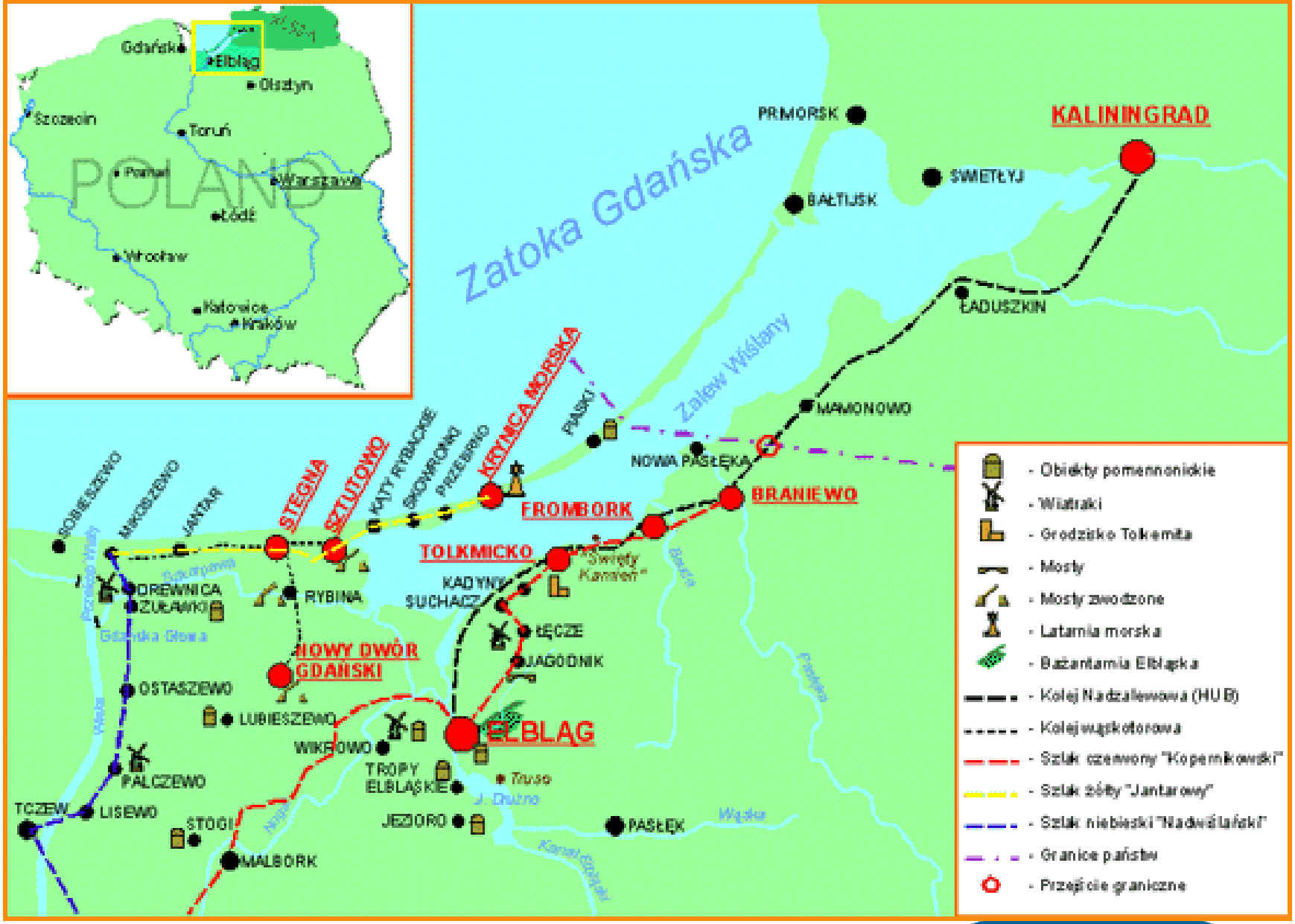



## Before:

- **Focus groups for**
  **Vistula Lagoon** 28 – 31 May 2012
- **3rd consortium meeting in Murcia, Spain**
  16 – 18 October 2012
- **Citizens Juries**
  beginning 2013

# THANK YOU!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Wrocław
Katowice
Kraków
Zatoka Gdańska
PRMORSK
KALININGRAD
SWIETŁYJ
BAŁTIJSK
ŁADUSZKIN
MAMONOWO
NOWA PASŁĘKA
PASKI
Zalew Wiślany
KOSYNCA MORSKA
BRANIEWO
FROMBORK
TOLKMICKO
"Święty Kamień"
KADYNY
SUCHACZ
ŁĘCZE
JAGODNIK
ELBLĄG
TROPY ELBLĄSKIE
JEZIORO
PASŁĘK
Wisła
Nogat
Kanał Elbląski
Tuja
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OSTASZEWO
LUBIESZEWO
WIKĘDOWO
PALCZEWO
TCZEW
LISEWO
STOGI
MALBORK
- Obiekty pomennonickie
- Wiatraki
- Grodzisko Tolkemita
- Mosty
- Mosty zwodzone
- Latarnia morska
- Bazantarnia Elbląska
- Kolej Nadzalewowa (HUB)
- Kolej wąskotorowa
- Szlak czerwony "Kopernikowski"
- Szlak żółty "Jantarowy"
- Szlak niebieski "Nadwiślański"
- Granice państw
- Przejście graniczne

# Lagoons

SEVENTH FRAMEWORK PROGRAMME

universidade de aveiro

Bioforsk

IBW PAN

90 YEARS OF SEA FISHERIES RESEARCH IN POLAND

MIR NATIONAL MARINE FISHERIES RESEARCH INSTITUTE 1921 - 2011

University of Dundee

OSENU

PIK

UNIVERSIDAD DE MURCIA

# Mar Menor lagoon