

The impact of the Vistula river on the coastal waters of the Gulf of Gdansk, Scenarios analyses by ecohydrodynamic model - (EUROCAT)

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Objectives:

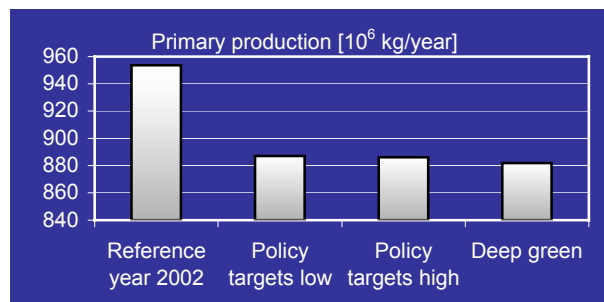
An impact of the Vistula River catchment on the biological state of the of Gulf of Gdańsk due to three economic scenarios was evaluated:

Policy targets - high scenario (5 - 6% growth in GDP in 2004-2020, this allows to realize the Program of Municipal Wastewater Treatment in agglomerations between 2 000 and 2010).

Policy targets – low scenario (2 - 4% growth in GDP in 2004-2020, the Program of Municipal Wastewater Treatment will be realized by the end of 2015).

Deep Green scenario (the Program of Municipal Wastewater Treatments until 2010; detergents without phosphates is reduced by 90 %, use of mineral fertilizers is decreasing). The projections for above scenarios determine the discharge of total N and P from the Vistula River into the Gulf of Gdańsk.

Results:



- Reductions of biological productivity for all scenarios are not very significant comparing to the reductions of phosphorus loads (from 40.9 % for the Policy target low scenario to 45.5 % for Deep green scenario).
- The lowest biological productivity has been obtained for Deep green scenario: the primary production is 7.5 % less than in the reference year 2002.
- The reduction in biological productivity for Policy targets low and high scenarios are 7.0 % and % 7.1 respectively less than in the reference year 2002.
- The coastal waters are the most biologically productive areas of the Gulf of Gdańsk including the recreational area along the beaches in Gdańsk and along the Vistula Lagoon (the reduction of primary production rate in these areas is rather low).

- Due to the fact that in the analyzed scenarios the reduction of phosphorus loads is much higher (more than 40 %) than nitrogen loads (less than 10 %) the phosphorus becomes a limiting nutrient in the Gulf of Gdańsk. Further reduction of phosphorus load should lead to the reduction of biological productivity in the Gulf of Gdańsk.

Potential exploitation by end users

- The developed 3D modelling method as well as the obtained results are of special interest for decision makers responsible for coastal zone management at the national and the European level.
- Furthermore, the policy targeting on the reduction of nutrients should not limit to the single gulfs but has to cover the whole catchment of Baltic Sea.

References:

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