Institute of Meteorology and Water Management
National Research Institute
Wrocław Branch

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Proposals for adaptation measures to climate change on an example of cross-border basin

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Wojewódzki Fundusz Ochrony Środowiska i Gospodarki Wodnej we Wrocławiu
SNPL 2007-2013

Instytut Meteorologii i Gospodarki Wodnej

Państwowy Instytut Badawczy

Climate change and changes in the use of water resources entail new challenges in the management and forecasting of water resources. Resources forecasts with the development of strategies for adaptation to changes require competent planning, control and coordination at the international level of water management undertakings.

To ensure the planning quality in water management a proper diagnosis of water resources in the analyzed catchment is necessary. This is the basis for the water balances development and creation of water management models.

Instytut Meteorologii i Gospodarki Wodnej

Państwowy Instytut Badawczy

NEYMO Lusatian Neisse
Climatic and hydrological modeling, analysis and forecast

The idea of the project was created at W1 Working Group on Hydrology and hydrogeology, worked for Polish-German Border Water Committee.

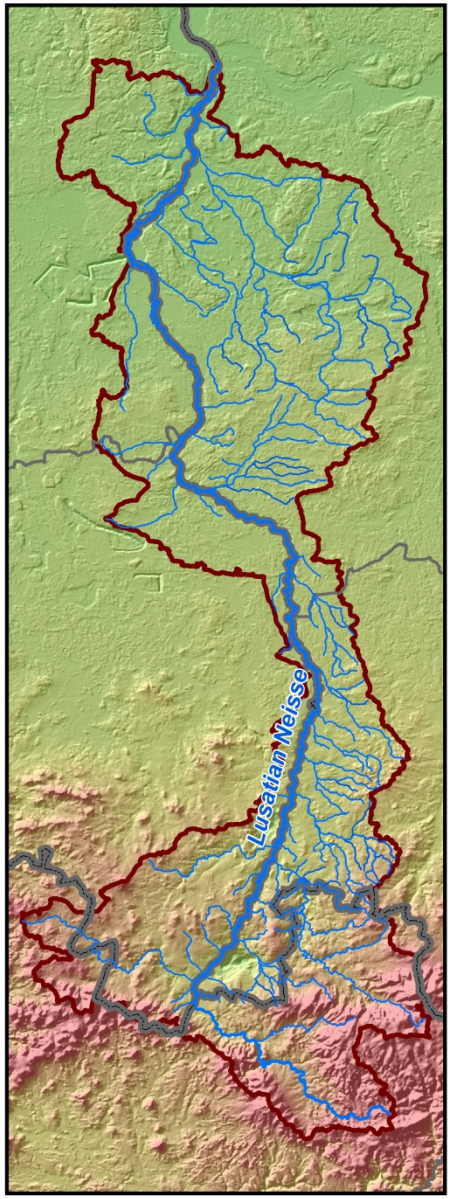
Lead Partner Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie, Germany

Project Partner Institute of Meteorology and Water Management National Research Institute, Branch in Wroclaw, Poland

Project is implemented under the Operational Programme of Cross Border Cooperation Poland-Saxony 2007-2013

Implementation period 2012 -2014

The project on the Polish side is co-funded by Regional Fund for Environmental Protection and Water Management in Wroclaw



Lusatian Neisse Basin

A = 4935 km^2

L = 246 km

Basin under strong anthropogenic pressure

Common Polish-German data base

- Climatic data
- Hydrological data

Climatic modelling

- global atmospheric circulation models (GCM) **ECHAM 5** and **ECHAM 6**, and five emission scenarios (**A1B** Run 1) and concentration (**RCP 2.6** Run 1, **RCP 8.5 (**Run 1, Run 2, Run 3).
- Statistical downscaling was made by the **WEREX V** model.

Hydrological modelling

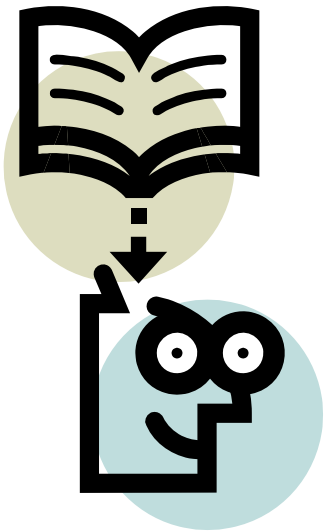
- rainfall-runoff model **MIKE NAM**
- water balance model **MIKE BASIN**

In the modeling of water resources carried out in the framework of the NEYMO project are included the results of projections of climate change and changes in the water resources use.

The modeling results are the basis for forecasting and the search for solutions in the case of the most important problems related to water management and allow for identify those elements that require action to protect resources.

It is planned to create a **catalog of adaptation measures** (for local scale), which will include, among others:

- guidelines for the legal acts in view of the development of terms of water use,
- socio-educational guidelines, including a proposal for training and other actions concerning the issues of water resources protection,
- guidelines for projects in the field of engineering and management of aquatic and water-dependent environment,
- principles of sustainable management of water resources.



EXAMPLES

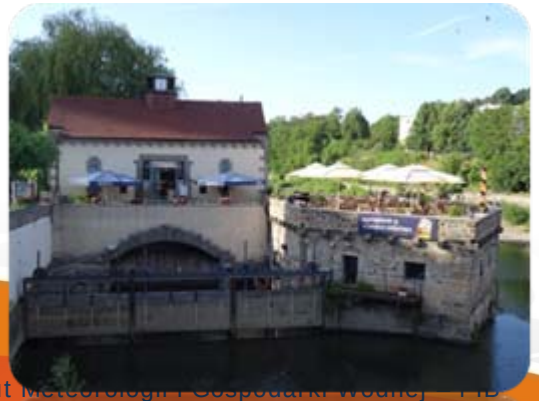
Recommendations for lignite opencast mines

- Coordination at the Polish-German level;
- Establishment of a long-term plan for the exploitation and reclamation of mines;
- Creation of a dynamic water balance that takes into account impact of all mines and other users in the Lusatian Neisse basin;
- Coordination of the timetable for flooding post mining excavation.

EXAMPLES

Recommendations for hydropower plants and hydrotechnical systems

- Use of turbines safe for fishes and with a wide range of flow or more turbines due to changing hydrological conditions.
- Changes in methods of water distribution in hydrotechnical systems, especially with longer derivative channels, in order to properly move the debris and not cause its excessive deposition, that is aim for hydrodynamic balance and retaining ecological flow.
- Updating water permits for hydropower plants;
- Installation and modernization of fish passes. It is also important to analyze the work of existing passes and recommendations for the construction of new ones, both in terms of the structure and the amount of water directed to these devices.



Next steps

- catalog of adaptation measures to climate change;
- brochure about the results of hydrological modelling using climatic projection data and consequences of shortage of water resources for water users;
- continuation of the project with the German partner, focus on the needs of water users and environment
- EU projects implementation in the new programming period 2014-2020.

We would like to invite all to the cooperation, especially within INTERREG EUROPE and CENTRAL EUROPE 2020 Programmes

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Thank you for your attention

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