Centre of Excellence in Wetland Hydrology – WETHYDRO

The protection of European freshwater resources is of vital importance for society well being and further development. Quality of water resources management depends strongly on being able to make the best use of possible understanding of **fundamental hydrological processes acting in the catchment** scale and capabilities to foreseen of future changes of water cycle due to human activities and natural processes.

The general objective of the WETHYDRO project is **growth of scientific potential** of Department of Hydraulics Engineering and Environmental Restoration in Warsaw Agriculture University through **increased international cooperation**.
Results of the project will directly facilitate implementation of EU Habitat Directive and Water Framework Directive in NAS countries. They will also contribute to make the public, technical staff and stakeholders more aware of **the role of wetlands in integrated water resources management**.

Two main subjects of the scientific research interest of the Centre are: **hydrological modelling of wetlands** and **coupling** the **hydrological knowledge** with **ecological** and **management issues**. It is done by collecting the hydro morphological data, data processing and hydrological modelling. The Centre focuses on reference sites and management of wetlands. Development will be achieved by **staff exchange**, **networking** and **training** with **leading specialists** and research centres of EU and NAS countries.

Envisaged effects of the Centre work will be positively related to social needs of Poland and NAS. Disseminated research results of the effort will be useful for **sustainable development of the agricultural areas in regions related to nature protection activities**.

BIEBRZA NATIONAL PARK covers 59,223 ha of Biebrza proglacial valley and protects most of the valley's peatland. The main task of the Park which covers, is to protect the variety of species of fauna and flora within the existing ecosystem. Biebrza River Valley is **the largest** and **the best preserved** area of **low bogs** and **forest raised bogs** in the temperate biogeographical zone. The most valuable feature of the Biebrza Marshes is its perfectly formed and well preserved **diagonal** and **longitudinal ecological zonation**. It is based on the **toposequence of plant communities** from the river banks to the edges of the Valley, **primarily shaped by water conditions**.

The diagonal ecological zonation is most fully developed in the southern basin of the River Valley, where the relationship between the plant species in the habitat, and the conditions is clearly evident. Biebrza Valley has water habitats, open bogs without any trees or bushes, rush forest, and post-bog (with lowered ground water level). The **natural biotopic conditions** resulted in the formation of **lengthwise** and **crosswise ecological zones** in the

NAREW NATIONAL PARK covers 7350 hectares in the most beautiful part of Upper Narew River valley. The mandate of the Park is to protect the wetland ecosystem (5400 ha, 73%) in the **natural marshy river valley** with its developed system of **river channels**. The protected part of Narew River system is **the largest**, **best developed** and **preserved anastomosing system in Europe**.

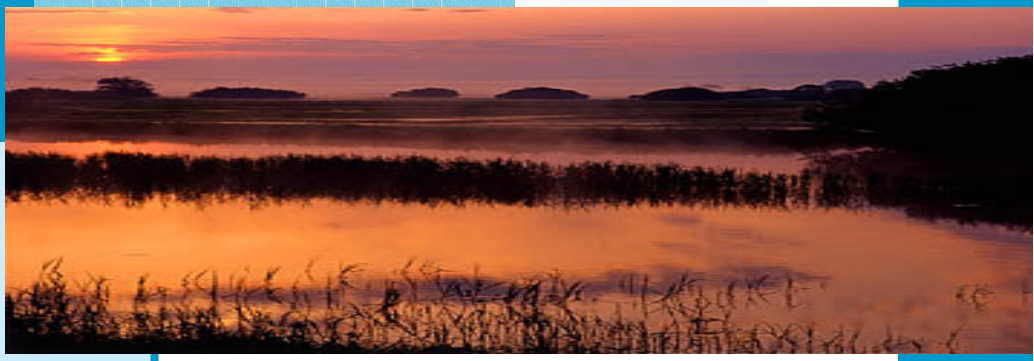
River is flow down by numerous channels which are bifurcate and rejoin creating a pattern of irregular network. Because of its attractiveness Narew is called **"Polish Amazon"**. It runs through a wide valley with sandy banks that are overgrown with osier. The upstream part creates an immense valley with flat banks, numerous meanders, and one clear river-bed. The hydrological regime of Narew is typical for Polish low-land areas with a single peak flow generated by spring thaws mostly with flood which supply the valley by surface water. The river nature caused development of **wetland eco-system** with **marshes** spread almost to all river valley wide area as well as accumulation of the 1 meter deep peat layer in the valley.

Main research domain is **collecting the hydro morphological data, data processing** and **hydrological modelling** by using appropriate technique, methodology databases and models. The main objectives in this area are: assessments of the measurements technique for the riparian wetlands; GIS and RS techniques for the land use mapping in the waterlogged areas; evaluation of the hydrological models for their accuracy in modelling of water flow in natural river and floodplains.

The main objectives are: deriving the nature protection goals including the anthropogenic influence (e.g. extensive agriculture) and their impact on water management (in wetlands and in the catchment); defining terms of sustainability for wetland areas.

Wetland protection and management has to **coupe engineering knowledge of hydrological systems**, **plant ecology** and in many cases **agricultural practices**.

One of the major problems in wetlands conservation and restoration is question of the goal to be obtained, in terms of the "naturalness", as the ecosystems in inundated areas are formed by geomorphologic process in situ, by agricultural practices on the spot and by hydrological processes in the catchment.



Dissemination measures and agreements with regional authorities together with collaboration with Polish research institutions involved in wetland hydrology research and creation of national network of such a units will establish leading position of the Centre in Poland.
The project activities will facilitate integration of Centre with European Research Area within 6 Framework Programme foreseen priority thematic area - **"Sustainable Development"** related to **water cycle aspects**.
Envisaged effects of the proposed Centre work will be positively related to social needs of Poland and NAS. Disseminated research results of the Centre will be useful for sustainable development of the agricultural areas in regions related to nature protection activities. They also will be applied for developing of master plans of these areas allowing for stimulation of sustainable development. National Parks will use Centre results for integrated management of park resources.

Researches will contribute towards **freshwater resources protection** and sustainable use and support the development of rural economy in ecologically important areas.
Researches has been done by The Centre of Excellence with cooperation with:
Wageningen University; Utrecht University; Ghent University; Free University Brussels; Antwerp University and others.

We are open for further cooperation and your interest and we'd like to invite you for common projects

If you are interesting in further information **see our website: http://levis.sggw.waw.pl/wethydro**
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