

Science, Technology and Innovation

Projects

Special Edition for the WETLANET Project



**Protecting
the world's
wetlands**

★ Researchers in Bulgaria are making great strides in understanding and spreading knowledge of wetlands areas and how to manage and conserve them. The WETLANET project, based at the country's Academy of Sciences in Sofia, is fast becoming one of the world's leading wetlands research facilities as it contributes to the restoration and protection of these critical ecosystems

Critical ecosystems in safe hands

WETLANET is coordinated by Professor Boyko Georgiev at the Institute of Biodiversity and Ecosystem Research at the Academy. His job is to bring together a local network of laboratories that study these wetland ecosystems. The chief aim of the project, he says, is to boost the technical and research capacity of the institute, while widening and strengthening its connections around Europe.

In this way, WETLANET can promote and spread news of its activities and thus make a significant contribution to policy changes in the management of wetland systems.

The importance of wetlands and the dangers facing them

Wetlands are extremely important to the world's environment. As well as supporting a large range of plants and animals, they prevent soil erosion and, by slowing down the flow of surface water, they reduce flooding on surrounding land while removing and storing greenhouse gases from the atmosphere. In addition, they play a significant role in delivering fresh water and promoting tourism.

These ecosystems, however, have not been managed well. During the past

century, it is estimated that half of the world's wetlands have been lost because of pollution, drainage, conversion to farmland and the building of dams. Governments and communities are now looking for ways to protect, restore and manage them.

"Wetlands and the local human communities co-existed in harmony for centuries," says Dr Georgiev. "Wetlands are part of traditional culture and a source of income, mostly by their traditional use as a source of resources - hunting, fishing, or medicinal plants, for instance. In addition, they are important as a storage of water frequently used for irrigation.

"Some wetlands are an excellent example of harmony between economic activities and nature conservation - for example rice fields, fish ponds or saltpans. Now we can add to these traditional activities the income from the tourist industry, which may result in the creation of new jobs, development of the local infrastructure or providing a better market for local production.

"One of the national priorities in Bulgaria is the development of tourism as an element of the sustainable economic growth. Many wetlands are protected areas with rich biodiversity.

They are of great interest for visitors, for those with a general interest in nature and specialist tourists such as birdwatchers.

"In addition to businesses, municipal authorities have a great interest at the accumulation and popularisation of scientific knowledge about wetlands in their areas. They look at well-managed and well-preserved wetlands as a prerequisite for the development of tourism in their areas."

Clearly, global warming is a big threat to wetlands systems. "The climate changes create a great challenge for the conservation of natural areas," says Dr Georgiev. "The changed hydrological regime and altered water temperature can modify the structure of the wetland biotic communities. We are still at the very early stage of the developing models predicting the alterations of wetlands in the conditions of changing climate."

The key wetlands convention

An important event for wetlands was The Convention on Wetlands of International Importance, also called the Ramsar Convention. Adopted in Ramsar, Iran, in 1971, it is an intergovernmental treaty that provides the framework for





national action and international co-operation for the conservation and wise use of wetlands and their resources. The Convention's member countries cover all regions of the planet.

The Convention uses a broad definition of wetlands covered in its mission, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and man-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.

There are more than 800 Ramsar sites in Europe, and eleven of these are in Bulgaria, Dr Georgiev says. Central to the Ramsar philosophy is the "wise use" of wetlands, which has at its heart the conservation and sustainable use of wetlands for our benefit.

The Bulgarian wetlands

Bulgaria has a unique position in Eastern Europe with its biodiversity, Dr Georgiev says. "Although it is a relatively small country, it is rich in biological diversity

because of its highly varied climatic, geological, topographic and hydrologic conditions." These characteristics predetermine the occurrence of biota, consisting of 94 species of mammals, 383 birds, 36 reptiles, 16 amphibians, 207 Black Sea and freshwater fish, around 27,000 insects and other invertebrates, between 3,500 and 3,750 higher plant species and more than 6,500 lower plants and fungi. Thus Bulgaria ranks among the countries of the greatest biological diversity in Europe.

But this diversity is under threat. "We expect serious changes in the ecosystem of Black Sea due to the increased temperatures, mostly the invasion and mass development of species typical for subtropical and tropical waters," says Dr Georgiev. "Some of them may have catastrophic effects for the marine ecosystems, mostly by affecting native species of key importance.

"Rivers, lakes, marshes and other inland waters will be affected mostly by the hydrological regime shifts. This will

result in shifts in fish habitats, degradation of wetlands and decreasing water quality. The worst scenario may include the disappearance of wetlands."

Dr Georgiev is adamant that there is much work to be done.

"We need much more information about the structure and the functional interactions within wetlands in order to propose more adequate scenarios, which will allow planning of mitigation measures and proposal of sound management solutions."

The WETLANET project

WETLANET is a three-year project based at the Institute of Biodiversity and Ecosystem Research at the Bulgarian Academy of Sciences that finishes on March 31, 2012.

Comprising 45 people, it has been made possible by funding from the EU (Framework Program 7, Capacity Program grant) of 937,000 euros, and a further 115,000 euros from the Bulgarian Ministry of Education and Science.



The Capacity Program contains an initiative (REGPOT) that targets research establishments in the EU's convergence regions.

The purpose of the funding is essentially to bring about the full research potential of teams that have already demonstrated success in their fields – as the institute had in wetland studies. For many years it has been the main Bulgarian research body dealing with the problems of biodiversity conservation, with wetlands among its biggest research topics.

WETLANET's general aim has been to enhance the research potential at the Bulgarian Academy of Sciences by strengthening a local network of laboratories for studying the functions, restoration and management of wetland ecosystems.

As well as the laboratory units in Sofia this network included the three remote field stations at wetlands of major ecological importance in the Lower Danube and in the Black Sea coastal area.

The funding has helped the project to achieve its four main aims:

1. It has improved the capacity of the institute by organising outgoing and incoming visits of scientists for the exchange of experience and know-how. It has also helped WETLANET to employ experienced researchers and to organise training events. Sixteen young scientists have learnt invaluable lessons in labs all around Europe, while international experts have come to work with WETLANET for up to two months at a time, transferring their experience.
2. Crucially, it has enabled the project to upgrade the technical capacity of its laboratories by developing and renewing its research equipment and developing its IT capacity. WETLANET has been able to upgrade its microscopes and equipment for sampling and analyses, and buy a new research boat for shallow coastal waters. All this has allowed the institute to strengthen its overall research performance.
3. It enabled the project to organise a conference, workshops and training courses and gave the research staff experience of the international scientific environment. "In a conference in October 2011 we had 74 people, more than half of

them from our own country," says Dr Georgiev. In this way it has promoted research collaborations that can bring about the formation of consortia carrying out high-level research, which can have a significant socio-economic impact.

"We have an extensive exchange programme aiming to expose the members of our research staff and students to the international environment," says Dr Georgiev. "This programme includes joint studies, participation in training events, scientific meetings, workshops, etc. Some of the strengthened old and the newly created collaborations will have strategic importance for our institute."

WETLANET's research team is now in a network with laboratories and researchers from all over Europe.

4. WETLANET has spread information about the achievements of wetland science (including recent developments in its own laboratories) in society, targeting mostly business, industry, nongovernmental organisations and educational establishments with promotional events and publication activities.

These included a large exhibition and open days, one opened by the Bulgarian prime minister on the International Day of Wetlands, February 2, which brought much press coverage.

All this increased the visibility of the research activities of the institute and improved its response to the socio-economic needs of the country. Dr Georgiev hopes that as a result of WETLANET, scientists at the Institute of Biodiversity and Ecosystem Research will be able to participate in research activities as equal partners at EU level.

With the collaborative contacts that have been made during WETLANET, further projects with international funding are likely so that more important work can be undertaken at the laboratories in the coming years.

"We believe that the information gathered by our teams and our experience in wetland management and restoration will be used by wetland researchers throughout the world," Dr Georgiev concludes. "There are not universal approaches in the wetland ecology but the efforts of many researchers in many countries will put together the pieces of the puzzle and help us to better understand our world." ★

At a glance

Project Information

Project Title: WETLANET
Enhancing research potential by strengthening a local network of laboratories for studying wetland ecosystems functioning, restoration and management

Project Objective:
Enhancing the research potential of the research entity by strengthening a local laboratory network for studying wetlands ecosystem functioning, restoration and management (WETLANET laboratories). This laboratory network includes three remote field stations situated at wetlands and specialised laboratory units at the headquarters in Sofia.

Project Duration and Timing:
36 months, April 2009 to March 2012

Project Funding:
€ 1,050,560

Boyko Georgiev



Professor. Head, Department of Animal Diversity and Resources – IBER-BAS. Bulgarian NCP for FP7, Theme 6 "Environment (including climate change)".

Bulgarian coordinator of 7 bilateral projects with Spain, UK, Ukraine and Russia. Principal researcher of 5 projects funded by National Science Fund of Bulgaria.

Expert in the EU projects *European Register of Marine Species* and *Fauna Europaea*. Current research interests include parasite diversity, impact of parasites on ecosystem functioning and role of parasites in biological invasions.

Member of the editorial boards of the international journals *Systematic Parasitology*, *Folia Parasitologica*, *Acta Parasitologica*.



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