

Lagoons Technical Brief

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

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The Tyligulskyi Lagoon, Ukraine

Despite favorable conditions for biological diversity, economical activities and settlements in the lagoon area appreciably harm the environment and natural resources, and are sources for water pollution. Ecological unconsciousness and poor information about the environmental situation also contribute to a non-efficient management of the lagoon area

The Tyligulskyi Lagoon, Ukraine

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Abstract

The coast of Tyligulskyi Lagoon is distinguished for its diverse landscape: capes, wave-cut niches, coastal benches, sandy spits and islands, shallow waters and water meadows, reed beds, steppe areas and woodlands as well as the lagoon itself create favourable conditions for biological diversity. The vegetative cover along the lagoon's coast is representative for the vegetation of the steppe zone in the south of Ukraine; many plant associations registered in the Green Book of Ukraine, and protected species of international, national and local importance are native to this area. The lagoon's wildlife is also characterized by a high level of biological diversity. It is a habitat for 70% of the birdlife in Ukrainian wetlands. In the waters of Tyligulskyi Lagoon, 118 species of planktonic algae, 51 species of bottom-living vegetation including multicellular water-plants and flowering macrophytes, 30 species of meso- and macrozooplankton, 46 species of macrozoobenthos, and 25–30 species of fish can be found. Unfortunately, economic activity and settlements in the lagoon area appreciably harm the environment and natural resources of the lagoon and are sources for water pollution. Also, residents, state authorities, and local autonomous bodies are ecologically unconscious and uninformed in respect of environmental protection and conservation.

References

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Fact box

Tyligulskyi Lagoon is one of the largest, longest and deepest of all 21 lagoons located between the Dnieper and Danube rivers in the Ukrainian part of the northwestern coast of the Black Sea. The coast of Tyligulskyi Lagoon is a designated natural reserve and is on the Ramsar List of Wetlands of International Importance. The lagoon possesses a unique natural environment that favors the socio-economic development of adjacent territories particularly for recreational purposes, eco-tourism, public health, aquaculture, and fishing.

Characteristics of the lagoon

Tyligulskiy Lagoon (Fig. 1) is located on the Ukrainian coast in the northwestern part of the Black Sea, 60 kilometres away from the city of Odessa at the border of the Odessa and Mykolaiv region (46°39.3'–47°05.3'N, 30°57.3'–31°12.7'E). When the watermark in the lagoon is –0.4 m BS (meters in the Baltic system of heights and depths), the estimated volume and water-surface area are 452 km³ and 170 km², respectively. The catchment basin of the Tyligulskiy Lagoon has an area of 5420 km².

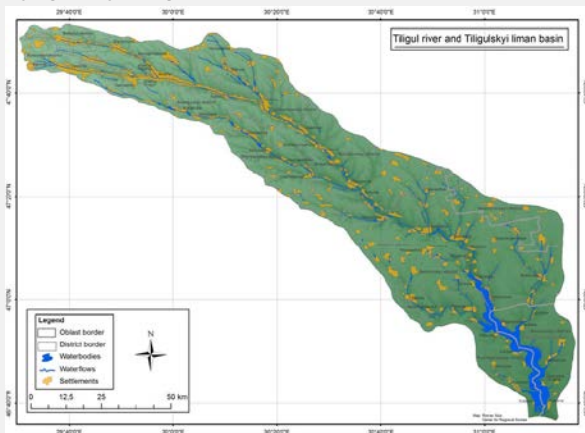


Figure 1 – Location of Tyligulskiy Lagoon and the Tyligul River drainage basin

The climate is temperate continental with low rainfall, short mild winters and long hot summers. The climate is extremely variable, but the vicinity to the Black Sea moderates temperature and humidity fluctuations. Figure 2 shows

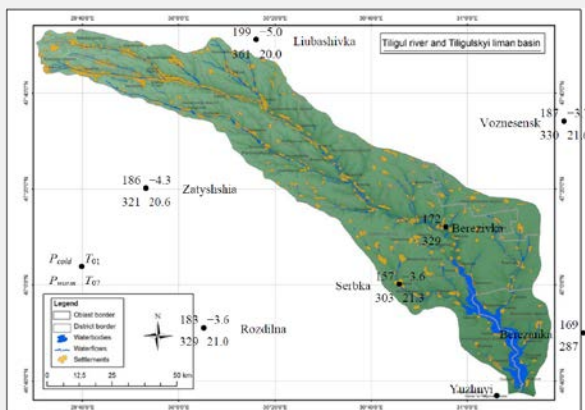


Figure 2 – Long term mean (1961–1990) precipitation during winter (P_{cold}) and summer (P_{warm}) as well as monthly temperatures during January (T_{01}) and July (T_{07}) for some sites near Tyligulskiy Lagoon.

temperature and precipitation recorded at sites near the Tyligulskiy Lagoon catchment. The flora of the lagoon's coast includes about 650 species of vascular plants; at least 70 of these are the dominant species of plant associations, and 22 species are listed in the National and International Red Book of Endangered Species. The Tyligulskiy Lagoon is also characterized by a high level of biological diversity of wildlife. It is habitat for 70% of the birdlife in Ukrainian wetlands. About 300 bird species are found here, 26 of them are registered in the Red Book of Ukraine, while three other species are on the European Red List. Since 1992, the fish species *Atherina mochon pontica* Eichwald became the principal commercial object in the Tyligulskiy Lagoon; catches at the end of the previous century ranged between 107 and 178 tonnes per year (Fig. 3). Under present-day conditions, a workable way to increase the fish capacity of the lagoon could be a purposeful formation of populations of valuable saltwater fishes, e.g. *Mugil so-iuy Basilewsky*, *Acipenseridae*, and *Platichthys flescus Pall*. The possibility of artificial reproduction and stocking as well as the formation of self-reproducing populations make these species suitable for maintaining large population sizes inside the lagoon.

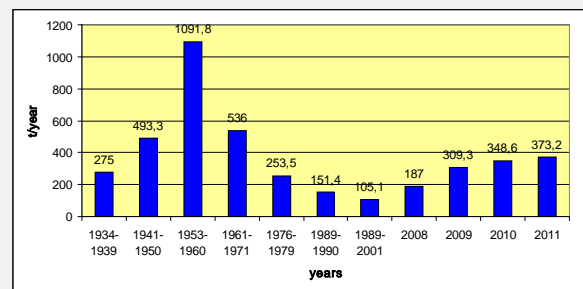


Figure 3 – Dynamics of the commercial catch of fish

Agricultural lands in the Tyligulskiy Lagoon basin comprise 75.4% of the total catchment area. In the upper and lower parts of the Tyligulskiy Lagoon basin the share of agricultural lands amounts to 70–85%, in the middle part it is 86–90%. Presently, 205 agricultural enterprises are registered in the basin, but only 54 of them cultivate a total area of more than 1000 ha. During years with optimal weather conditions,

high yields can be achieved from the cultivation of cereals and cucurbitaceae (e.g. cucumber, marrow, melon etc).

Socio-economic facts

The Tyligulskyi Lagoon is situated on the territory of two southern regions in Ukraine. By administrative and territorial subordination its northern part belongs to the Berezivskyi district in the Odessa region, the western part to the Kominternovskiyi district, also in the Odessa region, and the eastern part to the Berezanskyi district in the Mykolaiv region. The area of these administrative districts totals approximately 5 000 km² and is inhabited by a population of almost 130 000 people (2010).

The number of inhabitants permanently residing in the Tyligulskyi Lagoon area amounts to approximately 10 000 people. There are more than 100 boarding houses and several recreation centers ("Koblevo resort") that are able to accommodate around 17 000 people.

The good climate, an abundance of natural resources and the availability of therapeutic muds (supplies are estimated to 14 million tons) are strong factors favouring the development of recreational complexes in the Tyligulskyi Lagoon zone. The goal is to accommodate more than 100 000 guests annually.

In order to protect the natural resources in the Tyligulskyi Lagoon, two regional landscape parks were created along its coasts within the limits of the Odessa (3 973 ha of dry land and 9 981 ha of the lagoon's water area) and Mykolaiv (8 195 ha) region.

Laws, rights and conflicts

The management structure of the Tyligulskyi Lagoon area is extremely complicated. The coastal zone territory is subject to the Odessa and Mykolaiv regional state administrations.

The socio-economic and ecological management systems are in accordance with the Constitution of Ukraine, international conventions (The Ramsar Convention on Wetlands, The Convention on Biological Diversity, The Cartagena Protocol on Biosafety, Convention on the Conservation of

European Wildlife and Natural Habitats), Water, Forest and Land Codes of Ukraine, as well as many of the Laws of Ukraine.

Knowledge gaps & recommendations

There is a lack of hydrological and hydro-chemical data for the rivers in the Tyligulskyi Lagoon catchment. For example, hydrological and integrated ecosystem observations in the Tyligulskyi Lagoon were not conducted in the 1990s in view of the difficult socio-economic situation in the country.

The major disadvantages of the hydroecological monitoring of the Tyligulskyi Lagoon waters in the previous decade is that it was carried out mainly in the lagoon coastal zone and that its implementation was irregular and haphazard and lacked an overall plan. The observations were sporadic, their number substantially differed from year to year and some of the years no observations were at all.

In spite of the fact that there is a lot of data on the socio-economic state of the Tyligulskyi Lagoon, it has to be noted that most part of the data relates to the end of the 1990s and the beginning of the 2000s. Unfortunately, recent data are not freely accessible and lie scattered in many regional directorates and departments. Thus, there is a lack of information on the population of the settlements in the Tyligulskyi Lagoon zone; the number of country cottages and holiday-makers; the number of vacationers in the 'Koblevo' resort zone; indices of agricultural production in the Tyligulskyi Lagoon zone; indices of nature management and spending of nature protection funds on carrying out environmental measures in the Tyligulskyi Lagoon zone.

Modern environmental management systems are lacking such as the implementation of a basin management model for the catchment, river basin management plans, and programmes for the monitoring of the water status.



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