

2023 RECOMMENDATIONS

SPECIFICS FOR THE ODRA RIVER

Systemic actions
to protect against 'golden algae' blooms



Ministry of Climate and Environment
Republic of Poland

INTRODUCTION



One year after the publication of the first scientific report on the situation on the Odra River, we summarise the measures implemented. It refers to field of scientific and research activities. As a result, the Ministry of Climate and Environment issued recommendations to implement now and as long-term, systemic activities. The aim is to counteract environmental threats caused by climate change, including the development of invasive species.

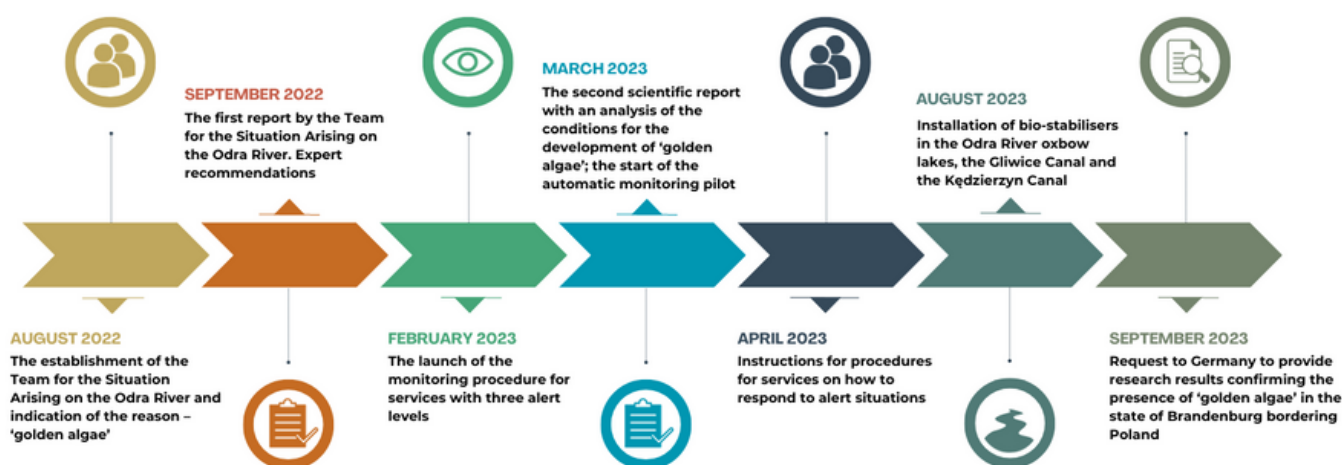
01. RECOMMENDATIONS

Experts developed recommendations based on scientists' findings and analyses of the constant monitoring results. They are aimed at water users and services at the regional and central levels responsible for water management. The goal is to prevent mass blooms of 'golden algae'. The most important ones include:

- 01 Maintaining constant monitoring of the Odra River for the occurrence of 'golden algae'.
- 02 Continuation of intelligent management of discharges and implementation of investments to increase industrial water retention.
- 03 Implementation of investments related to the retention and desalination of mine water by mining plants.
- 04 Control storm overflows and local water and sewage management investments.
- 05 Further inspections and removal of illegal sewage outlets.

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- 06 Constant cooperation between services, creating an environmental hazard management centre and a special model for hazard forecasting.
- 07 Continuation of scientific research related to the neutralisation of 'golden algae'.
- 08 The spot application of bio-stabilisers that limit the growth of algae.
- 09 Further implementation of the Odra River ecosystem restoration programmes, considering species typical of the Odra River basin.
- 10 As part of further cooperation and exchange of information with neighbouring countries, including the Czech Republic and Germany, it is advisable for these countries to carry out screening tests for the presence of 'golden algae'.

02. KEY ACTIONS. TIMELINE



CALENDAR 2022-2023

Remedial actions were carried out in various areas. The adopted procedures were based on the findings of scientists. Field actions were executed with the participation of provincial services, regional water management boards, representatives of the environmental protection inspection, the General Directorate for Environmental Protection, the Polish Armed Forces, the Fire Brigade and the Polish Angling Association. State research institutes supervised scientific activities. The results are summarised in reports. The calendar below complements the diagram and covers essential arrangements and activities.

18 August 2022 – the establishment of the Team for the Situation Arising on the Odra River to explain the causes of mass fish deaths in the Odra River. On that day, the Minister of Climate and Environment allocated PLN 250 million for an automatic river monitoring system in Poland.

19 August 2022 – the identification of the cause of mass fish deaths – 'golden algae'.

30 September 2022 – the first scientific report by the Team for the Situation Arising on the Odra River. A group of scientists presented the research results confirming the cause of mass fish deaths. The experts also provided recommendations for further actions.

30 December 2022 – the publication of the report on ichthyological monitoring with an assessment of losses in the Odra River ecosystems. The study, commissioned by the Chief Inspectorate of Environmental Protection, was prepared by the Inland Fisheries Institute – National Research Institute.

13 February 2023 – the launch of a monitoring procedure with three alert levels intended for services and water users. The Chief Inspectorate of Environmental Protection developed the procedure based on scientific research.

31 March 2023 – the second report by the Team for the Situation Arising on the Odra River – final scientific analyses. On the same day, a pilot automatic monitoring system for the Odra River was launched.

26 April 2023 – crisis management centres and services received instructions with detailed guidelines on what to do in the event of a mass fish die-off.

15 May 2023 – update of the Chief Inspectorate of Environmental Protection alert procedure – after the appearance of unusual blooms in oxbow lakes, different thresholds were adopted for oxbow lakes and rivers.

15-19 May 2023 – recruitment for the Odra River ecological diversity restoration programme implemented from the funds of five voivodeship environmental protection funds along the Odra River was announced.

17 May 2023 – the government adopted the Odra River Revitalisation act.

30 May 2023 – pilot automatic monitoring data was made available on the website www.gov.pl/web/odra

13 June 2023 – convening of the Crisis Management Team of the Ministry of Climate and Environment – issuing recommendations to limit mass blooms of ‘golden algae’.

26 June 2023 – activities of Polish services on the border section of the Odra River undertaken to explain the phenomenon of dead fish flowing from the Czech Republic.

4 July 2023 – installation of a bio-stabiliser on the Czernica Reservoir in the Odra River oxbow lake.

12 August 2023 – installation of a bio-stabiliser on the Odra River oxbow lake in Januszkowice.

29 August 2023 – installation of a bio-stabiliser at the mouth of the Kędzierzyn Canal into the Gliwice Canal.

6 September 2023 – the Polish side requests Germany to provide the results of research commissioned by the Brandenburg State Fishing Association, which confirmed the presence of ‘golden algae’ in Germany.

16 September 2023 – installation of a bio-stabiliser in the Port of Koźle on the Gliwice Canal.

03. SHORT- AND LONG-TERM ACTIONS

The invasive 'golden algae' has developed in the Odra River, and scientists cannot univocally indicate how it was transferred there from other regions of the world where it occurs. It could have been carried by migratory birds or ships sailing through various waters. In 2023, the 'golden algae' mainly concentrated in two oxbow lakes of the Odra River: Czernica Reservoir in Lower Silesia and Januszkowice in the Opole region, as well as in the Gliwice Canal. The single-celled algae entered the Odra River stream in small quantities, usually during temporary floods caused by rainfall. The Crisis Management Team of the Ministry of Climate and Environment issued ongoing recommendations for services and water users during the summer to stop the 'golden algae' expansion. Recommendations for further actions, including those to be implemented in the coming years, have been prepared based on the experiences and action patterns developed this season.

PRIORITIES FOR THE SEASONS TO COME

The most important is **maintaining constant monitoring of the Odra River water quality**. Regular sampling and analysis of physico-chemical water tests and assessment of the number of 'golden algae' cells make it possible to take appropriate remedial actions. Water quality monitoring should be performed, as currently, by accredited laboratories. It is also necessary to expand automatic monitoring based on the experience of the pilot programme.

Continuous **monitoring of the Wisła River basin**, where there are conditions for the potential development of 'golden algae', is also necessary. The appearance of 'golden algae' in Pszczyńska in the Wisła River basin in Silesia proves that the invasive algae can develop in other rivers or water reservoirs. Further analyses are necessary, including the selection of potential 'golden algae' habitats and screening tests, especially in spring and summer, when there is a greater risk of toxic algae blooms. An important task is to **continue to manage discharges intelligently**. It will be ensured by constant cooperation between the services, creating an environmental hazard management centre, and developing a special-purpose model enabling hazard forecasting. Systemic actions, including the operation of hydrotechnical facilities, are necessary primarily during droughts, low water levels and long-term heatwaves. During these periods, it is recommended to temporarily limit industrial discharges and maintain increased flows from retention reservoirs, intended to dilute the pollution load containing in the water to prevent stagnation and sudden deterioration of water parameters.

Environmental services and regional water management authorities should continue to inspect water users and eliminate illegal sewage outlets.

Unlawful sewage discharges massively pollute the Odra River, other rivers and reservoirs in Poland. This phenomenon promotes the degradation of ecosystems and algal blooms, including 'golden algae'. Therefore, services should continue inspections. Education is also necessary to raise public awareness through campaigns targeting local communities. It concerns mainly tourist regions, where periodically increased traffic intensifies the phenomenon of illegal dumping.

The further implementation of the Odra River ecosystems

restoration programmes, which consider the scientists' recommendations, is essential for restoring the populations of fish and other aquatic organisms. Stocking, taking species typical of the Odra River basin into consideration, should be conducted in consultation with experts.

More scientific research related to the neutralisation of 'golden algae' is necessary.

The 2023 scientific research in the Gliwice Canal showed the effectiveness of 3 preparations to neutralise 'golden algae'. However, the preparations to improve water quality cannot be used on a large scale, in open water, in the river. Research is still ongoing and should continue. **The spot application of bio-stabilisers is advised** to stop the growth of 'golden algae'.

Photo: RZGW Gliwicie



This method is environmentally safe and has proved effective in reducing the growth of 'golden algae'. Bio-stabilisers based on barley straw are applied in oxbow lakes: in Januszkowice, Czernica and Łacha Jelcz Reservoir. Moreover, one can find them in the Gliwice Canal at the level of the Port of Koźle and at the confluence of the Gliwice Canal and the Kędzierzyn Canal. Bio-stabilisers gradually release substances that reduce the proliferation of algae. They should be installed for up to several seasons to be effective.

Among the most critical tasks to fulfil in the years to come are **investments related to the desalination of mine water by mining plants.** In June 2023, the Management Board of KGHM Polska Miedź announced the construction of its saltworks for industrial and food-grade salt obtained during the process of mine drainage. The PLN 1 billion investment will halve the amount of salt entering the environment. Jastrzębska Spółka Węglowa also plans to invest in the further development of desalination systems for the Knurów-Szczygłowice mine. Equally crucial for improving water quality is increasing the retention capacity in systems designed for this purpose and subsequent **investments in the area of water and sewage management.**

Experts from national research institutes are also working on programmes related to establishing buffer zones around water bodies, designing and creating refugia, and increasing natural retention capacities in the Odra River basin.

The experience of September 2023, when the Brandenburg State Fishing Association reported the finding of 'golden algae' in Germany, suggests that the invasive algae is not only a Polish problem but may also affect neighbouring countries. All the more so as the 'golden algae' have been found in other European countries, including Denmark and Hungary. Therefore, one of the recommendations of the Ministry of Climate and Environment experts within the framework of international cooperation and information exchange is to perform **screening tests for the presence of 'golden algae'** on their territory, among others by Germany and the Czech Republic.

The Ministry of Climate and Environment has been actively involved since August 2022 in investigating the causes of a mass fish die-off on the Odra River and developing a catalogue of remedial measures to reduce the risk of recurrence. Scientific and administrative work in this direction continues. They are carried out by Ministry teams also involved in inter-ministerial work. Working meetings and deliberations involving specialists and scientists are held periodically. The latest findings are communicated to central and regional administrative units and services. The following institutions are directly involved in all official and field activities undertaken by the Ministry of Climate and Environment:

the Ministry of Climate and Environment

the General Directorate for Environmental Protection

the Chief Inspectorate of Environmental Protection

the Institute of Environmental Protection - National Research Institute

Up-to-date information about the situation on the Odra River and the Ministry's activities is regularly published on websites and social media profiles. The „SZTAB dla Odry” profiles are dedicated to the Odra River.

NEWS:

WEBSITE: WWW.GOV.PL/WEB/ODRA

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**MINISTRY OF CLIMATE AND ENVIRONMENT WEBSITE:
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