

Policies, actions and projects to manage Thermaikos Gulf in an integrated way - GR

1. Policy Objective & Theme

- SUSTAINABLE ECONOMIC GROWTH: Developing Europe's regional seas sustainably

2. Key Approaches

- Knowledge-based
- Ecosystems based approach

3. Experiences that can be exchanged

Water quality monitoring is an important tool for strategic development planning. Systematic oceanographic measurements in areas such as the Thermaikos Gulf is a multi-complex task, since the system of the parameters to be monitored have to be identified according to physical-chemical-ecological- economical- legal and social problems and needs.

4. Overview of the case

Since 1997 and until 2007, the Hellenic Centre for Marine Research in cooperation with the Aristotle University of Thessaloniki (Department of Hydraulics and Environmental Engineering, School of Civil Engineering) carried out systematic (monthly) monitoring for the marine environment in the Thermaikos Gulf.

5. Context and Objectives

a) Context

The Thermaikos Gulf is a multi-conflict area: urban (more than 1 million inhabitants), agricultural, tourist and industrial activities co-exist along the coastline, while 3 main rivers and several minor streams, with a catchment area of 50,000 km² discharge into the Gulf. A large part of the Gulf is shallow (with depth less than 5 m). A major part of the western coastal area was determined as a Ramsar site and includes three Natura 2000 sites (two "Sites of Community Interest (SCIs)" under the Habitats Directive and one "Specially Protected Area (SPA)" under the Birds Directive). Thermaikos Gulf is the final receptor of both municipal and industrial wastewaters from the city of Thessaloniki and considered to be one of the most polluted coastal zones in Greece. Also, the coasts of Thermaikos gulf and its adjacent area, host the most extended and productive mussel (*Mytilus galloprovincialis*) aquacultures of Greece (more than the 70% of the total production). Therefore, the quality of the marine environment is a vital issue for the health of the people and the ecosystems of the area. It is also an obligation according to the Water Framework Directive (WFD).

b) Objectives

The objectives of these extended monitoring schemes were the systematic recording/ creation of time series of oceanographic data and information that can give the picture of the condition of the marine environment in the Thermaikos Gulf and provide decision-makers (local and national) with an absolutely necessary tool for planning the development of the entire Thessaloniki metropolitan area and for the improvement actions.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Project Management

The coordinator of the monitoring programmes, since 1997, was the Hellenic Centre for Marine Research (HCMR) and has a partner the Hydraulic and Environmental Engineering Department of the Civil Engineering School of the Aristotle University of Thessaloniki.

a) ICZM tools

24 oceanographic stations have been identified within the Gulf. The parameters to be monitored have been defined aiming to a thorough description of the marine environment in the Thermaikos area:

- Monthly samples of physical, chemical, biological and pollution parameters, both in the marine environment (water column and sea bed) and in marine organisms.
- Monthly samples of pathogenic microbial populations.
- Continuous monitoring of ecological quality and sensitivity of the marine environment in relation with the operation of the new waste water treatment systems.
- Monitoring and study of the algal blooms (frequent in some parts of the Gulf).
- Geo-chemical analysis of suspended solids.

Based on the above data and analysis, it has been possible to formulate suggestions as regards the optimum protection and management of the Thermaikos Gulf, including the controlling of the waste water treatment plants and the monitoring and management of the mussel farms.

7. Cost and resources

The Thermaikos surveying programme offered a repeatable approach to marine environmental monitoring which has been lacking in the past and was used also as a prototype for several other Greek coastal areas (e.g. the Strymonikos Gulf). Large quantities of environmental data are being made available from the monitoring programmes and they are used for the study of the anthropogenic impacts to the Thermaikos coastal ecosystem. As a consequence of this analysis the northern part of the Thermaikos Gulf has been determined as a “sensitive” coastal environment, resulting in more restrictions and a higher standard for the municipal and industrial waste water’s treatment.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The monitoring programmes have been funded by the Ministry of Environment, Spatial Planning and Public Works of Greece (national funds).

9. Success and Fail factors

The involvement of HCMR (the only state marine research centre) along with the local university in the monitoring programmes was a successful factor. But the discontinuous funding of the monitoring programme resulted in the time series of environmental coastal data having notable gaps. On the other hand the European and Greek legislation (WFD, Bathing Waters Directive, etc) were the enforcement for the continuation of the monitoring programmes.

10. Unforeseen outcomes

The monitoring programmes and the consequential environmental analysis push forward the principles of ICZM for the Thermaikos Gulf and opened the discussion for the establishment of an independent Managing Authority and a strategic plan for improving and maintaining the whole Thermaikos Gulf ecosystem. As a result, the Direction for the Protection and

Development of Thermaikos Gulf was established (October 2006) in the Ministry of Macedonia and Thrace. The newly established body, as a state (instead of an independent) authority, has not the flexibility and the authorisation for negotiation with stakeholders and also to design the necessary strategic plan for improving and maintaining the ICZM plan for the Thermaikos Gulf.

11. Prepared by

Prof. Yannis N. Krestenitis, Department of Hydraulic and Environment Engineering, School of Civil Engineering of the Aristotle University of Thessaloniki, Greece.

12. Verified by

Dr. Kaliopi Pagou, Institute of Oceanography, Hellenic Center of Marine Research, Greece.

13. Sources

- Final Technical Reports for the Project: Monitoring of the marine environment in Thermaikos Gulf (Thermaikos 1997, Thermaikos 2000, Thermaikos 2004 and Thermaikos 2007), Hellenic Centre for Marine Research, Institute of Oceanographic.
- Thermaikos Gulf Coastal System, NW Aegean Sea: an overview of water/sediment fluxes in relation to air-land-ocean interactions and human activities, References and further reading may be available for this article. To view references and further reading you must purchase this article. S. E. Poulos, G. Th. Chronis, M. B. Collins and V. Lykousis, 2000, Journal of Marine Systems, 25 (1), pp. 47-76.
- The seasonal cycles of stratification and circulation in the Thermaikos Gulf Region Of Freshwater Influence (ROFI), north-west Aegean, References and further reading may be available for this article. To view references and further reading you must purchase this article. P. Hyder, J. H. Simpson, S. Christopoulos and Y. Krestenitis, 2002, Continental Shelf Research, 22 (17), pp. 2573-2597.
- Nutrient input, fluxes and cycling in relation to the biological production in Mediterranean ecosystems influenced by river discharges: Thermaikos Gulf (Greece), Pagou, K. Assimakopoulou, G. Krasakopoulou, E. Pavlidou, A., 2000, Dynamics of matter transfer and biogeochemical cycles: their modelling in coastal systems of the Mediterranean Sea: Final Scientific Report. Vol. 1, pp. 50-81.



Hyder_Simpson_2002 (2.63 MB) 



Poulos_Chronis_2000 (2.25 MB) 