



EuroGOOS

European Global Ocean
Observing System

Sea level observation networks in and around Europe

Challenges in monitoring increasing sea level hazards

Note to policymakers

Brussels, April 2017



Tide gauges support harbour operations and navigation, and are important for tsunami and storm surges warnings
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Sea level is an indicator of climate change and strongly affects coastal populations.

Sea level or “sea surface height” is considered an Essential Ocean Variable by the Global Ocean Observing System (GOOS). Sea level measurements along the coasts have been made since the XIX century by means of tide gauges. Today, tide gauges still are a key method to observe trends in mean sea level, assess extreme events, make tidal predictions and geodetic applications, support harbour operations and navigation. Furthermore, tide gauge measurements play an increasingly important role in the new warning systems for tsunamis and storm surges. Coastal inundation and storm surges can cause significant flood events and consequent destruction of property and infrastructure at the coast.

There is now a critical and increasing need for tide gauge data to help prevent and mitigate coastal disasters and deliver accurate projections of future sea level changes. In 2016, the EuroGOOS Tide Gauges Task Team conducted a survey to all national tide gauge operators in Europe and adjacent countries and collected information about the existing networks’ status. The survey also helped understand whether a permanent and sustainable European sea level network is possible.

In Europe, ocean measurements, including tide gauges, are typically made by individual countries. The recent economic crisis has negatively impacted the tide gauge networks. The need for a sustained network has become even more important to underpin both technical and financial efforts made by the European Commission to deliver sustained marine data for the blue economy.

The EuroGOOS Tide Gauge survey collected responses from 40 organizations across Europe and adjacent countries operating tide gauge networks, and representing 674 tide gauges. The most important question those organizations had to answer was on the sustainability status. Only 17 organizations considered there were no funding issues at present or in the near future, while at least three institutions lacked funds at present to maintain their stations in operation.

From the 674 tide gauges covered by the survey, 42 would not have dedicated or external funds in 2016, 64 could have funding problems in the future and 51 had reduced the funding for maintenance with respect to previous years. The situation in 2016 is broadly described in the map on the next page. There was a significant lack of responses from most of the North African countries, which are of tremendous importance for the monitoring of the Mediterranean Sea.

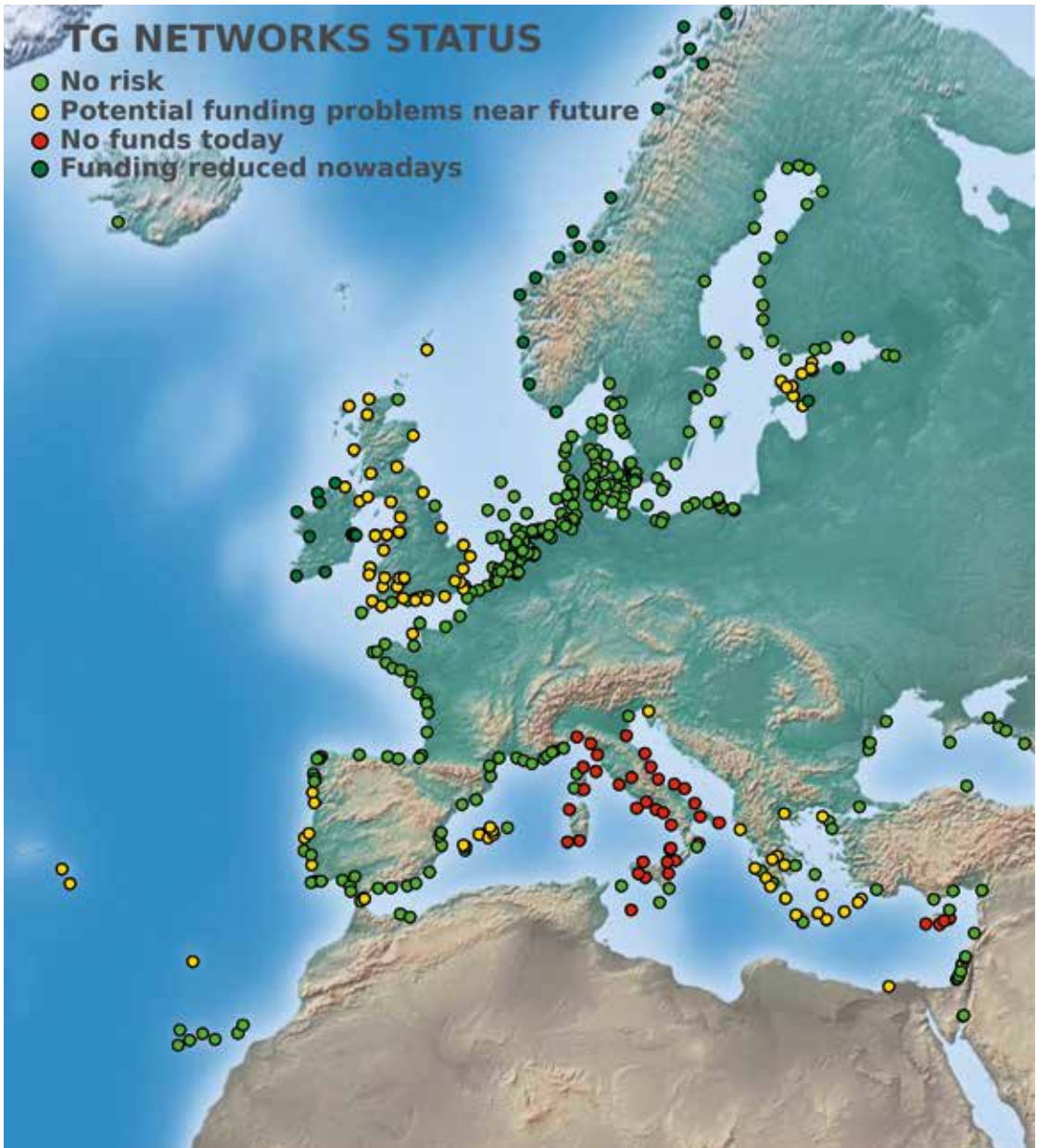


Figure 1: Funding status of tide gauge stations in the regions of European interest according to the responses from national contacts collected by the EuroGOOS Tide Gauge Task Team in 2016

The conclusion from the above numbers is that more than half of the institutions and nearly 25% of the tide gauge stations in Europe and Mediterranean region are facing problems of funding in some way. There is an urgent need therefore to ensure the sustainability of tide gauge stations in Europe and nearby countries. Should a national network be shut down for financial reasons, a blind spot would appear on the map where policymakers and public authorities would be incapable of assessing important coastal hazards such as storm surges, tsunamis, and sea-level elevation. For this reason, EuroGOOS encourages the Member States and the European Commission to allocate adequate funding for this critical element of our ocean observing system.

This map does not pretend to be a comprehensive inventory of the overall 674 tide gauges deduced from the survey: sometimes two or three tide gauges may be at the same harbour; also, many stations were not included along the German coast, for example, where the BSH reported to have 170

EUROGOOS TIDE GAUGE TASK TEAM

Sea level is a critical variable of our environment and has a high impact on coastal populations. Tide gauges are an important tool to determine trends in mean sea level, extreme conditions (and their relation to climate change), tidal computation, geodetic applications, harbour operations and navigation, as well as sea level hazards warning systems (tsunamis and storm surges).

Recognizing this critical and increasing need of tide gauge data, EuroGOOS Tide Gauge Task Team is bringing together the tide gauge communities in the European and adjacent seas. The EuroGOOS Tide Gauge Task Team compiles information on existing sea level networks, advises operators and scientists, and supports national and regional sea level initiatives towards enhanced and sustained system.

EUROGOOS, EUROPEAN GLOBAL OCEAN OBSERVING SYSTEM

EuroGOOS identifies priorities, enhances cooperation and promotes the benefits of operational oceanography to ensure sustained observations are made in Europe's seas underpinning a suite of fit-for-purpose products and services for marine and maritime end-users. EuroGOOS is a pan-European network operating within the Global Ocean Observing System of the Intergovernmental Oceanographic Commission of UNESCO (IOC GOOS).

Working hand in hand with partners in the European ocean research and observation community, EuroGOOS is promoting the integration of scientific knowledge and innovation for different users spanning science, policy, industry and society. The EuroGOOS Regional Operational Oceanographic Systems deliver analysis and forecasts of Europe's regional seas and feed quality-assured data to pan-European data portals (e.g. Copernicus Marine Service and EMODNet). EuroGOOS working groups and networks of marine observing platforms (Task Teams) enhance synergy and deliver strategies, priorities and standards, towards an integrated European Ocean Observing System (EOOS).

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