EMS Annual Meeting Abstracts
Vol. 22, EMS2025-521, 2025, updated on 12 Feb 2026
https://doi.org/10.5194/ems2025-521
EMS Annual Meeting 2025

Real-Time Monitoring of Maritime-Coastal Risks at the Basque Meteorology Agency

Santiago Gaztelumendi[1], Kepa Otxoa de Alda[1], Joseba Egaña[1], José Daniel Gómez de Segura[1], Iván R. Gelpi[1], Anna Rubio[2], Pedro Liria[2], and José Antonio Aranda[1]

[1]Basque Meteorology Agency (Euskalmet), Vitoria-Gasteiz, Araba, Basque Country (s-gaztelumendi@euskalmet.eus)

[2]AZTI Marine Research, Basque Research and Technology Alliance (BRTA), Pasaia, Gipuzkoa, Basque Country

The Basque Meteorology Agency (Euskalmet) and the Directorate of Emergency Attention and Meteorology (DAEM), within the Department of Security of the Basque Government, are responsible for issuing warnings, alerts, and alarms in response to potential risk impacts. Euskalmet's mission includes the continuous forecasting and monitoring of severe weather situations, operating 24/7. Among the various risks considered, maritime-coastal risk is one of the most significant in the region, often leading to considerable economic losses. The impact on the coastline may worsen with rising sea levels and the increasing development of coastal areas if adequate measures are not taken.

This contribution reviews the systems implemented in recent years for monitoring maritime-coastal risks and their integration into Euskalmet's surveillance framework. Real-time monitoring plays a crucial role in the Basque maritime-coastal early warning system, which also integrates predictive models to enhance its forecasting capabilities.

We provide an overview of the systems employed for real-time maritime-coastal risk monitoring, which convert raw data into actionable information. These systems focus on the three primary risks identified by the current operational framework: coastal wind reversals, navigation hazards, and coastal impacts. Additionally, continuous surveillance enables the detection of other meteorological hazards, such as low visibility and extreme winds, which also pose risks to the coastal zone. The data that powers these systems comes primarily from the Basque Ocean-Meteorological Observation Network, which includes a variety of observational instruments, such as coastal video cameras.

A key feature of this monitoring system is the use of various panels in the prediction and surveillance room. These panels, displayed on a central video wall, allow on-duty staff to quickly assess the risks by monitoring several key parameters in real time.

This paper also presents conclusions drawn from operational experience gained through

monitoring maritime-coastal risk events in recent years. Continuous vigilance and real-time data analysis are essential for issuing early warnings and supporting decision-making processes for effective risk management.