



How to monitor the Ocean with IN-SITU observations

4 June 2025 – 10:30 am - 6:00 pm CEST

Inspire Area – European Digital Ocean Pavilion

United Nations Ocean Conference 2025

Abstract

BigWaveTracker: Digitalising the World's Biggest Waves

Luis Pedro Almeida – CoLAB +ATLANTIC

BigWaveTracker is a groundbreaking digital system that revolutionises how we measure, monitor, and understand the largest waves on the planet. At its core, the system leverages advanced stereo-video technology to capture high-resolution data on big wave dynamics at Nazaré, Portugal, famous for its extraordinary surf conditions. By processing this data, BigWaveTracker creates highly detailed 3D digital representations of breaking waves, offering unparalleled precision and transforming the way we quantify and analyse wave behaviour. This digital innovation is a game-changer for surfers and the surf industry, resolving debates about the size of the largest waves ever ridden with accurate, transparent records. The system's ability to provide real-time, data-driven insights underscores its value not only in sports but also in broader scientific and practical applications. Beyond surfing, BigWaveTracker's digital capabilities enhance our understanding of coastal processes in the context of a changing climate. The system's advanced analytics contribute to coastal zone management, support search and rescue operations, and inform the design of resilient coastal infrastructure. By combining cutting-edge digital technology with interdisciplinary science, BigWaveTracker demonstrates how digital tools can address global challenges while pushing the boundaries of human achievement in extreme wave environments.

