



## **Geophysical Oceanography - a new tool to understand the thermal structure and dynamics of oceans**

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This pioneering project is the first dedicated EU project to address this novel research area that will ultimately bring the spatial resolution of the sub-surface seismic image, as used by the hydrocarbons industry, to address problems in oceanography. The project places demands on both sides: for the geophysicists, proving how the observed reflections are linked to boundaries in the water column; for the oceanographer, being able to build models and interpret data on the 10 m scale rather than the 1 km scale; and together, understanding how a 2-D snapshot of the 3-D ocean structure can be interpreted and translated into understanding of the dynamics of heat and mass transfer. A major goal will be providing the confidence to use legacy seismic data collected for academic research and hydrocarbon exploitation for understanding ocean processes. The project will: produce a joint interpretation from a combined calibration experiment with the simultaneous collection of both seismic and oceanographic data in the Gulf of Cadiz; build models based on oceanographic research and compute synthetic seismic data to test strategies; explore novel methods to use seismic data to understand processes involved in ocean mixing including internal waves and interaction with continental slopes; and establish research expertise in the EU at centres of excellence that can be used for training and exploitation of this new opportunity and that can compete with non-EU laboratories. Ultimately, the project will provide new tools to aid monitoring ocean circulation and heat transport which are important for the study of climate change.