



Seismic Oceanography on its fifth birthday: successes, challenges, and future directions

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Seismic oceanography has opened up new ways of visualizing thermohaline finestructure. Through reprocessing seismic reflection data with an emphasis on the water column, stunning images of fronts, eddies, water mass boundaries, and internal waves have been produced. As it approaches its fifth birthday as a discipline, seismic oceanography is entering a critical stage of development. An early rush to document the physical basis for the reflections and to catalog images in different oceanic environments is yielding to a need to extract useful, trustable, and quantitative information on physical oceanographic processes from the images. Here we review progress to date, and point to key areas of current and future research. Promising areas of research include emerging techniques to quantify internal wave energy and turbulence dissipation from seismic images, the acquisition of industry SO data, and the production of 3D and time-lapse images of finestructure. A principal challenge for the future is the merging of synthetic and field seismic data with realistic physical models of oceanic temperature/density structure, calculated at the dense horizontal and vertical spacing needed to simulate the seismic data.