

Seamount scientists offer new comprehensive view of deep-sea mountains

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This part of the back cover of the March 2010 issue of the journal *Oceanography* depicts seven seamounts formed by the Louisville hotspot in the South Pacific that were surveyed during the AMAT02 Expedition in 2006 (Peter Lonsdale, Scripps Institution of Oceanography, chief scientist) using R/V Roger Revelle. As part of the Integrated Ocean Drilling Program (IODP), this site survey provided key data to prepare for IODP Expedition 330 (December 2010) that aims to drill four seamounts in the Louisville seamount trail. Using paleomagnetic and geochronological data from the drilled basalts, this project attempts to answer the question of whether the deep Hawaiian and Louisville mantle plumes, the two longest-lived primary hotspot systems in the Pacific, have moved in concert or independently. Credit: The Oceanography Society

Lying beneath the ocean is spectacular terrain ranging from endless chains of mountains and isolated peaks to fiery volcanoes and black smokers exploding with magma and other minerals from below Earth's surface. This mountainous landscape, some of which surpasses Mt. Everest heights and the marine life it supports, is the spotlight of a special edition of the research journal *Oceanography*.

These massive underwater mountains, or seamounts, are scattered across every [ocean](#) and collectively comprise an area the size of Europe. These deep and dark environments often host a world teeming with bizarre life forms found nowhere else on Earth. More than 99 percent of all seamounts remain unexplored by scientists, yet their inhabitants, such as the long-lived deepwater fish orange roughy, show signs of habitat destruction and over exploitation from intense international fishing efforts.

Scientists from Scripps Institution of Oceanography at UC San Diego and colleagues from the National Oceanic Atmospheric Administration, Oregon State University, University of British Columbia and Woods Hole Oceanographic Institution were among those who contributed their expertise in seamount chemistry, physics, geology, hydrology, oceanography, biology and fisheries conservation to this special interdisciplinary effort to delve into the extremely broad research supported by seamounts and to communicate the science and threats facing them to the public.



This is an aggregation of orange roughy (*Hoplostethus atlanticus*) at 890-m water depth on the summit of Morgue seamount. This small seamount had been heavily fished, but in 2001 was closed to trawling. Orange roughy therefore find a refuge from exploitation on this seamount. Credit: The Oceanography Society

"One of the key goals of this special issue was to bring together the extremely diverse seamount research community that ranges from [fisheries science](#) and conservation all the way to mantle geochemistry," said Hubert Staudigel a research geologist at Cecil H. and Ida M. Green Institute of Geophysics and Planetary Physics at Scripps and the lead guest editor of the special issue. "In my eyes, this volume of Oceanography goes beyond that by presenting amazing new research in a way that the public can understand and get excited about."

"This issue of [Oceanography](#) offers a broad perspective on seamount research of all major disciplines to raise awareness of the diversity of seamount research and to promote collaboration among seamount scientists," wrote the editors of the issue, which represents the most comprehensive volume of peer-reviewed research on the subject to date.

"I was pleased to see how many of the contributions in this special issue deal with very practical and societally important issues of seamounts," said U.S. Geological Survey Director Marcia McNutt.

Provided by University of California - San Diego

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