

Researchers discover unknown species at juncture where hot and cold habitats collide

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A dense beds of large clams along with snails and crabs.

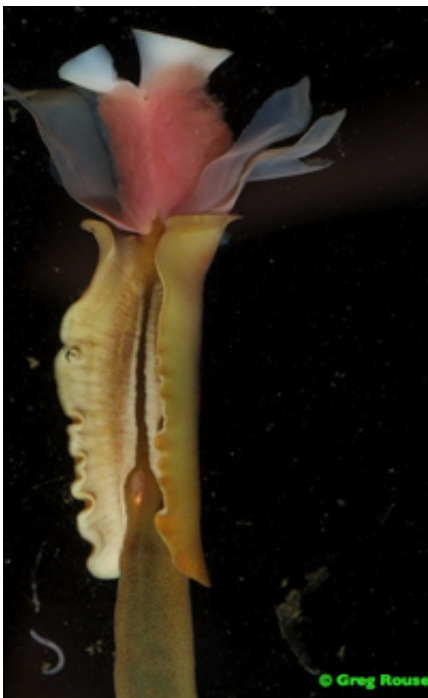
Among the many intriguing aspects of the deep sea, Earth's largest ecosystem, exist environments known as hydrothermal vent systems where hot water surges out from the seafloor. On the flipside the deep sea also features cold areas where methane rises from "seeps" on the ocean bottom.

It's extremely rare to find both habitat types intersecting in one place, but that's what researchers found and explored during an expedition in 2010 off Costa Rica. A description of the scientists' findings, including a large number of mysterious, undescribed species, is published in a study led by Lisa Levin of Scripps Institution of Oceanography at UC San

Diego in the March 7 issue of the [Proceedings of the Royal Society B: Biological Sciences](#).

Because researchers who study such areas primarily focus on hydrothermal vent systems or [methane seeps](#), Levin and her colleagues were surprised to find a hybrid site in an area where only cold seeps have been previously reported. They coined the phrase "hydrothermal seep" to describe the ecosystem.

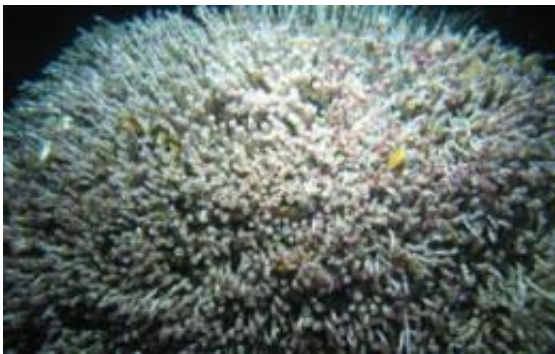
"The most interesting aspects of this site are the presence of vent-like and seep-like features together," said Levin, "along with a vast cover of [tubeworms](#) over large areas and a wealth of new, undescribed species."



A 'foundation' species of tubeworm found in hot vents and cold seeps. Photo credit: Greg Rouse

The researchers investigated the geochemical properties of the area—known as the Jaco Scar at the Costa Rica margin where an underwater mountain is moving under a tectonic plate—along with small organisms and microbes. Co-existing animals ranged from those known to primarily inhabit hot vents or cold seeps, along with "foundation" species that exist in both settings. In addition to tube worms the team documented fish, mussels, clam beds and high densities of crabs.

Because so little is known about the deep ocean, the researchers say it's likely that further hybrid or "mosaic" ecosystems remain undiscovered, possibly featuring marine life specialized to live in such an environment.



These are hydrothermal seep-dwellers: a large tubeworm "bush" with more than 14,000 tubeworms. Credit: Lisa Levin/NSF

"There are plenty of surprises left in the [deep sea](#)," said Levin, director of the Scripps Center for Marine Biodiversity and Conservation. "Not only are there new species but there are almost certainly new communities and ecosystems to be discovered." "In this instance the human presence, in the submersible ALVIN, was key to our findings. The site had been visited remotely by other researchers, but it was not until human eyes saw shimmering water coming from beneath a large

tubeworm bush that we really understood how special Jaco Scar is."

Provided by University of California - San Diego

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