

Deep sea vent diversity

Wherever researchers look on the sea floor, there are different types of hydrothermal vents. There is more variety than even the most enthusiastic deep-sea explorer could have dreamed. A spate of reports has unveiled the astonishing diversity of vent ecosystems around the globe.

In the Caribbean Sea, a team led from the National Oceanography Centre in Southampton has discovered two vent fields on the ultraslow-spreading Mid-Cayman ridge (*Nature Commun.* **3**, 620; 2012). These include not only the deepest field known (4,960 m down), but also a high-temperature system located at a distance to the ridge, on a seamount 13 km off the ridge axis.

The off-axis vents, named after the late geochemist Karen Von Damm, spew hot waters that support many types of

animals, but mostly shrimp. Finding a vent field so far from the active spreading centre suggests there may be more vents worldwide than previously suspected, the scientists say.

That claim is borne out by nearly every cruise looking for vents. In 2007, at the Southwest Indian Ridge in the Indian Ocean, a Chinese-led expedition spotted the first active high-temperature vent system on an ultraslow-spreading ridge (*Geology* **40**, 47–50; 2012). Heat flow from the spreading centre alone probably isn't enough to fuel the vent field, say Chunhui Tao of the Second Institute of Oceanography in Hangzhou and his colleagues. Rather, local hotspots of upwelling magma may keep the waters balmy enough for the shrimp, crab, snails



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and mélange of other deep-sea animals found by a British-led follow-up voyage in November and December 2011.

Vent fields warm even the frigid depths of the Southern Ocean. The East Scotia Ridge near the South Sandwich Islands is home to the southernmost vent field ever found, report Alex Rogers of the University of Oxford and his colleagues (*PLoS Biol.* **10**, e1001234; 2012). Here, thousands of a new species of yeti crab scramble over one another for a chance to bask in the hot vent waters, which can reach temperatures as high as 380 °C.

The Southern Ocean vents don't host many of the species that are common at other hydrothermal fields, such as certain kinds of tubeworms, mussels and shrimps. Something about the harsh Antarctic environment may act as a biogeographical barrier to keep them out, Rogers' team speculates. That could be the extreme seasonality of the polar ecosystem, or the background water temperature that ranges from –0.5 to +2 °C, too chilly for invertebrates whose larvae need to feed at sea when they hatch.

Shrimp and crabs are not the only ones interested in hydrothermal vents. These fields can host sizable deposits of metals and minerals. Indeed, China has obtained permission to explore a section of the Southwest Indian Ridge that includes active vents for mining opportunities. Much needs to be learned about the geochemistry of the vents and the bizarre creatures atop them, before any exploitation begins. □

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The journalist's take

The recent rush of hydrothermal vent discoveries highlights the common journalistic challenge of how to cover related but distinct stories that trickle out publicly over several weeks.

In most oceanography stories a team of researchers goes to sea, returns, and announces what they've found. This narrative drove the first media stories in the late 1970s, when scientists discovered hydrothermal vent animals at the Galapagos Rift in the eastern Pacific Ocean.

But as the years go by, the simple storyline of 'new vents found, new species discovered' starts to wear thin. Just as scientists must justify their exploration plans with every grant application, so too must journalists convince their editors that something different lurks in each latest tale of deep-sea discovery.

Coverage is complicated by the system of publication embargoes imposed by many scientific journals. In this case, after a British-led cruise returned from the Southwest Indian Ridge just before Christmas 2011, Southampton biologist Jon Copley contacted a BBC reporter who had been following the work. A story, replete with stunning images from a professional photographer who had made the trip, appeared on 27 December. Other media outlets quickly followed suit with their own versions during a slow holiday news week.

But many of the same team members were holding their big ammunition for the 3 January 2012 release of the *PLoS Biology* paper reporting the Southern Ocean vents. This discovery garnered headlines worldwide, with many stories highlighting the hairy yeti crab species nicknamed Hoff crabs, after American actor David Hasselhoff.

By the time a paper on the Cayman vents rolled around with a 10 January release date, media outlets were faced with the option of running yet a third hydrothermal vent story in three weeks. Several did, but others, including my magazine, opted to wait for the 10 January paper before publishing a single story incorporating all three findings.

Languishing in media coverage was the *Geology* paper on China's initial discoveries from the Southwest Indian Ridge. One strike against it, publicity-wise, was that it reported findings from a 2007 expedition, in the public mind already superseded by the biologists who returned from sea in December 2011. Another strike was that it came from a journal without a publication embargo, which paradoxically often results in less media coverage, and from an institution that did not issue a press release.

Yet overall, the vent discoveries made their way into a number of popular stories in different media outlets — a diversity of coverage as welcome as the diversity of the vents themselves.