Smoke from the deep

The deepest known hydrothermal vents were discovered last month five kilometers below the surface of the Caribbean Sea. Using an autonomous exploratory submarine and a remote-controlled deep-diving vehicle, a team of scientists from the UK's National Oceanography Centre in Southampton found the underwater geysers, appropriately called black smokers, in the Cayman Trough, an undersea volcanic ridge at the intersection of the North American and Caribbean tectonic plates.

Deep-sea vents tend to be found at depths of 1.5–3 kilometers. First seen in the Pacific Ocean in 1977, the vents have fascinated scientists and the public with their unique and unexpectedly thriving ecosystems fueled by the mineral-rich scalding water they spew. That water can reach temperatures greater than 450 °C. Although the pressure at those depths keeps the erupting water from boiling, the minerals quickly precipitate out. At the newly discovered vents, copper and iron precipitates have formed chimneys (the top of one is seen here) that are some 6 meters tall but only 50–60 centimeters wide; other minerals give the black plume its characteristic color. Microbial mats cover the bases of the spires.

The researchers' expedition to the Caribbean has ended, but they will be returning to study the biology, chemistry, and geology of the vents in more detail. (For more information, see http://thesearethevoyages.net. Image courtesy of the National Oceanography Centre, Southampton, UK.)

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