

Unique Species Found Near Sea Floor Vents

Difficulty:

DIFFICULT

Date of release:

Friday 20th January 2012

Discussion activities to be done after completing this EA lesson

Today's report was about vents found at the bottom of the ocean and animal species that have recently been discovered near them. What are these deep sea vents like? How hot is it there? What new animal species have been discovered? Why is this research important?

Extension discussion topics

A. Talking about and going over the specific topic / idea / issue in listening text

Introduction = The research conducted by Dr. Jon Copley of Southampton University and his team.

1. What do you remember about deep sea vents? Where are the ones that were discussed in the report?
 - Hot springs at the bottom of the ocean.
 - Similar to geysers in Yellowstone Park in the US.
 - They are nicknamed "black smokers".
 - They have extremely hot (450-degree) fluid full of dissolved minerals spewing out of them.
 - Located in the Cayman Trough, a trench south of the Cayman Islands, five kilometers under the sea surface.
2. What types of animals live near the deep sea vents? Do they live right in the vents?
 - Newly discovered species of shrimp with a light-sensing organ on their backs. They eat mostly bacteria.
 - White-tentacled anemones.
 - They live a few meters away, where the temperature is about 20-40 degrees Celsius, not 450 degrees like it is right at the vents themselves.
3. Why does Dr. Copley researchers think it is important to understand these deep-sea ecosystems?
 - There will be an increasing human presence in the deep sea (deep-sea fishing, oil and gas extraction, mining operations).
 - We need to better understand the deep sea in order to make responsible decisions about these ocean resources.

B. Expanding on (one of) the topics / ideas / issues in listening text

Topic = Expeditions.

1. Dr. Copley and his fellow researchers traveled to the Cayman Trough to do their research on deep sea vents and the animals that live near them. Do you know anyone who has gone on an expedition? If so, how long did it last? Where did they go? What did they go there to do?
2. Would you be interested in going on an expedition far away from home to explore or study a little-known place? Where would you go? What would you study?
3. Do you think you could go to an extreme place and survive? The South Pole? The middle of the Sahara Desert? A boat in the middle of the ocean? A submarine?
4. What is the longest period of time that you have ever been away from home? Did you have family members or friends with you? Did you miss home? What did you miss most about home? If you have lived in another place for a while and then moved back home, are there things that you miss about the other place now that you have left it?

OR, Topic = Famous expeditions and explorers.

Find out all you can about one of the expeditions at <http://www.toptenz.net/top-10-famous-expeditions.php> and give an oral presentation of your findings to a partner or to your teacher. If you think another important expedition or explorer is missing on the list, explore that and present what you learn.

C. Extending discussion of (one of) the topics / ideas / issues in listening text

Topic = Use of deepwater resources.

1. Dr. Copley mentions his belief that there will be an increasing human presence in deep-sea areas, for things like deep-sea fishing, oil and gas extraction and mining operations. What challenges do you think might be associated with working 5 km under the surface of the sea?
2. Do you remember the 2010 oil spill in the Gulf of Mexico involving the Deepwater Horizon? What do you remember about it? (See: http://en.wikipedia.org/wiki/Deepwater_horizon) Can you think of any other incidents at the bottom of the ocean?
3. Why do you think people are more interested in exploring resources at the bottom of the ocean now than they were 30 years ago? Is it due to improvements in technology making the impossible possible? Have human beings just gotten so desperate for resources (due to increasing population, increasing worldwide demand) that we are willing to take the risks associated with working on the sea floor?

Audioscript

The volcanic vents were discovered five kilometers down, near the bottom of Cayman Trough, an undersea trench south of the Cayman Islands. Expedition co-leader Jon Copley, a marine biologist at the University of Southampton in England, spoke to us via Skype.

"Deep sea vents are hot springs on the ocean floor, so they're a little bit like the geysers that you might know from Yellowstone Park in the U.S.A., except they're underwater, so they're not erupting steam. They're erupting really hot fluid, that's still liquid, but it's laden with dissolved minerals that form particles that look like smoke, and that's why we nicknamed them 'black smokers'."

Although they did not measure the vent temperatures directly, the scientists estimate that the dark material spewing out - mostly copper and other dissolved minerals - is hotter than 450 degrees Celsius.

"The animals don't live at those high temperatures, like 450 degrees. That's the temperature, the kind of temperatures you get right at the very throat of the vents, where the hot fluid is gushing out of the earth's crust. But the animals don't live there. They live a little bit further away. A few meters away, the temperature is down to 20 to 40 degrees."

In those cooler waters around the vents' six-meter tall mineral spires, the scientists found teeming populations of marine animals, including a new species of shrimp. Copley says the tiny white creatures exist in near-total darkness and feed mostly on bacteria.

"Instead of two eyes on stalks like shrimp normally have as an adult*, these shrimp have a light-sensing organ on their back."

They also found hundreds of white-tentacled anemones, but they could not collect specimens.

Copley says that by studying the deep-sea vents and their animal colonies, scientists can better understand how marine life disperses and evolves in the deep ocean. He notes that in the coming years, the ecosystem will see an increasing human presence, in the form of deep-sea fishing, oil and gas extraction and mining operations.

"If we're going to make responsible decisions about how we manage those ocean resources, we need to understand what determines the patterns of life in the deep ocean."

Copley and his team are now analyzing samples and data from "black smoker" vents recently found at four other seafloor sites around the world.

This is Zulima Palacio, VOA News.

* We would expect the speaker to say: "*Instead of two eyes on stalks like shrimp normally have **as adults...***".