

New research into the deep ocean floor yields promising results for microbiologists

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Research by a small group of microbiologists is revealing how marine microbes live in a mysterious area of the Earth: the realm just beneath the deep ocean floor. The ocean crust may be the largest biological reservoir on our planet.

Beth Orcutt, a post-doctoral fellow at Aarhus University in Denmark and the University of Southern California, presented her new findings about this little researched realm today at Goldschmidt 2010, an annual conference sponsored by a number of international geochemical societies and hosted this year by the University of Tennessee, Knoxville, and Oak Ridge National Laboratory.

"I think this research is exciting because it offers us a glimpse into a habitat on Earth that we know next to nothing about," Orcutt said. "If you consider how much ocean crust there is on Earth, and how much of that is hydrologically active, then this environment could be one of the most massive habitats for microbial life on Earth. There may be new species of life and new types of metabolism that we haven't discovered yet."

There has been limited research into this deep marine crust, so Orcutt and her colleagues have developed new hole-boring technologies to study [microbial life](#) living beneath rock on the seafloor. Orcutt must use a robotic submarine to reach this realm, buried under 2660 meters (1 $\frac{2}{3}$ miles) of water. Then she must drill through 260 meters (850 feet) of sediment. The microbes Orcutt and her team study receive no light that

far beneath the [ocean floor](#), so part of what they are exploring is how these microscopic organisms survive in such harsh conditions.

Orcutt believes this research also can yield a new understanding of the potential for life on other planets. The subsurface under deep oceans is an extreme environment for any life to exist. Such environments may be present on other planets, so Orcutt theorizes that life might exist there in the form of microbial organisms.

"I hope that the general public will understand that the ocean isn't just a giant pond with a featureless, unexciting bottom," Orcutt said. "The [seafloor](#) and sub-seafloor are exciting environments where microbes rule. We have to develop sophisticated experiments to try to learn more about these microbial habitats, experiments which will reveal new information about how life survives and thrives on [Earth](#) and maybe about how life may exist on other planets."

Provided by University of Tennessee at Knoxville

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