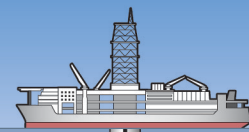
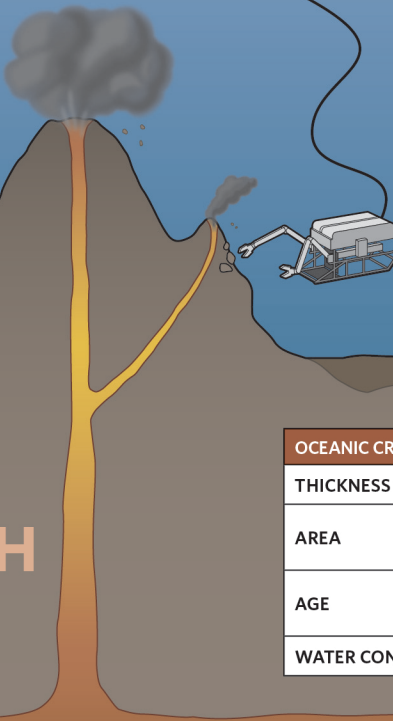


Deep-sea, manned submersibles and remotely operated vehicles collect fluid samples that exit natural points of access to the oceanic crust, such as underwater volcanoes or hydrothermal vents. These samples contain microbes living in the crust beneath.



Drilling holes into the Earth's crust allows retrieval of rock and sediment cores reaching kilometers below the surface. The holes can then be filled with monitoring equipment to make long-term measurements of the deep biosphere.



OCEANIC CRUST	
THICKNESS	6-10 kilometers
AREA	About 60 percent of Earth's surface
AGE	Rarely more than 200 million years
WATER CONTENT	High

Core

Marine Sediment

CONTINENTAL CRUST	
THICKNESS	30-50 kilometers
AREA	About 40 percent of Earth's surface
AGE	Up to 4 billion years
WATER CONTENT	Low

Core

Mine shafts

Tunnels

Deep mines provide access points for researchers to journey into the Earth's continental crust, from where they can drill even deeper into the ground or search for microbes living in water seeping directly out of the rock.

JOURNEY TO THE CENTER OF THE EARTH

The recent expansion of large-scale scientific drilling programs, combined with intensified efforts to take advantage of existing portals into the crust, has led to an explosion of research on the deep biosphere.

Mantle