

Since 2009, DCO scientists have explored more than 90 sites in 30 countries. More than 250 scientists from numerous disciplines participated in expeditions to learn about deep carbon inside Earth—how it moves, how much there is, what forms it takes, and how it originates. To learn more, visit deepcarbon.net or contact Katie Pratt (katie_pratt@uri.edu | 401 536 8813).

A selection of ongoing DCO field studies:

THE OMAN DRILLING PROJECT: OMAN

The Oman Drilling Project involves diamond coring at several sites in the southeast end of the Samail Ophiolite complex in Oman. Phase 1 drilling operations took place from November 2016 until late March 2017. Phase 1 core logging took place on scientific drilling vessel *Chikyu* while in port in Shimizu, Japan, in July and August 2017. Phase 2 drilling will begin in December 2017. The team is investigating many aspects of the deep carbon cycle, including quantities of carbon in the mantle and the extent of the subsurface biosphere.

More information: www.omandrilling.ac.uk



OMAN | KATIE PRATT

BIOLOGY MEETS SUBDUCTION: COSTA RICA

A team of DCO early career scientists investigated 24 sites in Costa Rica over the course of 12 days in mid-February 2017. Sites included Poás, Rincon de la Vieja, and Arenal volcanoes and a number of cold, warm, and hot springs along the Nicoya and Osa Peninsulas. The team is currently analyzing their samples, and planning a follow-up expedition in April 2018. The knowledge gained from this intensive, cross-disciplinary expedition will shed light on carbon movement between Earth's surface and interior and the biological and chemical changes that occur en route.

More information: <https://tinyurl.com/biology-meets-subduction>



COSTA RICA | CARLOS RAMIREZ

DEEP EARTH CARBON DEGASSING AND VOLCANO MONITORING: WORLDWIDE

The DECADE (Deep Earth Carbon Degassing) initiative unites scientists with expertise in geochemistry, petrology and volcanology to determine constraints on the global volcanic carbon flux. To gather needed data, DECADE is building a global monitoring network to continuously measure the volcanic carbon flux of 20 active volcanoes. Currently, eight volcanoes are outfitted with gas monitoring stations (one was lost during the eruption of Villarricca Volcano, Chile). Over the next two years, DECADE scientists will add more stations, and regularly maintain current stations.

More information: <https://tinyurl.com/deep-carbon-degassing>



NICARAGUA | ALESSANDRO AIUPPA

The Deep Carbon Observatory (DCO) is a global community of multidisciplinary scientists unlocking the inner secrets of Earth through investigations into life, energy, and the fundamentally unique chemistry of carbon. Visit deepcarbon.net for more.

INVESTIGATING DEEP ENERGY AND DEEP LIFE IN MINES AROUND THE WORLD

Existing mines offer relatively easy access to deep environments inside Earth. Several expeditions to Sudbury and Kidd Creek nickel and copper ore mines in Ontario, Canada, have resulted in significant insights into global geologic hydrogen production in continental environments. Related research is also taking place in the deep gold mines of South Africa, where scientists have characterized diverse microbial ecosystems. And in northern Minnesota, DCO scientists are investigating microbial life in the now abandoned Soudan iron mine. Studying these sites, and others on land and beneath the ocean, are giving DCO deep life scientists a global picture of the deep biosphere.

Canada: <https://tinyurl.com/billion-year-old-water>

South Africa: <https://tinyurl.com/deep-diverse-microbes>

Minnesota: <https://tinyurl.com/minnesotan-microbes>



MULTI-WELL DEEP UNDERGROUND LABORATORY: EASTERN CHINA

In the Songliao Basin, China, DCO scientists are taking fluid samples from existing boreholes to investigate the origins of hydrocarbons in this region. A workshop in the summer of 2016 set the stage to initiate a proposal to the International Continental Drilling Program in early 2017 to expand this underground laboratory.

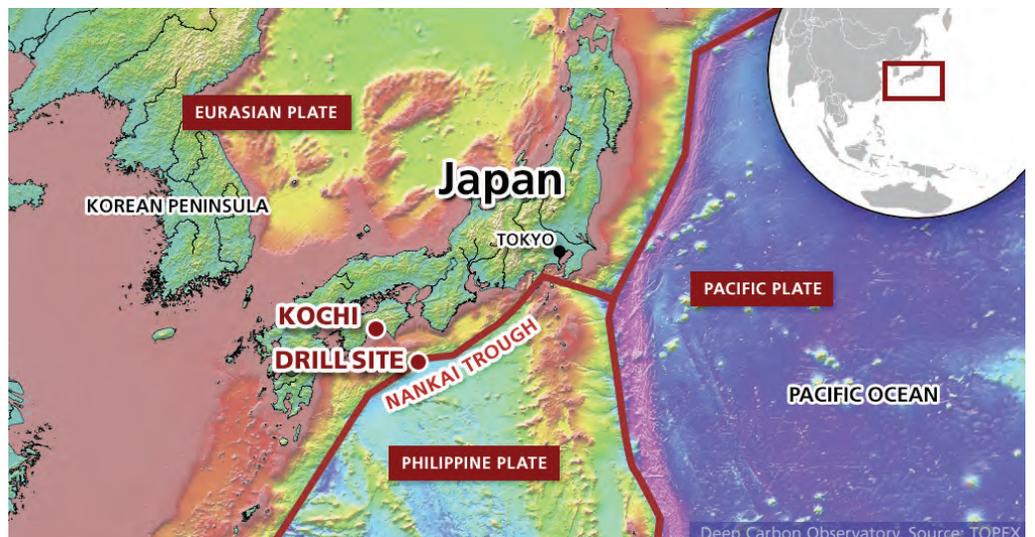
More information: <https://tinyurl.com/deep-underground-lab>



T-LIMIT OF THE DEEP BIOSPHERE: JAPAN

International Ocean Discovery Program Expedition 370 "T-Limit of the Deep Biosphere off Muroto," which took place in the fall of 2016, set out to investigate the the temperature limits of life. An international team of scientists on board the Japanese drilling vessel *Chikyu* collected precious core samples, which are currently undergoing analysis at the Kochi Core Center in Japan and laboratories around the world.

More information: <https://tinyurl.com/T-Limit>



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