In another EarthDate, we talked about Challenger Deep, the deepest point in all the oceans, at almost 7 miles down.

The first humans to explore it were a Swiss oceanographer and U.S. Navy Lieutenant. They built a special deepwater submarine called a bathyscaphe, and in 1960, headed for the bottom.

It took them 3 hours to reach the western pool of Challenger Deep at 35,000 feet. But they stirred up so much sediment, they couldn’t see anything.

That, and a worrisome crack in a window, cut their trip short. After 20 minutes, they jettisoned their ballast and began their 2-hour trip to the surface.

The next visit came 50 years later, when film director James Cameron co-designed his own ultradeep submersible and captained it solo into the deeper Eastern pool, at 35,800 feet.

He spent 2 hours motoring slowly around the bottom, taking photos and video, but didn’t see any creature longer than 1 inch.

Recently, explorer Victor Vescovo piloted his craft slightly deeper than Cameron, now holding the world record. His scientific team then made a few more trips to the bottom, discovering a new species and gathering samples.

They found small crustaceans with high concentrations of chemicals banned in the 1970’s. And, a plastic candy wrapper.

A reminder that, even in places where humans can scarcely visit, our impact can be seen.
Synopsis: Challenger Deep is deeper than Mount Everest is tall. Though thousands of people have summited Everest, just over a dozen have visited Earth’s deepest deep. But maybe you can visit soon—for a cool $750,000!

• Manned exploration of Challenger Deep began in 1960 with the Trieste, a “bathyscape” designed for the voyage by Swiss scientist Jacques Piccard and his father Auguste.
  ○ A spherical pressure vessel about 7 ft (2.16 m) in diameter served as the crew compartment, which was suspended beneath a buoyancy tank that was 60 ft (18.4 m) long with 5-inch (12.7 cm) steel walls to withstand the intense pressure.
  ○ U.S. Navy Lieutenant Don Walsh accompanied oceanographer Jacques Piccard for a 5-hour trip to around 35,800 ft (10,911 m), landing in the westernmost pool of the Challenger Deep.
  ○ They spent about 20 minutes in the midst of the sediment cloud stirred up by their landing. Concerned over a crack in the outer window and the lack of visibility, they decided to ascend to their support ships, which took 3 hours and 15 minutes.
  ○ It was 52 years later when the next manned expedition to the floor of Challenger Deep occurred, this time to the easternmost of the three pools.
    ○ Canadian film director James Cameron solo-piloted the deep submergence vehicle DSV Deepsea Challenger, a vertical submersible that he helped to design with an Australian company.
    ○ The descent took 2 hours and 36 minutes. At 35,787 ft (10,908 m), Cameron landed on a “gelatinous flat plain.” He later described the landscape as “lunar” and “desolate.”
    ○ He motored across the flat toward the slope for a couple of hours without seeing any organisms over 1 inch (2.54 cm) long. Discovering a hydraulic fluid leak, he started his 90-minute ascent.
    ○ After the adventure, he donated the Deepsea Challenger to the Woods Hole Oceanographic Institution.
  • Seven years after Cameron’s solo trip, in 2019, explorer Victor Vescovo piloted a state-of-the-art Triton submarine called DSV Limiting Factor to the eastern pool of Challenger Deep.
    ○ He then piloted the submarine twice more to the eastern pool to a maximum depth of 35,843 ft (10,925 m) ±13 ft (4 m).
    ○ Although apparently deeper than Cameron’s 2012 expedition, both expeditions landed on the flat floor of the eastern pool, so it is possible calculations were off for one of the depths.
    ○ On the Limiting Factor’s fourth dive, the sub designer Patrick Lahey piloted it to the shallower central pool.
In mid-2020, six more crewed landings occurred during Vescovo’s Ring of Fire Expedition.

- The first of these dives included the first woman to walk in space in October 1984, former U.S. Astronaut Kathryn Sullivan. The crew’s day ended with a call to astronauts in the International Space Station 254 miles above Earth.
- Another dive included mountaineer Vanessa O’Brien, and yet another included Kelly Walsh, the son of the Trieste’s pilot, Don Walsh.
- In total, 15 people have landed on the floor of Challenger Deep.
- Vescovo has reportedly put the DSV Limiting Factor up for sale, and a London firm is advertising the exclusive experience of dives on future expeditions for $750,000 a person.

What did these expeditions find in the trench?

- Conditions in deep-sea trenches are extreme—complete darkness, high pressure, and near freezing water—so life forms and the food web are limited. Some trench organisms rely on chemosynthesis of methane or sulfur.
- Deep in the trench, huge single-celled xenophyophores, shrimplike amphipods, and bizarre translucent holothurians (sea cucumbers) are the most common life forms.
- The small, pink, scaleless Mariana snailfish is the top predator, thriving at around 26,200 ft (8000 m).

Background: Deepest Dive
More than 200 microbes were identified in mud from the floor of the deep. Microbial mats have been identified near hydrogen and methane seeps in the trench.

Pollutants that were banned in the 1970’s have been found in high concentrations in the fatty tissues of the shrimp-like amphipods from the Challenger Deep.

When he landed in the eastern pool of the Challenger Deep in May 2019, Victor Vescovo noticed something familiar out his porthole: plastic waste resembling a candy wrapper had arrived before him at the deepest point in the ocean.

The United States has jurisdiction over the Mariana Trench because Guam is a U.S. territory and the 15 nearby Northern Mariana Islands are a U.S. commonwealth.

In January 2009, President George W. Bush established the Mariana Trench Marine National Monument as a protected marine reserve. The entire reserve is underwater.

The 44-mi-wide (71 km) zone extends for 1100 mi (1770 km) to include 95,216 mi² (246,610 km²) of seafloor along the trench, including nearby volcanoes and mud volcanoes.

The protected area ends just east of Challenger Deep.