

Research vessel SONNE

SO318: 22.02. – 26.03.2026

San Diego – Ensenada – San Diego

First weekly report: 23 February – 1 March 2026



On Monday, 23 February, 2026, the SONNE departed from its berth at the 10th Avenue Marine Terminal in San Diego at 10:00 a.m., under glorious sunshine (Fig. 2). The research vessel had previously spent five days in port unloading the expedition supplies from its previous voyage, SO317, taking on new expedition equipment, and setting up the laboratories and equipment. A 40-foot container from Bremen was unloaded and a total of eight 20-foot containers were loaded. The shipping company also sent two additional 40-foot containers of equipment to the ship. With such a large amount of material, the boatswain and cargo officer had to utilize almost every available space on board to stow everything. A pre-team for the mobilization of ROV QUEST had already arrived from Bremen and immediately began setup, as did the technical team from the Monterey Bay Aquarium Research Institute (MBARI), who were responsible for mobilizing the two in-house Dorado AUVs on board (Fig. 1). Friday, February 20, was a particularly busy day in port, as, in addition to all the ongoing activities, the new scientists were embarked, and in the afternoon, a small reception for invited guests was held at the invitation of the German Embassy in Washington. High-ranking representatives of the US Navy, as well as scientists from the Scripps Institution of Oceanography research institute in neighboring La Jolla, were present, along with representatives from the German Embassy and other San Diego institutions.



Figure 1: Already in the port of San Diego, the scientific equipment, such as the autonomous underwater vehicles (AUVs) from MBARI shown here, were prepared as best as possible for use at sea (© Gerhard Bohrmann)



Figure 2: RV SONNE departing for its 318th expedition in the Eastern Pacific on Monday, 23 February, in glorious weather with a view of Downtown San Diego. (© Gerhard Bohrmann)

The RV SONNE expedition's area of operation is the so-called "California Borderland," an approximately 200 km wide marine region with continental crustal structure between the Pacific deep sea and the landmass of Southern California and northern Baja California in Mexico. This area consists of a series of basins, dissected by ridges, whose main tectonic feature is strike-slip faulting, where, in some cases, active crustal segments are displaced horizontally at a few millimeters per year. Such strike-slip faults are common in California, the San Andreas Fault being the best known, primarily due to its earthquake activity.

The strike-slip faults allow fluids to rise from great depths, leading to the formation of active seeps on the seabed. These seeps are characterized, among other things, by the colonization of chemosynthetic

organisms and the formation of carbonate, or, particularly in our research area, by the precipitation of barite. During the expedition, we intend to investigate the known active barite seeps in Mexico, which should also occur in the US, but have not yet been confirmed as active seep sources there. Unfortunately, we do not yet have a research permit for Mexico and are therefore searching for such seeps in the US area off California, where we have received a permit from the US authorities. We hope to obtain the permit for Mexico during the second part of the expedition.

In the first week, our search for active seeps was primarily conducted using the ship's multibeam echosounder and the PARASOUND sediment echosounder. We also recorded the acoustic signals in the water column to identify gas flares on the seabed. These flares provide clues to the presence of active seeps. In the next step of our search, we deployed MBARI's two Dorado AUVs to map the areas of interest on the seabed. The AUVs generate maps with a one meter resolution, providing excellent orientation for our dives. The first AUV map created on our expedition, in the outflow area of La Jolla Canyon at the base of the eastern Thirty Mile Ridge, served as the basis for a dive on Thursday, 26 February. Among other things, the first relatively small seeps in the form of vesicomyid clam fields (Fig. 3) were found and sampled in the area of sand deposits of the canyon.



Figure 3: Nests of vesicomyid clams in their living position in the sandy deposits of La Jolla Canyon characterize fluid seeps on the seabed. Eighth dive of ROV QUEST5000. (© MARUM)

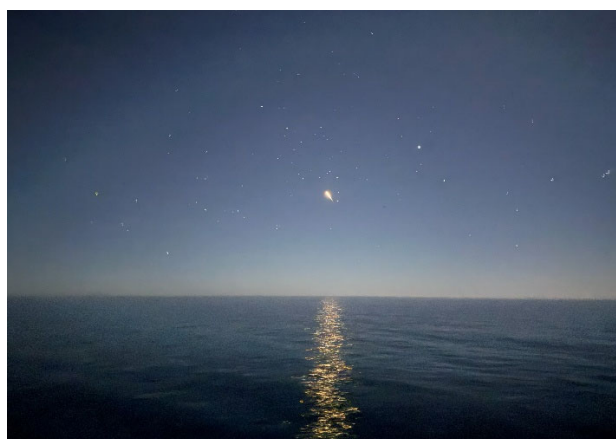


Figure 4: Photo of the SpaceX Dragon Cargo capsule taken on Thursday, February 26 at 11:45 pm during re-entry into Earth's atmosphere from the research vessel Sonne. (© Tina Treude)

We had to cut the dive short by an hour after receiving a message from SpaceX instructing us to leave the area within a 10-nautical-mile radius to avoid being endangered by the Earth's re-entry and subsequent water landing of a SpaceX capsule. We complied, and from the SONNE, we were able to witness the capsule's atmospheric entry, descent, and landing in the evening sky. On Friday, 27 February, a second survey was launched with the two AUVs, and on Saturday, 28 February it provided us with micro-bathymetry data on a potential seep area on the seabed. This seep area had been previously identified in the early days of the expedition by the registration of a distinct gas flare in the water column, and it is visible on the AUV map due to its rough morphology. We are investigating this seep area today, Sunday, 1 March, using the ROV QUEST, through video mapping and sampling. We will report on the dive results next week.

All participants (crew and scientists) are safe and sound!
Greetings for the weekend on behalf of all participants,

Gerhard Bohrmann,

FS SONNE, Sunday, 1 March, 2026

ROV QUEST's dives can be followed live on the MARUM YouTube channel:

<https://www.youtube.com/@marumTV>