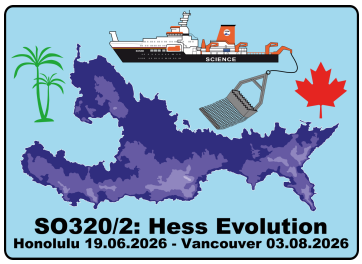
FS SONNE

Expedition SO320/2: Hess Evolution

19.06. – 03.08.2026, Honolulu (USA) – Vancouver (Canada)



1. Weekly Report (19.06 – 21.06.2026)

On Friday, June 19, the second leg of the SO320 expedition began aboard the research vessel SONNE (Fig. 1). Led by the GEOMAR Helmholtz Centre for Ocean Research Kiel, an international research team is studying the Hess Rise in the northwestern Pacific (Fig. 2), a large submarine plateau. The expedition sails from Honolulu (USA) to Vancouver (Canada) and ends on August 3, 2026.

Fig. 1: The FS SONNE departing from the Port of Honolulu (Hawaii) (Photo: J.G.)

Oceanic plateaus are large undersea volcanic mountain ranges and are among the least understood forms of volcanism on Earth. Important questions regarding their formation, structure, and geodynamic relationships remain unanswered. Although the Hess Rise, with an estimated volume of 9 million km^3, is considered one of the larger oceanic plateaus, it is nonetheless one of the least studied.

Research on the Hess Rise will help us understand how enormous quantities of magma can reach the Earth's surface within a geologically short period of time and how the tectonic evolution of the Pacific Ocean has unfolded. In Earth's history, such massive volcanic events are almost always associated with the release of large quantities of volcanic gases, particularly carbon dioxide. This often led to global climate changes and mass extinctions; therefore, these processes can also be viewed as an analogy for the modern climate crisis.

During the roughly four-day transit from Honolulu to the research area, the equipment brought along is unpacked, the laboratories are set up, and work procedures are discussed and practiced. Researchers from institutions of several countries collaborate on this project. In addition to GEOMAR, the University of Heidelberg, the Museum für Naturkunde Berlin, Oregon State University (USA), the Museum of Nature and Science Tokyo (Japan), and the

Japanese Agency for Marine-Earth Science and Technology (JAMSTEC) are participating. Meteorological support is provided by a scientist from the German Weather Service (DWD) who is traveling with us.

While geophysical surveys were conducted during the first leg of the expedition (SO320/1) (https://www.geomar.de/expeditionen), the work program for the second leg (SO320/2) primarily consists of bathymetric mapping and rock sampling using chain-bag dredges.

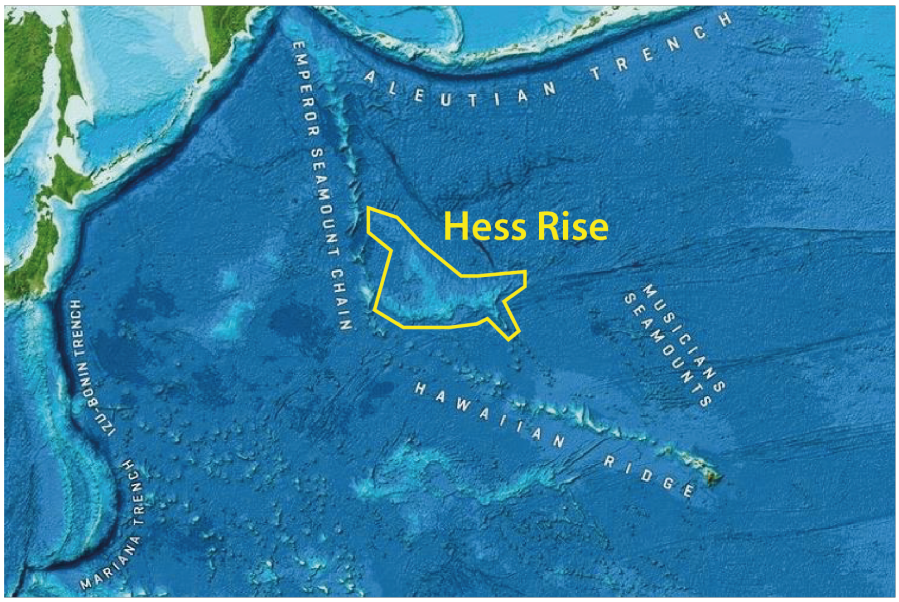


Fig. 2: Location of the Hess Rise in the northwestern Pacific (http://www.gebco.net)

Ever since boarding the ship in Honolulu, we have been enjoying the hospitality and excellent support of the entire crew.

Greetings on behalf of all cruise participants from FS SONNE,

Jörg Geldmacher
(GEOMAR Helmholtz Centre for Ocean Research Kiel)