

multibeam echo-sounder sonar for seafloor mapping will be routinely operated whenever the *Revelle* is underway. The Kongsberg-Simard EM-120 sonar images the seafloor over a 120–140 degree-wide swath (about 10–20 km, or 5–10 nm wide), using very short (15 msec) transmit pulses with a 10–20 second repetition rate and a 11.25–12.60 kHz frequency sweep. Source level in deep water is 240 dB root-mean-squared (rms), but the brevity, directivity, and narrow beam-width (1 degree fore-and-aft) of the transmit pulses make it unlikely that operation of this depth sonar will affect marine mammals.

None of the 3 research legs for which an IHA is requested will be a dedicated seismic reflection survey of the sort typically conducted by a specialized seismic vessel. The seismic reflection profiler will be used as just one tool in integrated marine geology and geophysical studies that also employ bathymetric echo-sounders, passive geophysical sensors (such as a gravimeter and magnetometer), and geologic sampling tools (like rock dredges and cores). Typical operating procedure during these three legs of the cruise will be to conduct seismic profiling, at a ship speed of 9–11 knots for periods of 8–12 hours, interspersed with episodes of geologic sampling and periods of faster steaming with no profiling system deployed. In a few instances (1–3 per leg), longer profiles will need to be collected, requiring up to 36 hours of continuous airgun operation. The objective is not to image deep crustal structure or the stratigraphy of thick sedimentary units (the typical goals of seismic surveys); instead the purpose is to measure the varying thickness of the 100–400 m-thick (328–1312 ft) cover of pelagic sediment that buries and obscures the igneous oceanic crust in the study areas, because establishing the relief of the buried crust is essential for interpreting the bathymetric, magnetic and gravity data. For this limited objective, the large powerful sound sources and hydrophone streamers several kilometers long that typify dedicated seismic surveys are not required. Nor will any broad ocean volume be ensounded by profiling on closely-spaced seismic lines.

Leg 1 of the cruise, from San Diego to Puerto Caldera, Costa Rica, is planned for September 27 - October 9, 2003. This will be primarily a staging and instrument testing and calibration leg, but with 2 days of seismic reflection profiling and rock-dredging 40–80 nm (74–148 km) off the coast of Costa Rica. In addition to the approximately 24

hours of seismic profiling, SIO also plans to test and calibrate new components of the system, and train shipboard technicians in their use, with 2 or 3 12–18 hour test runs along parts of the transit track. Because these test profiles may obtain scientifically useful data, specific sites that are of interest to Mexican researchers have been targeted, in partial fulfillment of SIO's foreign-clearance obligation to collect data of value to coastal states.

Leg 2, from Puerto Caldera, Costa Rica, to Manta, Ecuador, is planned for October 10 - November 6, 2003. The plan for this leg is to (i) conduct a 2-day seismic reflection plus rock dredging survey of Cobia Ridge, south of Panama, (ii) collect a north-south seismic reflection plus magnetics profile across the eastern Panama Basin, and (iii) conduct a 14-day seismic reflection plus bathymetry plus rock dredging survey off northern Peru. A total of 200–250 hours of seismic reflection profiling is anticipated for this leg of the cruise.

Leg 5, from Callao, Peru, to Puerto Caldera, Costa Rica, is planned to take place from December 28, 2003 - February 23, 2004. Primary survey tools will be a multibeam echo-sounder and a new magnetometer system. Seismic reflection profiling will have a subsidiary role, imaging the relief of the igneous crust in the approximately 20 percent of the survey area that has a significant cover of structure-obscuring sediment. A total of 150–200 hours of profiling is anticipated for this leg of the cruise. All three legs will use the same bathymetric sonar and seismic profiling system, described above.

All planned geophysical data acquisition activities are funded by the National Science Foundation (NSF) and will be conducted by SIO scientists, with a specific Principal Investigator aboard the vessel. Additional information on the airgun array and bathymetric multibeam sonar is contained in the application, which is available upon request (see **ADDRESSES**).

#### Comments and Responses

A notice of receipt of the Scripps' application and proposed IHA was published in the **Federal Register** on August 25, 2003 (68 FR 51240). During the 30-day public comment period, comments were received from the Marine Mammal Commission (Commission) and the Center for Biological Diversity (CBD).

*Comment 1:* The Marine Mammal Commission (the Commission) believes that NMFS' preliminary determinations are reasonable, provided NMFS is satisfied that the proposed mitigation and monitoring activities are adequate

to detect marine mammals in the vicinity of the proposed operations and ensure that marine mammals are not being taken in unanticipated ways or numbers. In this regard, NMFS' **Federal Register** notice states that "[b]ecause of the ineffectiveness of mammal observers during darkness (even though the vessel is equipped with night-vision binoculars), seismic reflection profiling will be concentrated during daylight hours [but that on] 1–3 occasions....limited night profiling is needed to allow completion of the marine geophysical research." However, it remains unclear that, for nighttime activities, the monitoring effort will be sufficient to determine that no marine mammals are within or about to enter the safety zone.

*Response:* Because the SIO's scientific research cruise is multi-disciplinary, and because the seismic research is fairly short-term, SIO does not propose to use the 2-GI airgun array during nighttime. If a seismic trackline has not been completed, that work will continue provided observers are able to see the entire safety zone. However, because the size of the airgun array to be used is small, and because the safety zones are relatively small, it is unlikely that mammals will be within the appropriate safety zones whenever the airguns are on, either in daylight or nighttime.

*Comment 2:* The NMFS' **Federal Register** notice states that "[o]perations would not resume until the animal is observed outside the safety radius or until a minimum of 15 minutes has elapsed since the last sighting." The Commission notes, however, that beaked and sperm whales can dive for much longer than 15 minutes and, thus, could be directly below the sound source when it is reactivated.

*Response:* The NMFS concurs with the Commission on this point. SIO will not proceed with powering up the 2 GI-airgun array unless the entire safety radius is visible and no marine mammals are detected within the appropriate safety zones; or until 15 minutes (for small odontocetes and pinnipeds) or 30 minutes (for mysticetes/large odontocetes) after there has been no further visual detection of the mammal(s) within the safety zone and the trained marine mammal observer on duty is confident that no marine mammals or sea turtles remain within the appropriate safety zone. As added mitigation, SIO will follow standard ramp-up procedures (see Mitigation below). Also, while some whale species may dive for up to 45 minutes, it is unlikely that the ship's bridge personnel (who are always on watch) would miss a large whale