

availability of the species or stock(s) for subsistence uses and that the permissible methods of taking and requirements pertaining to the monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Subsection 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Under Section 3(18)(A), the MMPA defines "harassment" as:

any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

The term "Level A harassment" means harassment described in subparagraph (A)(i). The term "Level B harassment" means harassment described in subparagraph (A)(ii).

Subsection 101(a)(5)(D) establishes a 45-day time limit for NMFS review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny issuance of the authorization.

### Summary of Request

On April 21, 2003, NMFS received an application from LDEO for the taking, by harassment, of several species of marine mammals incidental to conducting a seismic survey program within the Storegga slide area off the west coast of Norway, in the Norwegian Sea, between 80W and 70E and between 62 and 68N, during late August and September 2003. The Storegga slide was produced by colossal slope failures on the Norwegian continental margin in the late Quaternary period. The purpose of this survey is to determine whether submarine landslides can release methane from hydrate into the oceans and/or atmosphere. More specifically, the survey of the Storegga slide seeks to discover: (1) How much hydrate and free gas is present in the Storegga region and how it is distributed, (2) if methane escaped from the slide, and if so, how much, when and by what mechanisms,

and (3) if hydrate dissociation promotes and/or localizes submarine landslides. A coordinated seismic and coring study of the Storegga slide is proposed to obtain information on these subjects (the coring portion of the project will be completed in 2004). This study will help explain whether methane in gas hydrate reservoirs is mobile and can affect the earth's climate.

### Description of the Activity

The seismic survey will involve a single vessel, the *R/V Maurice Ewing*, which will conduct the seismic work. The *Maurice Ewing* will deploy an array of airguns as an energy source, plus a 6-km (3.2-nm) towed streamer containing hydrophones to receive the returning acoustic signals.

All planned geophysical data acquisition activities will be conducted by LDEO scientists, with the participation of scientists from the University of Wyoming. Water depths within the Storegga slide survey area will range from approximately 100 to 5,000 m (330 to 16,405 ft). The *Maurice Ewing* will initially deploy a 2-General Injector (GI) gun array for several survey lines, and then a 6-airgun array will be employed for several survey lines. Whichever array produces better data will be used for the rest of the cruise. The project will consist of 3,109 km (1,678 n.mi) of survey lines, of which approximately 2,596 km (1,402 n.mi) will be conducted in water depths greater than 1,000 m (3,280 ft), 504 km (272 n.mi) will be surveyed in depths 100–1000 m (330–3,280 ft), and 9 km (4.9 n.mi) will be surveyed in water less than 100 m (330 ft) deep. There will be additional operations associated with equipment testing, startup, line changes, and repeat coverage of any areas where initial data quality is sub-standard.

The procedures to be used for the 2003 seismic survey will be similar to those used during previous seismic surveys by LDEO, e.g., in the equatorial Pacific Ocean (Carbotte et al., 1998, 2000). The proposed program will use conventional seismic methodology with a towed airgun array as the energy source and a towed streamer containing hydrophones as the receiver system. The energy to the airgun array is compressed air supplied by compressors on board the source vessel. In addition, a multi-beam bathymetric sonar will be operated from the source vessel continuously throughout the entire cruise, and a lower-energy sub-bottom profiler will also be operated during most of the survey. Seismic surveys will likely commence on August 28, 2003, and continue until September 25, 2003,

for a total of 29 days of seismic surveying.

The *R/V Maurice Ewing* will be used as the source vessel. It will tow the airgun array (either the 2-GI gun or 6-gun array) and a streamer containing hydrophones along predetermined lines. The vessel will travel at 4–5 knots (7.4–9.3 km/hr), and seismic pulses will be emitted at intervals of approximately 20 seconds. The 20-sec spacing corresponds to a shot interval of about 50 m (164 ft). The 6-gun array will include six 2000 psi 1500C Bolt airguns ranging in chamber volume from 80 to 500 in<sup>3</sup>, with a total volume of 1,350 in<sup>3</sup>. These airguns will be spaced in an approximate rectangle with dimensions 12 m (39.4 ft) (across track) by 10 m (32.8 ft) (along track). The two 105 in<sup>3</sup> GI guns will be towed 7.8 m (25.6 ft) apart side by side and 37 m (121.4 ft) behind the vessel, with a total volume of 210 in<sup>3</sup>.

The dominant frequency components for both airgun arrays is 0 - 188 Hz. The 2-airgun array will have a peak sound source level of 237 dB re 1  $\mu$ Pa or 243 dB peak-to-peak (P-P). The 6-airgun array will have a peak sound source level of 243 dB re 1  $\mu$ Pa or 250 dB P-P. These are the nominal source levels for the sound directed downward, and represent the theoretical source level close to a single point source emitting the same sound as that emitted by the array of 2 or 6 sources. Because the actual source is a distributed sound source (2 or 6 guns) rather than a single point source, the highest sound levels measurable at any location in the water will be less than the nominal source level. Also, because of the downward directional nature of the sound from these airgun arrays, the effective source level for sound propagating in near-horizontal directions will be substantially lower.

Along with the airgun operations, two additional acoustical data acquisition systems will be operated during most or all of the cruise. The ocean floor will be mapped with an Atlas Hydrosweep DS-2 multi-beam 15.5-kHz bathymetric sonar, and a 3.5-kHz sub-bottom profiler will also be operated along with the multi-beam sonar. These mid-frequency sound sources are commonly operated from the *Maurice Ewing* simultaneously with the airgun array.

The Atlas Hydrosweep is mounted in the hull of the *R/V Maurice Ewing*, and it operates in three modes, depending on the water depth. The first mode is when water depth is <400 m (1312.3 ft). The source output is 210 dB re 1 Pa-m rms and a single 1-millisecond pulse or "ping" per second is transmitted, with a beamwidth of 2.67 degrees fore-aft and 90 degrees in beamwidth. The