

XV. Oceanography - Government

Section XV outlines plans for United States Antarctic Program sponsored oceanographic expeditions during the 2005-2006 season.

R/V Nathaniel B. Palmer

The R/V *Nathaniel B. Palmer* first arrived in the Antarctic Peninsula area in April 1992 and is now in the fourth year of its second long-term charter to the United States Antarctic Program. The vessel is owned by Edison Chouest Offshore and is of United States Registry. The R/V *Nathaniel B. Palmer* is ice-class ABS A2 (capable of breaking 3 feet of ice at 3 Knots), is 93.9 meters long, has a beam of 18.3 meters, a design draught of 6.9 meters, and displaces 6800 long tons. The vessel has 13,000 shaft horsepower driving two controllable pitch propellers and is also equipped with both bow and stern thrusters. The vessel is a multidisciplinary research platform, has a crew of 26 and accommodation for 41 scientists and RPSC support staff. It is designed for year-round operations in Polar Regions.

Research Capabilities

The vessel is equipped with a Seapath GPS and inertial navigation system, a P-Code GPS satellite navigation system, an Ashtec GPS, an Acoustic Doppler Current Profiler (ADCP), fish-finding sonar, sub-bottom profiling sonars, a Simrad multi-beam swath bathymetry system, INMARSAT and Iridium voice and data communications, TeraScan satellite imaging system, and HF and VHF transceivers. The vessel is also equipped with a DP0(zero)-rated dynamic positioning system. Two deep-sea trawl and coring winches and two hydrographic winches are operated through stern and starboard A-frames, respectively. An additional hydrographic winch, equipped with electromechanical cable, leads through a baltic-room arrangement that protects it from the weather. The vessel is also equipped with multi-channel seismic capability and laboratory space totaling approximately 520 square meters, all located contiguously on the main deck. The vessel

also has a suite of portable lab vans. Zodiac inflatable boats and an aluminum landing craft are available for ship-to-shore transport and sample collection.

Ship's Master: Captain Mike Watson

Scientific Programs in the Antarctic Treaty Area

The R/V *Nathaniel B. Palmer* will conduct cruises in the Southern Ocean surrounding Antarctica; and will conduct a second annual cruise to acquire sediment cores via a shipboard drill rig mounted over the vessel's moon pool. Scientific research conducted onboard will include the following disciplines: Marine Biology, Marine Geology and Geophysics, and Physical and Chemical Oceanography.

Intended Tracks and Schedule

The vessel is scheduled for work in the Antarctic polar regions as well as in the mid-latitudes of the Pacific Ocean during the 2005-2006 season, including the Pacific and Southern Oceans and Ross Sea. Ports of call will include: Lyttelton, New Zealand; McMurdo Station, Antarctica; Punta Arenas, Chile, and Palmer Station, Antarctica. The NBP will sail in support of approximately nine science cruises during the 2005-2006 season.

R/V *Laurence M. Gould*

The R/V *Laurence M. Gould* first arrived in the Antarctic Peninsula in January 1998. The vessel is owned by Edison Chouest Offshore and is of United States Registry. The vessel is on long-term charter to support the United States Antarctic Program. The R/V *Laurence M. Gould* is ice-class ABS A1 (capable of breaking 1 foot of ice at continuous forward motion), is 70.1 meters long, has a beam of 14.02 meters, a design draught of 5.48 meters and displaces 3780 long tons. The vessel has 4,575 shaft horsepower driving two controllable pitch propellers and is also equipped with a bow thruster. The vessel is a multidisciplinary research platform with a crew of 16 and accommodation for 28 scientists and RPSC staff. It is designed for year-round operations in polar regions.

Research Capabilities

The vessel is equipped with a P-Code GPS satellite precision navigation system, an Ashtec GPS, an Acoustic Doppler Current Profiler (ADCP), fish-finding sonar, sub-bottom profiling sonar, INMARSAT and Iridium voice and data communications and HF and VHF transceivers. A deep-sea trawl winch and two hydrographic winches are to be operated through either a stern or starboard side A-frame. One hydrographic winch, equipped with electromechanical cable, leads through a baltic-room arrangement that protects it from the weather. Various over-the-side sampling equipment will be handled through use of an articulated Hiab crane on the ship's fantail. In addition, the vessel is equipped with laboratories totaling 99 square meters and a suite of portable laboratory vans. A 22-foot aluminum landing craft and Zodiacs inflatable boats are available for ship-to-shore transport and sample collection.

Ship's Master: Captain Mike Terminel

Scientific Programs in the Antarctic Treaty Area

The *R/V Laurence M. Gould* will conduct cruises in the Antarctic Peninsula area of the Southern Ocean and Drake Passage. Research projects supported during the 2005-2006 season will include Marine Biology, Chemical and Physical Oceanography, and Marine Geology and Geophysics. The *R/V Laurence M. Gould* will also provide logistics support to transport scientists, cargo, and personnel to and from Palmer Station from its primary port of Punta Arenas, Chile.

Intended Tracks and Schedule

The *R/V Laurence M. Gould* will provide transport as described above and provide oceanographic and field camp research support in and around the Bransfield Strait area of the Antarctic Peninsula. Ports of call will include: Punta Arenas, Chile and Palmer Station, Antarctica. During the 2005-2006 season, the vessel will sail in support of six science cruises, three peninsula research field camp openings and numerous Palmer Station staff and resupply shuttles in the Antarctic Peninsula area.

R/V Yuzhmorgeologiya

The R/V Yuzhmorgeologiya was constructed in 1985 and is an ice class ship, capable of stable operations in extreme conditions. The vessel is 104.5 Meters overall length, a beam of 16 Meters, and a displacement of 5626 tons. It is driven by two 3500 hp engines and carries a fuel stock of 1220 tons, giving her a cruising range of 21,000 miles. The vessel accommodates a total of 91 crew and passengers. The ship and shipowner are fully trained, certified and operating in accordance with ISM (International Safety Management) standards. All personnel, equipment and operations are in full compliance with SOLAS, MARPOL, GMDSS, COLREG-72, ILLC 1966/88, and STCW-78.

Research Capabilities

Geology and microbiology wet laboratories are available onboard with additional analytical chemistry capabilities. Service workshops are dedicated to mechanical and electromechanical maintenance (facilities exist onboard for arc and gas welding and grinding), computing center equipment repair, and photo and TV equipment maintenance. Navigation and communications systems include an integrated navigation system, scientific survey echo sounders, GPS (Furuno), subsea acoustic navigation (optional), radar (Furuno), 2 gyros, GMDSS, Furuno, and NMARSAT B. Underwater equipment for biological and lithological/mineralogical are available as well as the following deployment/handling systems:

- A-Frame 16.0 t
- J-Frames (2) 1.2 t each
- Cranes (4) 3.6 t each
- Traction winch 160 kN
- Trawl winches (2) 16 t max ea.
- Geophysical winches (2) 8 kN each
- Geophysical winch 6 kN
- Geophysical winch 5 kN
- Air gun winch 18 kN
- Other winches (2) 11.2 t each

Scientific Programs in the Antarctic Treaty Area

The R/V Yuzhmorgeologiya is contracted by the Korean Polar Research Institute as a supply ship to service the Korean Antarctic base at King George Island and to conduct research cruises in the Drake Passage and Bransfield strait off of the Antarctic Peninsula.

Intended Tracks and Schedule

The vessel is scheduled for work in the Drake Passage and Bransfield Strait regions in Antarctica. The one project involving US researchers will be to deploy 6 underwater hydrophones in the Bransfield Strait to passively record the sound of submarine earthquakes in the region.