

## THE AGS 61 “CABO DE HORNOS” NEW CHILEAN SCIENTIFIC RESEARCH VESSEL

By Fernando Mingram, Captain (Ret.)  
Executive Secretary, National Oceanographic Committee –CONA

On the 1<sup>st</sup> July 2013, a new Chilean Scientific Research Vessel “Cabo de Hornos” initiated her research activities. Operated by the Chilean Navy, she constitutes a sound change in modernization, equipment and capabilities with respect to the previous naval oceanographic vessels and the limited resources that have existed within other national institutions (see *Figure 1*).



*Figure 1. Cabo de Hornos*

### 1. ORIGIN OF THE PROJECT

#### Marine Scientific Research in Chile

Chile is an oceanic country that includes an oceanic islands system, fiords and austral channels together with the Antarctic Territory. This particularity demands Chile to have in place a sustainable scientific marine research development, not just to improve knowledge but to make a responsible use and appropriate management of the natural resources without affecting the ecosystem.

The history of the marine research in Chile contains several benchmarks in which the Chilean Navy has had an outstanding participation with its ships and personnel. One of these benchmarks was the initiative proposed by the Navy to the Government in 1970, to establish a National Oceanographic Committee (CONA). The formation of this committee constitutes a pioneer decision worth highlighting. The Committee is chaired by the Director of the Chilean Navy Hydrographic and Oceanographic Service, in his capacity as the National Authority in Oceanography. Actually, 29 members - Universities and State Organizations – form the CONA which has had an active role in its 42 years of existence, having been recognized as the research and marine science coordination and enhancing reference institution in Chile.

An example of this was the creation, in 1994, of the CIMAR Program (Marine Research Cruises in Remote Areas). The general objective of this Program is to study with a multidisciplinary vision the oceanographic, marine biodiversity, ocean-atmosphere interaction and submarine morphology in remote areas, where the marine environment knowledge has a

strong influence in the sustainable socio-economic development of local communities and the country in general, through annual cruises. CIMAR constitutes a reference example of integration and cooperation between the Chilean Navy – through its vessels and SHOA – with universities and research centers, facilitating the start-up to hundreds of projects, scientific publications, presentations at marine national and international Science Congresses, together with the support for Pre and Post grade Thesis for Bachelors in Science and PhDs.

### **The Need for an Oceanographic Vessel**

The shortage of adequate marine research, oceanographic and fishery platforms has been a recurrent subject in the Chilean marine sciences environment. For a long time, through different documents and discussions, SHOA and CONA jointly with the national marine scientific community, have expressed the need to have an oceanographic vessel to satisfy national research needs.

In September 1992, the former “Thomas Washington” from Scripps, USA, a vessel of the 1960’s with over a million nautical miles sailed was received by Chile. With the name AGOR “Vidal Gormaz”, she started her service in the Chilean Navy with an oceanographic research role until 2010.

Different attempts to obtain better platforms did not progress. Nevertheless, SHOA continued to work on a project to replace the old “Vidal Gormaz” by another used vessel or through the building of a new platform. SHOA developed and established the High Level Requirements, a fundamental step in the definition of the characteristic and capabilities such an eventual platform should have to fulfill the national requirements.

### **The “Medusa” Project**

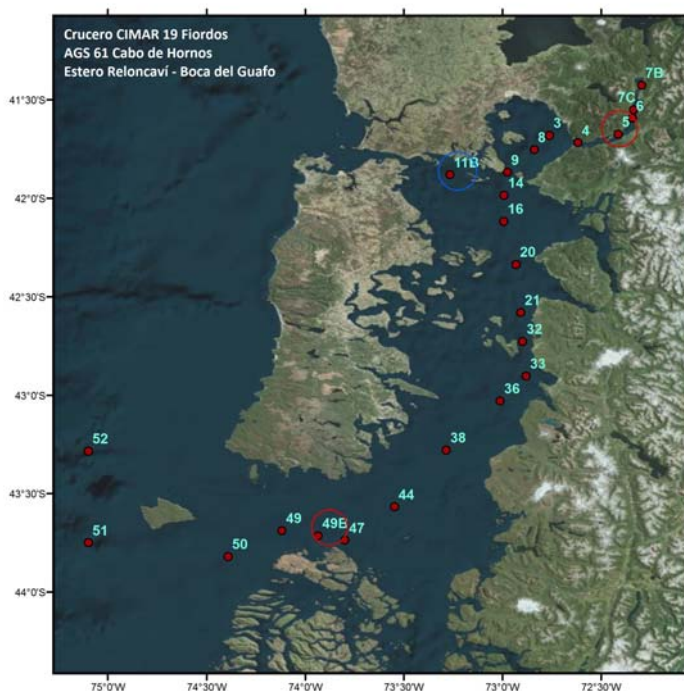
In May 2007, the Navy’s CNO decided to hand the Project to the Naval Program, Research and Development Directorate, with the name “Medusa” to which the fishery research component was incorporated. On the 28<sup>th</sup> December 2007, a contract was signed between the Chilean Navy and ASMAR for the construction of an Oceanographic Vessel. ASMAR hired SKIPTEKNISK company for the ship’s design based on the final needs definition; WARTSILA for the development and acquisition of the propulsion system and KONGSBERG for the acoustic sensors. In July 2008 the shipyard started building the ship in Talcahuano, Chile.

In February 2010, with the vessel ready for her launching and baptism, an 8.8 Richter scale earthquake and related tsunami affected Talcahuano, causing severe damage to the shipyard and the brand new platform was left sunken over a sand bank at the end of the dock, after the passage of the tsunami. This extremely complex event affected the project, the shipyard, the Navy and the country. Insurances were activated and the recovery of the platform started. After preparatory hard work that took several weeks in the field with the support of specialized machines, on the 28<sup>th</sup> January 2011 the MAMMOET, a Netherland company conducted a titanic maneuver to revert the situation and left the vessel afloat and in conditions to repair all damages and to continue the construction.

## **2. AGS 61 “CABO DE HORNOS” – CHARACTERISTICS**

She is a 74.1m in length and 15.6m in the beam with a deadweight of 3,000 tons and 35 days of autonomy without being replenished. With a crew of 9 Officers and 34 enlisted personnel, she can carry up to 25 scientists on board. She has three labs, acoustic and special sensors’ room, 10 and a 40 cubic m freezers with adjustable temperature ranging from +5°C to -30°C; three jib cranes one of which has a 30 tons type “A” frame at the stern; three telescopic cranes with a 12 tons capacity, 13 winches for oceanographic, geology and fishing gears; three multibeam echosounders; a sub bottom profiler, a sound speed profiler, an Acoustic Doppler Current Profiler (ADCP), multi-frequency sonar for biomass classification; short and long range omni-directional biomass scan sonar; high precision acoustic positioning sub-system with transponders; monitoring wireless network system, sensors and data synchronization and control sub-system; submarine telephone UQC, radars and echosounders for navigational purposes and a variety of meteorological instruments that collects data automatically in digital format. It worth highlighting that the vessel “Cabo de Hornos” is an ultra silent vessel, complying with ICES 209 acoustic standard, that means that she can sail at a distance of 20 meters from a fish school without being notices by the fishes.

### 3. THE “CABO DE HORNOS” ACTIVITIES



*Figure 2. Study Area CIMAR Cruise*

The first “Cabo de Hornos” mission was the project “CIMAR Fiordos 19”, which took place from 01 to 20 July, in the area delimited by the Reloncaví estuary and the Guafo gulf and included base line studies to continue the population of the existing data bases such as bio-oceanographic processes; primary, bacteria and zooplankton production and sediment studies in different areas identified as important for the sciences development. Samples were taken at 17 oceanographic stations in the area, together with samples of the main rivers. The activities were conducted by 18 researchers of different universities and 5 specialist of SHOA (see *Figure 2*).

During August, “Cabo de Hornos” conducted her first fishery research cruise to evaluate three different types of hake spawning stock in the austral oceanic waters. This project was funded by the Fishery Research Fund and executed by the Fishery Development Institute together with two invited researchers of the Pontifical Catholic University of Valparaiso, for the gathering of the oceanographic data (see *Figure 3*).



*Figure 3. Fishery research onboard Cabo de Hornos*

She also conducted a large oceanic bathymetric survey as part of the program aimed at completing the studies required by the Chilean Government to submit its proposal to the United Nations for an extended Continental Shelf. The planning for 2014 includes over 200 operation days, comprising four oceanographic cruises, one bathymetric survey and two fishery research cruises (see **Figure 4**).



*Figure 4. Inside the Sonar room*