# Chapter 1. Prologue



***"We are just at the threshold of our knowledge of the oceans… [this] knowledge is more than a matter of curiosity. Our very survival may hinge upon it."***

*John Fitzgerald Kennedy*
*(1917-1963)*

These words are as true today as they were four decades ago when President Kennedy wrote them in a letter to the congressional leadership of the country on 29 May 1961. In the post-*Sputnik*, cold-war era, detailed study of the oceans would be a source of national pride and science leadership, as well as contributing to our national defense, economic vitality, and environmental protection.

It wasn't until the late 19th century that the word "oceanography" was used to describe interdisciplinary marine research. The US Exploring Expedition (1838-1842), under command of Lieutenant John Wilkes was one of the first marine science field programs. The establishment of the Navy Hydrographic Office following the Civil War, and the US Fish Commission in 1871 led to greater opportunity for at-sea observations and research. The 4-year worldwide voyage of the HMS *Challenger* beginning on 21 December 1872 initiated large-scale, global research programs in oceanography and changed the course of scientific history.

In addition to numerous global ocean expeditions, several key marine laboratories were established worldwide. These facilities provided opportunities for sustained observations of selected coastal habitats and for the conduct of controlled experiments on marine organisms. One of the first and most famous of these marine stations was the Stazione Zoologica founded in Naples, Italy in 1872 by German zoologist Anton Dohrn. The Sevastopol Biological Station of the Academy of Sciences of the USSR, also founded in 1872, was dedicated primarily to interdisciplinary studies of the Black Sea. The Kristineberg Marine Research Station of the Royal Swedish Academy of Sciences was founded on the west coast of Sweden in 1877 to focus on the study of both coastal and offshore marine habitats. This was followed by the establishment of the Plymouth Marine Laboratory in the United Kingdom in 1888. At that time, the Plymouth Marine Laboratory owned and operated an 88-foot wooden vessel, *Salpa*, that was equipped for offshore water sampling and trawling. During the next two decades (1890-1910), marine laboratories were established in Canada (Atlantic Biological Station in St. Andrews, NB in 1899, and the Pacific Biological Station at Nanaimo, BC in 1908), Germany (Institut und Museum für Meereskunde in 1900), Bermuda (Bermuda Biological Station for

Research in 1903), and Monaco (Musée Océanographique de Monaco, created and endowed by Albert the First, Prince of Monaco in 1906).

In the US, several major research and educational facilities emerged near the turn of the 20th century. The Marine Biological Laboratory at Woods Hole was founded in 1888, the same year as the Plymouth Marine Laboratory. Other facilities included Hopkins Marine Station of Stanford University founded in 1892; Mount Desert Island Biological Laboratory in Maine founded in 1898; Tortugas Marine Biological Laboratory of the Carnegie Institution of Washington founded in 1902; Coronado Marine Biological Laboratory of the University of California (UC) at Berkeley founded in 1903 (this was the predecessor to the George H. Scripps Memorial Marine Biological Laboratory in 1909, Scripps Institution for Biological Research in 1912, and Scripps Institution of Oceanography in 1925); Marine Biological Station of the University of Southern California founded in 1911; San Juan Islands Biological Station founded in 1904 (this was the predecessor of the Oceanographic Laboratories, University of Washington in 1920); Chesapeake Biological Laboratory of the University of Maryland founded in 1920; and Woods Hole Oceanographic Institution founded in 1931. By 1909 there were several scientific vessels actively engaged in US scientific research. Carnegie Institution operated a non-magnetic oceanographic research vessel, *Carnegie*, a 155-foot, 568-ton displacement auxiliary brigantine capable of a global mission, and George H. Scripps Memorial Marine Biological Laboratory operated the research vessel *Alexander Agassiz*. Scripps Institution of Oceanography awarded the first PhD in (biological) oceanography in the US in 1930 through an affiliation with the zoology department at UC Berkeley. So it would appear that the origins of the major marine science research and training centers of the nation all began with emphases on biology; the emergence of academic programs in marine sciences at the University of Hawaii (UH) would be no exception (see section 3).

The publication, in 1942, of the comprehensive scientific treatise, *The Oceans: Their Physics, Chemistry, and General Biology* by H. Sverdrup, M. W. Johnson, and R. H. Fleming fueled the US Navy's interest in academic oceanography. World War II demonstrated the value of applied oceanography as part of our nation's defense and heightened interest in this "new" discipline. In 1946, the Department of Defense, through its newly created Office of Naval Research (ONR), became a major sponsor for broad interdisciplinary research in oceanography, and in 1950 the National Science Foundation (NSF) was created. These new agencies provided funding opportunities for university-based research in oceanography and promoted the establishment of new academic centers for professional training in marine sciences. The successful launch of *Sputnik*, the Soviet satellite that beat the US into space on 4 October 1957, led to the formation of the National Aeronautics and Space Administration (NASA) in 1958. It was also in the 1950's that the first bathyscaphes, *Trieste* and *Archimede*, began to take scientists into the abyss for observation and experimentation. The discovery of plate tectonics and the geophysical revolution that followed also began in the 1950s. At that time, Scripps Institution of Oceanography was still the only academic organization in the US that granted a PhD degree in oceanography. This would all change for the better with dramatic growth of new programs, including UH, over the next decade.

At UH, an effort led by Robert Hiatt, then Dean of Graduate Studies and Director of Research, to establish an oceanography graduate degree program in 1956 ended in failure, but an independent evaluation committee established by the UH Board of Regents (BOR) in 1954 eventually led to the formation of the Hawaii Institute of Geophysics (HIG) in 1957 under Hiatt's leadership. HIG consolidated teaching and research in all areas of geoscience, including astronomy, meteorology, geology, geochemistry, solid earth geophysics, and oceanography. The establishment of HIG facilitated the formation of the graduate field of oceanography in 1962, and the Department of Oceanography in 1964, and eventually led to the creation of the School of Ocean and Earth Science and Technology (SOEST) nearly three decades later.

However, the study of marine science in Hawaii, especially marine expeditionary and field research, pre-dates the formation of HIG and is nearly as old as the university itself. A formal history of the significant benchmarks and key personalities has not previously appeared. What follows is a modest attempt to provide such an account for the occasion of the 40th anniversary of the establishment of the Department of Oceanography at the University of Hawaii at Manoa (academic year 1964-5 to 2004-5).

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