

Scripps On Defense: Military Funding At Scripps, 1940-1970

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For Scripps Environmental Advocates (SEA) group

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I. Background

Scripps was founded 1903.

Became Oceanographic in 1925. Had only one small ship.

Funding: Scripps Family and the state of California.

WWI: Research in fouling organisms & potash from kelp. Contracts were with the U.S. government, not the military.

\$0 from Navy for oceanography.

II. WWII

1930's young American oceanographers became naval reserve officers to get access to ships. In 1935 Roger Revelle wrote:

"My reasons for applying for such a commission were the result of the Bushnell experience; I felt that in any future oceanographic work on board a naval vessel it would be best to be able to give and take orders, rather than being in the anomalous position of a paying guest. This rather slight liaison with the Navy may also be of some future value to Scripps Institution; and in any case is good fun."

Naval Research Laboratory, Washington, D.C.

However, Navy was developing in oceanography through research At the Naval Research Laboratory.

1920's early sonar installed on naval ships

1937 Bathythermography, a temperature recording device was used by Navy

1941 UCDWR established in San Diego

A committee of the National Academy of Sciences was concerned that research in support of subsurface warfare was urgently needed. They convinced the Regents

of the University of California to establish the University of California Division of War Research at in San Diego in 1941. UCDWR had its first headquarters in an old Point Loma mansion that was promptly renamed Building X. During the course of the war, UCDWR received twelve million dollars for research and employed up to 575 people.

Military Meteorology

The Army Air Forces funded a national program to train military officers as meteorologists. UCLA was one of the centers of training.

Norwegian/Swedish Refugee Scientists

SIO Director Harald Sverdrup taught this course, including methods of predicting surf conditions.

Recovery of Downed Pilots

The famous ace, Eddie Rickenbacker was shot down over the Pacific in 1942, focusing military interest on means to aid downed aviators and promote their recovery at sea. Harald Sverdrup was asked to develop a series of drift charts for the Pacific that could be printed on waterproof material and distributed to pilots. The charts were supposed to aid pilots in survival and also assist rescue efforts. The Army Air Force printed Sverdrup's charts in great numbers on artificial silk (rayon). Pilots used them to line their flight jackets or wore them as neckerchiefs.

Surf/Swell Forecasting

This work became very important after the Tarawa landing disaster, and Sverdrup And his student Walter Munk developed a method of predicting surf conditions that was used for landings in North Africa, the D-Day landings, and Pacific landings.

III. COLD WAR

Scripps efforts during WWII were so successful that the Navy provided the institution with annual block funding up to \$900K after the war. Scripps also acquired a fleet of retired wartime vessels, equipped with the latest sonar and navigational equipment and the donation of a piece of Navy land on Point Loma as a port facility for the institution. The Scripps fleet enabled the institution to undertake oceanographic research around the world.

Crossroads, Mike, Redwing

In 1946, the United States Government planned a peacetime test of its atomic weapons at Bikini Atoll and recruited a large number of American oceanographers to participate in the tests.

Roger Revelle led these scientists to conduct a biological survey of Bikini Atoll before and after the Crossroads test, and then authored a series of National Academy of Sciences BEAR reports.

MPL and other Laboratories

UCDWR was closed in 1945, but some of its research projects continued with military funding under a new laboratory, the UC Marine Physical Laboratory established in 1946. This Lab became part of SIO in 1948. In 1952, the Visibility Laboratory was transferred from MIT to Scripps. These two labs were located at Point Loma and did research for the government, including military agencies. Most of the military research conducted at SIO during the second half of the 20th century was done by these two laboratories.

Other laboratories had navy funding: IGPP (geophysics) and Center for Coastal Studies (coastal geology).

III. The Rise of the National Science Foundation

The National Science Foundation (NSF) began to replace the Office of Naval Research as the major funder of basic research in 1950. By 1960, NSF became the largest funder of projects at Scripps. Military research at Scripps diminished, and this trend was heightened during the Vietnam War, when students at UCSD protested military funding for research on campus and led Scripps to reexamine its military research projects.

IV. CONCLUSION

Historians of science have studied military funding for science in the United States for decades. A number of historians (Oreskes, Rainger, Doel) have studied Scripps Institution of Oceanography, and have identified both positive and negative aspects of military funding.

Positive Effects

Oceanography is so expensive and is so significant to world geopolitics that it can only prosper with national funding.

Military oceanography during WWII saved thousands of lives that would otherwise have been lost in amphibious, air and sea operations. The same can be said on a smaller scale about other conflicts, including the Korean War, Vietnam.

Established a strong link between military and scientists, strengthening both military and academic institutions and creating new technologies and capabilities in oceanography.

Enabled Scripps to build a fleet and mount expeditions to explore the Pacific, resulting in discoveries including the Plate Tectonics Revolution, the discovery of Hydrothermal Vents, acoustic tomography, etc. etc.

Military funding advanced environmental science by funding research such as biological effects of atomic radiation, ocean pollution, ocean ecology, air-sea interaction

Negative Effects

Academic transfer of navy traditions contributed to the reduction in the number of women in oceanography.

During the war and postwar McCarthy era, government security restrictions were imposed on some academic labs. Loyalty oaths and security investigations were instituted which adversely affected the careers of some scientists and led some scientists and citizens to reject all military sponsored research.



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Military Funding \$0

- Between 1903 and 1940, every Scripps director tried unsuccessfully to interest the U.S. Navy in funding oceanography

Navy Interests: Battleships Harbors, Ordnance



Exceptions

- Potash from Kelp
- Fouling Organisms
- Mines
- Submarine Fleet
- Military Aviation

Oceanographers As Reserve Officers



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Bathythermograph

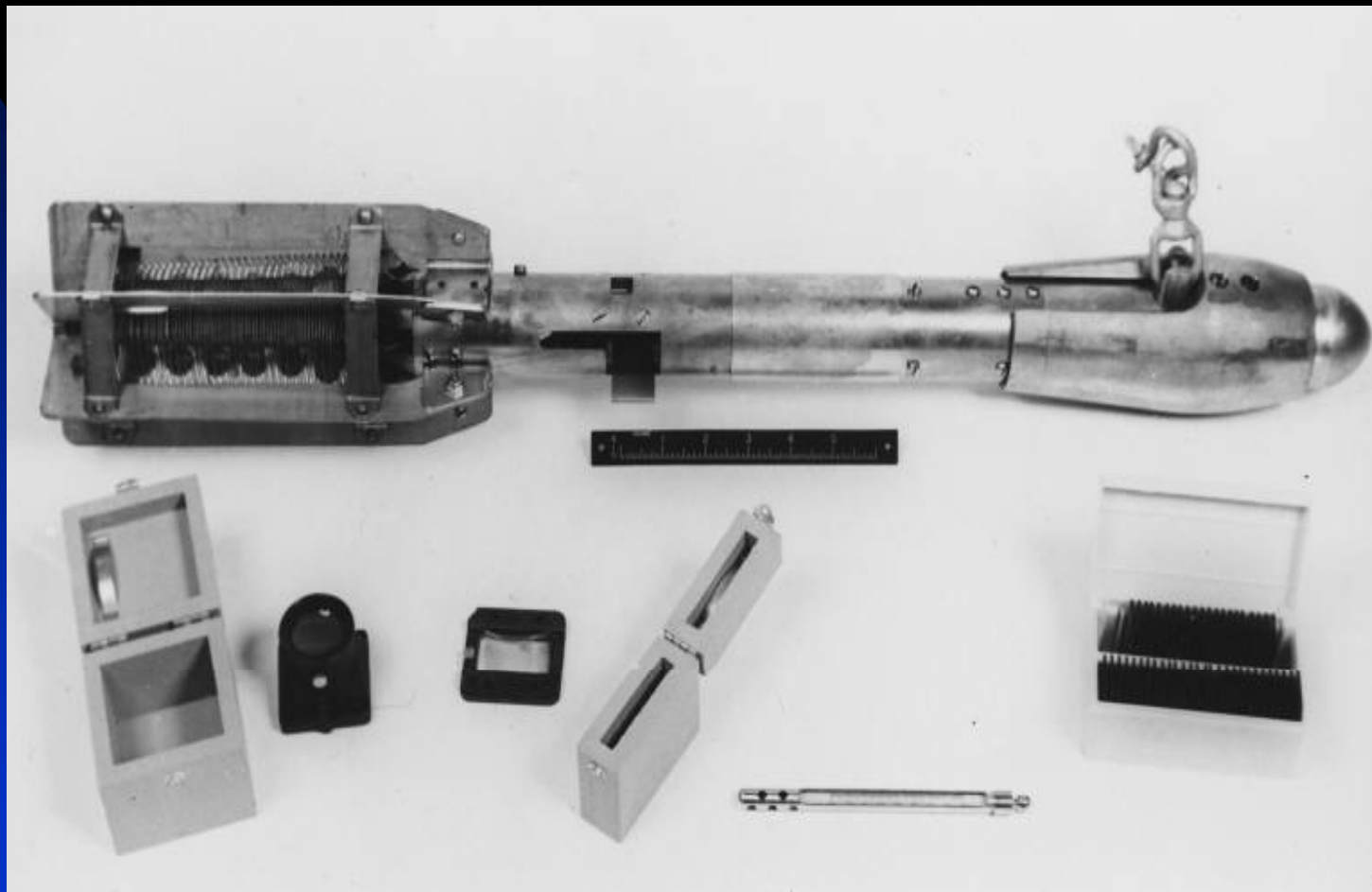
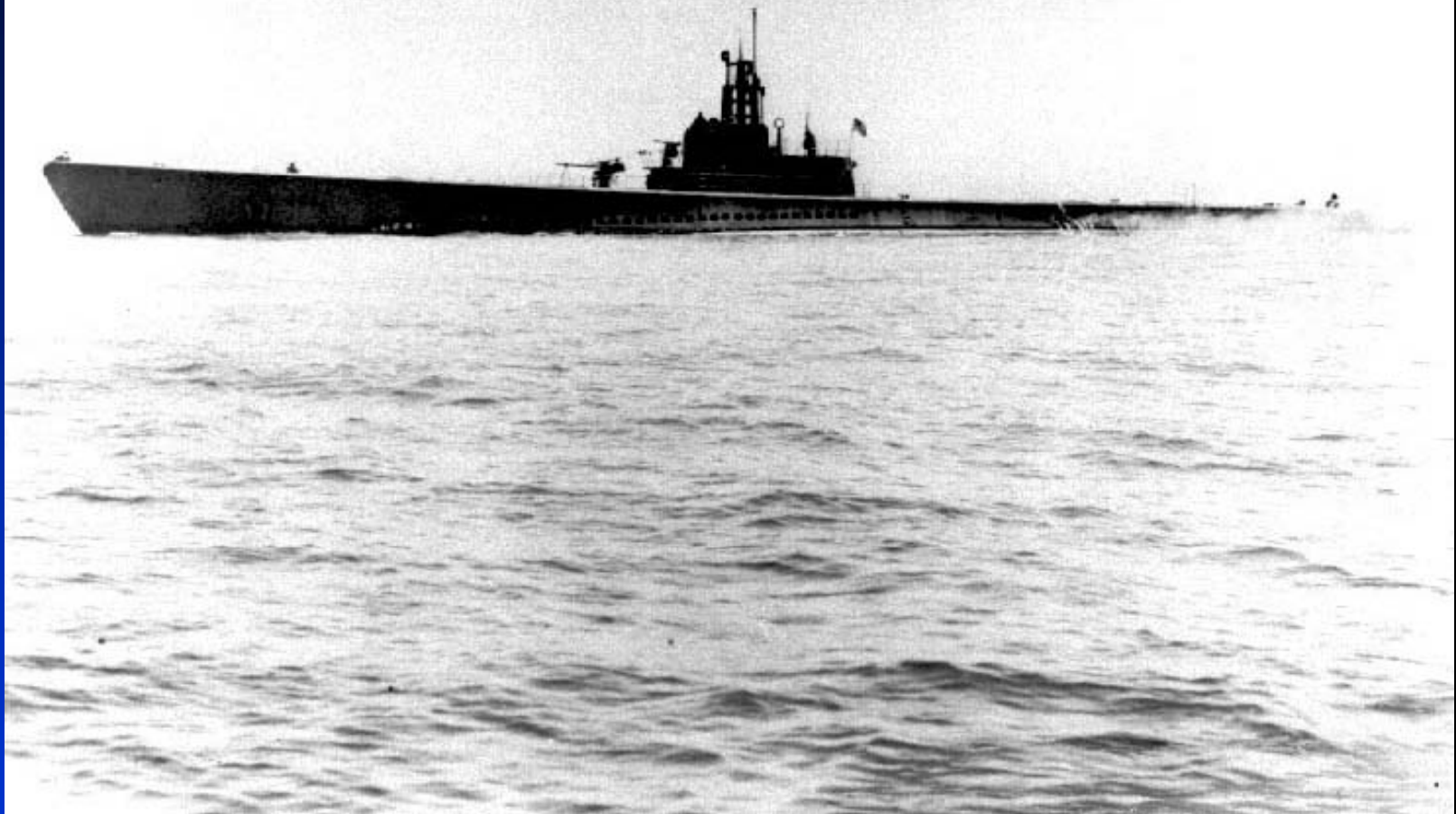


Photo # NH 97309 USS Sculpin off San Francisco, California, 1 May 1943

Submarine Warfare



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UCDWR



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Military Meteorologists



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Surf/Swell Forecasting



8/27/2009

12

Scripps Fleet



8/27/2009

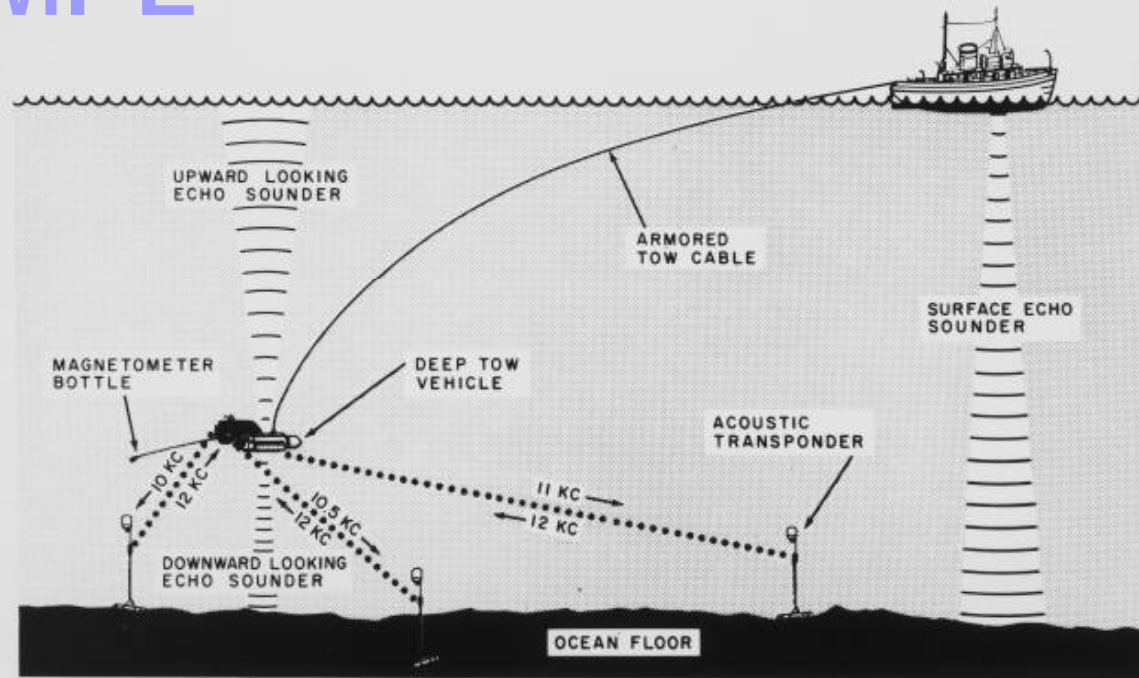
Crossroads



8/27/2009

14

MPL



In this drawing the Deep Tow vehicle is making micro-topography and magnetic field studies of the sea floor while measuring its own depth with upward- and downward-looking echo sounders. It is shown using for precise navigation a sonar beacon network consisting of three acoustic transponders placed in a triangular pattern on the ocean bottom. During operations, the ship's echo sounder monitors the sea floor in advance of the Deep Tow vehicle.

The Deep Tow vehicle and its navigation are electronically controlled from the research vessel's laboratory by means of the towing cable. The entire system, a powerful research tool for studying the geology of the sea floor, was designed and developed by Marine Physical Laboratory at Scripps Institution of Oceanography, University of California, San Diego.

Photo 164.1

--Scripps Institution of Oceanography
University of California, San Diego

82-50

Military Funding Positives

- Military oceanography helped win the war and saved thousands of lives in World War II
- Military funds and support built the oceanographic fleet
- Military funding for oceanography contributed to environmental sciences

Military Funding Negatives

- Military Secrecy impedes the dissemination of some research results, slowing progress in oceanography
- Postwar academic transfer of some military traditions barred some groups (women) from oceanography

CONCLUSIONS

- Oceanography is big science that requires the scale of funding that can be provided only by governments

CONCLUSIONS

- Oceanography is a global science that can prosper only when scientists have free access to information, access to the world's oceans and opportunities to collaborate internationally