USNA OCEANOGRAPHY DEPARTMENT

INTERNSHIP 2015

CDR W.A. SWICK
FALL IN LOVE WITH SOME ACTIVITY, AND DO IT! NOBODY EVER FIGURES OUT WHAT LIFE IS ALL ABOUT, AND IT DOESN’T MATTER. EXPLORE THE WORLD. NEARLY EVERYTHING IS REALLY INTERESTING IF YOU GO INTO IT DEEPLY ENOUGH. WORK AS HARD AND AS MUCH AS YOU WANT TO ON THE THINGS YOU LIKE TO DO THE BEST. DON’T THINK ABOUT WHAT YOU WANT TO BE, BUT WHAT YOU WANT TO DO. KEEP UP SOME KIND OF A MINIMUM WITH OTHER THINGS SO THAT SOCIETY DOESN’T STOP YOU FROM DOING ANYTHING AT ALL.

RICHARD P. FEYNMAN

EVERY PHYSICAL FACT, EVERY EXPRESSION OF NATURE, EVERY FEATURE OF THE EARTH, THE WORK OF ANY AND ALL OF THOSE AGENTS WHICH MAKE THE FACE OF THE WORLD WHAT IT IS, AND AS WE SEE IT, IS INTERESTING AND INSTRUCTIVE. UNTIL WE GET HOLD OF A GROUP OF PHYSICAL FACTS, WE DO NOT KNOW WHAT PRACTICAL BEARINGS THEY MAY HAVE, THOUGH RIGHT-MINDED MEN KNOW THAT THEY CONTAIN MANY PRECIOUS JEWELS, WHICH SCIENCE, OR THE EXPERT HAND OF PHILOSOPHY WILL NOT FAIL TO BRING OUT, POLISHED AND BRIGHT, AND BEAUTIFULLY ADAPTED TO MAN’S PURPOSES.

MATTHEW FONTAINE MAURY

. . . SCIENTIFIC TRAVELS [WERE] INDISPENSABLE FOR ANYONE IN OUR RESTRICTED SITUATION WHO WISHES TO DEVELOP INTO A MAN OF SCIENCE.

VILHELM BJERKNES
Introduction

This 2015 Internship prospectus contains Oceanography internship descriptions, the primary investigator (USNA professors or Military leads), offered dates and locations, special activities (like field work, lab work, modeling), how to get in contact with the respective primary investigator, and how to apply.

Overview

All internships listed below have been vetted and approved however, for summer training credit, internship must be greater than 20 days. Be aware that all organic USNA training requirements (Plebe Detail, Weapons Detail, Summer Seminar, STEM Camp, etc.) take priority over internships. If you are assigned to an internship (even if that internship is granted summer training credit) and you are assigned to an organic USNA training requirement, you will have to do your internship in lieu of leave.

<table>
<thead>
<tr>
<th>Block</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Saturday, 09 May</td>
<td>Friday, 22 May</td>
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<td>Block 1</td>
<td>Tuesday, 26 May</td>
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<td>Block 2</td>
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<td>Block 3</td>
<td>Monday, 20 July</td>
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Many internships are unfunded, which means that interns are responsible for all travel, lodging, and meal expenses. Contact the respective primary investigator to determine personal local costs.

USNA policy, guidelines and priorities for the Summer Training Program at USNA are available on the USNA Internship Intranet.

Review the information in Summer 2015 Activities and Requirements to understand the responsibilities of midshipmen and faculty sponsors in the execution of academic internships.

Information about Summer Training Responsibilities and Requirements will be posted on the Brigade Training website.
Oceanography Internship Descriptions

The Internship Program provides hands-on training and experience through participation in field work and agency assignments that allow for the practical application of academic knowledge and the development of critical thinking skills necessary of a Naval Officer. Midshipmen work side by side with scientists in areas such as numerical modeling, impact assessment, data collection, sensor development, and decision support as they experience the day-to-day workings of National and Naval Meteorology and Oceanography centers.

Internships not only provide practical training but also encouragement, inspiration, and continuing mentors for the next generation of Oceanography leadership.

Summary

Below are two tables which summarize 2015 internships, the tables are divided by UNFUNDED and FUNDED internships. The first table lists all UNFUNDED internships. The second table lists all FUNDED (partially or fully) internships. Below the tables are detailed description of each internship. USNA POC and Agency supplemental information is contained in the right margin for each internship. Contact the listed USNA POC for additional information.
Unfunded 2015 Ocean Internships

<table>
<thead>
<tr>
<th>Internship Name</th>
<th>Principle Investigator</th>
<th>Location</th>
<th>Blocks</th>
<th>PTE Eligible</th>
<th>Nature of Work</th>
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Funded 2015 Ocean Internships

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<th>Internship Name</th>
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<td>2 3</td>
<td>Field Surveys</td>
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Descriptions

Coastal Ocean Processes Internship

Familiarization with ocean observing technology and the study of coastal ocean processes and numerical modeling of these processes. Midshipmen will gain hands-on experience with deployment and/or recovery of ocean gliders (autonomous vehicles which collect oceanographic data throughout the water column) and will learn how to use this data to better understand wind-driven upwelling, variability of ocean currents, phytoplankton blooms, and other coastal processes which can impact naval operations.

Coastal Survey Lab

Midshipmen will accompany NOAA coastal survey teams during the collection of hydrographic survey data. A significant portion of the internship may involve fieldwork usually on small
watercraft. The midshipmen will participate in the analysis of data and the preparation of final products (e.g. harbor charts), gaining an understanding of the production cycle of critical navigational aids and the environmental data required to construct these products.

Deep Diving Technology: the Exosuit

The internship will involve training and familiarization with operation of the newest generation Atmospheric Diving Suit (ADS) known as the Exosuit. The training will be conducted at the J. F. White Dive Training Center in Stoughton, MA and the Woods Hole Oceanographic Institution pier in Woods Hole, MA. Midshipmen majors will be assigned to a designated point of contact at J. F. White for familiarization with ongoing advanced dive training and ocean operations. Midshipmen will then become involved in preparing the Exosuit for deployment, development, and evaluation of specialized tooling and operational interaction between the Exosuit and other deep diving tools and technologies such as Remotely Operated Vehicles (ROVs) and small submersibles.

Deep Ocean Exploration aboard E/V Nautilus

Familiarization with operation of remotely operated vehicles (ROVs) for deep ocean exploration. These operations will be conducted aboard the Exploration Vessel Nautilus. Midshipmen Oceanography majors will be assigned to the Ocean Exploration Trust’s Corps of Exploration aboard Nautilus as ROV Navigators, and will therefore be involved in coordinating the efforts of the bridge team, ROV engineers, and science team to correctly position the ship and ROVs for deep ocean operations. ROV Navigators will also be responsible for providing daily weather briefs to the watch teams. Ocean Engineering majors will be assigned to E/V Nautilus as ROV co-pilots, and will therefore be involved in preparing the ROVs for deployment, operating the ROVs while they are deployed, and conducting post-recovery maintenance.
Department of Energy, Oil and Gas Analysis

This internship will involve policy analyses related to energy issues within the Office of Oil and Gas, in the Department of Energy. This office works on current issues and assignments that change from week to week, depending on what is happening in the global and domestic energy markets and with the world, in general. Due to the dynamic nature of work flow, it is difficult to outline a specific project. Broadly speaking, this research focus will focus in one of two arenas: Analysis of world oil and gas markets or Analysis of domestic production of oil and gas resources.

Fleet Numerical (Meteorological and Oceanographic) Center (FNMOC)

FNMOC is the Department of Defense’s primary central production site for worldwide computer generated operational meteorological and oceanographic analysis and forecast products. With 65 military and 135 civilian personnel, Fleet Numerical is one of a half dozen internationally recognized operational weather centers and the world’s leader in global oceanographic and coupled air-ocean forecasting.

The Johns Hopkins University, Applied Physics Lab

This internship will take place in the Force Projection Sector (FPS) of APL’s Oceanic, Atmospheric and Remote Sensing Sciences Group. Most of this work will center on the Sea Control mission objective at APL. This research will focus on: Model development and theoretical work on sub-mesoscale ocean circulation and ocean internal waves and Analysis of data collected from various platforms as a tactical aid for surface and undersea combatants.
Michigan State University, Enviro Weather

Based out of Michigan State University, Enviro Weather provides services to the farming and environmental community of the state. Products of Enviro-weather include weather outlooks for field crops, fruit, trees, turf grass, vegetables, landscapes, nurseries, and weather summaries, including rainfall data, for the last five years. Enviro-weather’s mission statement is to develop and deliver a sustainable weather-based information system that helps users make pest, plant production, and natural resource management decisions in Michigan. The USNA intern will help with data collection, specifically in the area of agro science as it relates to climate change. Areas of research will include agricultural meteorology, potential impacts of climate change on water use for agricultural irrigation, potential future changes in climate, and weather and risk management in agricultural production and plant protection.

NCAR Undergraduate Leadership Conference

The NCAR Undergraduate Leadership Workshop has the purpose of informing students about exciting research and career opportunities in the atmospheric and related sciences. The five-day program establishes informal dialogue between students and research scientists as the students explore the laboratories, instrumentation, and computing facilities that support studies on weather, climate change, solar dynamics, the Sun-Earth system, and impacts of severe weather and climate change on societies around the world.

National Disaster Preparedness Training Center

The internship is an intensive educational opportunity for officer candidates in meteorology, oceanography, GIS, maritime search/rescue, and related fields, providing a real-world immersion in the challenges facing the disaster management communities. During the 3-week period, the Midshipmen will contribute to research efforts leading to the development of NDPTC training courses as well as have the opportunity to attend course deliveries. At the end of the internship, interns will be expected to submit a 10-page report about their internship experience.
**National Geospatial Intelligence Agency (NGA)**

This internship will involve familiarization with the NGA organization and mission, and involvement with current research projects being undertaken by NGA. Midshipmen involved in this internship will receive formal training in remote sensing, imagery, and geographical information systems used in the intelligence community and in the Fleet. They will also learn about the various types of intelligence, in addition to geospatial intelligence, they will be briefed on human and signals intelligence and the role of intelligence support in operational mission planning, with emphasis on support to naval forces.

**National Geodetic Survey**

Midshipmen will collect, analyze and/or process geodetic data relevant to improving position determination. Data collection may be via in-situ field collection or remote sensors. Specific application of the effects of ocean currents on the geodetic field are a particular focus area. Midshipmen will gain an understanding of the impacts of the dynamic environment on operational positioning information. This will improve the student’s appreciation of measurement techniques, statistical analysis, and proper scientific practices. Understanding the impacts of the environment on position information is relevant to their future work in navigation, targeting, and resource management.
National Ice Center (NIC)

Midshipmen will work with the National Ice Center personnel to assist in creating relevant snow and ice products / services to meet the strategic, operations, and tactical requirements of the United States.

Navy Marine Mammal Training at SPAWAR

Scientific research conducted to support the development of systems and technology and to gain a better understanding of the animals. This research, conducted by both staff and visiting scientists, has covered a broad spectrum of topics including hydrodynamics, sensory systems, anatomy and physiology, health care, behavior, reproduction, telemetry, open sea operations, and environmental ecology. This work is facilitated by well-trained animals that can participate in research in ocean pens, pools, or open water. Midshipmen work hands on with the Program’s Internship Coordinator to include training of the various marine mammal Fleet systems. Midshipmen are integrated in the training watch bill and participate in multiple aspects of the system.

Mammal Program (NMMP) began in 1959 with a single Navy scientist and one dolphin. Since that time, the program has expanded its study with the development of the Fleet Marine Mammal Systems utilizing dolphins, beluga whales, and sea lions. In addition, the NMMP is doing a variety of research projects investigating the hearing abilities in a number of species of marine mammals.
National Marine Sanctuaries

Midshipmen will assist NOAA personnel with research cruises and other field work, which may include remotely operated vehicle work, dive monitoring, and habitat mapping involved in the Office’s mission to monitor ecosystem health and promote responsible, sustainable ocean uses that ensure the health of the nation’s most valued ocean places. Internships may be available at the NOAA offices at Annapolis, the Florida Keys, Savannah Georgia and Galveston, Texas.

Operational Oceanographic Products - National Ocean Service/CO-OPS

Midshipmen will participate in analyzing collected tide station data, assimilating the data into an operational tidal model, and running the model in various operational scenarios to develop tidal predictions in complex areas. It is envisioned that the USNA student Intern would be incorporated into the modeling team operational protocols to learn all aspects of operational oceanography within the National Ocean Service. If they occur, the student volunteer would assist in investigating and diagnosing any model failures. They would assist in the development of numerical model skill assessment system for the operational models and the development of a user product to would provide users with an understandable model skill. The intern could also conduct in-depth analysis of the numerical skill output to help address where improvements in the models
would be most effective. The intern may also investigate what existing observational data is available that would aid the model product either through better skill assessment, numerical assimilation, or as input for running the models.

**Research Vessel Bay Hydro II, NOAA, Office of Coast Survey**

**Midshipmen will accompany NOAA coastal survey teams onboard the Bay Hydro II, a 57 foot survey catamaran.** The Bay Hydro II is Coast Survey research vessel engaged in on-the-water hydrographic surveying including testing of hydrographic systems and the acquisition of sounding data. The midshipman would participate in all aspects of the mission from preparation to acquisition to processing. Additionally, the midshipman will be presented opportunities for small boat handling by operating a 57 foot survey catamaran. The boat is berthed about 1 1/2 hours south of USNA at Solomons Island, MD. Midshipmen might be able to stay at Naval Air Station Pax River which is about 30 minutes away.

**Severe Weather In-Field Training (SWIFT)**

**Midshipmen will travel to the Norman, OK and Fort Campbell, KY areas by duty van to engage in daily, real-time exercises to forecast and observe severe convective storms, guided by Dr. Barrett and CDR Cooper.** On the days when severe convective activity is not forecast, midshipmen will visit the operational and research facilities of NOAA and AFWA for tours and discussion of the role of each agency by forecasters and leading scientists. Meetings with operational Air Force, Army, and NOAA meteorologists will give midshipmen exposure to the forecast challenges presented by severe convective storms including effects on the environment and the economy, danger to civilians and impact on military operations. This experience will be invaluable to all Midshipmen involved, regardless of their choice of warfare specialty, but especially to those who are considering careers as Navy METOC officers.
Tropical Cyclones (TROPIC), Research on Oceanographic Processes

Midshipmen will launch AXBTs from USAF 53rd WRS WC-130Js in tropical cyclones over the Atlantic Ocean, Gulf of Mexico, and eastern Pacific Ocean in support of a forecast demonstration project in conjunction with the Naval Research Laboratory, Monterey and the USAF 53rd Weather Reconnaissance Squadron (USAF Hurricane Hunters). CDR Sanabia will coordinate and oversee pre-flight and in-flight training for the midshipmen on the AXBT system and launch procedures with subject matter experts at the start of the TROPIC training block, and prior to launching AXBTs. Forward deployment of the WC-130J and USAF crew to St. Croix is standard operating procedure during high-tempo flight periods, and is expected during the training block. On days when there are no flights, midshipmen will process the data collected from previous flights and stage gear for upcoming flights. Once flight preparations are complete, midshipmen will visit the numerous USAF and USN operational and research facilities in the Keesler, Gulfport, Stennis area to include the 53rd Weather Reconnaissance Squadron; Naval Oceanographic Office (NAVO); Commander, Naval Meteorology and Oceanography Command; Center for Naval Aviation Technical Training Unit, and METOC Professional Development Center.
This internship will involve conducting unclassified research in support of the NRL Determining the Impact of Sea Ice Thickness on the Arctic’s Naturally Changing Environment (DISTANCE) project. The objective of the NRL DISTANCE project is to understand the changing Arctic environment, characterized by reduced ice volume, using new techniques for deriving accurate multisensor snow and ice thickness information and coupled ice ocean models to explore the new Arctic dynamics.

Midshipmen will conduct limited, independent research projects in the field and laboratory and participate in ongoing collaborative, interdisciplinary research related to the three topics above. This internship as currently planned will involve a 7-10 day field research expedition on the R/V Sharp on the continental shelf of the northeastern U.S. as part of an Office of Naval Research (ONR)-sponsored research project.
Midshipmen will conduct independent research projects in the field and numerical laboratory. In this particular internship you will apply your education to cutting edge numerical research and development of software tools for modeling sediment mobility. You will develop, test and evaluate fast and efficient models to improve current U.S Navy fine scale prediction. You will work in an intellectual and supportive environment and will be using our world-class laboratories.
Internship Application Procedure

All applicants must fill out and submit the SOC Internship application. The application form will be open for entries as soon as 05 January. The application deadline is 18 January, 2015.

Internship selections will be made based on the Midshipman’s overall performance, the context of that performance, and the principal investigators assessment of the Midshipman’s ability to perform in the internship. Should further information be required, the principal investigators will contact Midshipmen directly.

Internship and Travel Approvals

Internships travel authorization is a two step process.

1. Travel Authorization Form must be filled out no later than Monday, 09 February 14. Once the form is filled out you will be contacted via email by your principal investigator to sign and date. The authorization form will be open for entries as soon internship selections are finalized o/a 23 January, 2015.

2. You and your respective principal investigator will enter your orders in DTS (Defense Travel System 1).

3. All travel orders, regardless of block for the internship, must be entered into DTS and ready for approval no later than 15 April 15

Funding

If an internship is funded, fully or partially, the Department principal investigator for the account must sign and date the Internship Travel Request form.

1 If this is your first time traveling on Military Orders you will need to Self Register for a DTS account.

All funded internship travel must start and end at USNA. Midshipmen on unfunded permissive travel orders must start their travel from USNA, but may depart the internship and proceed on leave without returning to USNA since there is no voucher requirement. Leave should NOT be included in any internship travel order - before, during, or after the internship.
All vouchers will be filed immediately after the end of the internships, prior to the midshipman being approved to proceed on leave or to the next summer activity. Unfunded Internships do not require a voucher. Submitting a voucher by following the following guidance will ensure the voucher is processed correctly and efficiently. Incorrect or missing documentation can will slow the process down.

**Required Voucher Receipts**

**Lodging receipts** A single traveler’s name MUST appear on the lodging receipt to get reimbursement. If multiple traveler names appear it should be clear and easily identified as to who paid what portion. The bill should have a zero paid balance.

**Eticket PDF copy** from Virtually There

**Any other receipts for expenses** that were authorized on the travel orders prior to departure. (Ex. Super Shuttle, Taxi, Rental Cars, Rental Car-gasoline, etc)

**Completed Mileage log** if Midshipmen drove to and from internship and in and around mileage. Mileage logs should be legible and totals for official business tallied. POV gasoline will not be reimbursed.