

# Naval Meteorology and Oceanography Command



## **what will the weather be like tomorrow?**

**A seemingly innocuous question —  
except when asked by a military operator.  
On the field of battle, the environment  
can be a formidable adversary — or a  
welcome ally. The defeat of the Spanish  
Armada. Waterloo. D-Day. Desert Storm.  
Throughout the eras of sailing ships, naval  
aviation, and nuclear submarines, the  
weather — and the ability to predict it —  
has affected the outcome of battles, the  
fates of nations, and, ultimately, the  
course of history.**



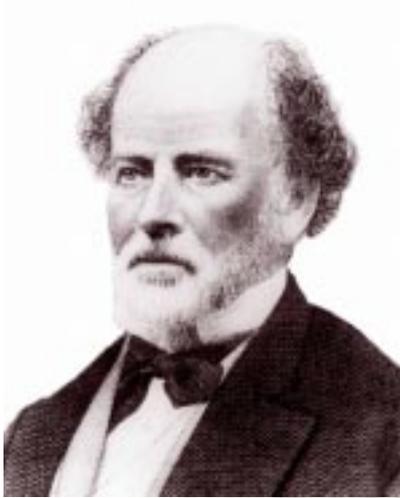


Today's world order ushers forth a new era in naval warfare — that of joint operations in the littoral — and a host of new technologies. Yet even in the computer age, naval platforms, weapons, and systems remain vulnerable to the elements.





## our heritage



The Naval Meteorology and Oceanography Command traces its ancestry to the Depot of Charts and Instruments. In the 1840s, its superintendent, **Lieutenant Matthew Fontaine Maury**, created and published a revolutionary series of wind and current charts. This information, still resident in modern computer models, laid the foundation for the sciences of oceanography and meteorology.



Atmospheric science was further developed with the birth of naval aviation early in this century. During World War I and the following decades, naval aerological specialists applied the fledgling concepts of air masses and fronts to warfare and provided forecasts to the **first transatlantic flight**.



The Navy's weather and ocean programs contributed greatly to **Allied victory in World War II.**

In the Pacific, Navy forecasters cracked the Japanese weather code.

Hydrographic survey ships, often under enemy fire, collected data along foreign coastlines for the creation of critical navigation charts.

In the mid-1970s, the Navy's meteorology and oceanography programs were integrated in a single organization reflecting nature's close interaction of sea and air. This structure is today the Naval Meteorology and Oceanography Command.



## our mission



The Naval Meteorology and Oceanography Command's mission is to collect, interpret and apply global data and information for **safety at sea**, strategic and tactical warfare, and weapons system design, development and deployment. The command provides meteorological, oceanographic, and geospatial information and services to **increase the effectiveness** of our Navy in both peacetime and in conflict.



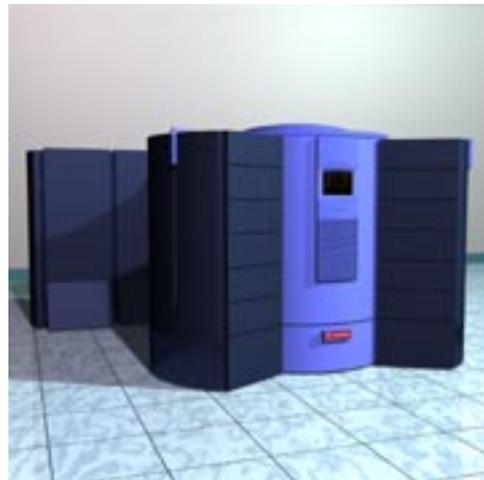
This **worldwide organization** comprises some three thousand officer, enlisted and civilian personnel at two master computer centers, as well as a number of regional centers, facilities, detachments and aboard the ships and aircraft used in conducting oceanographic surveys.



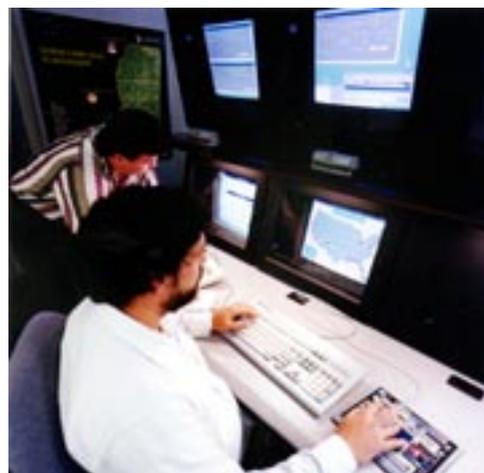
The Naval Oceanographic Office is the largest single element of the command and one of the two master computer centers. Its primary mission is to conduct **multidisciplinary** oceanographic surveys in the world's oceans.



The office collects hydrographic, geodetic, chemical, navigation and acoustic data using ships, aircraft, satellites, and other platforms.



The supercomputer center at NAVOCEANO administers and operates one of four Department of Defense **Major Shared Resource Centers**. The MSRC processes high-resolution data of the oceans and atmosphere in support of various projects across the Armed Services. In the MSRC Visualization Laboratory, users can analyze the data in an **interactive, 3-D** setting using applications that extend into the realm of virtual reality.





The Fleet Numerical Meteorology and Oceanography Center is the other master computer center. It produces **global and regional scale** meteorological and oceanographic prediction products, including analyses, forecasts and tactical decision aids for direct operational use by Navy ships and aircraft.



Regional centers provide services to naval and other Department of Defense forces operating in their respective regions. These centers are generally located with, or in close proximity to, **major fleet and joint force** commanders.



The facilities manage detachments, provide local support and some provide **specialized functional tasks**. The detachments throughout the world provide local meteorological and oceanographic services.



In addition to the support products by the various centers, the Naval Meteorology and Oceanography Command provides **on-scene services**. Teams of skilled personnel from the centers and facilities embark on board combatants for specific operations, exercises or deployments. They assist in the interpretation of products received from the centers ashore and generate **tactical support products** using on-scene observations of air and ocean conditions.





Recent hostilities indicate that warfare of the future will involve **increased interaction** between the armed services and with our allies.

The Navy and Marine Corps team is preparing for this outlook through combined exercises and missions with the Army, the Air Force, and with our allied counterparts — a concept known as joint operations.



Whether the operation is an amphibious landing in the Western Pacific, a humanitarian mission in Europe or Africa, or a research study in the High Arctic, whether the product is a prediction of surf conditions, a flight weather brief, or an ice forecast, **sharing of knowledge,**



techniques, and equipment increases accessibility of environmental information and, ultimately, enhances the potential for success and safety of all United States military operators.

Traditionally, naval operations call to mind images of the “high seas.” Historically, however, much of our nation’s naval power was exerted on or near shore. The American Revolution. The Barbary Wars. The War of 1812. The Civil War. The Spanish-American War. Each conflict was fought largely in the littoral, the area extending from coastal waters inland along the shore.



After the Cold War, an era dominated by deep ocean operations and a Soviet threat, tactical attention once more focused on the littoral.



Threats to our national security now appear in a regional rather than global context. To succeed in this world order, naval forces must project power and pressure off many diverse foreign coasts — and far inland as well. Therein lies the challenge. For no region is more environmentally complex, no area more variable than the littoral.



# meteorology

Meteorology deals with the atmosphere and atmospheric phenomena. **Accurate prediction** of these conditions is essential for guiding Navy ships and aircraft.

A variety of analyses and prognostic weather charts and **performance predictions** relate the Navy's operating environment to fleet platforms and weapons and sensor systems.

Although modern ships no longer rely on the winds to move them through the water, knowledge of weather conditions is still **vital to success** in naval operations. Weather is seldom neutral; it favors those who know it and use it to advantage.



# oceanography

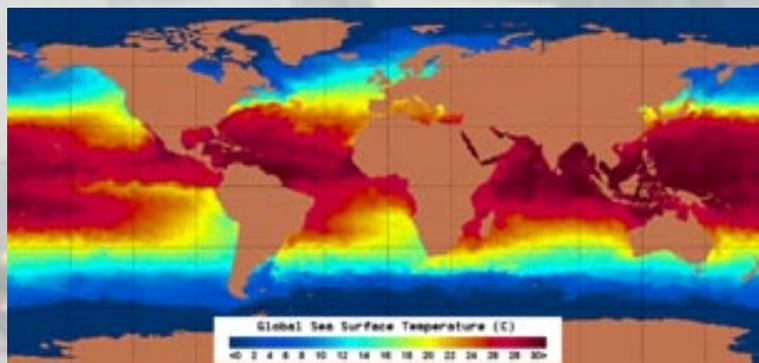
Oceanography investigates the nature and behavior of the oceans - the Navy's operating environment. Temperature, salinity and pressure influence the path that sound will take as it moves through the water. This information is used to locate and track submarines of potential adversaries, as well as to conceal our own.

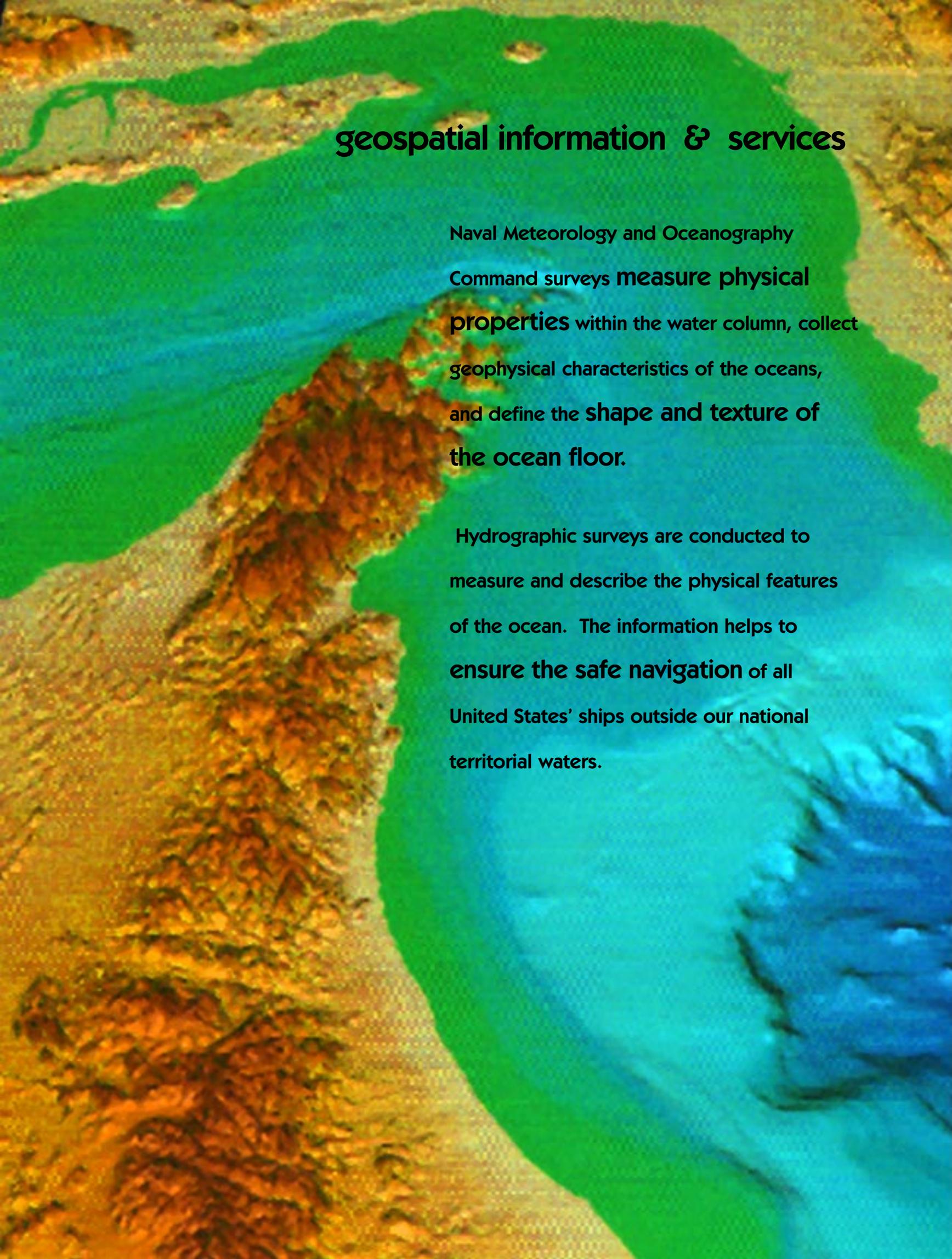


Sea ice influences ocean acoustics and presents a hazard to navigation. Personnel at the Naval Ice Center observe and record sea ice ridges, water openings and thickness.



Satellite imagery is used to determine sea height, sea surface temperature, ocean current, upwelling, water masses in the sea and frontal boundaries that separate them and the swirling eddies that spiral off from them.





## geospatial information & services

Naval Meteorology and Oceanography

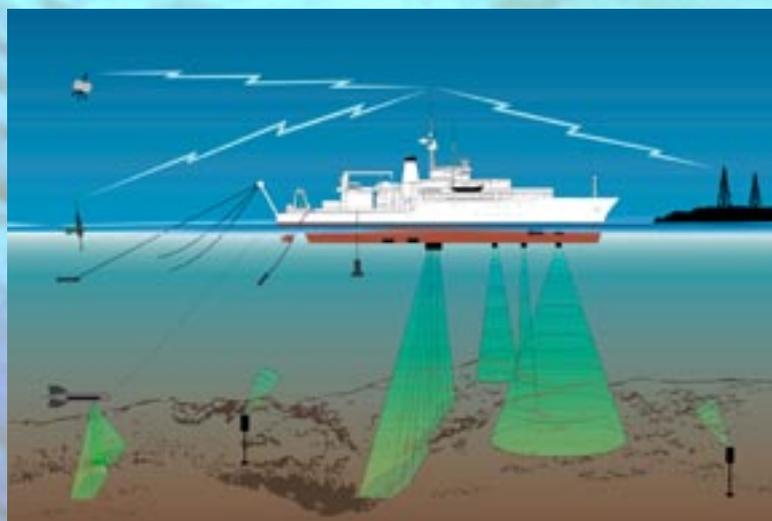
Command surveys **measure physical properties** within the water column, collect geophysical characteristics of the oceans, and define the **shape and texture of the ocean floor.**

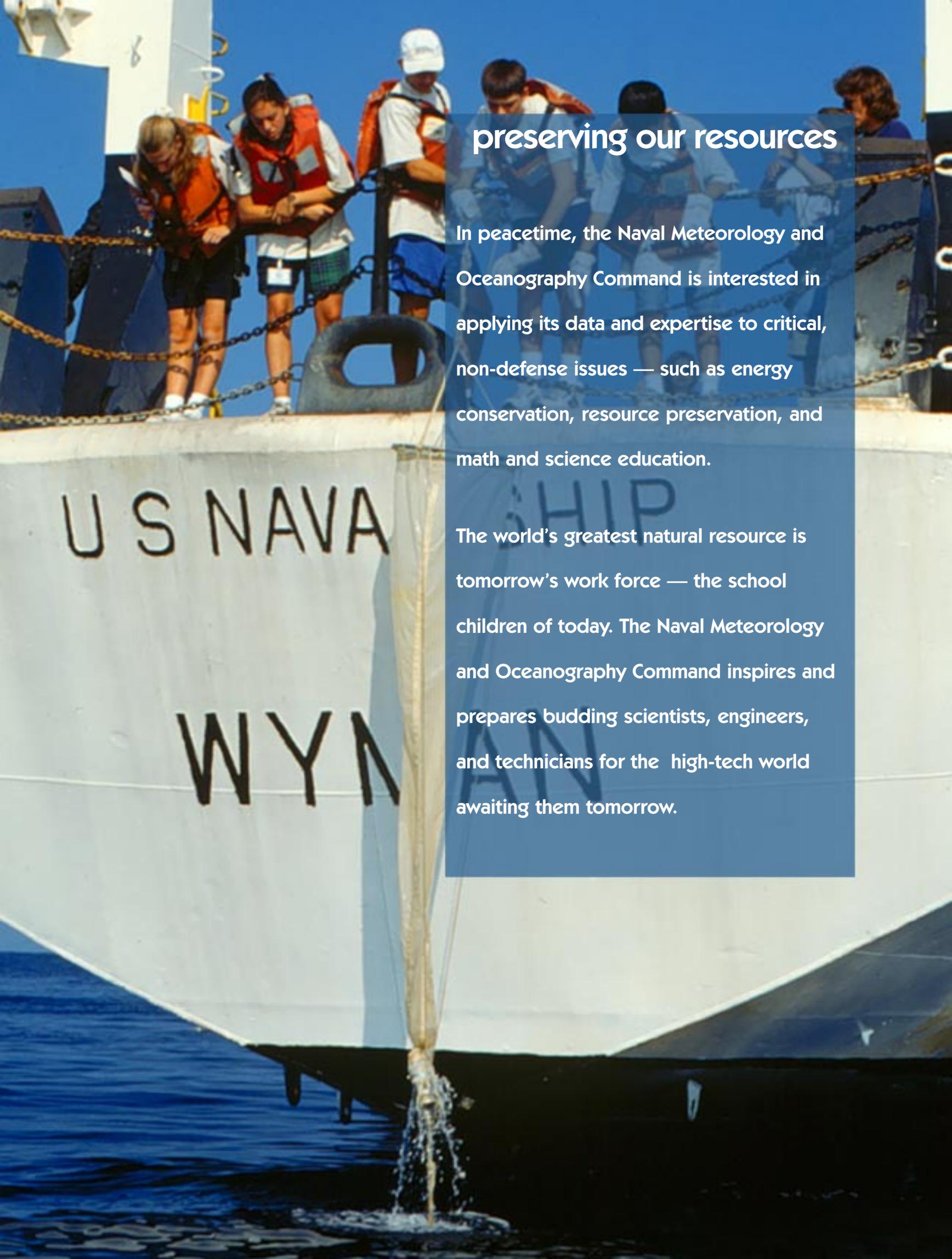
Hydrographic surveys are conducted to measure and describe the physical features of the ocean. The information helps to **ensure the safe navigation** of all United States' ships outside our national territorial waters.



The data are provided to the National Imagery and Mapping Agency for processing and delivery of digital and paper nautical charts.

The end result of these efforts is to promote efficiency and safety for all who use the world's ocean highways.





## preserving our resources

In peacetime, the Naval Meteorology and Oceanography Command is interested in applying its data and expertise to critical, non-defense issues — such as energy conservation, resource preservation, and math and science education.

The world's greatest natural resource is tomorrow's work force — the school children of today. The Naval Meteorology and Oceanography Command inspires and prepares budding scientists, engineers, and technicians for the high-tech world awaiting them tomorrow.



JASON Project



Project Marco Polo



Project Marco Polo



JASON Project



Project Marco Polo

# what will the world be like tomorrow?

In today's uncertain global climate, the future remains enigmatic. The only certainty is that technology will continue to define the way the world — including the Naval Meteorology and Oceanography Command — operates. From Maury's fading hand-drawn charts to vibrant satellite images, to prediction tools as yet unknown, the Naval Meteorology and Oceanography Command has always and will continue to provide the best information available on the atmosphere and oceans.

**because tomorrow's  
will always matter**

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