RDML Thomas Q. Donaldson V

Commander, Naval Meteorology and Oceanography Command/Hydrographer of the Navy

Modern-Day Maurys

150th Brussels Maritime Conference

17-18 November 2003

Our Mission

To turn environmental information into combat power

- **Describe the environment now**
- **Predict the environment in the future**
- **Translate its impact on Naval operations**
- **Increase likelihood of mission success**

From the top of the atmosphere...

Any time... Anywhere

...to the bottom of the sea

Key Enablers

- Oceanography
  - Amphibious/Special Operations
  - Acoustics for ASW, Mine Warfare
- Meteorology
  - The Navy's Weather Service
  - DoD NWP
  - Theater METOC Centers
- Geospatial Information and Services
  - Navigator of the Navy

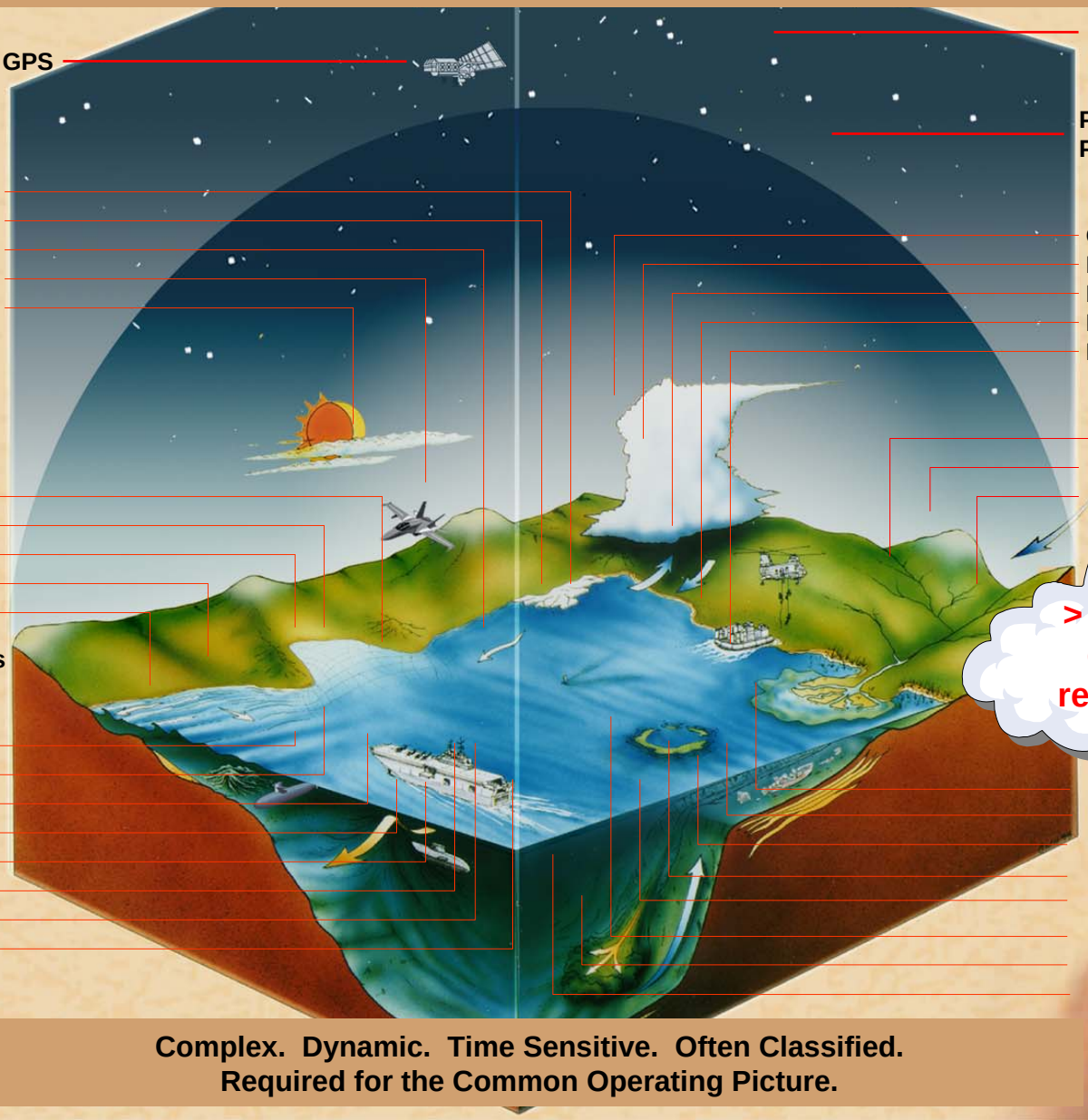
  Rear Admiral Tomaszeski
  - Hydrographer of the Navy

  Rear Admiral Donaldson

Mission Scope
Battlespace Characterization

524 customers*

> 1400 product lines



Precise Time for GPS

Celestial Reference Frame

Positions of Sun, Moon, Planets and Satellites

Increased radar masking
Sea ice
Sea clutter
Precision munitions
Cloud layers

Communication ranges
Hazards to aviation
Rain/Visibility
Mud flats
Mine burial

Air drop wind
Ballistic winds
Radar counterdetection

Rocky bottom
Water clarity
Heat stress/Frostbite
Chemical dispersion
High surf

Earth Orientation Parameters

> 13,000 info exchange requirements

Dangerous marine life
Wave heights
Station keeping
Bathymetry
Wind over the deck
Radar coverage
Structural icing
Bioluminescence

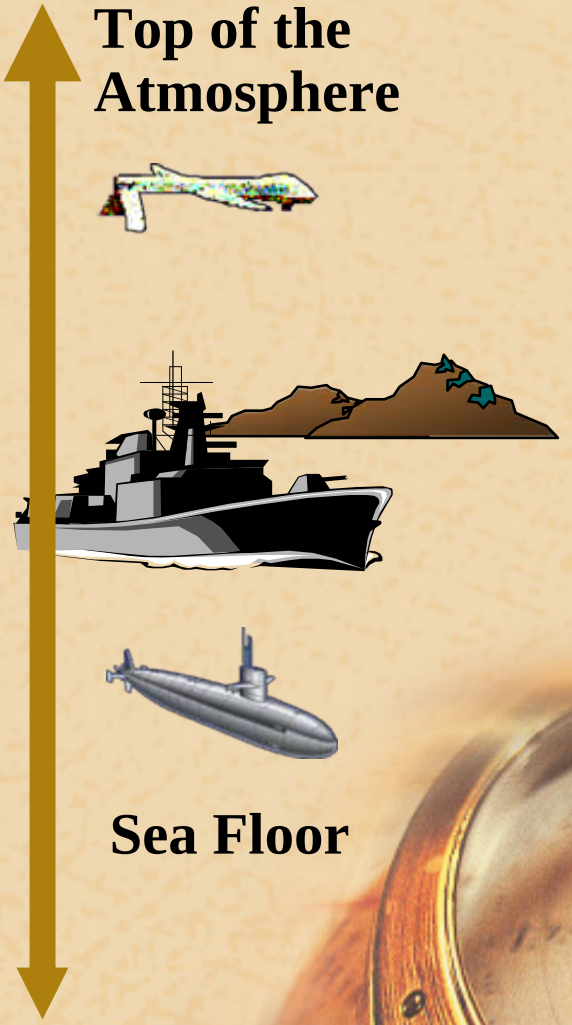
Currents
Buoyancy
MAD performance
Hazards to navigation
Fog
Acoustics
SAR
Temperature

*Note: Does not include web customers!

Complex. Dynamic. Time Sensitive. Often Classified.
Required for the Common Operating Picture.

COMNAVMETOCCOM Assets

< 0.4 %
Navy TOA

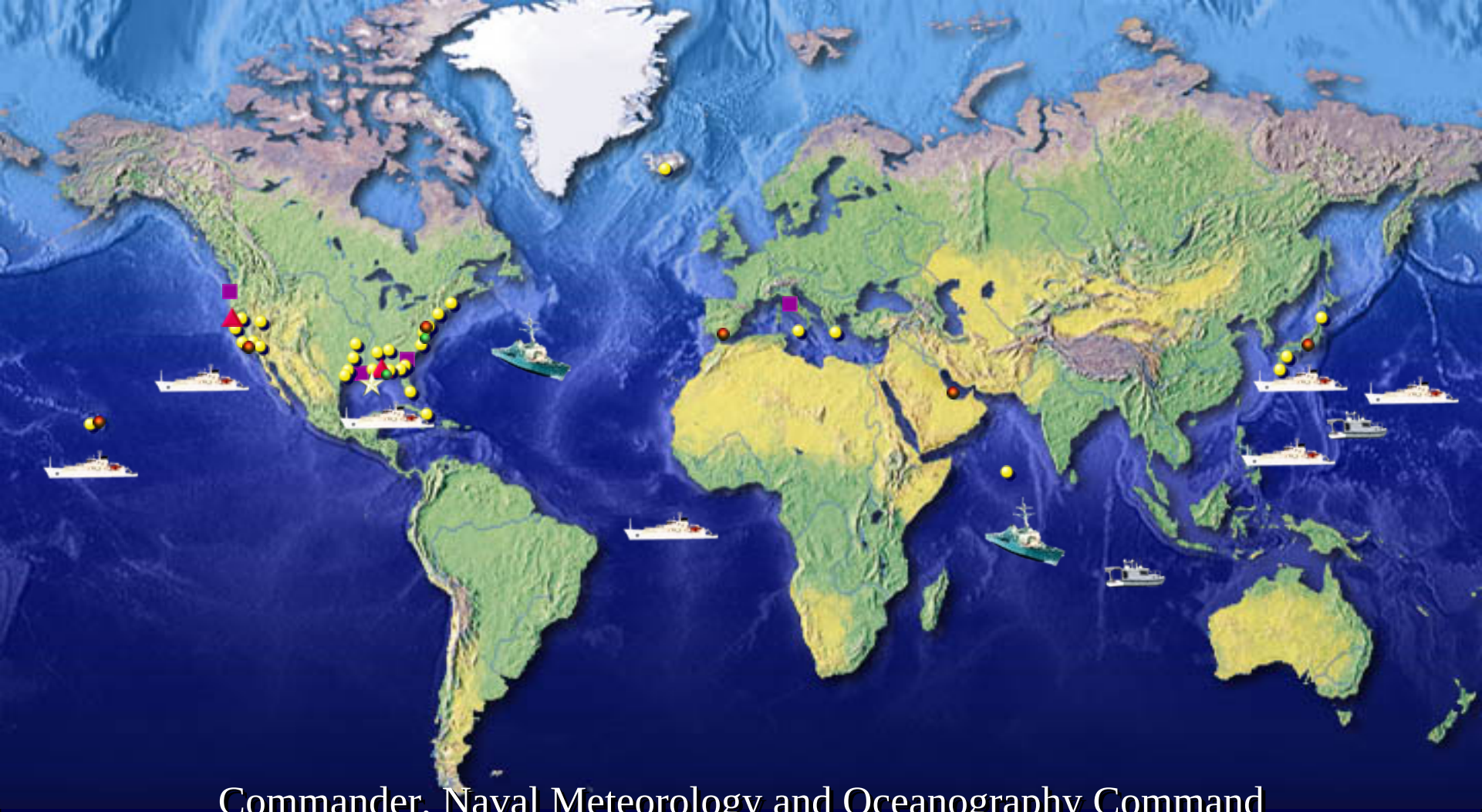


3173 Total End Strength

- **Military - 440 Officers & 1400 Enlisted**
- **Civilians - 1333**

7 Military Survey Ships

8 Major Activities

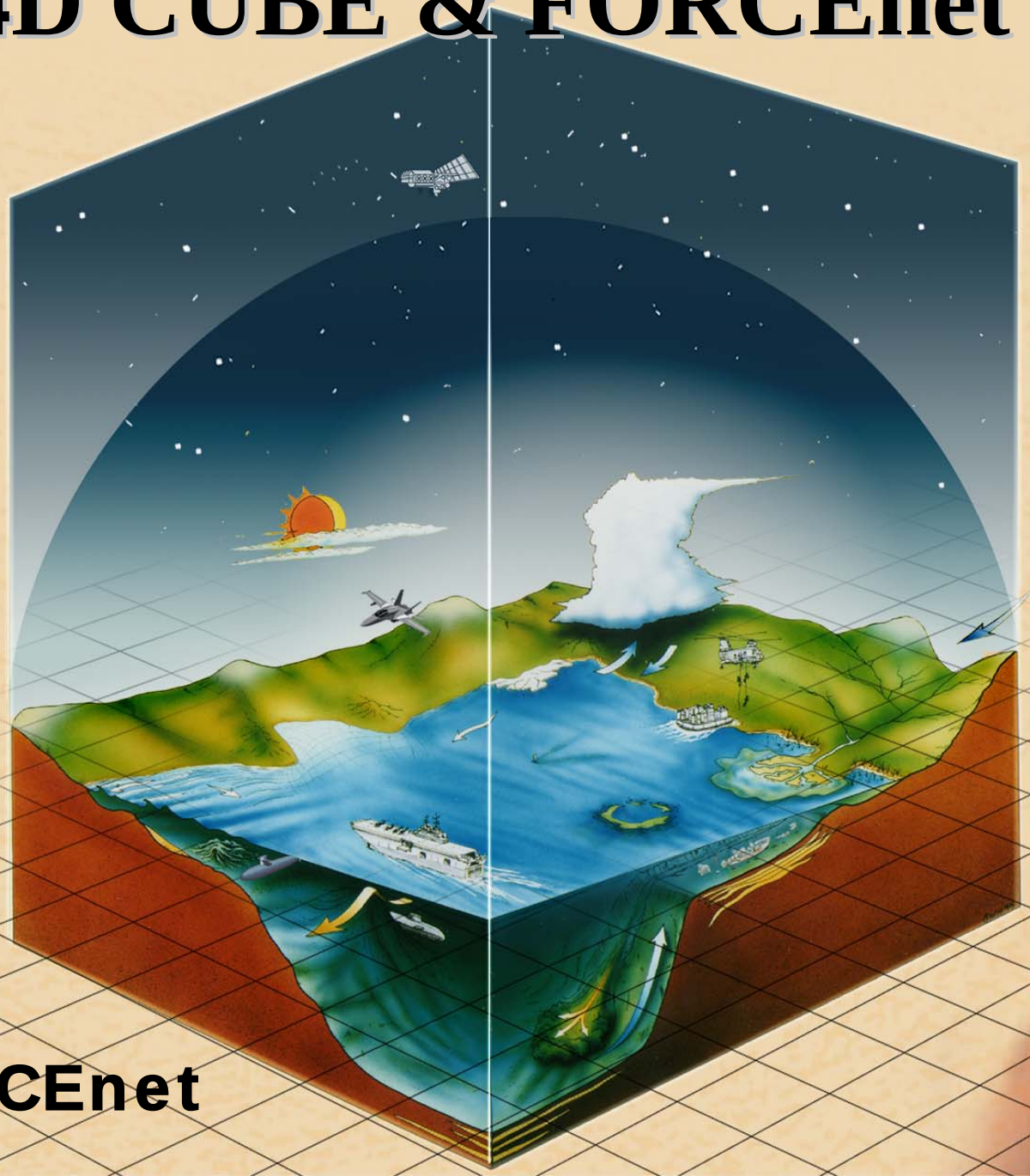


Commander, Naval Meteorology and Oceanography Command

Forward Deployed - Warfighter Focused

- Headquarters
- 2 Production Centers
- 6 Regional Centers
- 2 Special Centers
- 4 Facilities
- 31 Aviation Detachments
- 7 Oceanographic Ships
- 9 Mobile Environmental Teams
- 2 Fleet Survey Teams

4D CUBE & FORCEnet



4D
CUBE

VNE

FORCEnet

Oceanography

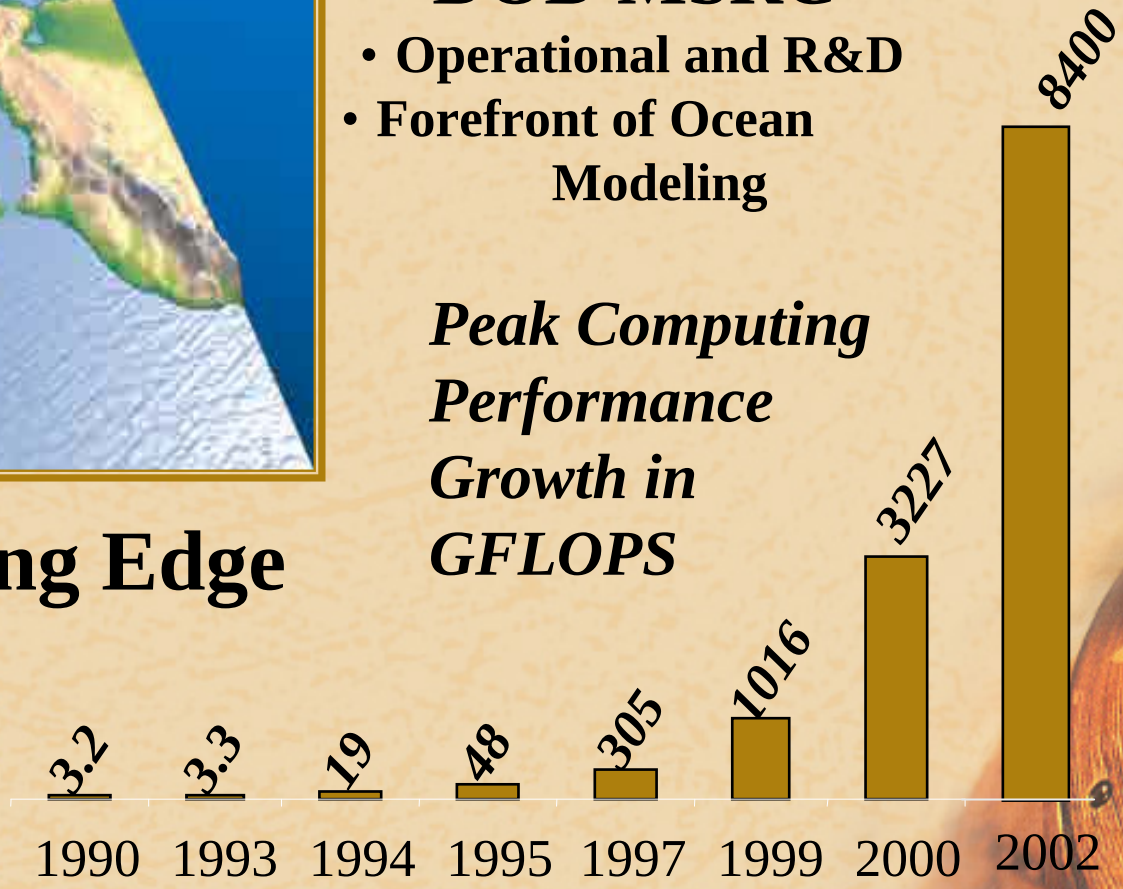
Naval Oceanography Supercomputing

The Cutting Edge

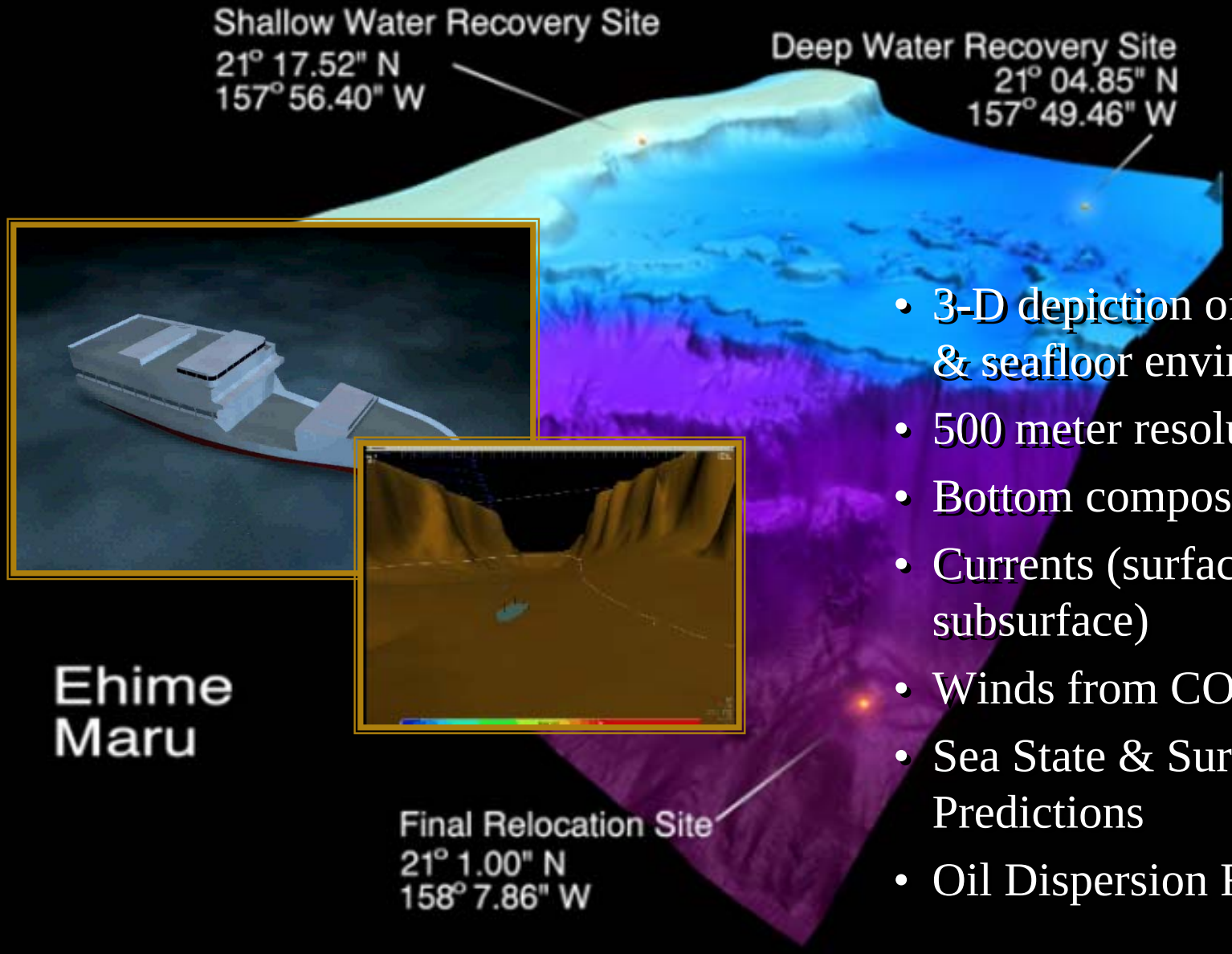
DOD MSRC

- **Operational and R&D**
- **Forefront of Ocean Modeling**

Peak Computing Performance Growth in GFLOPS

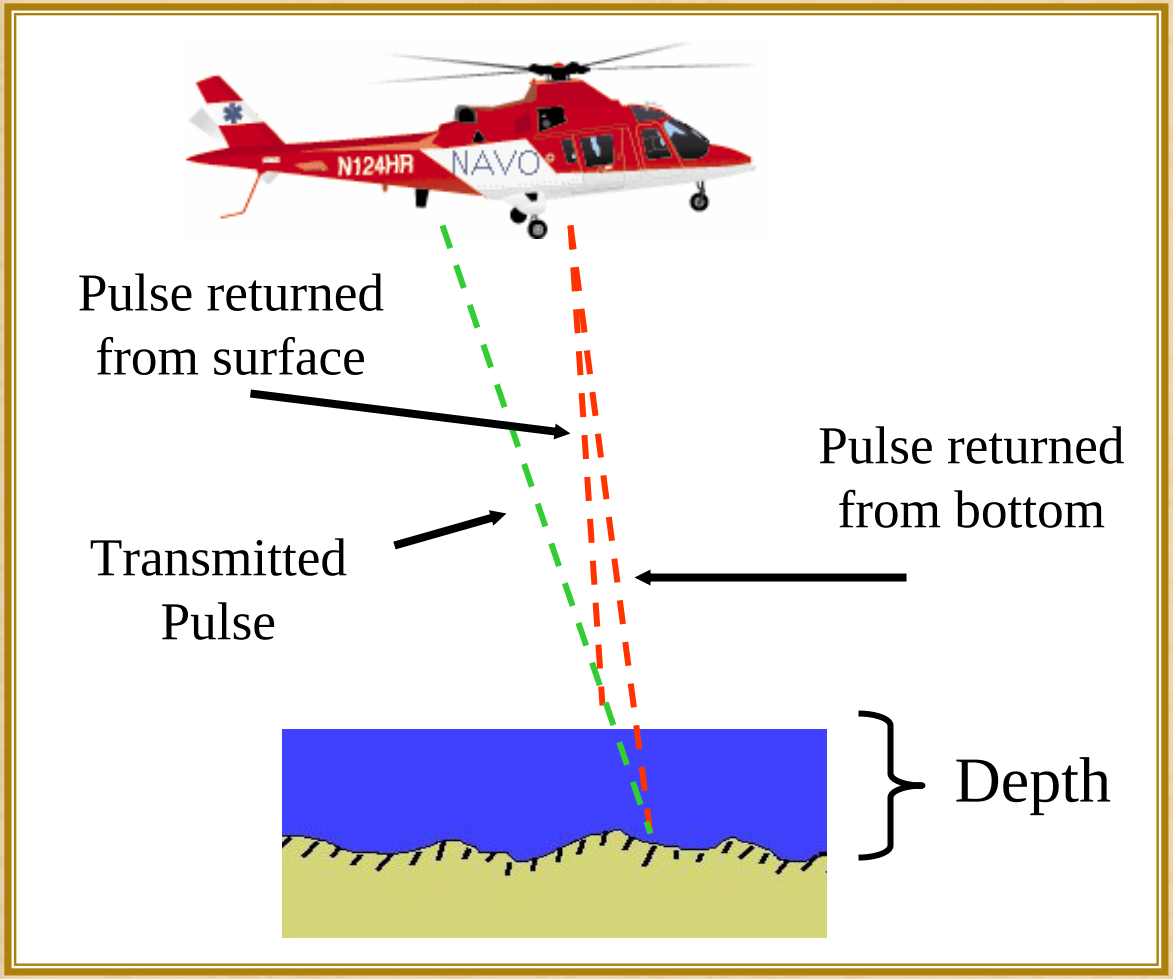


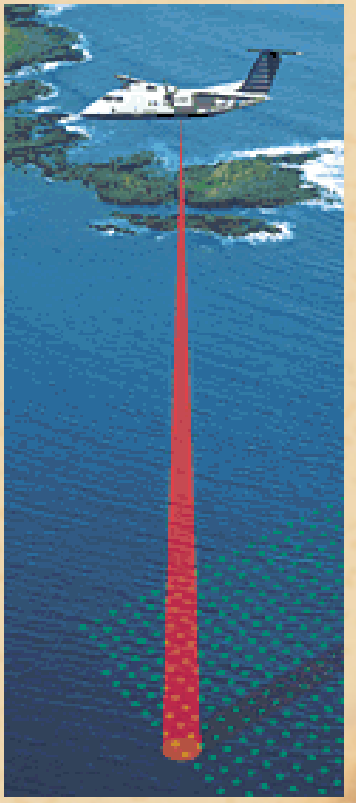
Ehime Maru Salvage Support

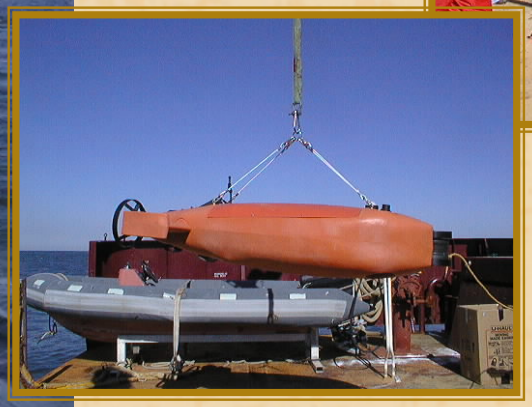


- 3-D depiction of the ocean & seafloor environment
- 500 meter resolution
- Bottom composition
- Currents (surface & subsurface)
- Winds from COAMPS
- Sea State & Surf Predictions
- Oil Dispersion Forecasts

Airborne LIDAR Survey







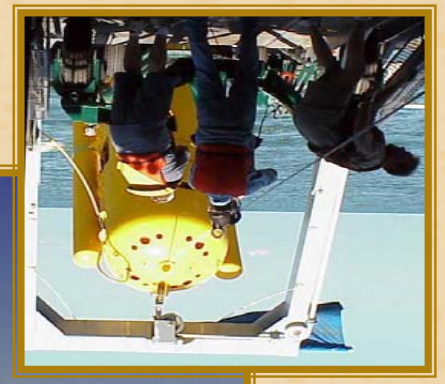
NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND

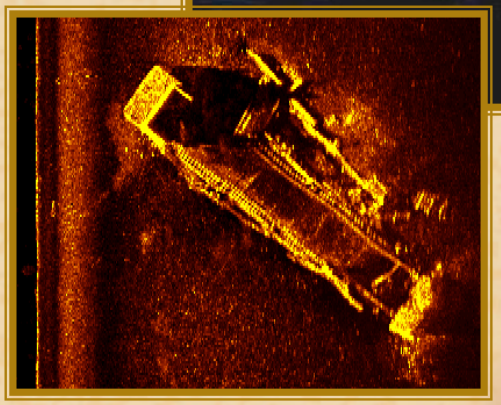
AUVs

Seahorse 1

Operational Demonstration

- Successfully completed on 21 October 2001, at the NAVOCEANO UUV Test Range off West Ship Island, Mississippi.
- Seahorse 1 ran continuously for 47 hours, 44 hours completely submerged.
- The vehicle cruised 9 m off the bottom over a 348 km track, while continuously collecting CTD, side scan, and bathymetry data.
- The survey area was a 2 x 4 km checkerboard, with 100 m leg spacing, repeated several times for data comparison.



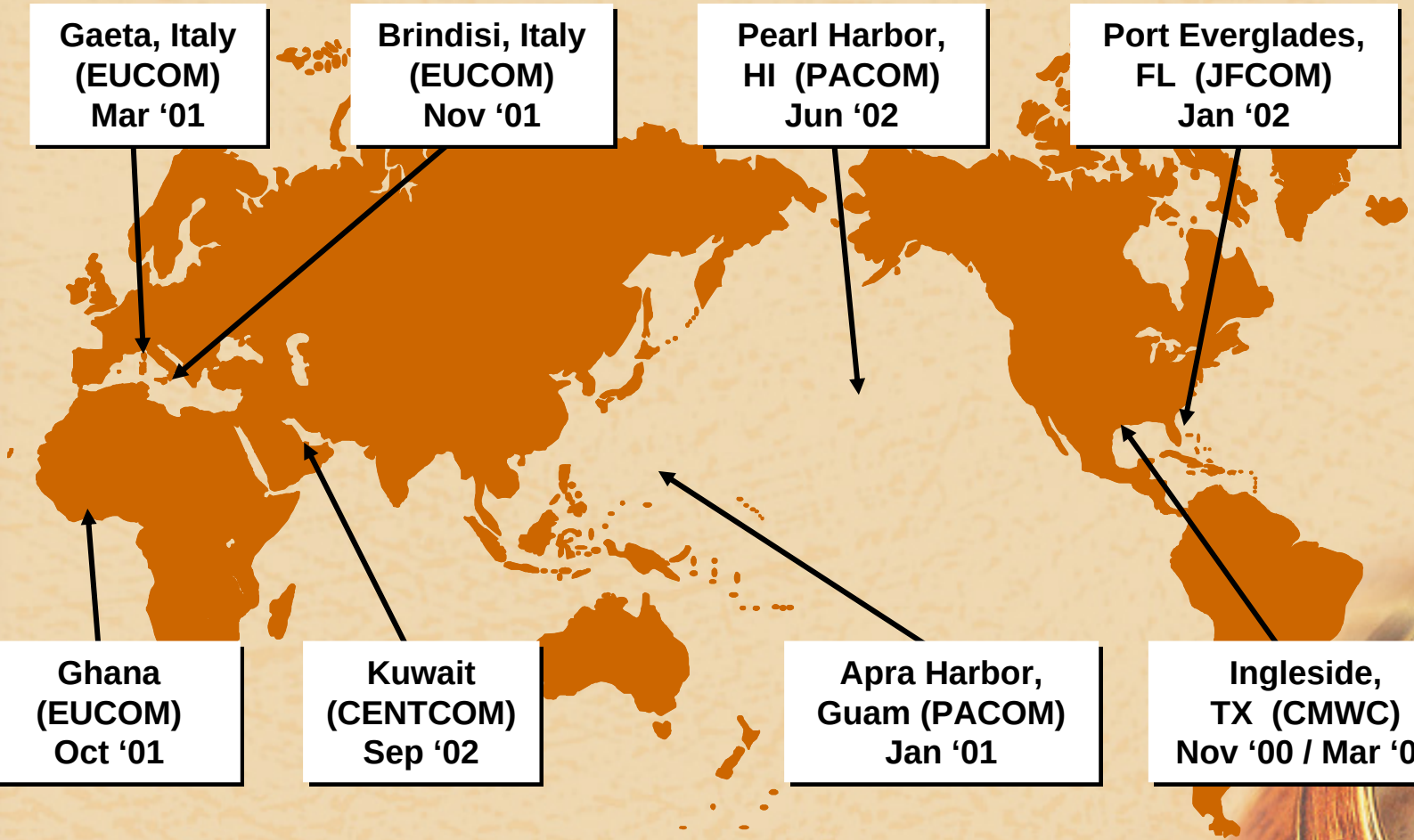


150 kHz Side Scan Sonar image of a sunken barge in 20 m of water, obtained by Seahorse 1 on 21 October 2001.

What is a Fleet Survey Team (FST)?

- Rapidly-deployable, Fleet-oriented, near-shore hydrographic and oceanographic data collection and production capability :
  - Small, highly trained teams (14 officers, 2 Enlisted)
  - Equipment suite tailored to mission
  - HSL, RHIB, platforms of opportunity
  - Field collection, processing and on-scene production
- Support emergent real-world operations, exercises and exigencies

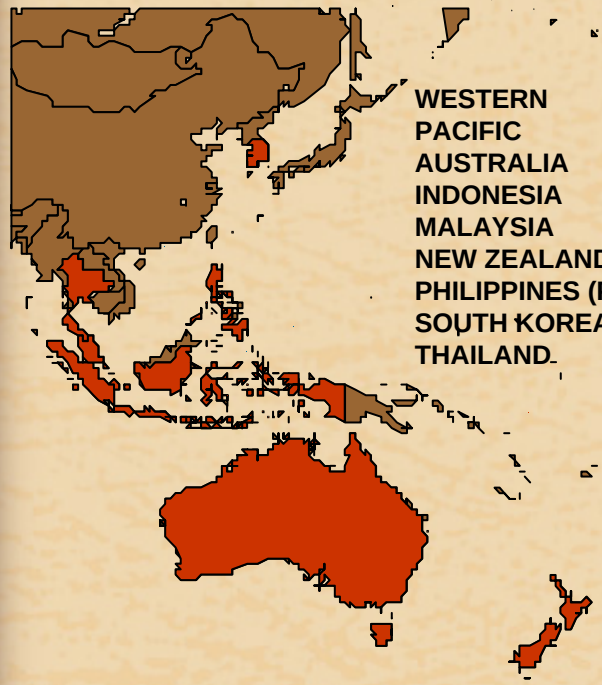
Fleet Survey Team Deployments



INTERNATIONAL AGREEMENTS FOR DATA EXCHANGE AND COOPERATIVE SURVEYS

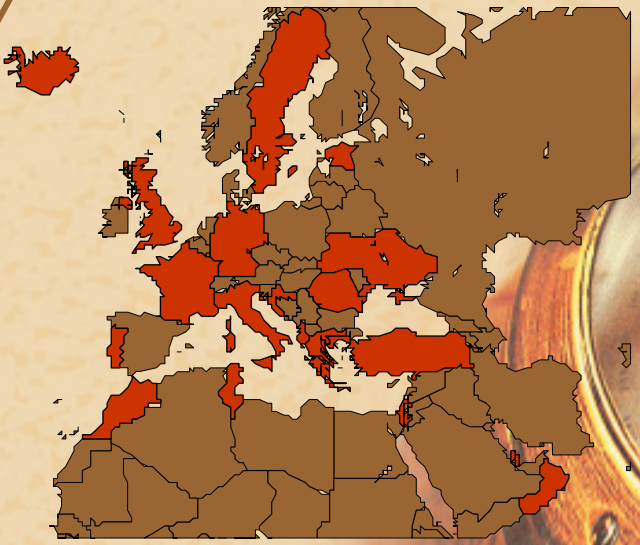
MEXICO
NICARAGUA
PANAMA
PERU
TRINIDAD & TOBAGO
VENEZUELA

AMERICAS
ARGENTINA
BELIZE
CANADA
CHILE (PENDING)
COLOMBIA
COSTA RICA
DOMINICAN REP.
ECUADOR
EL SALVADOR
GUATEMALA
HONDURAS
JAMAICA



WESTERN PACIFIC
AUSTRALIA
INDONESIA
MALAYSIA
NEW ZEALAND
PHILIPPINES (PENDING)
SOUTH KOREA
THAILAND

EUROPE
ALBANIA
CROATIA (PENDING)
BAHRAIN
ESTONIA (PILOT/PROJECT)
FRANCE
GERMANY
GREECE
ICELAND
ISRAEL
ITALY (PENDING)
MOROCCO
OMAN (PENDING)
PORTUGAL
ROMANIA (PILOT/PROJECT)
SLOVENIA (PENDING)
SWEDEN
TUNISIA
TURKEY
UAE (PENDING)
UKRAINE (PENDING)
UNITED KINGDOM



Examples of International Cooperation

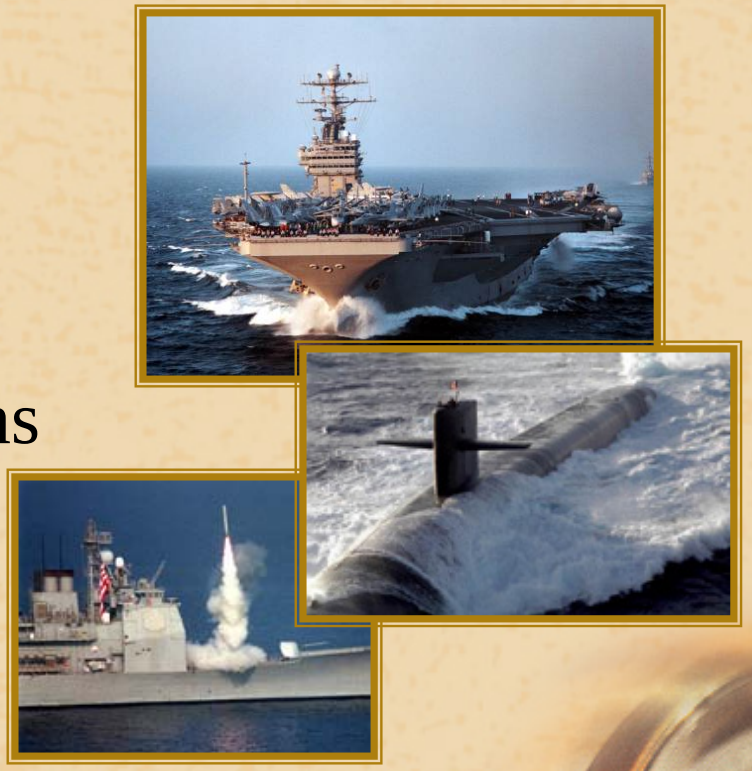
- Provided assistance in hunt for INS DAKAR
- Promoted assistance in search and recovery after Sweden ferry disaster
- Provided assistance in recovery of downed Albanian fighter
- Resurveyed ports such as Honduras after hurricane
- Survey ports such as Jordan and Romania to open for commercial and military traffic
- Assist in economic development by surveying coastlines in countries such as Eritrea, Albania and Croatia.
- Provide buoys, deployment, data and LUTS to improve worldwide weather forecasts
- Provide data such as MCSST,and wave model output to assist the world weather community and shipping interests
- Assist in development of Hydrographic and Oceanographic data collections which can lead to:
  - Coastal Zone Management
  - Mineral and Hydrocarbon Exploitation
  - Natural Resource Conservation

Thank You !

Questions ?

Three Focus Areas

- Safety of the Fleet/Navy shore establishment
- Assess & predict the impact of the environment on Navy platforms, weapons systems and sensors
- Integrate Environmental Considerations into New Weapon Systems and Sensors



What We Do

- Characterize: Assess and predict battlespace conditions for all warfare commanders and describe impacts on warfighting operations
- Battlespace: Ocean and atmospheric conditions from time-critical to strategic time scales in support of global naval operations
- Enable: METOC supports operations through:
  - Protecting resources from severe weather damage (24x7x365)
  - Protecting resources through safe navigation
  - Optimizing sensor, weapon and platform performance
- Prompt and Sustained: 50% of community is underway or stationed overseas

Naval Meteorology and Oceanography

Data Collection

LIDAR

Satellites

PATHFINDER Ships

Drifting Buoys

METOC Personnel

Hydrographer of the Navy

- Changes how USN does business -- US national partnerships continue
- Acquire data globally for Navy's "4D Cube" (digital 3D time-varying "navigation space"):
  - Hydrography -- Oceanography -- Weather
  - Ships, boats, aircraft and international cooperation
- Exploit technology:
  - Collection -- processing -- production -- dissemination
  - Survey Operations Center
- Train and educate, continuously:
  - Navy/USM MS Hydrographic Science/Cat A
  - NAVOCEANO Cat B

ISSUES

Data Coverage/Currency
Standards/Quality
Training/Education
Growing Demand/Fewer Resources
Intellectual Property Rights
Rapidly Changing Technology
Multi-Use Data Sets
ECDIS / ECDIS-N