

# From the Bottom of the Ocean to the Stars



## **COMMANDER, NAVAL METEOROLOGY & OCEANOGRAPHY COMMAND (CNMOC)**

**12 Feb 2025**

**Jason R. McKenna, PhD, PG**  
**Chief Technology Officer & Deputy N8/N9**

***#ItStartsWithUs***

# NMOC Enterprise Overview

- 6 Oceanographic Survey Vessels (T-AGS)
- Forward-deployed 24/7/365 around the world
- DoD High Performance Computing Center
- Leader in unmanned underwater vehicles



**13 Subordinate Commands**

60 Global Locations

**Civilian**

1200+

**Military**

1600+

**Contractor**

100+



**2,900+ Personnel**



**Headquartered:  
NASA John C. Stennis  
Space Center, Mississippi**



## **Mission:**

Define and apply the physical environment, from the bottom of the ocean to the stars, to ensure the U.S. Navy has freedom of action to deter aggression, maintain freedom of the seas – and win wars.

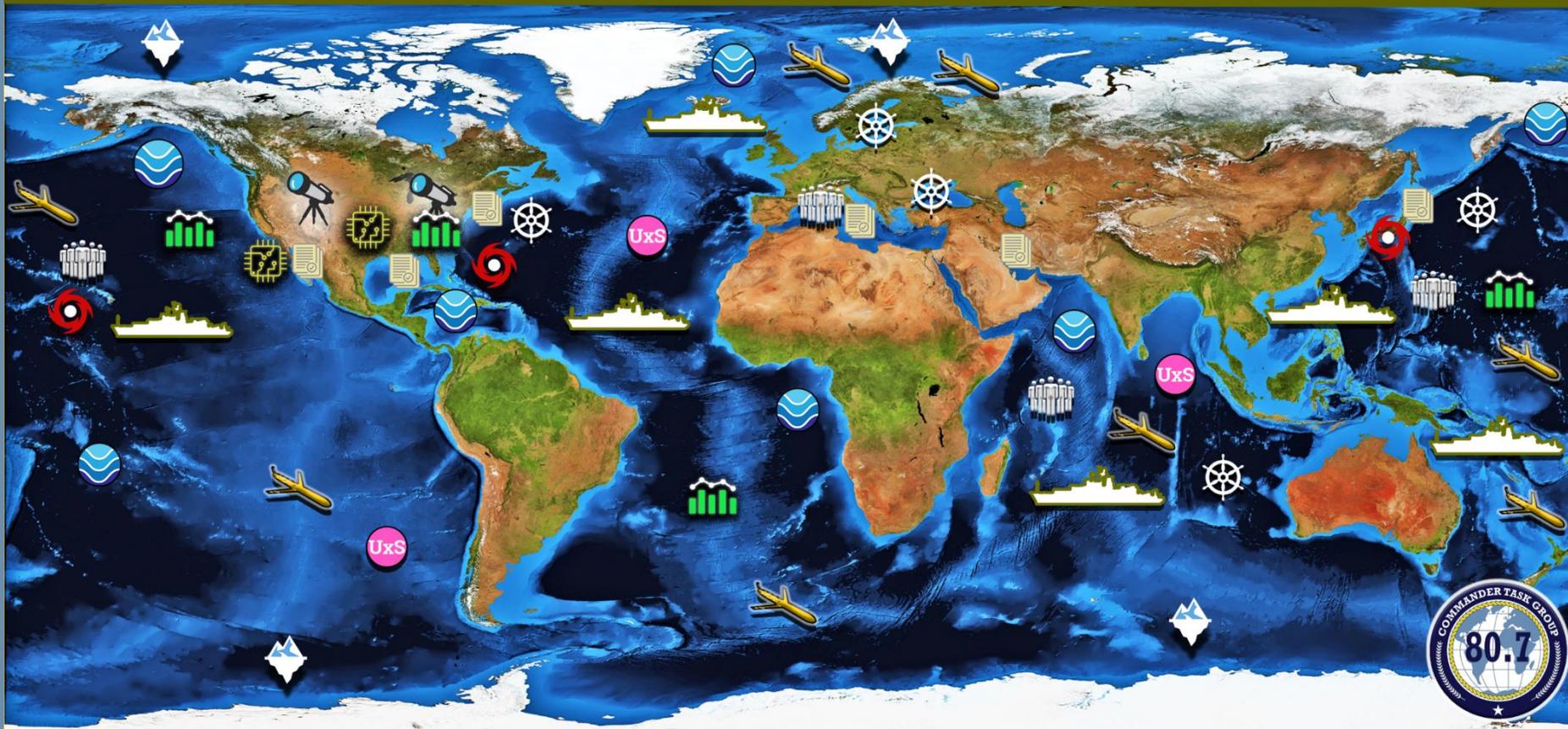


# U.S. NAVAL METEOROLOGY & OCEANOGRAPHY COMMAND

Approved for Public Release; Distribution unlimited

## 2023 Year In Review

### #ItStartsWithUs



262,968 NM TRAVELED BY T-AGS



425 PERSONNEL DEPLOYMENTS



329,994 FORECAST MODEL RUNS



6,310 RFS/RFI FROM THE FLEET



18,918 ICE REPORTS & PRODUCTS



226 TROPICAL SYSTEMS TRACKED



41,582 UNMANNED SYSTEMS DEPLOYMENTS



780 OPS & EXERCISES SUPPORTED



5,901 CELESTIAL REPORTS



117,954 NM TRAVELED BY UxS



4.3 BILLION SUPERCOMPUTER CORE-HOURS



214,811 WEATHER & CLIMATOLOGY REPORTS





# CHAIN OF COMMAND

Note: CNMOC Commander is ECH 1 Oceanographer of the Navy & Navigator of the Navy



U.S. FLEET FORCES COMMAND



NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND



NAVAL INFORMATION FORCES

OPCON

ADCON

ECH 3 Command

ECH 4 Commands

ECH 5 Commands



NAVAL OCEANOGRAPHIC OFFICE



FLEET NUMERICAL METEOROLOGY AND OCEANOGRAPHY CENTER



U.S. NAVAL OBSERVATORY



NAVAL OCEANOGRAPHY OPERATIONS COMMAND



FLEET WEATHER CENTER NORFOLK



FLEET WEATHER CENTER SAN DIEGO



# N8N9 Organizational Chart



**N8N9 ACOS**  
Capabilities, Requirements,  
Concepts, and Experimentation  
O6/CAPT

**N8N9B**  
Chief Technology Officer  
& Deputy N8/N9

**N91**  
Weather Services

**N9AF Air Force Rep.**  
O4/Maj

**N92**  
OAML Project Manager

**N93**  
USW/T-AGS/UxS

**N94**  
PNT/MIW/Special Projects

**N95**  
Chief Scientist & ORTA Rep

**N81**  
Requirements/  
Program Manager

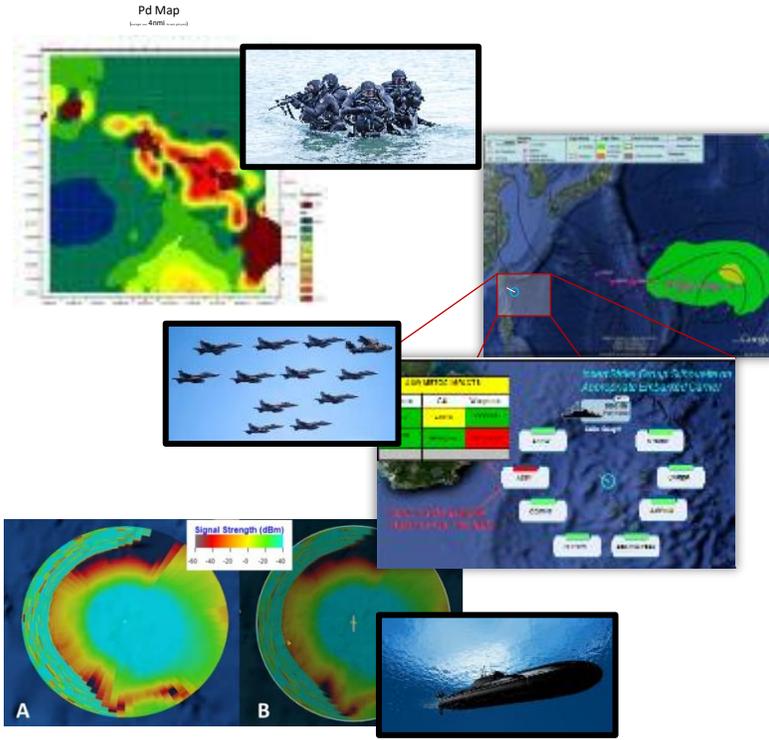
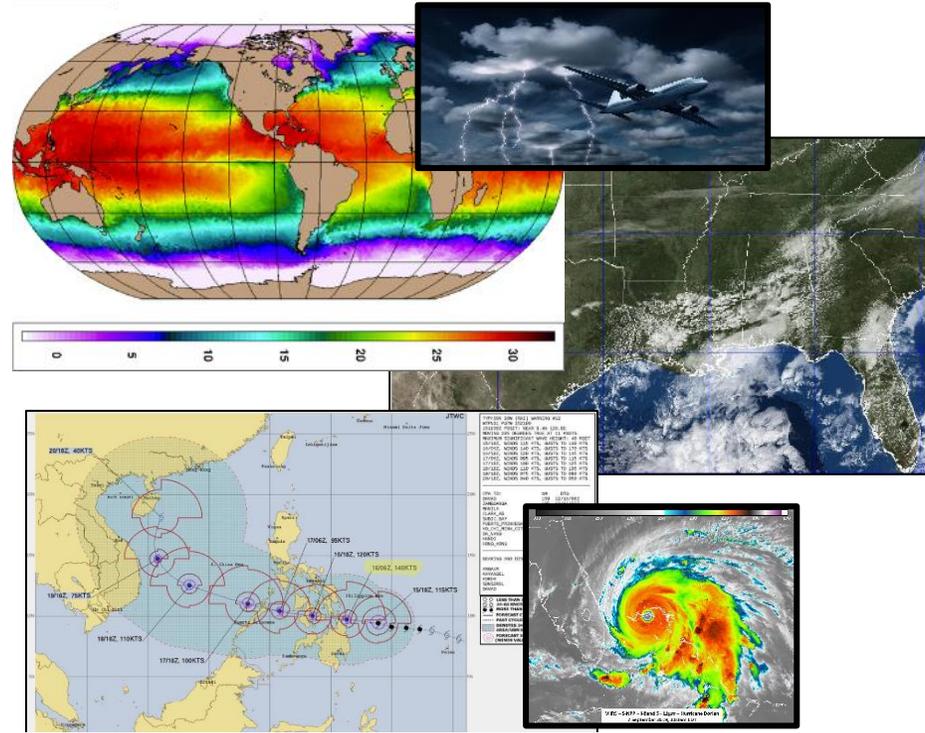
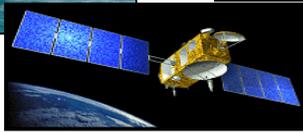
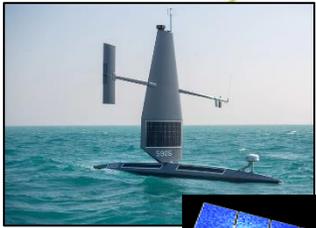
**N82**  
Physical Scientist/  
Oceanographer

**N8N9C**  
Contractor Support

**N8R Requirements**  
O4/LCDR



# What we do...



## Smart Sensing

Emplacing our sensing capabilities where we can make the most impact in generating the state of the atmosphere and reducing our uncertainty

## Improved Prediction

We have assured Global Atmospheric, Global Ocean and Regional Models, underpinning all our Naval Activities

## Decision Superiority

We aid decision makers to make the right choice in tactics, time and location to maximize combat effectiveness



# Why it matters...



Air Warfare



Surface Warfare



Submarine Warfare



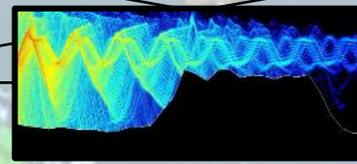
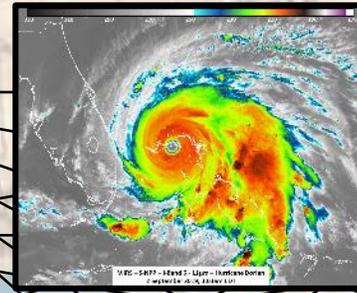
Electromagnetic Warfare



Special Warfare



Information Warfare



Operational Planning

Intelligence, Surveillance, and Reconnaissance

Blue Force Detectability

Safety of Navigation

Adversarial Detection and Targeting

Targeting and Weapons Employment

The environment has an impact in every aspect of military operations

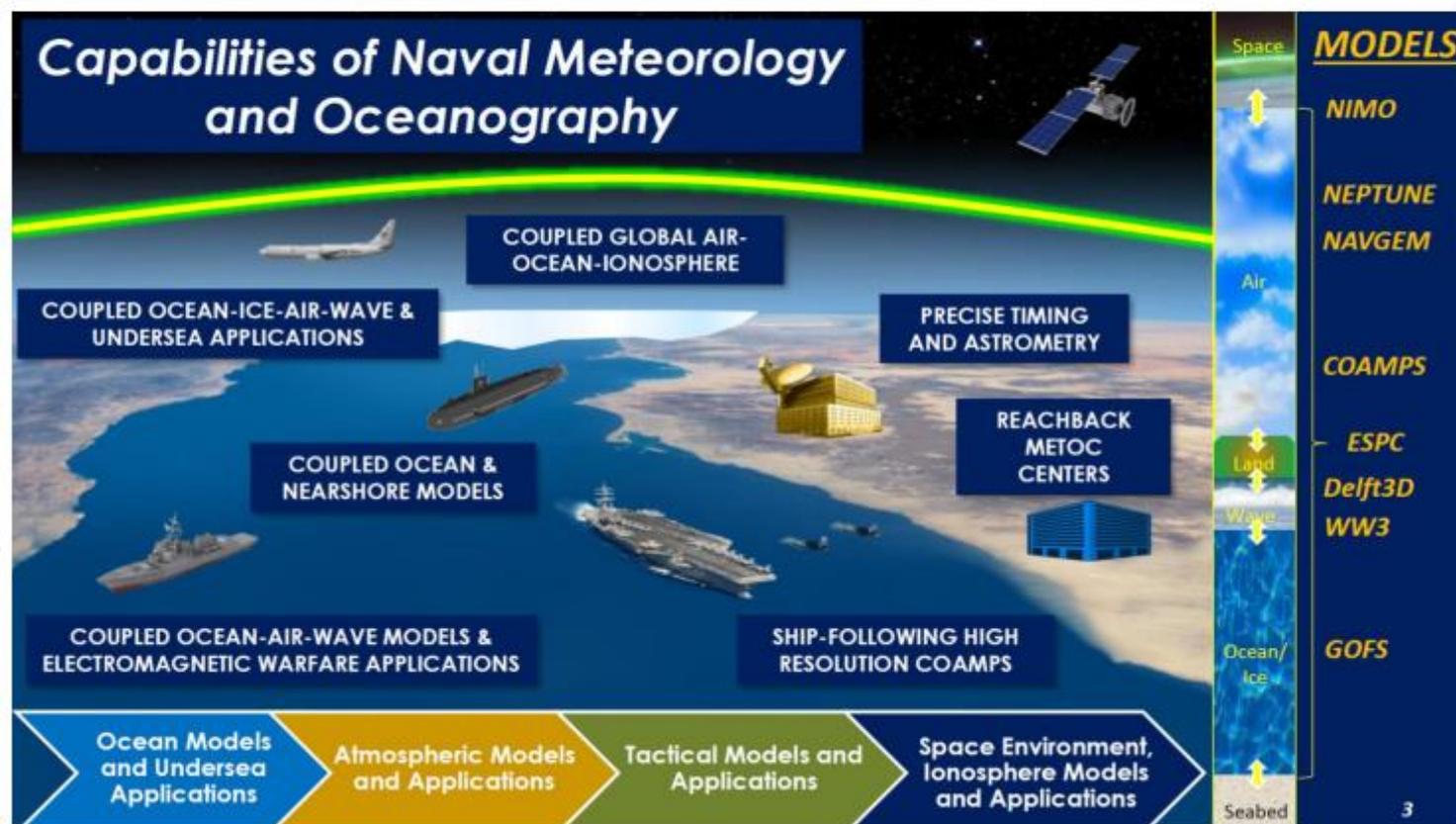


# Research Topics Supporting Naval Meteorology and Oceanography

## CNMOC Discipline Areas Captured in Annual RDT&E Priority Reporting

1. Precise Timing and Astrometry
2. Meteorology and Space Weather
3. Oceanography and Acoustics
4. Hydrography
5. Subsea and Seabed Warfare
6. Numerical Modeling
7. Forecasting and Tactical Decision Aid
8. Sensing and Data Dissemination
9. Automation

*Focus on Getting right data to forward forces, with useful tools, in all data capacity environments.*





# Research Topics Supporting Naval Meteorology and Oceanography

- Advanced Air Mobility
- Directed Energy
- Ship-board weather sensing
- Global networks of in-situ sensors
- Satellite Sensing
- Data-as-a-Service



*Get Navy focused capabilities and sensors in the right spots to support operations!*



# Research Topics Supporting Naval Meteorology and Oceanography

## Sensing and Data Dissemination

- Develop a capability to measure key atmospheric and oceanographic parameters at scale for inclusion in data analysis and assimilation into numerical prediction systems
- Improve satellite-derived and in-situ sensing of ocean velocity, along with real-time data exfiltration and delivery
- Develop capability to collect in-situ Arctic environmental observations and transmit via non-traditional real-time communication pathways
- Near real time, observationally-derived Internal Wave (IW) reporting capability

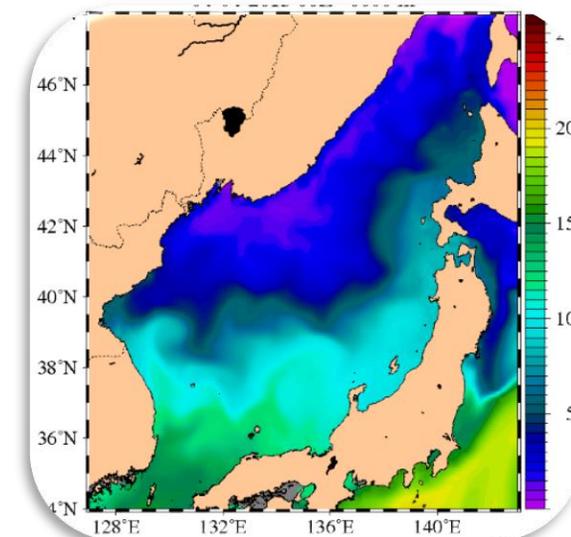
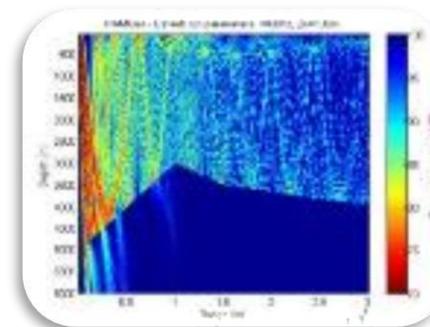




# Research Topics Supporting Naval Meteorology and Oceanography

## Sensing and Data Dissemination

- Optimized post-processing techniques for model data and prediction products to support the full spectrum of consumer dissemination, including machine-to-machine use of environmental data





# ADVANCED NAVAL TECHNOLOGY EXERCISE ANTX 2025

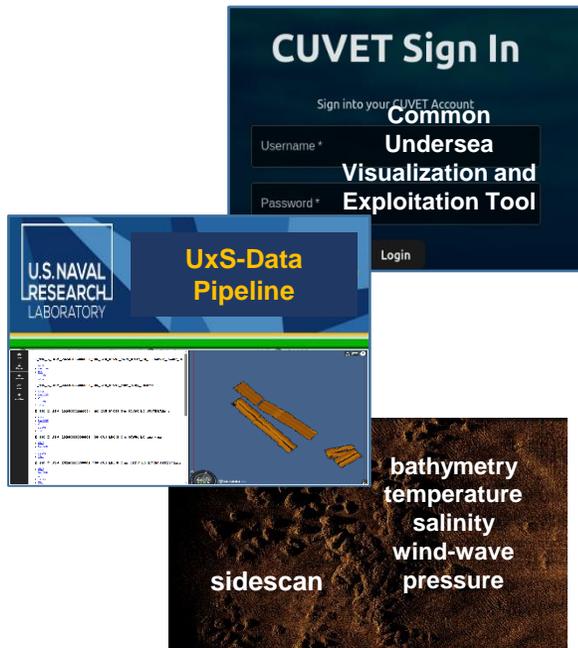
**CNMOC Mission:** To define and apply the physical environment, from the bottom of the ocean to the stars, to ensure that the U.S. Navy has the freedom of action to deter aggression, maintain freedom of the seas and win wars.



**VISION:** Demonstration of Uncrewed Systems in 2 domains on NSWC Panama City's Range



Visualize and Curate Data Utilizing Tools: CUVET / UxS Pipeline



*April 17, 2025  
Culminating Event*



Approximately 15 Vignettes Includes NOAA, Industry Partners, Academia & Navy Exercises



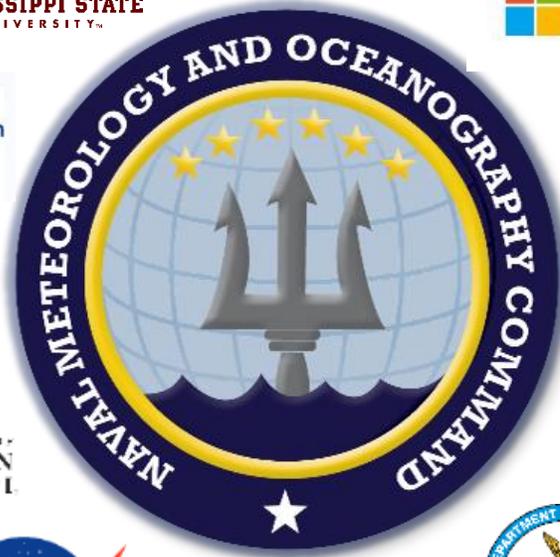
Example Navy/NOAA/USM Vignettes:

- Use of REMUS 620 for Mesophotic deep benthic corals characterizations
- DriX Testing HI, Pacific Ocean, Gulf of Maine
- Buoyancy Glider work in support of Hurricane Characterization & fisheries
- USM work with SEATRAC USV, GOMEX
- BALTOPS, UNITAS and Polar Star

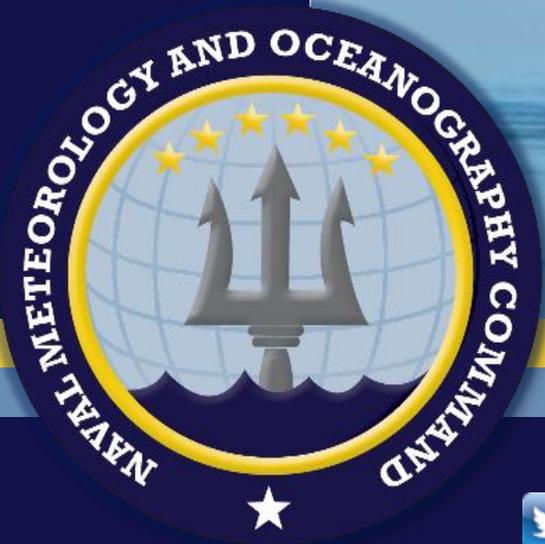
# Partnerships



Always room  
for more!



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 @NavyOceans

 @CNMOC

 Naval Oceanography

 @NavalOceanography

## CONTACT US

Commander, Naval Meteorology and Oceanography Command

1100 Balch Boulevard

Stennis Space Center, MS 39529-5005

CTG 80.7

