Slide 1

Naval Meteorology and Oceanography Enabling the Navy to Fight and Win – Today and Tomorrow

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Approved for Public Release

Slide 2

Current Strategic Drivers

Maritime Traffic System

Global Information System

Tech Creation & Adoption

Slide 3

Current Strategic Drivers

Slide 4

Future Strategic Drivers

Anti-Access Threats   *Distributed Operations*   *USN-USMC Integration*

Unmanned Systems   *Higher End Platforms*   *Non-traditional Platforms*

Higher Precision, More Accurate with Longer Lead-Time !

Slide 5

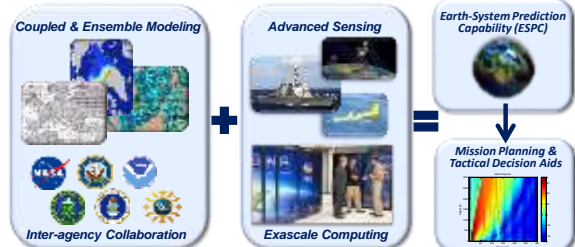### Weather Gauge of the 21st Century

The Enemy (and Nature!) Gets a Vote

Slide 6

Advance Battlespace Prediction

Improved Coupled Global & Regional Prediction → Operational Advantage

Coupled & Ensemble Modeling   *Advanced Sensing*   *Earth-System Prediction Capability (ESPC)*

Inter-agency Collaboration   *Exascale Computing*

Mission Planning & Tactical Decision Aids

Collaborating Towards World-Class Battlespace Prediction Capabilities

1

Advance Electromagnetic Warfare

Mapping the 'invisible terrain'…

Probability of Detection

Communications
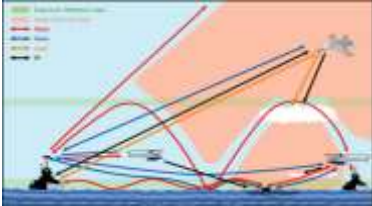
Sensor Settings

… to take the high ground & force the ambush

Enabling Maneuver in Fleet Distributed Operations

Advance Ocean Science
Task Force Ocean

"We need to up our game and stay ahead of the competition"
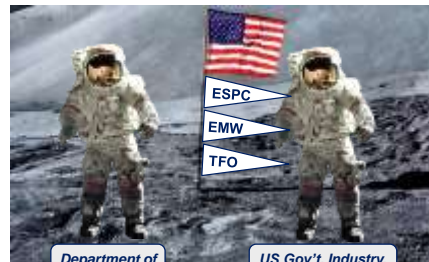*Chief of Naval Operations, Admiral John Richardson*

Task Force Ocean Organization

Executive Steering Committee

Executive Outreach Group

BOEM

Working Groups / Focus Areas

Sensing/ Observations	Modeling/ Prediction	Applications/ Decision Aids	Human Capital/ Tech Workforce	Communication

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METOC Moonshots

ESPC
EMW
TFO

Department of Defense

US Gov't, Industry, & Academia

Back Ups

2

High Performance Computing
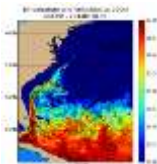
Year	Center's Peak Teraflops	CNMOC Peak Teraflops	CNMOC Cost/TF/ Year
2001	8.4	1.26	$2,400k
2008	226	33.9	$89k
2014	2,556	325	$9.2k
2015 (Oct)	6,787	900	$3.3k
2017 (Oct)	~10,000	~1,500	$2.0k

*Teraflops (1 million million) today,
Exaflops (1 billion billion) by 2025*

Opportunities for Further Predictive IW (Cyber, Intel) and DWO MBSE

Task Force Ocean Mission Statement

Mission: Advance ocean science in the U.S. to ensure that the U.S. Navy maintains a competitive advantage in our ability to exploit the ocean environment

Tasks:
* Assess the state of Navy-relevant ocean science in the U.S.
* Assess the U.S. Navy's capability and capacity to understand and exploit the ocean environment
* Develop and implement a five-year roadmap that outlines objectives, tasks, and metrics for advancing ocean science in the U.S. and the U.S. Navy's capability and capacity to understand and exploit the ocean environment

Endstate:
* Navy-relevant ocean science infrastructure in the U.S. remains measurably ahead of our competitors.
* The U.S. Navy's capability and capacity to understand and exploit the ocean environment remain measurably ahead of our competitors.
* The U.S. Navy's capability and capacity to exploit the full range of science and technology development in the U.S. advance through increased permeability between the Navy and government, academia, and the private sector.