

*Naval Pacific Meteorology and
Oceanography Center/Joint Typhoon
Warning Center*



*William Little
31 Aug 2004*

An aerial photograph of a fleet of approximately ten large ships, likely oil tankers, sailing on the open ocean. The sun is low on the horizon, creating a bright, hazy glow over the water. The ships are scattered across the frame, with some appearing larger and more detailed than others. The overall scene is a wide expanse of water under a soft, golden light.

Regional METOC Centers

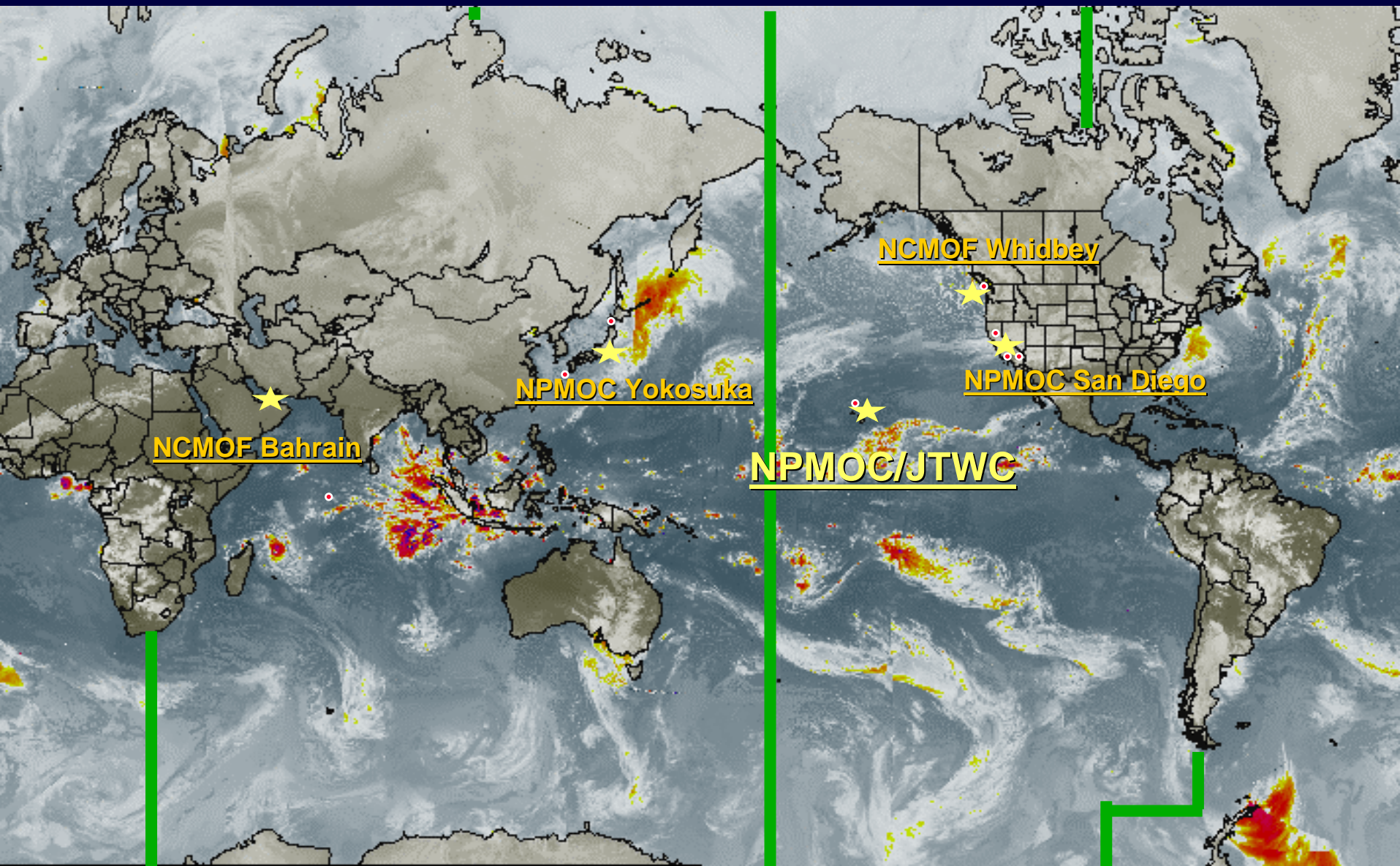
Facilities and Detachments

OA Divisions - afloat

Mobile Environmental Teams - MET

Downsizing and centralizing

METOC Support Across the Pacific



The Mission:

Keep the Fleet Safe and Ready to Fight

*Observe, Analyze, Forecast, and Deliver
the Right METOC Products at the Right Time*

Center of Excellence

OTSR

ASW

JTWC

TAM

Mission, METOC, Limits

**Accelerated Transaction
Rates**

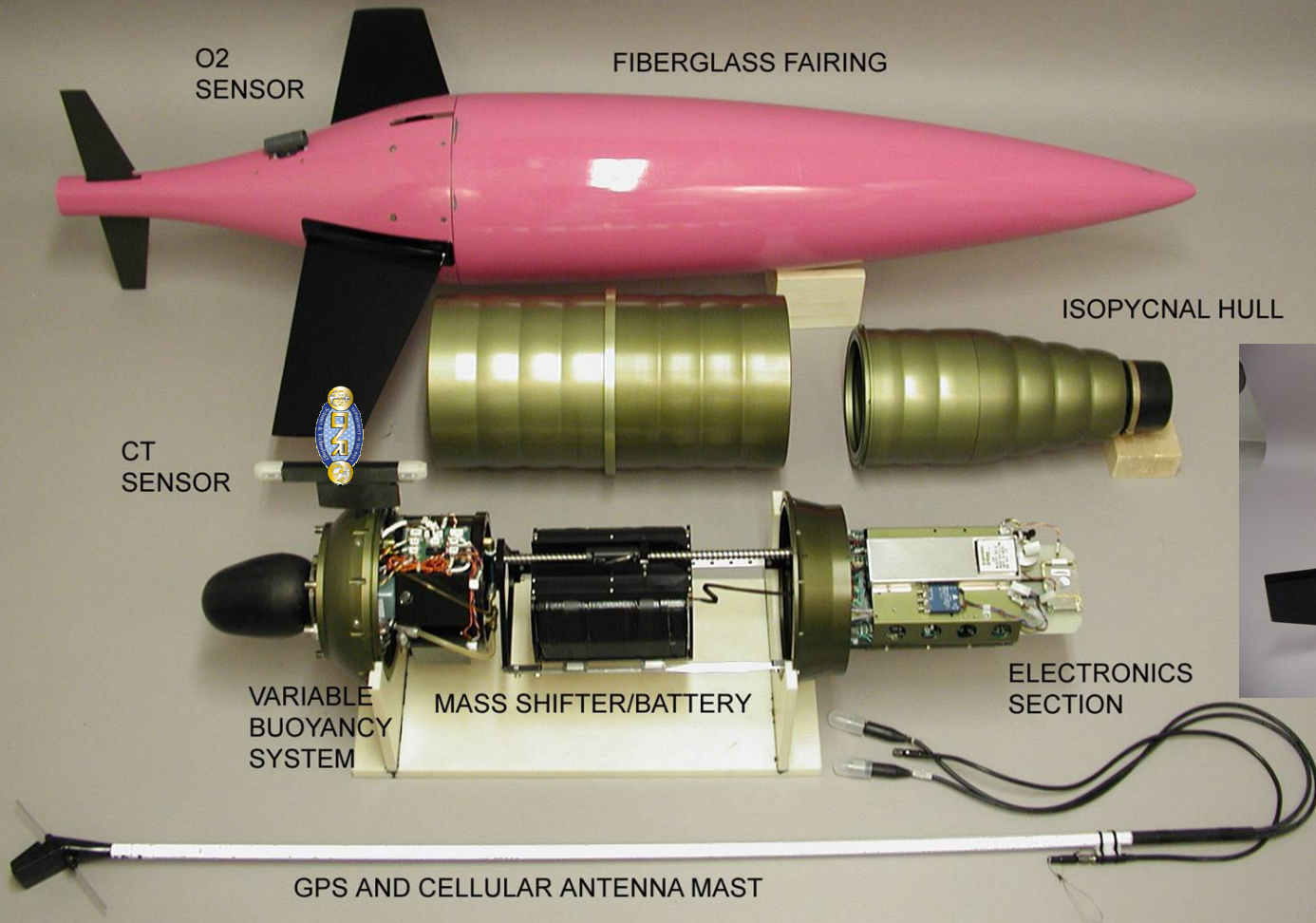
**Time Sensitive Missions
Time Critical Strike**

**Decision-makers -
Warfighters**

**Timely METOC
observations**



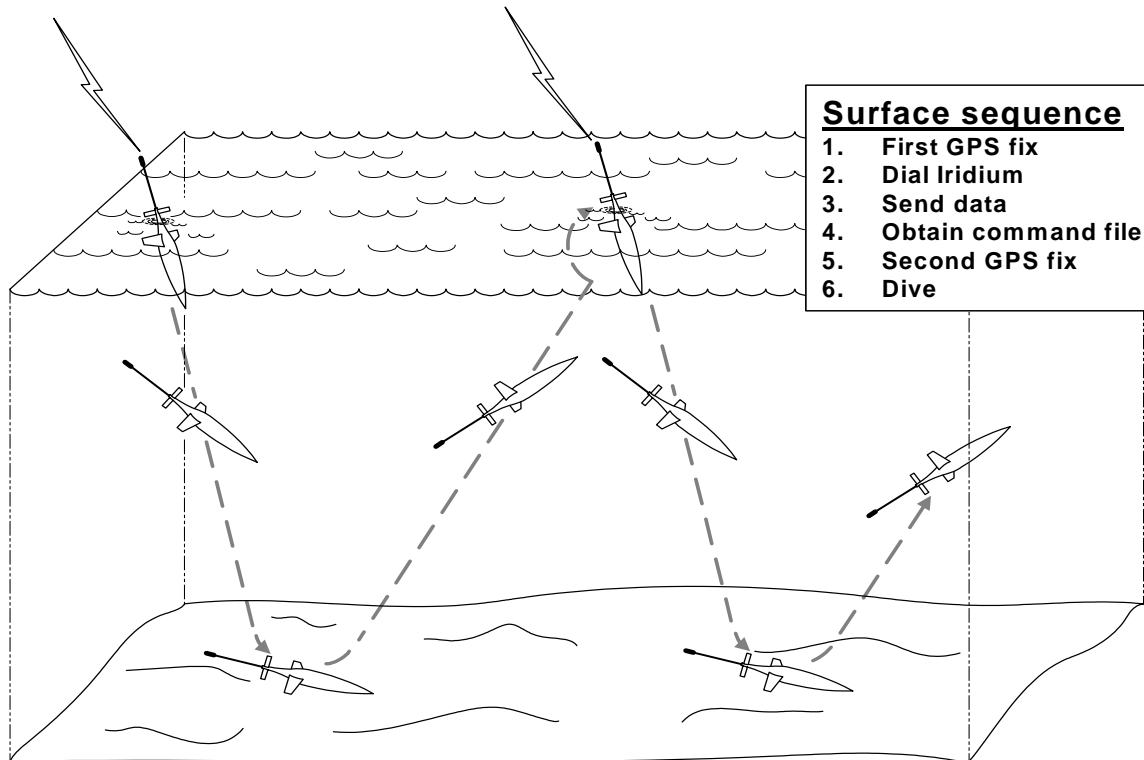
Typical Seaglider



3m nose to tail
55kg dry weight
No moving parts
(outside)

Optical sensors

Basic Operation



Data thread integration into models



Shallow water - littorals < 100 fathoms

Remote Sensing

- **Bottom characteristics**
- **Sound velocity structure**
- **Ambient noise**
- **Wrecks**
- **Salinity**
- **Biologics**
- **Magnetics**
- **Wave pressure**

Mobile sensor??

Smart Seaweed??

SEAL Operations

Shallow water
Oceanography.

Scale - six feet.

Submarine to
Submersible to
Swimmer to
Shore. And return.

Underwater Currents
and visibility.



Special Forces

- **Currents**
 - surface
 - subsurface
- **Tides**
- **U/W Visibility**
- **Bioluminescence**
- **Bottom Composition**
- **Water Temperatures**
- **Sediment composition and magnetics**
- Underwater communications**



Amphibious Warfare

Surf Zone

Remote Sensing

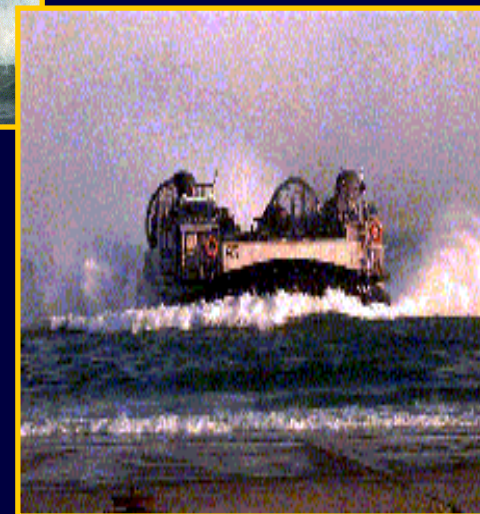
- Wave Heights
- Breaker Heights
- Currents

** Behind the reef.

Beach Trafficability

LIDAR

Forecasts and Models



88/86/83 MAN
09:03:34

16 AUTO 00
IFLT 78

SKY: CLR
VIS: 6 BR
BREAKER HT: 2FT
BREAKER PD: 10SEC
30% SPILLING
70% PLUNGING

2 LINES
10 SEC PERIOD

SPILLING

PLUNGING

33:07:28N
ACFT 117:19:34W

1835

INS STATE
ALIGNING

TGT

A photograph of a ship's deck with a missile launch. A missile is being launched from a vertical launcher, creating a large plume of white smoke and a bright orange flame. The ship's superstructure, including a radar dome and various antennas, is visible in the background. The sky is blue with some clouds.

Surface Warfare

- Common Operational Picture (METOC)

AUV

Ice Edge

Marine Mammals

- Automatic sensing

Acoustics

Radar Ducts

- Wave Heights Sensor

- Man Overboard

Illuminator

Oceanography

- Data Management/Delivery
 - Theater Sensing Strategy
 - Forecast Uncertainty
 - Visualization
 - Three dimensional
 - Geospatial Info
- Systems





Same area different time

UNCLAS Imagery from FEDERATION OF AMERICAN SCIENTISTS

Hawaii Ocean Lab

Instrumentation

Water-borne

Satellite-based

Shore-mounted

Video

Laser

Multispectral

Hyperspectral



Questions?

