Selected Slides From
Aerosol Observations and Modeling Briefing
T-AGS 60 Class Ship Battlespace Characterization

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NRL Monterey Aerosol and Radiation Modeling Section

Douglas L. Westphal (Section Head): Aerosol transport modeling& numerical weather prediction

Anthony Bucholtz: Experimental radiative transfer

Ming Liu: Mesoscale Meteorology and numerical weather prediction

Elizabeth A. Reid: Remote sensing&QA

Jeffrey S. Reid: Particle microphysics&radiation. Product development & validation

Annette Walker: Meteorology and source functions
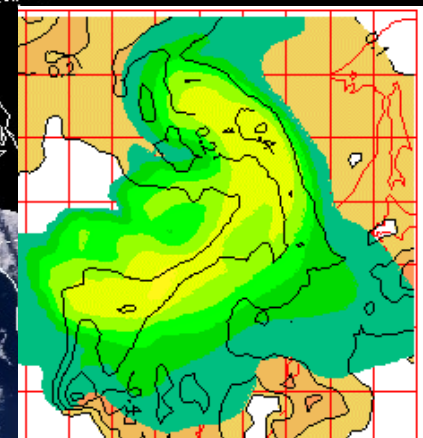

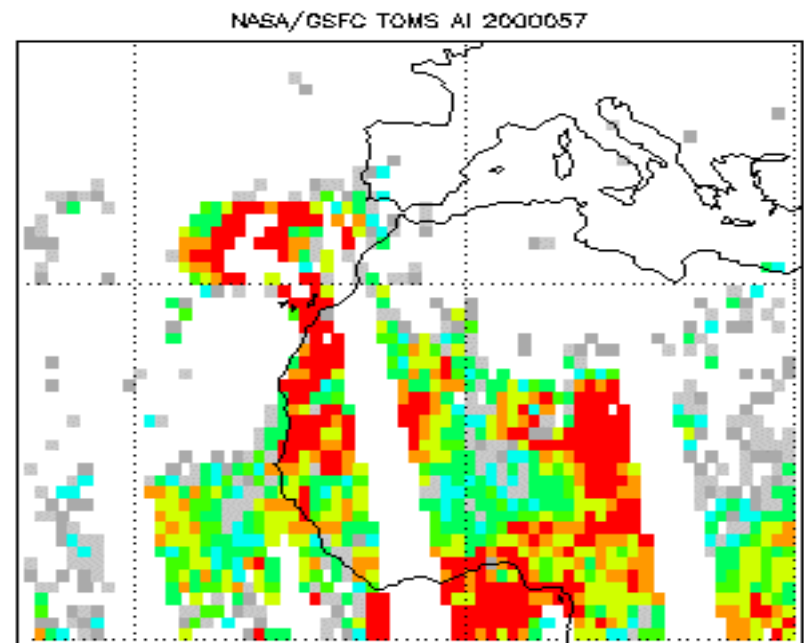**Kim Richardson (Code 7541):** Remote sensing

Piotr Flatau (Scripts/UCAR): Radiative transfer

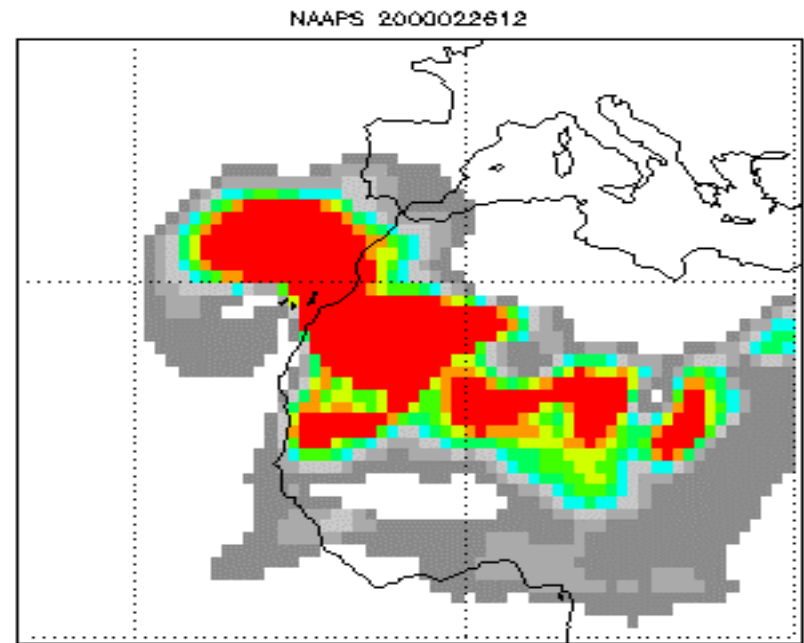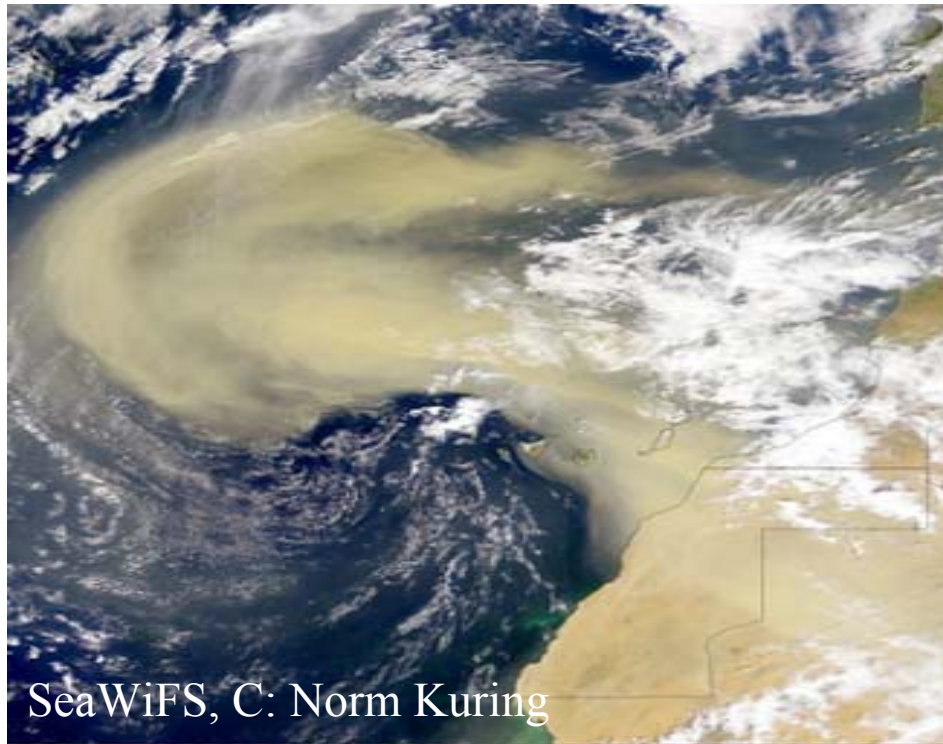Can we predict significant events???
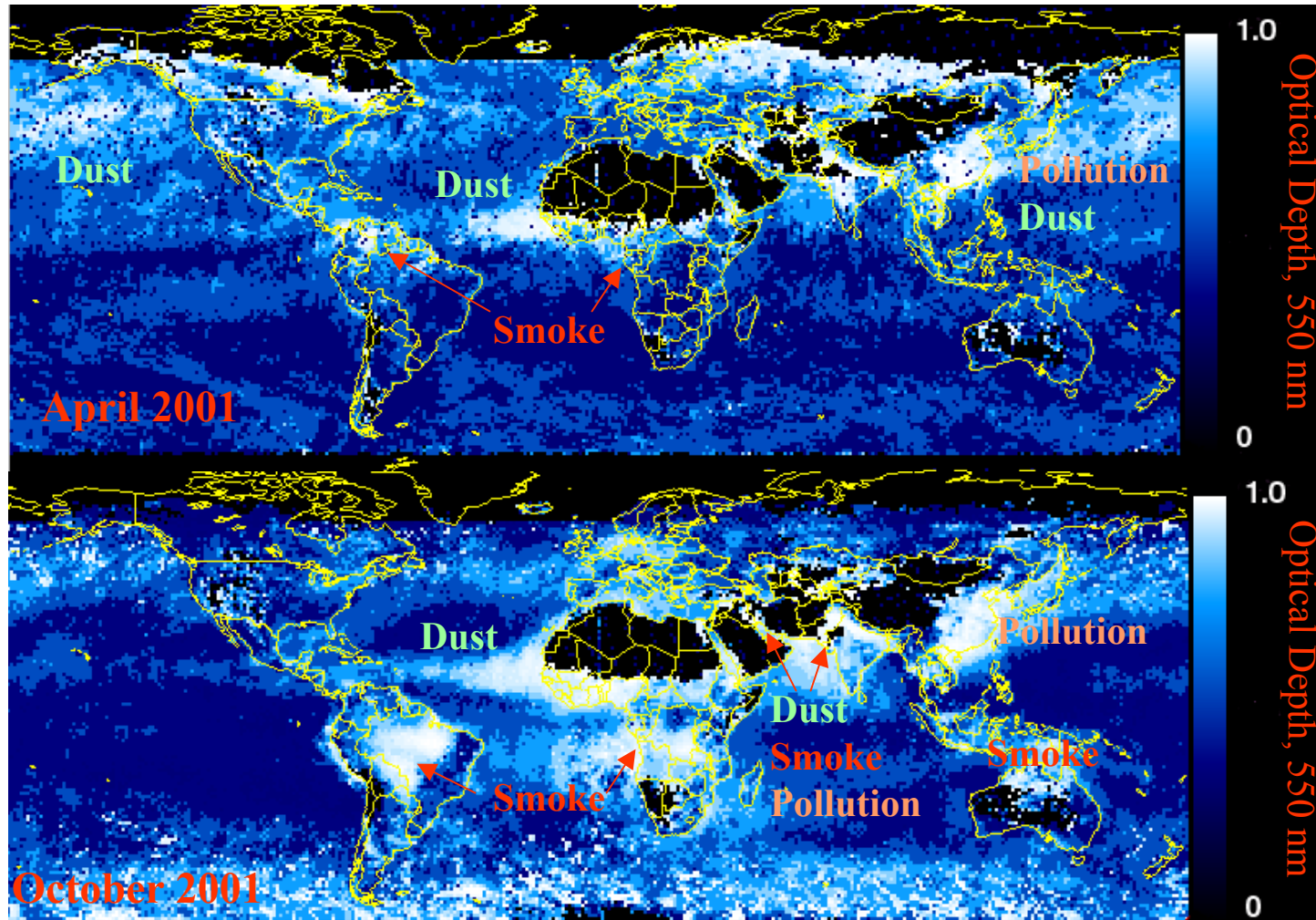
MODIS 1b
April 7, 2001

Synoptic/Global Events: NAAPS

- NRL Aerosol Analysis And Prediction System
- Based on NOGAPS
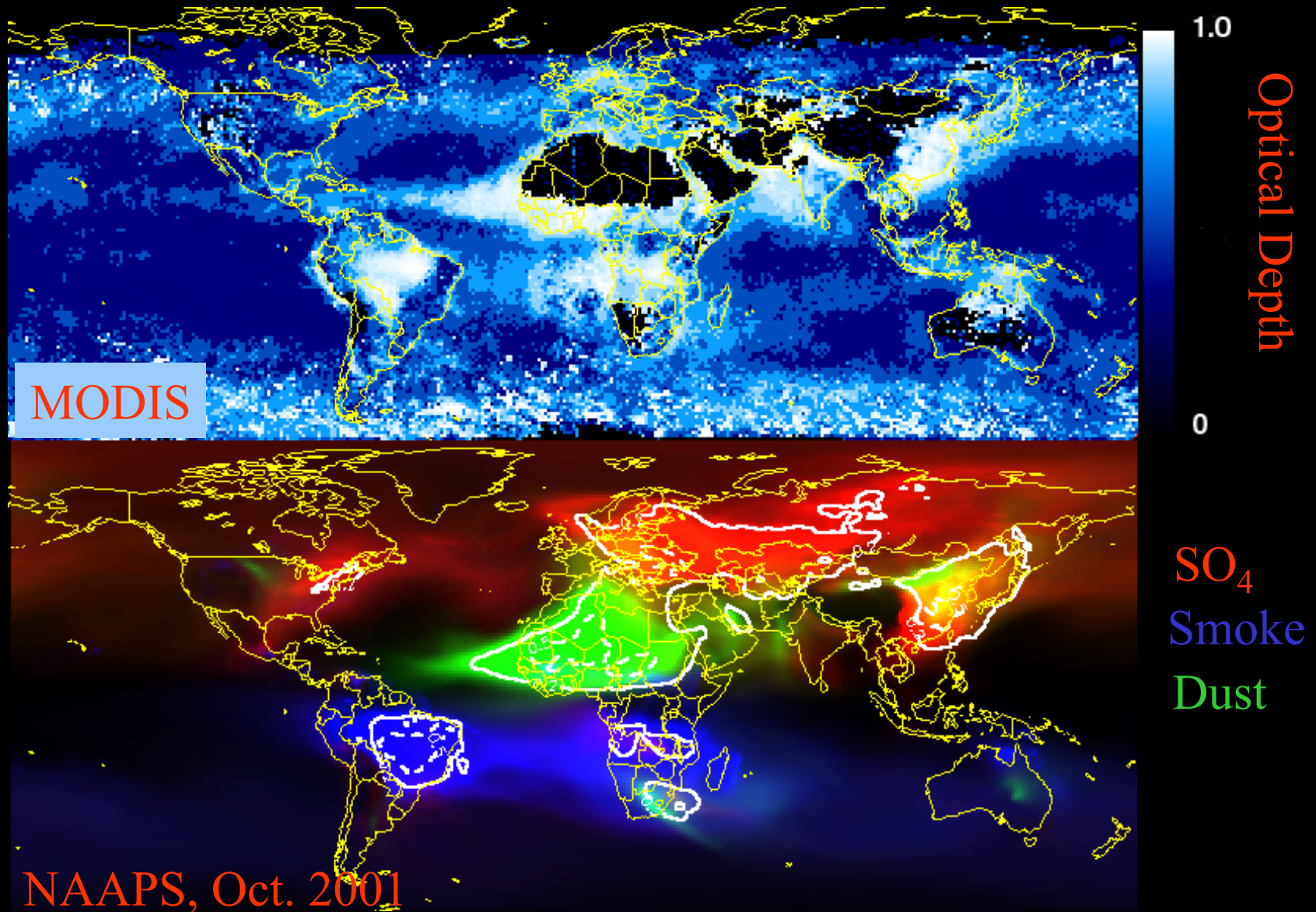- Dust, Smoke, Urban, (Marine)
- Global 1x1 Coverage, (0.5x0.5)

NAAPS 2000022612

NASA/GSFC TOMS AI 2000057

SeaWiFS, C: Norm Kuring

Our Needs: Intercontinental Transport of Aerosols Impacts Climate, Weather, and Visibility

MODIS: Moderate Resolution Imaging Spectrometer
April and October 2001

Future Work: Composites and Source Functions

MODIS

Optical Depth

1.0

0

SO$_4$
Smoke
Dust

NAAPS, Oct. 2001

Dust

Kuwait Airport

Bandar Abbas, Iran

Smoke+Dust

Bahrain Airport

Consider the Persian Gulf and Arabian Sea SeaWiFS, Sept. 1 2000
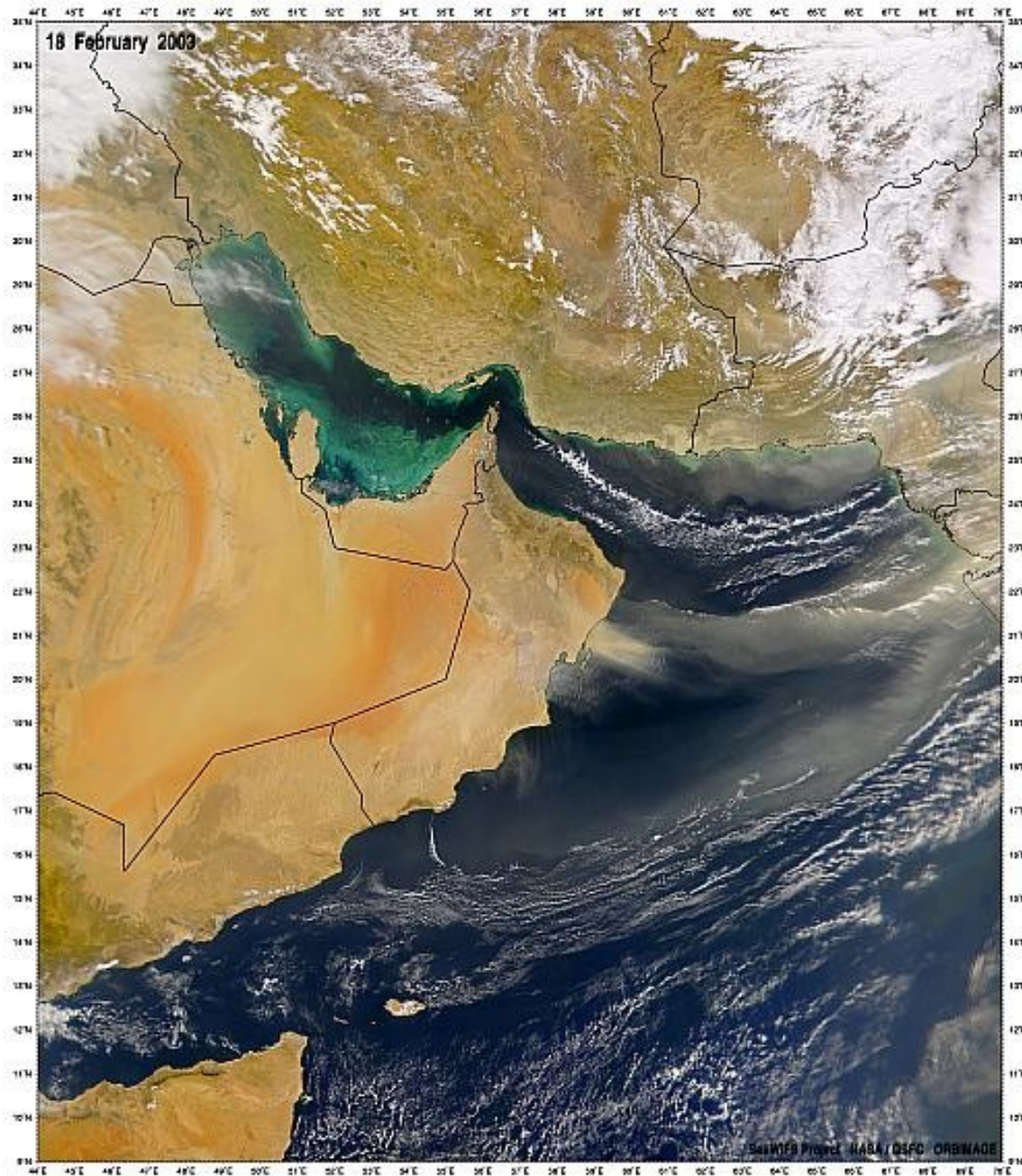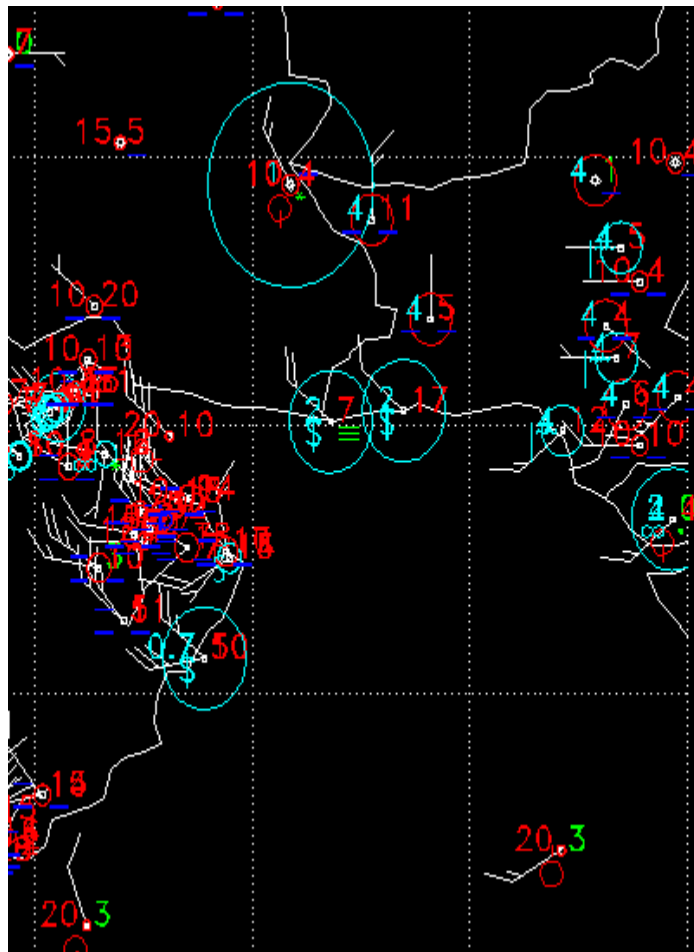
Meso/Micro Scale Validation

Land/Ocean Dust Forecasts and Enhancements

- Employs multi-spectral satellite data at 1-km, 500-m and 250-km spatial resolutions.

- Wind Bias?

- SST Bias?

- Specific extinction in the visible and IR?

- Validation in appropriate region?

Dust Enhancement (pink)
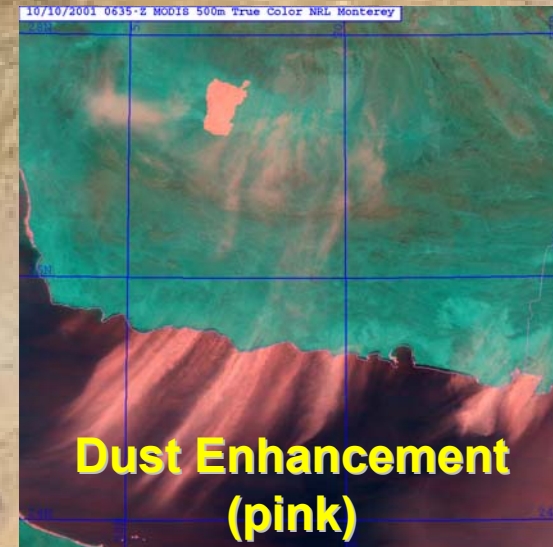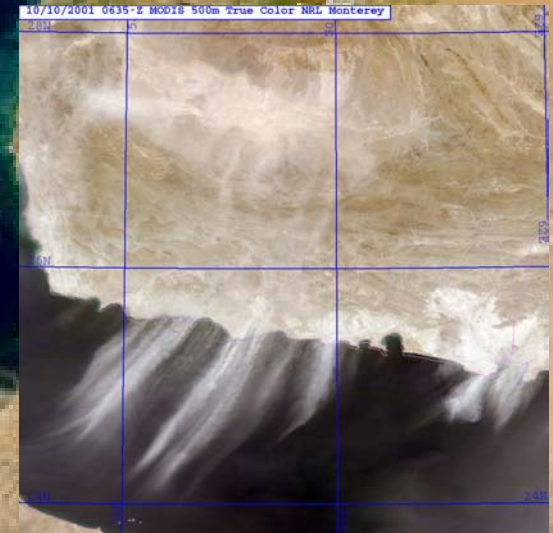
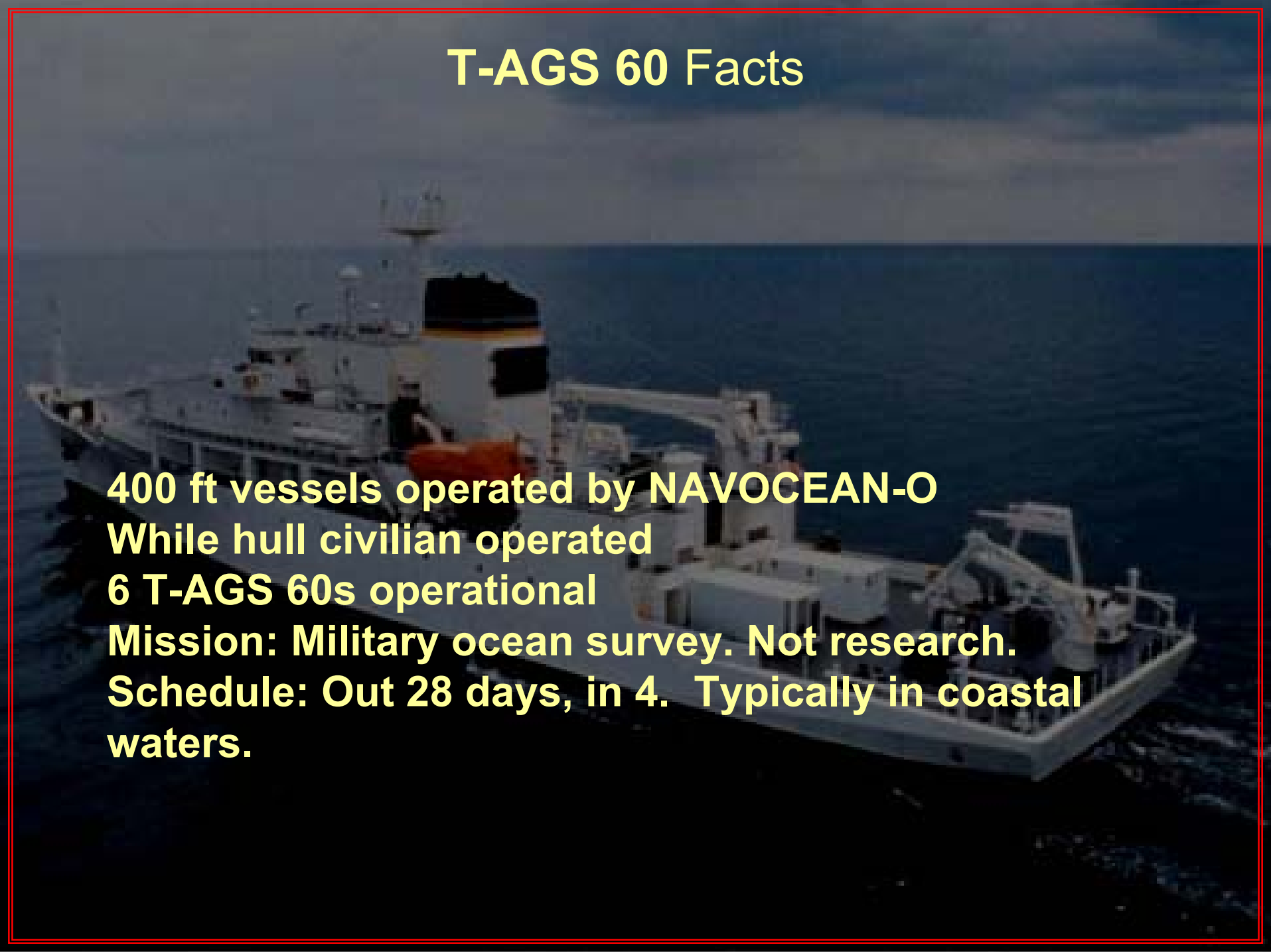Persian Gulf:
Last week's assessment

How **T-AGS 60** Can Support Our Work
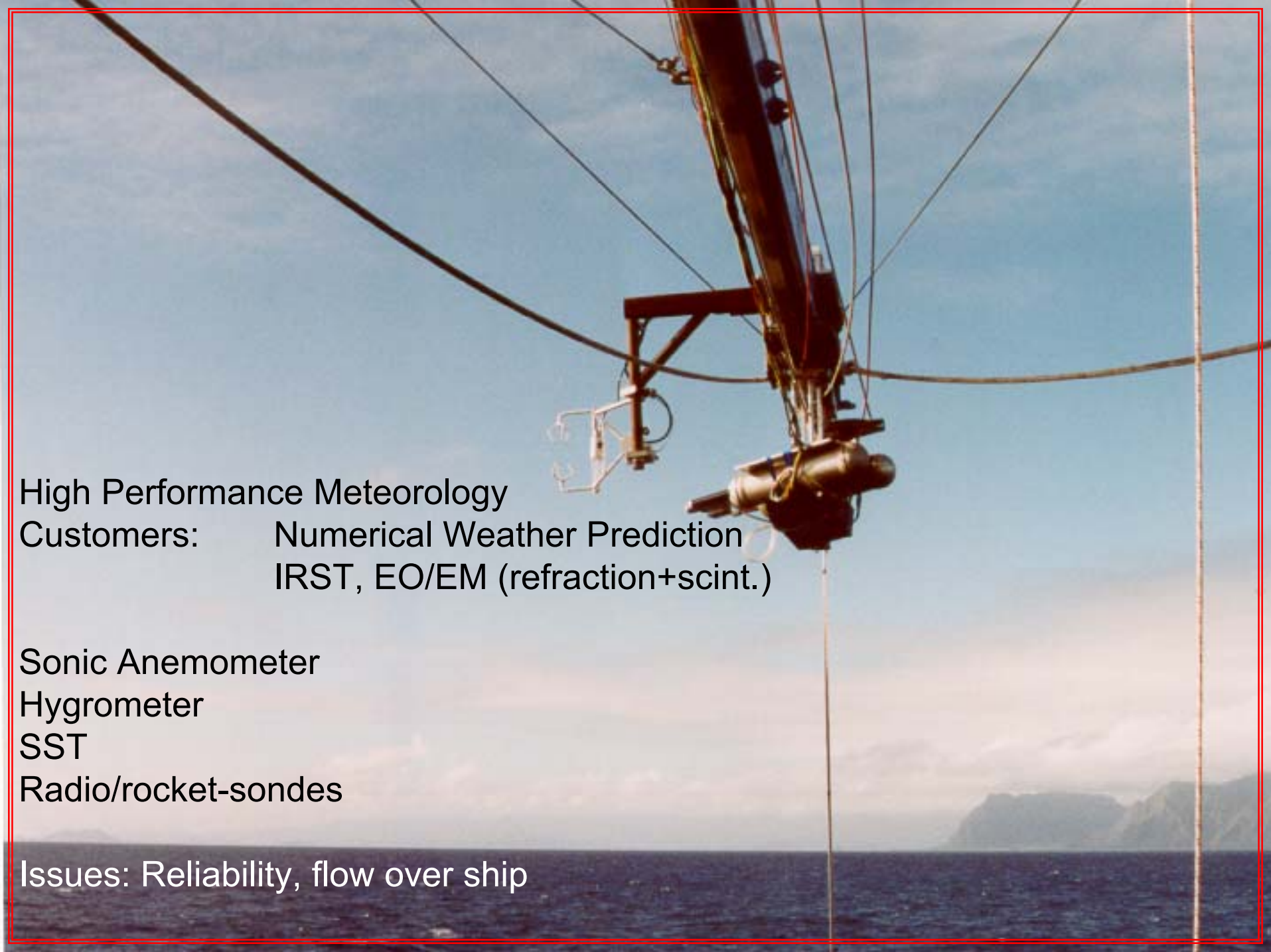## An oceangoing receptor?

T-AGS 60 Facts

400 ft vessels operated by NAVOCEAN-O
While hull civilian operated
6 T-AGS 60s operational
Mission: Military ocean survey. Not research.
Schedule: Out 28 days, in 4. Typically in coastal waters.

T-AGS 60 Instrumentation

Meteorology/Obs
Optical Depth
Ceilometer/LIDAR
Solar Flux
Aerosol Properties
Ocean Color
SST

High Performance Meteorology
Customers: Numerical Weather Prediction
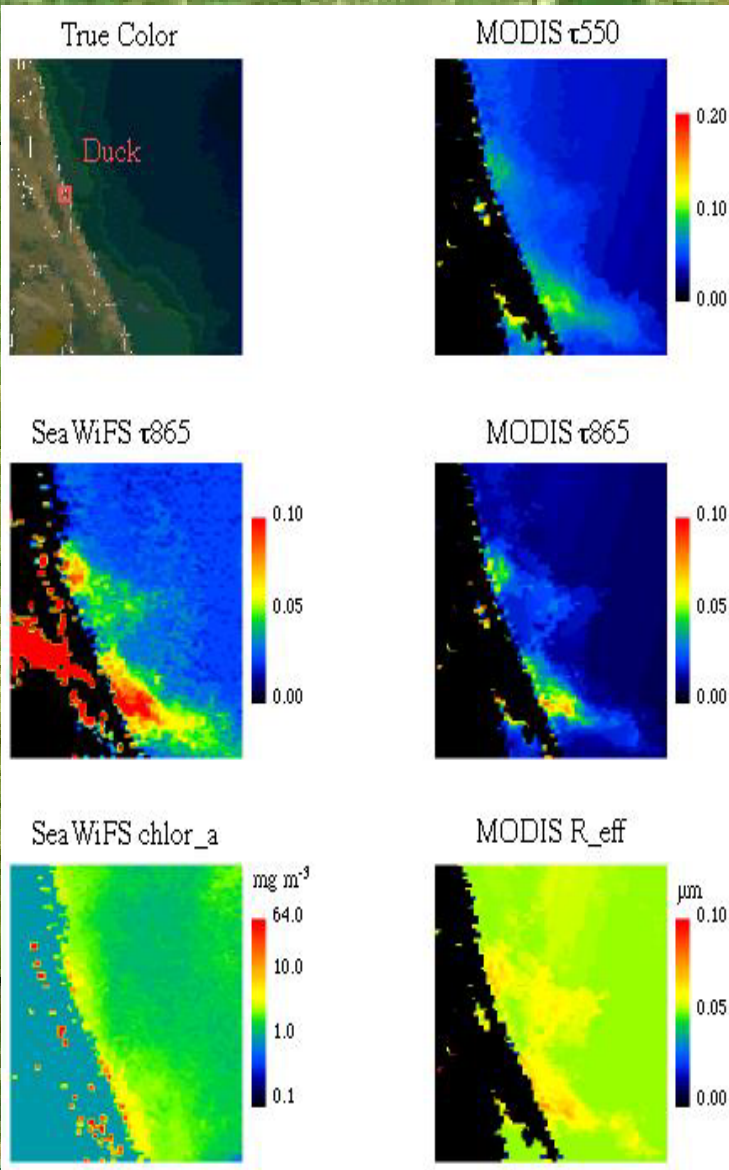   IRST, EO/EM (refraction+scint.)

Sonic Anemometer
Hygrometer
SST
Radio/rocket-sondes

Issues: Reliability, flow over ship

Ocean Color:
Verification improves RS performance

Optical Depth/Sun photometry
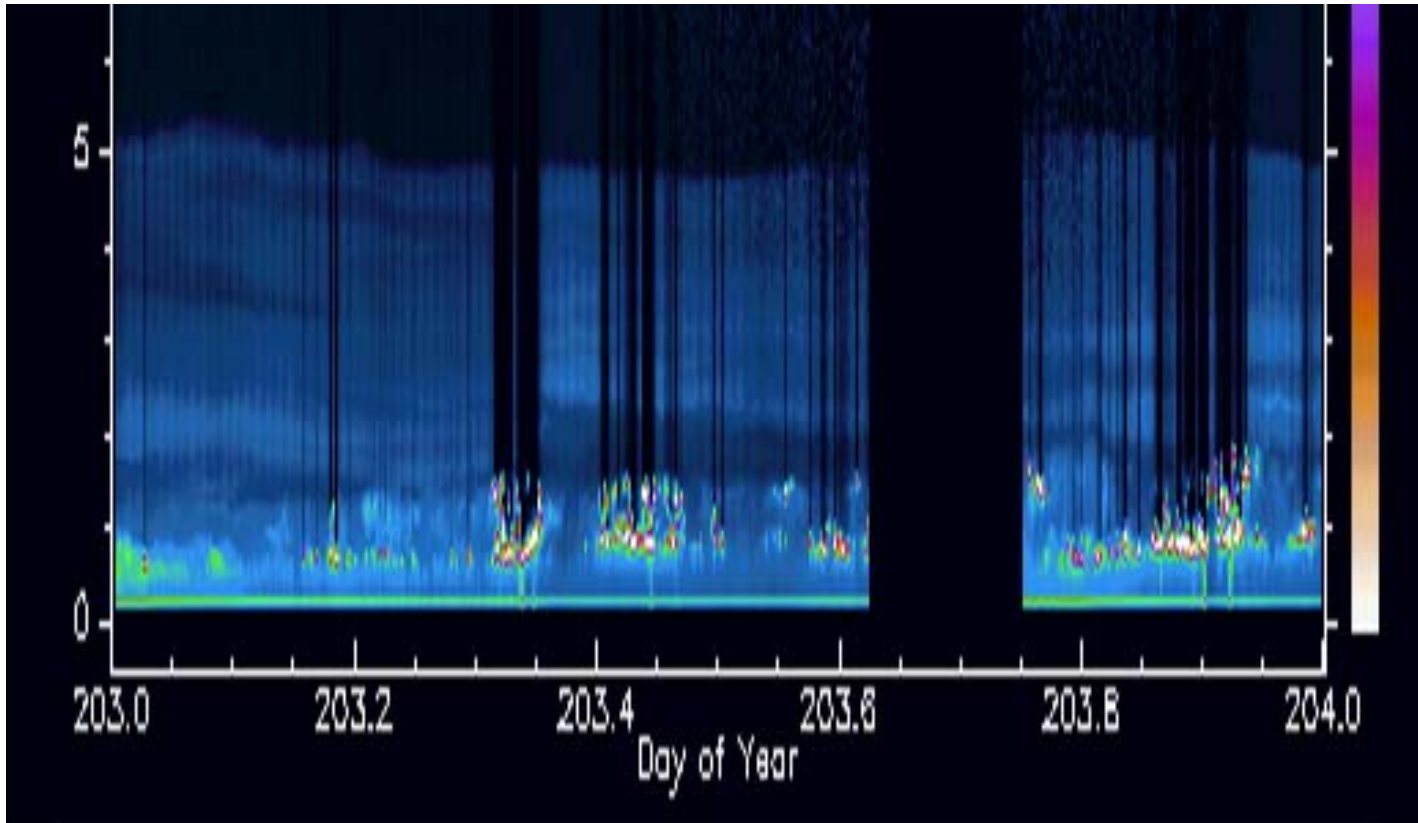Customers: NWP, radiative transfer, strike warfare

Package: $5-40k

LIDAR/Ceilometer
Customers: Slant-path visibility/strike warfare
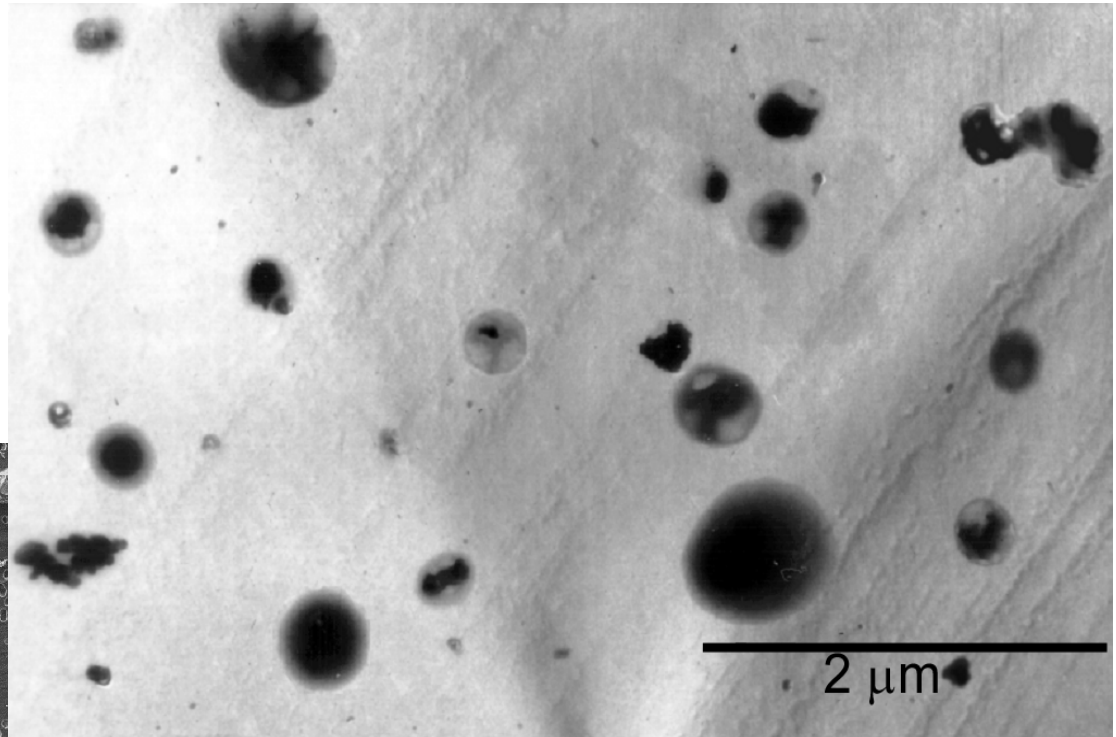model validation

LIDAR/Ceilometer

Flux Radiometers
Customers: NWP, radiative transfer

Particle Properties

Particle Size/Shape
Particle Chemistry
Light Scattering
Light Absorption

2 μm

Acc.V   Spot Magn Det WD ———————————   20 μm
2.00 kV 3.0   1250x SE 4.2

T-AGS 60 Class Ship Instrumentation Issues

- We don't do "climatology" we do meteorology/validation

- Is there commercially available instrumentation that is relatively stable? (Tuesday?)

- The difference between "meteorology reporting" and research

- How far can we interpret UN law of the sea