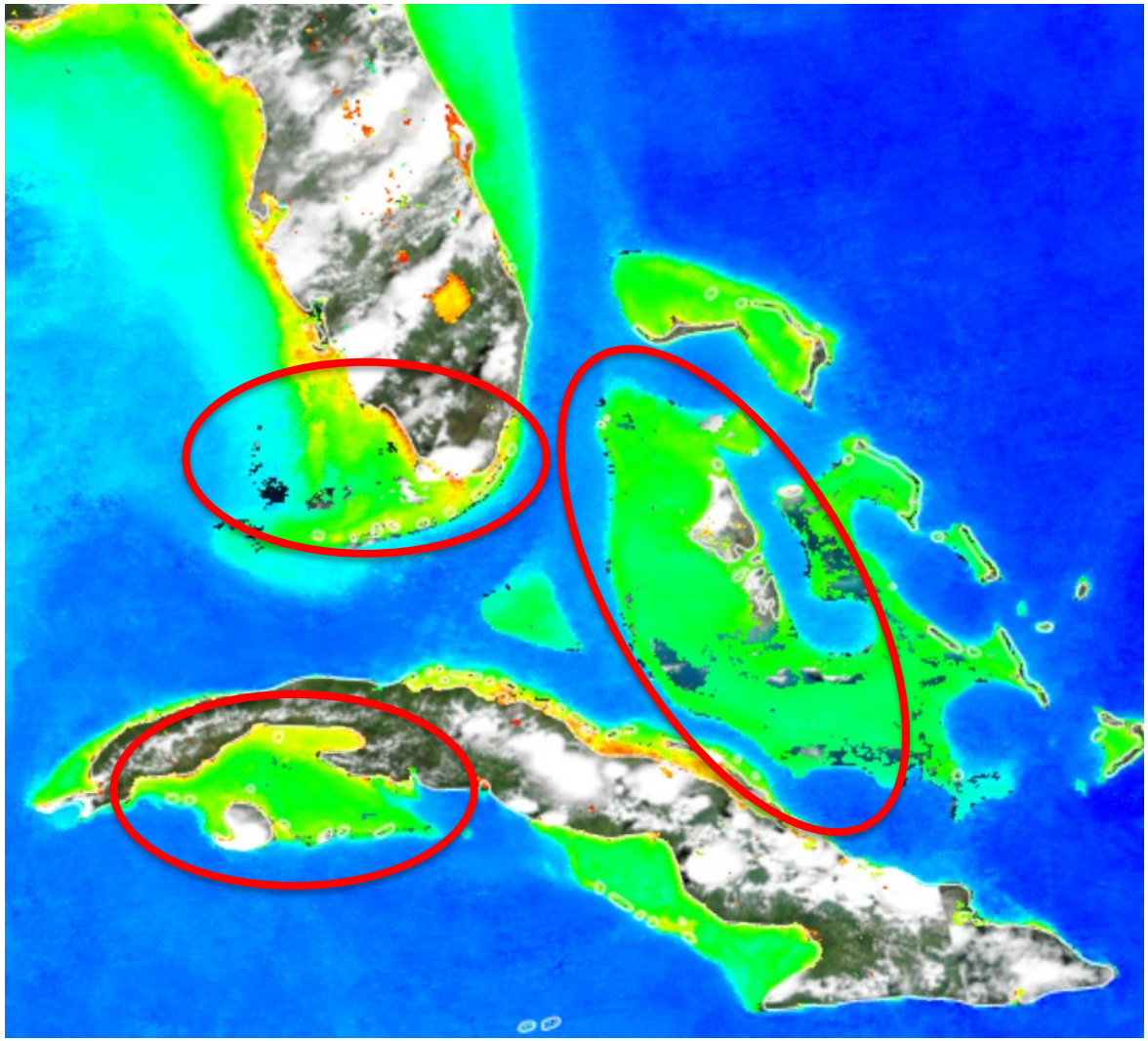
Breakout Workshop:

Remote sensing of optically complex and shallow waters

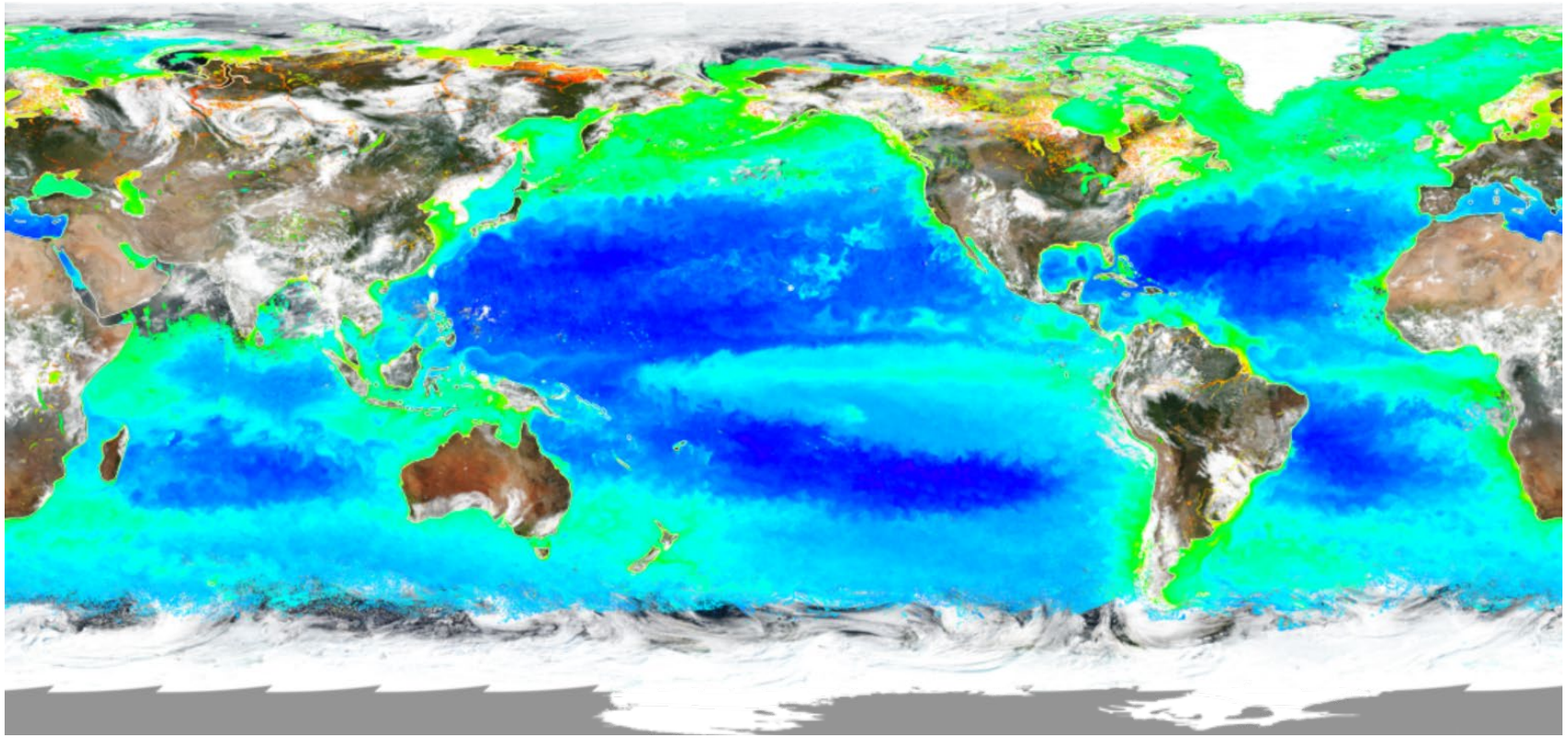
Co-chairs: Zhongping Lee and Dirk Aurin

What is shallow water and the need?



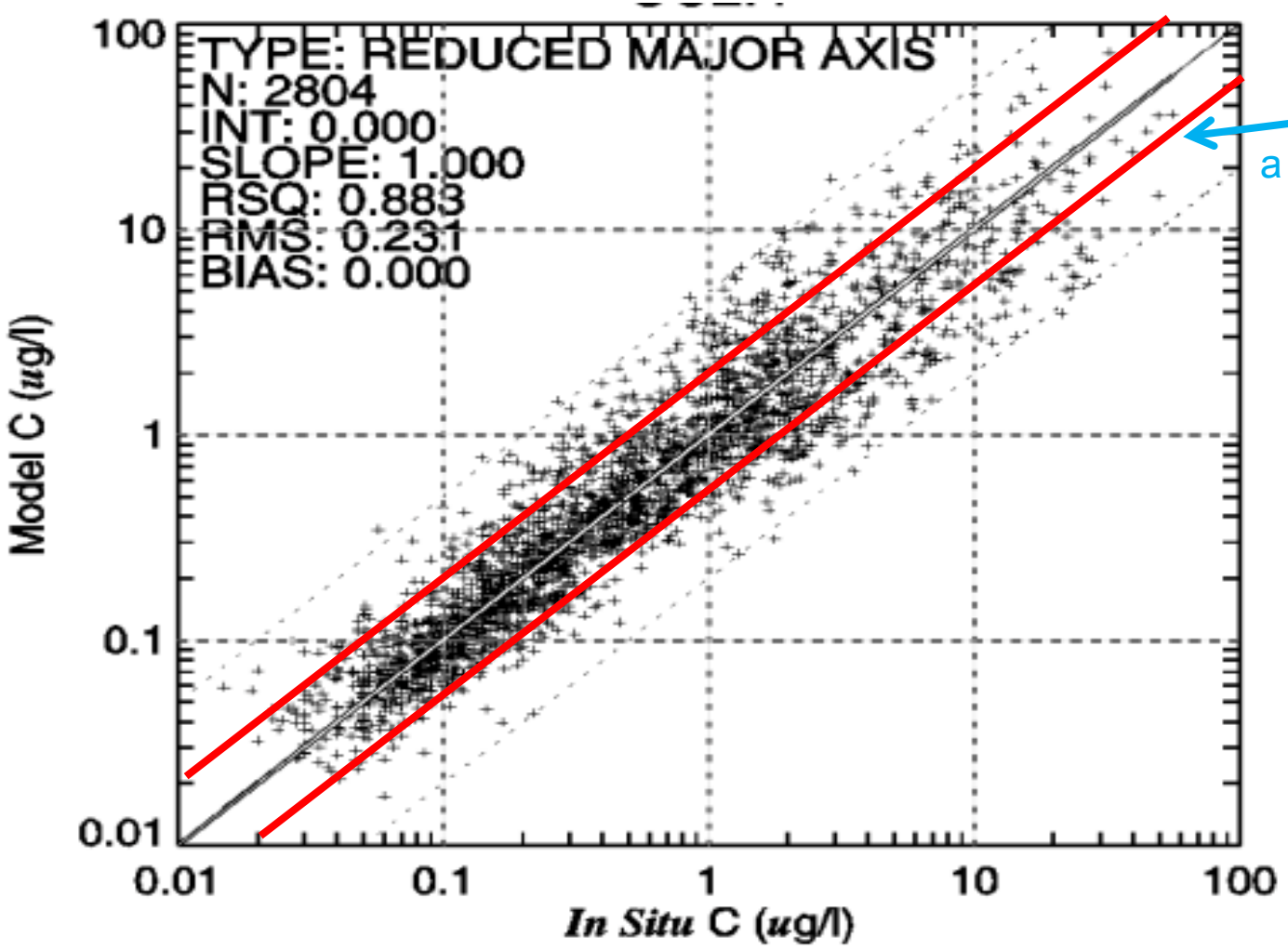
What is complex water?

NOAA/STAR/OCview



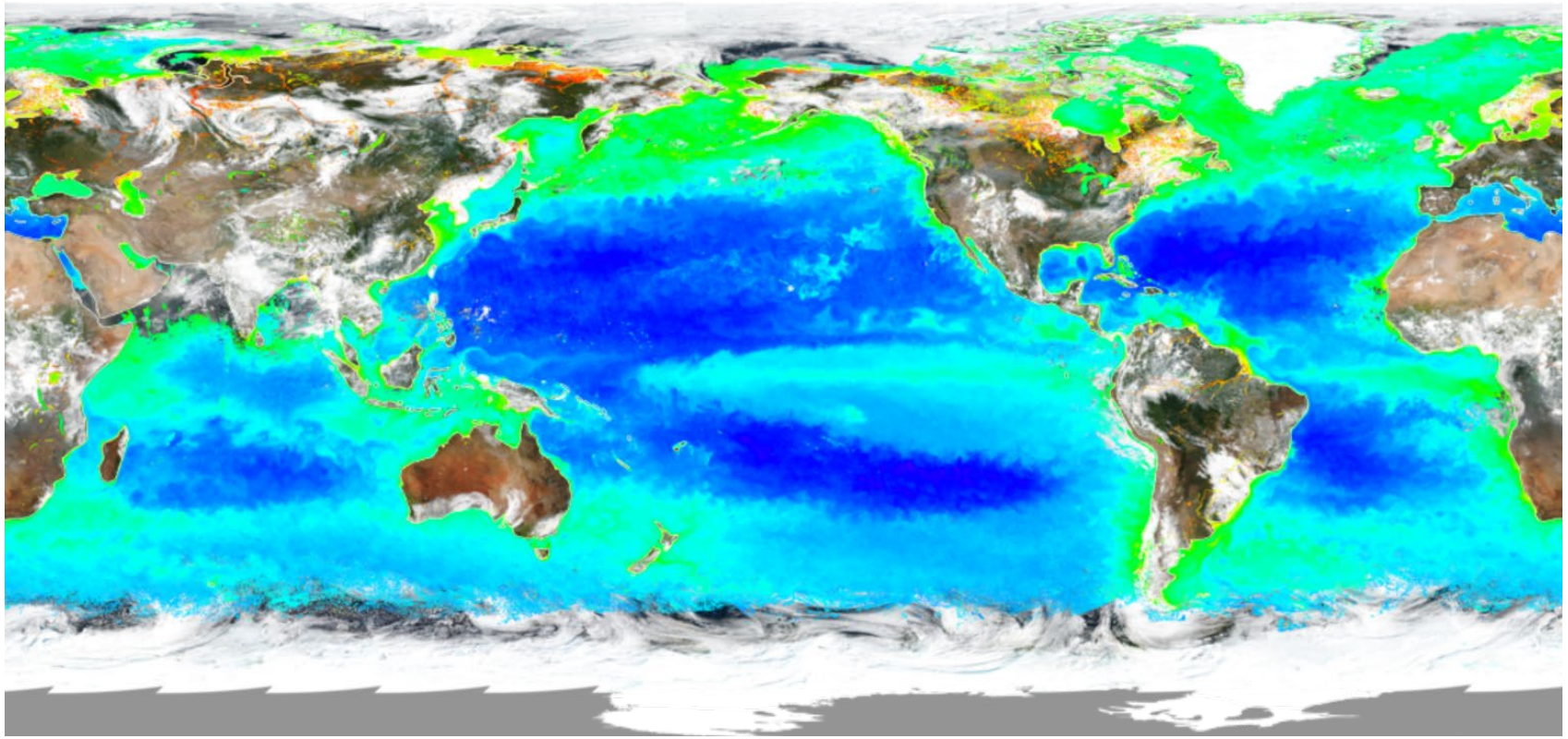
Is open-ocean water NOT “complex”?

Model C = Fun(Rrs(λ_1)/Rrs(λ_2))



Why such a wide range? How to narrow this “band”?

(Source:seawifs.gsfc.nasa.gov/SEAWIFS/RECAL/Repro3)



“Chl” from Rrs ratio or Rrs difference == absorption coefficient

“intruders”: green/golden algae, oil spills, ‘new’ water from melted ice …

How to handle these? Or how to get a distribution of “true” Chl and/or other BGC properties from Rrs?

Key Questions:

- What are the main challenges to accurate remote sensing in optically complex and/or shallow waters today? (Common issues and regional-specific challenges)
- How will developments in mission and operational capabilities over the next 3-5 years impact current limitations in ocean color remote sensing within these environments? (Plume evolution, PFTs/species differentiation/phytoplankton absorption coefficient distinction, CDOM source and properties (spectral slope, CDOM/DOC), masking/saturation of high turbidity pixels/regions, adjacency issues, marine aerosol discrimination, etc.)
- What new developments are there in global or regional algorithms in complex and shallow waters that will be able to take advantage of these technological improvements?
- How can we improve our ability to classify water types/bottom types in order to facilitate operational analysis of ocean color in optically complex and shallow environments?
- Aside from optical data, what information -- such as tides, currents, temperature, bathymetry, salinity, etc. – can be made available through other means, can/should be employed when inverting a remote sensing spectrum?

Background and Practices:

Colleen Mouw: Overview

Antonio Mannino: “New” water

Chuanmin Hu: Floating algae

Yingcheng Lu: Oil spill

Yongxiang Hu: CALIPSO

Deric Gray: Ocean LIDAR

Rodrigo Garcia: Shallow water

Eric Hochberg: CORAL

Discussion

What are the gaps?

What should we focus on in the near term?

hardware (instruments, protocols)?
software (algorithms, AI vs physics-based)?
data (profiling data; ancillary data: such as T, S‰, MLD, Es, …)?

training?
applications?
.
.