

US “Potential” Contribution to YMC Field Campaign

Ren-Chieh Lien¹, Janet Sprintall²

Eric D’Asaro¹, Craig Lee¹, Tom Sanford¹, Luc Rainville¹

¹Applied Physics Lab, University of Washington

² Scripps Institute of Oceanography

Potential US Contribution

I. Ship

- Shiptime: Significant number of days
- US Global: Such as R/V Sally Ride, Roger Revelle, Thompson

II. Observation Assets

1. Ship Based (RV, ship of opportunity)

- Shipboard ADCP/CTD/Met, microstructure profiler, undulating profiler, towed chain, wire walker, Lidar, radar, wind profiler, aerosol, sounding, direct air-sea flux, etc.
- Intensive process study for a period < months

2. Moored

- Surface/subsurface mooring, bottom station, winch profiler etc.
- Time series measurements for month–years

3. Autonomous

- Glider, float, drifter, etc.
- Sustained, persistent, repeated section, scalable distributed measurements for month–years

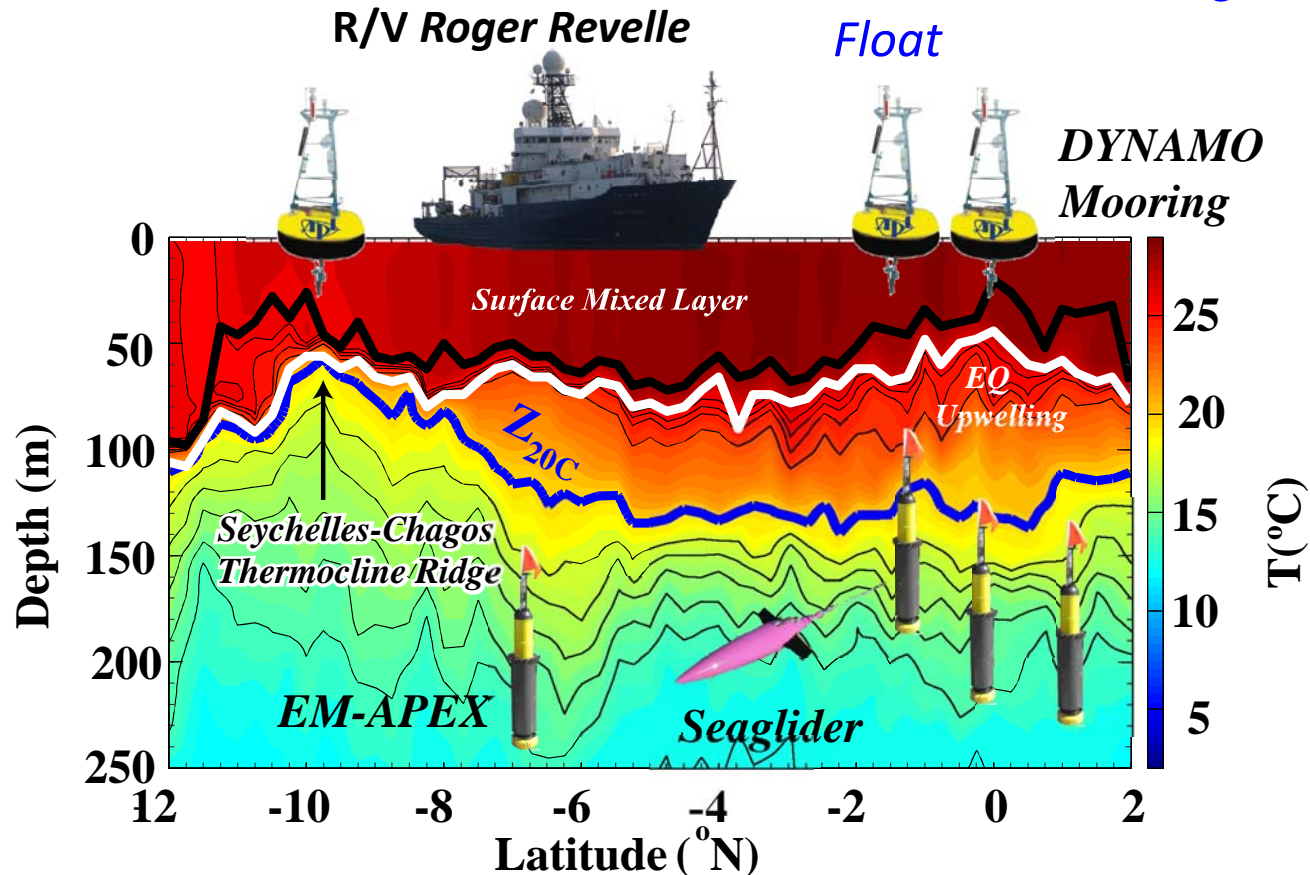
DYNAMO/CINDY (US and Japan)

Atmosphere

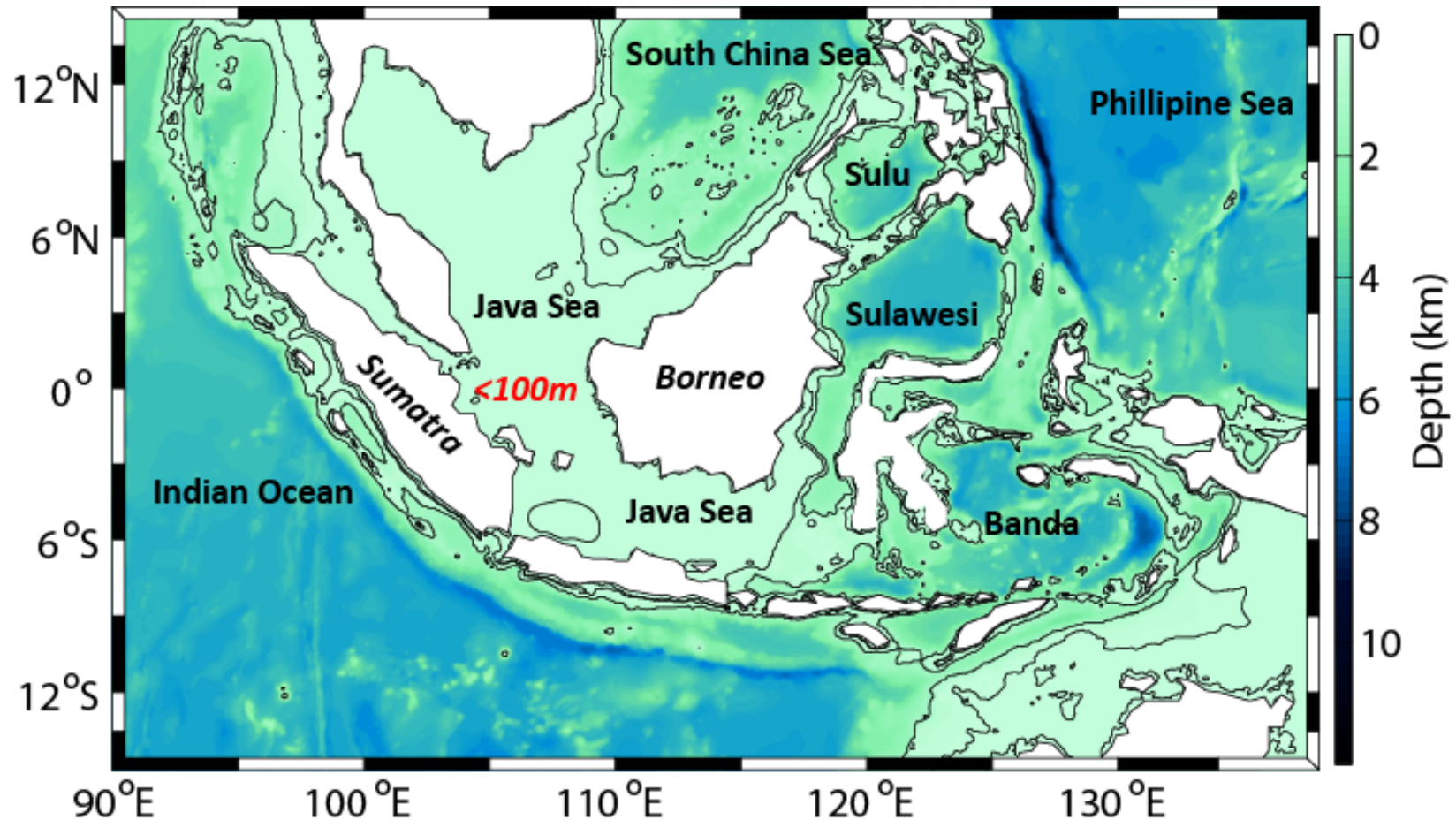
- TOGA Radar
- Wind Profiler
- Lidar
- Aerosol
- Direct Air-Sea Flux

Ocean

- Ship Based: CTD, ADCP, Microstructure Profiler, Wire Walker, Towed CTD Chain, SeaSoar, XBT
- Moored: Surface and Subsurface Moorings
- Autonomous: Seaglider, EM-APEX Float



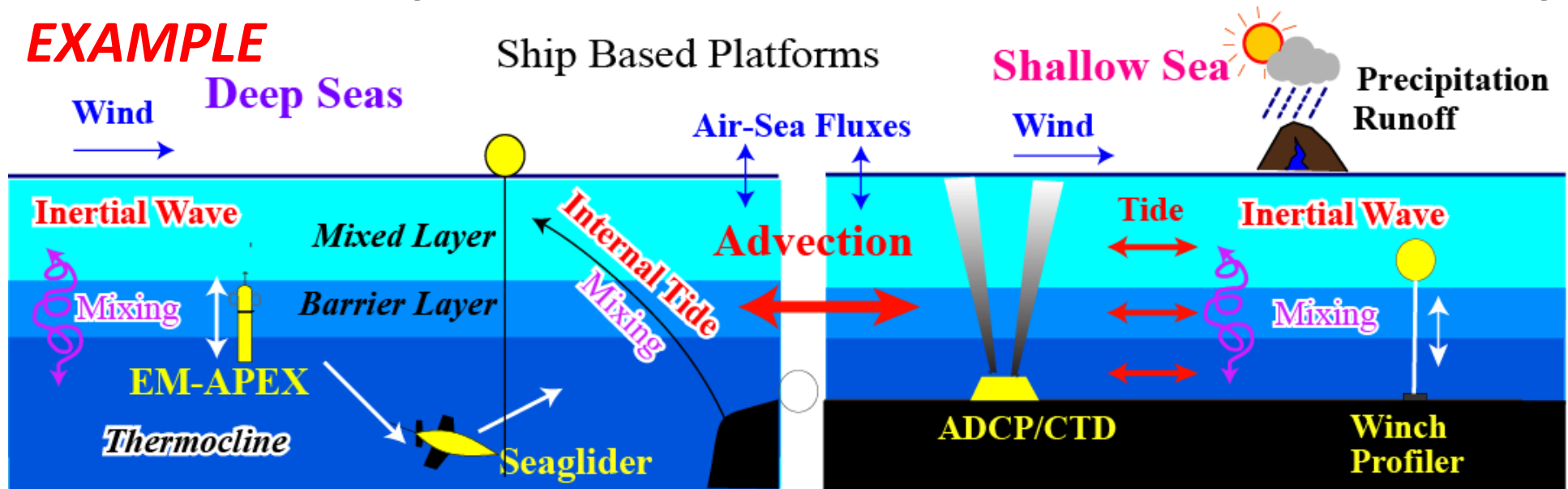
Oceanic Processes



- ~50% of shallow water (< 100m), ~50% of deep water.
- In deep water, wind forced inertial waves and internal tides are important mixing processes. In shallow water, barotropic tidal mixing is also important.
- Shallow water and deep water are dynamically coupled via lateral processes.

International Effort to Build an Observational System for Sustained Multi-Scale Process Study

EXAMPLE



Deep Water (Easier)

- Moorings (T, S, V, Turbulence, Met) (Year)
- Autonomous Microstructure EM-APXE Floats (T, S, V, Turbulence, SGW) (Year)
- Autonomous Microstructure Seagliders (T, S, Turbulence) (Year)
- Ship Based Platforms (Month)

Shallow Water (challenging)

- Bottom ADCP/CTD/Passive Acoustic Listener (T, S, V, Rain, Wind) (Year)
- Winch Profiler (T, S, V) (Year)
- Ship Based Platforms (Month)