

Philippine Marginal Seas
Write a description for your map.

Marginal Seas of the Philippines: Status and Challenges

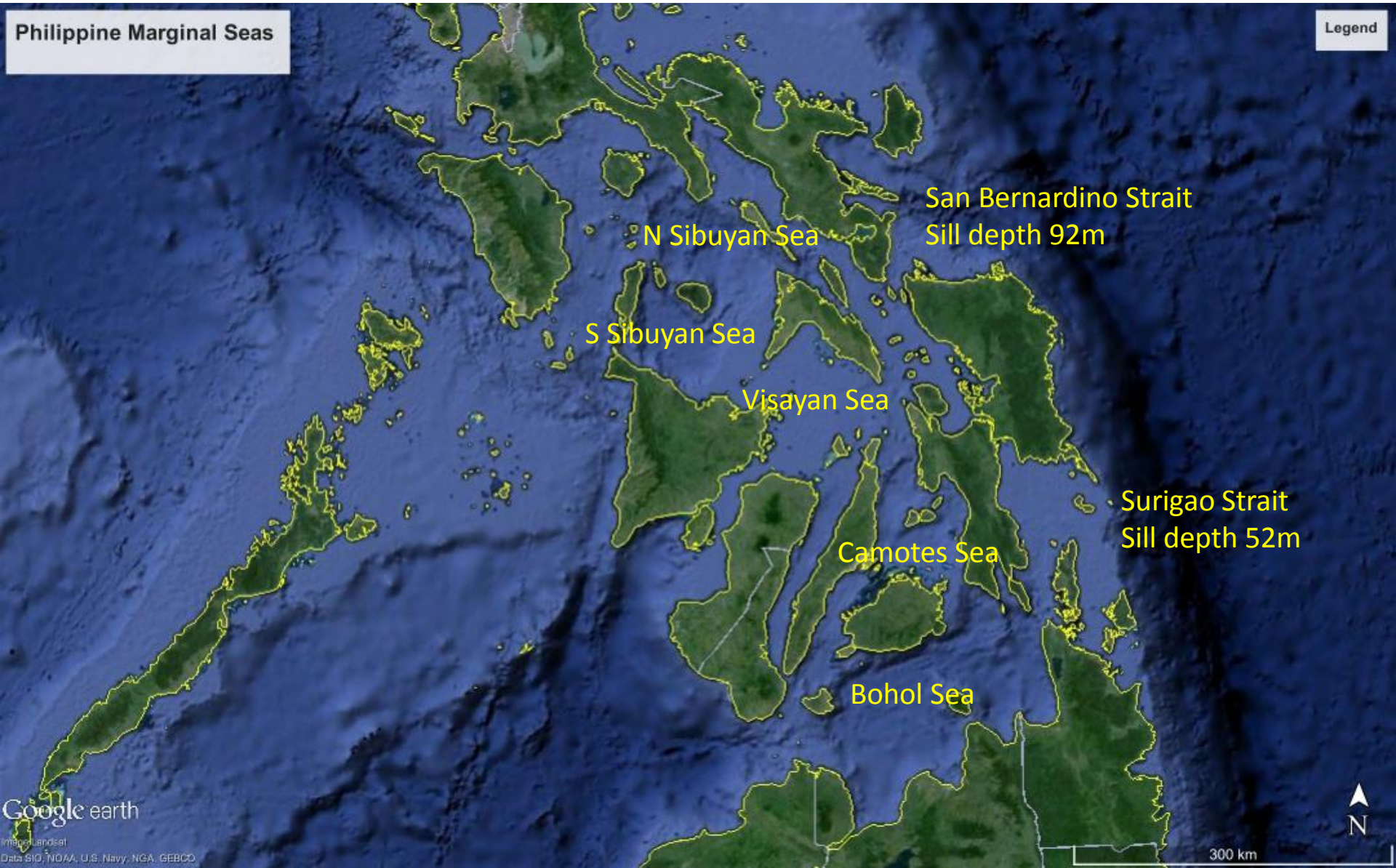
a marginal sea is a sea partially enclosed by islands, archipelagos, or peninsulas, adjacent to or widely open to the open ocean at the surface, and/or bounded by submarine ridges on the sea floor - Wikipedia

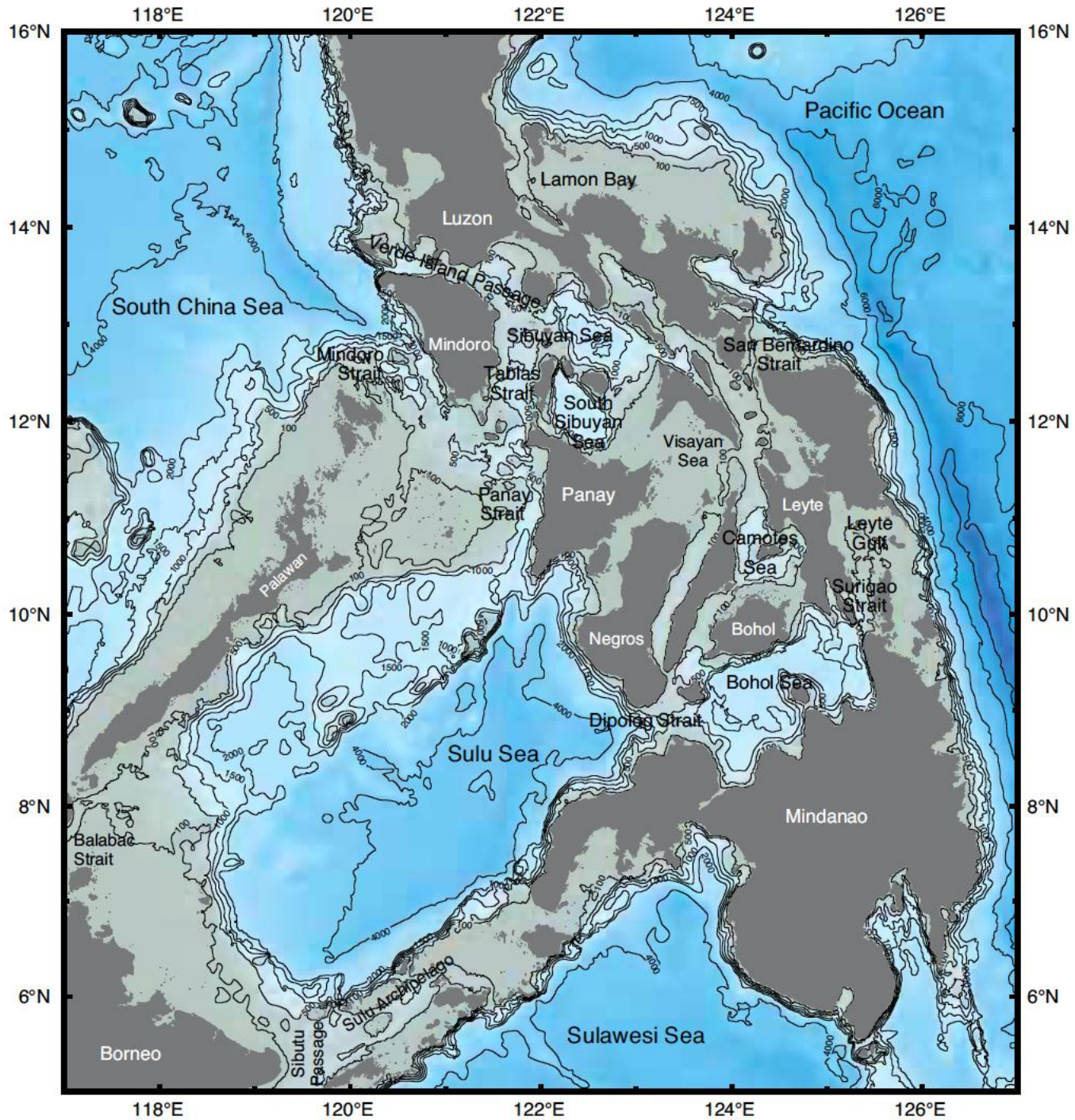
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- South China Sea
- West Philippine Sea
- East Philippine Sea
- Sulu Sea
- Sulawesi Sea

RTD on Philippine Marginal Seas
NAST/NRCP/DOST

Smaller Marginal Seas within the Archipelago



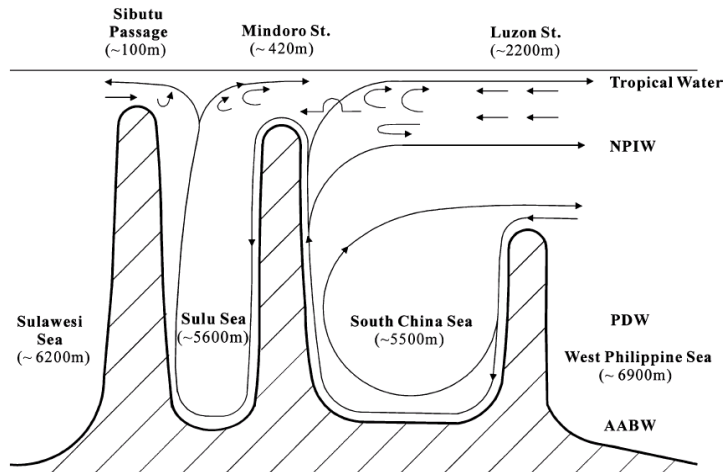
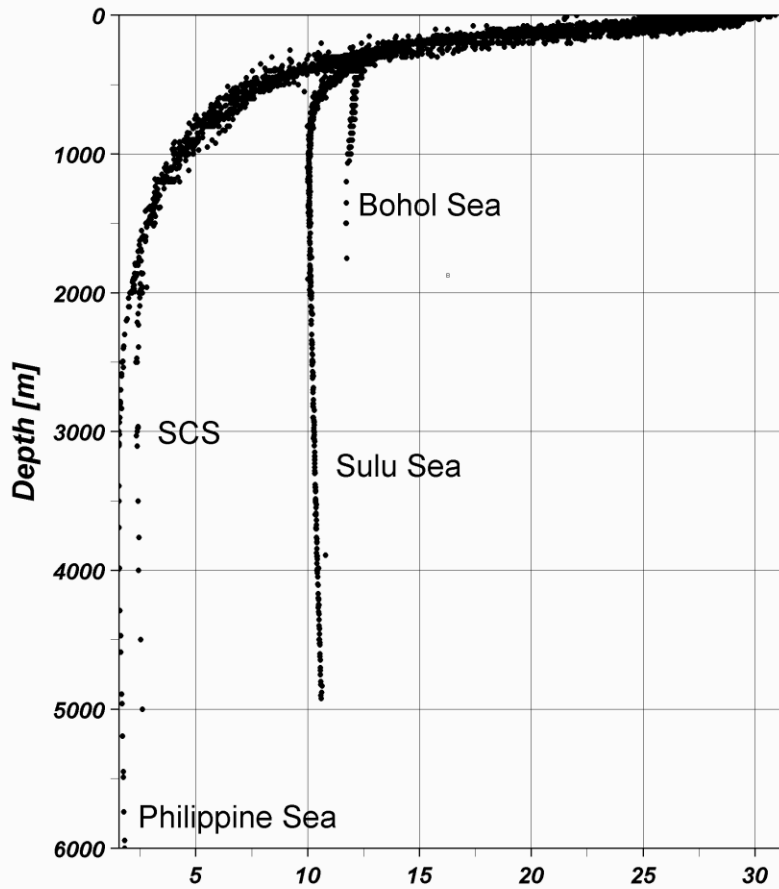


Bathymetry

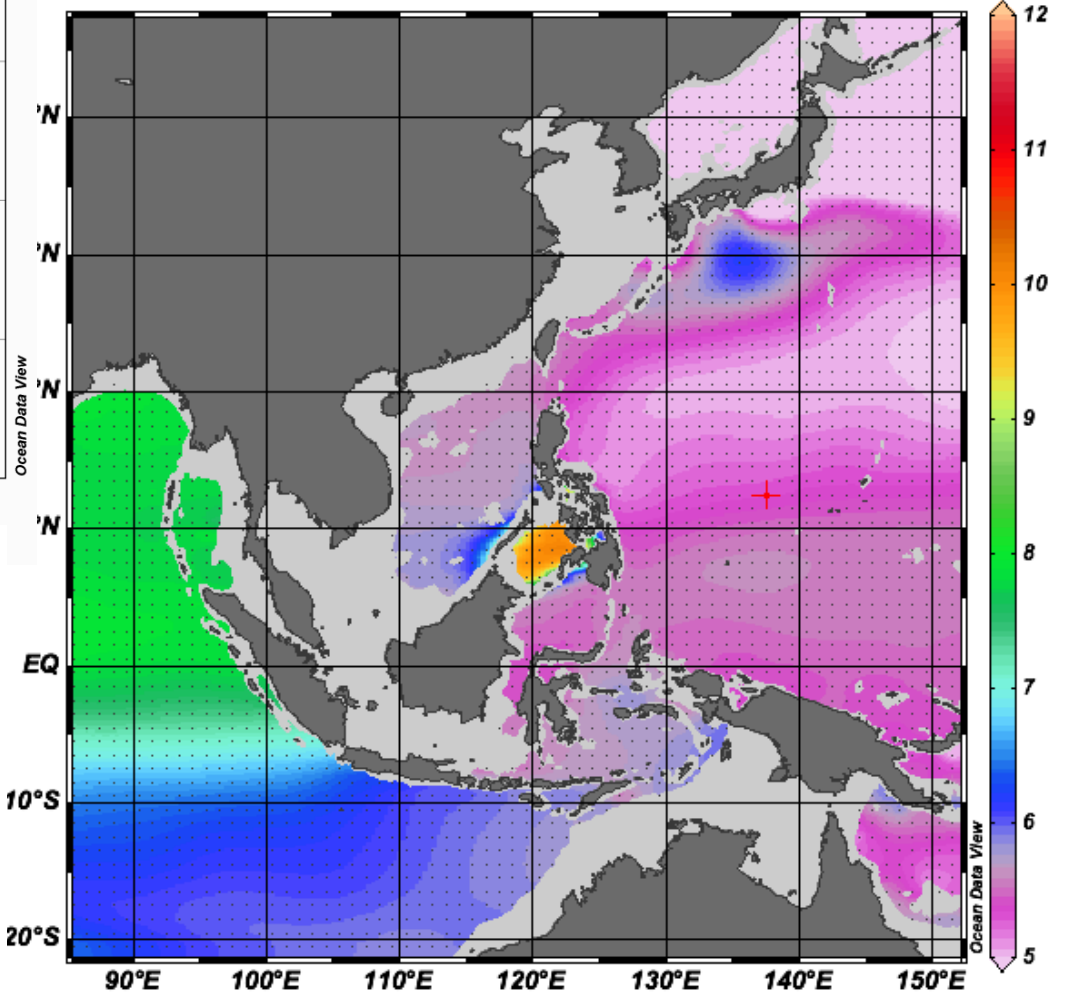
Philippine archipelagic basins are deep but separated by shallower topographic barriers of sills

Name	Max Depth	Sill Depth (m)	Surface Area (km ²)
South China Sea	>5,000	2,200	3,352,500
Sulawesi Sea	>5,000	1,350	430,000
Sulu Sea	>5,000	520 (Panay) 350 (Sibutu)	287,500
Bohol Sea	1,800	420 (Sulu) 52 (Surigao Strait)	26,150
North Sibuyan	1,700	500	9,500
South Sibuyan	1,350	400	7,500
Visayan	50	Shallow sea	8,900
Camotes	800	<300	8,600

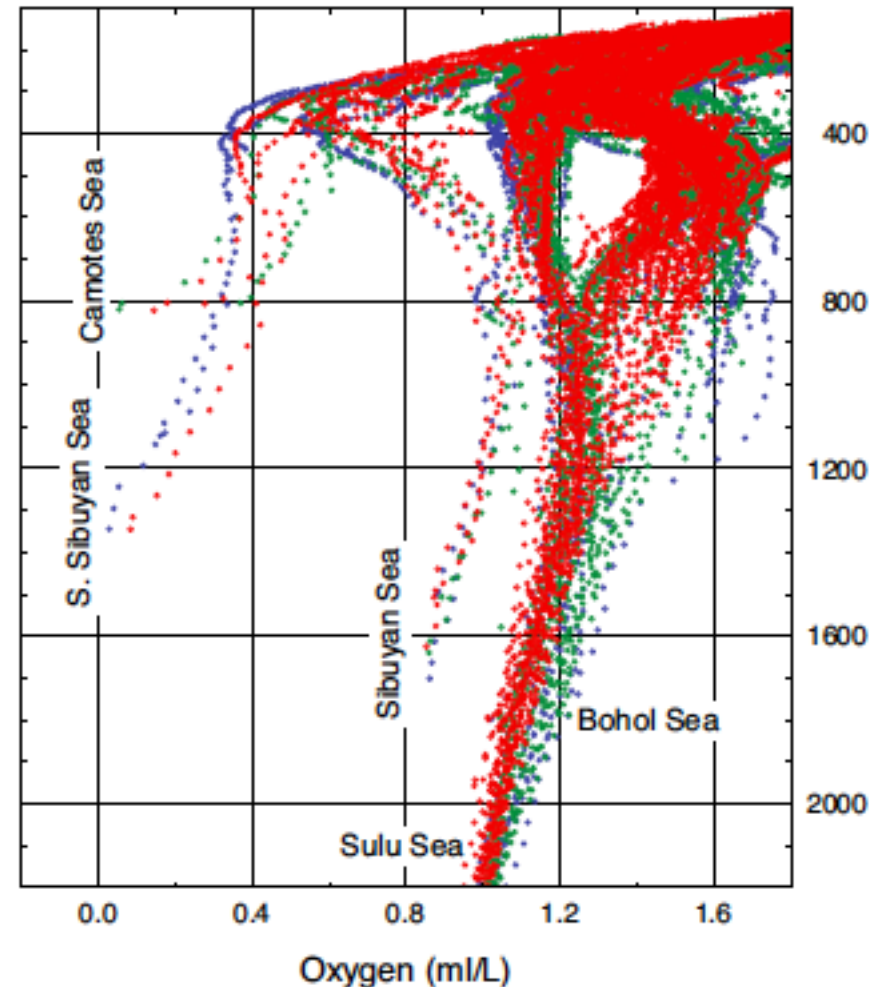
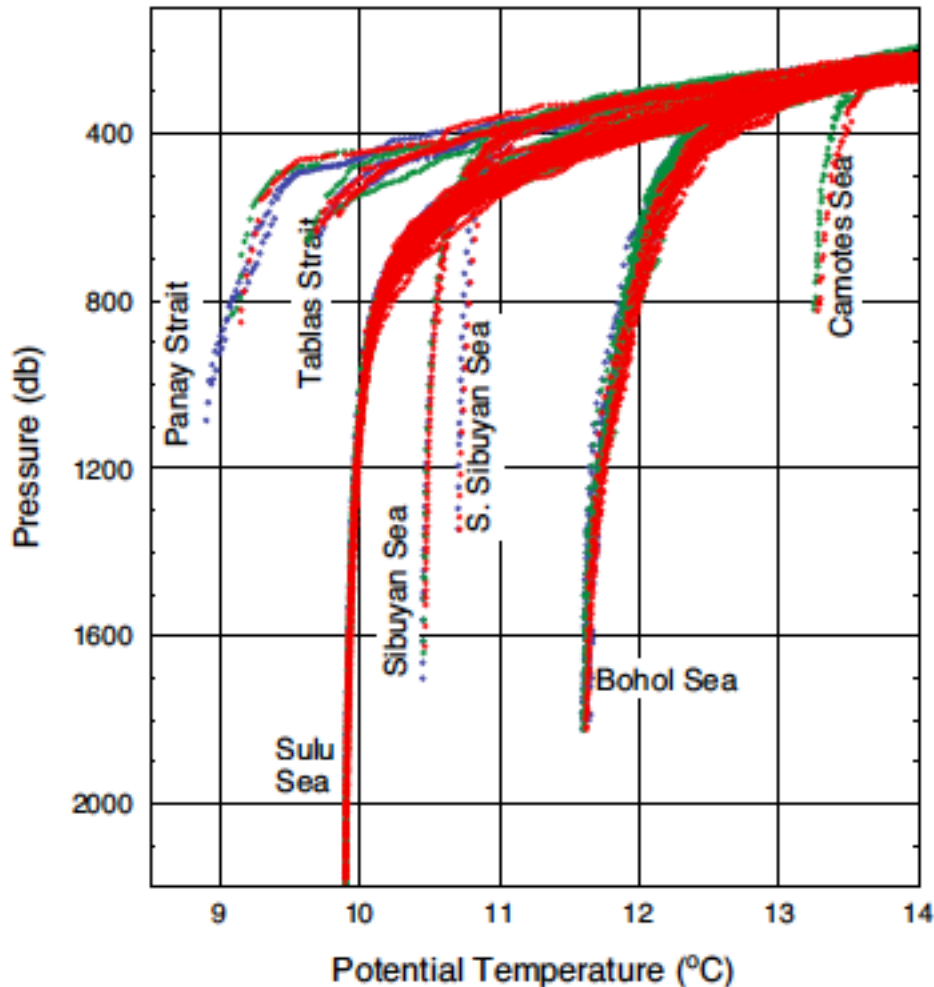
Deep water flowing over sills



Temperature [C] @ Depth [m]=800

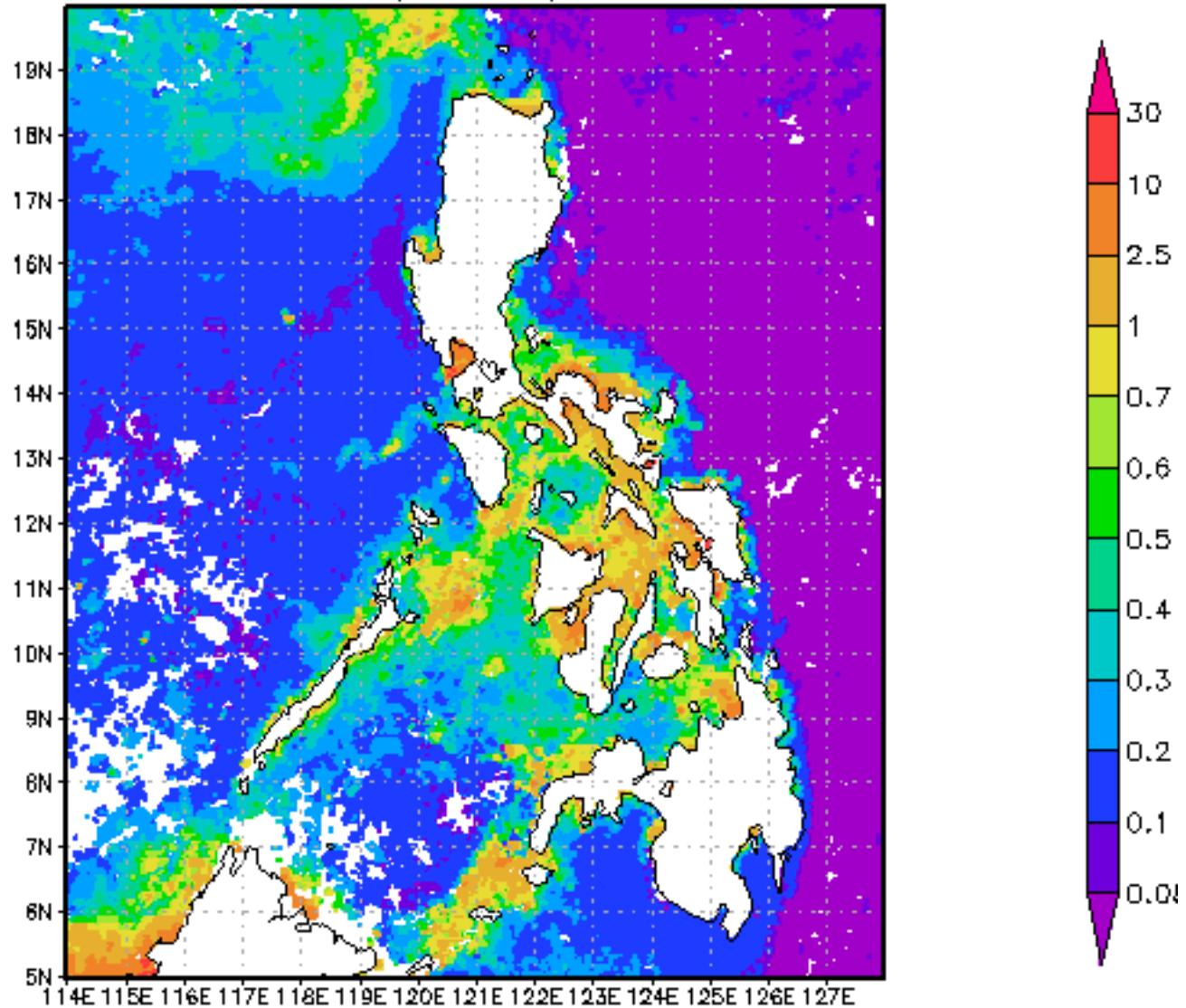


Temperature and oxygen profiles below 300m in the different basins



Chlorophyll

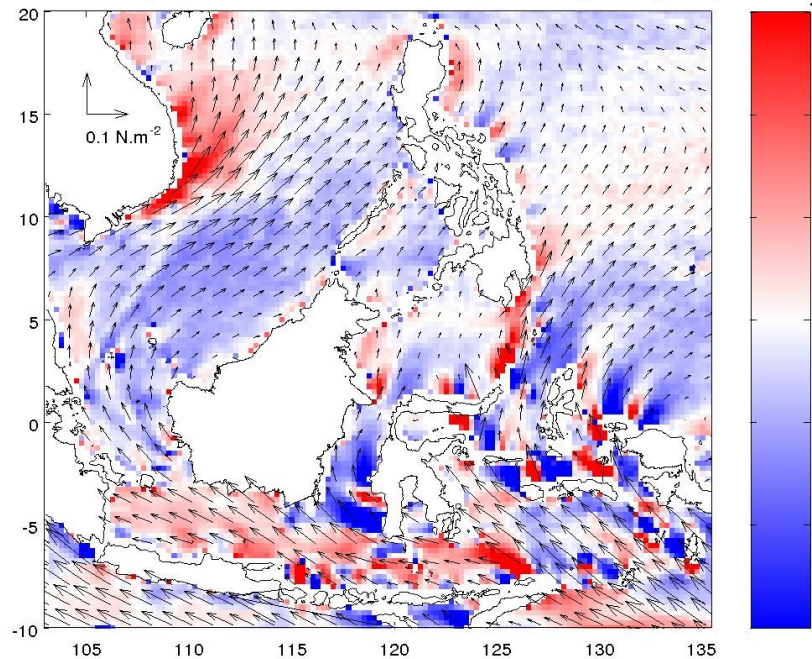
MAMO_CHLO_4km.CR chlorophyll a concentration 4km [mg/m³]
(Jan2015)



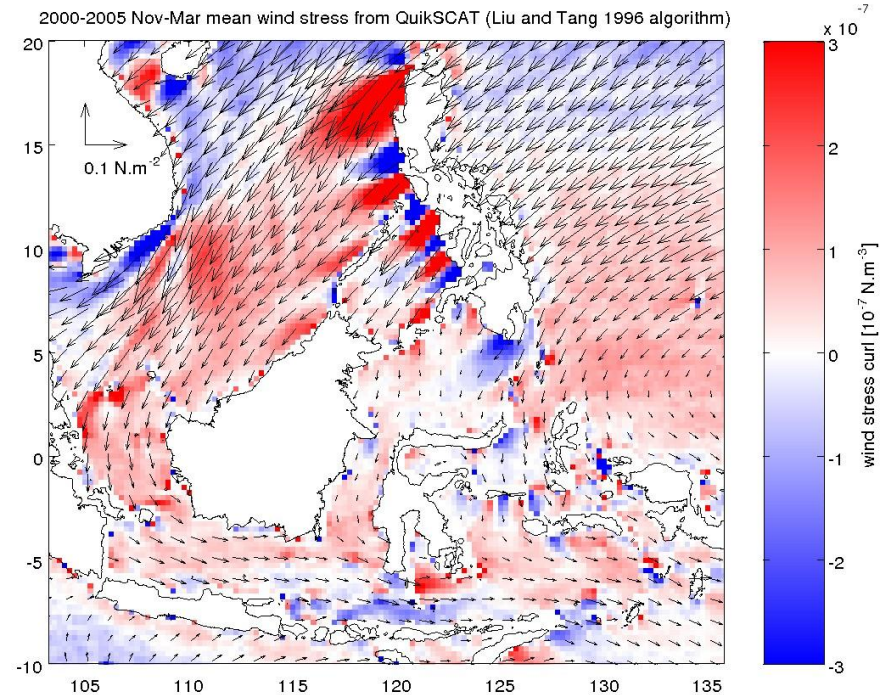
Forcing in the Marginal Seas

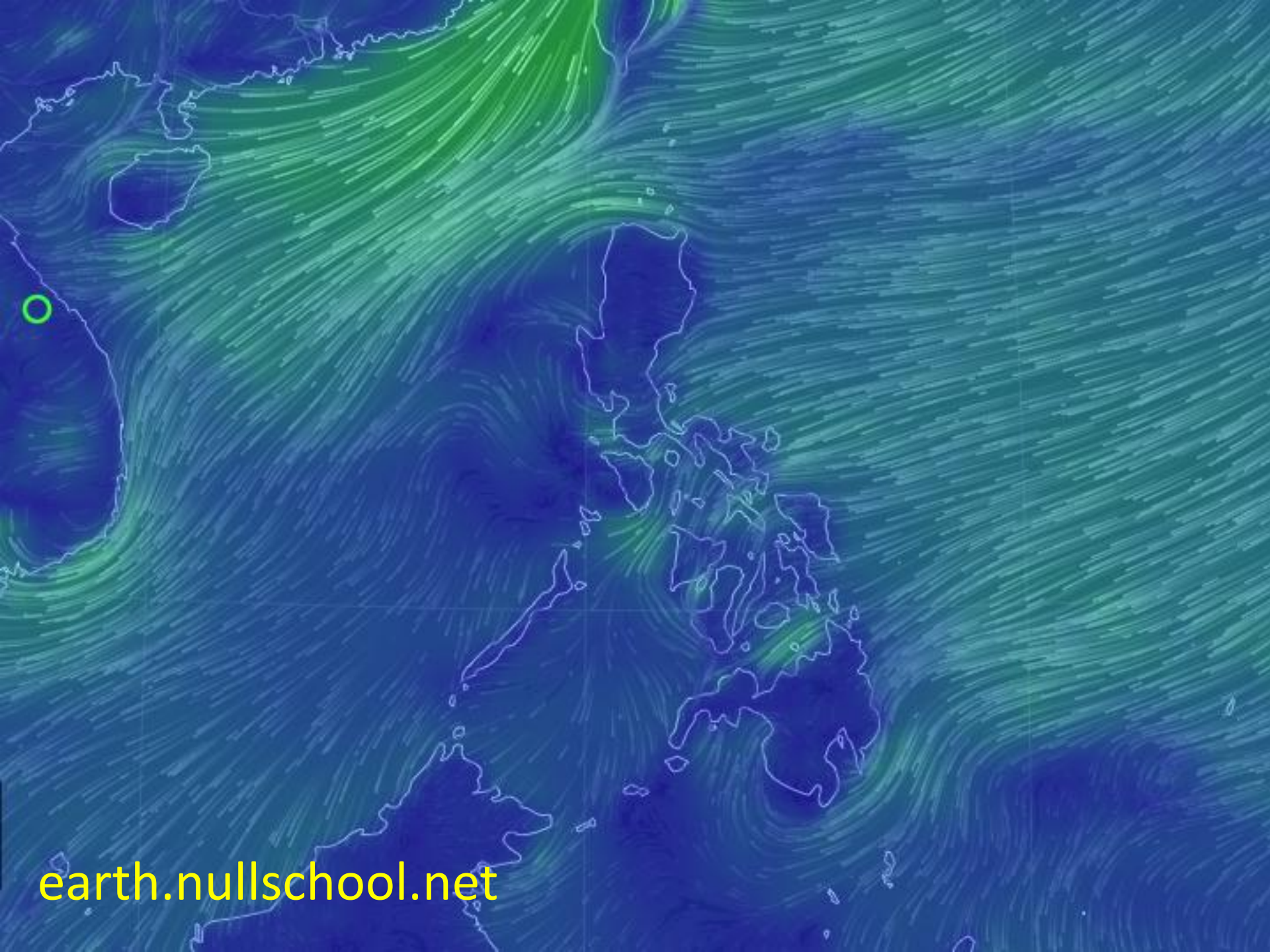
Asian Monsoon Winds

2000-2005 May-Sep mean wind stress from QuikSCAT (Liu and Tang 1996 algorithm)

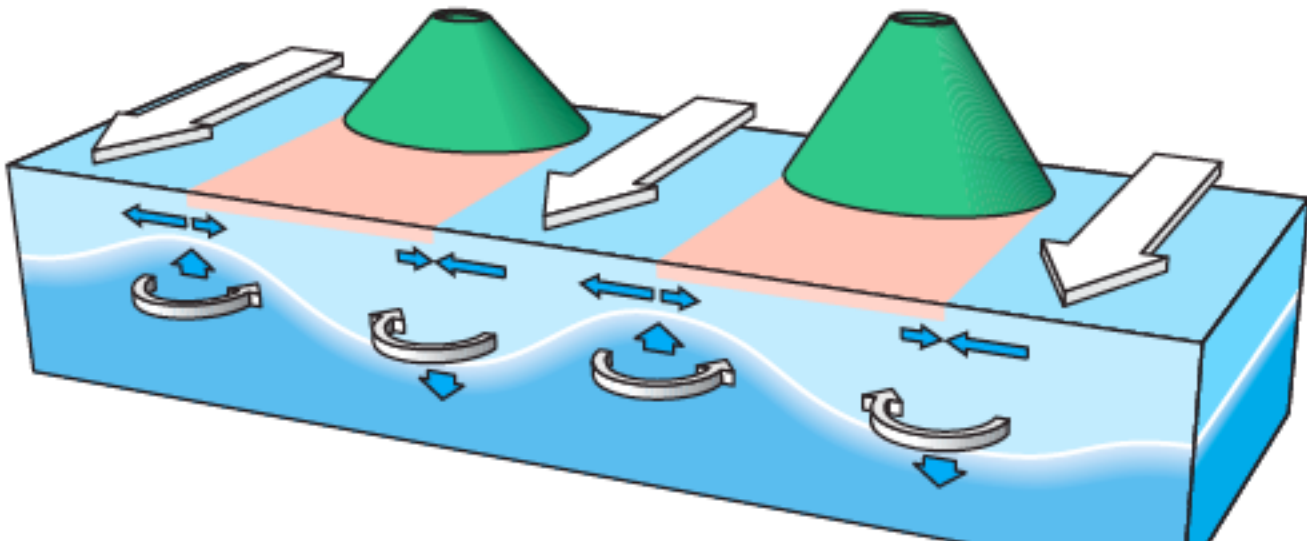
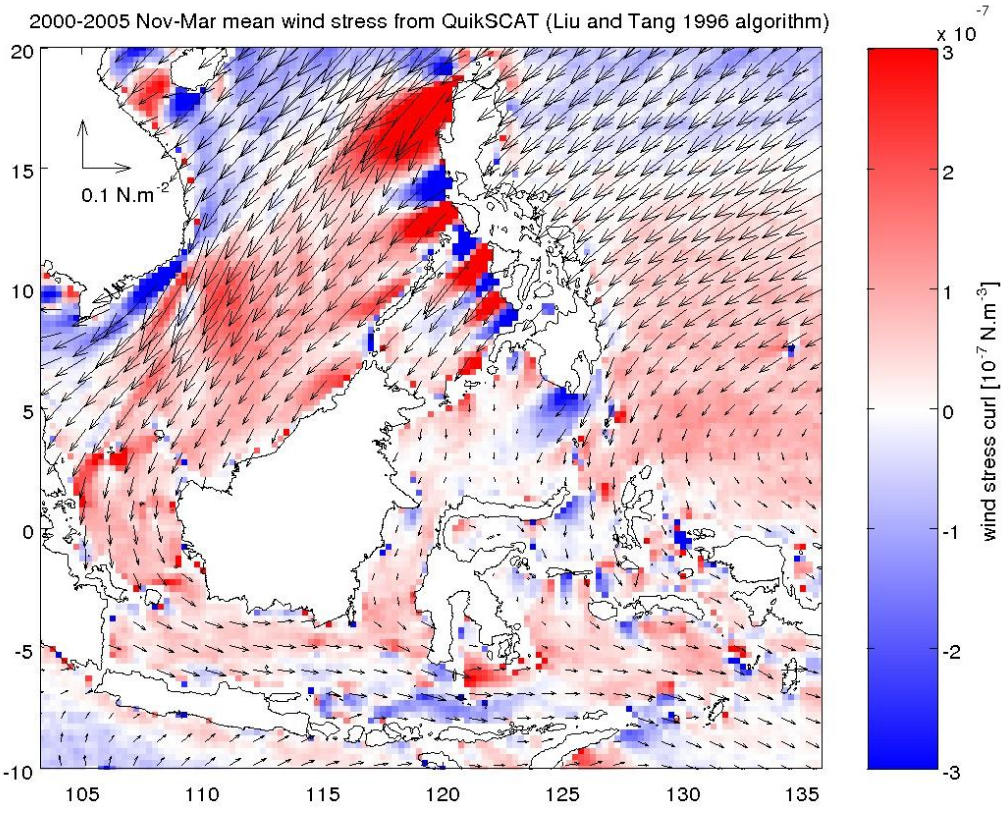
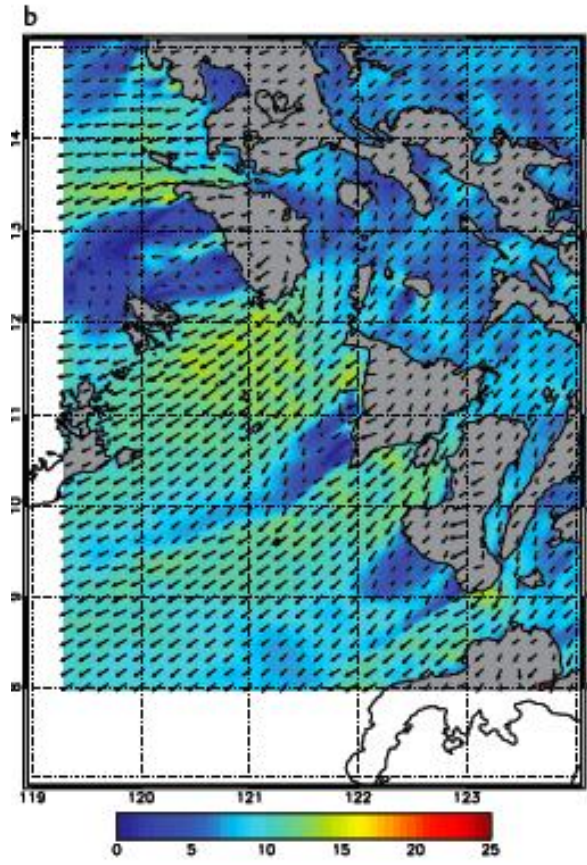


2000-2005 Nov-Mar mean wind stress from QuikSCAT (Liu and Tang 1996 algorithm)



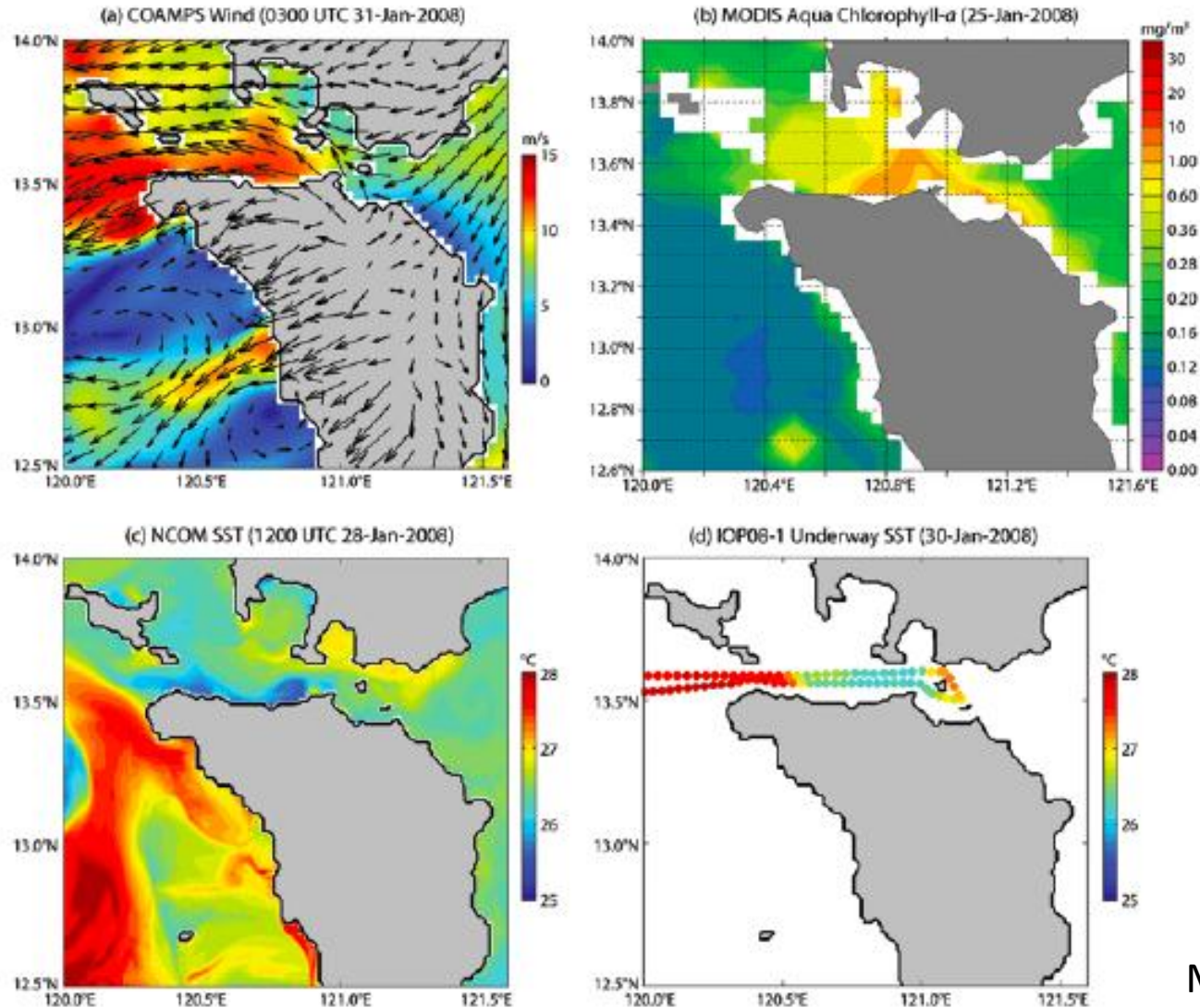


earth.nullschool.net



Chavanne et al., 2002)

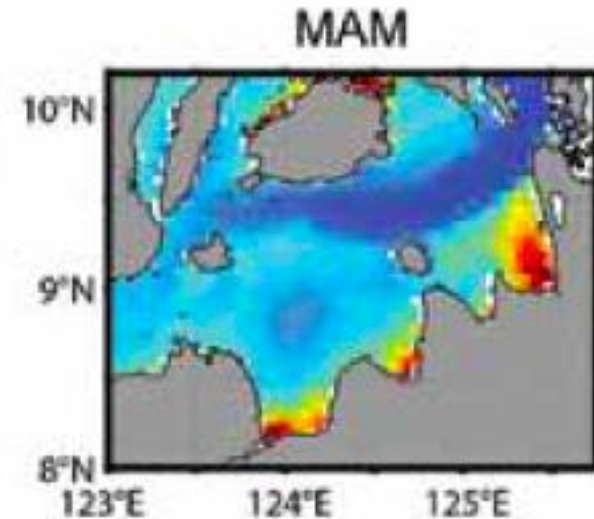
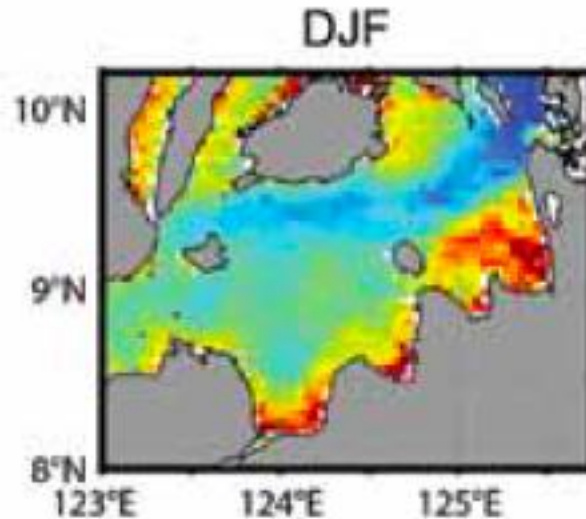
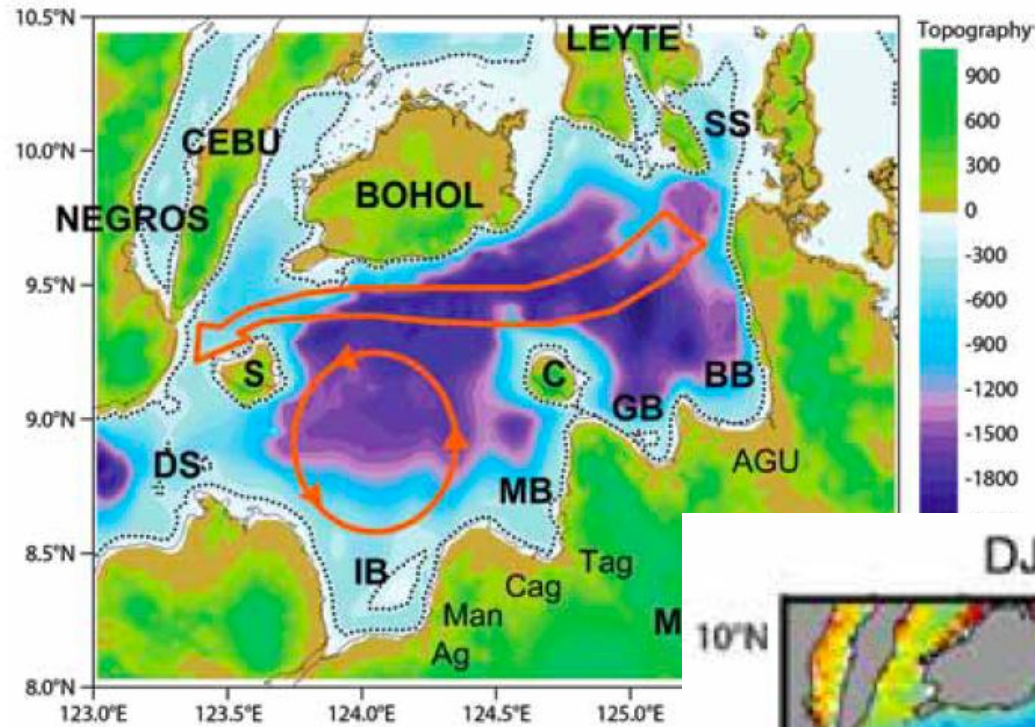
Wind jets in the Verde Passage forcing local upwelling



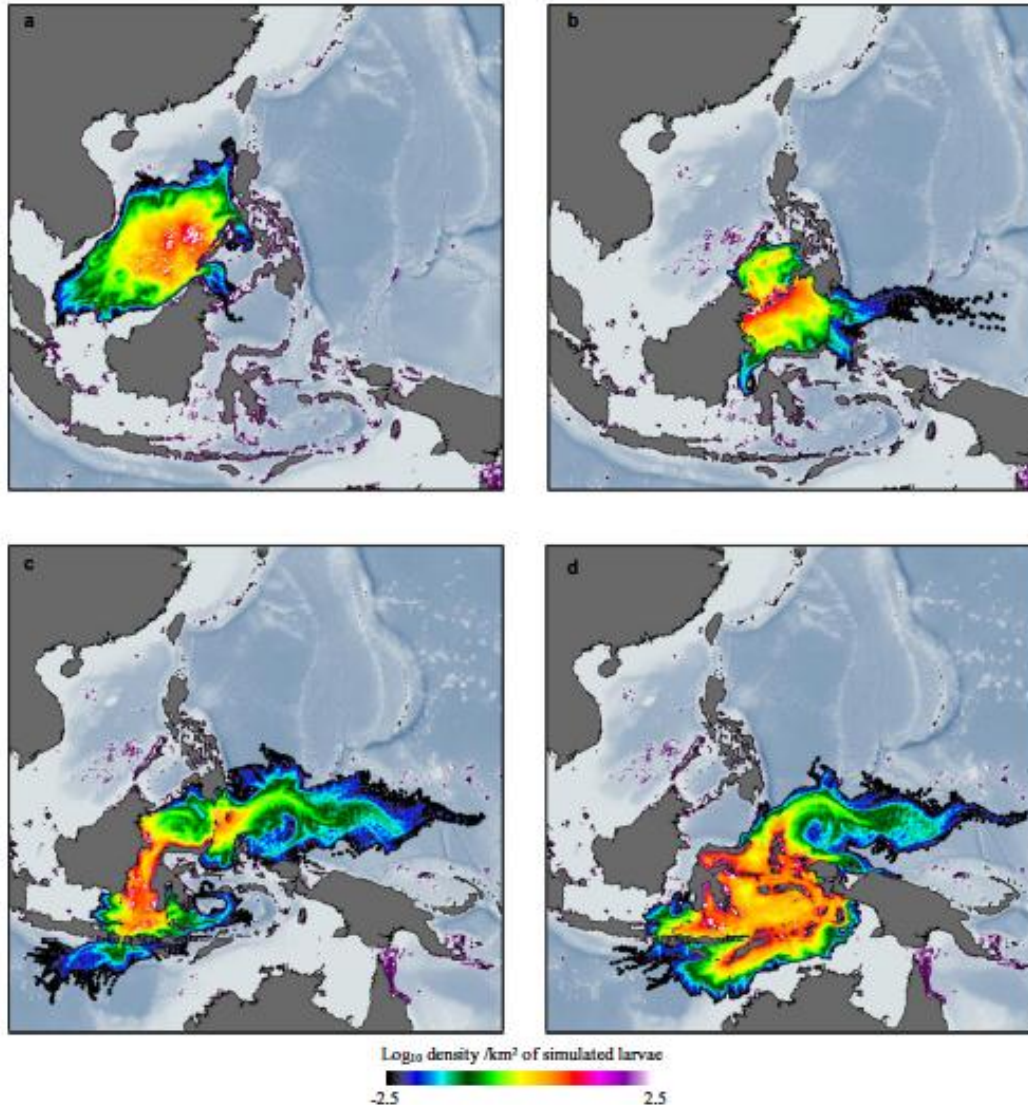
Bohol Sea

Marginal Sea with significant flow from Pacific to Sulu Sea

Bohol Jet and Iligan Bay Eddy



Semi-enclosed nature of archipelagic basins and implications to reef connectivity



Kool et al, 2011

Summary

- Archipelagic marginal seas semi enclosed with topographic sills
- Sills play important role in determining properties of the deep waters of basins and degree of mixing (influences productivity)
- Monsoonal forcing
- Funneling of wind between islands (and along boundaries of marginal seas) can produce wind jets which drives enhanced mixing and upwelling – contribution to productivity

Challenges

- Understanding the dynamics of marginal seas
 - No accurate representation of winds over the archipelagic basins
 - Land-sea-air interaction – orographic effects, runoff
- Small time and space scales /high variability – more difficult to measure and to predict