

The Philippine Rise (= Benham Rise) Exploration, Mapping and Assessment

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from presentations of

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The Philippine Rise (= Benham Rise)

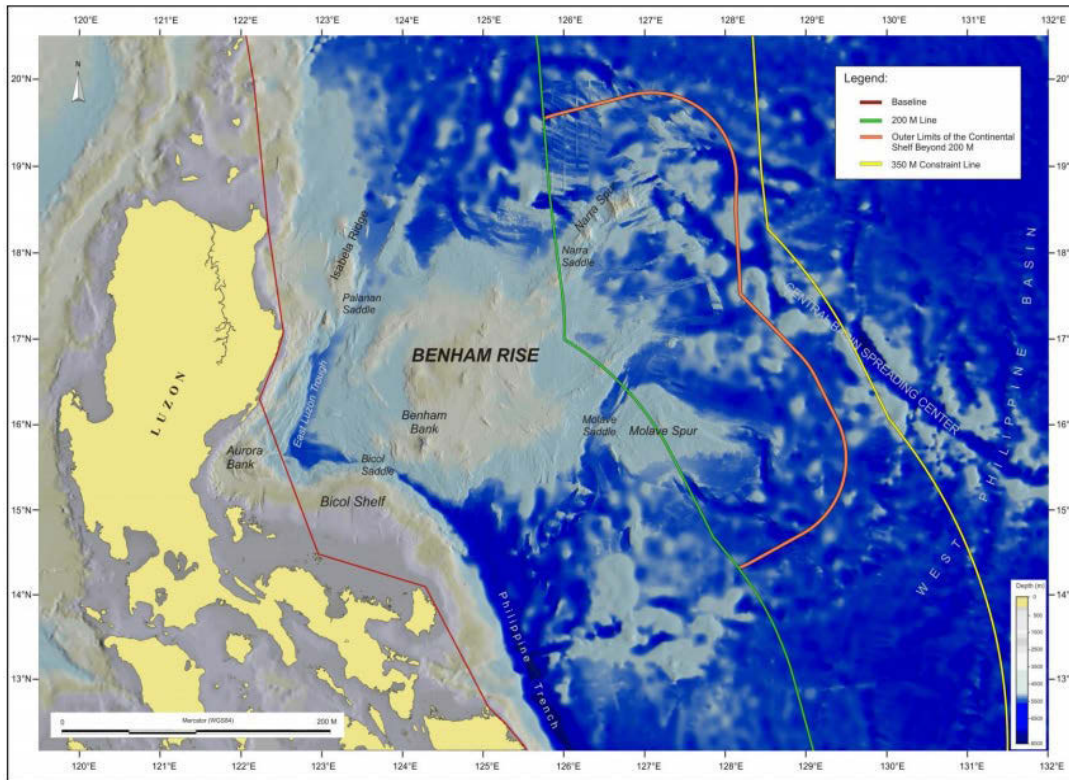
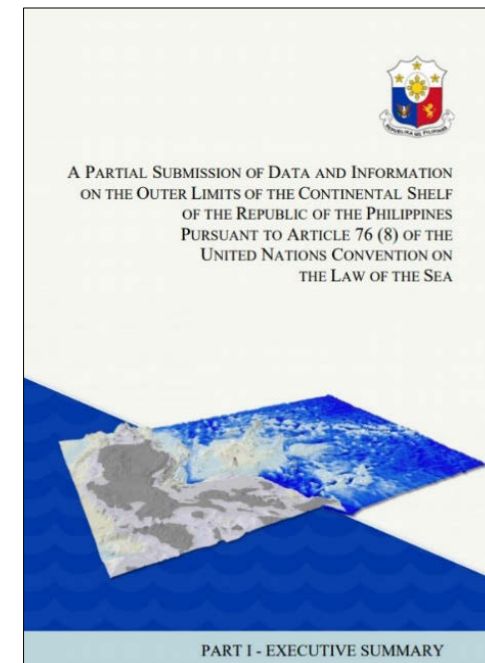


Figure 1. The outer limits of the continental shelf beyond 200 M in the Benham Rise region. The 200 M line and the 350 M constraint line are also shown

UNCLOS granted the Philippines its claim for Benham Rise as ECS in April 2012



- Extinct volcanic ridge
- 2,000 m rise from 5,000 m seafloor
- 250 km wide plateau
- Benham Bank is the shallowest area

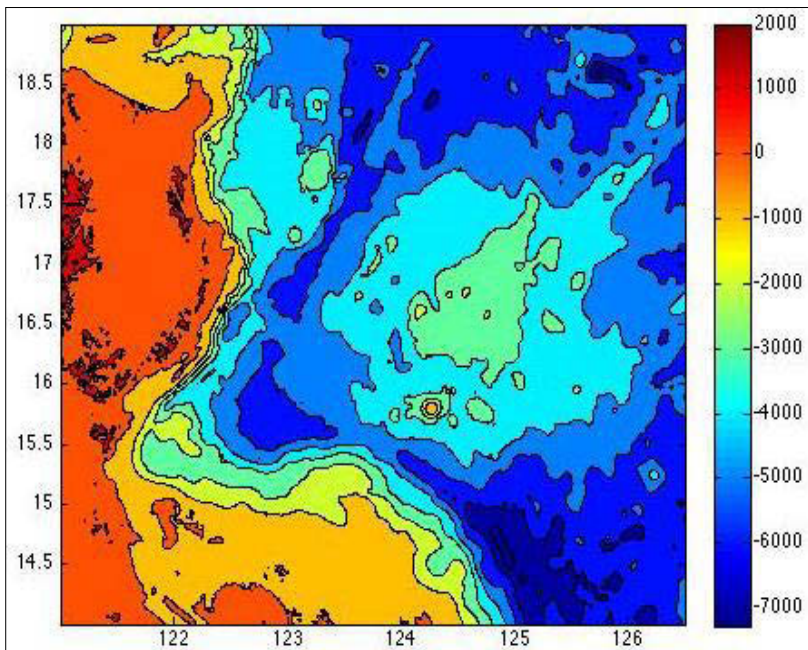


Figure 2. Bathymetry of eastern Luzon showing Benham Rise

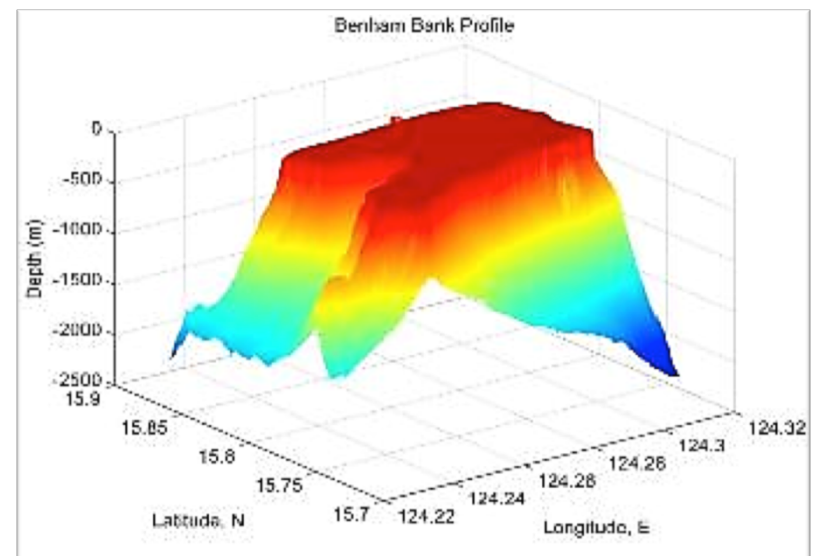
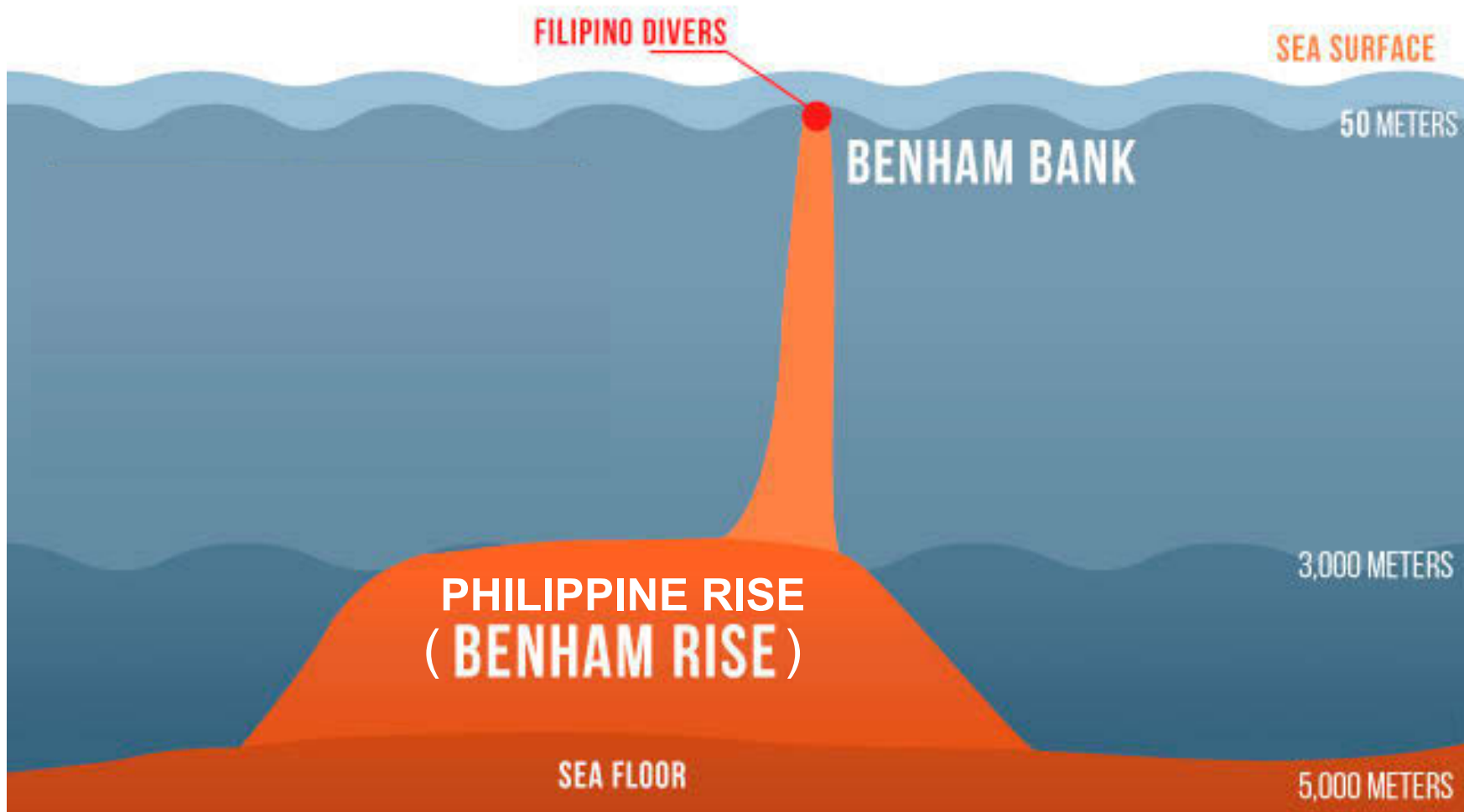
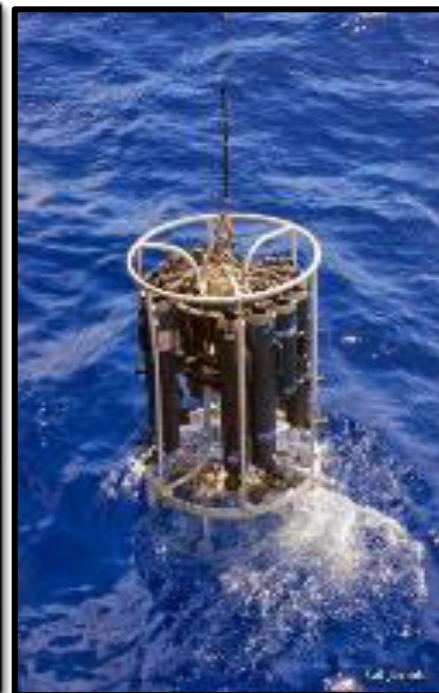
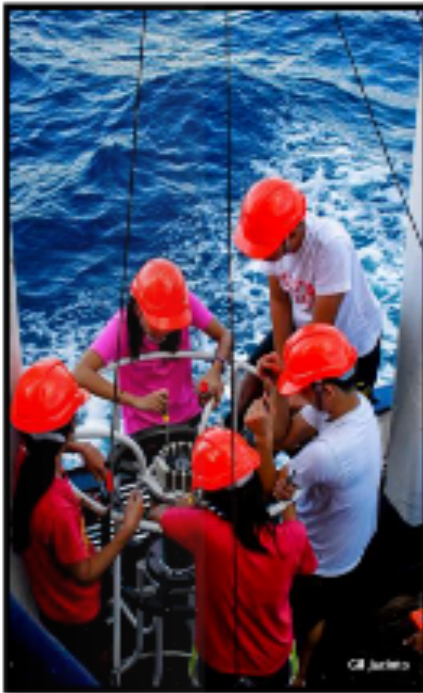


Figure 3. 3D map of Benham Bank



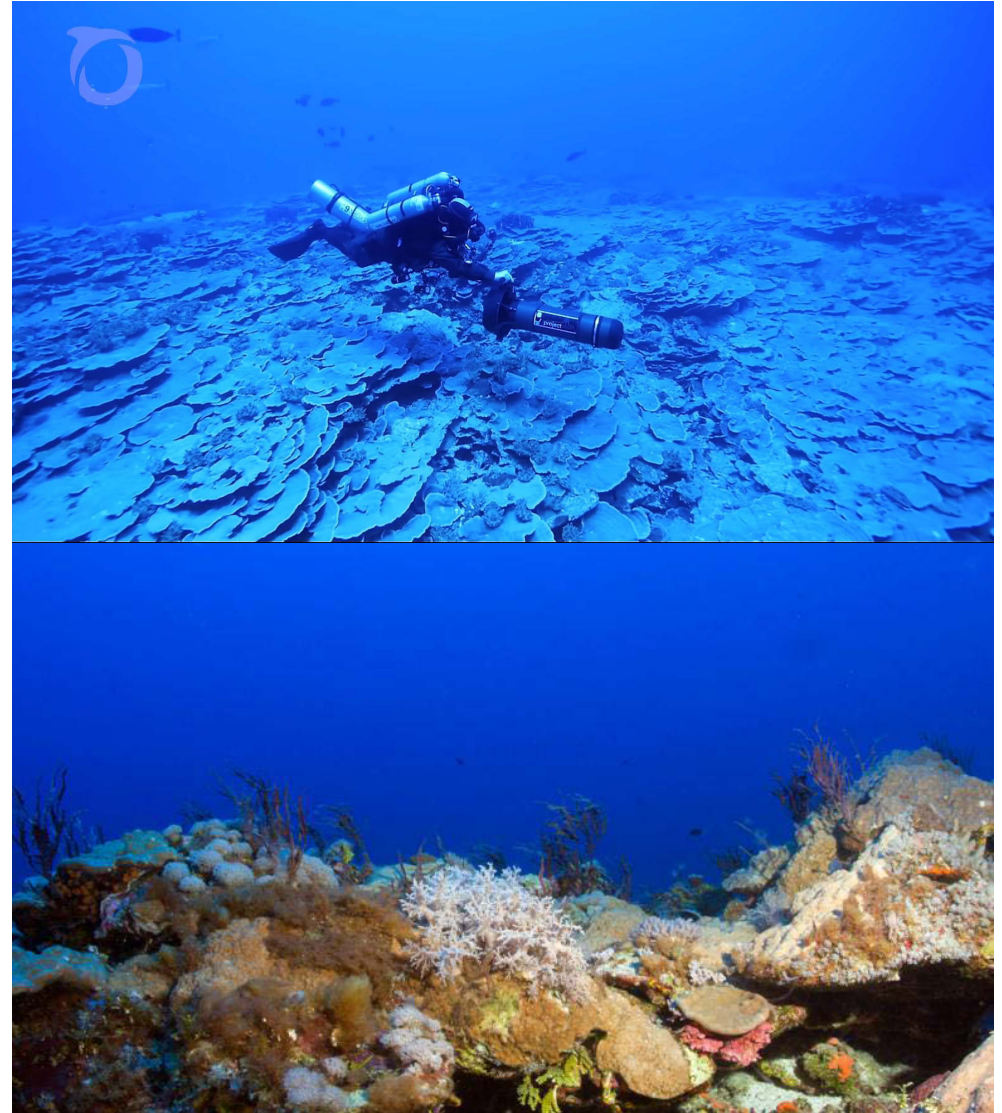
Research Cruise 2014 onboard M/V DA-BFAR (3-17 May 2014)

- The first all-Filipino oceanographic exploration
- Conducted several dives and oceanographic surveys



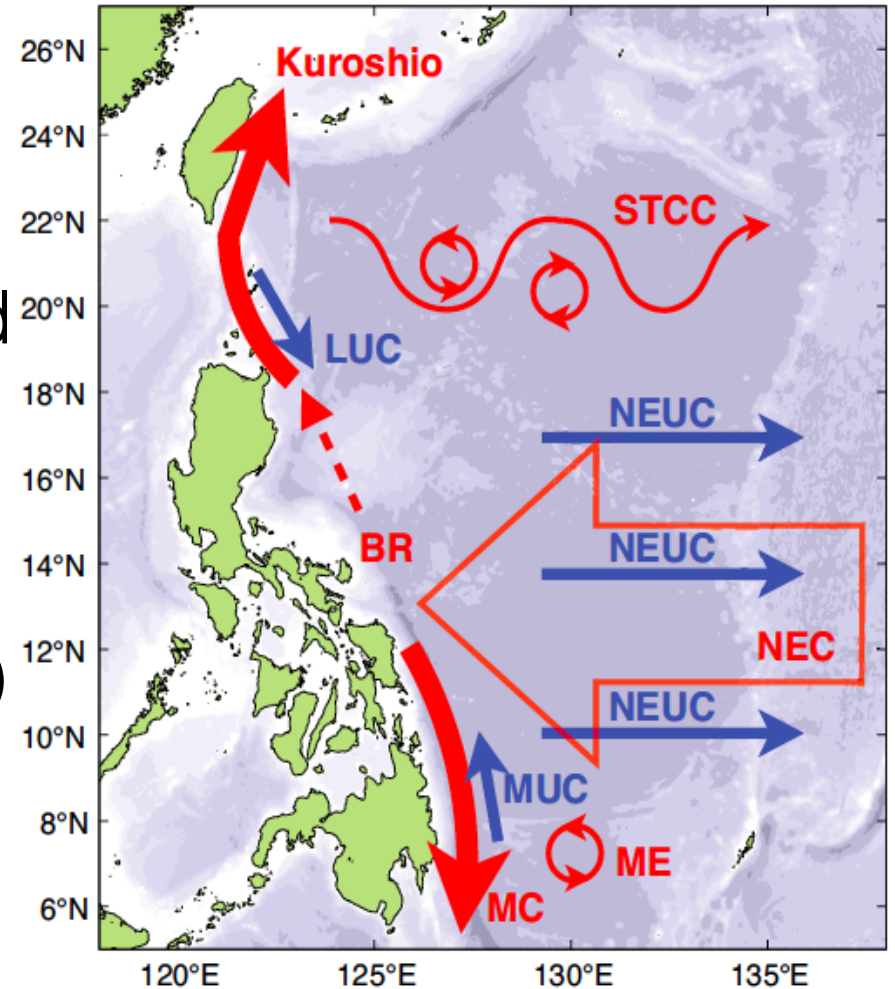
Benham Rise Expedition (23-31 May 2016)

- M/V DA-BFAR
- Remotely Operated Vehicles (ROV) surveys
 - 11 stations
 - total observation time of about 13 hours
 - 122 species were identified



Surface Circulation in the Philippine Sea

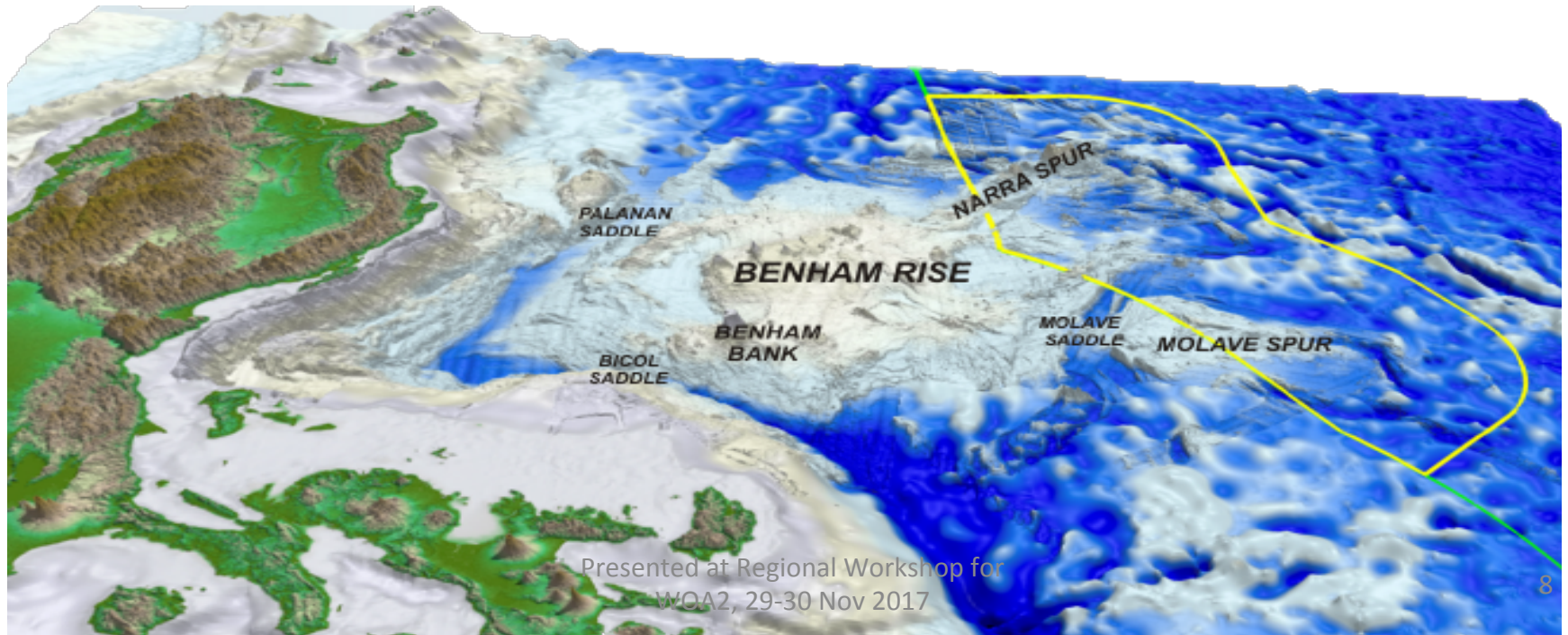
NEC splits and gives rise to the Kuroshio (north) and Mindanao Currents, resulting in increased biological productivity (~ increased fish biomass)



Red arrows = surface currents (0-100 m)
Blue arrows = subsurface (800-1500 m)

Significance of the Philippine (Benham) Rise

- Site of dynamic oceanographic interactions in the Pacific
- Potential resources: Fisheries, Biodiversity, Geologic resources



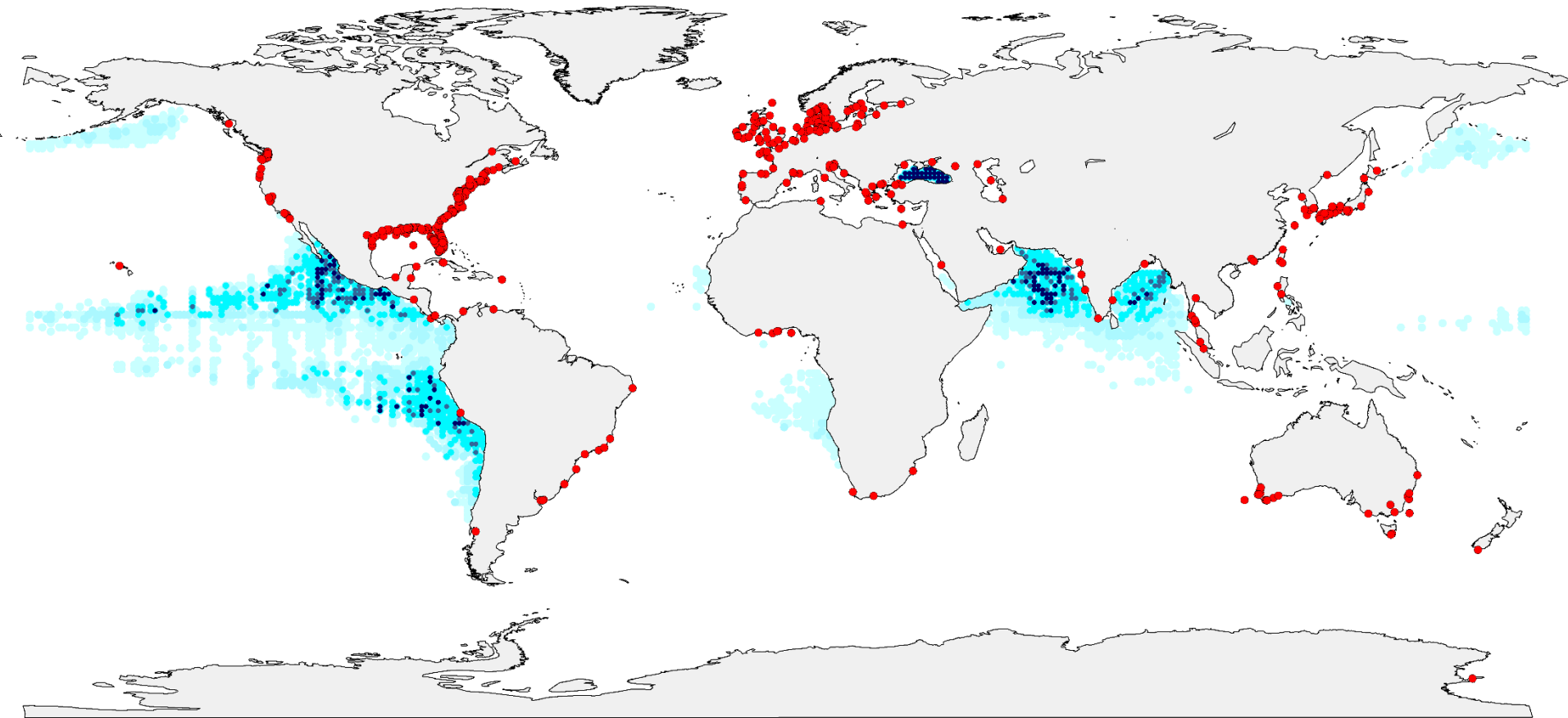
AN AQUATIC PHARMACY: THE BIOMEDICAL POTENTIAL OF THE DEEP SEA

BY SARA MAXWELL

DEEP-SEA ORGANISMS HAVE UNIQUE ADAPTATIONS *that enable them to survive in cold, dark, and highly pressurized environments. As a result of these unique environments, deep-sea species often produce chemical compounds not found in their shallow-water or tropical counterparts that aid in their defense and survival in the deep sea. Compounds that protect corals and sponges from predation can also protect humans from a variety of ailments such as cancer, Alzheimer's disease, and even pain (Newman and Cragg, 2004).*

The Ocean is Losing its Breath....

coastal waters



Breitburg et al, in prep

Diaz & Rosenberg 2008 and unpublished update

UN Ocean Atlas

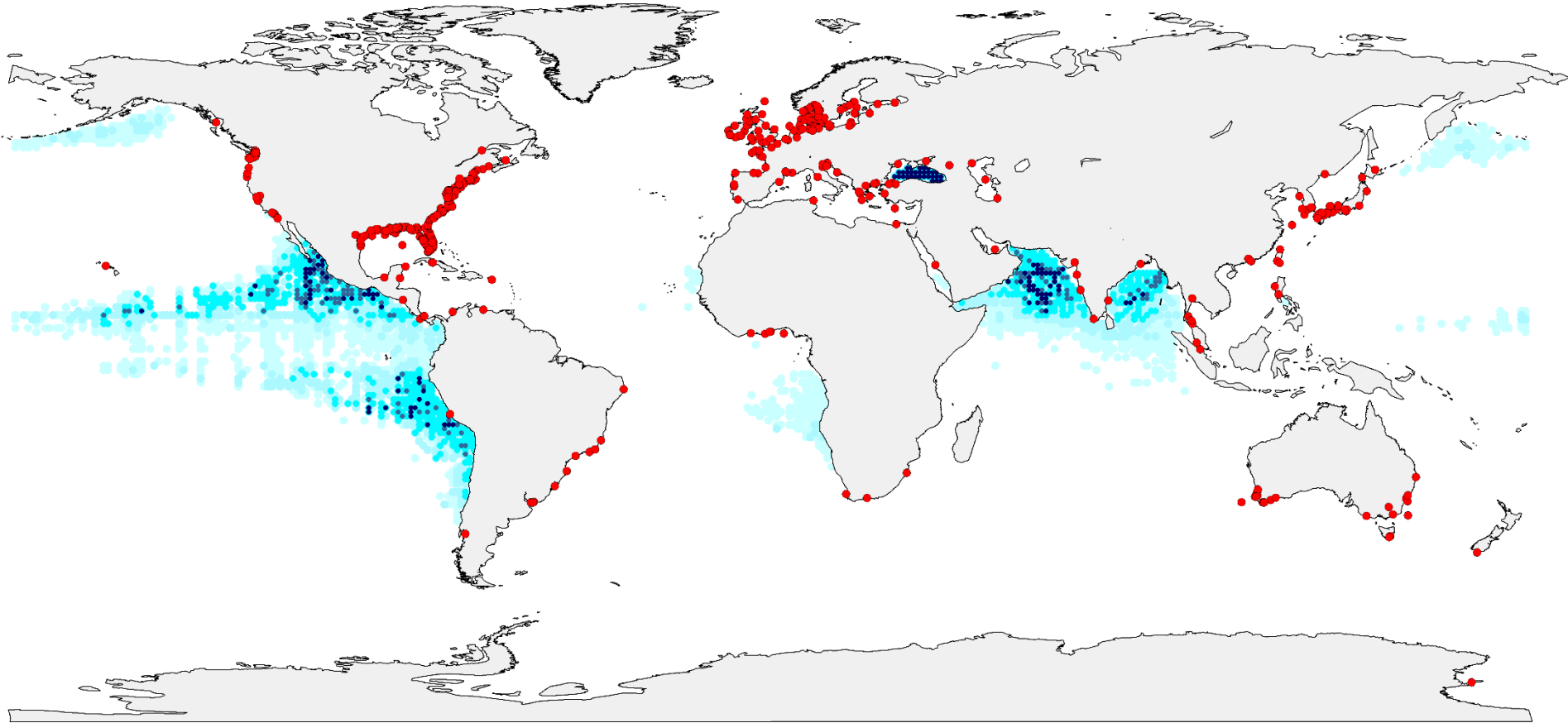
Over 500 systems with only 20-25% oxygen saturation (or less)

Lack of sites in developing countries often lack of monitoring – map is known sites

Presented at Regional Workshop for
WOPAC, 29-30 Nov 2017

The Ocean is Losing its Breath....

open ocean



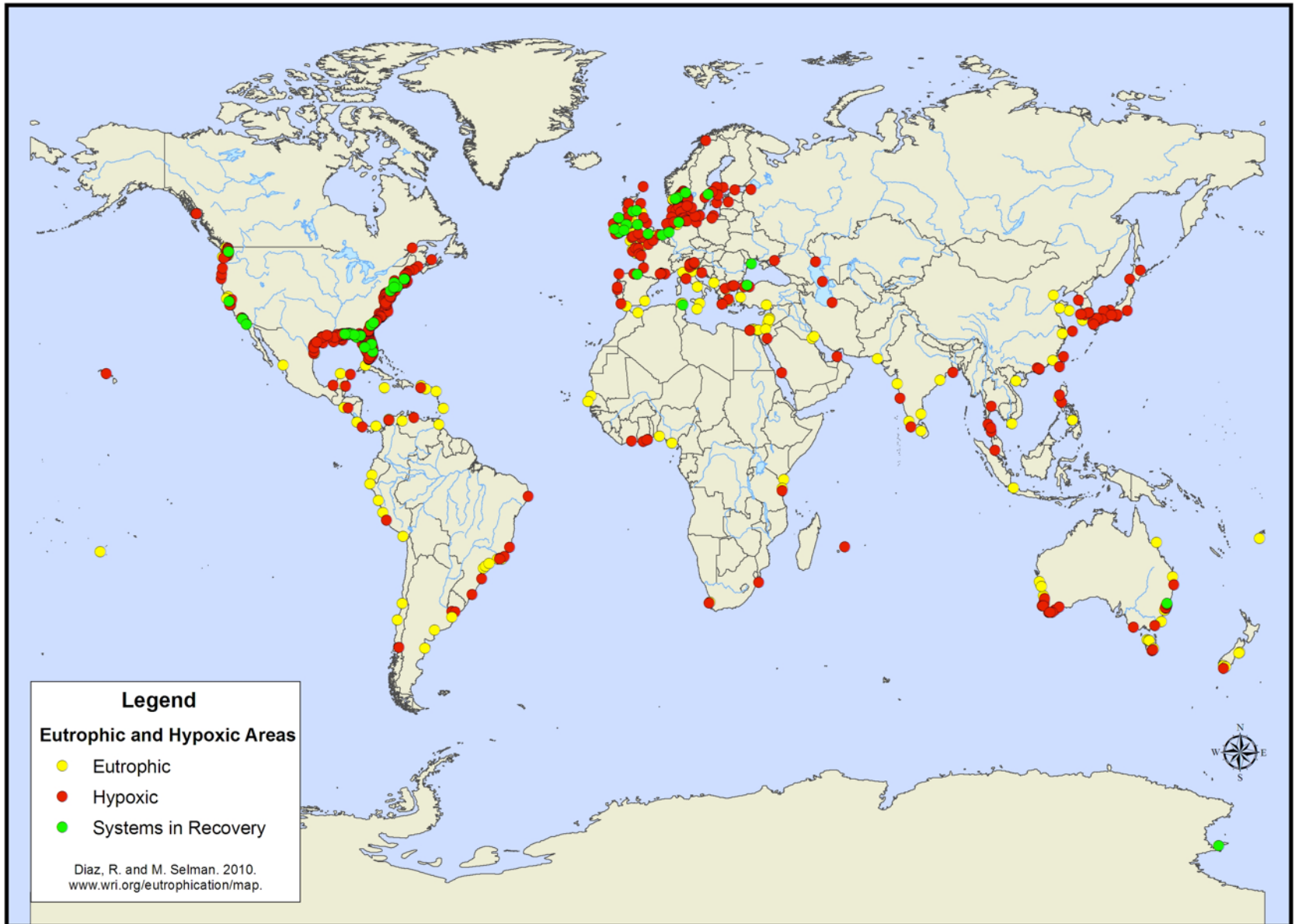
Over the past 5 decades:

Oxygen minimum zones have expanded 4.5 million km² ~ ½ the area of the US

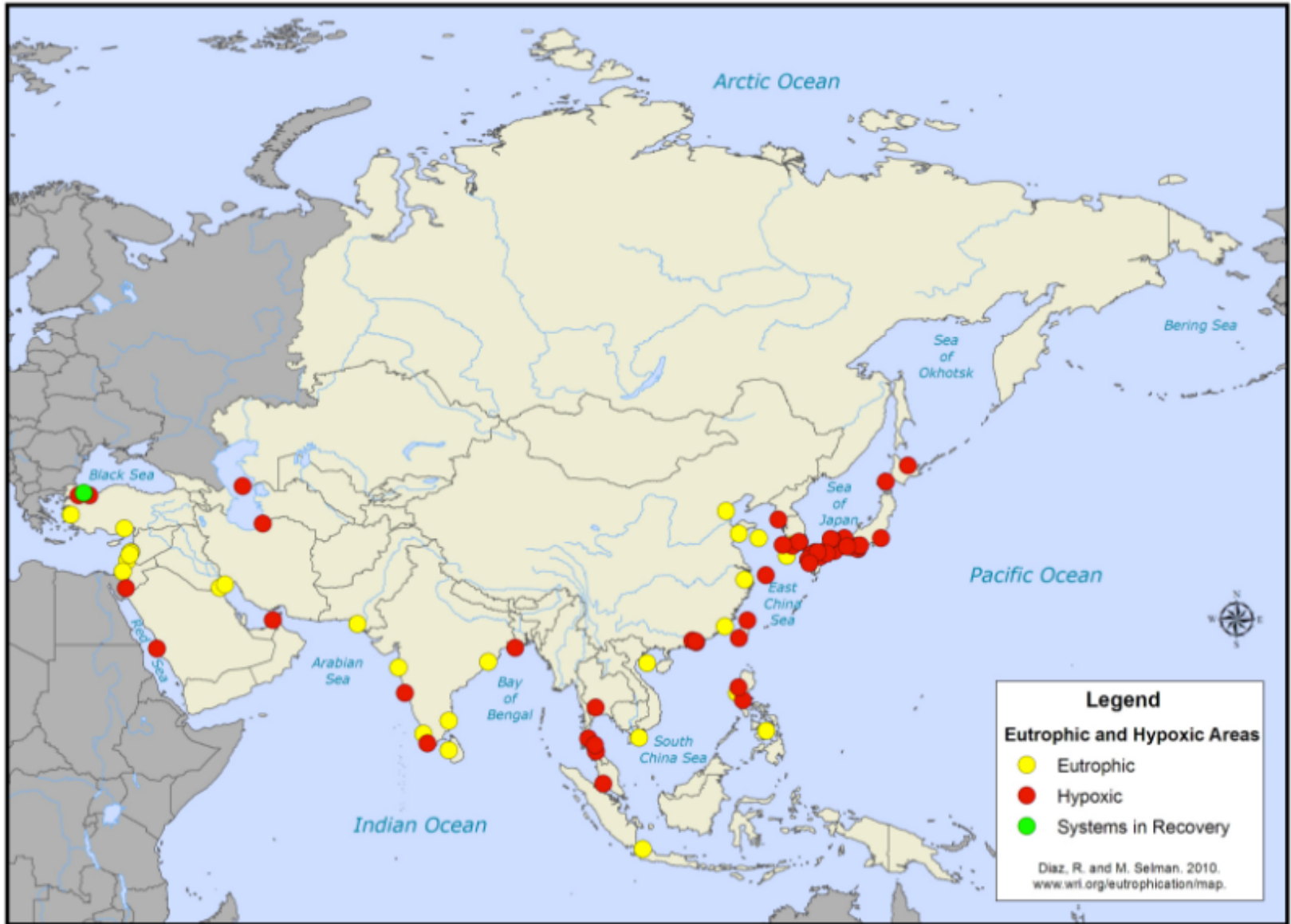
The oceans have lost 8 million metric tons of O₂/year =

almost 1 m thick layer of oxygen across the entire contiguous 48 states

World Hypoxic and Eutrophic Coastal Areas



Eutrophic and Hypoxic Coastal Areas of Asia



<http://www.wri.org/resources/maps/coastal-eutrophic-and-hypoxic-areas-asia>

Presented at Regional Workshop for

WOA2, 29-30 Nov 2017