POTENTIAL OF BLUE CARBON IN THE PHILIPPINES

SEAGRASS MEADOWS

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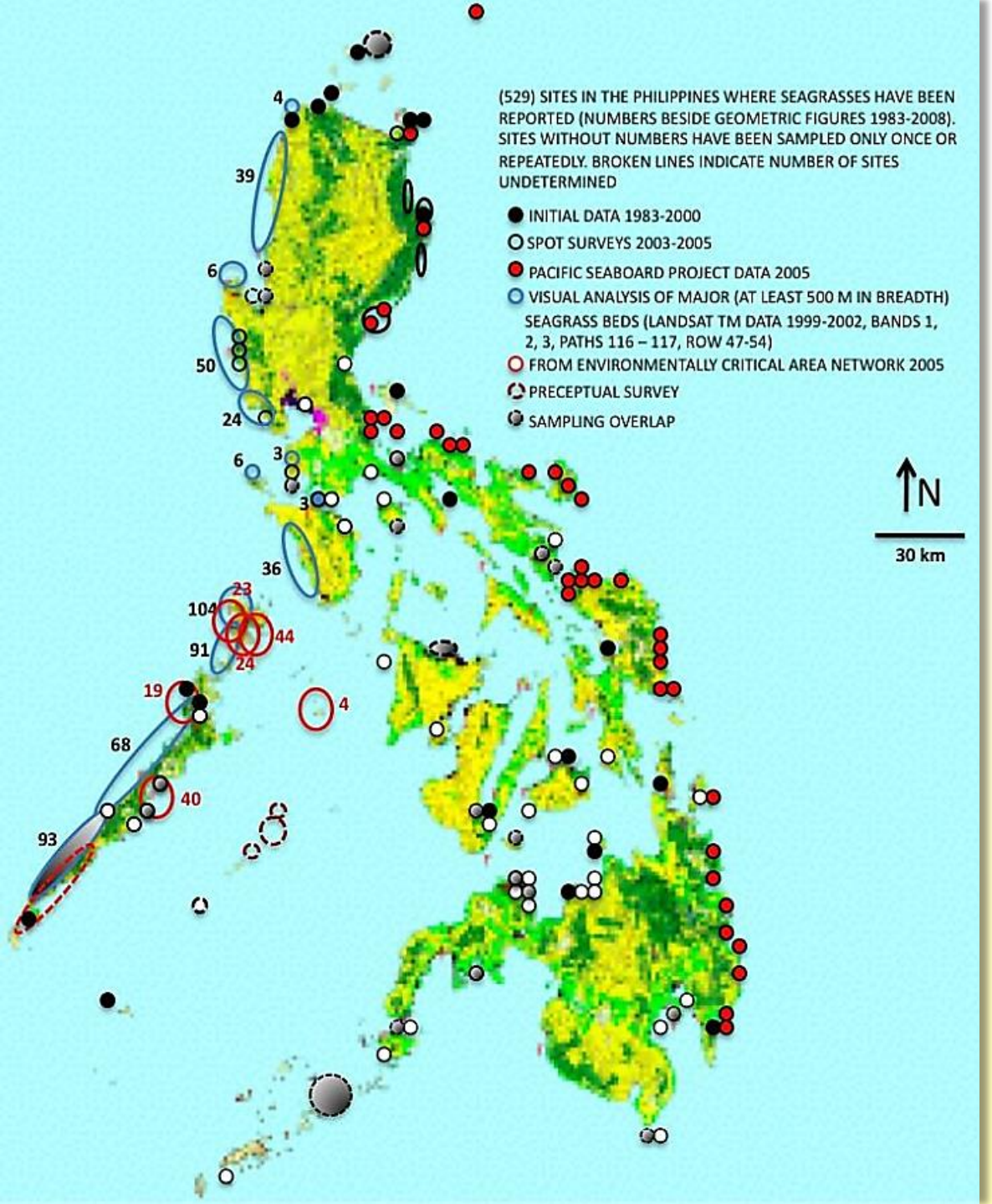


SEAGRASS IN THE PHILIPPINES

27,282 km²

seagrass area

(Fortes 2008)

18 species

(Fortes 2013)

CARBON SEQUESTRATION IN SEAGRASS MEADOWS

In megagram carbon dioxide per hectare (**Mg CO_2 ha^{-1}**)

522
Global estimate
(Pendleton et al. 2012)

439
Indonesia
(Alongi et al. 2015)

506
Singapore
(Phang 2015)

218
Banacon Is, Bohol
(Gevaña et al. 2015)

BLUE CARBON IN SEAGRASS MEADOWS

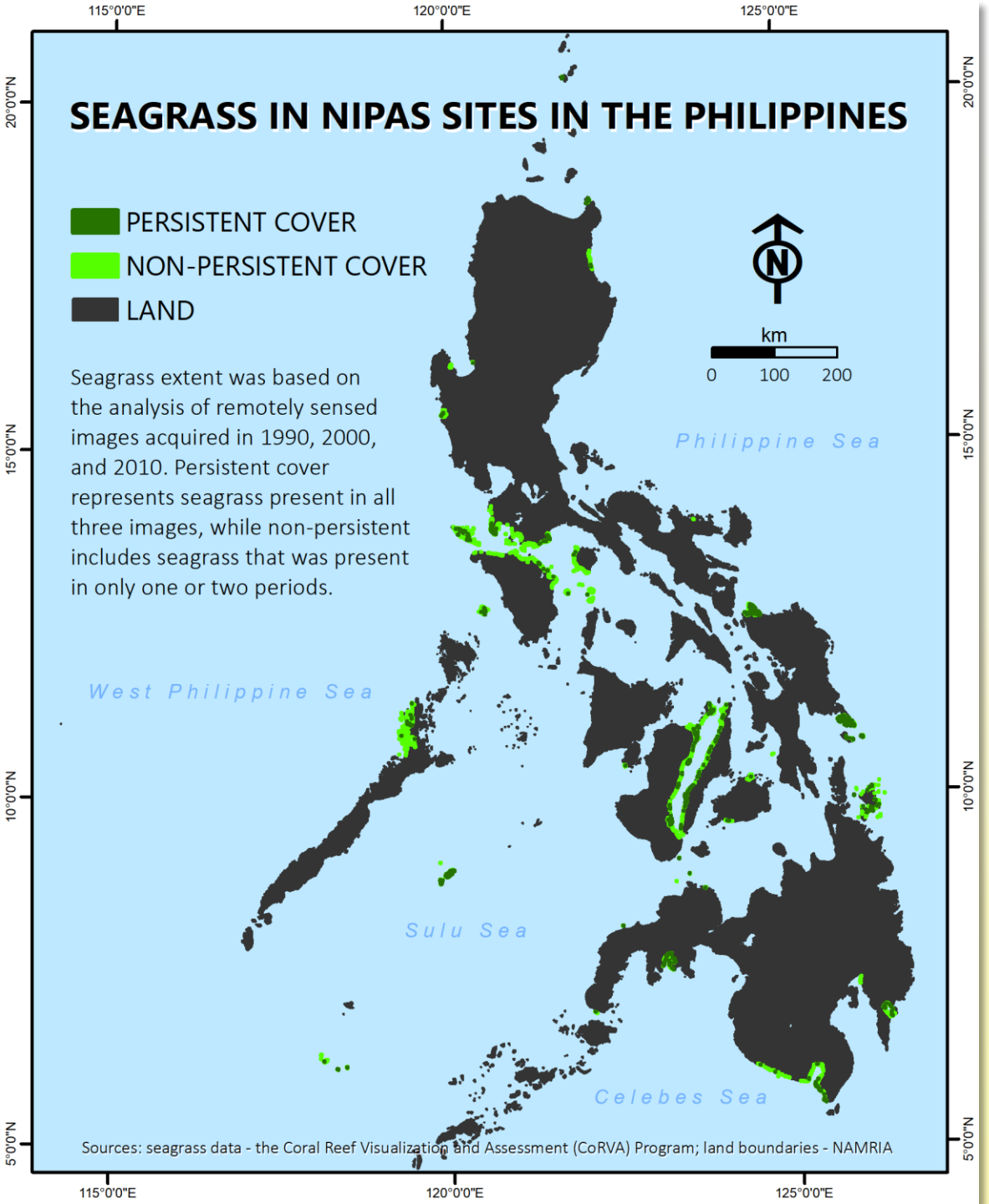
27,282 km^2 seagrass area (Fortes 2008)

X

439 (Mg CO_2 ha^{-1}) Indonesia (Alongi et al. 2015)

1.2 billion Mg CO_2

National



SEAGRASS IN THE PHILIPPINE

National Integrated Protected Areas System

222.7km² (1990)

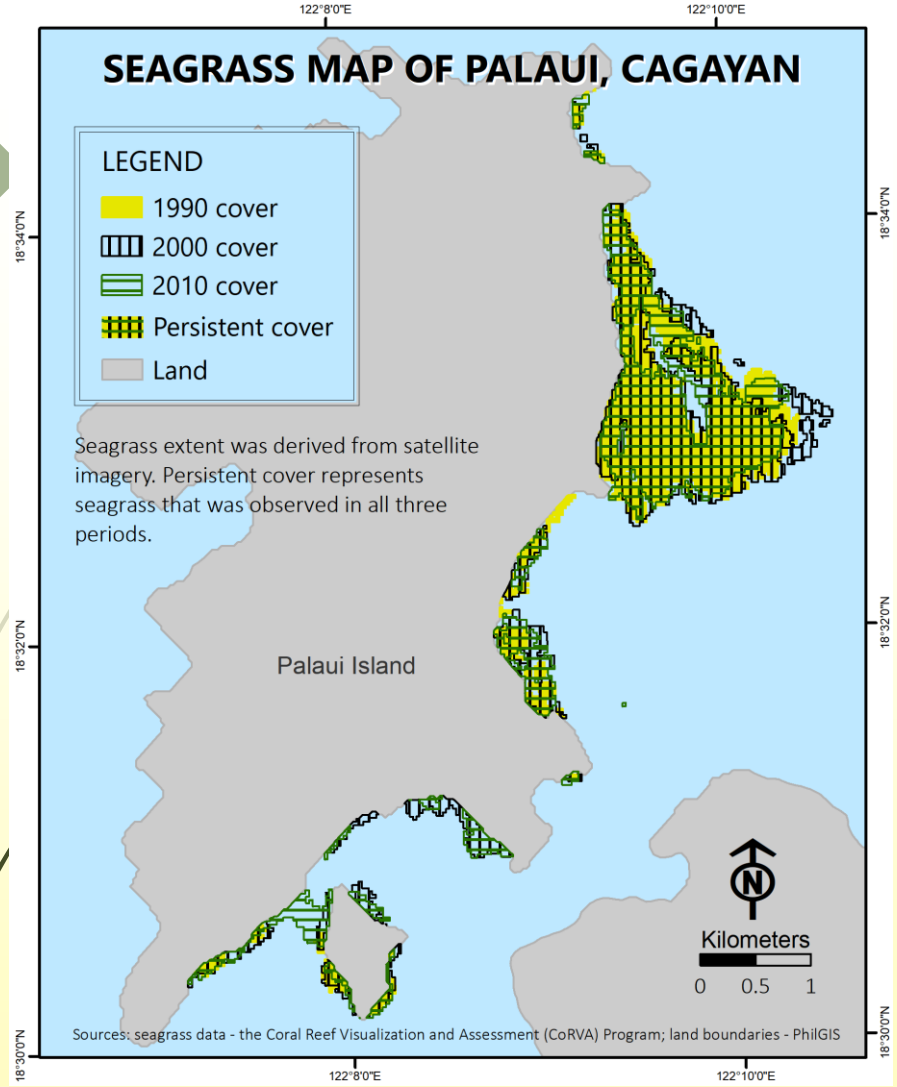
283.4km² (2000)

275.7km² (2010)

(CoRVA Program)

SEAGRASS IN THE PHILIPPINE

National Integrated Protected Areas System



57.3 km² (20-25%)

persistent seagrass in NIPAS sites from 1990 to 2010

(CoRVA Program)

465.1 km²

Changing cover of seagrass in NIPAS sites from 1990 to 2010

(CoRVA Program)

C_{org} concentration and density varied with sediment depth and tended to increase from unvegetated to restored sites [revegetation] and the continuously vegetated meadow..
Marba et al. (2015)

BLUE CARBON POTENTIAL OF PH SEAGRASS MEADOWS

1.2 billion Mg CO_2

National

239 million Mg CO_2

in persistent seagrass

THREATS TO SEAGRASS

Fortes, MD 2013 "A Review: Biodiversity, Distribution and Conservation of Philippine Seagrasses":

Problem	Immediate	Short-term	Long-term
Habitat destruction***	1	1	1
Sewage pollution***	2	2	3
Industrial pollution***	3	3	2
Fisheries overexploitation***	4	4	6
Siltation/sedimentation***	5	5	4
Oil pollution **	6	6	8
Hazardous waste*	7	7	7
Agricultural pollution**	8	8	5
Red tides*	9	9	11
Coastal erosion*	10	10	10
Natural hazards*	11	12	12
Sea level rise*	12	11	9

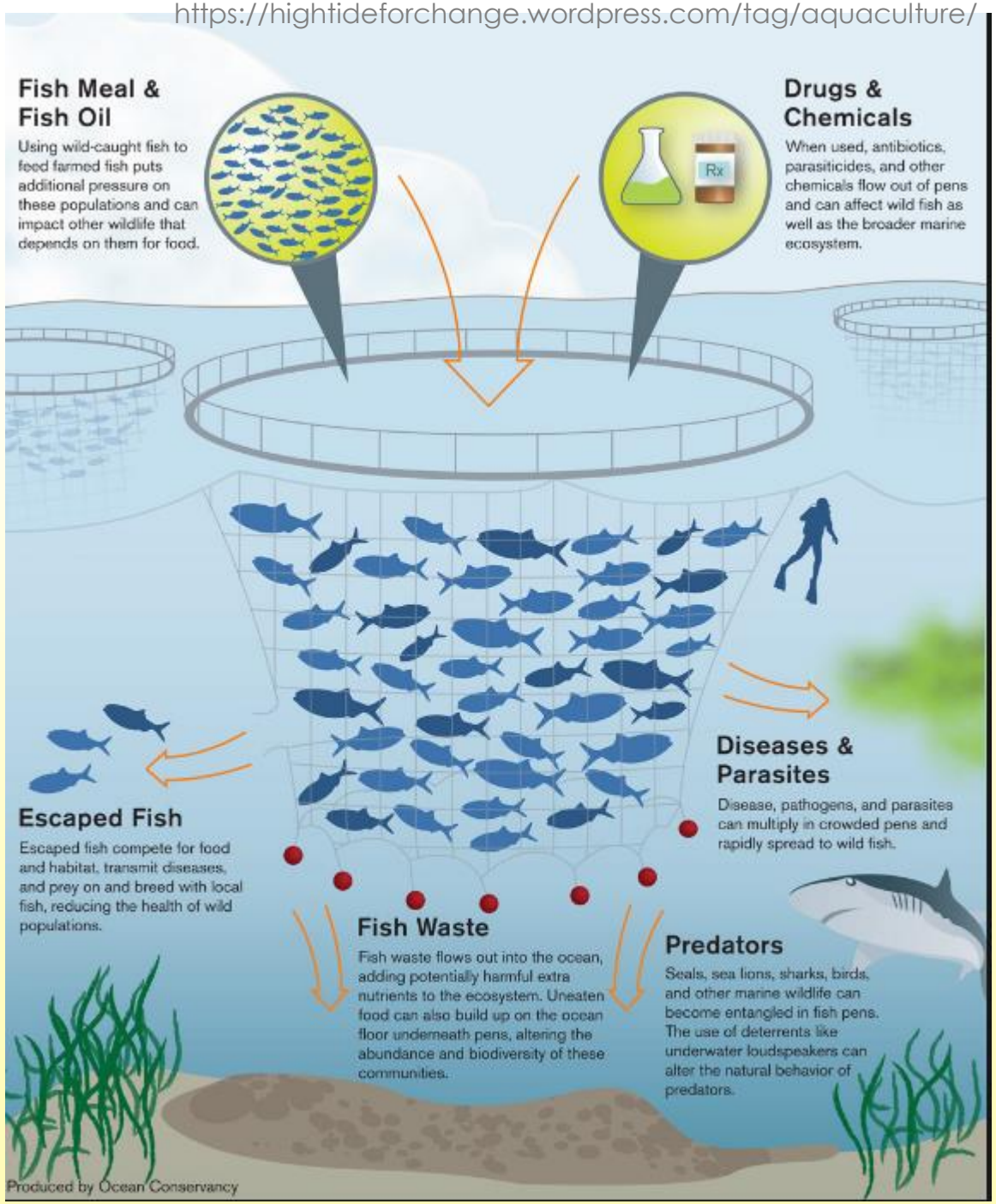
MARICULTURE

Based on increasing sensitivity (decreasing resistance) to a combined effect of nutrients, chlorophyll-a and siltation:

Enhalus acoroides > Thalassia hemprichii >Cymodocea rotundata > Halodule uninervis > C. serrulata > Halophila ovalis > Syringodium isoetifolium.

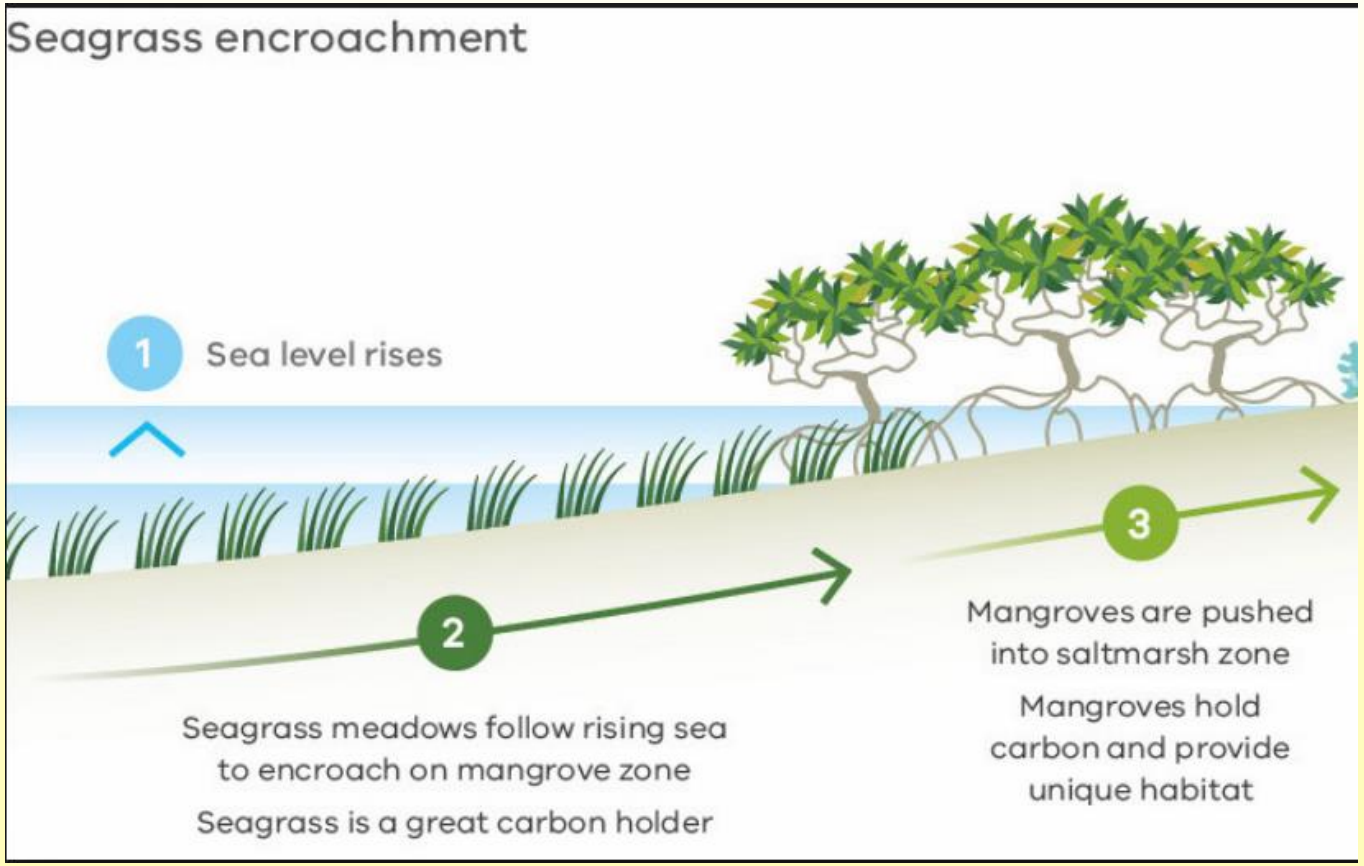
Fortes et al., 2012

https://hightideforchange.wordpress.com/tag/aquaculture/




12 Nov
2017
Google Earth
Image © 2018 DigitalGlobe
N
400 m

MANGROVE REPLANTATION



https://www.ces.vic.gov.au/sotb/chapter/mangroves-saltmarsh

WHERE DO WE GO FROM HERE?

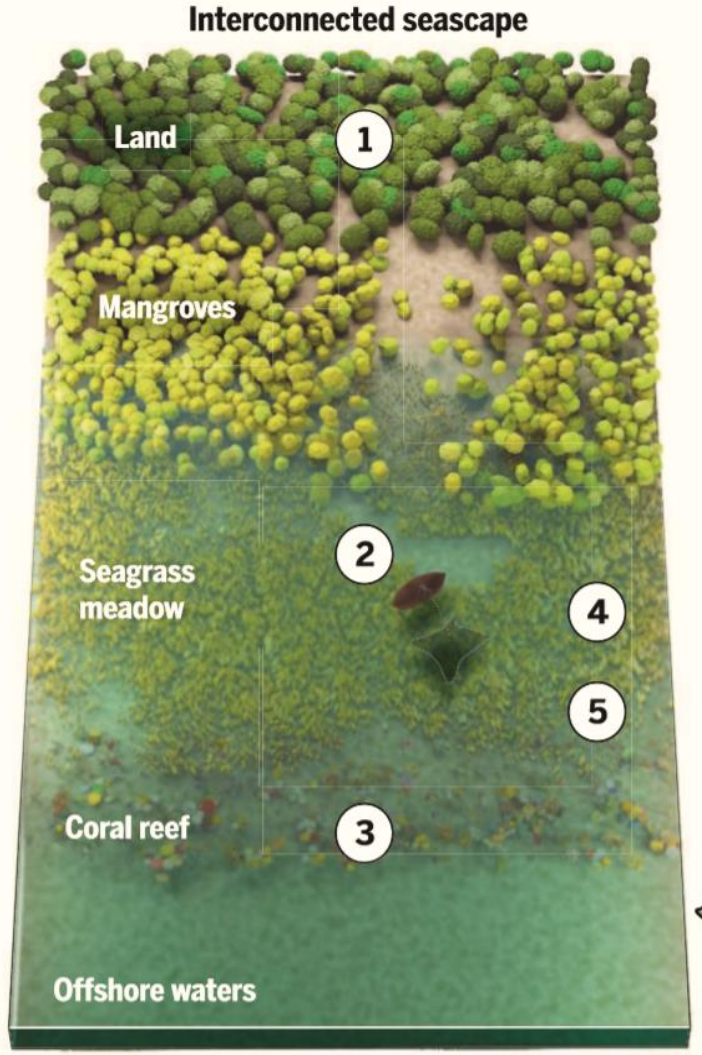
Threats to seagrass meadows

Seagrass meadows supply a vast suite of ecosystem services such as carbon sequestration, fisheries support, and coastal protection. They are part of an interconnected seascape; degradation of any habitat in this seascape has negative consequences for the other component habitats.

Major threats

1 Habitat destruction, coastal development, and aquaculture lead to increasing inputs of nutrients and other pollutants into the sea, threatening coastal habitats.

2 Overfishing threatens biodiversity, ecosystem resilience, and the food security of local people. Anchors and moorings result in direct physical damage to seagrass meadows.

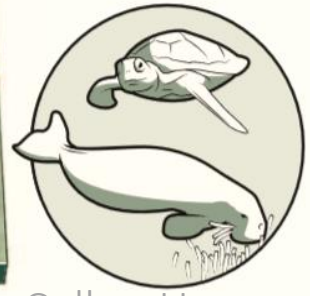


GRAPHIC: V. ALTOUNIAN/*SCIENCE*

Consequences

3 Local buffering of ocean acidification by healthy seagrass meadows may help to reduce the negative impacts of changing pH on nearby **calcifying organisms such as corals.**

4 Seagrass meadows store large amounts of carbon in both the plants and the sediments below. If their integrity is disturbed, this **carbon is released.**

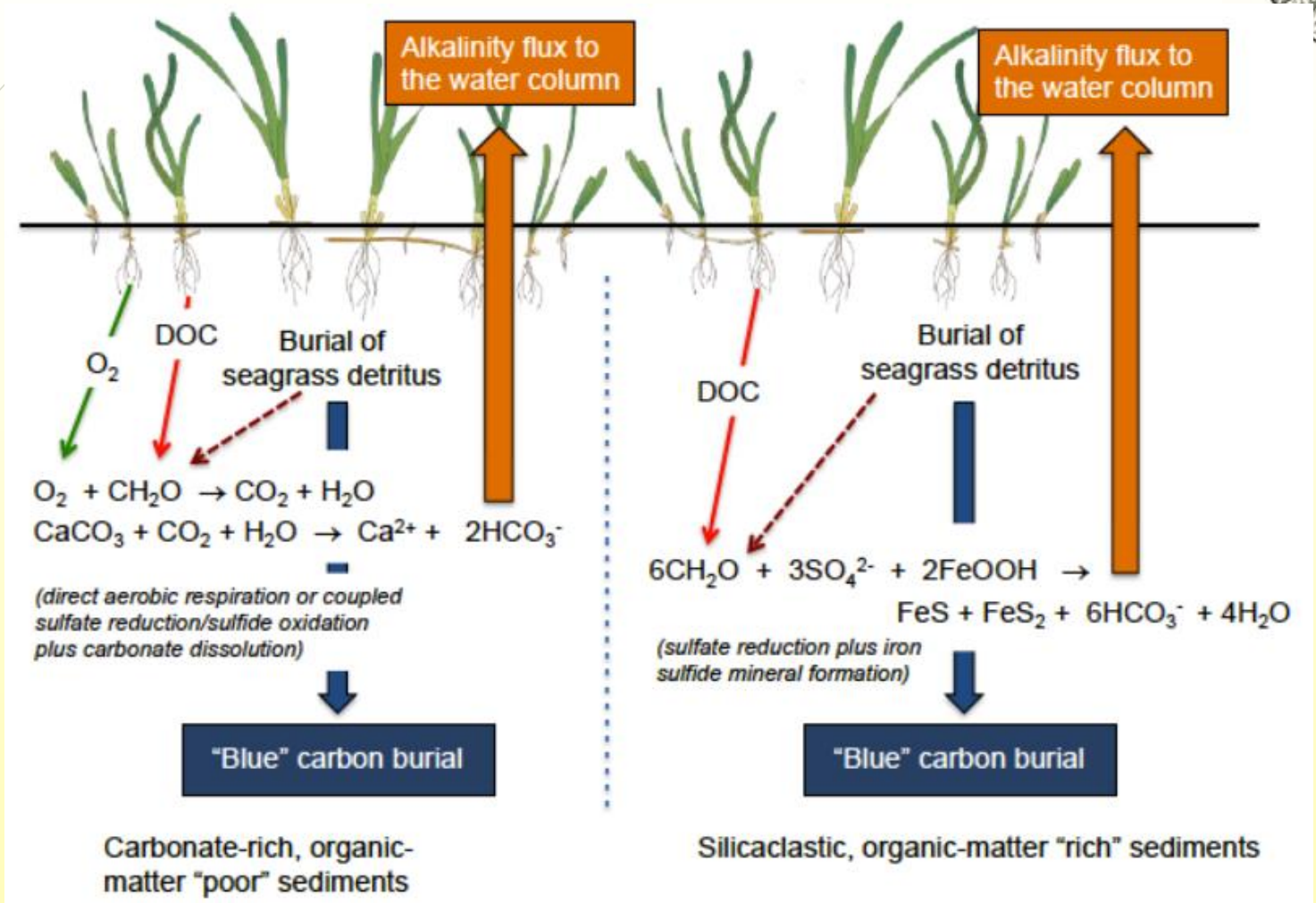


5 Seagrass meadows are important habitats for **marine herbivores** such as turtles and dugong. Loss of these habitats threatens **the survival of these species.**

Cullen-Unsworth & Unsworth, 2018

Consequences

3 Local buffering of ocean acidification by healthy seagrass meadows may help to reduce the negative impacts of changing pH on nearby **calcifying organisms such as corals.**



https://www2.whoi.edu/staff/mlong/projects/project-2/

BLUE CARBON POTENTIAL OF PH SEAGRASS MEADOWS

1.2 billion Mg CO_2

National

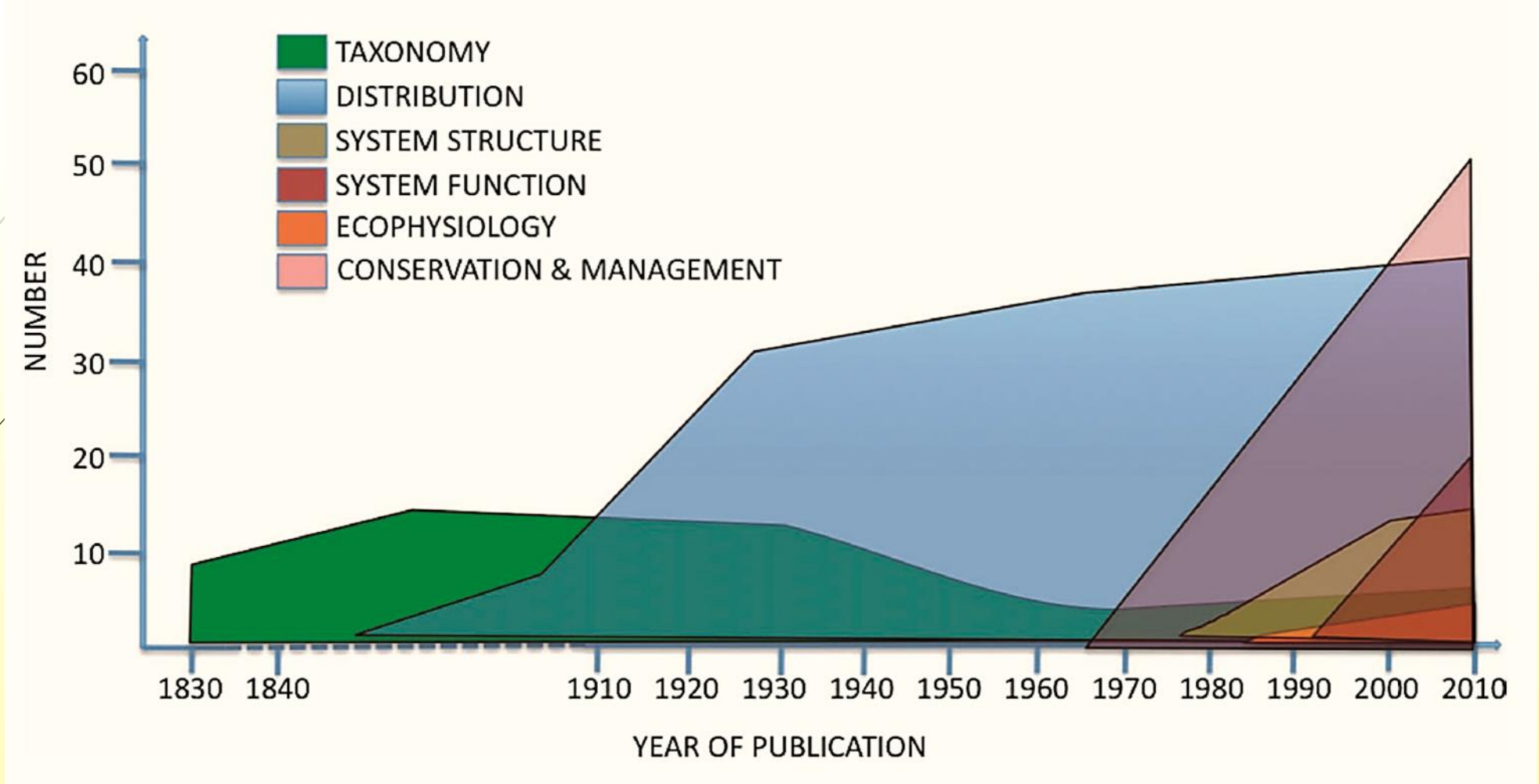
239 million Mg CO_2

in persistent seagrass

756 million Mg CO_2

in seagrass revegetation

Loss of seagrass triggers the erosion of historic carbon deposits/stocks and that **revegetation effectively restores seagrass carbon sequestration capacity . Marba et al. (2015)**



The relative distribution of published materials on seagrass among the 6 major research concerns in the Philippines (1830–2010) (Fortes, M 2012)