State of research on climate mitigation benefits from conservation and restoration of blue carbon systems

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Tidal Wetland Ecosystem Services

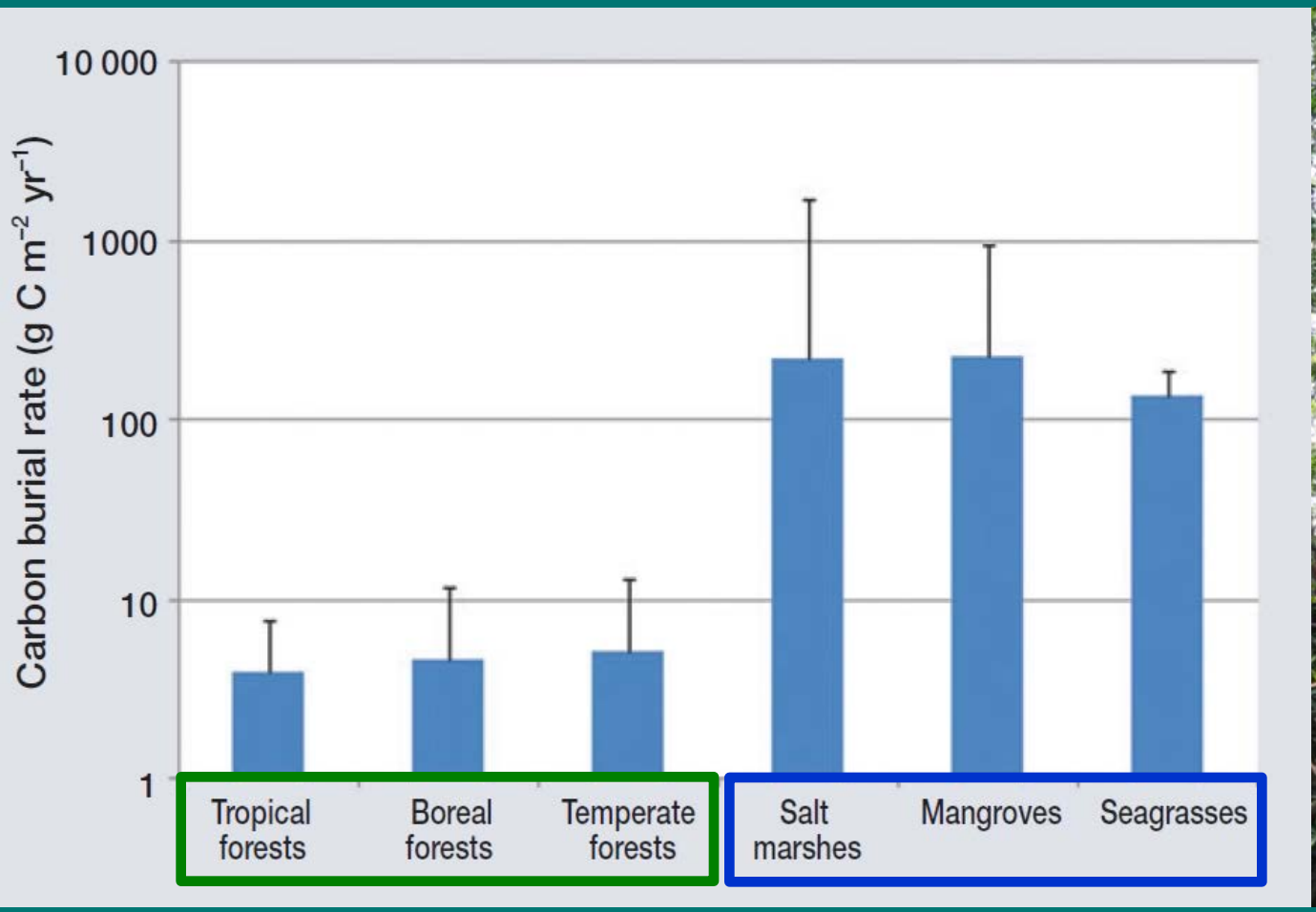
Sea Level-Driven C Sequestration Capacity

carbon deposited with sediment

carbon from plants

Created by Adam Langley

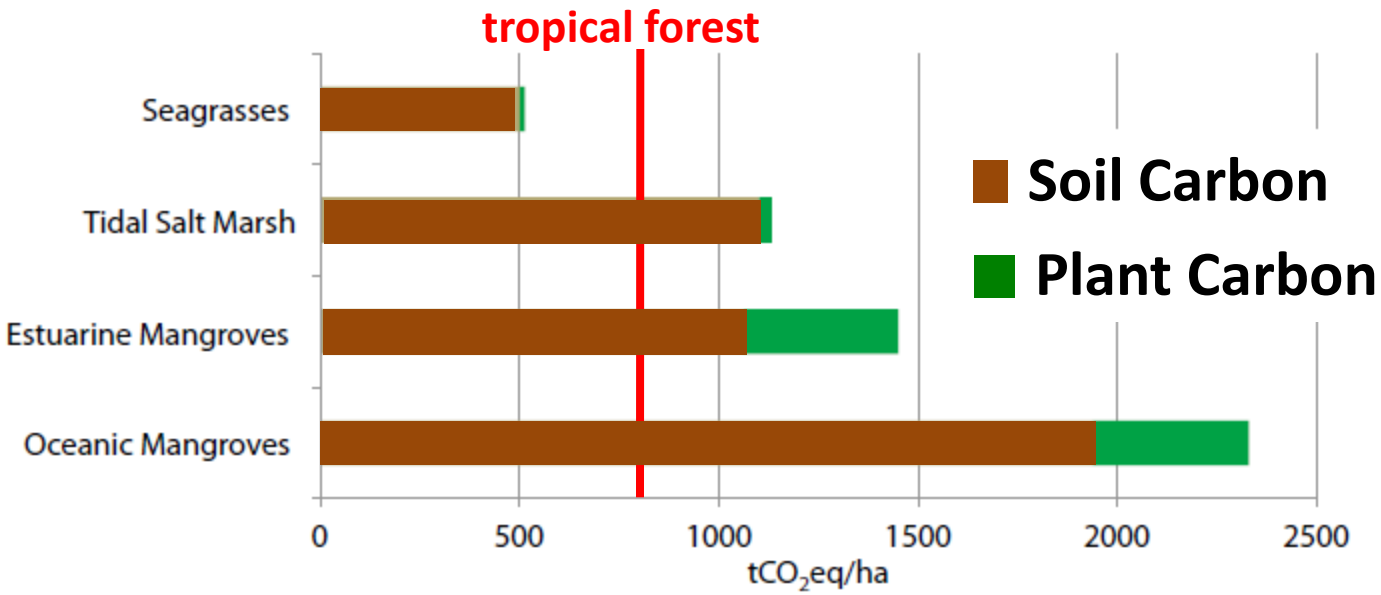
Annual Rate of Carbon Storage



McLeod et al. 2011, Frontiers

Blue Carbon Pools

Figure 2. Global averages for carbon pools (soil organic carbon and living biomass) of focal coastal habitats.



Murray et al. 2010, Nicholas Institute Policy Brief

Threats to Blue Carbon Ecosystems

Kirwan & Megonigal 2013, *Nature*

Carbon Losses from Blue Carbon Ecosystems

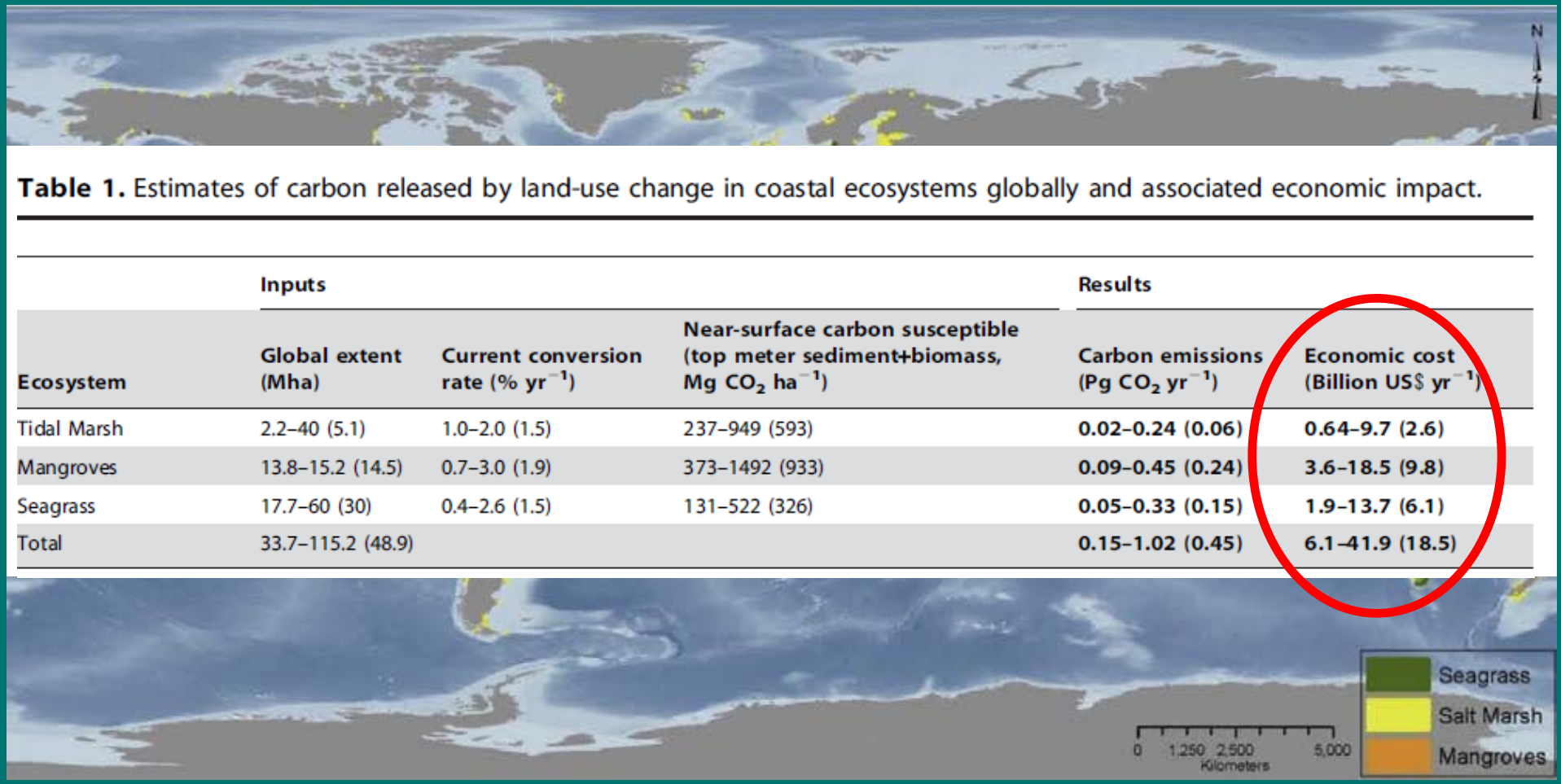
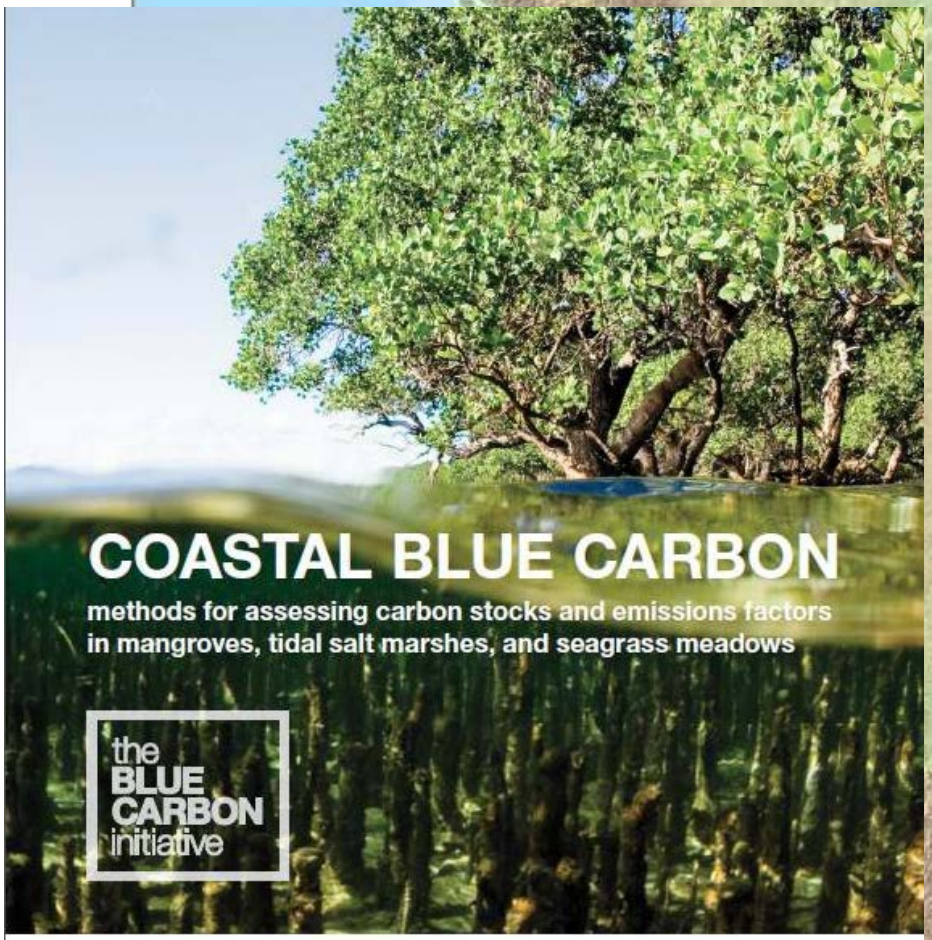


Table 1. Estimates of carbon released by land-use change in coastal ecosystems globally and associated economic impact.

	Inputs			Results	
Ecosystem	Global extent (Mha)	Current conversion rate (% yr^{-1})	Near-surface carbon susceptible (top meter sediment+biomass, Mg CO_2 ha^{-1})	Carbon emissions (Pg CO_2 yr^{-1})	Economic cost (Billion US$ yr^{-1})
Tidal Marsh	2.2–40 (5.1)	1.0–2.0 (1.5)	237–949 (593)	**0.02–0.24 (0.06)**	**0.64–9.7 (2.6)**
Mangroves	13.8–15.2 (14.5)	0.7–3.0 (1.9)	373–1492 (933)	**0.09–0.45 (0.24)**	**3.6–18.5 (9.8)**
Seagrass	17.7–60 (30)	0.4–2.6 (1.5)	131–522 (326)	**0.05–0.33 (0.15)**	**1.9–13.7 (6.1)**
Total	33.7–115.2 (48.9)			**0.15–1.02 (0.45)**	**6.1–41.9 (18.5)**

Pendleton et al. 2012, *PLoS One*

Figure 13: Geographic Distribution of Estimates of Carbon Storage in Salt Marsh Sediments



Howard et al. 2014

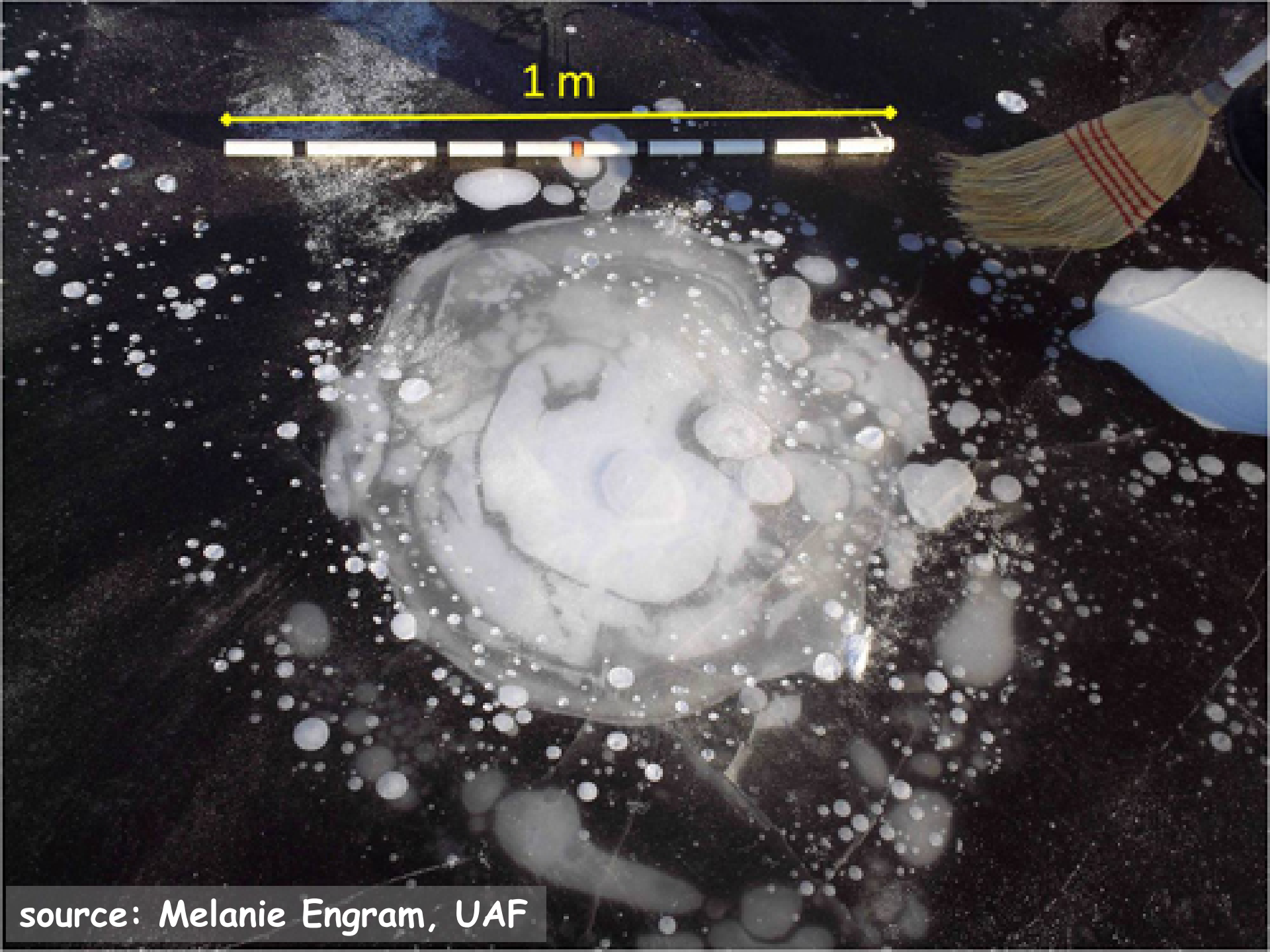
CEC. 2013. North American Blue Carbon Scoping Study.

Challenges to Carbon Accounting

METHODOLOGY FOR TIDAL WETLAND AND SEAGRASS RESTORATION

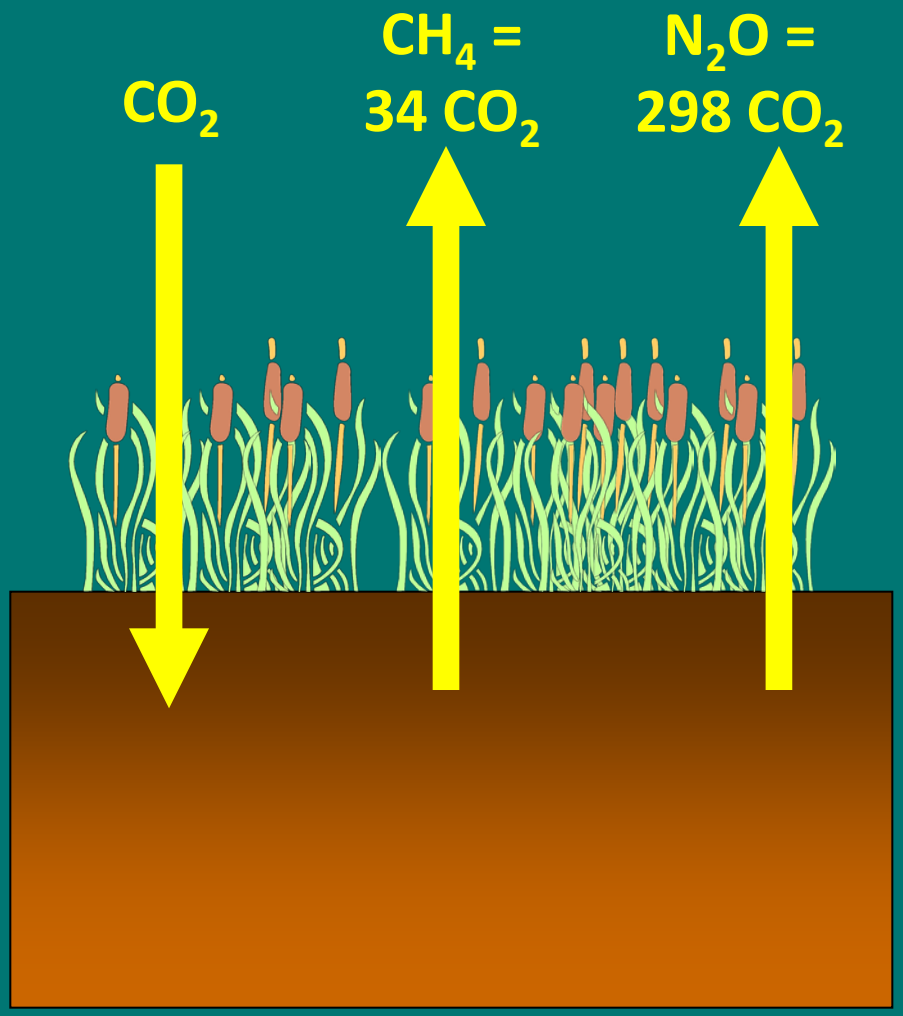
RESTORE AMERICA'S ESTUARIES

Title	Methodology for Tidal Wetland and Seagrass Restoration
Version	2013-1205
Date of Issue	27 January 2014
Type	Methodology
Sectoral Scope	14. Agriculture Forestry and Other Land Use (AFOLU) Project category: ARR + RWE
Prepared By	Silvestrum, University of Maryland, Restore America's Estuaries, Dr. Stephen Crooks, Smithsonian Environmental Research Center, Chesapeake Bay Foundation, University of Virginia

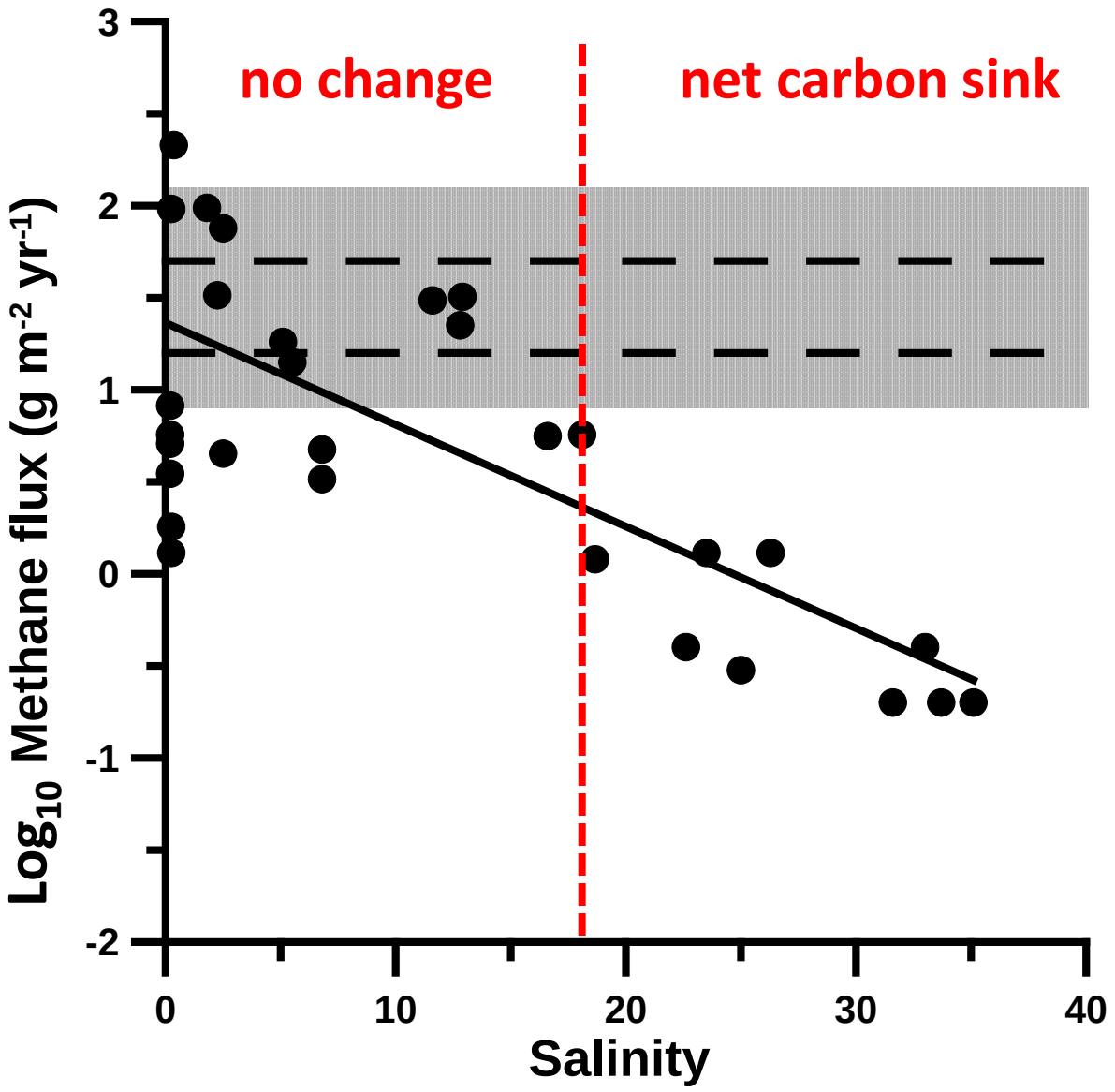


source: Melanie Engram, UAF

Radiative Forcing by CH_4 and N_2O

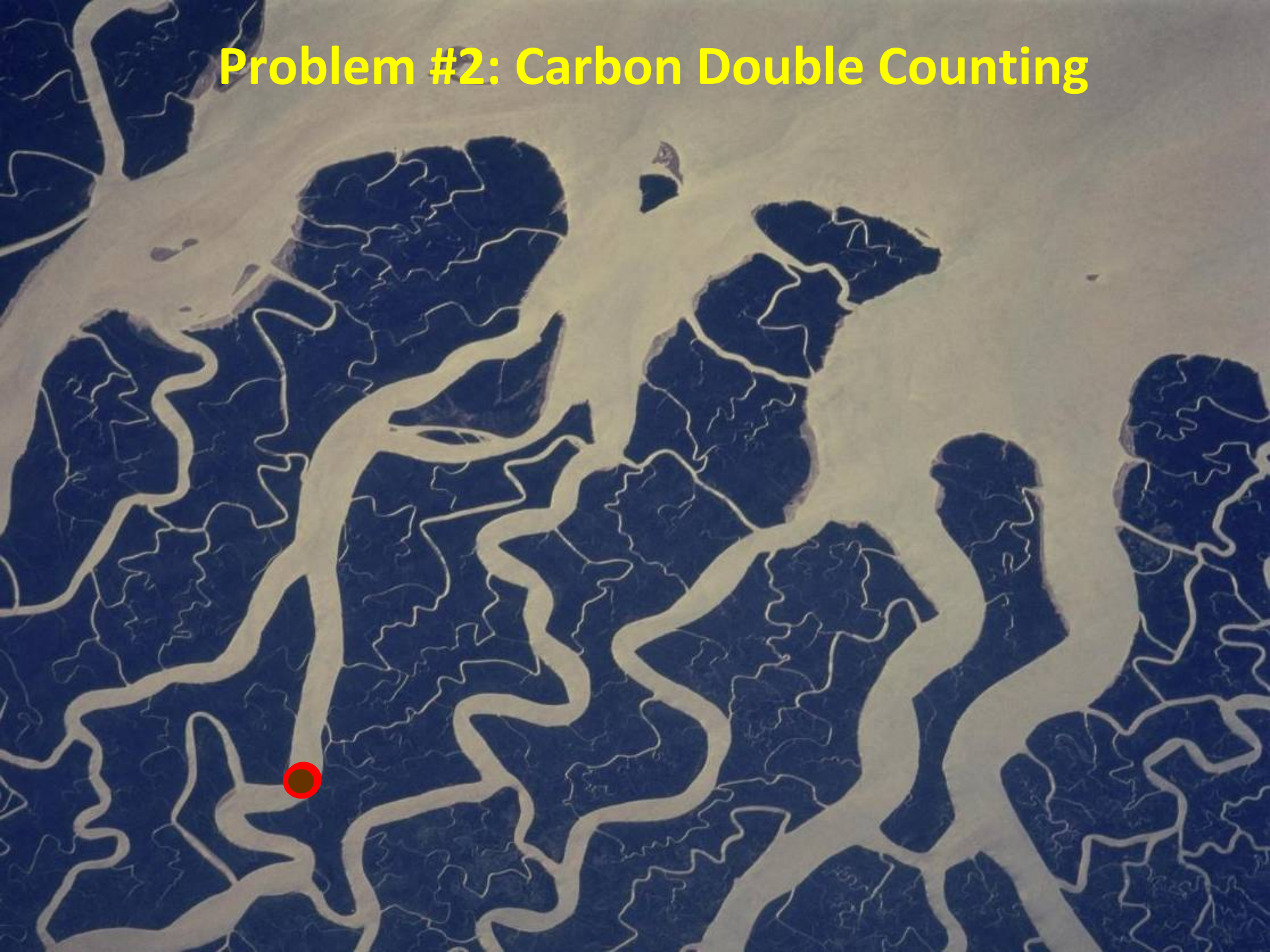


Problem #1: CH_4 and N_2O Emissions

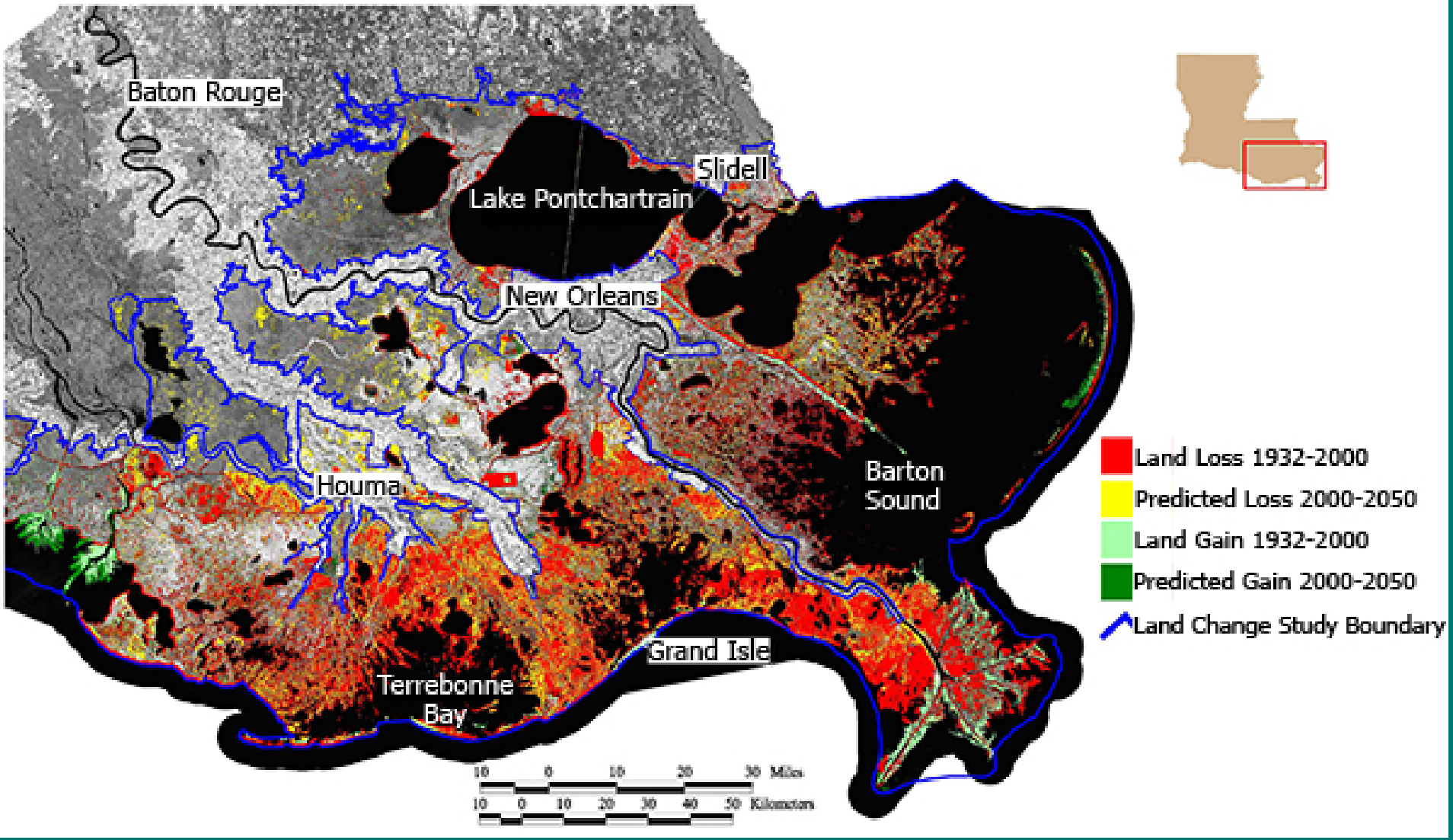


Poffenberger, Needelman & Megonigal (2011)

Problem #2: Carbon Double Counting



Problem #3: Stability Against Sea Level Rise



USGS

Thank You

Nickolay Lamm
StorageFront.com