Socio-Economic Value and Ecosystem Services Benefits of Blue Carbon

David W. Yoskowitz

Blue Carbon Workshop
Mission-Aransas NERR
November 5, 2015

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Blue Carbon

Are our wetlands less valuable?


VALUE

Paradox of Value (diamond-water paradox)

The idea: Although *water* is more useful (need it to survive) than diamonds, diamonds command a higher price and are thought of as more valuable.

Are wetlands worth less than diamonds?

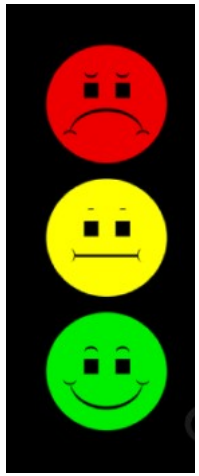
Do they serve as an important function as water?

More than diamonds?

Demonstrating Value

They can be monetary

They can be non-monetary



1, 2, 4, 8

Value of Ecosystem Services

Seagrass

- Photosynthesis
- 3-D Structure

Bio-physical Function

Ecosystem Services

- Gas regulation
- Disturbance regulation
- Nutrient regulation
- Water regulation
- Raw materials
- Ornamental resources
- Recreation
- Science and education
- Spiritual and historic

- Habitat
- Modify current velocity
- Sedimentation patterns
- Nutrient cycling
- Carbon sequestration
- Food source

Ecological Function

Constituents of Well-Being

Security
- Personal safety
- Resource access
- Secure from disasters

Material
- Livelihoods
- Food
- Shelter

Health
- Strength
- Feeling well
- Clean air and water

Social Relations
- Social cohesion
- Mutual respect
- Ability to help others

Freedom of Choice and Action
Opportunity to be able to achieve what an individual values doing and being

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Value of Blue Carbon

Where will the value of blue carbon be generated?

No surprise, DEMAND.

But does blue carbon go it alone?

Co-benefits are always talked about no matter what specific ecosystem service we are interested in.

- Carbon sequestration and co-benefits.
- Storm protection and co-benefits
- Recreational fisheries enhancement and co-benefits

What are we Valuing? Carbon storage or something else?

Aboveground Biomass

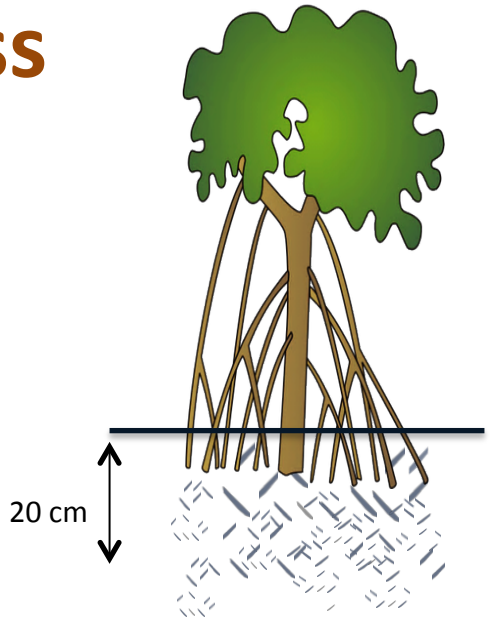
(vegetation above the soil level)

Belowground Biomass

(roots and rhizomes)

Soil Carbon

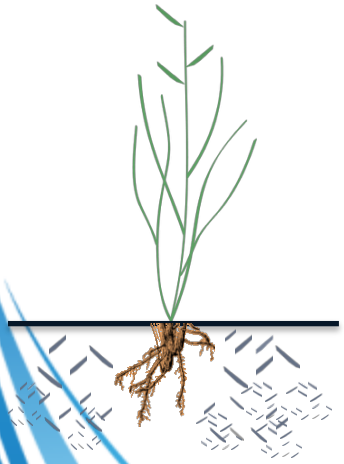
(particulate carbon in the soil)



TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Meta-Analysis for the Northern Gulf of Mexico

- Data collected on a **one-time** and **mean** basis
- Some one-time data targeted **peak** biomass
- Analyses were conducted to determine if **mean**, **one-time**, and **peak** datasets could be combined to create more robust datasets.

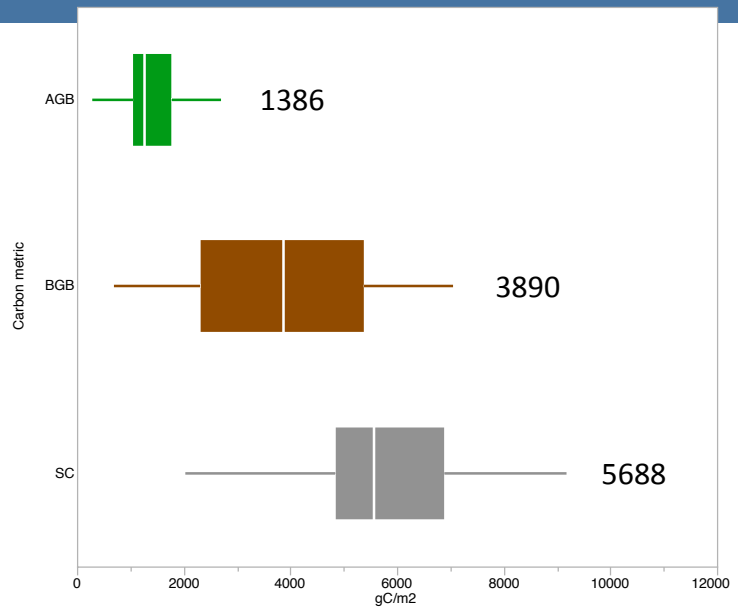


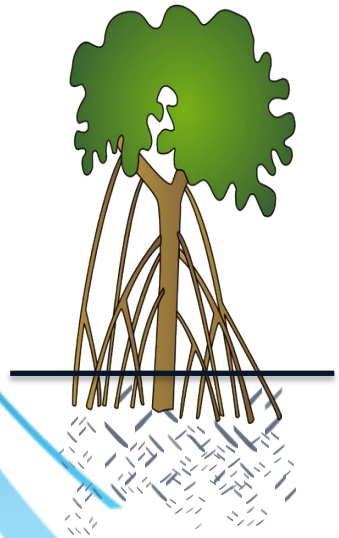
AGB (mean)
BGB (mean + one time)
SC (mean + one time)

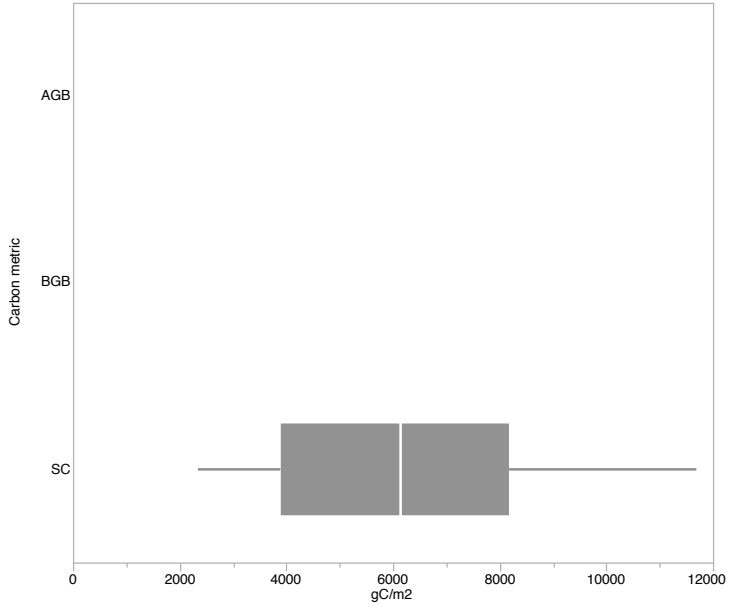
AGB (no data)
BGB (minimal data)
SC (one time)

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Carbon Storage (gC/m^2)







TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Interesting Findings

- Lack of mangrove data
  - Lack of data for AGB, BGB, and for states other than Florida
  - Mangrove AGB data can be estimated using equation developed by Osland *et al.* 2014
- Need for long-term studies
  - Peak biomass data may not be capturing actual peaks

STICKS AND CARROTS

Blue Carbon Workshop Mission-Aransas NERR November 5, 2015

Why Blue Carbon?

Blue Carbon suffers from “non-proximal demand and supply”

Storm protection and fishing occur at defined locations.

Policy directives in the development of BC markets are necessary but not sufficient.

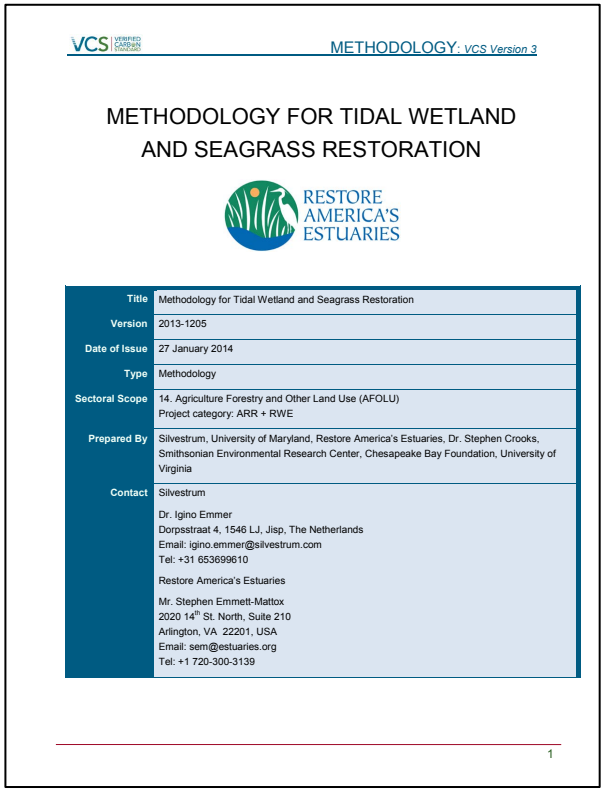
Involvement by the private sector firms (land holders) are a necessary partner.

Important First Steps

Restore America's Estuaries (RAE) began to develop, with support from NOAA, the first globally applicable tidal wetland and seagrass restoration greenhouse gas offset methodology.

Starts to create certainty – Applicable worldwide

The combination of **certainty** of methods and **applicability worldwide** is critical in private sector participation.



VCS VERIFIED CARBON STANDARD METHODOLOGY: *VCS Version 3*

METHODOLOGY FOR TIDAL WETLAND AND SEAGRASS RESTORATION

RESTORE AMERICA'S ESTUARIES

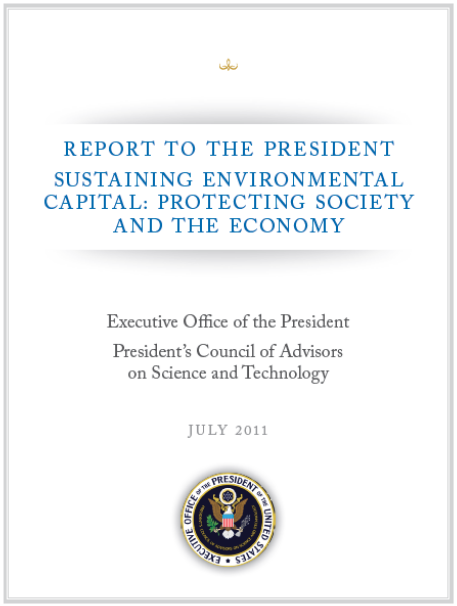
Title	Methodology for Tidal Wetland and Seagrass Restoration
Version	2013-1205
Date of Issue	27 January 2014
Type	Methodology
Sectoral Scope	14. Agriculture Forestry and Other Land Use (AFOLU) Project category: ARR + RWE
Prepared By	Silvestrum, University of Maryland, Restore America's Estuaries, Dr. Stephen Crooks, Smithsonian Environmental Research Center, Chesapeake Bay Foundation, University of Virginia
Contact	Silvestrum Dr. Igino Emmer Dorpsstraat 4, 1546 LJ, Jisp, The Netherlands Email: igino.emmer@silvestrum.com Tel: +31 653699610 Restore America's Estuaries Mr. Stephen Emmett-Mattox 2020 14th St. North, Suite 210 Arlington, VA 22201, USA Email: sem@estuaries.org Tel: +1 720-300-3139

1

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Opening up Policy Space

Presidents Council of Advisors on Science and Technology (2011) called for the Federal government to "*... launch a series of efforts to assess thoroughly the condition of U.S. ecosystems and the social and economic value of the services those ecosystems provide.*"



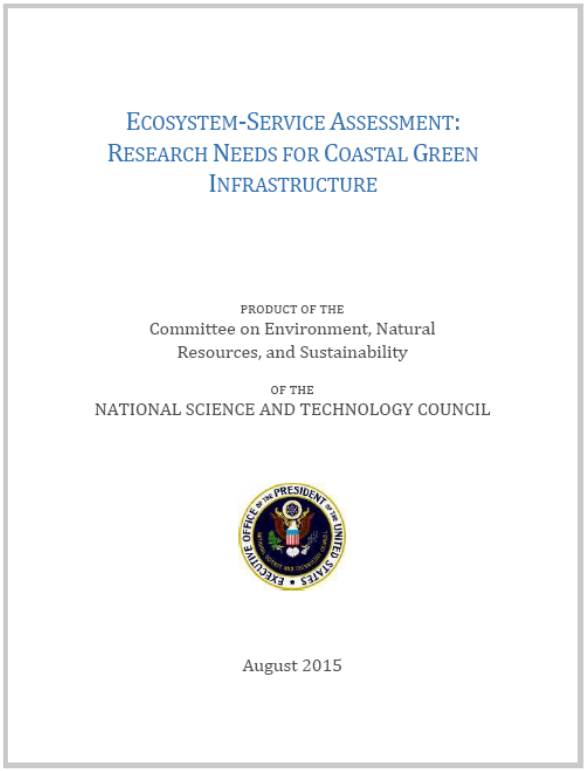
- Regulations-NRDA, Magnuson-Stevens
- Enabling Legislation-NEPA, CZMA, ESA, FWCA, WRDA (P+G/R)

The space is there, and getting better, it's just a matter of applying it!

Coastal Green Infrastructure and Ecosystem Services

White House Task Force - OSTP

- Research strategy for the Federal family for the next 10-15 years;
- Need to explicitly link bio-physical structure and function to human well-being, and;
- Will need places to pilot this work.



ECOSYSTEM-SERVICE ASSESSMENT:
RESEARCH NEEDS FOR COASTAL GREEN INFRASTRUCTURE

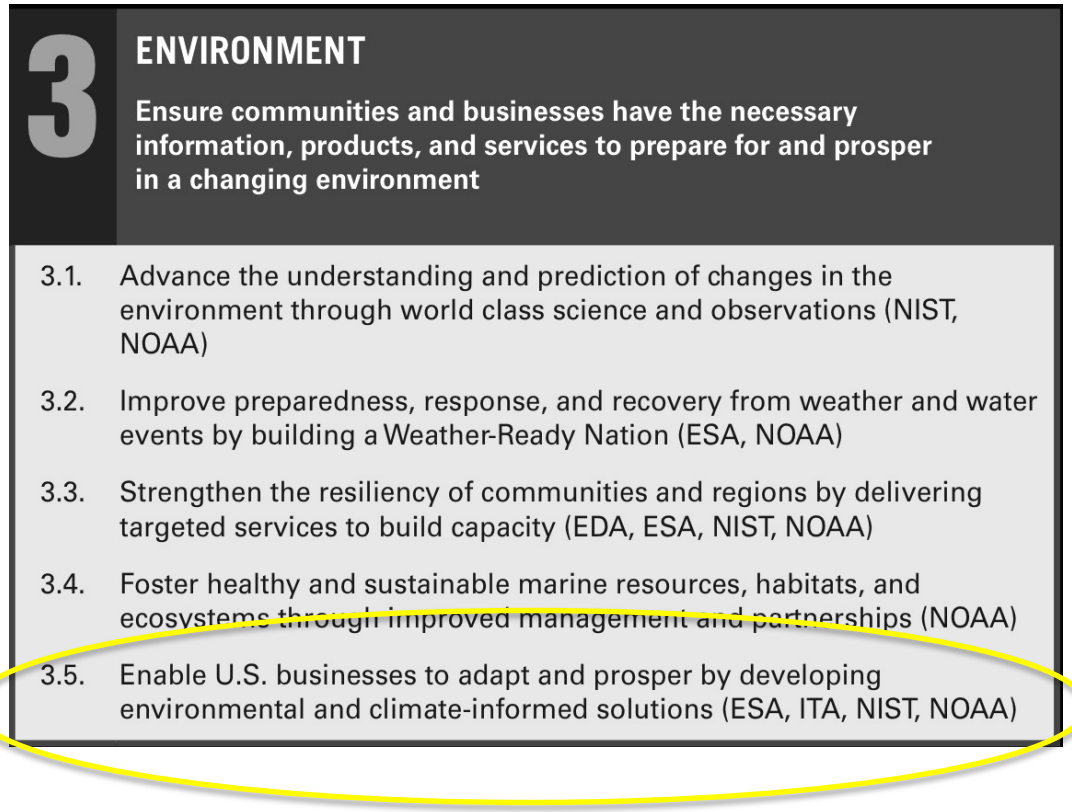
PRODUCT OF THE
Committee on Environment, Natural Resources, and Sustainability

OF THE
NATIONAL SCIENCE AND TECHNOLOGY COUNCIL

August 2015

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Department of Commerce and Natural Capital



3 ENVIRONMENT

Ensure communities and businesses have the necessary information, products, and services to prepare for and prosper in a changing environment

3.1. Advance the understanding and prediction of changes in the environment through world class science and observations (NIST, NOAA)

3.2. Improve preparedness, response, and recovery from weather and water events by building a Weather-Ready Nation (ESA, NOAA)

3.3. Strengthen the resiliency of communities and regions by delivering targeted services to build capacity (EDA, ESA, NIST, NOAA)

3.4. Foster healthy and sustainable marine resources, habitats, and ecosystems through improved management and partnerships (NOAA)

3.5. Enable U.S. businesses to adapt and prosper by developing environmental and climate-informed solutions (ESA, ITA, NIST, NOAA)

Strategic Plan 2014 - 2018

A series of roundtables throughout the country focused on *natural capital*.

Carbon sequestration was prominent at the the first roundtable in Houston.

Roundtables will take place during 2015: Houston, Cleveland, New York, Palo Alto

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Finally – Communicating “It”

- This is our constituency.
- If we can’t communicate it to our grandmothers and next door neighbors we are missing a large and influential piece of the population.

Thank You

david.yoskowitz@tamucc.edu

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES