Blue Carbon in Florida

Blue is the New Green:
Coastal Wetlands in Sustainability Planning

TerraCarbon®

Case Studies

Mangrove Restoration at Fruit Farm Creek

(planned)
(feasibility stage)

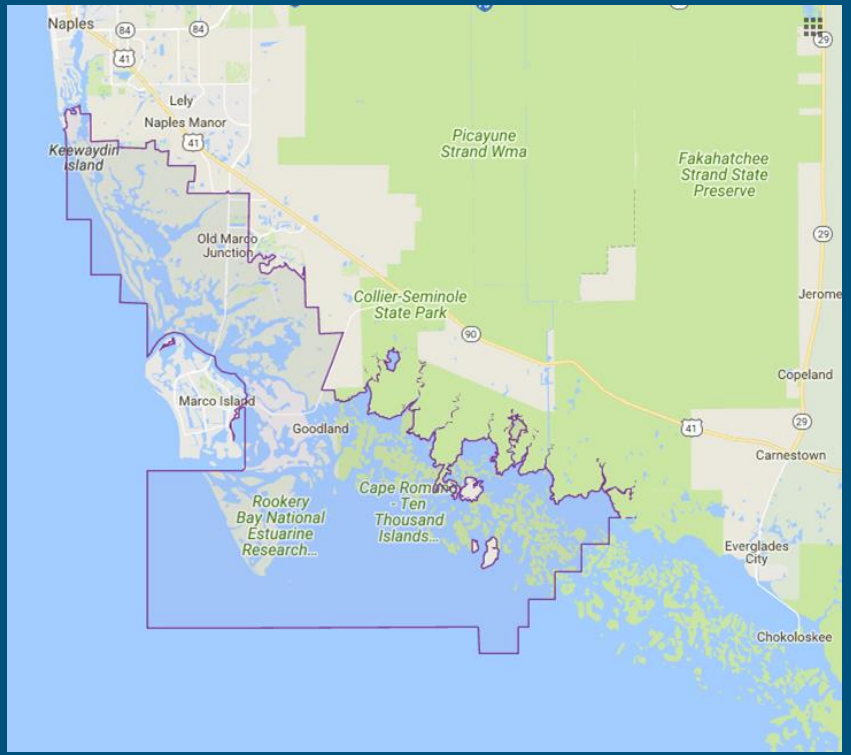
Seagrass restoration in Tampa Bay

(completed)
(theoretical exercise)

Fruit Farm Creek Mangrove Restoration

Area


Daytona Beach
Ocala
Orlando
Kissimmee
Melbourne
Tampa
Lakeland
Clearwater
FLORIDA
St. Petersburg
Port St Lucie
West Palm Beach
Fort Myers
Naples
Fort Lauderdale
Miami
Everglades National Park


Naples
Lely
Naples Manor
Keewaydin Island
Picayune Strand Wma
Fakahatchee Strand State Preserve
Old Marco Junction
Collier-Seminole State Park
Jerome
Copeland
Marco Island
Goodland
Carnestown
Rookery Bay National Estuarine Research...
Cape Romano - Ten Thousand Islands...
Everglades City
Chokoloskee

Area

260+ acres, located between Marco Island and Goodland, Florida

- 64 acres die-off
- 200+ acres of stressed (degraded) mangroves

Activity

Project activity

➔Restoration of mangroves by improving tidal flows (1 additional and 2 new larger culverts, remove roots from tidal creeks)

Feasibility assessment

➔Carbon market assessment

➔Emission reduction potential

➔Financial projections

➔Carbon rights

➔Organizational design

➔Landscape potential

Feasibility assessment

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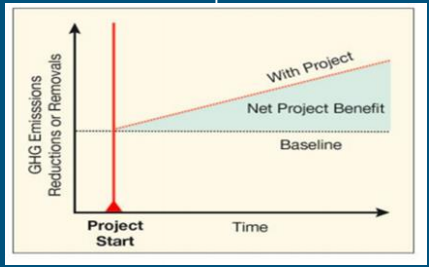
Emission reduction potential

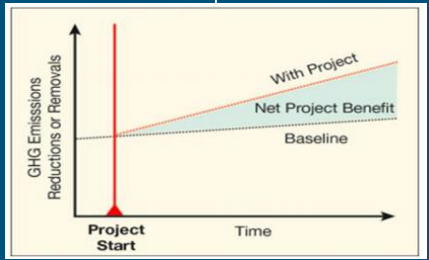
Reviewing literature, collecting site specific research data from USGS

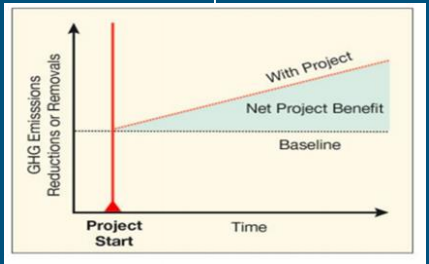
Scenarios

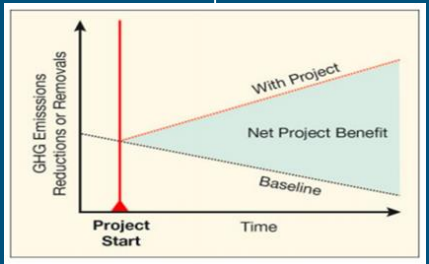
Dead Zone



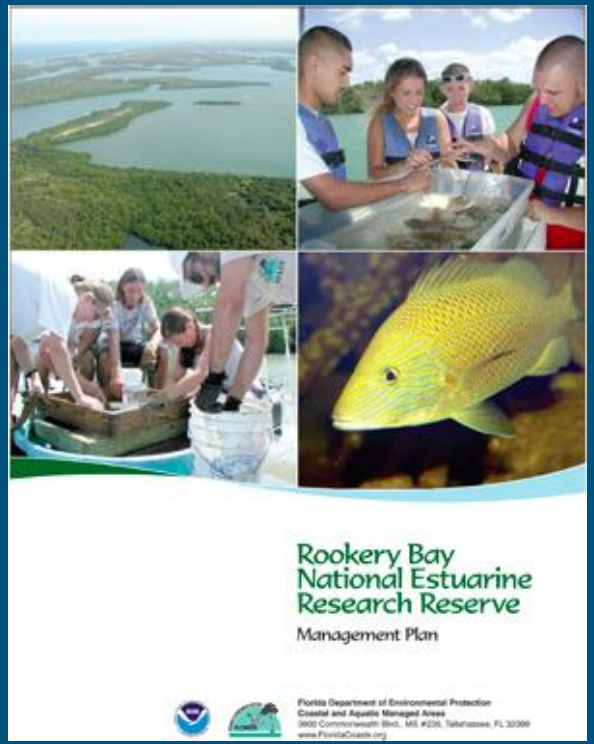
Degraded Zone

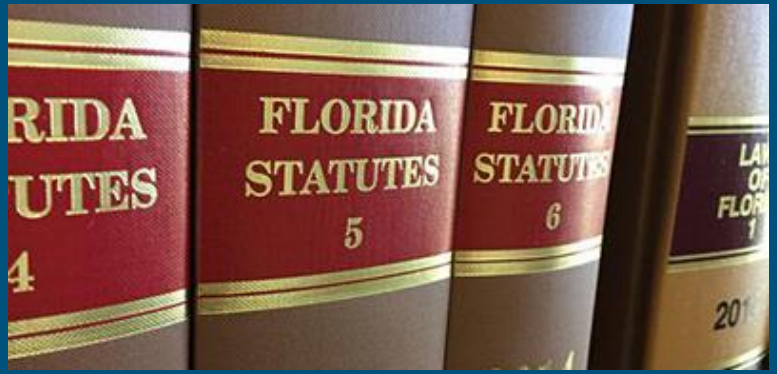






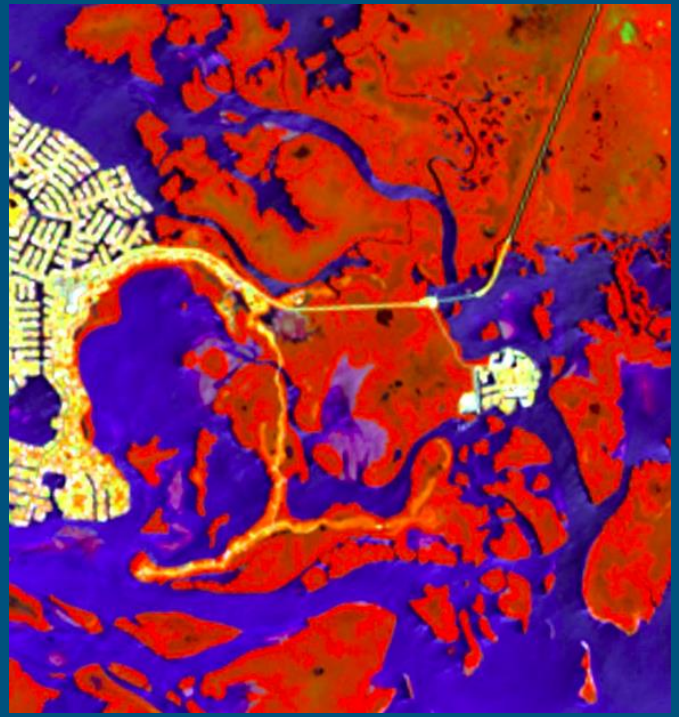
Carbon rights





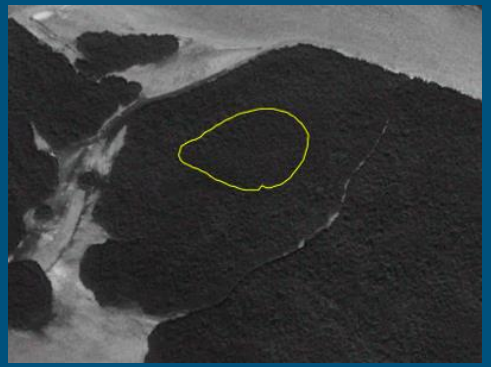
Landscape potential

Extent of degradation in Rookery Bay NERR



Landscape potential

Historical analysis and time scale of degradation



1999

2008

2017

Tampa Bay Seagrass Restoration

Activity

Project activity

➔Restoration of seagrass meadows by improving water quality (by reducing nutrient loads leading to improved water clarity)

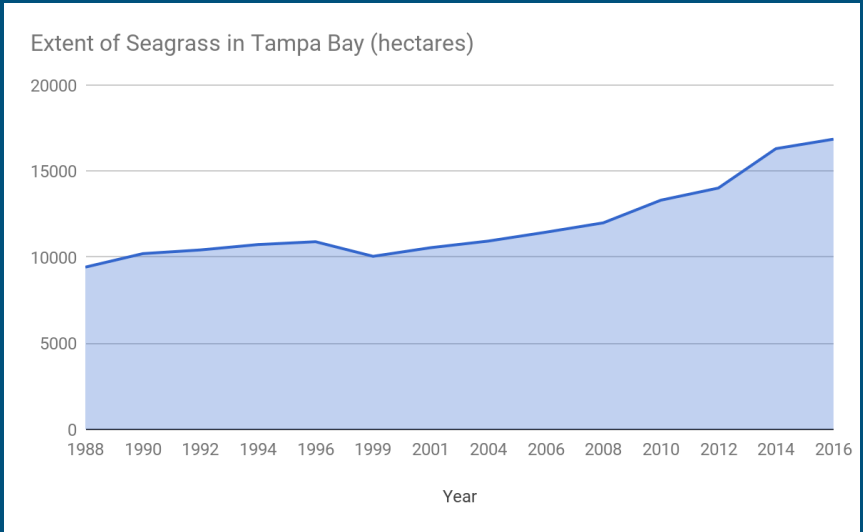
Additionality

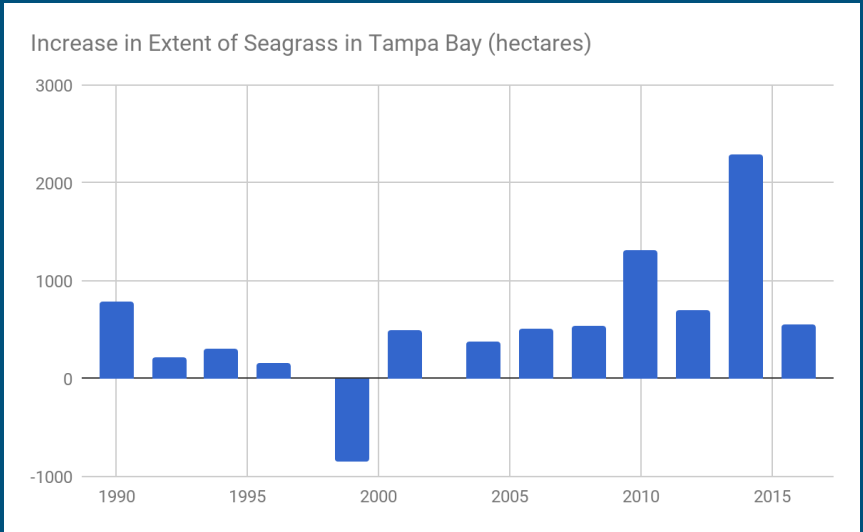
→Carbon projects must meet regulatory additionality requirement

→Requirement met if activity was not mandated by the state or federal EPA

→For purpose of this analysis, assume all activities are additional

Area

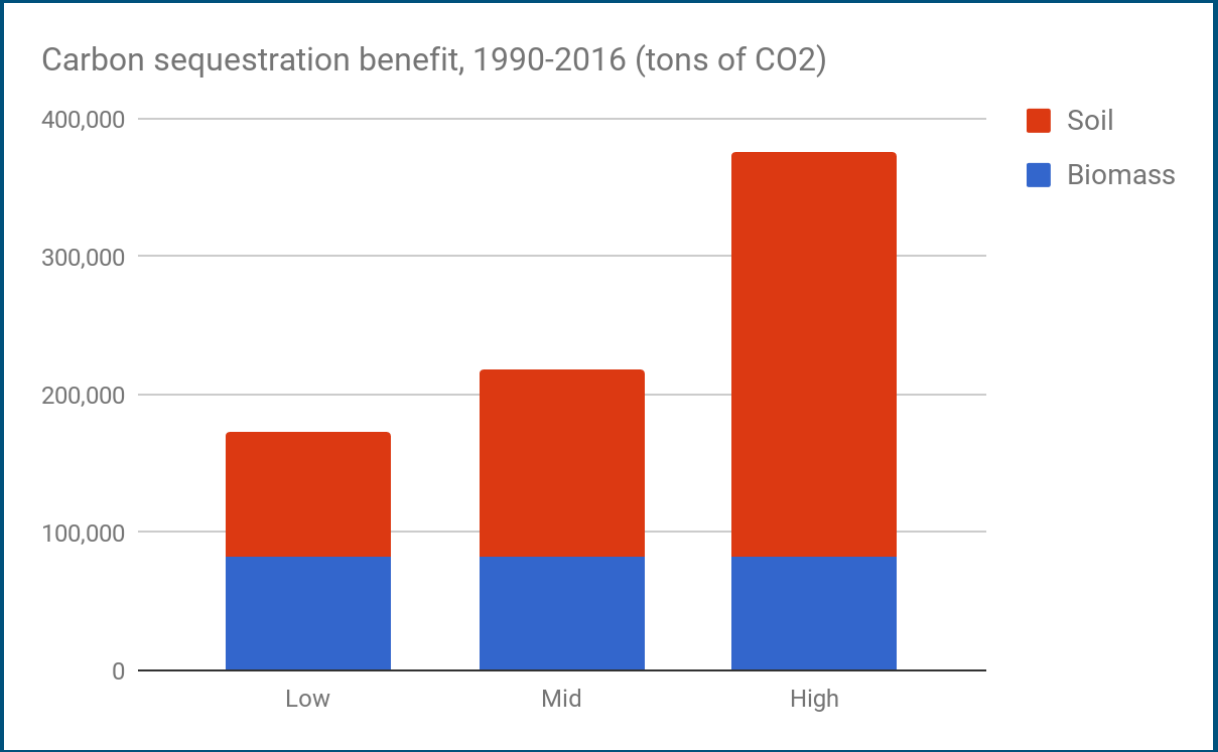

Extent of Seagrass in Tampa Bay (hectares)
20000
15000
10000
5000
0
1988
1990
1992
1994
1996
1999
2001
2004
2006
2008
2010
2012
2014
2016
Year


Increase in Extent of Seagrass in Tampa Bay (hectares)
3000
2000
1000
0
-1000
1990
1995
2000
2005
2010
2015

GHG Assumptions

- Biomass carbon: 3 tons C/ha (default value per VCS methodology)
- Soil carbon:
  - Low = 0.43 tons C/ha/yr (IPCC)
  - Medium = 0.63 tons C/ha/yr (Avg TB BlueC)
  - High = 1.38 tons C/ha/yr (High TB Blue C)
- Methane: Exclude, near zero, same salinity in pre and post-restoration
- Nitrous oxide: Exclude per VCS methodology

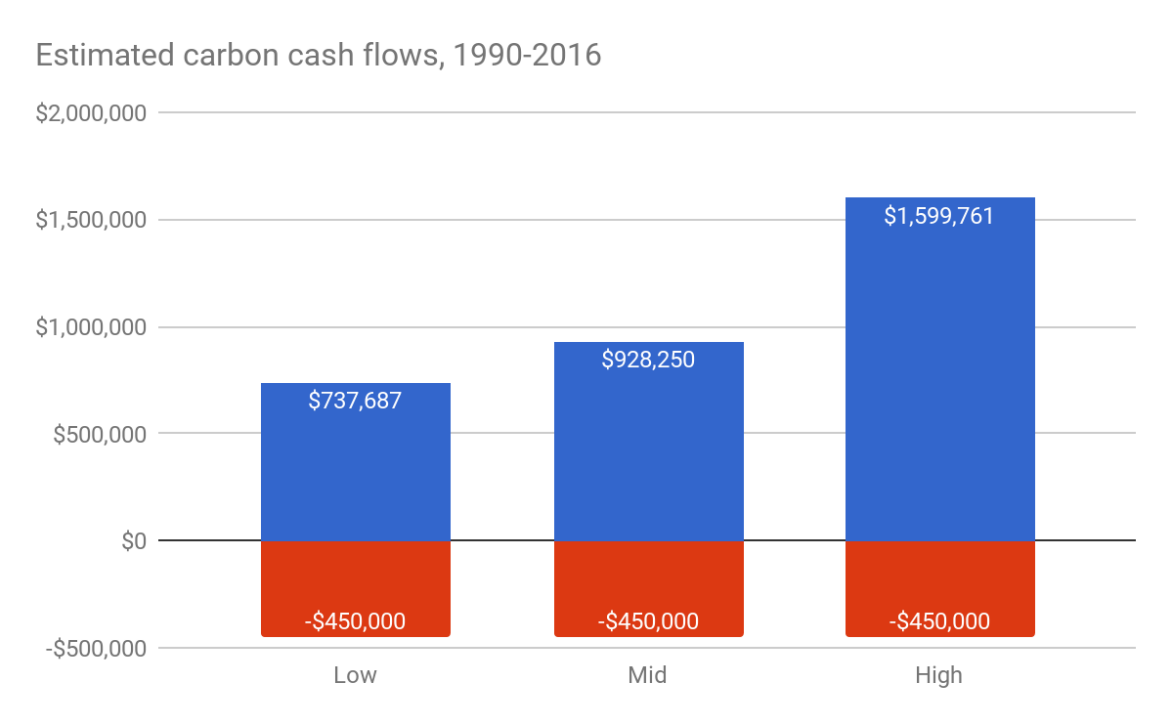
Estimated GHG benefits



Cash Flow Assumptions

- Buffer contribution = 15%
- Carbon price = $5/ton
- Upfront carbon costs (design and validation) = $150,000
- Periodic carbon costs (monitoring and verification, excl fieldwork) = $50,000/every 5 years

Estimated carbon cash flows



Carbon project considerations

➔Additionality

➔Carbon rights

➔Costs of monitoring field work

Additionality

➔Can regulatory vs. voluntary actions be distinguished (by type of activity or when/where implemented)?

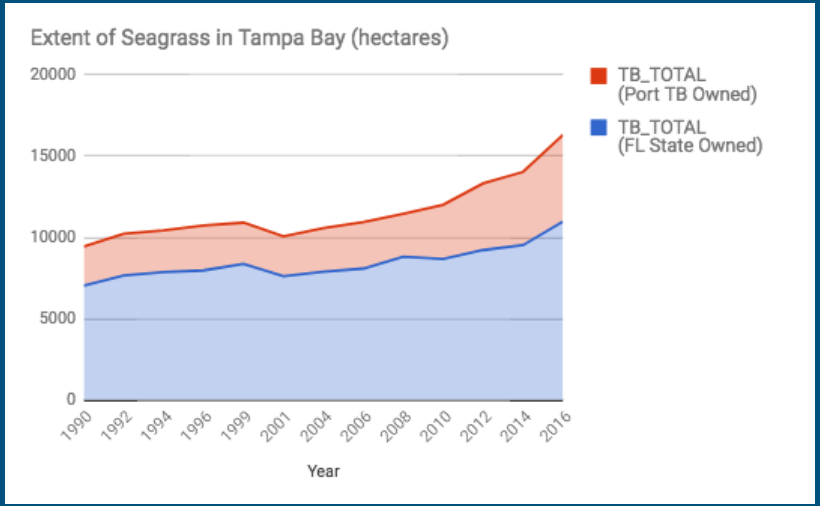
➔Can the effects of voluntary vs. regulatory actions on seagrass extent be distinguished and quantified?

Carbon rights

➔Governing documents of Port of Tampa Bay?

➔Position and process for State of Florida?

➔Project developer role?



Monitoring

➔Carbon sequestration of seagrass not field measured in Tampa Blue C study

➔Can default values (from IPCC) be justified (appropriate, conservative)?

➔What are options for field measurements? Cost/benefit?

Figure 3.7 A demonstration of method used to drive corer into soil in seagrass meadows. (A) Shallow water with a sledgehammer (© Sarah Hoyt, CI), (B) shallow water with a post-pounder (© Sarah Hoyt, CI), (C and D) deep water with a sledgehammer (© James Fourqurean, FIU)

Thank-you

Scott Settelmyer
scott.settelmyer@terracarbon.com

http://terracarbon.com
Twitter: @TerraCarbonLLC