Tampa Bay Oyster Target Setting

Gary Raulerson, Ecologist
Tampa Bay Estuary Program

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Oyster Integrated Mapping
and Monitoring Program Workshop
GTM Research Reserve, Ponte Vedra Beach

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Co-Authors and Partners

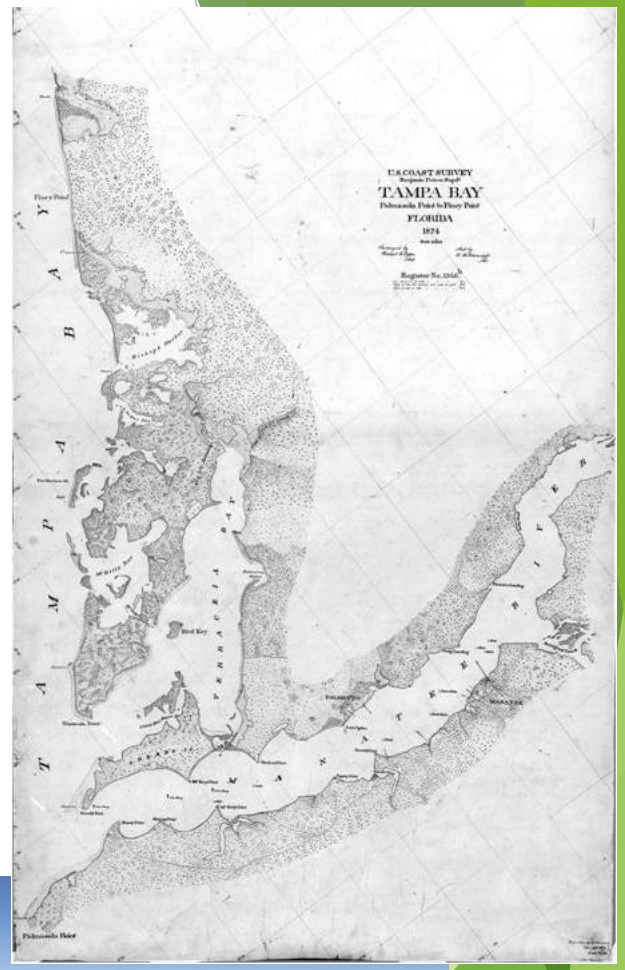
- Maya Burke – TBEP
- Kris Kaufman – NOAA
- Ed Sherwood – TBEP
- Lindsay Cross – Florida Wildlife Corridor

What to expect

- Thought process
- Historical background
- Monitoring
- Restoration
- Goal metrics

Restoration/Protection Process

- Identify habitat(s) of interest
- Estimate historical extent
- Determine current area/functionality
- Establish targets
- Create restoration recommendations
- Initiate actions
- Assess projects
- Non-linear



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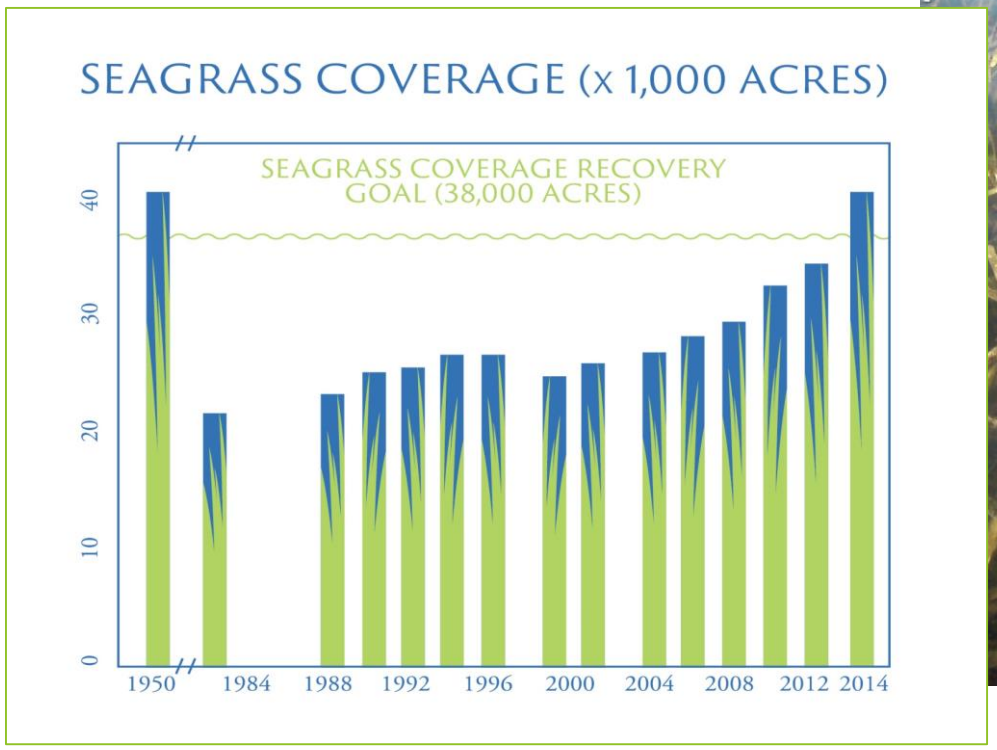
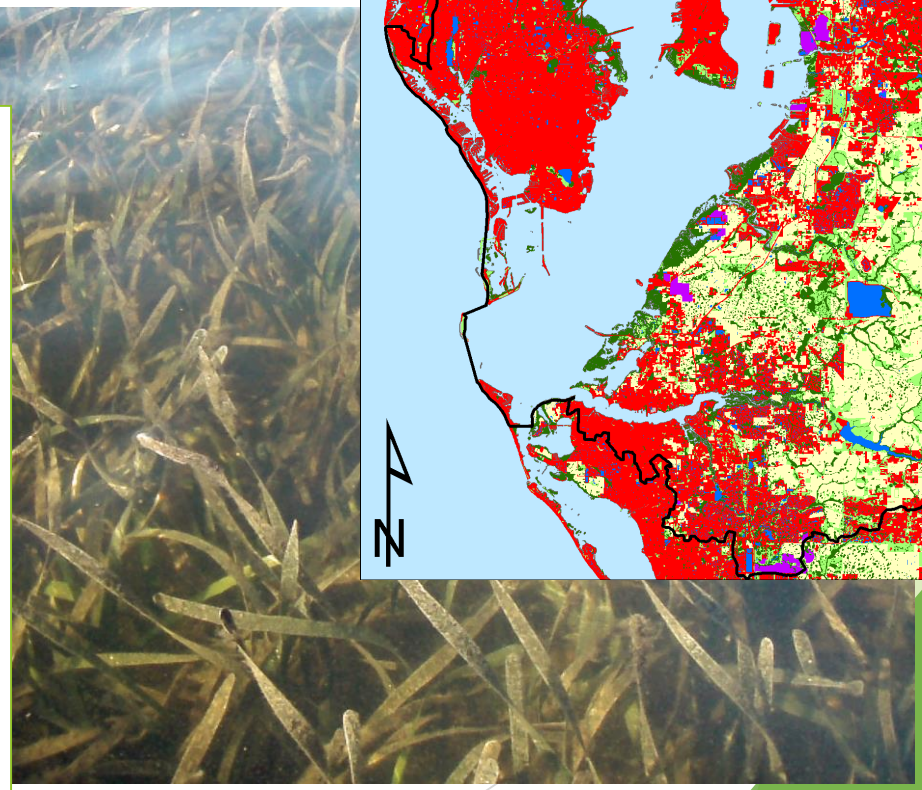
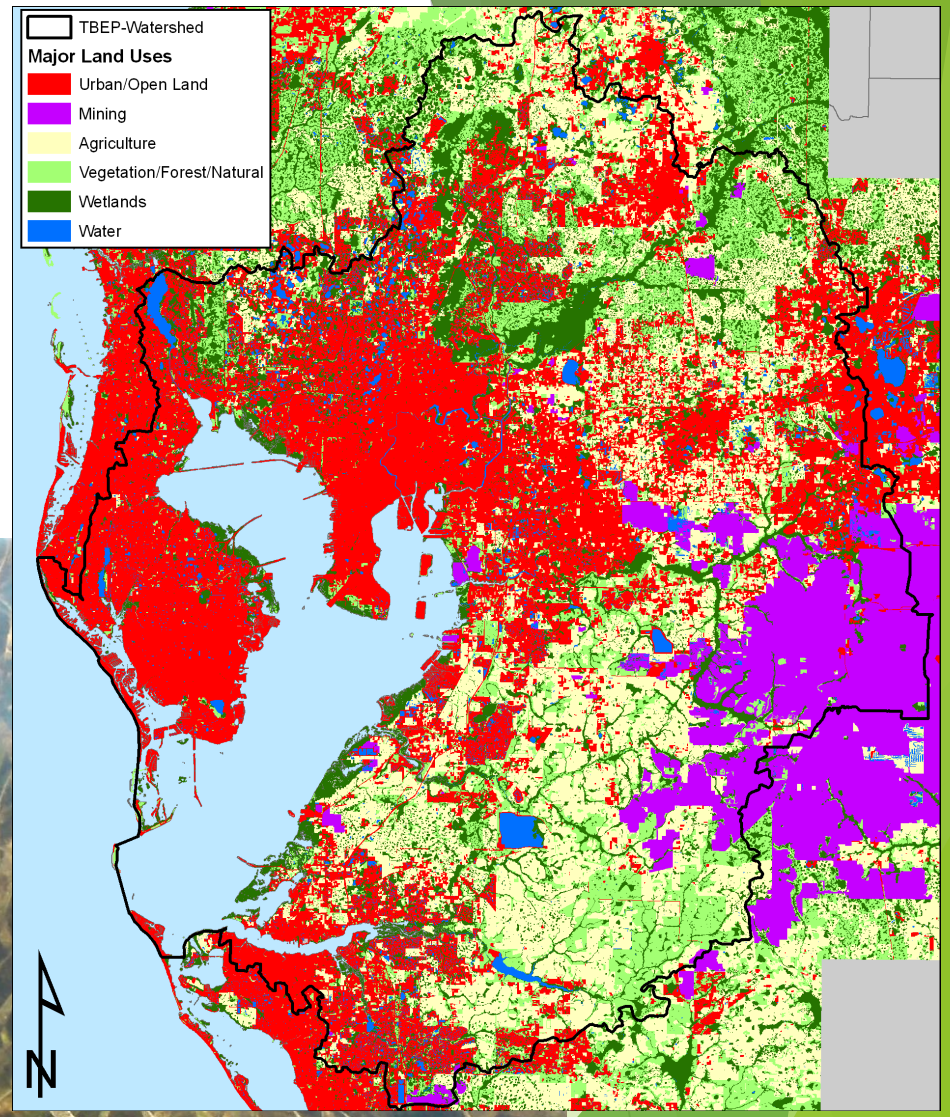
Tampa Bay (Seagrass)

- Established goal of 1950s acreage
- Seagrass goal met in 2014 & 2016
- Nitrogen Management Consortium
- Science-based partnerships







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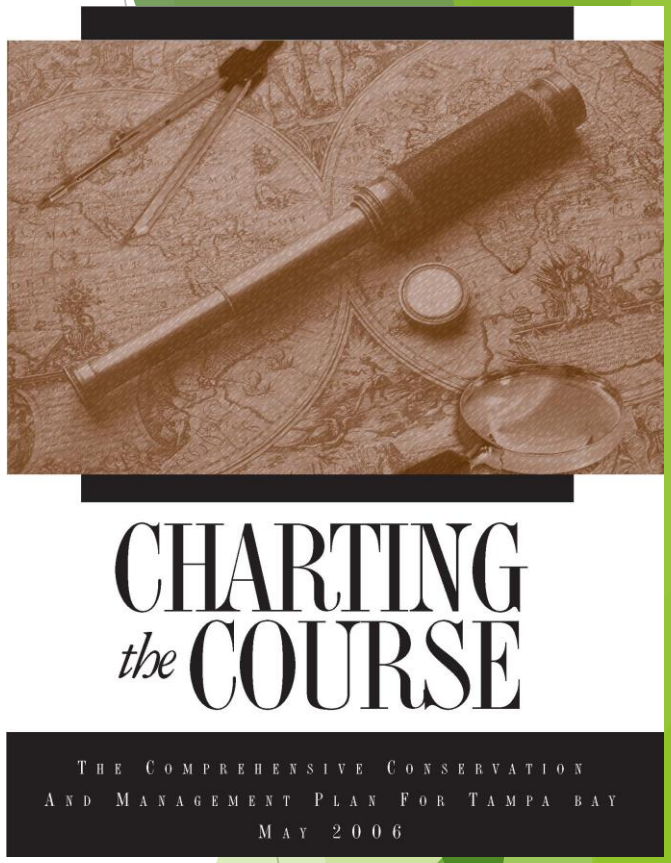
TBEP CCMP Actions for Oysters

- BH-1: Implement the Tampa Bay Master Plan for Habitat Restoration and Protection (*2006 and current update with greater attention to oysters/hard bottom/tidal flats*).
- BH-2: Implement mitigation criteria for Tampa Bay, and identify priority sites for mitigation.
- BH-4: Restrict impacts to hard-bottom communities *(update includes id and protect, including oyster reefs)*.
- BH-8: Expand habitat mapping and monitoring programs.



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2010 Habitat Master Plan Update – R&D Bullet 1

- The *existing distributions of oyster bar* and hardbottom habitats in Tampa Bay *has never been comprehensively mapped*, and developing such a map remains a significant research challenge due to the sparse distribution of these habitats in the bay, and difficulties in detecting these communities. It is recommended that a *more thorough study be conducted to map the existing distribution*, and to estimate the existing areal extent, of oyster bars and hardbottom in Tampa Bay which will *allow for the establishment of meaningful protection targets* for these poorly understood habitats.

TB Oyster Restoration

- Tampa Bay Watch projects (bags, domes)
  - 3.8 ac
- Manatee County
  - Robinson and Perico
  - Oyster recycling mini-grant
- Reef modules protecting Audubon sanctuary islands

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  - 3.8 ac (6 feet wide = 5.2 miles!)
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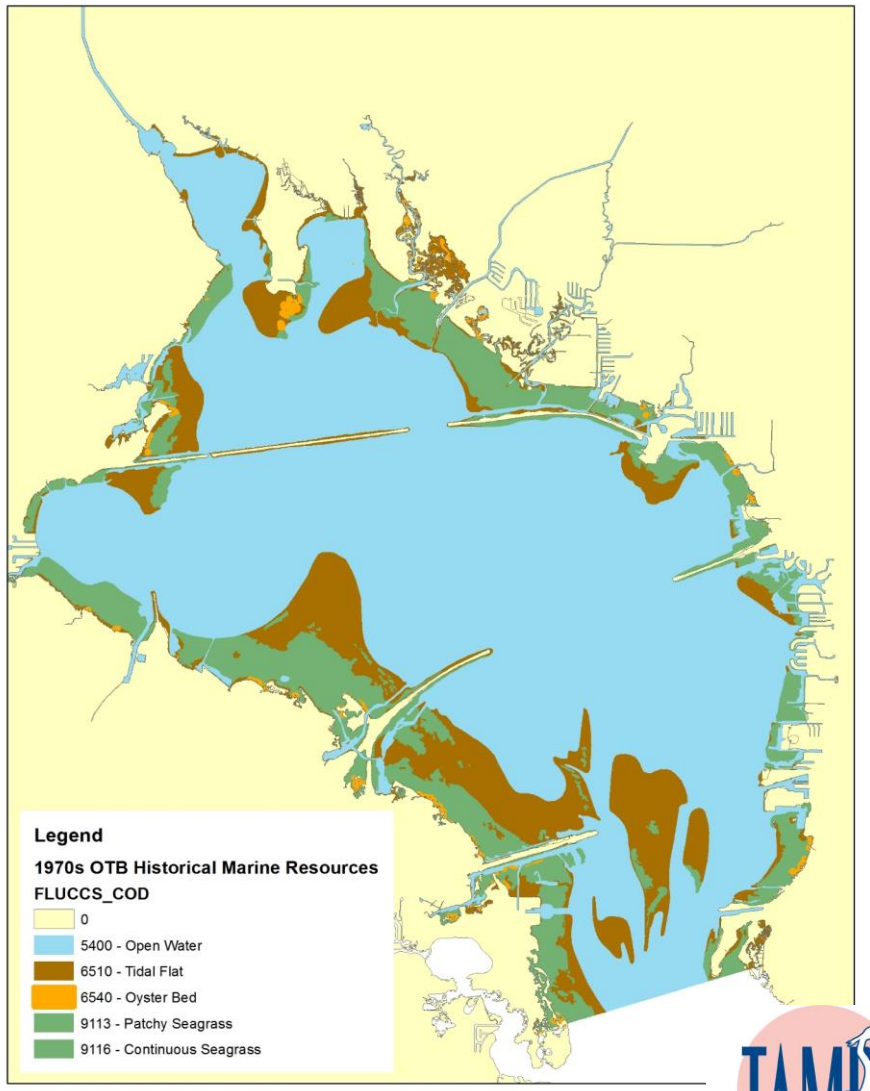
Historical Oyster Information

- Estevez (2010) – 2 sq mi (pre-historic)
- Smeltz (1898)
  - Oysters “everywhere” during 1876 visit
  - Depleted <25 years later
- Ingersoll (1881, DOI Census)
  - 1,500 bushels/yr
  - Mounds and shell-heaps at “Point Pinellos”
- Dawson (1953) - late 1800s with reports of 300,000+ lb oyster harvests
- Shell mining in 1930s-1950s (651K cy)
- 1970s SWFWMD aerial analysis



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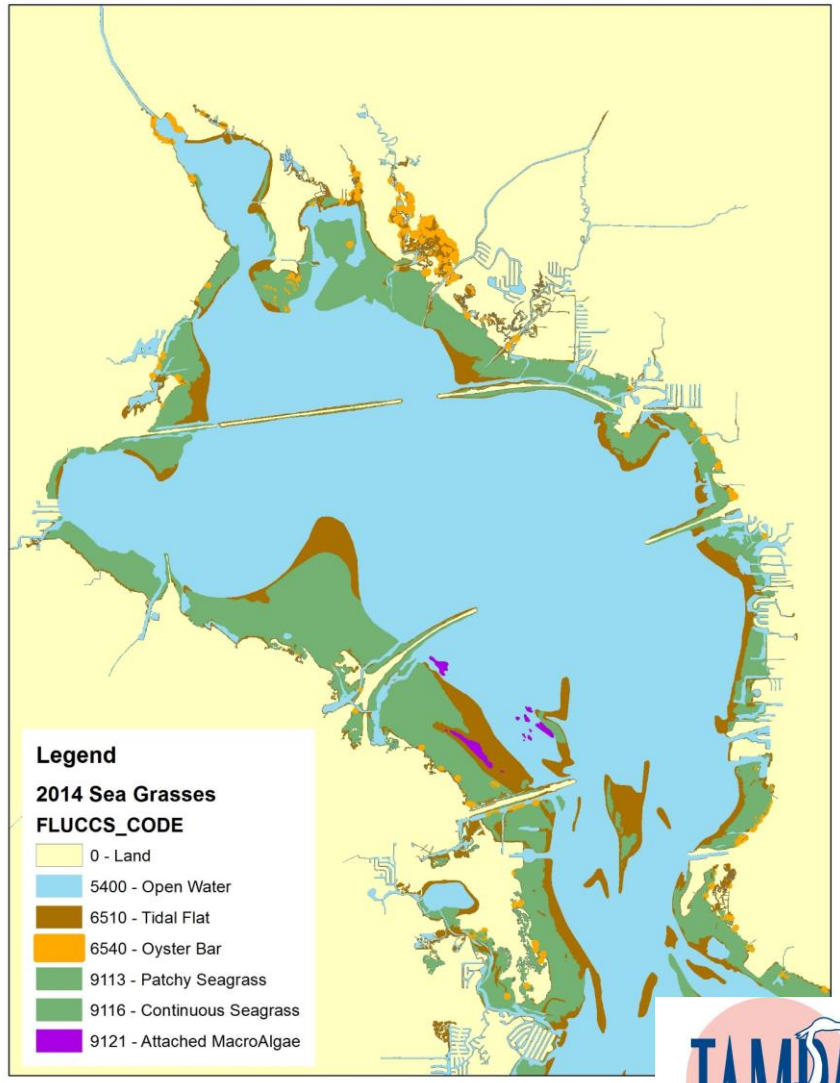
Recent Oyster Mapping/Assessment

- 2006 project mapped 43.5 acres in TB
- FWRI work
- Drexler MS Thesis 2011 (USF)
  - Density, biomass
  - Reefs, mangroves, seawalls, (restoration)
- TBW – % Cover, live/dead, sediment…
- SWFWMD added oysters to bi-annual SAV assessment in 2014
  - Caveats - no mangroves, live/dead…
  - 2016-166 ac bay-wide
- 2.5 Billion oysters in the bay



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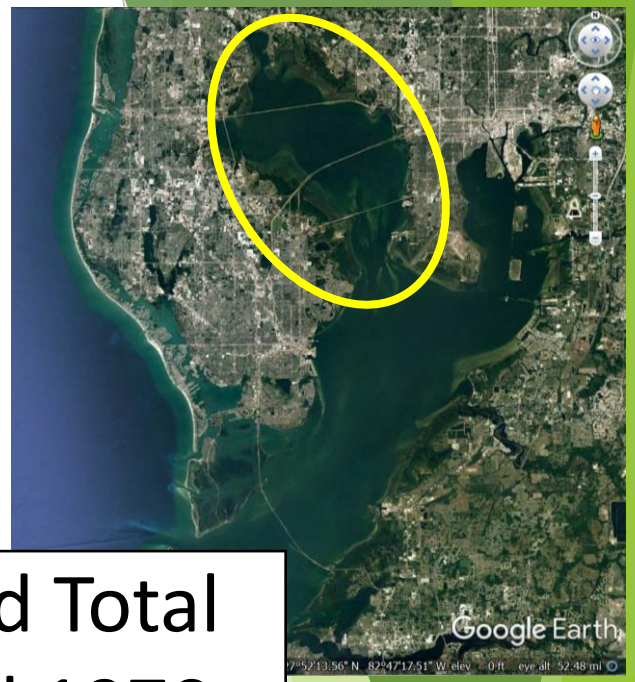
Goal Setting – Habitat-based

- Start with protection of existing resource (166 ac)
- Target based on 1970s extent (Caveats!)



	2014 Cover (ac)	% of TB oysters in 2014	1970 Cover (ac)	Extrapolated Total TB Estimated 1970s reefs only (ac)
Old Tampa Bay	59.3	45.1%	83.8	185.8

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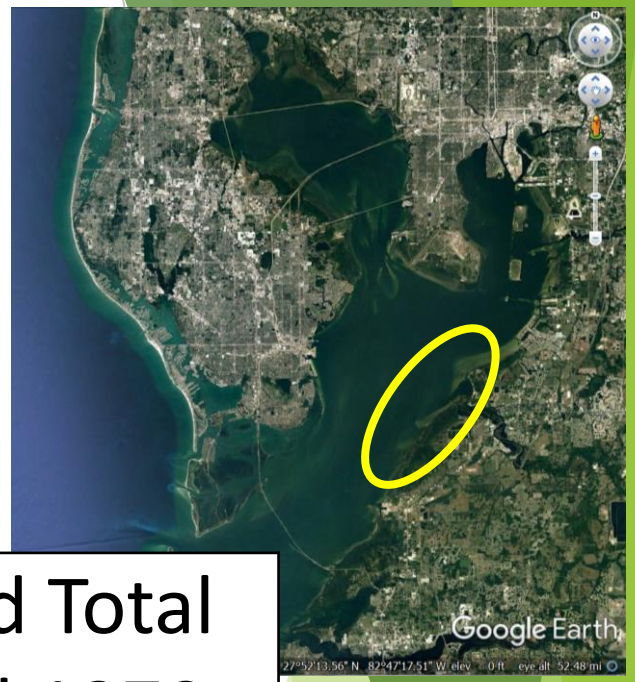

	2014 Cover (ac)	% of TB oysters in 2014	1970 Cover (ac)	Extrapolated Total TB Estimated 1970s reefs only (ac)
Old Tampa Bay	59.3	45.1%	83.8	185.8
Southeast Tampa Bay	13.64	10.4%	34.53	332.0

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Ecological function – Oyster Filtration

- ZuErmgassen et al. (2013)

A. Volume of TB (Trillion L)	B. Estimated residence time for TB (days)	C. Desired filtration within residence time	D. Volume (L) to turnover in residence time (=A*C)	E. Volume (L) to turnover in 1 day (=D/B)	F. Filtration rate (L/d/oyster)	G. # oysters needed (=E/F)	H. m2 of oysters needed (=G/1790 oy/m2 from Drexler)	I. Acres of oyster reef needed (=H*2.47 ac/10,000m2)
3.6	9	0.2	6.47E+11	7.18E+10	36	1,995,693,967	1,114,913	**275 ac**
3.6	9	1.0	3.60E+12	4.00E+11	36	11,111,111,111	6,207,325	**1539 ac**
3.6	9	8.0	2.89E+13	3.21E+12	36	89,299,145,299	49,887,791	**12322 ac**
3.6	9	15.9	5.72E+13	6.36E+12	36	176,602,596,631	98,660,669	**24369 ac**

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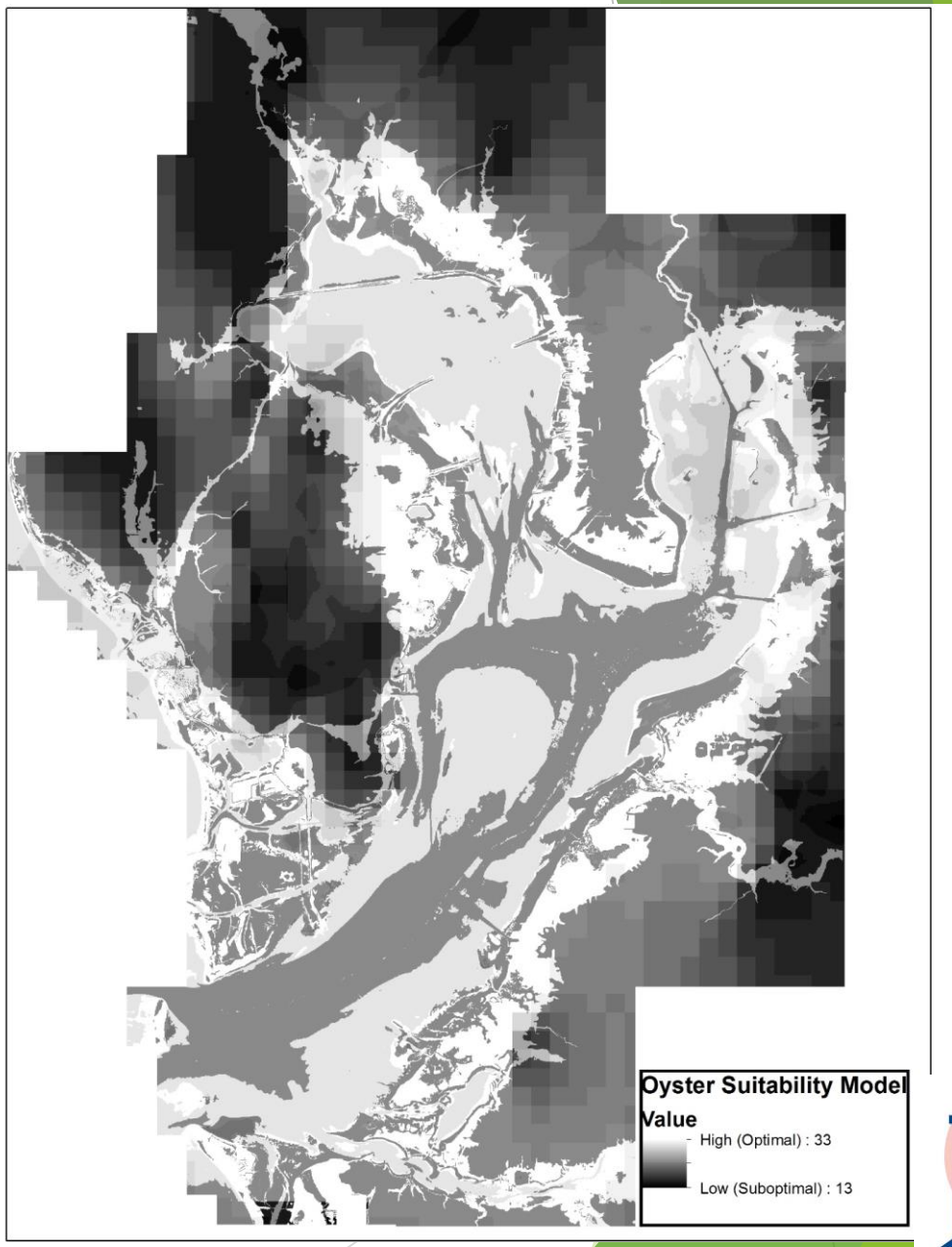
GIS suitability model (draft)

- Thank you CHNEP!
- Identification of areas with higher likelihood of oyster restoration success
- Scaled criteria
  - Water depth
  - Salinity
  - Silt/Clay
  - Seagrass persistence



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Next steps

- Considering multiple options
- Looking for additional comments/thoughts
- Habitat Master Plan Update
- Continue TAC vetting

Gary Raulerson, TBEP
graulerson@tbep.org
727-893-2765

Thanks, any questions?