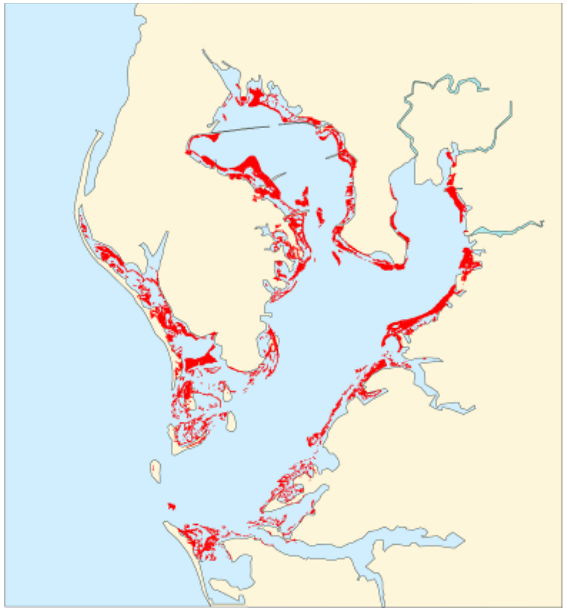
A view from the outside
OCB OA Workshop
Progress and Challenges

September 20, 2013

Holly Greening
Tampa Bay Estuary Program

Tampa Bay in the 1970s

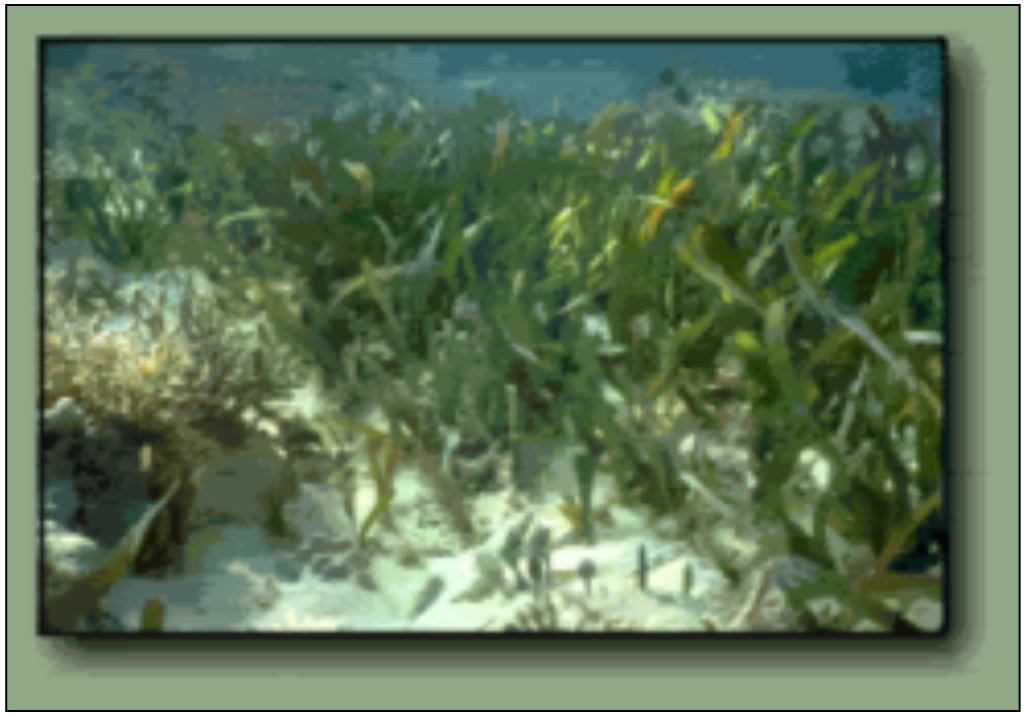


- Half of Tampa Bay seagrasses lost between 1950 and 1982
- Excess N loading from WWTPs, other sources
- Visibility reduced to 2 feet
- Macroalgae and phytoplankton dominated

TBEP GOAL: RESTORE SEAGRASS TO 1950s levels

Tampa Bay Nitrogen Management Strategy
GOAL: Limit N loading to provide water quality adequate to support seagrass recovery

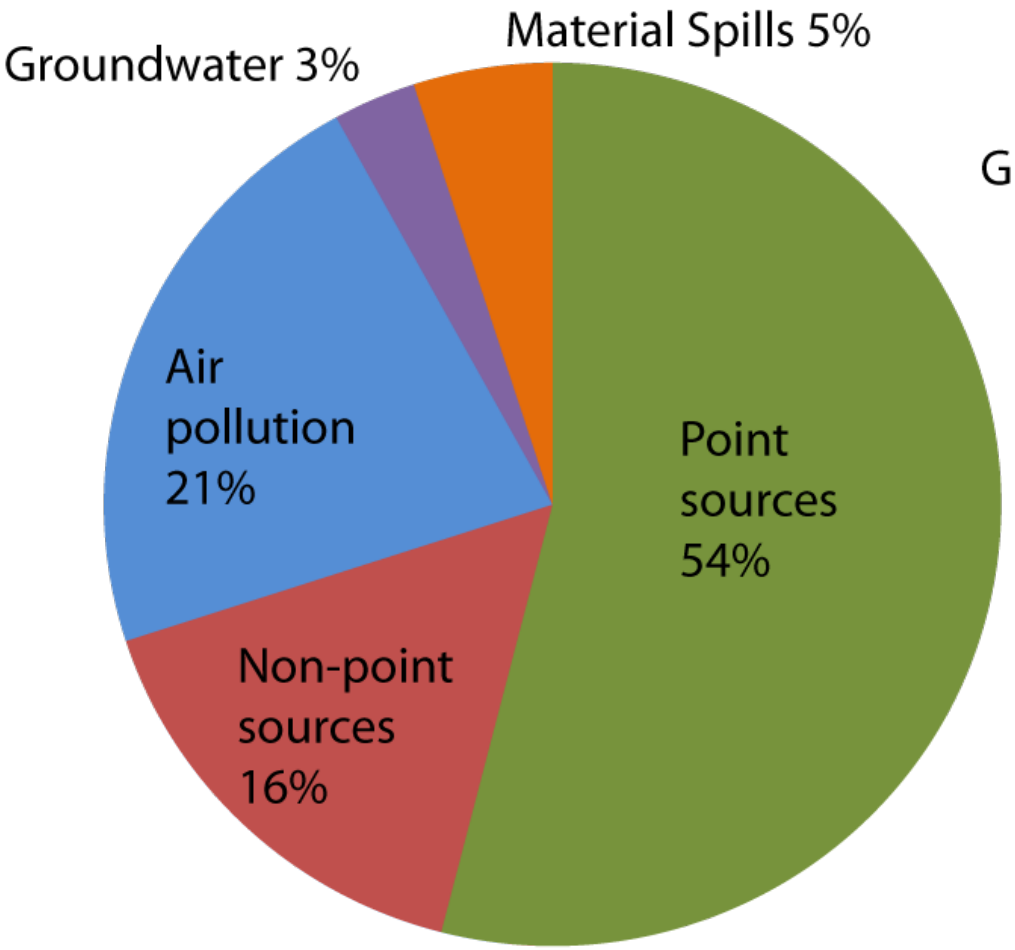
- local governments
- regulatory agency participants
- academic and agency scientists
- local phosphate companies
- agricultural interests
- electric utilities
- community members



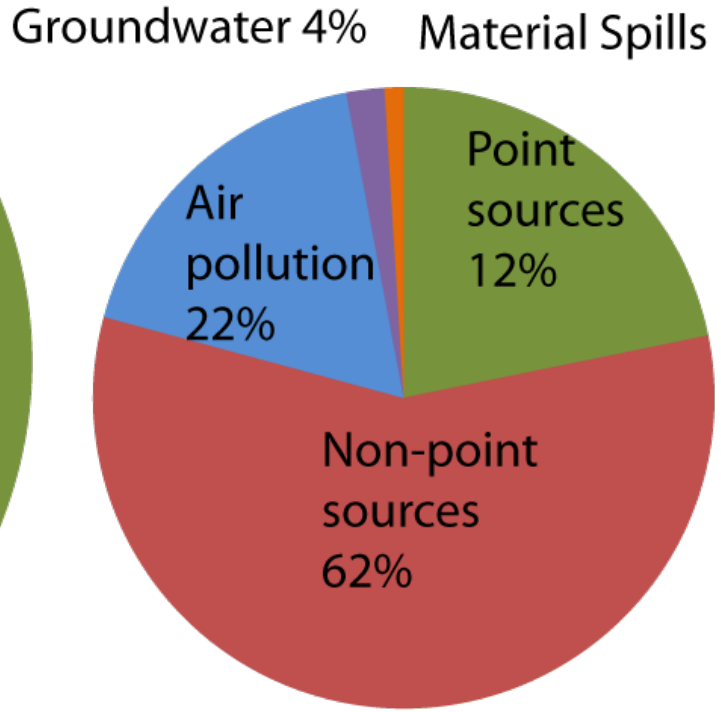
Many projects have improved the Bay

- 250+ projects implemented between 1996-2011
- Decreased industrial discharges
- Upgrades to sewage plants
- Improvements to air quality at power plants
- Better handling of materials (less spills)
- Stormwater treatment
- Residential fertilizer restrictions
- Sources capped- 2003 levels

Nitrogen loading has decreased



1970s: ~10,000 tons nitrogen/year



2000s: ~4,500 tons nitrogen/year

Water quality has improved

Annual average chl-a concentration thresholds

Advanced wastewater treatment begins

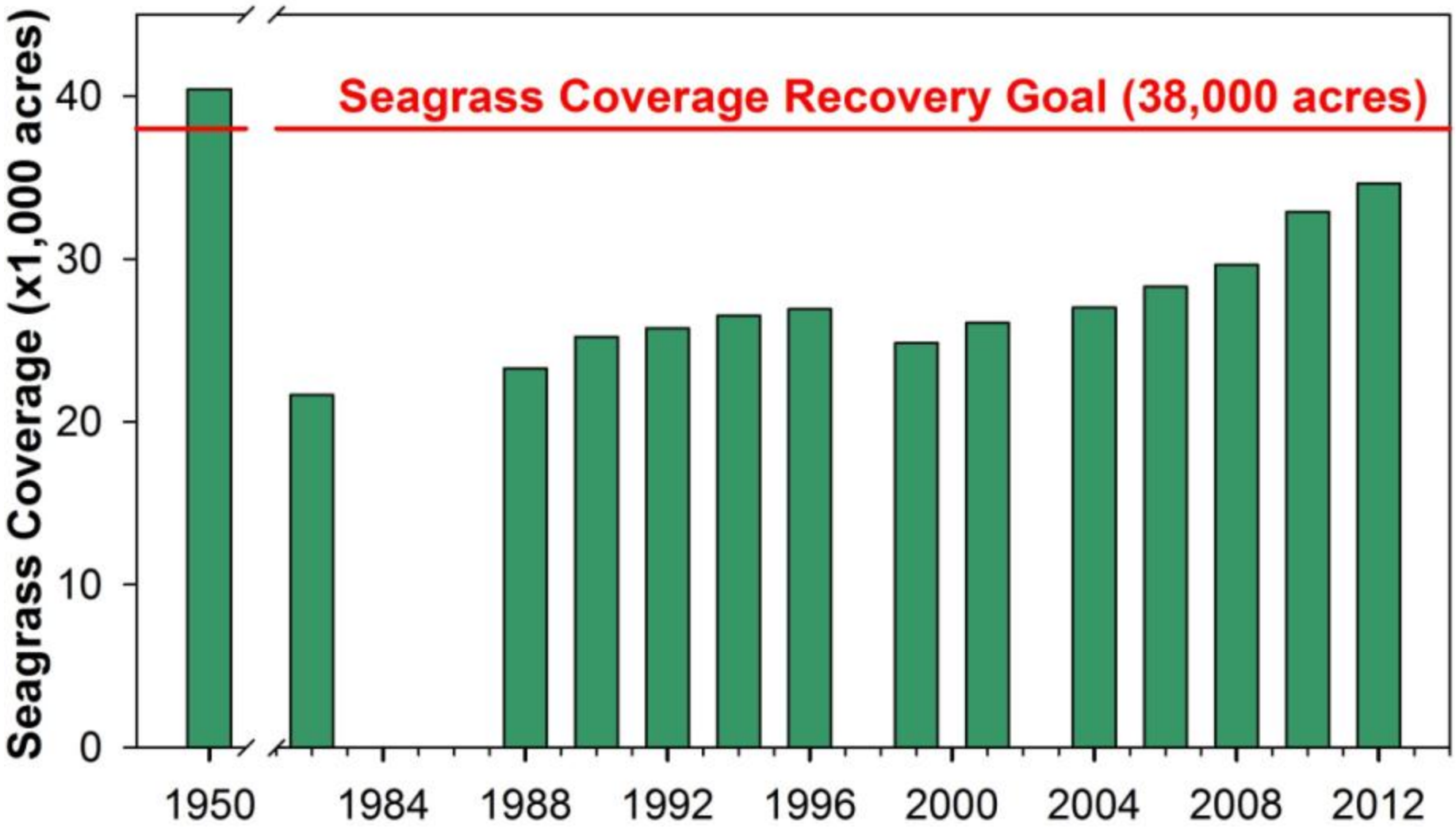
Stormwater regulations enacted

NMC formed

Year	Old Tampa Bay	Hillsbor-ough Bay	Middle Tampa Bay	Lower Tampa Bay
1974	No	No	No	Yes
1975	No	No	No	Yes
1976	No	No	No	Yes
1977	No	No	No	No
1978	No	No	No	Yes
1979	No	No	No	No
1980	No	No	No	No
1981	No	No	No	No
1982	No	No	No	No
1983	No	No	No	No
1984	Yes	Yes	No	Yes
1985	No	No	No	Yes
1986	No	No	Yes	Yes
1987	No	Yes	No	Yes
1988	Yes	Yes	Yes	Yes
1989	No	Yes	Yes	Yes
1990	No	Yes	Yes	Yes
1991	Yes	Yes	Yes	Yes
1992	Yes	Yes	Yes	Yes
1993	Yes	Yes	Yes	Yes
1994	No	No	No	No
1995	No	No	No	Yes
1996	Yes	Yes	Yes	Yes
1997	Yes	Yes	Yes	Yes
1998	No	No	No	No
1999	Yes	Yes	Yes	Yes
2000	Yes	Yes	Yes	Yes
2001	Yes	Yes	Yes	Yes
2002	Yes	Yes	Yes	Yes
2003	No	Yes	Yes	Yes
2004	No	Yes	Yes	Yes
2005	Yes	Yes	Yes	No
2006	Yes	Yes	Yes	Yes
2007	Yes	Yes	Yes	Yes
2008	Yes	Yes	Yes	Yes
2009	No	Yes	Yes	Yes
2010	Yes	Yes	Yes	Yes
2011	No	Yes	Yes	Yes
2012	Yes	Yes	Yes	Yes

Data source: EPCHC

And seagrasses have responded



Data: SWFWMD

Collaborative Approach to Integrated Science and Management: What's working in Tampa Bay

- Target resources identified by both public and scientists as "worthy" of effort to restore
- Community willing to work together towards common goals- federal, state, local, public, private, academic, industries
- Science-based goals and targets
- Long-term monitoring
- Recognized "honest broker" to track, facilitate, assess and report progress/setbacks
- Assessment and adjustment

OA Bottom Line (my limited take)

- Basic OA science is progressing
- Agency policy and coordination is lagging, but interest is there
- Many challenges, but engaged OA science community seems up to the challenge

Kudos

- Workshop organization:
  - overview day, full day breakout working session, summary and next steps
    - Initiated synthesis and consensus on complex issues
    - Identified knowledge and organizational gaps
    - Incorporated communication training
    - Impressive range of science projects in poster session
    - Students, post-docs, faculty, agencies engaged

Really cool stuff

- Incorporating communication training into scientific meetings- COMPASS

  - how to communicate uncertainty, but provide information that is important despite the uncertainty ("… results *so far* show that…")

  - importance of providing succinct results FIRST, then details– set the hook

- Message box preparation- include So What?

Really cool stuff, con't

- Impressive array of projects and progress on understanding basic OA science issues
- Starting to synthesize and integrate, and recognize the need for more of this
- *" We are over the hurdle of recognizing the importance of interdisciplinary approach to OA". Now we need to do it.*

Really cool stuff, con't.

- Your research has attracted an exciting and highly visible new public challenge
  - Wendy Schmidt Ocean Health X-Prize
- *"We are creating a community"*
  - Scientists have a strong sense of working together on an important issue

Really tough challenges

New technology takes time to develop

- Lab technology good, in-situ limited
- Common application some time off

Determining the impacts of OA -

"The Holy Grail"

Really tough challenges

- National OA office for fed agencies?
  - *"That's a good question"*
  - Agencies have different mandates, timelines, focus areas, funding requirements
  - IWG Strategic Plan been in the works for a long time, coming out soon

Really tough challenges

- Data Management (always a challenge)
  - Declaration of Interdependence
    - Common portal, distributed databases
    - Agency-directed endorsement (not there yet)
    - Importance of metadata recognized
    - Insufficient effort allocated typically
    - Firehose of data- types and volume
    - RECOGNITION that data management and documentation is critical.

Really tough challenges

- *"OA research focus as a 'hot science topic' has moved on".*
- Will funding entities step up to continue basic OA research?
- OA researchers realize the need to move to multiple stressors and integrated approaches- major theme of this meeting.
- Difficult to address a global issue at the local/ regional scale– how to do this.

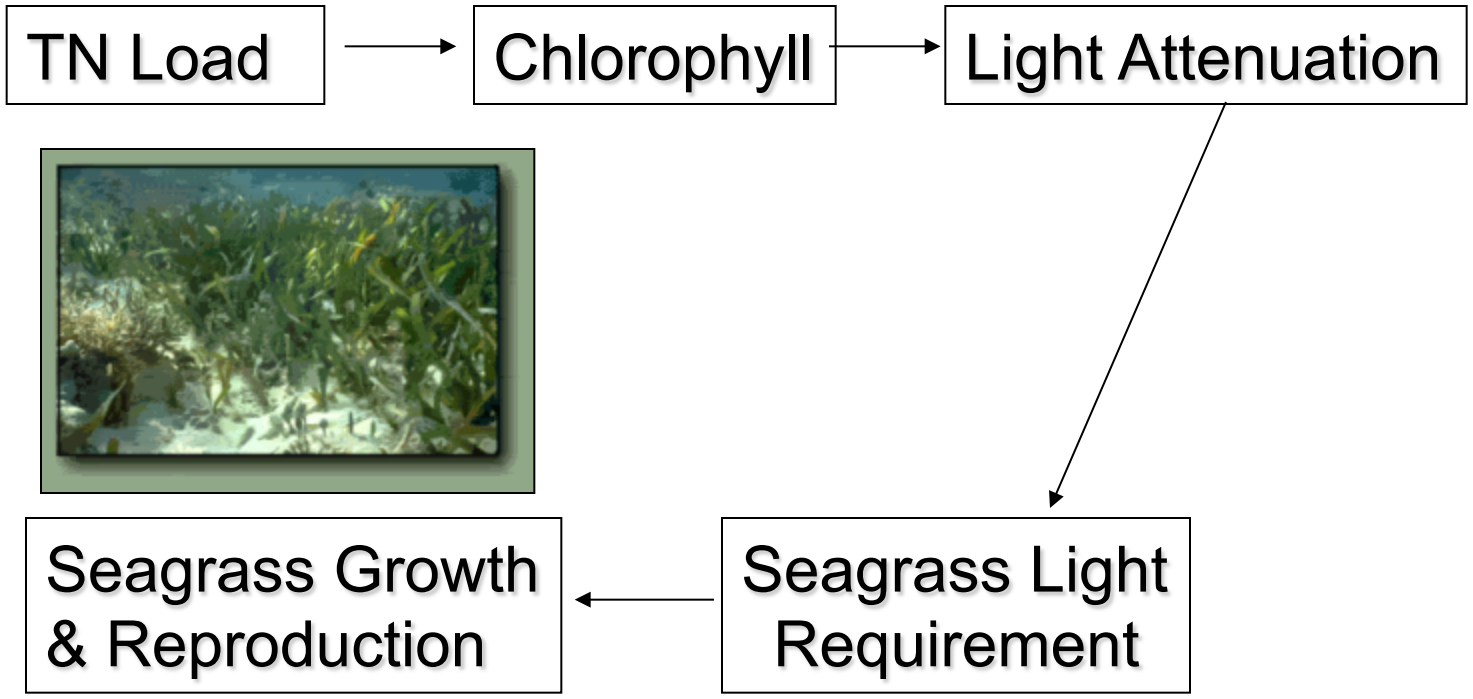
The Missing Middle

- Strong basic science ongoing, with significant implications
- IWG in place for federal policy coordination
- Getting to the management middle–
  - Is the scientific evidence strong enough to support management action?
  - If so, where and when?
  - How do you get this information to managers?

Some thoughts on ways forward

- Finalize a simple conceptual diagram of OA issues and interactions (you've got a good start).
- Use for education, as a guide for identifying priorities, and to demonstrate how a project fits into the overall strategy.

An example: Tampa Bay Nitrogen Management Strategy Paradigm



Some thoughts on ways forward

- Get your information to management when and where you can, as soon as you can. Managers need to know what's likely to happen (and where) to make changes in their practices. Are we there for some issues or areas?