BISCAYNE BAY COMMISSION MEETING

Ed Sherwood
Tampa Bay Estuary Program

Tampa Bay Estuary Nitrogen Management Strategy & Reasonable Assurance Process

TBEP
TAMPA BAY ESTUARY PROGRAM
PARTNERSHIP FOR A HEALTHY BAY

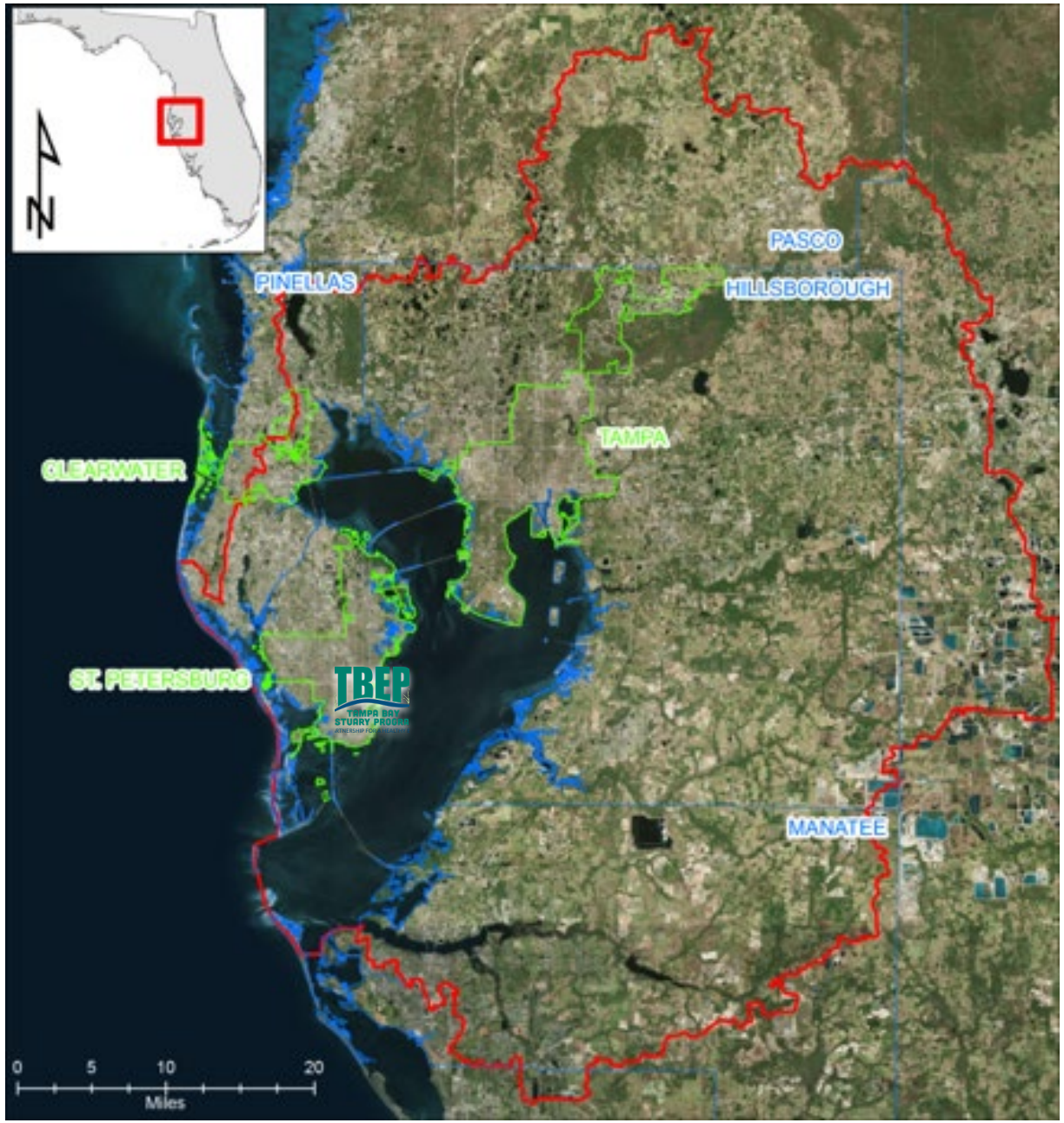
Biscayne Bay Commission Meeting #2
April 8th, 2022

- Tampa Bay Estuary Program Background
- Seagrass Restoration Goals & Status
- Tampa Bay Nitrogen Management Consortium Initiation
- History of Reasonable Assurance Development
- Recent Challenges & Adaptive Management Response
- Recipe for the Tampa Bay Process

Ed Sherwood
Executive Director

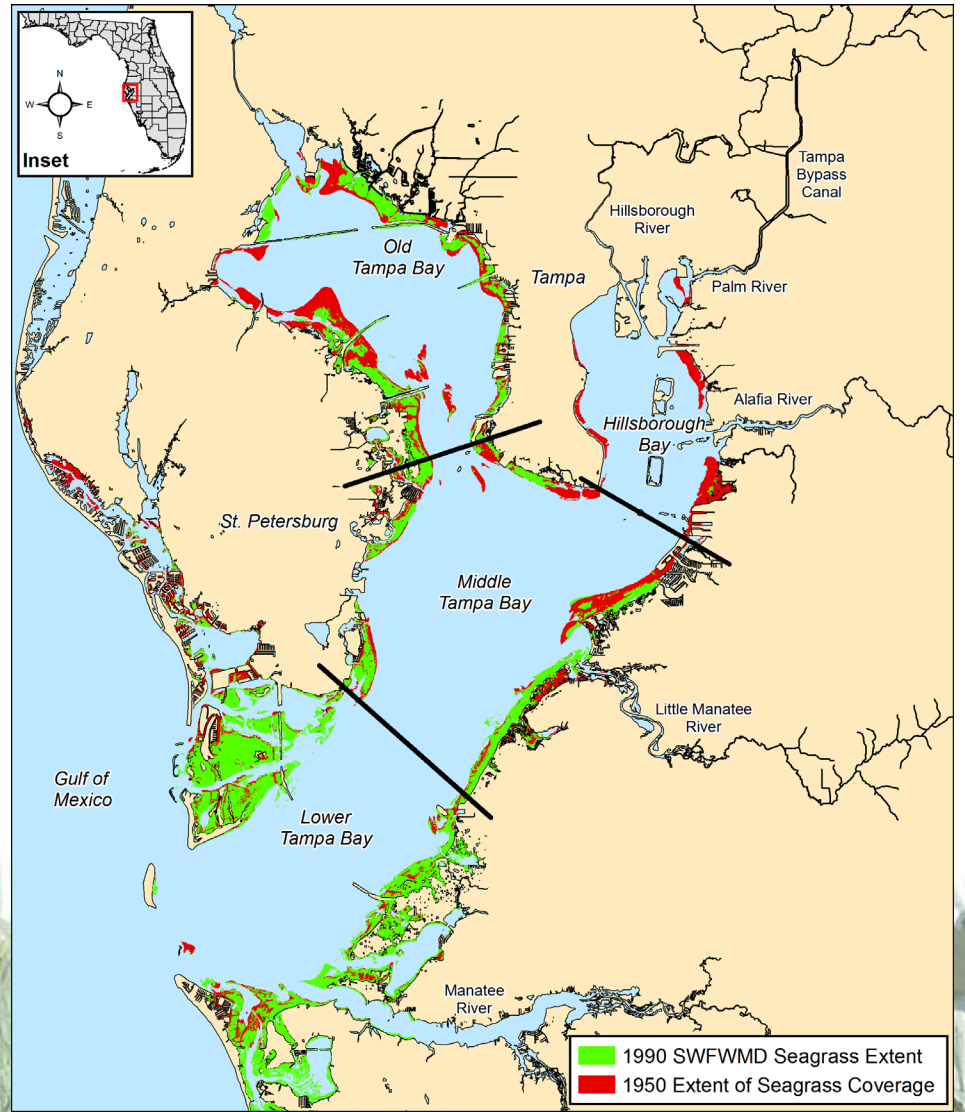
Tampa Bay Estuary Program

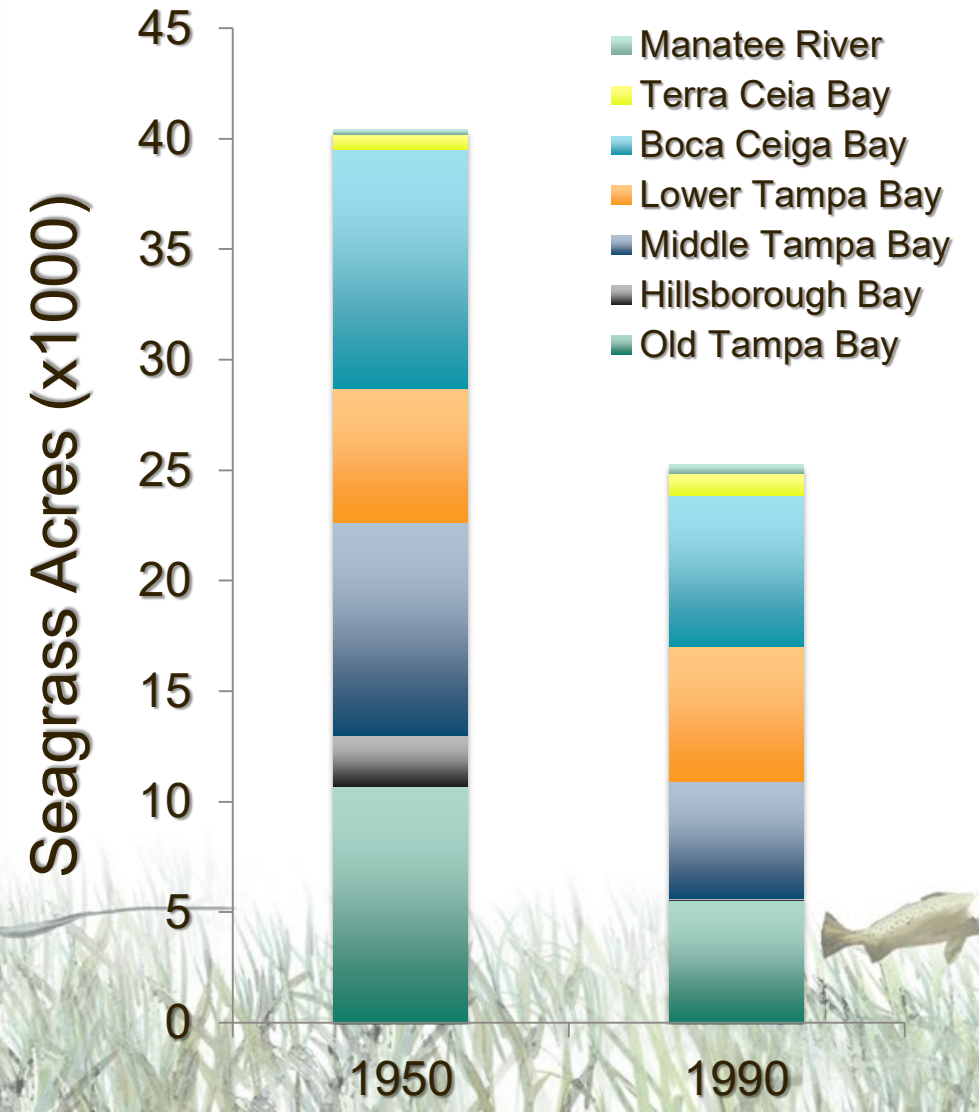
- Mission: Develop & foster partnerships to implement a science-based, management & restoration plan for the Tampa Bay estuary
- Comprehensive Conservation & Management Plan (v. 3 in 2017)



Shared Vision: Restore Seagrass to Promote Overall Ecological Recovery

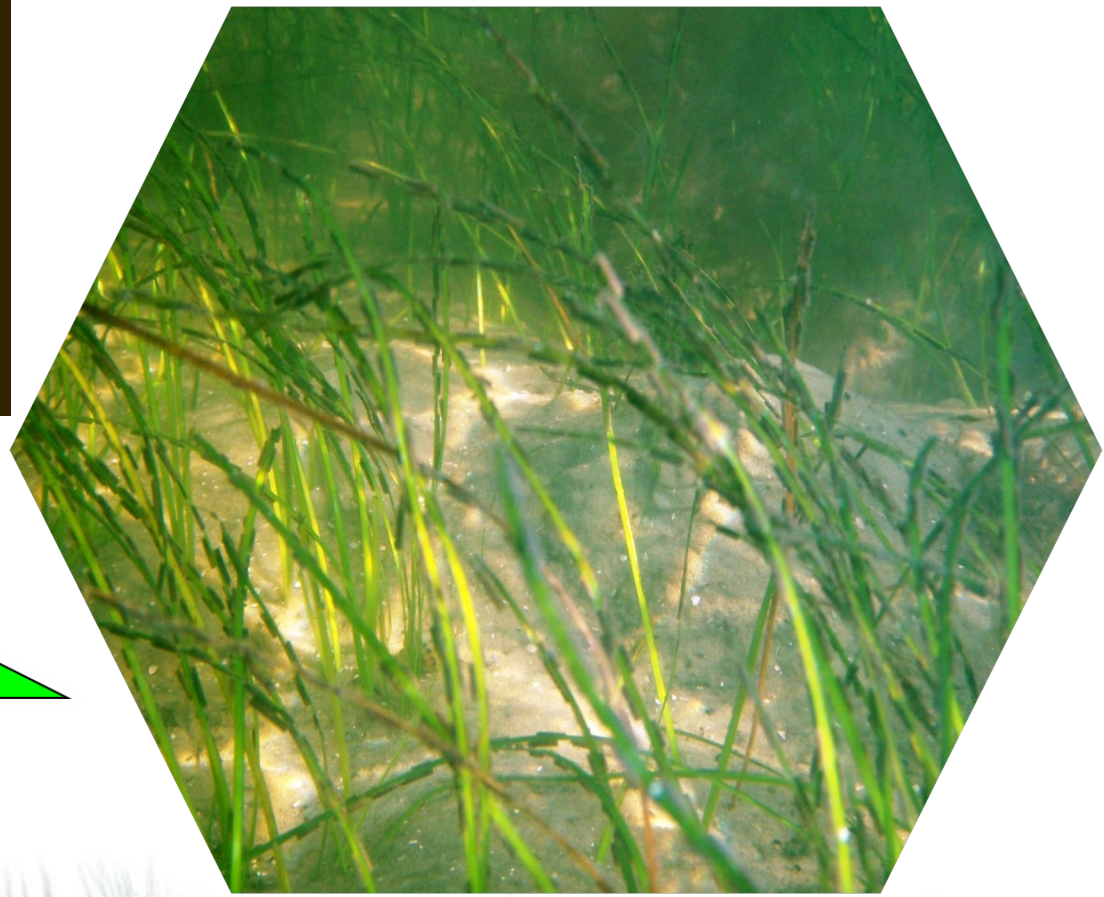
- 1950 Benchmark period (Complete aerial photos available)
- Protect & Restore Tampa Bay Seagrass to 95% of 1950s Levels (38,000 acres)





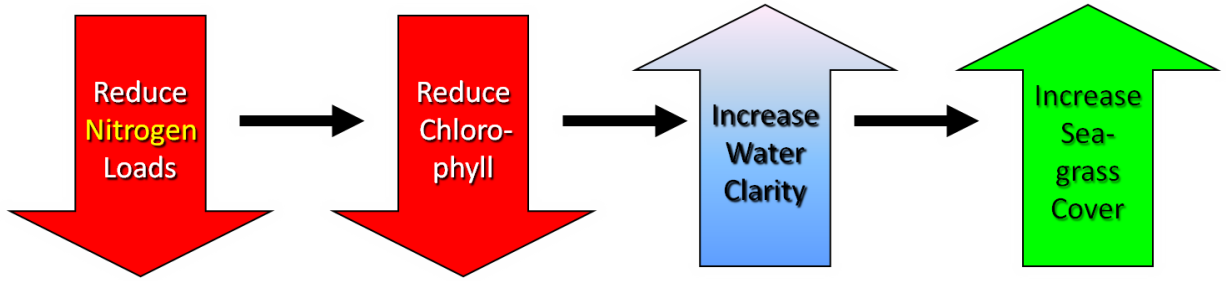
Target Root Causes

K.I.S.S. Approach

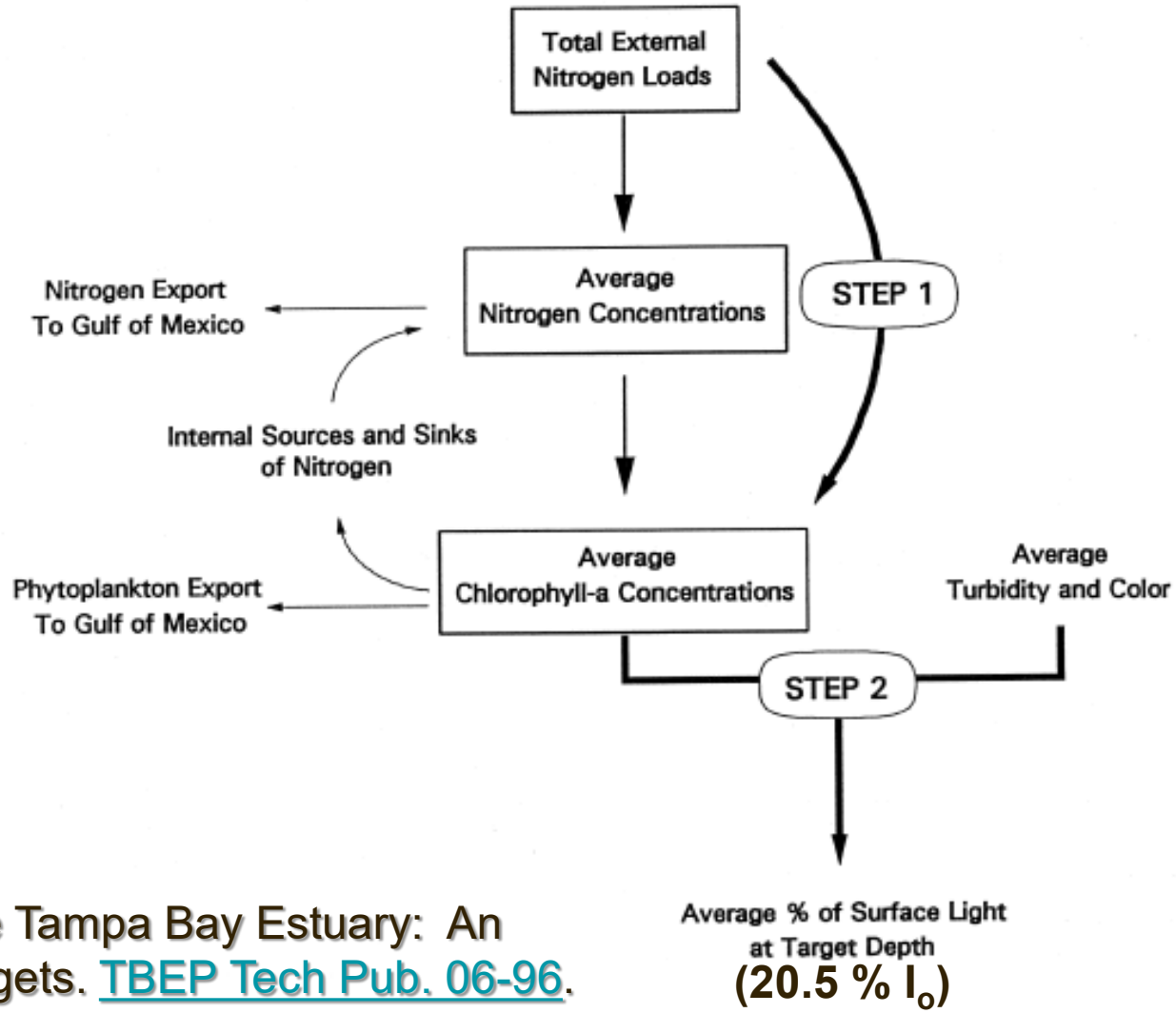


Reduce Nitrogen Loads → Reduce Chloro-phyll → Increase Water Clarity → Increase Sea-grass Cover

K.I.S.S.: Empirical Modeling Approach Pursued



- Step 1:
  - Relate external TN loads to chlorophyll-a concentrations in the major bay segments
- Step 2:
  - Relate chlorophyll-a (w/ other light attenuating factors) to specific light at depth targets for each bay segment



Janicki & Wade 1996: Estimating Critical N Loads for the Tampa Bay Estuary: An Empirically Based Approach to Setting Management Targets. TBEP Tech Pub. 06-96.

1998: Partnership for Progress Develops Collaborative N Load Reduction Commitments

Partnership *for* Progress

THE TAMPA BAY NITROGEN MANAGEMENT CONSORTIUM ACTION PLAN 1995-1999

A RESOLUTION OF THE TAMPA BAY NITROGEN MANAGEMENT CONSORTIUM ADOPTING THE 1995-1999 NITROGEN MANAGEMENT ACTION PLAN AND COMMITTING TO ITS IMPLEMENTATION

Whereas, the Tampa Bay National Estuary Program (NEP) was established in 1991 to assist the Tampa Bay area in developing a comprehensive conservation and management plan (CCMP) to restore and protect the natural resources of Tampa Bay; and

Whereas, the Policy Committee of the NEP, comprised of six local governments and three regulatory agencies as listed in Exhibit "A", unanimously adopted the CCMP for Tampa Bay known as Charting the Course in December 1996 including, but not limited to, measurable goals for restoration of seagrasses and corresponding goals for reduction/management of nitrogen loading to major bay segments as specifically enumerated in Exhibit "B"; and

Whereas, in August 1996, the NEP Management Committee listed in Exhibit "A" joined with key industries in the Tampa Bay region to create a unique public/private partnership known as the Tampa Bay Nitrogen Management Consortium (Consortium) as listed in Exhibit "C" for the express purpose of cooperatively developing a plan of action (Consortium Action Plan) to meet its assigned portion of the nitrogen reduction/management goal; and

Whereas, on March 26, 1998 the local governments and non-federal agencies represented on the Policy Committee and the Management Committee of the NEP entered into an Interlocal Agreement: adopting the goals and priorities of the CCMP; defining the responsibilities of the parties including the development of action plans to achieve the CCMP goals; creating guidelines for regulatory flexibility to facilitate implementation of action plans; establishing the CCMP as an ecosystem management conceptual design upon which more detailed ecosystem management agreements may be entered into pursuant to Section 27 of 97-164, Laws of Florida (to be Codified as Section 403.0752 of the Florida Statutes); and including other appropriate provisions; and

Whereas, the U.S. Army Corps of Engineers has executed a joinder to the Interlocal Agreement and the U.S. Environmental Protection Agency has executed a separate Memorandum of Understanding setting forth the commitments of those federal agencies to the implementation of the CCMP; and

Whereas, the members of the Tampa Bay Nitrogen Management Consortium seek to express their good faith intentions to implement the Consortium Action Plan adopted through this Resolution.

NOW, THEREFORE BE IT RESOLVED BY THE TAMPA BAY NITROGEN MANAGEMENT CONSORTIUM:

Section 1: That the Consortium hereby adopts the Consortium Action Plan attached as Exhibit "D" to achieve the Consortium's portion of the cumulative 1995-1999 goals for nitrogen reduction/management; and

Section 2: That to ensure that the overall nitrogen reduction/management goals will be met, the Consortium Action Plan is subject to the approval, by majority vote, of both the Policy Board and the Management Board of the new NEP Entity created through the Interlocal Agreement cited above; and

Section 3: That those Consortium members who are also parties to the Interlocal Agreement will incorporate projects from the Consortium Action Plan for which they are responsible into their individual local government and agency action plans within sixty (60) days of adoption of this Resolution and the Interlocal Agreement; and

Section 4: That the non-governmental members of the Consortium hereby pledge to exercise their best efforts to implement in a timely manner, either individually or in cooperation with other Consortium members, the projects they have offered to undertake as part of the Consortium Action Plan; and

Section 5: That to encourage voluntary efforts which further the attainment of the adopted nitrogen reduction/management goals, members of the Consortium with regulatory authority agree to exercise reasonable flexibility within the framework of their rules and regulations in the processing of permit applications for projects included in the Consortium Action Plan as approved and subsequently amended, providing that an agency's decision to grant regulatory flexibility is totally within the discretion of each agency.

This Resolution shall take effect upon the last date of execution.

Preclude 85 tons TN / 5 years from entering Tampa Bay

Nitrogen Management Consortium

- Formed between 1996-1998, now includes 45+ public/private partners
- Members include TBEP government and regulatory agency participants, local phosphate companies, agricultural interests, electric utilities and port facilities
- Mid-1990s, collectively accepted responsibility for meeting nitrogen load reduction goals
- Consortium members may choose to implement any combination of projects to maintain loads to Tampa Bay at 1992-1994 levels

Public Partners:

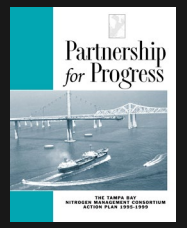
- Hillsborough County
- Manatee County
- Pinellas County
- Pasco County
- Polk County
- Sarasota County
- City of Tampa
- City of St. Petersburg
- City of Clearwater
- City of Palmetto
- City of Bradenton
- City of Largo
- City of Lakeland
- City of Oldsmar
- City of Gulfport
- City of Mulberry
- City of Plant City
- City of Safety Harbor
- SWFWMD
- US EPA
- FDEP
- FDACS
- FDOH
- FDOT
- MacDill AFB
- TBRPC
- Tampa Bay Water
- Tampa Port Authority
- EPC of Hillsborough County
- AEDC of Hills. County

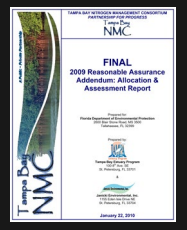
Private Partners:

- Busch Entertainment
- Lowry Park Zoo
- Mosaic Co.
- CSX Transportation
- Florida Power & Light
- Tampa Electric Co.
- Kinder Morgan Bulk T., Inc.
- Duke Energy
- Tropicana Products, Inc.
- Kerry I&F
- Trademark Nitrogen
- Yara N.A.
- Alafia Preserve, LLC
- Eagle Ridge, LLC
- LDC Donaldson Knoll Investments, LLC

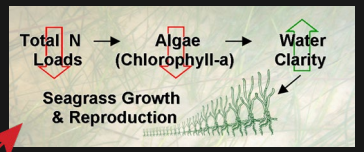
TBEP

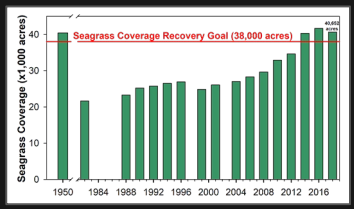
Background & Timeline of Activities





1991	1995-1999	1998-2001	2002	2007-2010	2012	2017	2022
TBEP established; Seagrass recovery goals begin to be developed	TBNMC formed to help achieve TN loading targets	Tampa Bay federal TMDL established; State later adopts alternatives, e.g, Reasonable Assurance determination in lieu of a TMDL	TBNMC develops 1st, 2002 Reasonable Assurance Plan for Tampa Bay; Chl-a regulatory thresholds formalized	2007 RA Update & 2009 RA Addendum; Responds to regulatory need to develop allocations for federal TMDL; 2010 FDEP WQBEL & FO	2012 RA Update Submitted; Interim allocations continued to be refined	2017 RA Update Submitted; FDEP: All segments attaining designated use related to TN	2022 RA Update in process (due 12/31/2022); Annual assessments continue (Year 5 of 5)





TN Loads Capped & Reductions Routinely Documented

- All TN Loads Apportioned to Sources
- Future loads will require offsets/transfers

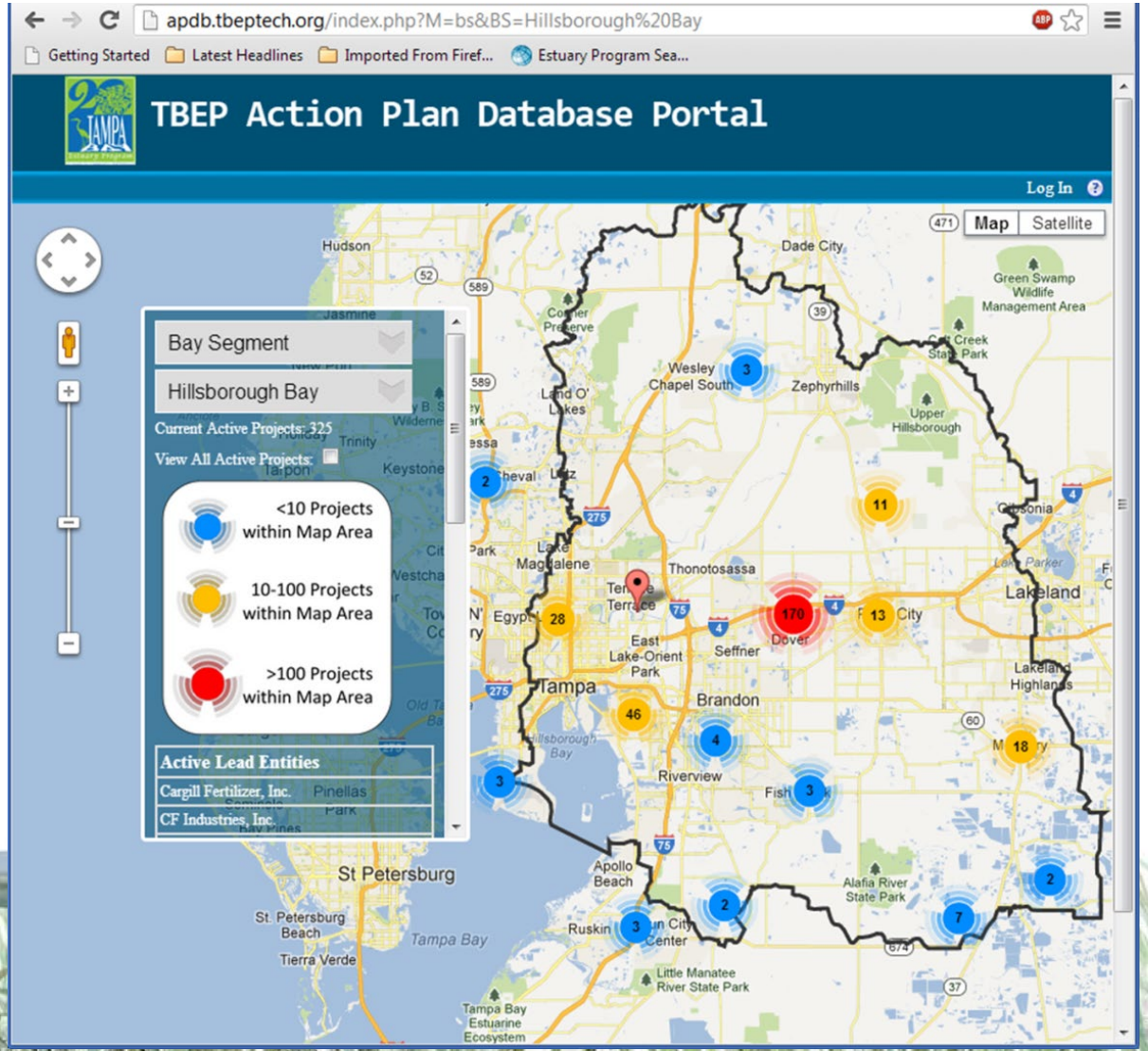
- http://apdb.tbep.org
- Load reductions reported every 5-yrs

Table IX-3: Proposed allowable, transferable nitrogen allocations for 2008-2012 for Middle Tampa Bay. SW=Surface water discharge, RE=Reuse discharge.

Entity	Source	Proposed MS4 and Point Source Permit Limit (%)	TMDL Load (tons/year)
Harbor Bay	NPS	<0.1%	0.2
Hillsborough County	MS4	9.9%	70.9
	Point Source - South County RE		0.5
MacDill Air Force Base	MS4	1.0%	7.0
	Point Source - WWTP RE		0.7
Manatee County	MS4	3.0%	21.8
Pinellas County	MS4	0.5%	3.2
City of Pinellas Park	MS4	0.7%	5.3
City of St. Petersburg	MS4	6.5%	46.5
	Point Source - St. Pete Facilities RE		20.8
Mosaic	Point Source - Four Corners SW	4.1%	29.3
TECO Big Bend*	Point Source – SW*		56.5*
	Point Source - RE		2.1
Non-MS4/Non-Ag NPS		0.5%	3.8
Atmospheric Deposition		35.2%	252.1
Other (Groundwater, Springs, Conservation)		5.1%	36.7
FDACS (Agriculture)		33.4%	239.2
Small Sources			2.4
Total			**799**

Note: The resulting MS4 and point source TMDL loads based on percent allocations are not proposed as permit limits.

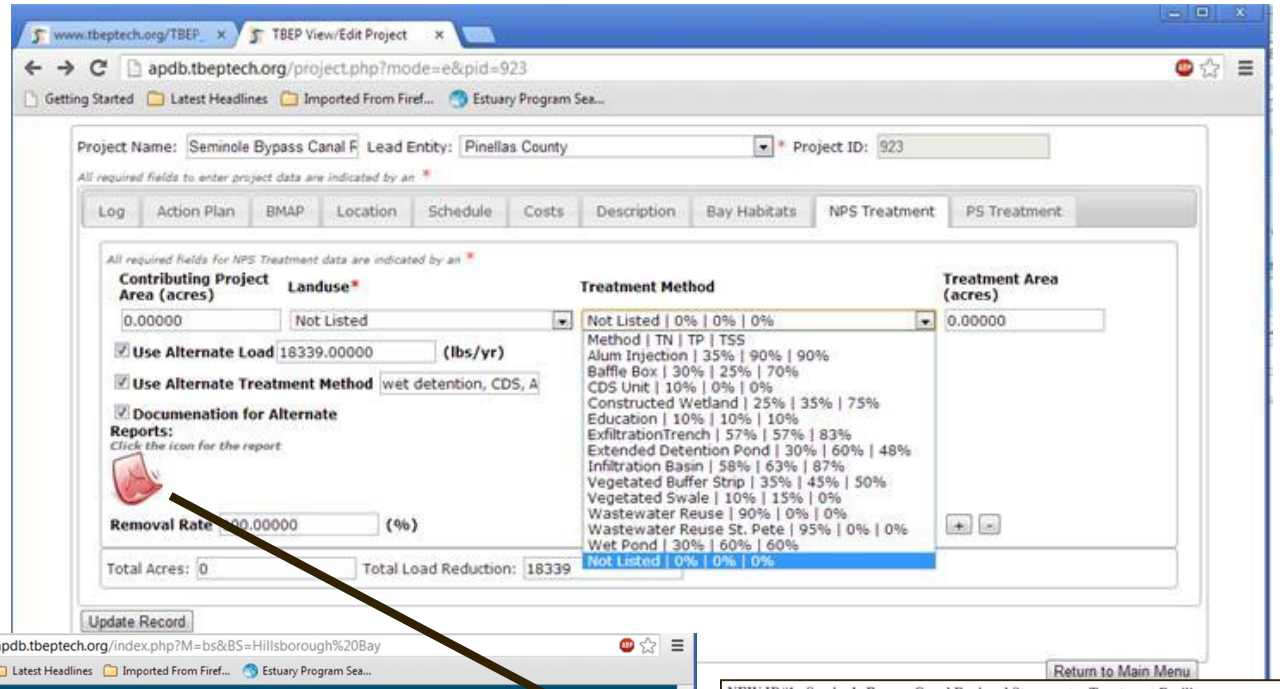
Includes a Set Allocation of 35.0 tons/year and an Interim Allocation through 2012 of an additional 21.5 tons/year to allow determination of new discharge loads.

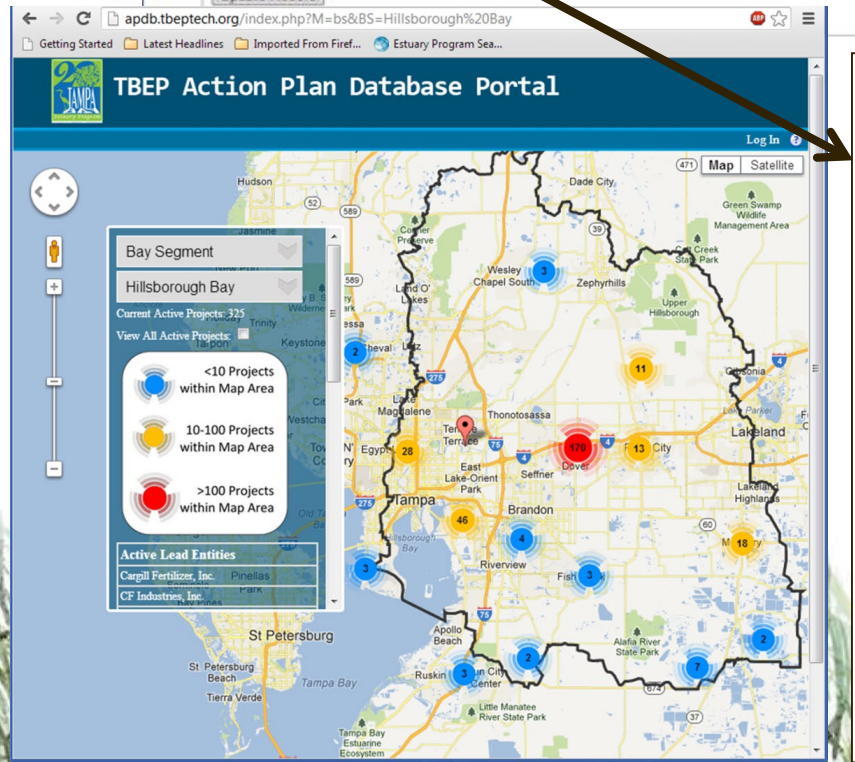


Partner-Driven TN Load Reduction Reporting

- Partners can enter either NPS or PS load reductions
- Default calculations and BMP efficiencies used based on land use, subbasin, and treatment method
- User-defined efficiencies & reductions can also be entered
- TBEP collates & reports by bay segment

- **1992-2017: 470+ Projects, 530 Tons TN/yr prevented from entering Bay**
  - **>$2.5 Billion Invested**
- **2017-2021: Another 138 Tons TN/yr**





NEW ID#1 Seminole Bypass Canal Regional Stormwater Treatment Facility
Lead Agency: Pinellas County
Project summary: Diverted water from the Seminole Bypass Canal will be treated with alum to achieve a 90% reduction in TP, 35% reduction in TN, and 85% reduction in TSS.
Subbasin location: 501 and 524
Planned initiation: 10/2004
Planned completion: 3/2007
Drainage basin area (acres): 5120 acres
Drainage basin land use and percentages or acres by land use type (approximate):

LAND USE	ACRES	%
RESIDENTIAL HIGH DENSITY	6536.2622	45.07%
COMMERCIAL AND SERVICES	1078.5667	7.44%
INDUSTRIAL	991.2254	6.84%
BAYS AND ESTUARIES	857.3327	5.91%
RECREATIONAL	677.2572	4.67%
LAKES	668.6781	4.61%
INSTITUTIONAL	578.0629	3.99%
OPEN LAND	502.7464	3.47%
TRANSPORTATION	415.7077	2.87%
RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	323.9821	2.23%
RESERVOIRS	305.6389	2.11%
RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	266.5345	1.84%
PINE FLATWOODS	235.9539	1.63%
HARDWOOD CONIFER MIXED	191.6533	1.32%
WETLAND FORESTED MIXED	176.4321	1.22%
UTILITIES	113.8942	0.79%
OTHER	581.3124	4.01%
LAND USE TOTAL (ACREAGE AND %)	14501.2407	100.00%

Treatment method (wet detention, CDS, etc): Alum
Current load: 23,772 kg/yr (52,398 lbs)
TN removal rate for alum injection: 35%
Load reduction (lbs/yr): 18,339 lbs/yr
Total estimated cost, if available: $1,198,500
Funding sources, if available: SWFWMD SWIM, FDEP 319(h), and Pinellas County

NEW ID#2 Alum treatment of five priority sub basins discharging to Lake Seminole
Lead Agency: Pinellas County
Project summary: Alum treatments of stormwater systems in Lake Seminole SubBasins 1,2,3,6 and 7.
Subbasin location: 524
Planned initiation: 10/2004
Planned completion: Phase I: 3/2007; Phase II 12/2009
Drainage basin area (acres): 2,532

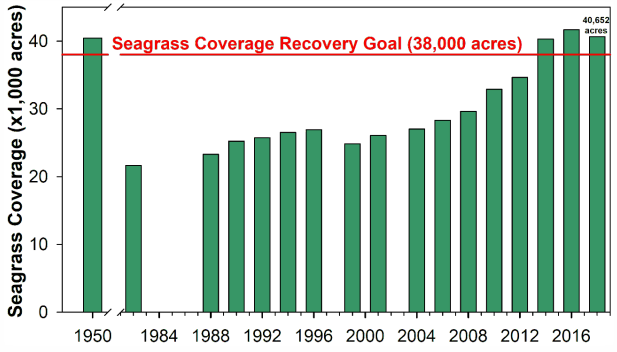
Guidelines for Calculating Nitrogen Load Reduction Credits. 1997. Prepared by Coastal Environmental (H.W. Zarbock and A.J. Janicki). TBEP Tech. Pub #02-97.

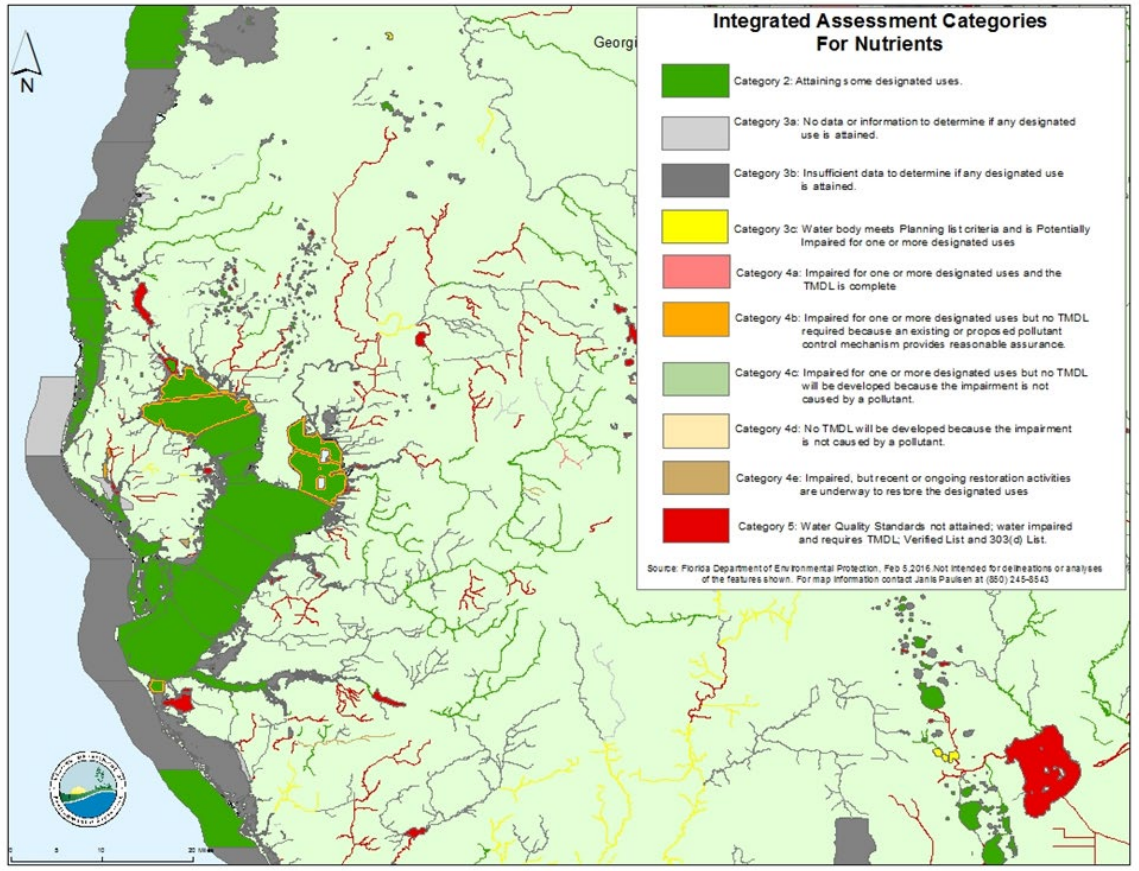
Consistent Cooperation, Collaboration & Reporting

- TBNMC have submitted Reasonable Assurance documentation to FDEP in 2002, 2007, 2009, 2012, 2017 & 2022(In progress)
- FDEP Approved 2017 RA Update on Nov. 15, 2017

TAMPA BAY
NITROGEN MANAGEMENT CONSORTIUM
A PUBLIC - PRIVATE PARTNERSHIP

https://tbep.org/our-work/boards-committees/nitrogen-management-consortium/





Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

November 15, 2017

Ms. Holly Greening
Executive Director
Tampa Bay Estuary Program
263 13th Ave South, Suite 350
St. Petersburg, FL 33701

Dear Ms. Greening:

This letter is to inform you, the Tampa Bay Estuary Program, and other members of the Tampa Bay Nitrogen Management Consortium of the continued approval by the Florida Department of Environmental Protection of the Nitrogen Management Consortium's Reasonable Assurance Plan (RA). The 2017 update demonstrates that reasonable progress towards attainment of the narrative nutrient criteria and associated Class III designated uses continues because of the completed and proposed management actions, and compliance with the allocations.

On October 31, 2017, the department received the Tampa Bay Nitrogen Management Strategy – 2017 Reasonable Assurance Update Document and following a review of the document concluded the 2017 update demonstrates not only the attainment of the RA seagrass targets, but also the total nitrogen numeric nutrient criteria. Because of this success, all segments covered by the RA will be placed in assessment category 2 for total nitrogen. This assessment category designation identifies the segments as not impaired and attaining their designated uses.

I would like to close by emphasizing our appreciation for the outstanding job that you and the stakeholders have done over the years. Taking a valuable water resource, such as Tampa Bay, from impaired to restored is no easy feat. We are especially appreciative of the way stakeholders have continued to embrace this comprehensive restoration plan, and commend them for their efforts to protect and restore Tampa Bay.

If you have additional questions about the information provided in this letter or the assessments, please contact me (850-245-8416, Julie.Espy@dep.state.fl.us).

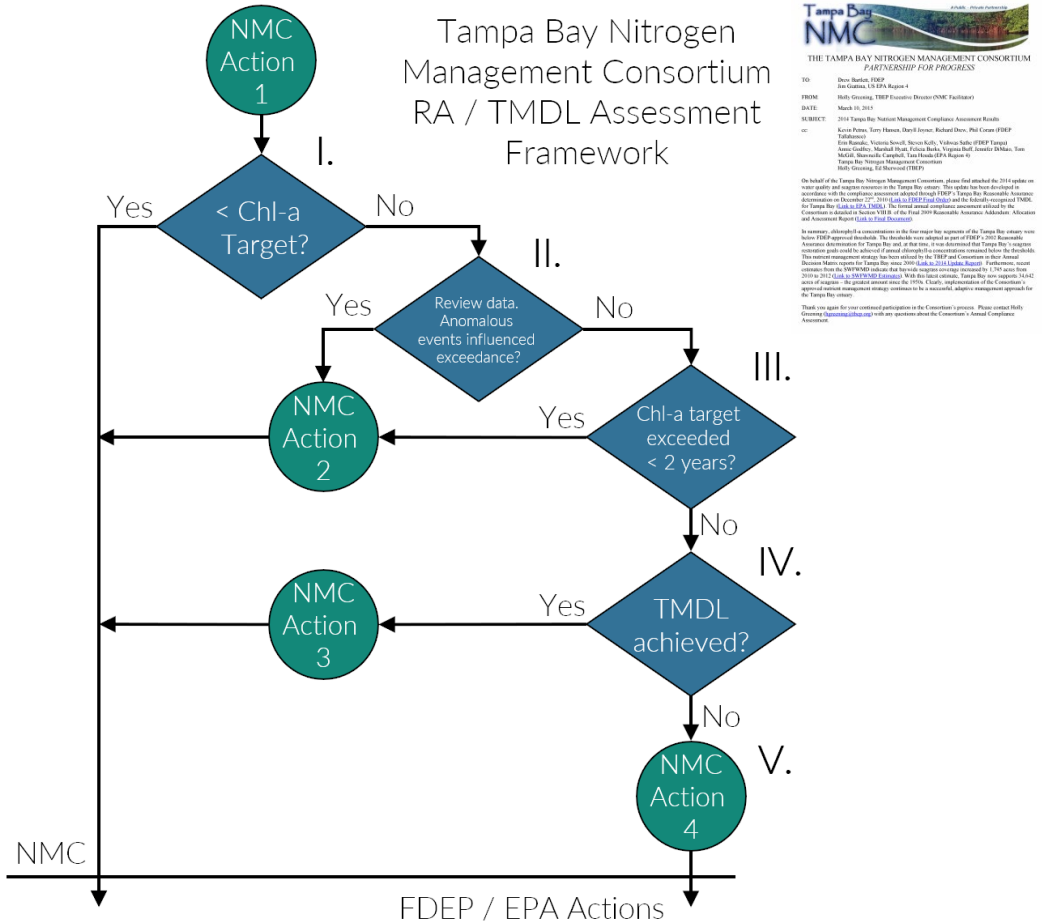
Sincerely,

Julie Espy, Program Administrator
Water Quality Assessment Program

Cc: Drew Bartlett, FDEP
Tom Frick, FDEP
Mary Walker, US EPA Region 4
Julie Espy, FDEP

If WQ is Poor, Additional Regulatory Step Required (2009 – Present)

- Section VIII in the 2009 RA Addendum
- Annually assess chlorophyll-a relative to NNC over the 5-yr RA period
- Additional reporting triggered when chl-a > thresholds for 2 straight years
- Bay segment / Entity TN loads assembled and further assessed
- Possible outcomes: Recommend adjustment of bay segment TN TMDL and/or individual entity source load allocations



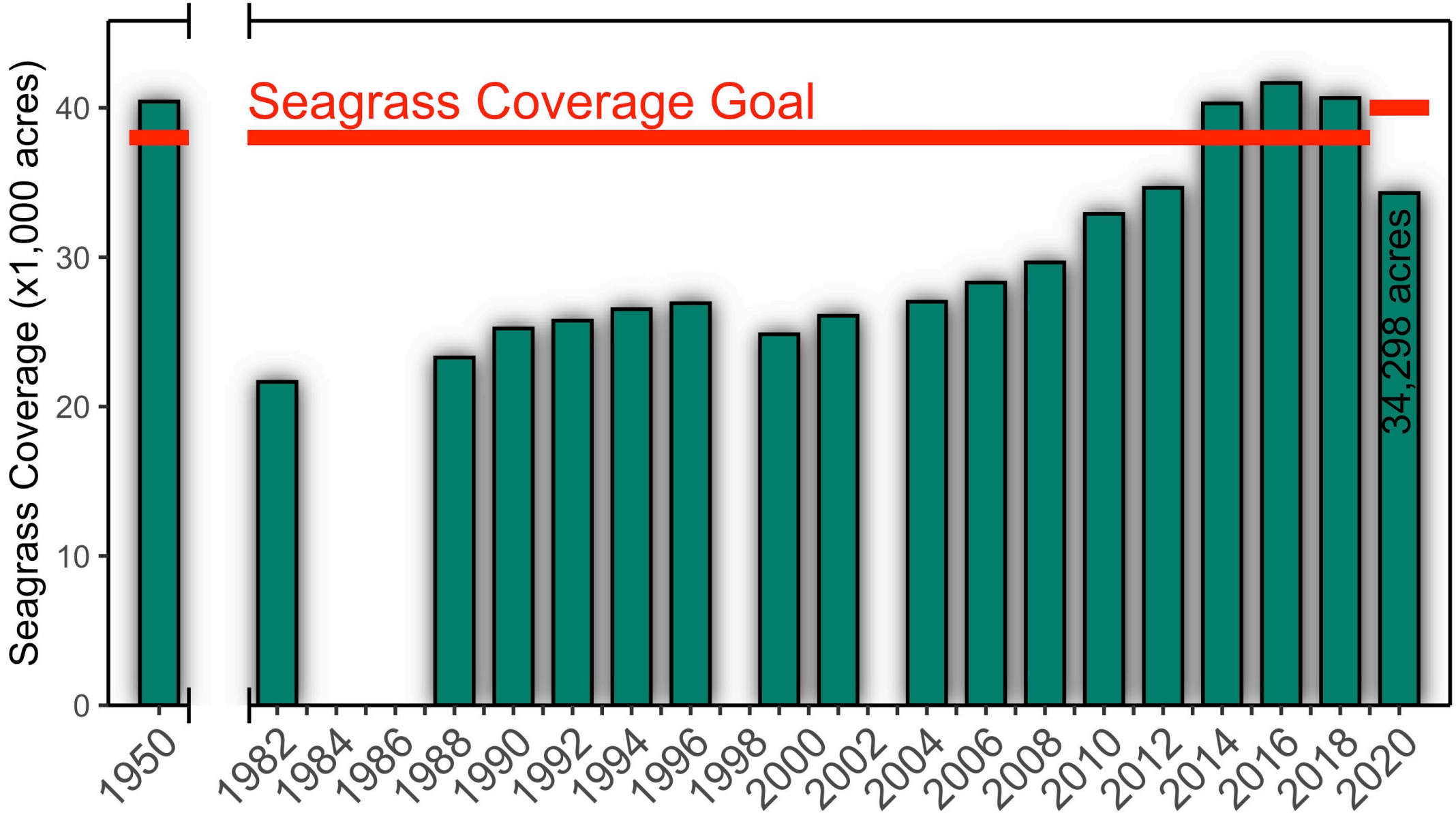
Assessment Step Linked to Roman Numerals of Figure Above	Result	Action
I. Determine annual bay segment specific chlorophyll-a regulatory threshold attainment.	Yes	NMC Action 1
	No	NMC Action 1
II. Review data and determine if an anomalous event(s) influenced non-attainment of the bay segment specific chlorophyll-a threshold.	Yes	NMC Action 2
	No	Go to III.
III. Determine if the chlorophyll-a thresholds have been exceeded for <2 consecutive years.	Yes	NMC Action 2
	No	Go to IV.
IV. Determine if the bay segment specific federally-recognized TMDL has been achieved.	Yes	NMC Action 3
	No	Go to V.
V. For a given year or for multiple years, compile and report entity-specific combined source loads in comparison to source allocations.	Compile & Report	NMC Action 4

Old Tampa Bay: Additional RA Assessment Steps

Bay Segment Reasonable Assurance Assessment Steps	DATA USED TO ASSESS ANNUAL REASONABLE ASSURANCE					OUTCOME
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	
NMC Action 1: Determine if observed chlorophyll-*a* exceeds FDEP threshold, 9.3 μg/L	9.5 μg/L (Yes)	9.2 μg/L (No)	9.8 μg/L (Yes)	9.5** μg/L (Yes**)	9.4* μg/L (Yes)	2021 exceeds chl-a threshold.
YES						
NMC Action 2: Determine if any observed chlorophyll-*a* exceedances occurred for 2 consecutive years, review / report on any anomalous events and data.	No	No	No	Yes**	Yes	3rd concurrent annual exceedance.
No?						
NMC Action 3: Determine if observed hydrologically-normalized total load exceeds federally-recognized TMDL of 486 tons/year	No* (332)	No* (346)	No* (369)	No* (355)	? (Pending)	**Prep. for NMC Action 3: Assemble 2021 loading info; Further scrutinize data; *Assess re-evaluation of bay segment assimilative capacity***
NMC Actions 4-5: Determine if any entity/source/facility specific exceedances of 5-yr average allocation occurred during implementation period						

*Provisional loading data; **April-May data not collected & analyzed

2020 Seagrass Coverage Dips Below Recovery Goal & 1950s Benchmark Period Extent



Old Tampa Bay Segment: Requires an Adaptive Management Approach

Changing Hydrology?

Shellfish Restoration

Total N Loads → Algae (Chlorophyll-a) → Water Clarity

Seagrass Growth & Reproduction

Poor Circulation

The Recipe

Key Elements in Tampa Bay's Adaptive Management Approach & Prior Success

- Target resources identified by both public and scientists as "worthwhile" indicators (seagrass)
- Long-term monitoring
- Science-based numeric goals & targets
- Multiple tools: Regulation; Public/private collaborative actions; Citizen actions
- Recognized "honest broker" to track, facilitate, assess and report on progress
- Ongoing assessment & adjustment when needed
- Linking to regional economic vitality

Thank you, any questions?

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PARTNERSHIP FOR A HEALTHY BAY

tbep.org

#LOVE Tampa Bay

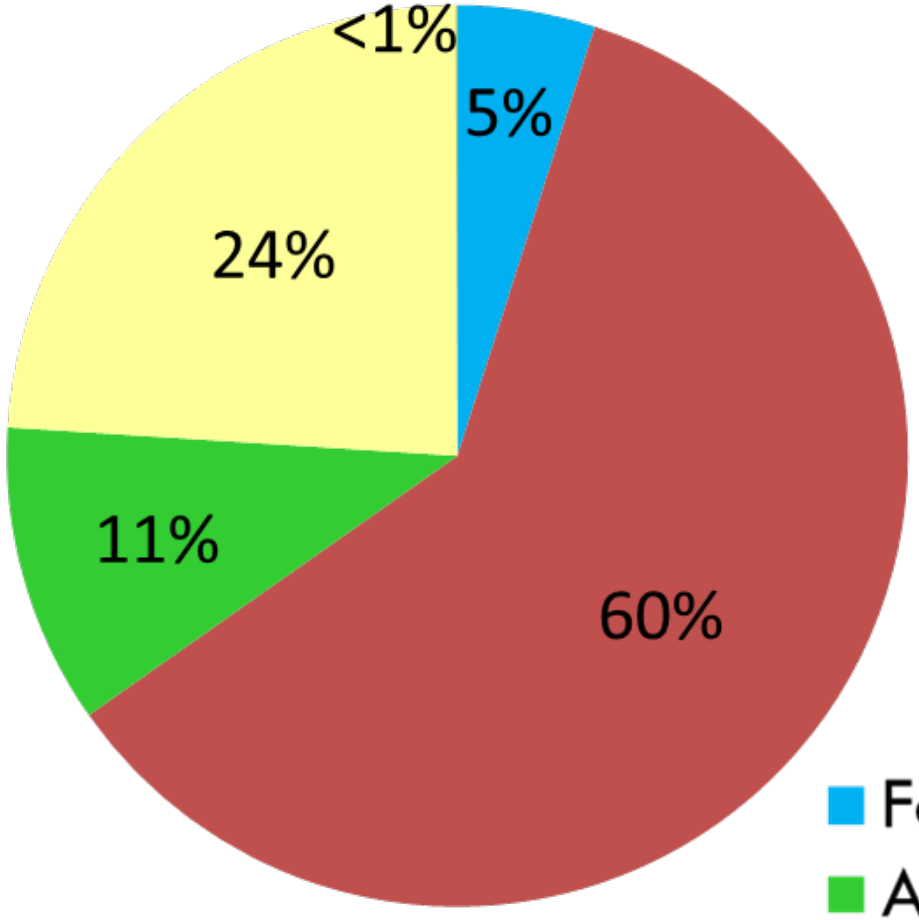
Bay Soundings

Ed Sherwood
esherwood@tbep.org

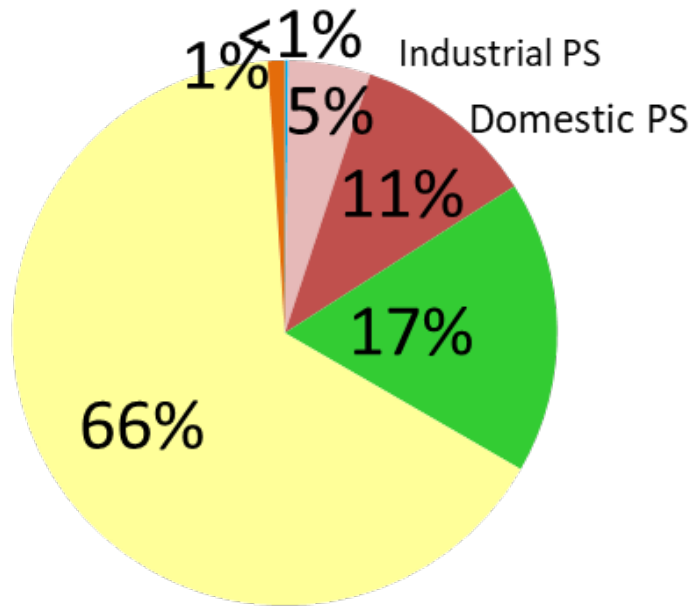
Extra Slides

Tampa Bay Coastal Nutrient Sources Have Been Reduced, Now Dominated by Stormwater Runoff

1970s: TN Load ~ 9 x 10^6 kg/yr



2010s: TN Load ~ 3.4 x 10^6 kg/yr



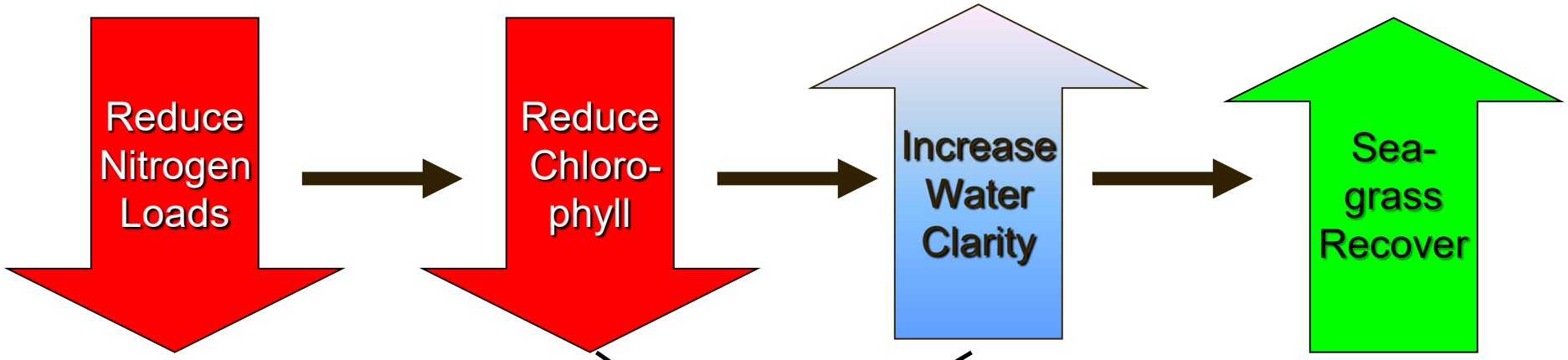
- Fertilizer Losses
- Atmospheric Deposition
- GW & Springs
- Point Sources
- Nonpoint Sources

Generalized Reasonable Assurance (RA) Update Process for 2022 - 2026

Documentation Requirements:

- 2022-2026 Annual assessment of water quality and attainment status of chl-a thresholds (TBEP)
- 5-year TN, TP, TSS, BOD and hydrologic loading report (2022-2026) (NMC Consultant)
- Assessment of allocation attainment over 2022-2026 RA Period (NMC Consultant)
- Update Action Plan Projects Database through 2022+ (NMC participants, NMC Consultant and TBEP)
- Finalization of any 2027-2031 allocation updates (NMC Consultant and TBEP)

Summary: Tracking our Progres



- Limits (voluntarily) and proactively developed by NMC local partners
- Regulatory agencies partners in the process
- Load allocation targets periodically re-assessed

- Local-programs consistently monitor water quality since 1970's
- Bay-Segment Specific Annual Targets Developed
- Targets tied to Seagrass Restoration Goal

- Local-program consistently estimates seagrass coverage since 1980's
- Restoration endpoint clearly defined

5-Yr Annual Assessment;
Tied to Observed Bay Conditions

Bottom Line

Annually-Assessed;
Localized Management Responses Implemented, if necessary

~2-Yr Assessment;
Water-quality Targets Re-Evaluated, if necessary