Progress on implementation of the Delaware Inland Bays Pollution Control Strategy, a 10 year review

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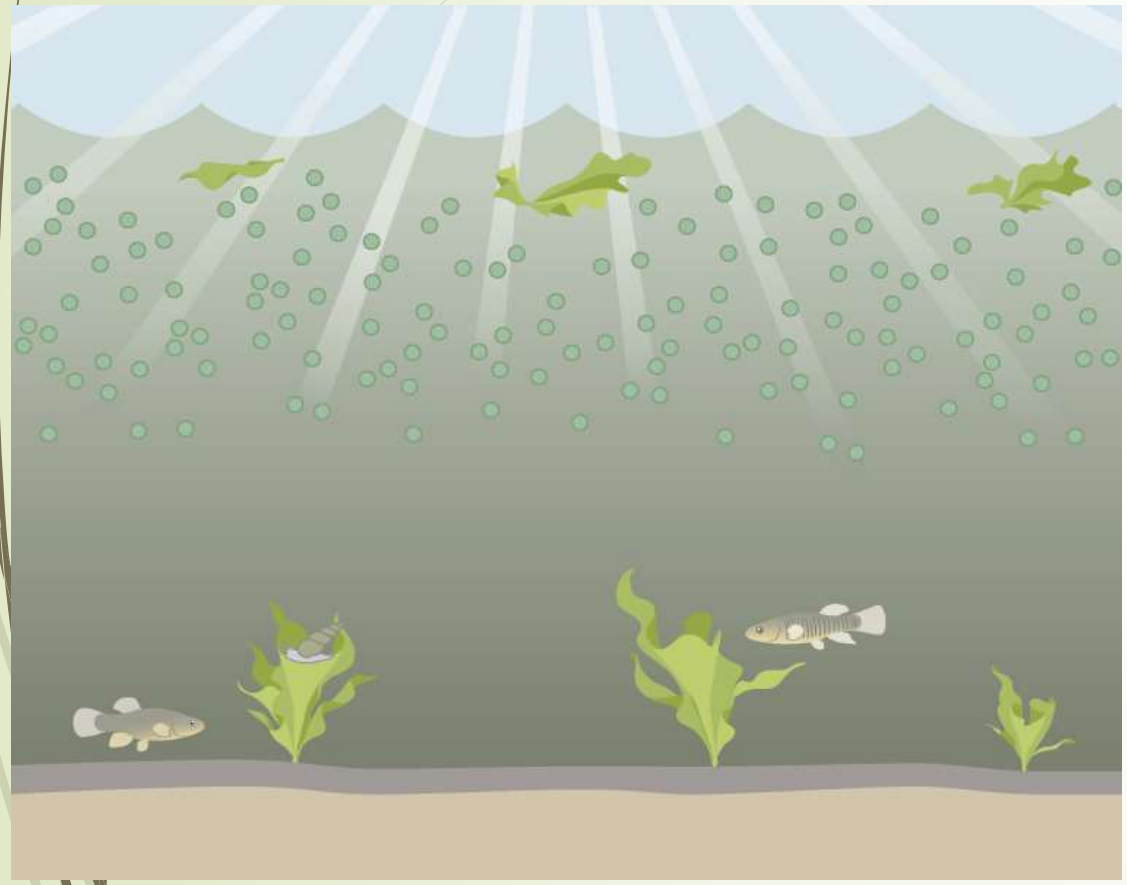
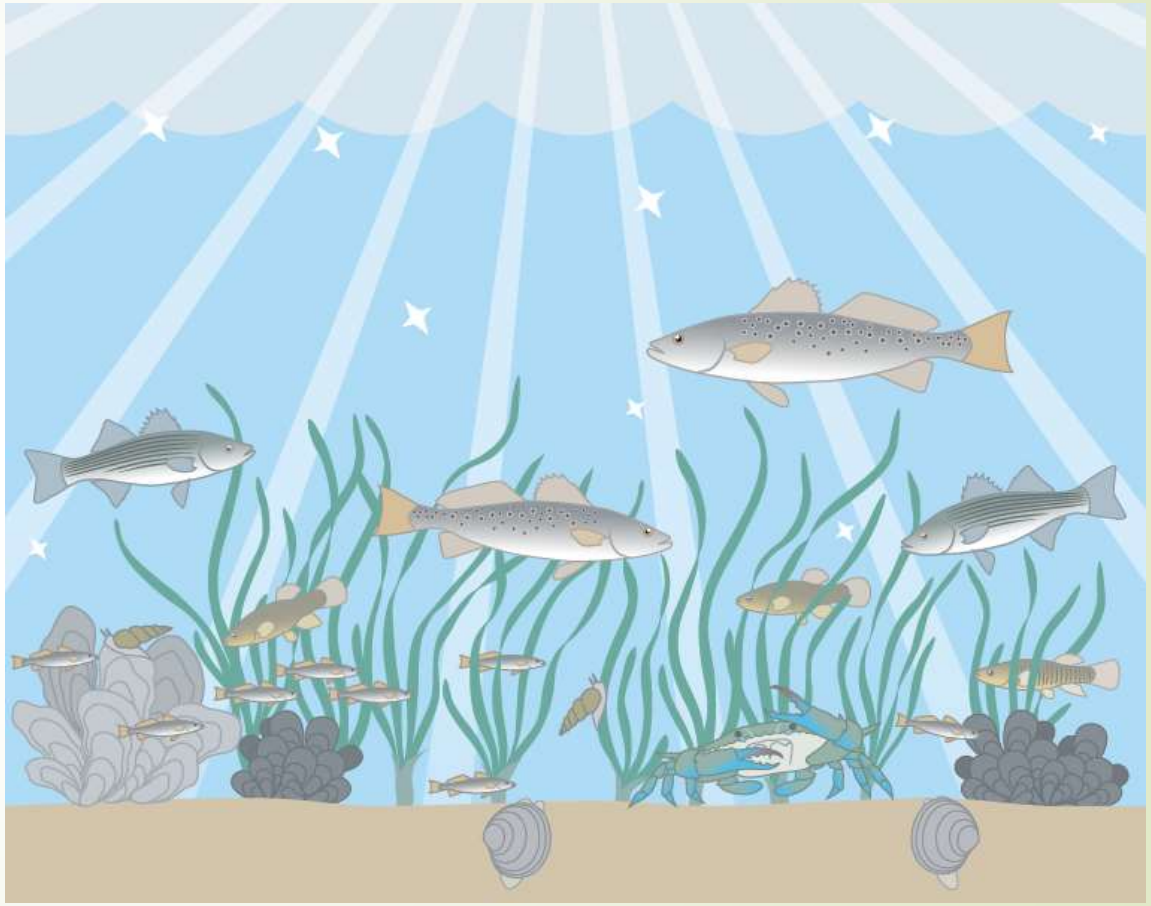
Inland Bays Watershed

- Coastal lagoon system behind a barrier island
- Shallow, poorly flushed estuary
  - Average depth: 4.5 ft
  - Inlets: Indian River and Ocean City
- Watershed is 292 mi^2 that drains to 35 mi^2 of bays and tributaries
- Land use: Agricultural, developed, forested

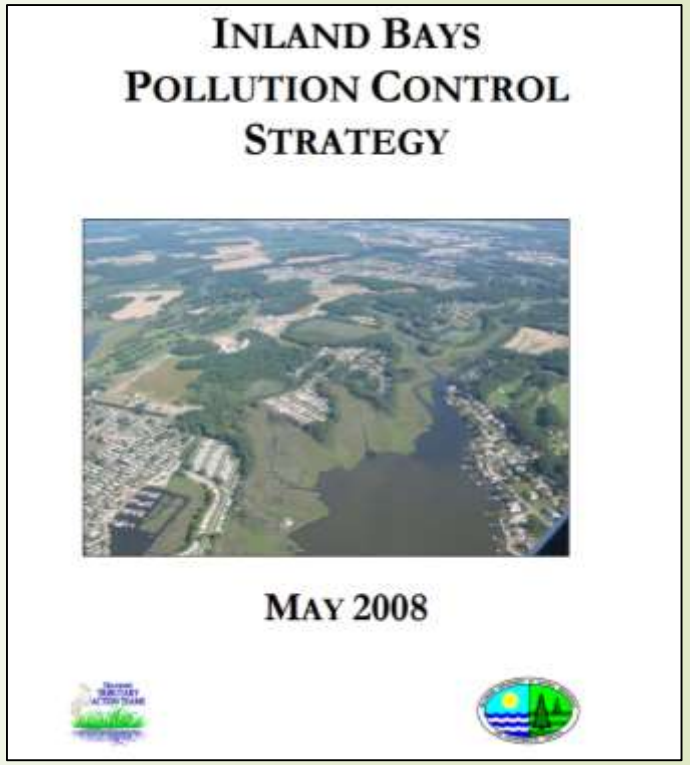
Excessive nutrients pollute our Bays





Purpose of the Pollution Control Strategy (PCS)

- Designed to reduce nutrient loadings from current and future land practices
- Voluntary and regulatory actions to achieve TMDL
- Included estimated BMP nutrient reductions and implementation cost
- Promulgated in 2008
- NEED: comprehensive assessment
  - Progress determined by nutrient reductions and evaluated by sector



Point Sources: From 13 down to 2

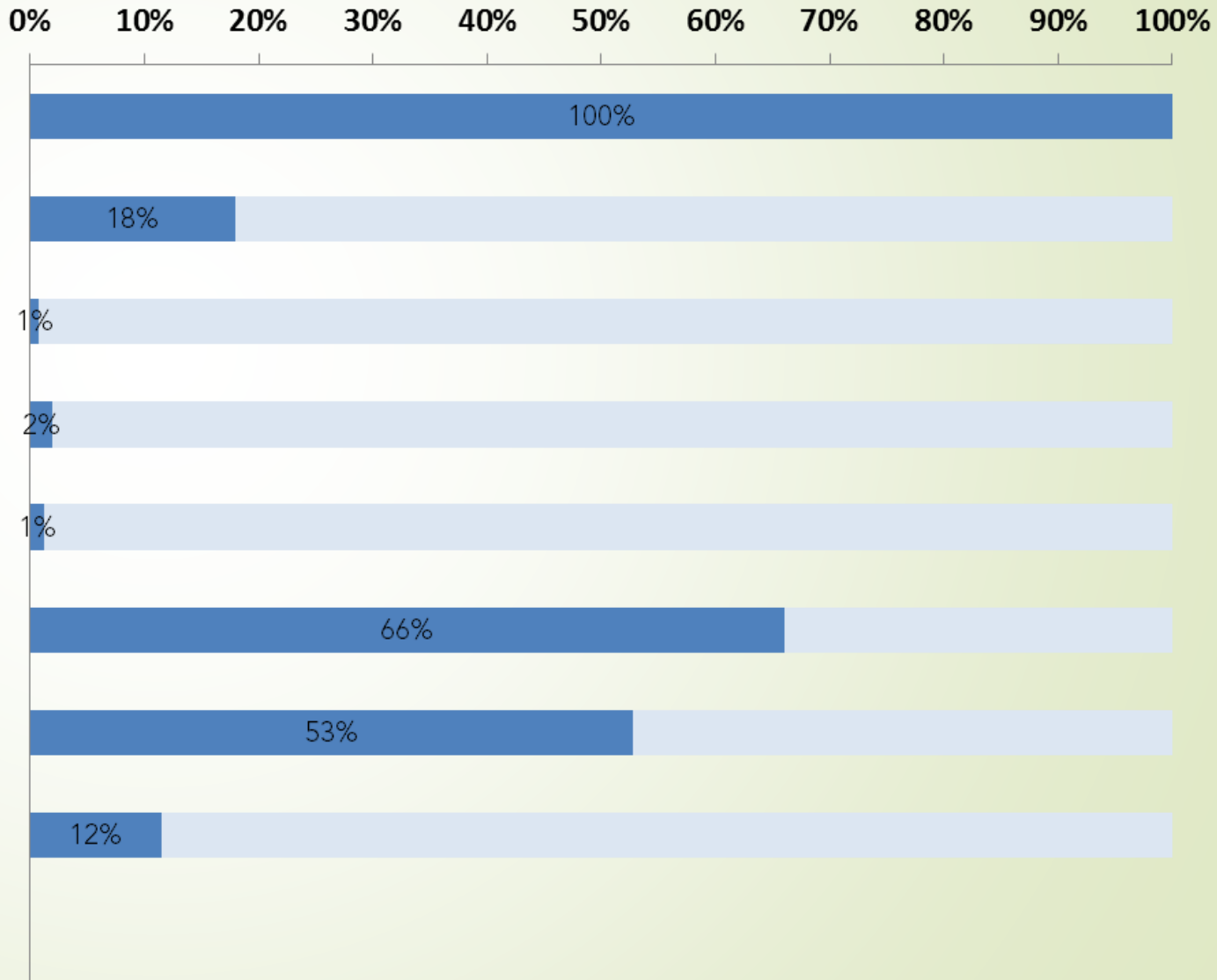
- General Action: Systematic elimination of all point sources of N and P
  - Lewes: mitigation by manure relocation
  - Millsboro: RIBs in August 2015
  - Rehoboth: scheduled for ocean outfall by 2018
  - Allen Harim: In discussions with DNREC to address discharge
- TN Reductions: 50.1 lb/d N (59%)
- TP Reductions: 11.5 lb/d P (27%)

Nonpoint Source-Agriculture

- General action: The agricultural sector should implement additional BMPs
  - TN Reductions:1,048 lb/d N (32%)
  - TP Reductions: 27.2 lb/d P (73%)

Nonpoint Source-Agriculture

Practice	Goal
Implement Nutrient Mgmt. Planning	*100% of farms*
Establish Cover Crops	*Avg. of 37,637 acres/year*
Establish Forested Waterway Buffers	*3,037 acres*
Establish Grassed Waterway Buffers	*1,718 acres*
Restore Wetlands on Former Cropland	*4,147 acres*
Build Poultry Manure Sheds or Composters	*50 structures*
Relocation & Alternative Use of Manure	*Avg. of 20,909 tons/year*
Treat Cropland with Water Control Structures	*450 acres*



Nonpoint Source-Onsite Wastewater Treatment and Disposal Systems

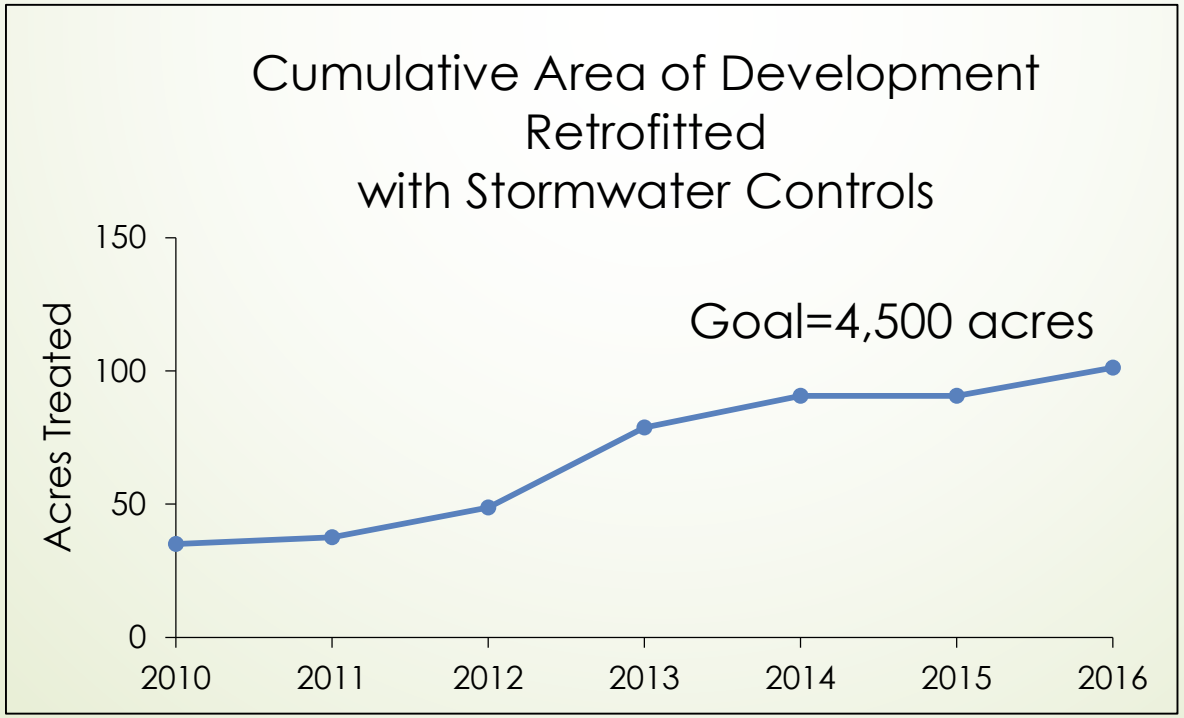
- General action: Improve O&M of onsite systems such that nutrient loadings from them are reduced
  - 10,936 EDU systems converted to central sewer
  - New or replacement systems to achieve performance standards
  - Permanent holding tanks not allowed
  - Septic Rehabilitation Loan Program
- TN Reductions: 314 lb/d (89%)
- TP Reductions: 26.3 lb/d (445%)

Nonpoint source-Urban Land Use

- General action: Decrease nutrient loading from urban nonpoint sources
  - 2011 DE Superior Court decision declared the buffer portions void and unenforceable
    - Considerably weakened the PCS
  - Specific nutrient reductions were not assigned
- Overview
  - No actions complete
  - In progress: From 2008 to 2015, CIB and partners planted about 248 acres of trees or other plants adjacent to waters and wetlands

Nonpoint source-Stormwater

- General action: Stormwater runoff shall be managed for nutrient reductions when practicable
  - TN Reductions: 2.9 lb/d (2%)
  - TP Reductions: 0.12 lb/d (2%)

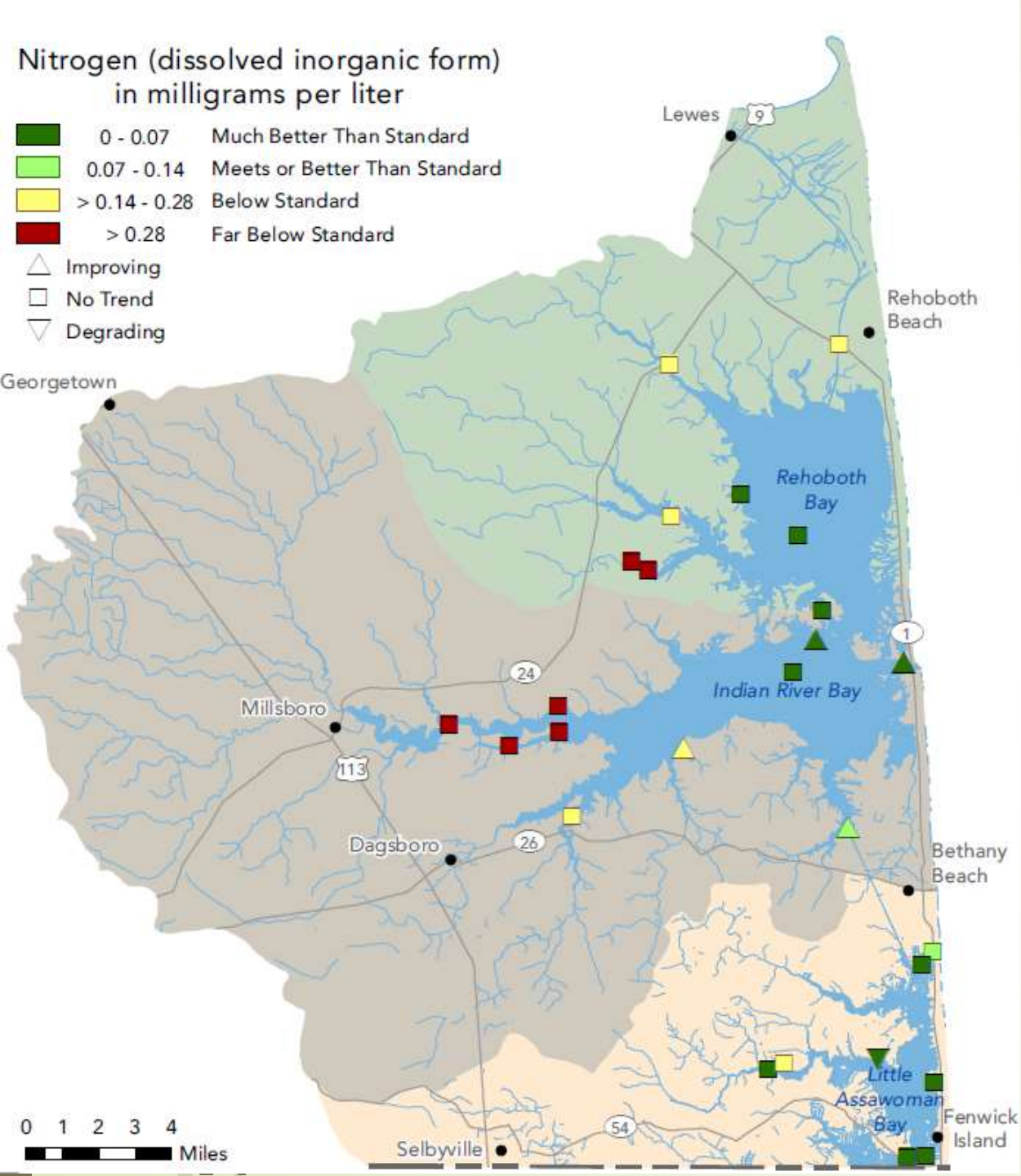


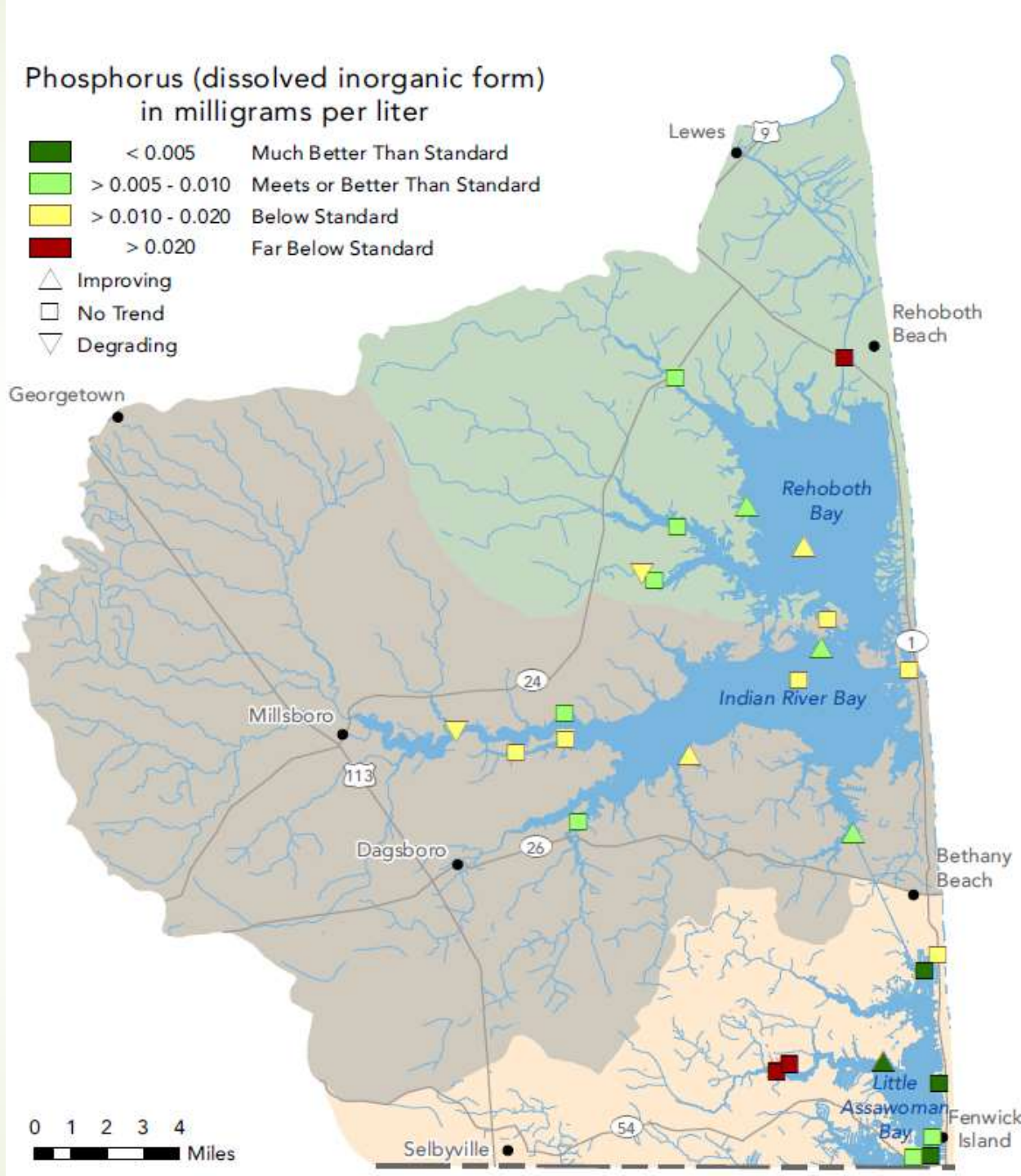
Concurrence

- General action: A mechanism shall be established to ensure concurrence of policies, laws, and regulations within, between, and among government and other agencies
  - There is a need to develop a system of accountability for the Inland Bays region
  - Nutrient reductions are not quantified

Results

Sector	Nitrogen			Phosphorus		
	Reduction (lb.)	Goal (lb)	% complete	Reduction (lb.)	Goal (lb.)	% complete
Point sources	50.1	84.6	59	11.5	42.9	27
Agriculture	1,049	3,272	32	27.2	37.2	73
Onsite systems	336.4	377	89	34.7	7.8	445
Stormwater	2.9	130.5	2	0.1	5.5	2
Total	1,437	3,864.1	37	73.5	93.4	79


Nitrogen (dissolved inorganic form)
in milligrams per liter
0 - 0.07 Much Better Than Standard
0.07 - 0.14 Meets or Better Than Standard
> 0.14 - 0.28 Below Standard
> 0.28 Far Below Standard
Improving
No Trend
Degrading
Lewes
9
Rehoboth Beach
Georgetown
Rehoboth Bay
1
24
Indian River Bay
Millsboro
113
Dagsboro
26
Bethany Beach
Little Assawoman Bay
Fenwick Island
54
Selbyville
0 1 2 3 4
Miles


Phosphorus (dissolved inorganic form)
in milligrams per liter
< 0.005 Much Better Than Standard
> 0.005 - 0.010 Meets or Better Than Standard
> 0.010 - 0.020 Below Standard
> 0.020 Far Below Standard
Improving
No Trend
Degrading
Lewes
9
Rehoboth Beach
Georgetown
Rehoboth Bay
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Little Assawoman Bay
Fenwick Island
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Selbyville
0 1 2 3 4
Miles

Summary

- Progress in some, not all sectors
  - Likely linked to water quality improvements
- Partnerships and dedicated funding are critical for success
- Next steps
  - Review BMPs and nutrient reduction values using best available science
  - Update BMP cost estimates
  - Use these to inform 2018 revision


Questions?
www.inlandbays.org