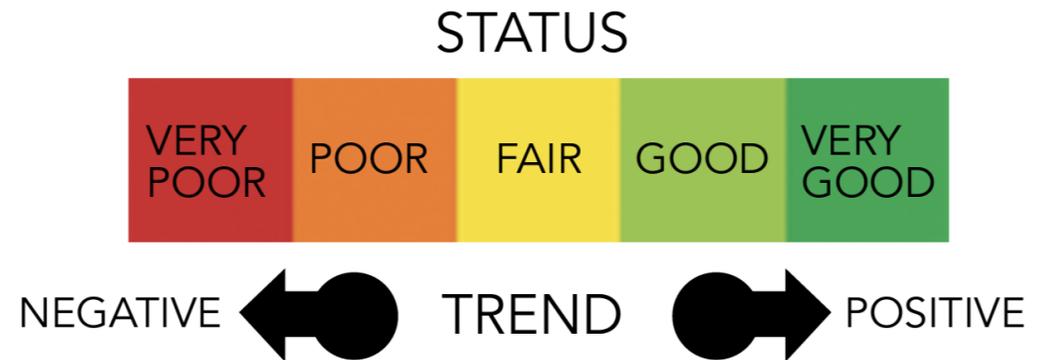# 2022
State of the
Delaware Inland Bays

ORGANIZATION OF THE REPORT

40 environmental indicators, grouped into six chapters

- ➢ Watershed Condition
- ➢ Managing Nutrient Pollution
- ➢ Water Quality
- ➢ Living Resources
- ➢ Human Health Risks
- ➢ Climate

STATUS

| VERY POOR | POOR | FAIR | GOOD | VERY GOOD |

NEGATIVE ⬅ TREND ➡ POSITIVE

New this time!

Shorezone Fish

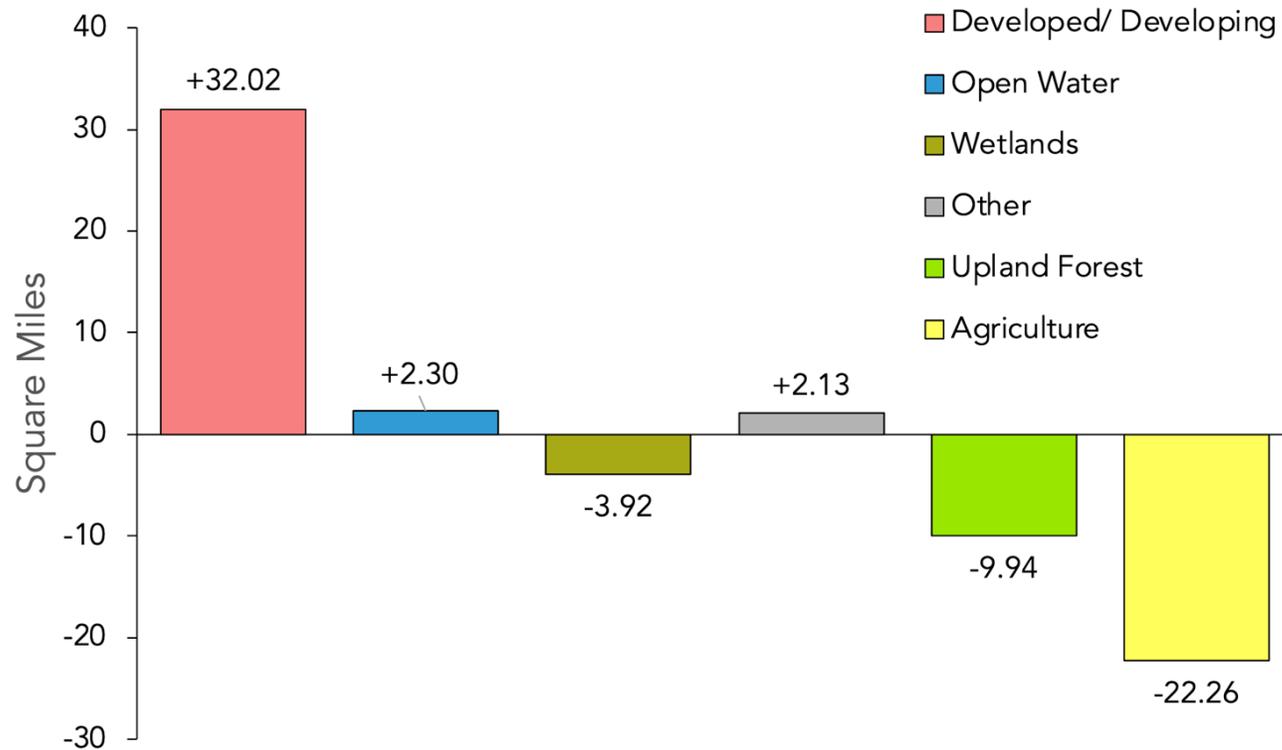Horseshoe Crabs

Shellfish Farming

New Local Climate Data

WATERSHED CONDITION

Land Use Change

Changes in Land Use from 1992 to 2017

Legend:
- Developed/ Developing
- Open Water
- Wetlands
- Other
- Upland Forest
- Agriculture

Square Miles:
- Developed/ Developing: +32.02
- Open Water: +2.30
- Wetlands: -3.92
- Other: +2.13
- Upland Forest: -9.94
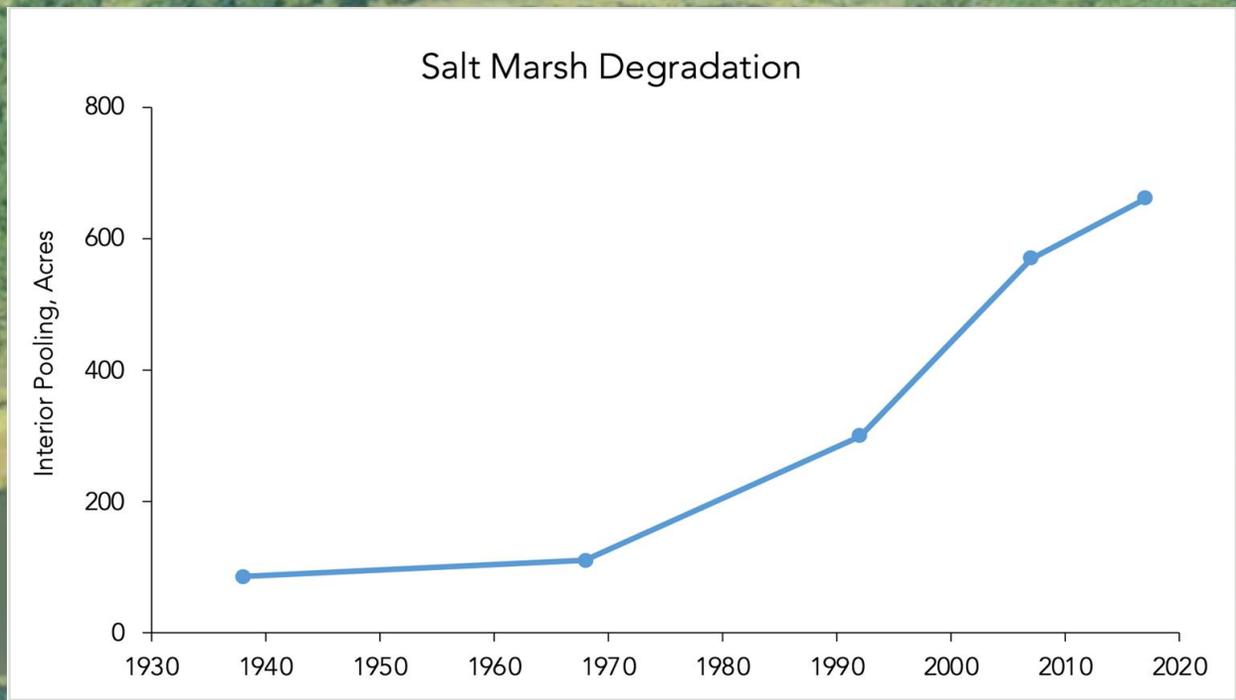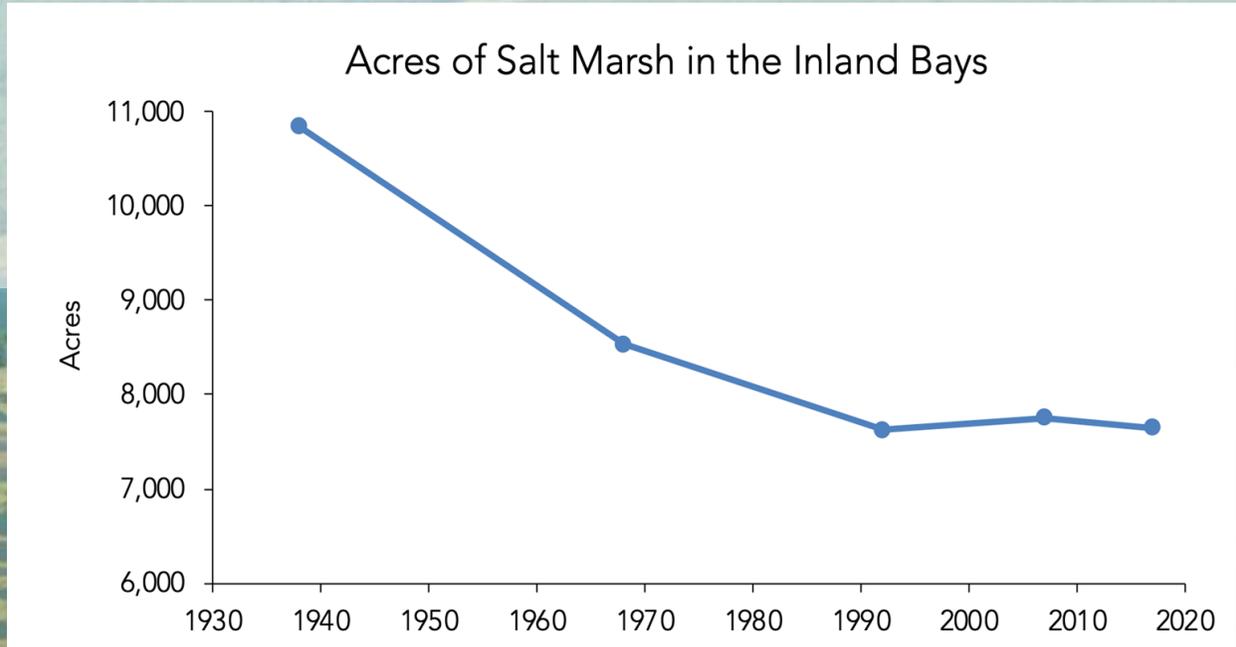- Agriculture: -22.26

- 18% loss in forest
- 6% loss in wetlands
- 19% loss in agriculture
- 78% increase in development

Photo: Driscoll Drones

Number of Residential Units in Sussex County Development Applications and Building Permits

- - - Development Applications
—●— Building Permits

Housing Units (y-axis): 0, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000

Years (x-axis): 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020

Photo: Driscoll Drones

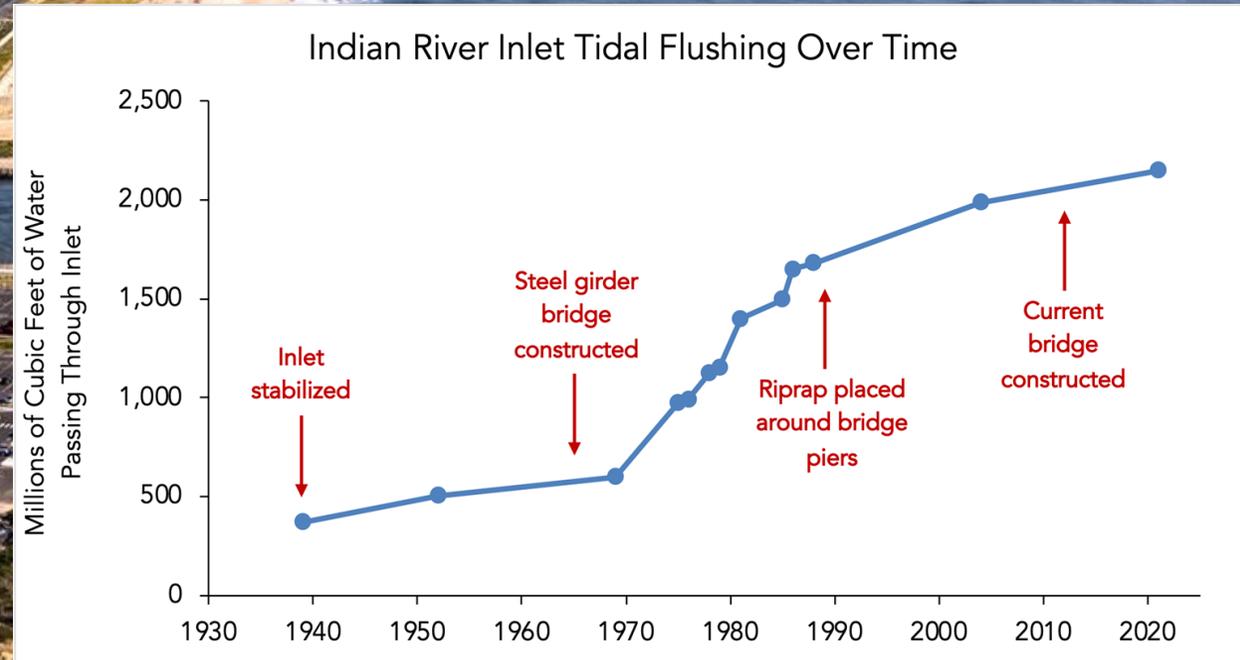# Salt Marsh Acreage and Condition

Acres of Salt Marsh in the Inland Bays
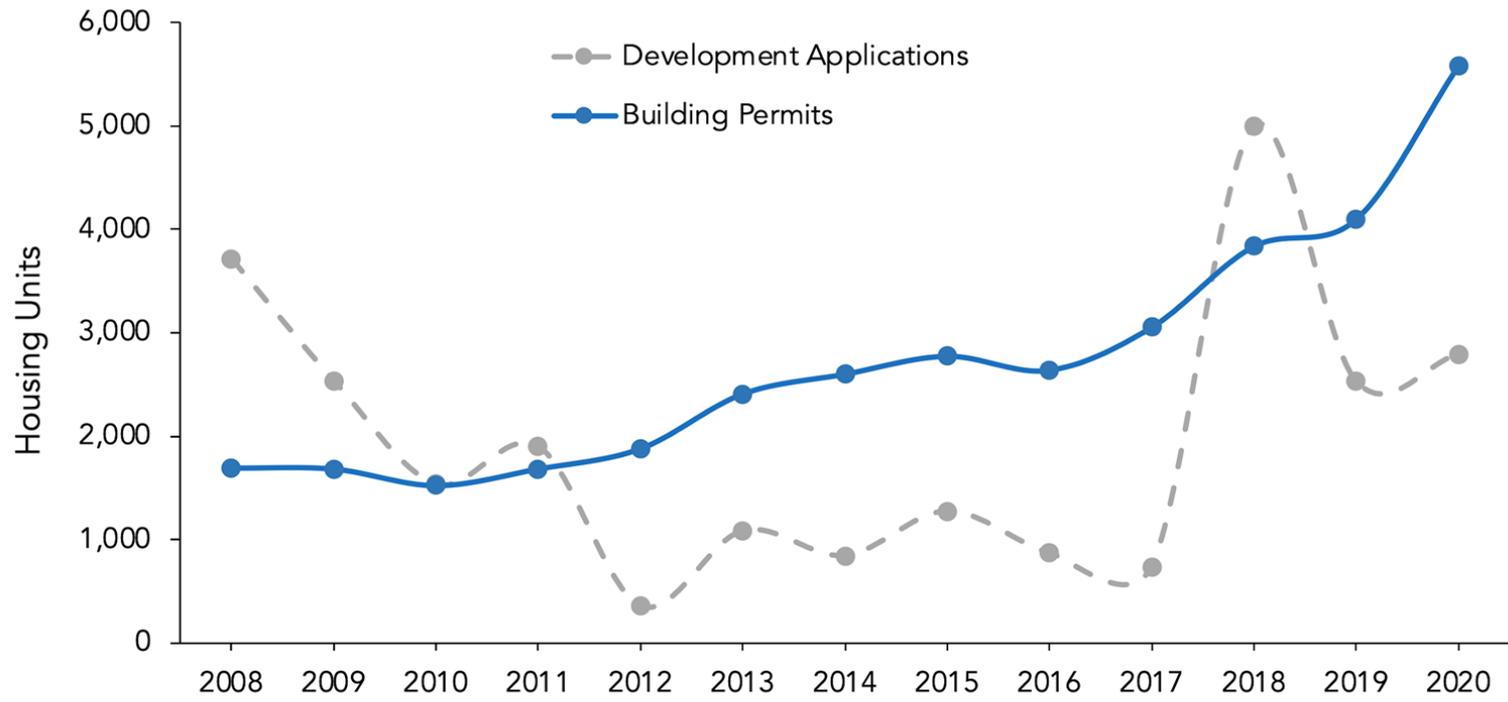
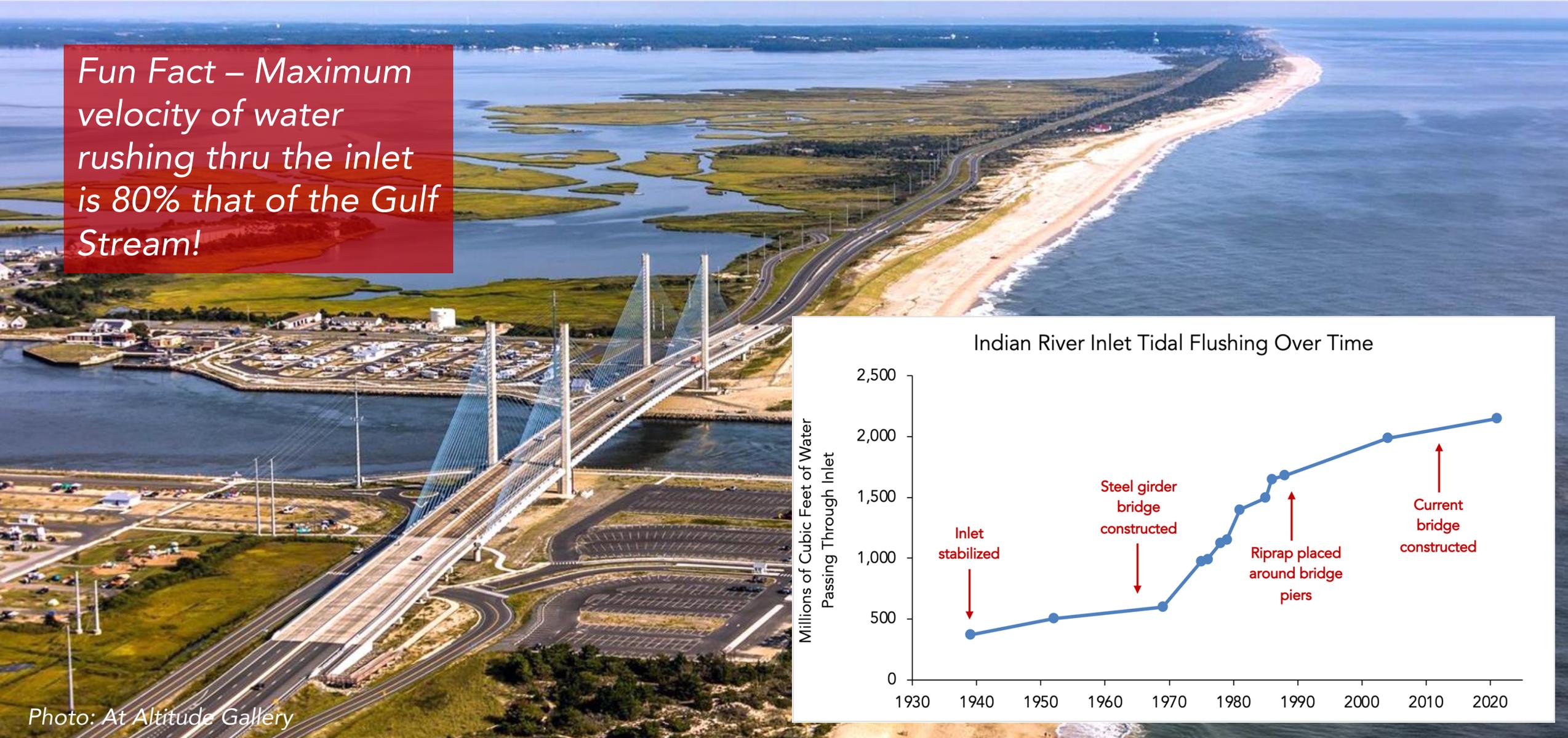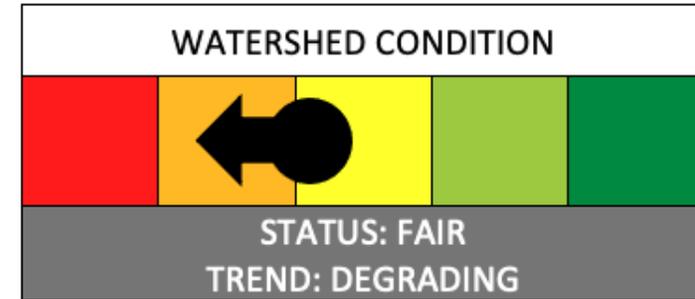Salt Marsh Degradation

Indian River Inlet Flushing

Fun Fact – Maximum velocity of water rushing thru the inlet is 80% that of the Gulf Stream!

Photo: At Altitude Gallery

Indian River Inlet Tidal Flushing Over Time

Millions of Cubic Feet of Water Passing Through Inlet

Inlet stabilized

Steel girder bridge constructed

Riprap placed around bridge piers

Current bridge constructed

WATERSHED CONDITION
Overall Status and Trends

WATERSHED CONDITION

STATUS: FAIR
TREND: DEGRADING

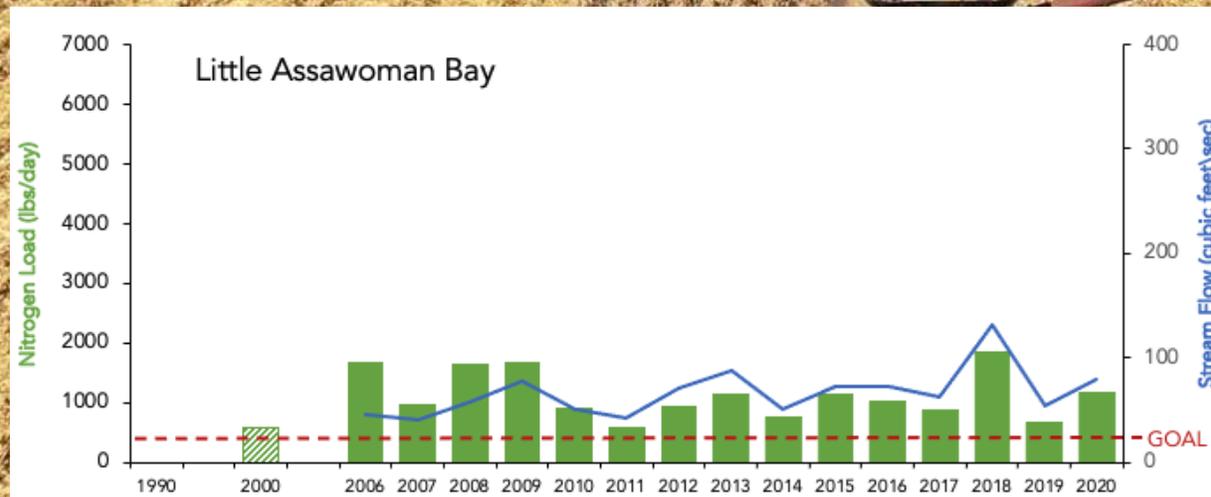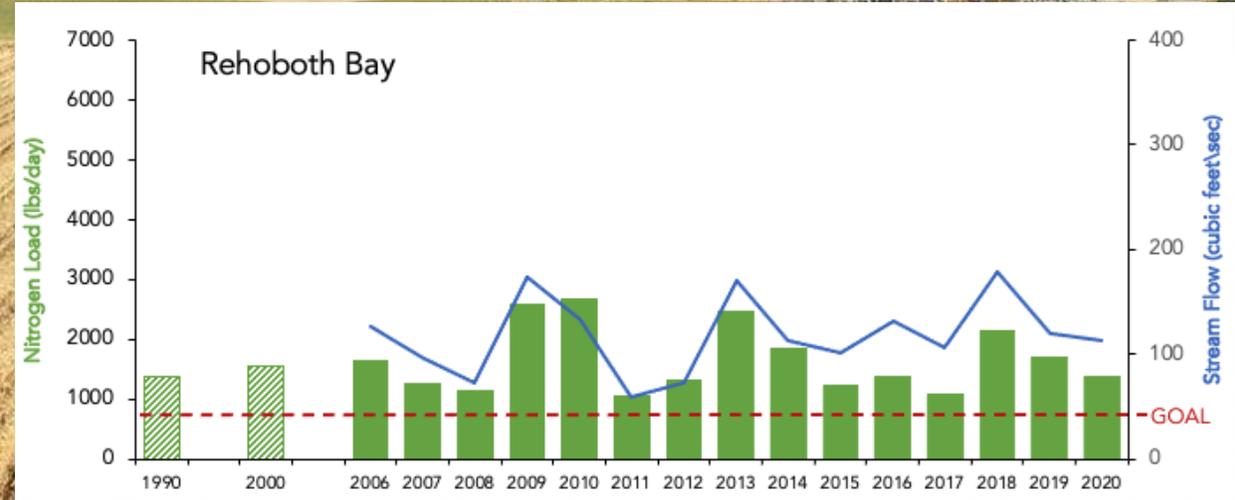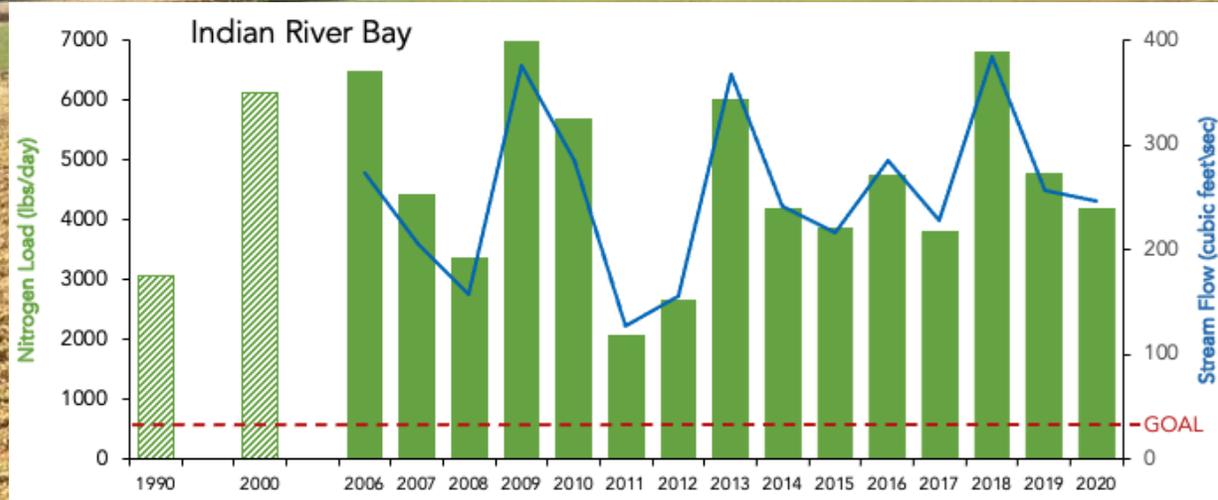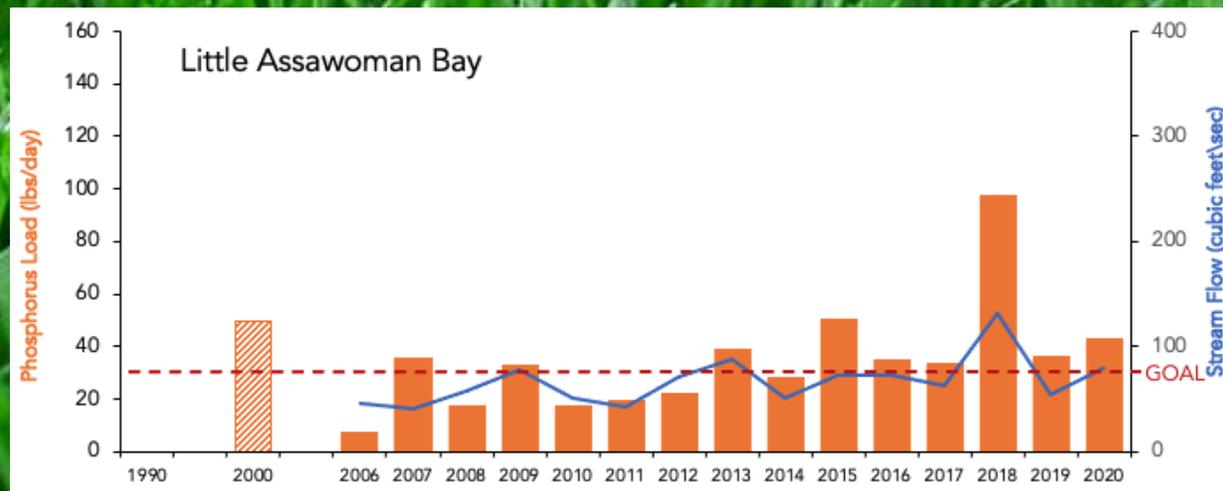| Indicator	Status	Trend (last 5 yrs)
Human Population Growth	Fair	Degrading
Land Use Change	Fair	Degrading
Impervious Surface Coverage	Fair	No Trend or Slightly Degrading
Salt Marsh Acreage and Condition	Poor to Fair	Degrading
Natural Habitat Protection and Restoration	Fair to Good	Improving
Indian River Tidal Flushing	Fair	No Trend

MANAGING NUTRIENT POLLUTION

Nutrient Loads – Point Sources

Loads of Nutrients from Point Sources Discharging to the Inland Bays
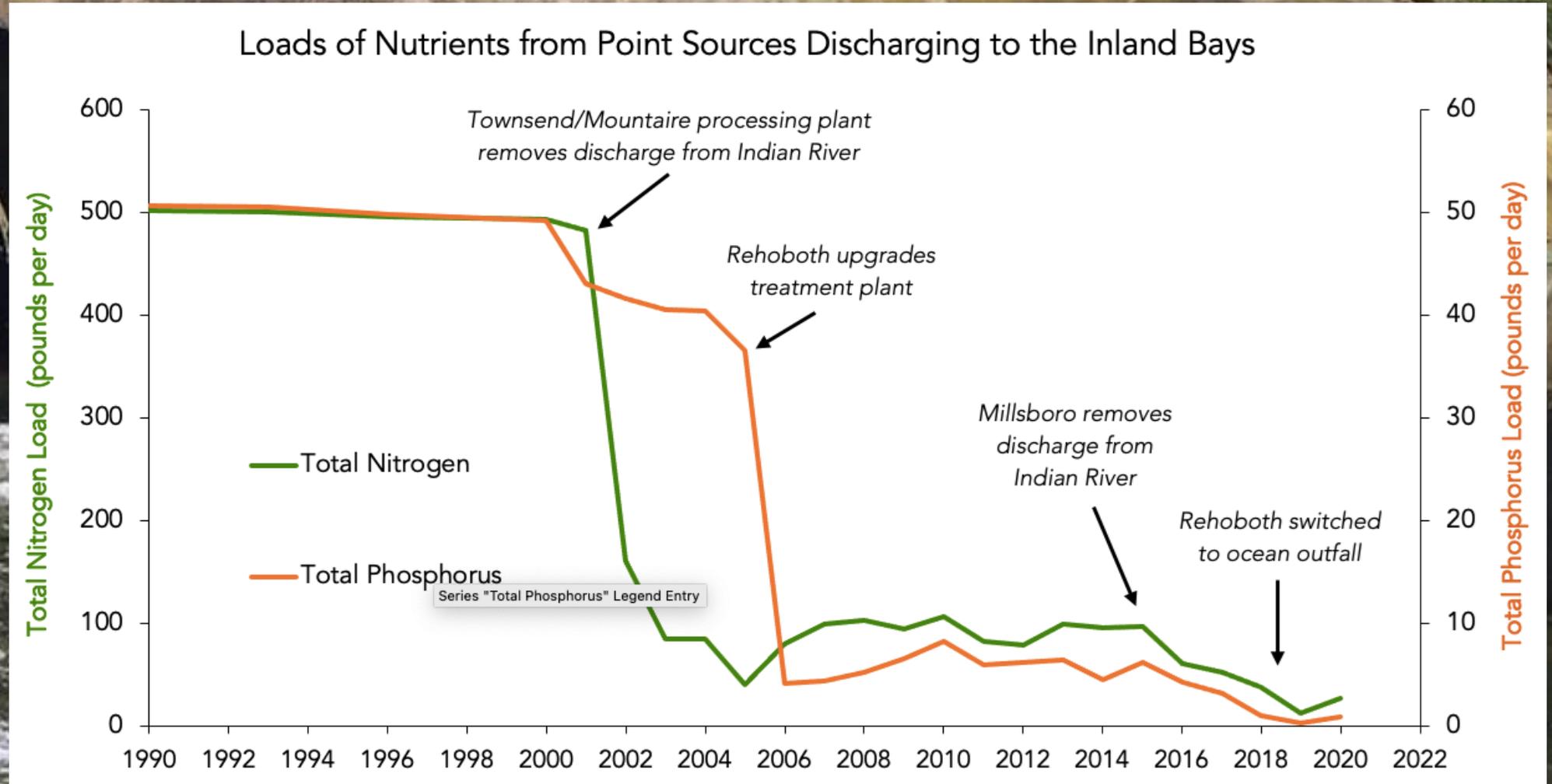
Nitrogen Loads – Nonpoint Sources

Photo: Driscoll Drones

Phosphorus Loads – Nonpoint Sources

Photo: Driscoll Drones

Septic System Conversion to Central Sewer
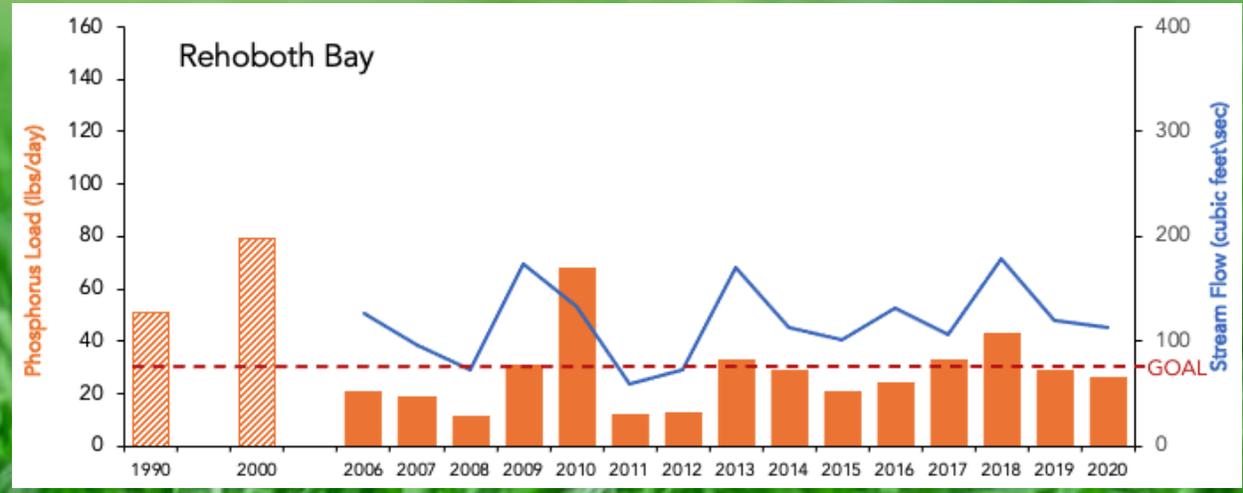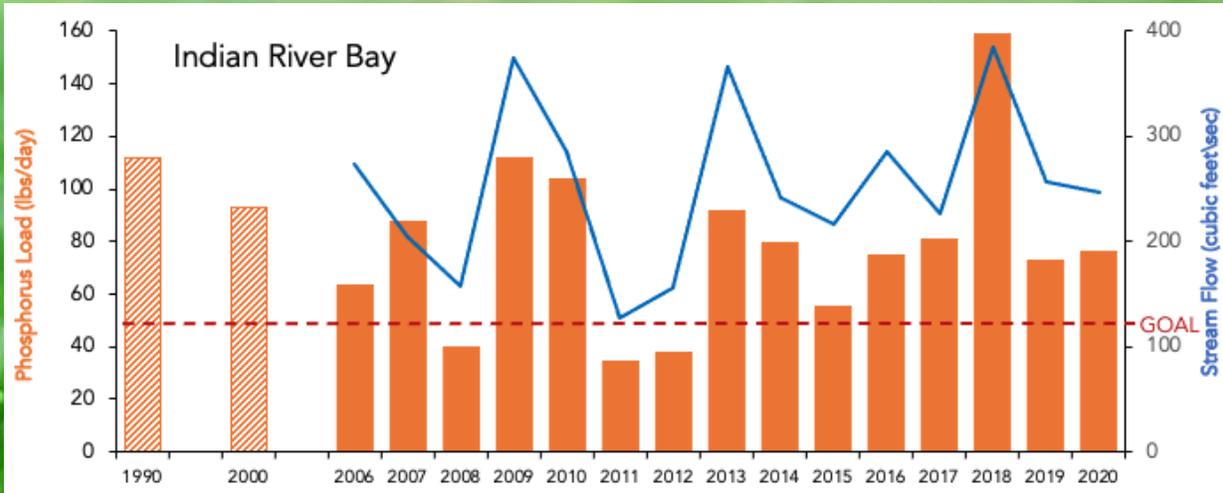
Cumulative Number of Equivalent Dwelling Units (EDUs)
Converted from Septic to Central Sewer
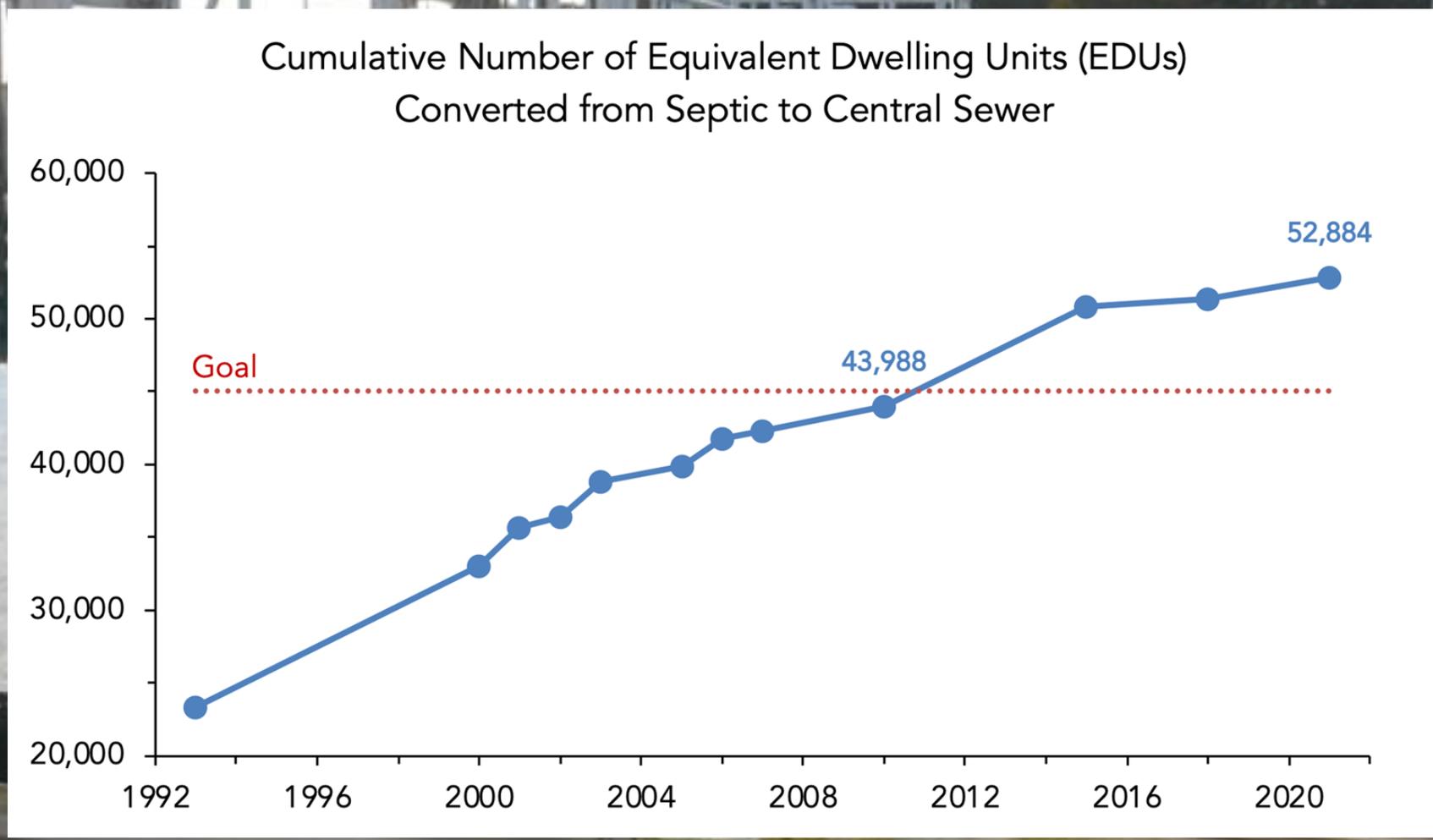
NUTRIENT POLLUTION
Overall Status and Trends

MANAGING NUTRIENT POLLUTION

STATUS: FAIR
TREND: NO TREND
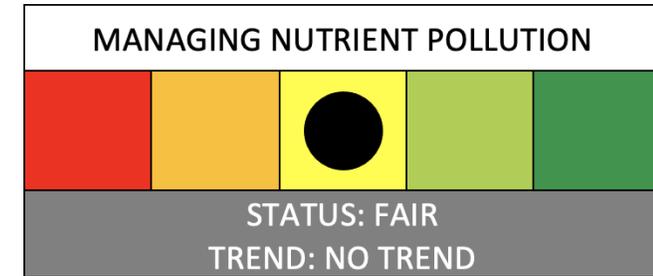
| Indicator	Status	Trend (last 5 yrs)
Inputs from Point Sources	Good/Very Good	Improving
Inputs from the Atmosphere (nitrogen)	Good	Improving
Inputs from the Atmosphere (phosphorus	No Data	Degrading
Inputs from Nonpoint Sources (nitrogen)	Very Poor	No Trend
Inputs from Nonpoint Sources (phosphorus)	Fair	Degrading
Agricultural Nutrient Practices	Fair	Improving
Septic System Conversion to Central Sewer	Very Good	Improving
Stormwater Retrofits	Poor	Slightly Improving

WATER QUALITY

Concentrations of Nitrogen

Dissolved Inorganic Nitrogen mg/L

- ● Much Better Than Standard 0 - 0.07
- ● Meets or Better Than Standard >0.07 - 0.14
- ● Worse than Standard >0.14 - 0.28
- ● Far Worse than Standard >0.28
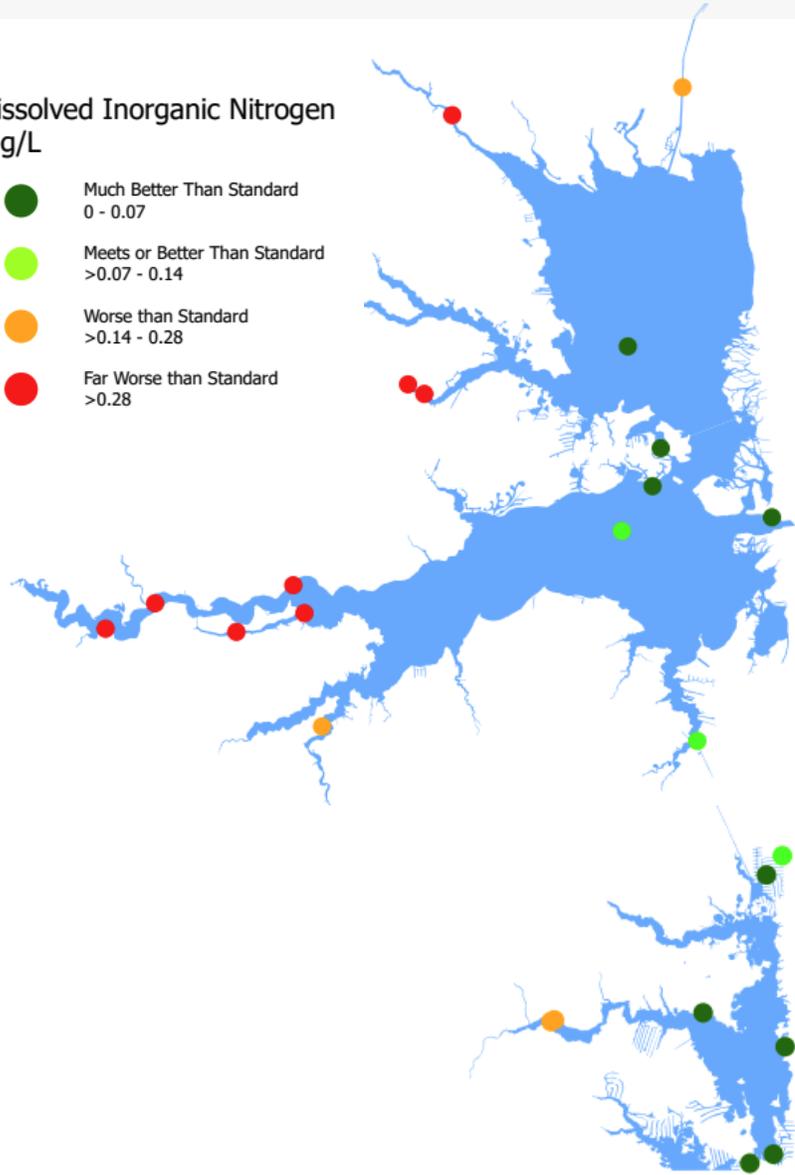
INLAND BAYS STATIONS MEETING WQ STANDARD

- *Nitrogen Concentration – 48% (down from 55%)*
- *Phosphorus Concentration -- 48% (up from 36%)*
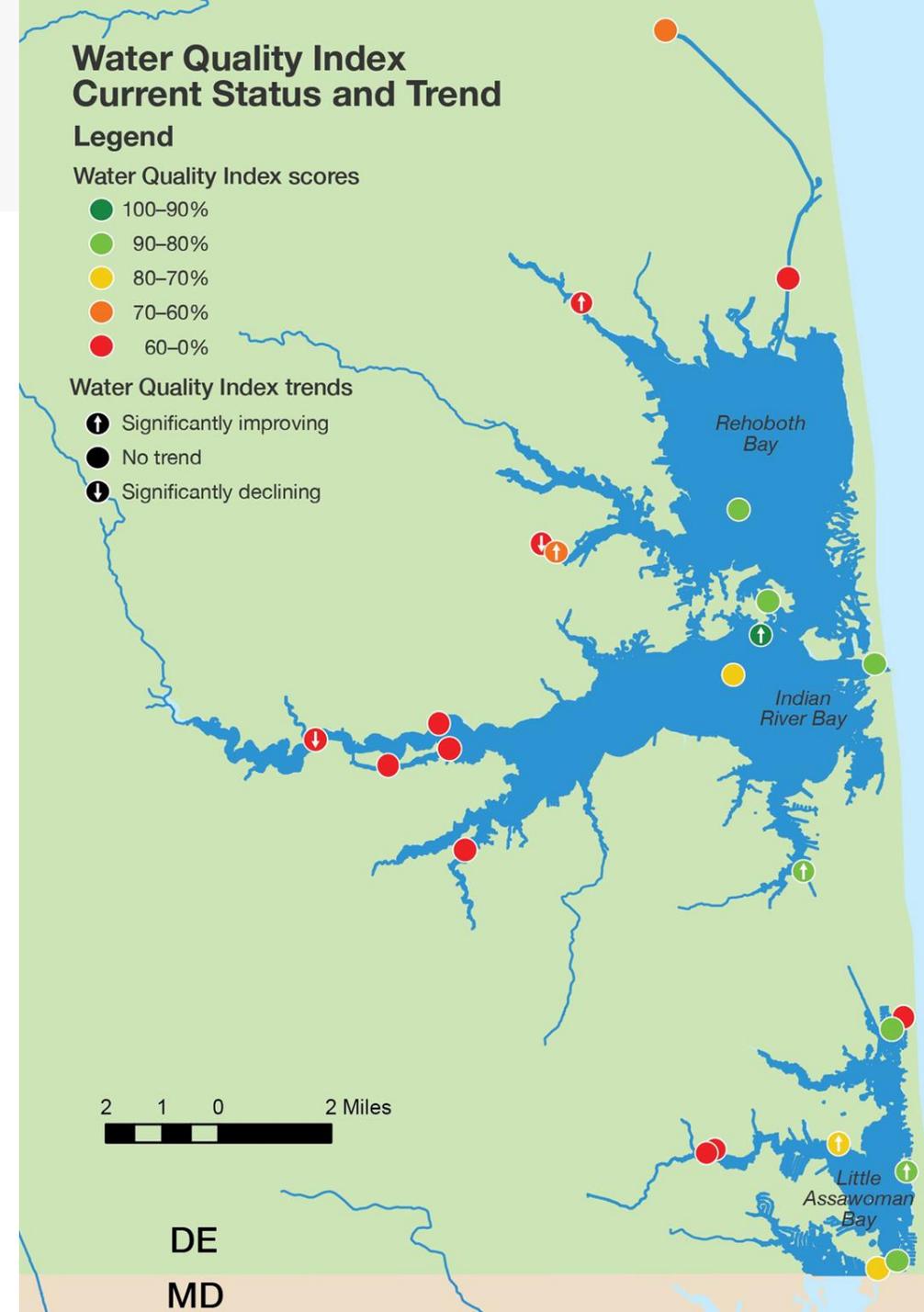- *Chlorophyll – 56% (down from 64%)*

Water Quality Index

New water quality score this year

- Averages N/P concentrations, chlorophyl, and water clarity

- Public-friendly

Overall:

- Upper IR and tributaries poor

- Open bay areas good

- LAB continuing to improve

**Water Quality Index
Current Status and Trend**
Legend
Water Quality Index scores
- 100–90%
- 90–80%
- 80–70%
- 70–60%
- 60–0%

Water Quality Index trends
- Significantly improving
- No trend
- Significantly declining

Rehoboth Bay

Indian River Bay

Little Assawoman Bay

2 1 0   2 Miles

DE

MD

WATER QUALITY
Overall Status and Trends

WATER QUALITY

STATUS: POOR to FAIR
TREND: NO TREND
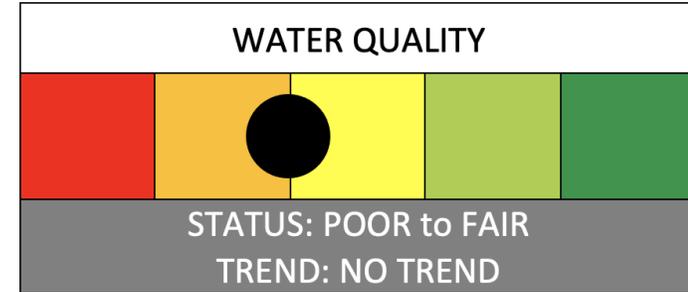
Indicator	Status	Trend (last 5 yrs)
Nitrogen Concentration	Poor to Fair	No Trend
Phosphorus Concentration	Poor to Fair	No Trend
Algae Concentration	Fair	No Trend
Water Clarity	Poor	No Trend
Dissolved Oxygen	Fair	No Trend
Seaweed Abundance	Good	No Trend

LIVING RESOURCES

Eagle and Osprey Nesting

Active Bald Eagle Nests

Active Osprey Nests

CIB Survey

Last DNREC Survey
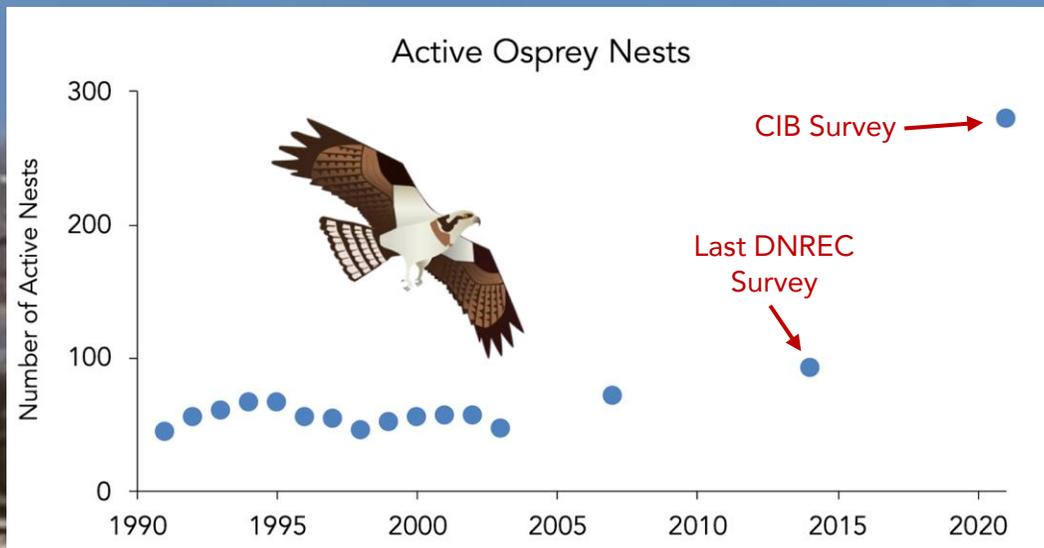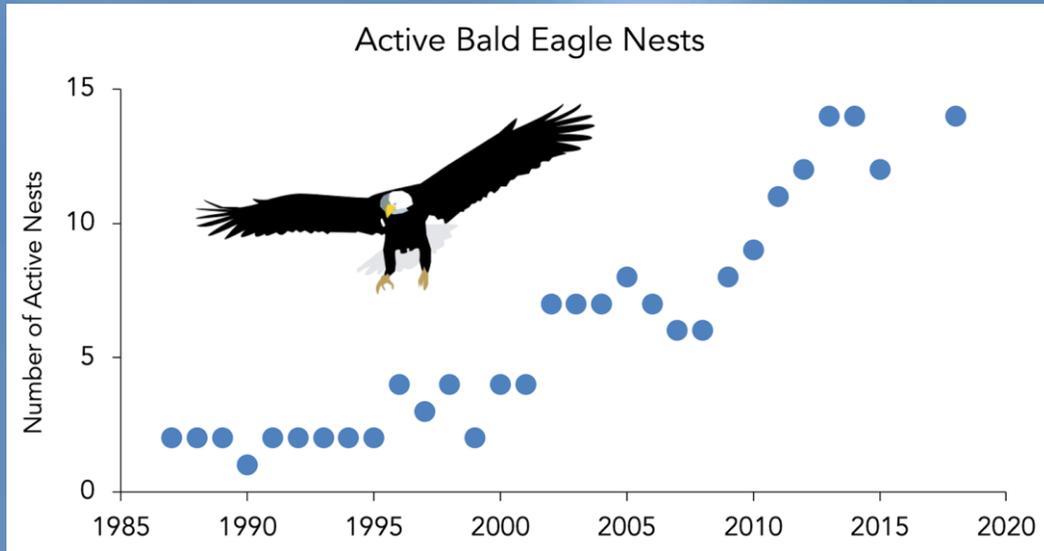
Since the last report, populations of bald eagles have remained stable. Ospreys have become more common.

Blue Crab Abundance

Blue Crabs in Rehoboth & Indian River Bays
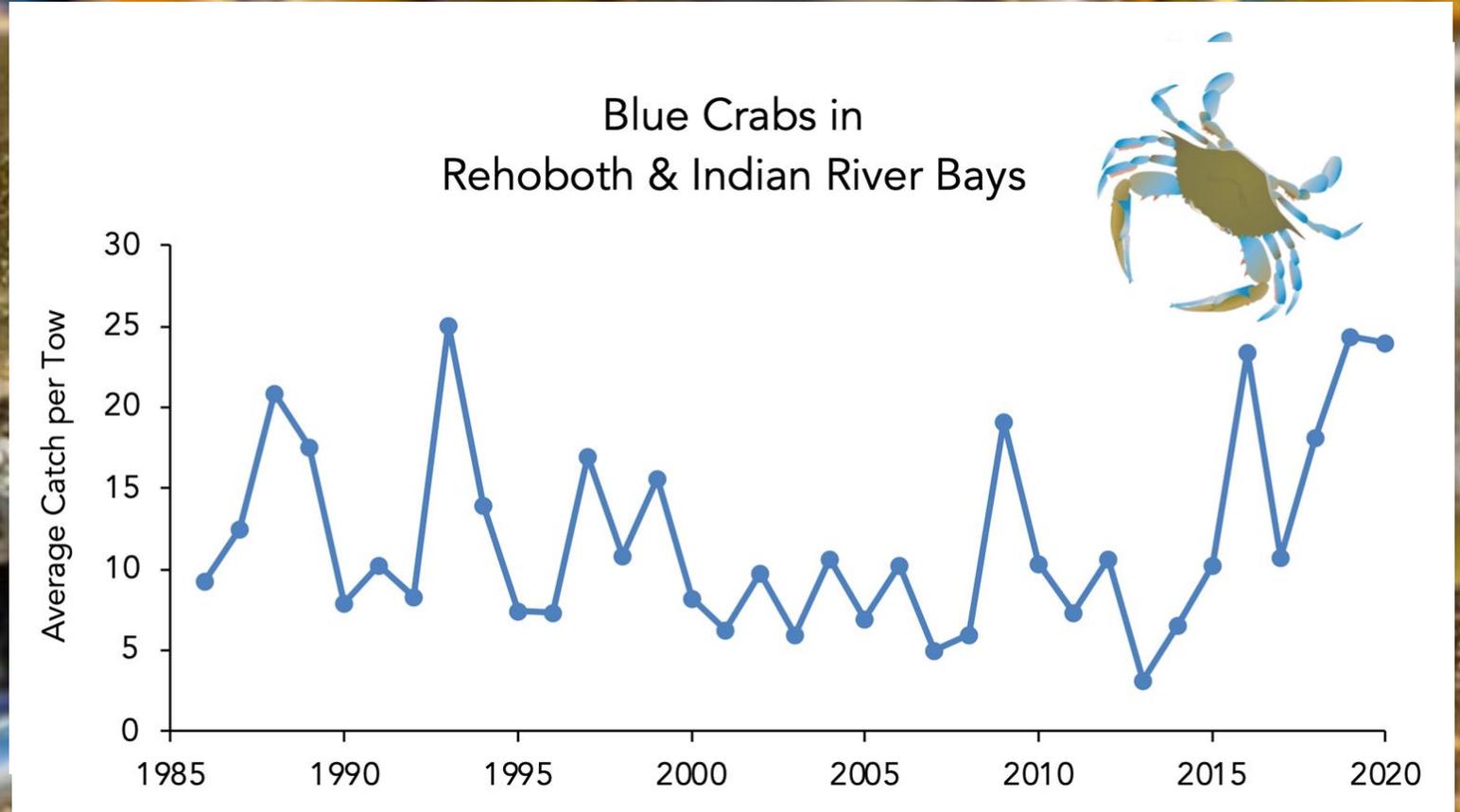
Fish Abundance

Baygrasses

Widgeon grass restoration
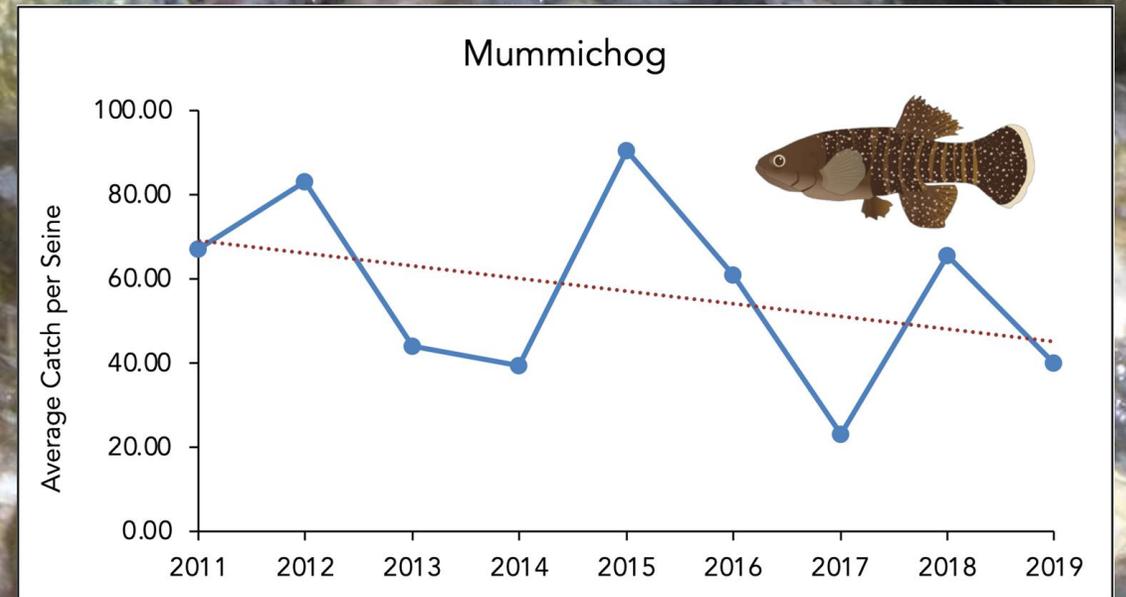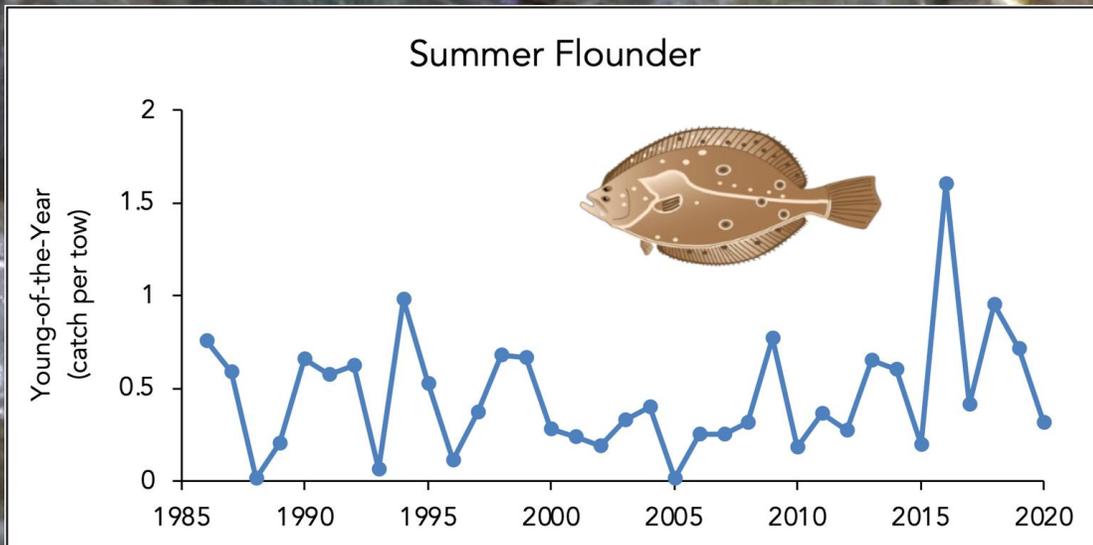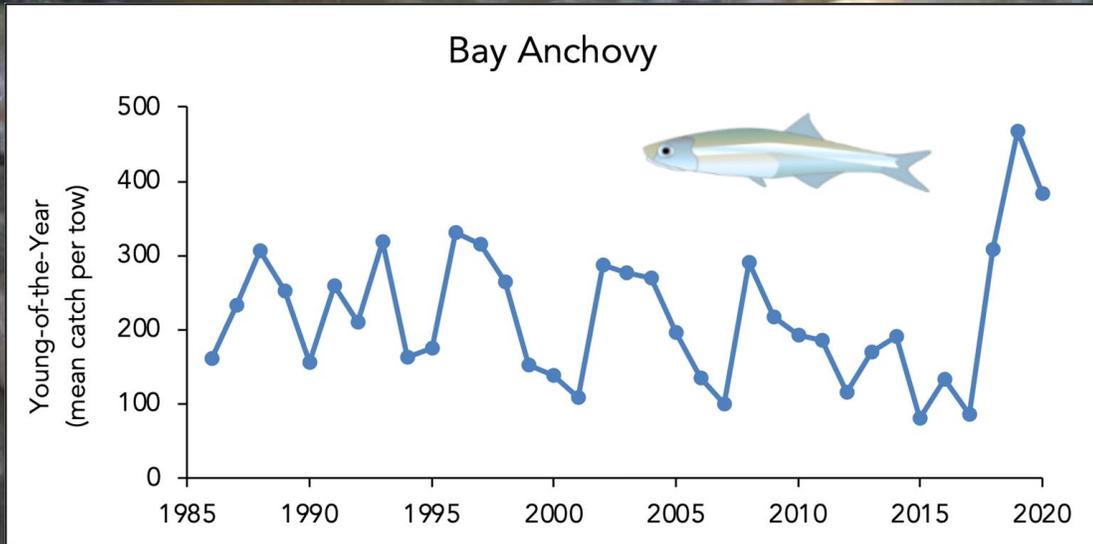
Current Status of Baygrasses in the Inland Bays

- Horned Pondweed -- 9.52 acres
  (Love Creek)

- Widgeon Grass – 1.17 acres
  (LAB, S. Bethany canals)

- Eelgrass – 0 acres

Nearby estuaries support thousands of acres.

LIVING RESOURCES
Overall Status and Trends

Indicator	Status	(ST) Trend
Baygrasses	Very Poor	Very Slightly Improving
Eagle/Osprey Nesting	Very Good	Improving
Hard Clam Landings	Poor	No Trend
Shellfish Farming	Fair	Improving
Winter Waterfowl Counts	Fair	No Trend
Blue Crab Abundance	Fair	Improving
Fish Abundance	Fair to Good	Improving
Shorezone Fish	Fair	Degrading
Recreational Fishing	Poor	No Trend
HSC Spawning	Fair	No trend
No. of Fish Kills	Poor	Degrading

LIVING RESOURCES

STATUS: FAIR
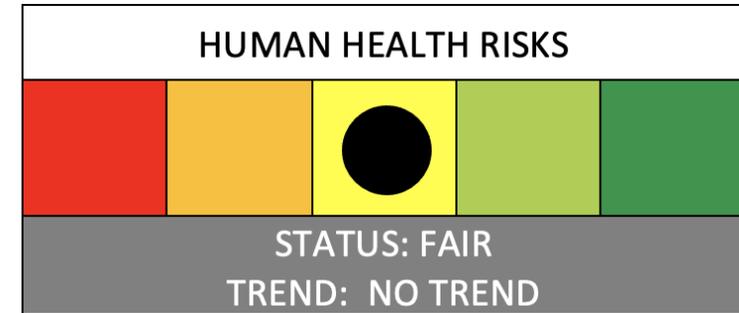TREND: NO TREND

HUMAN HEALTH RISKS

Fecal Bacteria Pollution

- Many tributaries routinely fail to meet the bacteria standard for primary contact (e.g. swimming).

- However, most areas of the bays do routinely meet the standard for other uses.

- Not all of the sources are human, or of equal risk.

PROHIBITED SHELLFISH AREA
DO NOT HARVEST
OYSTERS, CLAMS,
OR MUSSELS
SHELLFISH NOT FIT FOR HUMAN CONSUMPTION

OYSTERS
CLAMS MUSSELS

PLEASE REFER TO THE
DELAWARE FISHING GUIDE
FOR DETAILS OR CALL
302 739 4590

HUMAN HEALTH RISKS
Overall Status and Trends

HUMAN HEALTH RISKS

STATUS: FAIR
TREND: NO TREND

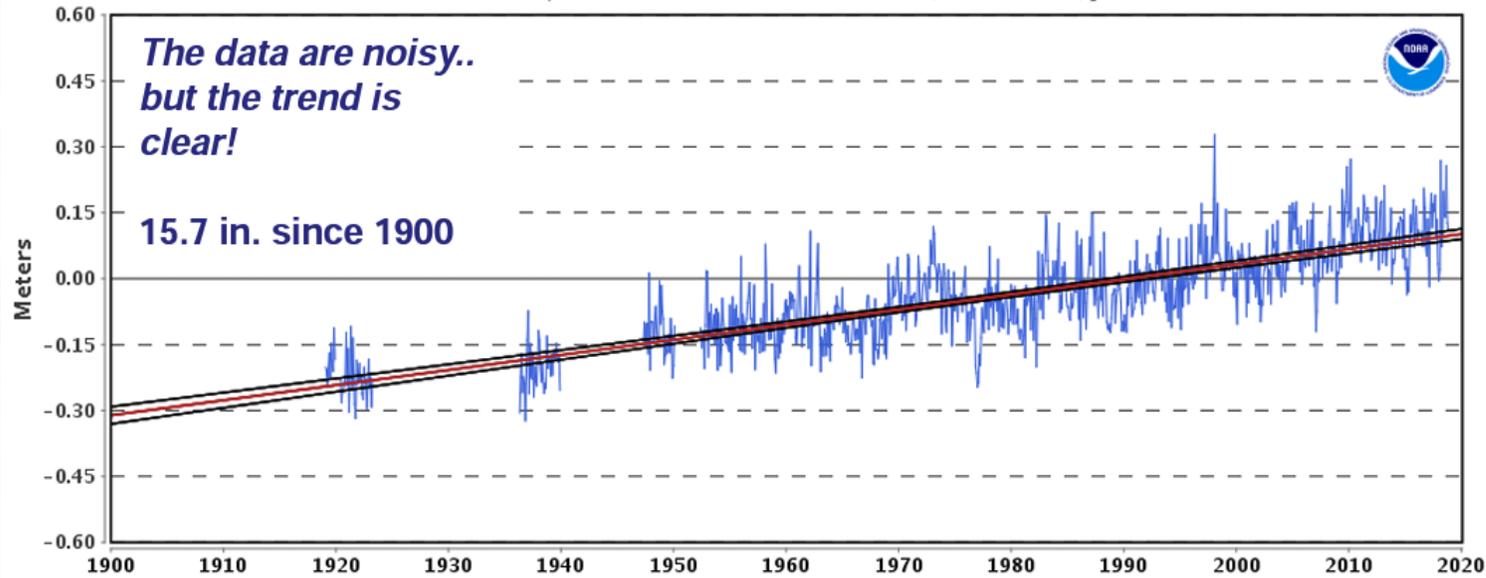| Indicator	Status	Trend (last 5 yrs)
Fecal Bacteria Pollution	Fair	Slightly Degrading
Approved Shellfish Waters	Fair	No Trend
Fish Consumption Advisories	Fair	No Trend

CLIMATE

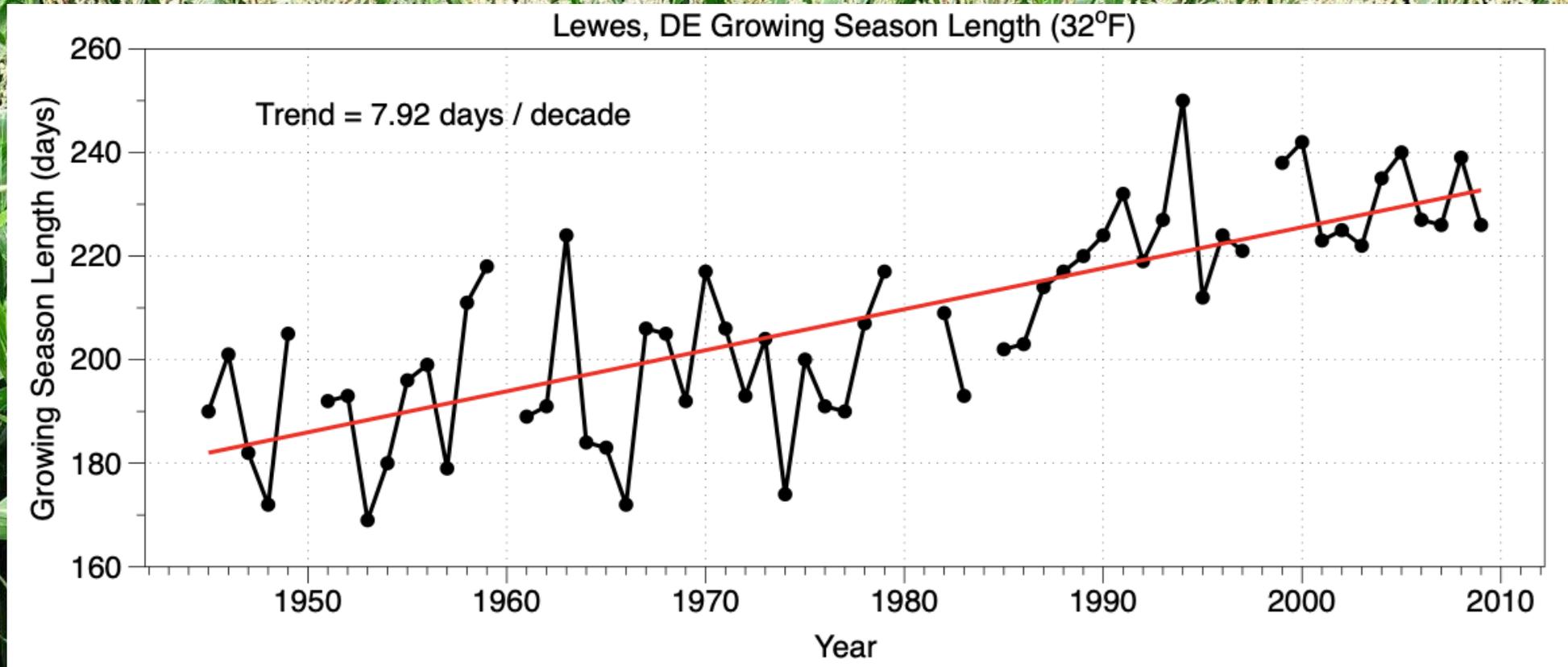# Sea Level Rise

8557380 Lewes, Delaware — 3.44 +/- 0.24 mm/yr

The data are noisy.. but the trend is clear!

15.7 in. since 1900

Impacts:
- *Rising Temperature*
- *Sea Level Rise*
- *More Precipitation*
- *Ocean Acidification*

Photo: Driscoll Drones

Growing Season Length

Lewes, DE Growing Season Length (32°F)

Trend = 7.92 days / decade
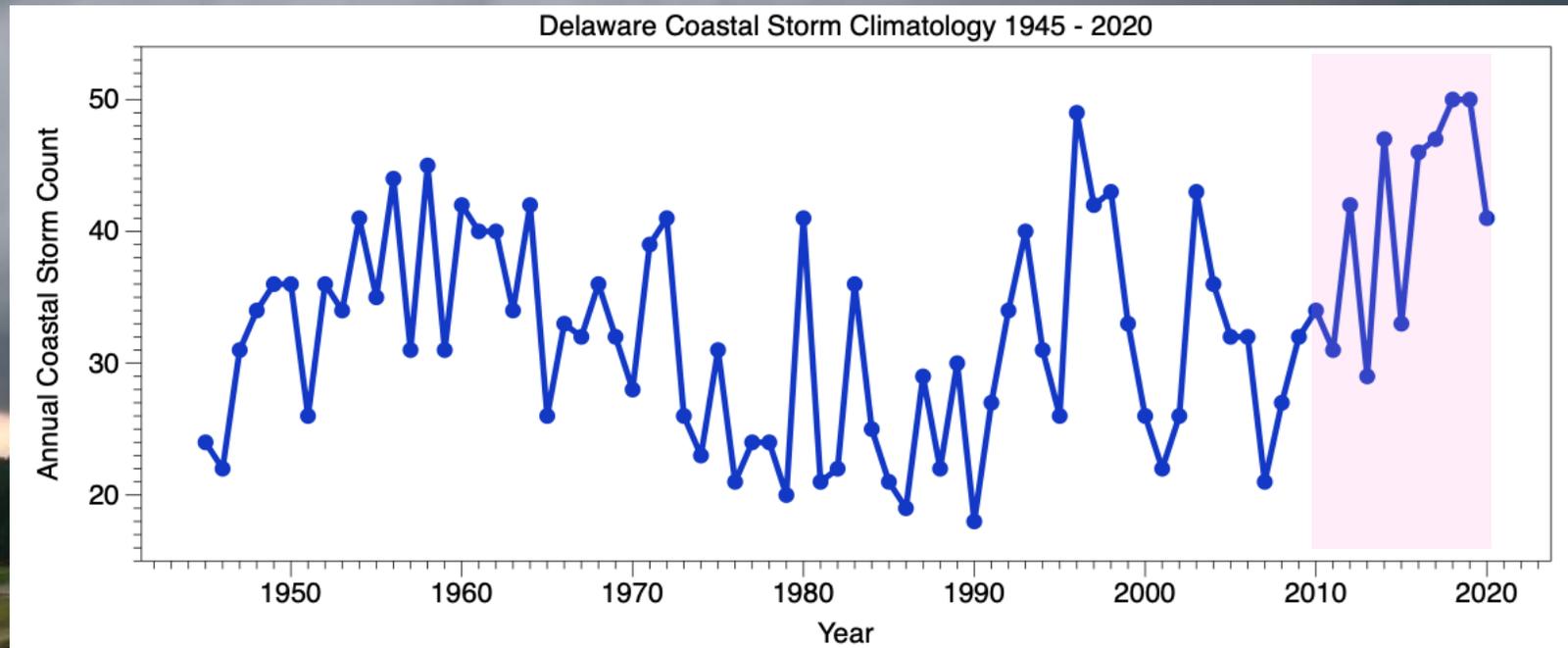
Coastal Storm Frequency

Larger numbers of storms during the last decade.

Greater frequency of intense storms.

Delaware Coastal Storm Climatology 1945 - 2020

Photo: Driscoll Drones

CLIMATE
Overall Status and Trends

CLIMATE

STATUS: POOR
TREND: DEGRADING
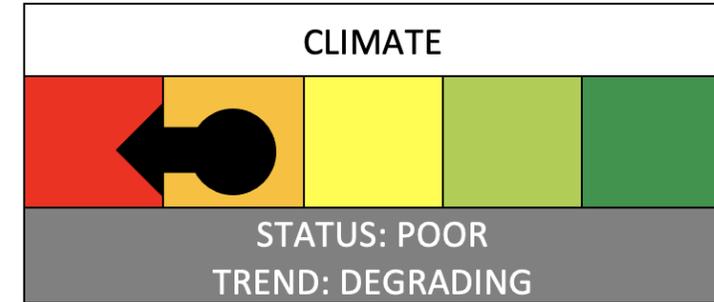
Indicator	Status	Trend (last 5 yrs)
Atmospheric Carbon Dioxide	Poor	Degrading
Air Temperature	Poor	Degrading
Sea Level Rise	Poor	Degrading
Growing Season Length	Fair to Poor	Degrading
Annual Precipitation	Fair	Degrading
Coastal Storms	Fair to Poor	To Be Determined
Ocean Acidification	Fair	Degrading

The State of the Inland Bays 2022

mm

Progress in some areas:

- *Point sources gone*

- *Water quality in LAB*
- *Nutrient management practices (septics, agric. practices)*
- *Some of our living resources*

Continuing challenges in others:

- *Nonpoint source pollution*
- *Land use change*
- *Salt marsh degradation & buffer loss*
- *Baygrasses*
- *Climate change*

Now more than ever, renewed partner commitments and dedicated funding are needed to swing the pendulum towards improved Bay health.

Photo: Driscoll Drones