**Why Needed?** Limited / incompatible data on hundreds (?) of tide gates with varying ecological impacts and restoration potential.
MassBays National Estuary Program Planning Area

- 50 coastal communities
- NH border to tip of Cape Cod
1. Tide Gate Geodatabase

Regionalized Tidal Atlases (1996-2001)

Statewide Geodatabase
1. Tide Gate Geodatabase

- Create tide gate data categories
- Enter atlas data into database
- State & municipal staff review
- Field inspections
1. Tide Gate Geodatabase

- Preliminary review using GoogleEarth .kmz file
109 Active Tide Gates

137 TGs at 100 sites
Tide Gate Condition by Region

32% of Assessed TGs in Poor or Fair Condition

**Common Reasons:** Inoperable (sealed shut), leaking, deformation, waterlogged, corrosion, not secure (bolts falling off etc.)
2. Geospatial Analysis Tool

Purpose/goals for geospatial tool?

- Climate change resiliency planning
  - Sea level rise scenarios
  - Storm surge scenarios

- Ecological restoration planning
  - Where is restoration feasible...without increased flood risk?
2. Geospatial Analysis Tool

Primary Ingredients:

- Lidar Elevation Data
- Coastal Storm Surge Profiles
- Ecological Resources
- Building/Parcel Data

Harness Existing Data!
TIDE Gateway

Interactive Tide Gate Map
Tide Gate Inventory
Field Inspection Protocols

MassBays
National Estuary Program

Massachusetts Office of Coastal Zone Management
I want to...  

Select flood condition and optional sea level rise to visualize impacts.

Coastal Storm Surge:
- MHHW
- 2-yr flood
- 10-yr flood
- 25-yr flood
- 50-yr Flood
- 100-yr flood

Sea Level Rise (ft):
- Select a sea level rise condition in feet above Mean Higher High Water (MHHW)
EASTHAM-02 IMPACT ANALYSIS
Surge 10yr; SLR 0
Total Flood: 20.92 ac
Flooded Wetland: 16.31 ac
Structures: 2
EASTHAM-02 IMPACT ANALYSIS
Surge 10yr; SLR 1
Total Flood: 23.71 ac
Flooded Wetland: 16.56 ac
Structures: 3
EASTHAM-02 IMPACT ANALYSIS
Surge 10yr; SLR 3
Total Flood: 25.84 ac
Flooded Wetland: 16.63 ac
Structures: 6
EASTHAM-02 IMPACT ANALYSIS
Surge 10yr; SLR 3
Total Flood: 25.84 ac
Flooded Wetland: 16.63 ac
Structures: 6
3. Field Inspections/Protocols

Allows flexible approach, with or without survey equipment.

Can use any web-accessible device or paper field form
3. Field Inspections/Protocols

Estimating MHHW, stain lines, and inverts
3. Field Inspections/Protocols

Tide gate type, material, size, condition
3. Field Inspections/Protocols

Culvert/headwall characteristics and condition
3. Field Inspections/Protocols

Upstream resources and restoration potential
3. Field Inspections/Protocols

O&M Procedures, Permits, and Monitoring Data
NEXT STEPS...

Geospatial Analysis Tool

- Ground-truth ZOI’s (culvert connections, etc.)
- Incorporate more sophisticated modeling at priority sites...currently “planning level”
- Develop prioritization method(s) based on TG data, for both restoration sites and resiliency planning
NEXT STEPS...

- Expand TIDEGateway beyond Massachusetts
- Include **all tidal restrictions**...not just tide gates
- Prioritize restoration sites / coastal resiliency sites
  - Develop construction cost estimates
- Coastal Resiliency Network
  - Real-time monitoring/controls
# Current Business Status

Color shows current risk

## Massachusetts Coastal Resiliency Network

### Network-wide Risk

#### Site ID | Location  | Current Risk
--- | --- | ---
COBB13 | Cohasset |  
COBB2 | Cohasset |  
HIHH9A | Hingham |  
WEWF1 | Weymouth |  

To see more, scroll down

### US NOAA Image

6 Hour Forecast

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### Locus Map

Location marker colors show current risk

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Network-wide Dashboard

Recent Status

### Local Network

Offline 0%, Online 100%

Past 24 Hours
Recommended Actions:

- Close gate by **2pm 12-Nov-2015** and until storm risk subsides
- Check for debris buildup following storm
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