Creation and Use of a Decision Support Tool for Culvert Prioritization

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Major Storm Events:

- **August, 1991 – Hurricane Bob**
  - 8 inches of rain
- **October, 1996**
  - Slow – moving Noreaster combined with moister from Hurricane Lili
  - 19 inches of rain – exceeded all records back to 1871 by 5.5 inches
- **May, 2006 “Mother’s Day Storm”**
  - 15 inches of rain, stalled system lasted 8 days (majority fell May 13-15)
- **April, 2007 “Patriots Day Storm”**
  - 8.5 inches of rain + snow melt, along with coastal flooding/surge
- **February 26, 2010**
  - Noreaster, 6-8 inches of rain, snow and high winds
- **March 15, 2010**
  - Noreaster, 6-10 inches of rain + snow melt, along with coastal flooding/surge
A lot of other work was going on as well…

- Saco Bay Sea Level Adaptation Work Group (SLAWG)
  - Vulnerability Assessment – Sea Level Rise and Potential Impacts by 2100
  - Road Infrastructure Assessment Report – 2015

- 2014 - Integrating Storm Surge and Sea Level Rise Vulnerability Assessments and Criticality Analyses into Asset Management at MaineDOT
  - COAST Decision Support Tool
  - Analyzed cost/benefit, life cycle costs for different infrastructure options

- Catalysis Adaptation Partners – Minnesota DOT Flash Flood Vulnerability and Assessment project – 2014
Project Steering Committee

- Maine Audubon
- U.S. Fish and Wildlife Service, Gulf of Maine Coastal Program
- The Maine Geological Survey
- Maine Department of Transportation
- The Nature Conservancy
- Southern Maine Planning and Development Commission
- Biddeford, Eliot, Kennebunkport, Kittery, Ogunquit, Saco, South Berwick, Wells and York
Initial Project Goals

- Maps of MaineDOT bridges, scour bridges, and culverts
- Maps of essential services and locations (Fire/Rescue, hospitals, police etc.)
- Providing MaineDOT with a list of rated and prioritized culverts based on available data
- Draft and final reports in paper and electronic PDF format
Initial Project Flow Chart

Information Sources
- 2006/2007 Storms
- SLOSH Mapping
- Bridge/Culvert Data

Preliminary List of Locations
- Committee Meeting
- Refine based on Committee Input
- Review Decision Support Tool

Apply DST to Selected Locations
- Committee Meeting
- Provide Ratings/Results of DST
- Mapping and Other Products

Develop Draft Report
- Send out draft to Committee for review/comment
- Committee Meeting

Final Report
- Develop Final Report Based on Input and Submit to MaineDOT
Reality

- Slight Panic & Regroup
- Narrow the Focus
- Culverts 3-5 feet in diameter in coastal flood zone
DST Process

- Development of DST questions and spreadsheet
- Utilized examples from MnDOT, MaineDOT
- Staff test for 4 locations
- Presented draft to Steering Committee
- Changes made based on comments and staff tests
- Developed DST Instructions with step-by-step directions and sources for information/data
  - Maine Stream Habitat Viewer
  - MaineDOT Map Viewer
  - Maine Audubon Barrier Habitat Table
  - Municipal information
DST Development – Assessment Categories

- **Infrastructure-Risk**: Risk of failure or damage the culvert presents during storm events and sea level rise.

- **Infrastructure-Condition**: Current condition of the culvert, which relates to the risk that the culvert poses to failure or damage during storm surge events and/or sea level rise.

- **Habitat Potential**: The potential for improvement of primary and secondary habitat concerns.

- **Access Importance**: This category incorporates the surrounding community’s connection to emergency services, by comparing evacuation routes and distances to services.

- **Probability of Implementation**: This category assesses budgetary risks and the likelihood of local community support for restoration efforts.
## Primary Habitat Values

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<th>Blocked Salmon Habitat</th>
<th>Salmon Critical Habitat</th>
<th>Sea Run Sockeye Habitat</th>
<th>Brook Trout Habitat</th>
<th>Tidal Marsh</th>
<th>Non-Native Fish</th>
<th>Native Aquatic Habitats</th>
<th>GFW Focus Area</th>
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The DST in Action

- Jake takes it from here...

- http://arcg.is/1DOn8G