MDOT MPA Climate Resilience
An Ongoing Dialogue

EESI Briefing: Navigating the Climate Future

November 17, 2020

Jill Lemke, CPE, CC-P, Manager Strategic Planning
Kristen Keene, Innovative Reuse Program Manager

MDOT - Maryland Port Administration
The MDOT Maryland Port Administration

Mission:
To increase the flow of waterborne commerce through the State of Maryland in a manner that provides benefits to the citizens of the State.

Vision:
- Capitalize on Port business opportunities;
- Provide, manage, and promote competitive, secure, state-of-the-art terminals capable of efficiently handling diverse cargoes;
- Ensure the Port's navigational channel system is competitive and efficient;
- Leverage mutually supporting public and private sectors; and
- Act as a good steward of Maryland’s natural environment.
Baltimore has a great maritime history due to its inland location.
The Port of Baltimore is a complex mix of Private and Public Facilities

- **45 miles** of waterfront facilities and industries.
- **23 private facilities** handle nearly all of POB’s bulk commodities.
- **Six MPA public terminals** handle over 90% of POB’s general cargo.
- Active relationships by both public & private sector entities, on local, regional, state, national and international levels.
Cargo Summary – Port of Baltimore is a healthy, diverse, and nationally significant port.

The Port generates over 37,000 jobs:

- 15,330 direct port jobs
- $3.3 billion in wages and salaries,
- $395 million in state and local tax revenues annually.
- The Port’s average annual salary for direct job holders is 9.5% higher than the statewide average annual wage.

➢ #1 in Autos and Roll-on Roll-off Heavy Equipment.
➢ #1 in imported Gypsum
➢ #2 in exported Sugar and Coal.
➢ #9 in the U.S. in the value of foreign cargo.
➢ #11 in the U.S. in foreign cargo tonnage.
Marine Terminals are water dependent. They must be located on the water to function and are therefore vulnerable to the impacts of Climate Change and Sea Level Rise.
To plan for future climate impacts we have looked at historical trends, climate change prediction models, and lessons learned from past events.

Historical High Water Trends Baltimore
1900 - 2017

Hurricane Isabel
Category 5
September, 2003
Recognizing that port operations may be threatened by changing climate conditions, the MPA conducted a vulnerability assessment in 2010, and in 2015 adopted a three-pronged approach to future projects, as follows:

- **MIGRATE**: Move terminal functions out of the flood plain, whenever feasible.
- **ELEVATE**: Design all new MPA facilities or structures that must remain on the terminals to be 2 feet above the 100-year flood elevation, if operationally feasible.
- **MITIGATE**: Reinforce and/or strengthen facilities to limit potential weather damage, whenever significant maintenance or major capital investments are being made.
Preparing for Resilience
Policy Considerations and Actions

• Consider resiliency in all capital project designs and prioritize investments by level of risk and potential impact.

• Explore reuse of dredge material for resilience projects (i.e. terminal raising, wetland restoration, shoreline/island restoration).

• Identify potential resilience partnerships with Federal, State and local partners.

• Investigate electric/micro-grid improvements, redundancies, and emergency power generation options.
Marine Terminals are vulnerable to a variety of OTHER Climate Change risks:

- Extreme Rain Events
- Extreme Temperatures
- High Winds
- Snow, Ice and Hail Events
- Increased Sedimentation

Less is known about the potential severity and frequency of these risks as they relate to Climate Change and are therefore more difficult to plan for.
MPA Actions on Climate Resilience & Adaptation

Examples of how this model is being or has been implemented

Storm Water Vault, Dundalk Marine Terminal – dual benefits helping to meet MD storm water management requirements, and reduces impacts of extreme rain events (mitigate)
Examples of how this model is being or has been implemented

When MPA filled its Fairfield Marine Terminal (FMT) Wet Basin (using Federal TIGER funds), a large underground storm water management system was installed to reduce severe rain event flooding. In addition, once redeveloped for cargo storage the former wet basin was also elevated (elevate/mitigate).
MPA Actions on Climate Resilience & Adaptation

Examples of how this model is being or has been implemented include:
MPA Actions on Climate Resilience & Adaptation

Examples of how this model is being or has been implemented include:
MPA Actions on Climate Resilience & Adaptation

Examples of how this model is being or has been implemented include:

Proposed Dundalk Marine Terminal Resiliency and Flood Mitigation Improvements
Cargo Up 10% & Emissions Down 19% between 2012 and 2016

- Emissions per ton cargo handled comparing 2012 to 2016
- Decreases due to modernization of cargo handling equipment, replacement of older dray trucks and operational changes.
Mitigation Projects also provide Climate adaptation benefits beyond our facilities.
This Shoreline Restoration At the Arlington Echo Outdoor Education Center created 400 feet of new living shoreline with over 5,000 shoreline grasses to help provide habitat and protect from erosion.
Major shipping channels in the Chesapeake Bay and Baltimore Harbor are maintained at a 50-foot depth; other channels are maintained at a 35-foot depth.
Port of Baltimore Dredging Demand

- Port of Baltimore’s shipping channel
  - Maintaining a 50’ depth keeps channels safe and open and the Port competitive.

- Annual maintenance of the State’s marine highway
  - 136 miles of dredged channels/yr

- 4.7mcy of material is dredged annually
  - Harbor channel material: 1mcy/yr
  - Bay channel material
  - C&D Canal approach channel material
New Solutions are Needed

Innovative Reuse & Beneficial Use

**Innovative Reuse** = Land applications for dredged sediment

**Beneficial Use** = In-water applications for dredged sediment

- Building Materials
- Habitat Restoration
- Manufactured Topsoil
- Site Reclamation
Dredged Material in ACTION!

Dredged Material Recovery

Remedial Capping Material

Habitat Development

Daily Landfill Cover

Engineered Fill
Poplar Island is an international model for the beneficial use of dredged material located in the mid-Chesapeake Bay.

The expanded site includes 1,715 acres of restored habitat:

- 776 acres of tidal wetlands
- 829 acres of upland habitat
- 110-acre open water embayment
Future Beneficial Use

Mid-Chesapeake Bay Islands Project

- Provides **90-95 million cubic yards** of dredged material placement capacity.
- Beneficial use of sediment dredged from the Port of Baltimore’s 50’ deep open Bay channels in Maryland.
- Restores important, scarce remote island habitat at James and Barren Islands.
- Provides shoreline protection and resiliency for Dorchester County and its property owners.

**James Island**: 2072 acres
- 55% wetland
- 45% upland habitat

**Barren Island**: 72 acres
- Sub-Aquatic Vegetation restoration/protection
Ports: Navigating the Climate Future

Discussion/Questions?