

# Supplementary Information

## Indicator O: Coastal Habitats

### State of Casco Bay 6<sup>th</sup> Edition

#### References

Bohlen, C., M. Stelk, M. Craig, L. Redmond, and C. Gerber. 2012. Geomorphology and the effects of sea level rise on tidal marshes in Casco Bay. Casco Bay Estuary Partnership.

[https://www.cascobayestuary.org/wp-content/uploads/2014/08/2012\\_sea\\_level\\_rise\\_tidal\\_marshes.pdf](https://www.cascobayestuary.org/wp-content/uploads/2014/08/2012_sea_level_rise_tidal_marshes.pdf)

#### Further Reading

Maine Natural Areas Program hosts an interactive mapping viewer for Current Maine Tidal Marshes. URL: [https://www.maine.gov/dacf/mnap/assistance/tidal\\_marshes.htm](https://www.maine.gov/dacf/mnap/assistance/tidal_marshes.htm). A fact sheet prepared by MNAP describes Salt-hay Saltmarsh, and its significance in Maine, in more detail.

URL: <https://www.maine.gov/dacf/mnap/features/communities/spartinasaltmarsh.htm>

The Nature Conservancy hosts an interactive Coastal Resilience mapping viewer that includes a Future Habitat Explorer, which models gain (via marsh migration) and loss (via erosion/conversion) of tidal marshes under different sea level rise scenarios. URL:

<https://maps.coastalresilience.org/maine/#>.

Maine Coastal Program hosts an interactive Tidal Restriction Atlas to assist communities, road owners, conservation groups and others to identify tidal restrictions, including predicted tidal sites under future sea level rise scenarios. URL:

<https://www.arcgis.com/home/item.html?id=8f7fc922c464482d8fe946ca5b17c7ea>

Casco Bay Estuary Partnership prepared a series of reports, Sea Level Rise and Casco Bay's Wetlands: A Look at Potential Impacts, for coastal municipalities around Casco Bay. Individual municipal reports are available from CBEP's publication portal. URL:

<https://www.cascobayestuary.org/resources/publications/>

Monitoring of tidal restoration project outcomes is underway at several tidal marshes around Casco Bay. CBEP has prepared monitoring reports at a subset of these sites. An example report for a tidal culvert replacement initiated by Maine Department of Transportation at Long Reach Lane in Harpswell is available at:

<https://www.cascobayestuary.org/wp-content/uploads/2019/04/Long-Marsh-Monitoring-Report-FINAL.pdf>

The Gulf of Maine Council on the Marine Environment released the State of the Gulf of Maine Report in 2010. The sub-report on Coastal Ecosystems and Habitats goes into more detail about status, classification, and trends related to coastal habitats in the Gulf of Maine. URL:

<http://www.gulfofmaine.org/state-of-the-gulf/docs/coastal-ecosystems-and-habitats.pdf>.

## Methods and Data Sources

### Coastal Habitat Area

We obtained geospatial data from the U.S. Fish & Wildlife Service National Wetland Inventory. We categorized coastal habitat types according to NWI codes and classifications as listed below.

**Tidal Marsh:** E2EM1/5P, E2EM1/5P6, E2EM1/5Ph6, E2EM1/US2P, E2EM1N, E2EM1N6, E2EM1P, ESEM1P6, E2EM1Pd, ESEM1Ph, E2EM1Ph6, E2EM2Nh6, E2EM5/1P6, E2EM5P6, E2EM5Ph, E2EM5Ph6, E2SS1P, E2US4M, E2US4P, E2US4Ph. Excludes tidal creek channels through salt marshes (E1UBL) because they are classified as subtidal by NWI and there is no simple way to distinguish between tidal creeks channels and open water in the bay, such as the New Meadows River, which is classified the same way.

**Tidal Flats & Beach** (mud or sand). E2US2M, E2US3M, E2US3Mh, E2US2N, E2US3N, E2US3Nh, M2US1M, M2US1N, M2US1P, M2US2/1N, M2US2/1P, M2US2/AB1N, M2US2M, M2US2N, M2US2P, M2US3M, M2US3N, M2US3P. Beach (rock or sand). E2US1N, E2US1P, E2US2P, M2US2P, M2US2N, M2US2/AB1N.

**Rocky Intertidal**, including aquatic beds. E2AB1/RS1N, E2AB1M, E2AB1N, E2AB4M, E2RS1/AB1N, E2RS1N, ESRS1P, E2RS2M, E2RS2N, M2AB1/RS1N, M2AB1/US3N, M2AB1M, M2AB1N, M2AB3M, M2RS1/AB1N, M2RS1M, M2RS1N, M2RS1P, M2RS2Pr, M2RSM, M2RS2N, M2RS2P, M2US3M, M2US3N, M2US3P.

We created the coastal habitats map with ArcMap and exported tabular data from ArcMap to Excel to develop area estimates for habitat types. A peer reviewer suggested we use the more recent tidal marsh data set developed by the Maine Natural Areas Program, but we decided to proceed with the NWI data for the sake of consistency across all habitat categories.

U.S. Fish and Wildlife Service. 2019. National Wetlands Inventory.

<https://www.fws.gov/wetlands/Data/Mapper.html>. Date accessed: December 16, 2019.

### Tidal Crossings

We obtained a Beta version of the Maine Coastal Program's tidal crossing geodatabase, an assemblage of provisional data from MCP's tidal restriction assessment using remotely sensed data. We also utilized CBEP in-house geospatial data for tidal restrictions. We pulled the two data sets together into ArcMap, and conducted a manual review of the sites along Casco Bay's shoreline by visually comparing sites and NWI tidal marshes. We tabulated the tidal crossing types and prepared the pie chart in Excel. Structural type and potential for restriction is based on CBEP site specific knowledge and/or presence of adjacent wetlands, and assumes that all culverts are likely to be restrictive to some degree but that large bridges would not be.

Bartow-Gillies, E. 2020. Tidal crossing data (Beta). Maine Coastal Program. Via email, June 22, 2020.

Casco Bay Estuary Partnership. 2009. Tidal restrictions geospatial data. Last updated: 3/31/2009.

### [Culvert Replacement Projects](#)

We used in-house CBEP tracking to create a list of tidal culvert replacement projects in Excel. Acreage estimates for restored area of enhanced tidal flow were obtained referencing NWI and MNAP geospatial data for tidal marshes and tabulated in Excel.