Chatham Salt Marshes Interactive Map

Energy and Climate Action Committee of the *Town of Chatham.*

Description as of December 3, 2022

An interactive map for viewing, analyzing and exploring the Chatham salt marshes is available online at:

https://ecac.maps.arcgis.com/apps/instant/sidebar/index.html?appid=fb37b3b366894a0bb8809885aa665aee

See *Figure 1* for a screenshot of the map showing the salt marshes at Cockle Cove Creek and Bucks Creek.

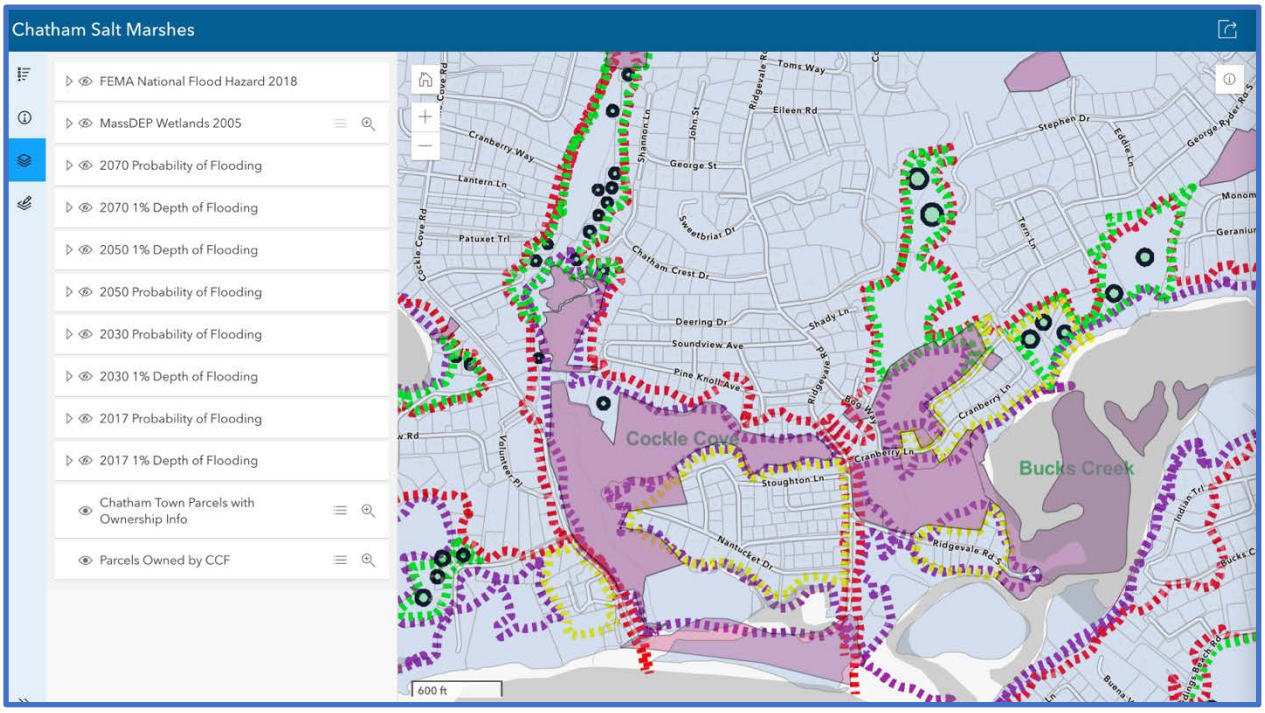

Figure 1. An image of the interactive map.

This map includes several "layers" indicating water levels (flooding) observed/predicted for different recent/future years. Display the list of Layers on the right by clicking on the layers icon. Click on the eye icon to make a particular layer visible/invisible. The map is clearest with only one layer of flooding visible at a time.

The layer of "FEMA National Flood Hazard" is based on satellite data from 2018. A legend for this data is given in *Figure 2*. The layer of "MassDEP Wetlands" is based on satellite data from 2005. A legend for this data is given in *Figure 3*. The Wetlands layer still provides a close approximation to current conditions. The Flood Hazard layer provides a close approximation to probable future conditions in roughly 50 years.

The other layers provide projections based on the Massachusetts Coastal Flood Risk Model (MC-FRM). This is a recent, detailed modeling based on current conditions (2017) and projections of the most likely climate-change effects through 2030, 2050 and 2070. Some layers project probable flooding areas (with different levels of probability based on storm intensities). A probability of 1% indicates a hundred-year storm. Other layers project depth of flooding. A 1% depth is the projected water depth during a hundred-year storm. Legends for these layers are given in *Figure 4*.

The final two layers show Town parcel boundaries and parcels owned by the Chatham Conservation Foundation (shown in reddish purple). Clicking on a particular parcel displays ownership and other information from the Town assessor's office. Note that the data for these layers is from about 2020.

In the main map area, you can zoom in and out as well as scroll around to view different areas in Chatham. Some of the salt marshes have been outlined to explore possible migration areas and paths. These colored outlines are very rough hand-drawn sketches.

- The purple lines indicate the current boundaries of a salt marsh -- given by the 2017 Probability of Flooding layer at the level of percentage = 100%. The areas within the purple boundaries are currently under water at normal high tide.
- The red lines indicate projected future boundaries of the same salt marsh -- given by the 2070 1% Depth of Flooding at the level of depth = 3.5 feet. The areas within the red boundaries are projected to be under at least 3 ½ feet of water during a hundred-year storm in 2070.
- The yellow lines indicate residential areas threatened by severe flooding.
- The green lines suggest potential migration areas or migration paths for the same marsh. These are areas that are now dry, but are likely to be flooded or salt marsh in the future. Their viability as migration areas or migration paths needs to be explored and confirmed by other methods, including field work and associated studies, using methodologies that are currently being developed and reported.

Parcels or partial parcels with green circles are possible targets for obtaining CRs for marsh preservation. These are parcels associated with potential migration areas or migration paths, which might need access or interventions to aid in salt marsh preservation.

Example	Feature/Usage	Standard* [Hatch Pattern] (RGB Values)
(ortho) (vector)	All flood hazard lines coded as SFHA / FLOOD ZONE BOUNDARY. Lines coded as OTHER BOUNDARY indicate different source citations, apparent limits, or end of spatial extent and are not symbolized.	Ortho: Line weight 1 Pt., White (255, 255, 255) Vector: Line weight 1 Pt., Grey (178, 178, 178)
	The Limit of Study line is used to indicate the terminus of a 1-percent-annual-chance floodplain where the SFHA is abruptly truncated and no floodplain follows.	1. Line weight 1 Pt., White (255, 255, 255) 2. Line weight 2.5 Pt., Red (250, 52, 17)
	1-percent-annual-chance Flood Hazard Area (Zones A, AE, AO, AH, AR, AR/AE, AR/AH, AR/AO, AR/A, A99, V, and VE)	Blue (0, 230, 255), 70 percent Transparency
	Zone X of zone subtype 0.2-percent-annual-chance Flood Hazard Area (shaded Zone X)	Orange (255,128, 0), 70 percent Transparency
	Zone D areas	Tan (242, 230, 115), 70 percent Transparency
	Area with Reduced Flood Risk due to Levee	1. Line weight 5 Pt., Black (0,0,0), Angle 45; Offset 5, Separation 10; 70 percent Transparency 2. Line weight 5 Pt., Orange (255, 128, 0), Angle 45; Offset 0, Separation 10; 70 percent Transparency
	Area with Flood Risk due to Levee	1. Line weight 5 Pt., Black (0,0,0), Angle 45; Offset 5, Separation 10; 70 percent Transparency 2. Line weight 5 Pt., Tan (242, 230, 115), Angle 45; Offset 0, Separation 10; 70 percent Transparency

Figure 2. Legend for FEMA National Flood Hazard layer.

Figure 3. Legend for Mass DEP layer.

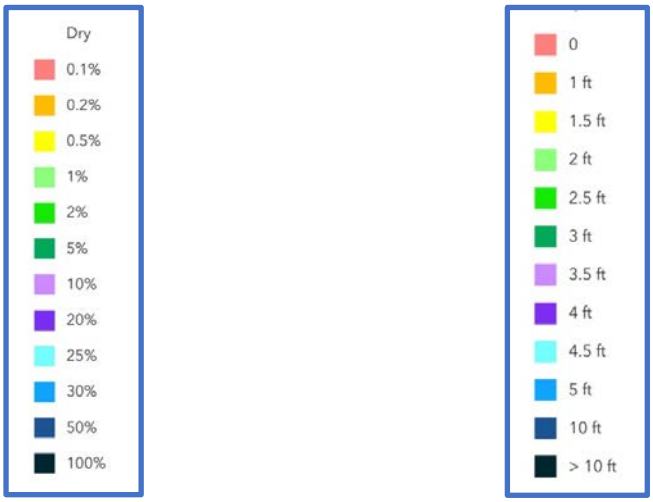

Figure 4. Legend for Probability of Flooding layers and legend for 1% Depth of Flooding layers.

Figure 5. Sample boundaries of Frost Fish Creek salt marsh. Note purple, red, and green dashed-line boundaries as well as green circles for specific parcels. In this view, the MassDEP Wetlands layer has been turned on to show current areas of water, salt marsh and wooded marsh.

Additional GIS (geographic information system) layers can be compared at the following websites:

- East-Southeast (surveyor): https://www.ese-llc.com/toc
- Town of Chatham (assessor): https://www.mapsonline.net/chathamma

These sites have a variety of different layers of information related to parcels and wetlands. Some of their information is more up-to-date or more accurate than the data in this map. However, they do not include the Massachusetts Coastal Flood Risk Model (MC-FRM), which is probably the most detailed projection about the future of wetlands in Chatham.

Development of this map is a project of the *Energy and Climate Action Committee* of the Town of Chatham. Note that this is a work in progress, based on incomplete information and numerous assumptions. It may be passed on to others, with the knowledge that this is an exploratory and speculative effort. For further information, comments, suggestions or questions, please contact Gerry Stahl at Gerry@GerryStahl.net.