These raster datasets and maps are derived from output of the Boston Harbor Flood Risk Model (BH-FRM) for sea level rise and coastal storm simulations as described in the report MassDOT-FHWA Pilot Project Report: Climate Change and Extreme Weather Vulnerability and Adaptation Options for the Central Artery/Tunnel System (Pilot Project Report). Details of the project and model are described in the Pilot Project Report which is available for download here:

https://www.massdot.state.ma.us/Portals/8/docs/environmental/SustainabilityEMS/Pilot_Project_Report_ MassDOT_FHWA.pdf (PDF 16mb).

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This information is not intended for use as a flood insurance determination, nor should it be directly related to FEMA FIRM maps or data since these data and FEMA data are for different purposes. This information cannot be used for the purpose of boundary resolution or location.

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While every effort has been made to assure the accuracy and correctness of the data presented, it is hereby acknowledged that inherent mapping inaccuracies are present due to interpolation between BH-FRM calculation nodes. Any reliance upon the data presented herein used to make decisions or conclusions is at the sole discretion and risk of the user. This information is provided with the understanding that these data are not guaranteed to be accurate, correct or complete and assumes no responsibility for errors or omissions. Data and documents may not be the most currently available data. All data are subject to constant change given the changing climate. BH-FRM data may lag behind real-world changes by varying periods of time.

Locations located near boundaries of a probability zone may or may not be within the probability zone due to mapping inaccuracies and interpolation between model nodes. BH-FRM nodal spacing varies throughout the City of Chelsea. Therefore, care should be taken when using the maps or raster data to evaluate site-specific properties or locations. By accessing these data, the user agrees with the terms herein and understands the limitations of the data provided.

Each BH-FRM raster dataset was developed in Esri GRID format and includes an associated ArcGIS 10.3.1 layer file to facilitate the recommended symbology. For ArcMap users, we recommend adding the layer file to your MXD and then setting the data source to the associated raster dataset.

Flood exceedance probability is defined as the probability of flood water encroaching on the land surface at a particular location for a given climate time frame. Maps show flood exceedance probabilities across Chelsea for near future climatic conditions (represented by the 2030 scenario) and late 21st century conditions (represented by the 2070 scenario). Exceedance probabilities shown on these maps range from 0.1% (0.001, otherwise known as the 1000-year flood level) to 100% (the annual storm water surface elevation level). These maps can be used to identify locations, structures, assets, etc. that lie within different risk levels within the area. For example, a building that lies within the 2% flooding exceedance probability zone would have a 2% chance of flooding in that year (under the assumed climatology). In other words, in each year there is a 2% percent chance that this location will get wet. Stakeholders can then determine if that level of risk is acceptable, or if some action may be required to improve resiliency, engineer an adaption, consider relocation, or implement an operational plan.

By comparing the 2030 flood probability map to the 2070 flood probability map, individual structures, assets, and areas can be assessed to determine how flooding is changing as a function of time and the overall influence of climate change projections can also be evaluated. These maps can also be used to assess flood entry points and pathways and thereby identify potential regional adaptations.

The probability of flooding maps provide stakeholders the ability to determine if areas, buildings, etc. are expected to be flooded and at what probability flooding is expected to be initiated. This is important for weighing the tolerance for risk and evaluating when adaptation options may need to be considered. Perhaps equally as important is the magnitude, or depth, of flooding expected. Therefore, depth of flooding map can be created for any given flooding probability level. For the City of Chelsea, 1% (100-yr) and 0.1% (1000-yr) depth maps have been created showing flood depths (at 0.5 ft increments). As such, the depth of flooding can also be evaluated when assessing the risk to a system.











