FloodViewer
City of Cambridge, MA

F.A.Q.

What does this tool show?

The Cambridge FloodViewer 2022 visually displays the *extent* (area covered) of flooding for various storm scenarios, which includes flooding from both precipitation (rainfall), as well as sea level rise and storm surge. Clicking on a parcel will also display the maximum flood elevations modeled within that parcel under each storm scenario, including different planning horizons (2030 and 2070) and storms with different recurrence intervals (10-year and 100-year storms). Ground elevation data provides reference to assess the approximate range in depth of flooding on a specific parcel.

How does the output from the Cambridge FloodViewer 2022 Tool compare with other Statewide data?

The sea level rise/storm surge flood elevations represented in the Cambridge FloodViewer 2022 version correspond to the latest sea level rise/storm surge statewide flood model results from the Massachusetts Coast Flood Risk Model (MC-FRM). The MC-FRM is also being used as part of the Resilient Massachusetts Action Team (RMAT) "Climate Resilience Design Standards and Guidelines" project being led by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA). The MC-FRM results will be displayed in the updated version of RMAT Climate Resilience Design Standards Tool, which will be released by EEA in April 2022. Projects entered in the RMAT Tool will receive maximum, minimum and area-weighted average values for (i) projected future tidal datums, (ii) projected water surface elevations, (iii) projected wave heights, and (iv) projected flood elevations that factor both water surface and wave heights for sea level rise/storm surge from MC-FRM for the recommended planning horizon (2030, 2050 2070) and recommended return period (5%, 2%, 1%, 0.5%, 0.2%, 0.1% annual exceedance probability) as output from the RMAT Tool.

The Cambridge FloodViewer 2022 provides maximum projected water surface elevation from sea level rise/storm surge from MC-FRM for each parcel in the City for 2070 planning horizon for 10% and 1% annual exceedance probability and factors both overland coastal flooding and propagated coastal flooding through the City's piped infrastructure. The Cambridge FloodViewer 2022 only reports the water surface elevation output from MC-FRM and does not factor wave heights in the flood elevations since wave heights have been estimated in MC-FRM based on

conservative assumptions and there are limitations with respect to how buildings in the City are likely to impact projected wave heights.

My property is shown as "impacted", what does this mean?

If flooding is detected anywhere within the boundary of a parcel under a storm scenario, that parcel is flagged as “impacted” and a flood elevation is provided for the respective storm. Note that while a parcel may display as impacted, flooding may not reach any structures or buildings. Flood extents shown are approximate based on the best available information, and subject to change as more information becomes available about climate change projections.

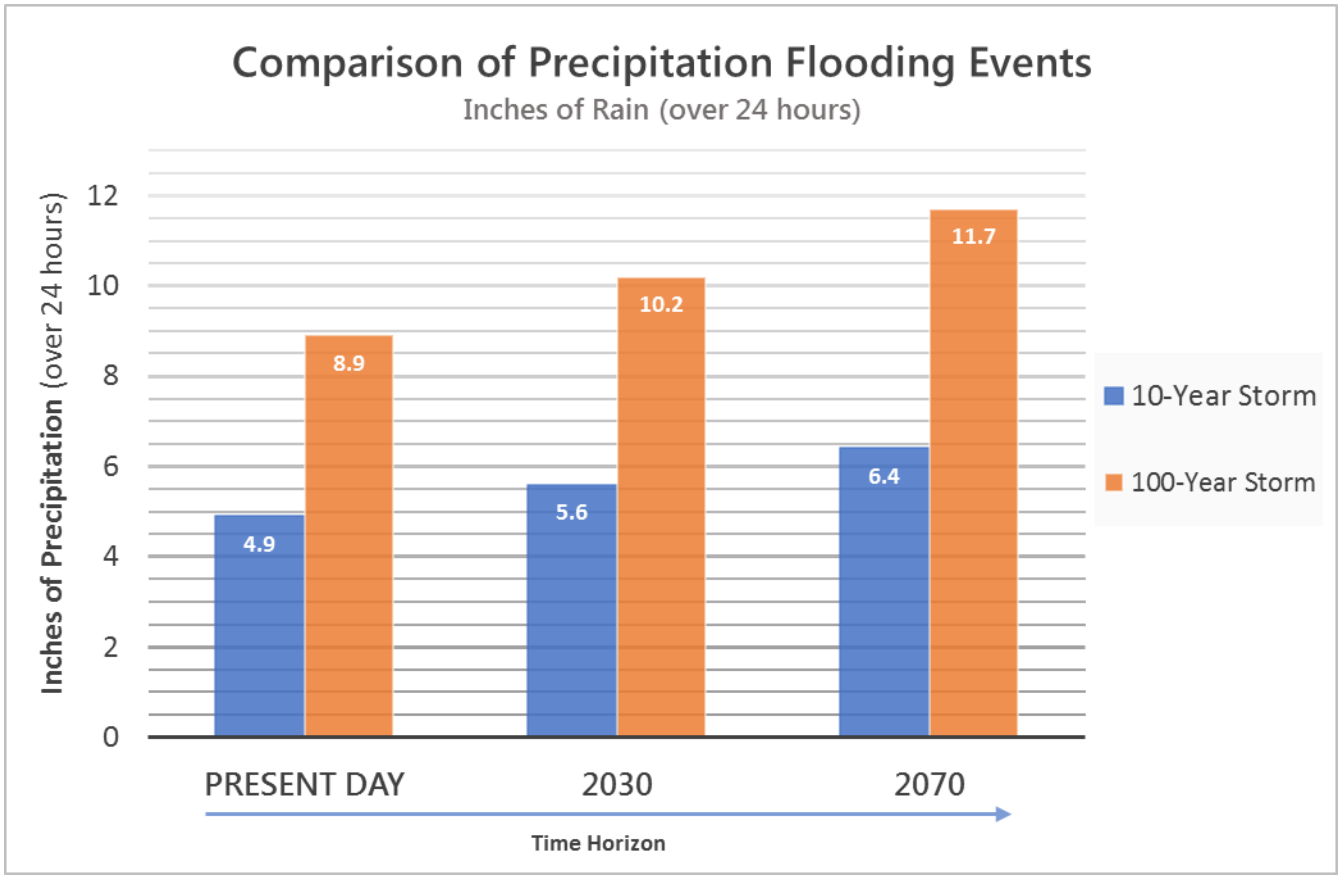
How do I change the storm scenario displayed?

In the upper right corner of the web app, click the  button to bring up a list of storm scenarios, organized by year and recurrence interval of 100-year or 10-year storm event[1]. You can toggle these layers on and off to display the desired event(s). Note that the more severe storm will take precedence in terms of display hierarchy, so you may want to enable only one layer at a time to ensure accurate viewing.

What are the 2030 and 2070 planning horizons?

The City of Cambridge has chosen 2030 and 2070 as the two planning horizons for climate change planning and preparedness. The 2030 planning horizon provides a nearer-term future, while 2070 provides a longer-range forecast on shifts in climate. However, it is important to note that the precipitation projections for 2030 and 2070 are based on a 30-year averaging period around each planning horizon to capture some of the uncertainty associated with climate change projections. Climate change projections are subject to revision as more information becomes available or by taking actions that mitigate greenhouse gas emissions. However, recent literature and findings suggest that flooding from both extreme precipitation, as well as sea level rise and storm surge are likely to be more frequent and intense.

[1] Hydrologists don't like to hear a term like "100-year flood" because, scientifically, it is a misinterpretation of terminology that leads to a misconception of what a 100-year flood really is. Instead of the term "100-year flood" a hydrologist would rather describe this extreme hydrologic event as a flood having a 100-year recurrence interval meaning that a flood of that magnitude has a 1 percent chance of happening in any year. A “10-year flood” as 10 percent chance of happening in any year.


Comparison of Precipitation Flooding Events
Inches of Rain (over 24 hours)
Inches of Precipitation (over 24 hours)
12
10
8
6
4
2
0
4.9
8.9
5.6
10.2
6.4
11.7
PRESENT DAY
2030
2070
Time Horizon
10-Year Storm
100-Year Storm

Data Dictionary:

DataLayer Name:	Definition:
Ground Elevation Min:	The lowest ground elevation (in feet-CCB)[2] found within the parcel, sourced from 2014 LiDAR[3] data.
Ground Elevation Max:	The highest ground elevation (in feet-CCB) found within the parcel, sourced from 2014 LiDAR data.
2070 – 1% – SLR/SS[4]	Maximum flood elevation at the parcel from one percent annual probability of flooding due to sea-level rise and storm surge by 2070, considering both overland coastal flooding and propagated coastal flooding.
2070 – 1% – Precipitation	Maximum flood elevation at the parcel from one percent annual probability of flooding due to precipitation by 2070 (11.7 inches of rain over 24 hours).
2070 – 10% – SLR/SS	Maximum flood elevation at the parcel from ten percent annual probability of flooding due to sea-level rise and storm surge by 2070, considering both overland coastal flooding and propagated coastal flooding.
2070 – 10% – Precipitation	Maximum flood elevation at the parcel from ten percent annual probability of flooding due to precipitation by 2070 (6.4 inches of rain over 24 hours).
2030 – 1% – Precipitation	Maximum flood elevation at the parcel from one percent annual probability of flooding due to precipitation by 2030 (10.2 inches of rain over 24 hours).
2030 – 10% – Precipitation	Maximum flood elevation at the parcel from ten percent annual probability of flooding due to precipitation by 2030 (5.6 inches of rain over 24 hours).
Present Day – 1% – Precipitation	Maximum flood elevation at the parcel from one percent annual probability of flooding due to precipitation in present-day weather conditions (8.9 inches over 24 hours).
Present Day – 10% – Precipitation	Maximum flood elevation at the parcel from ten percent annual probability of flooding due to precipitation in present-day weather conditions (4.9 inches over 24 hours).
FEMA 500-Year Zone	Flood elevation at the parcel corresponding to an area of minimal flood hazard, or 0.2% annual probability of flooding, as defined by the Federal Emergency Management Agency
FEMA 100-Year Zone	Flood elevation at the parcel corresponding to an area with a 1% annual probability of flooding, as defined by the Federal Emergency Management Agency
1% – LTFE[5]	The higher of the flood elevation values between the “2070 – 1% – Precipitation” flood elevation and the “2070 – 1% – SLR/SS” flood elevation for the specific parcel.
10% – LTFE	The higher of the flood elevation values between the “2070 – 10% – Precipitation” flood elevation and the “2070 – 10% – SLR/SS” flood elevation for the specific parcel.

[2] Cambridge City Base (CCB) datum is a standard vertical datum used by the City of Cambridge. This datum is 11.65 ft below the North American Vertical Datum (NAVD) of 1988, which is approximately 0.3 ft above the mean sea level (MSL) in the Boston area..

[3] LIDAR stands for *Light Detection and Ranging,* is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. These light pulses—combined with other data recorded by the airborne system— generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. (https://oceanservice.noaa.gov/facts/lidar.html)

[4] SLR/SS refers to Sea Level Rise and Storm Surge

[5] LTFE refers to Long-Term Flood Elevation

Additional Resources:

- **CCPR Homepage**
- **City of Cambridge - Flooding Information Guide**
- **City of Cambridge - Public Works**
- **City of Cambridge - Community Development Department**
- **City of Cambridge GIS**

Credits:

Designed by Kleinfelder for the City of Cambridge, MA

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Technical review by Weston & Sampson

Elevation Data by EagleView