



Adapting to Rising Tides Bay Area Flood Explorer

The **Bay Area Flood Explorer** is a website designed to help Bay Area communities understand current and future flooding risks due to sea level rise and storms. The website will help users learn flood concepts, explore interactive flood maps, and download GIS data. These maps show what could be at risk without adaptation and identify specific areas that face the greatest risk, helping Bay communities, governments, and businesses to drive strategic action.

WHO IS THE FLOOD EXPLORER FOR?

The Bay Area Flood Explorer is designed for a wide variety of users with varying levels of knowledge and expertise regarding flooding. Below are some examples of these user groups:



Planning Partners



Elected Officials and their Staff



Government Entities



General Public

WHY ARE THESE MAPS UNIQUE?

The Bay Area Flood Explorer shows maps of the San Francisco Bay shoreline's current and future flood risk recently completed by the Adapting to Rising Tides (ART) Program and the Metropolitan Transportation Commission (MTC). The shoreline maps are designed to support detailed and consistent sea level rise assessment and adaptation in the region.

- **Stakeholder Review:** An intensive stakeholder review process solicited on-the-ground expertise that was used to improve the accuracy of the maps.
- **One Map, Many Futures:** The ability to communicate that flooding can occur from a variety of sources, and some areas will be temporarily flooded sooner than they are permanently flooded as seas rise.
- **Shoreline Overtopping:** A unique analysis that identifies low points in the shoreline that can lead to inland flooding. This enables users to identify the shoreline locations for additional investigation, analysis, and adaptation strategies, allowing limited resources to be directed to the locations that pose the largest risk to shoreline communities.

WHAT DOES THE FLOOD EXPLORER ACHIEVE?

- #1. Educate users about flooding concepts
- #2. Describe intended uses for maps
- #3. Enable users to explore and interact with maps
- #4. Provide data download for technical users
- #5. Connect the public to existing adaptation efforts

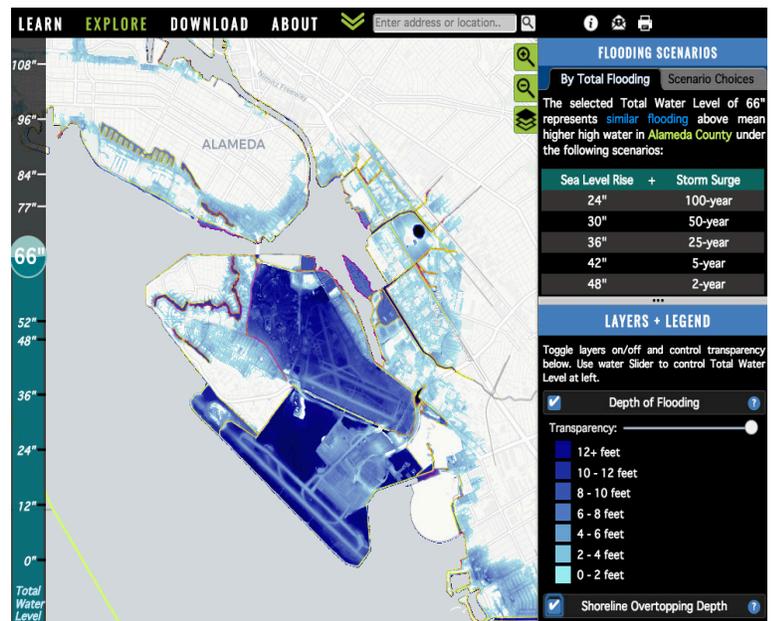


FIGURE 1 | Regional flood depth map of the Oakland International Airport is displayed in the Bay Area Flood Explorer. Users can choose a "Total Water Level" or select a sea level rise and storm surge flooding scenario to see how flooding will impact different stretches of the shoreline.



Mapbooks, geodatabases, and full report on methods and findings for all nine counties are available at: <http://www.adaptingtorisingtides.org/project/regional-sea-level-rise-mapping-and-shoreline-analysis/>. ART is a program of BCDP.



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STAKEHOLDER REVIEW PROCESS

To ensure the Flood Explorer maps represent the best available data of flooding in the Bay Area, local and regional partners have been included in an intensive stakeholder review process. Partners were asked to provide feedback on data accuracy and observations of local flooding. Stakeholder engagement will continue through updated iterations of maps.

ONE MAP, MANY FUTURES APPROACH

The Flood Explorer uses an approach called “One Map, Many Futures.” This approach demonstrates how different combinations of sea level rise and storm surge scenarios can cause the same height of flooding, and this “Total Water Level” can be shown on a single map. For example, a total water level of 48-inches (or 4 feet) above today’s water line could occur with: a) 100-year storm, b) 24-inches of SLR and a 5-year storm, or 3) 48-inches of sea level rise (Fig. 2). Therefore, for each total water level in the Flood Explorer, the tool provides a list of sea level rise and storm surge combinations that could result in that water level. This approach allows users to efficiently visualize impacts from permanent flooding due to sea level rise, temporary flooding from a storm, or a combination of both. Additionally, this tool remains flexible as emerging science continues to refine our understanding of future rates of sea level rise. Today, we can use the Flood Explorer to visualize the 2018 State of California Sea Level Rise Guidance.

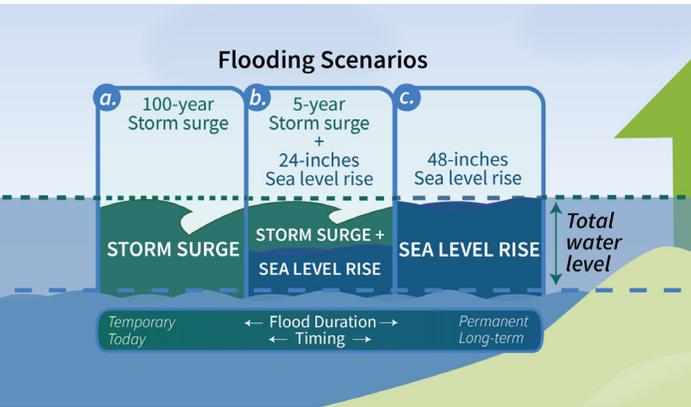


FIGURE 2 | Visual representation of “One Map, Many Future” approach, which emphasizes how multiple, different combinations of extreme tides, storm surge, and sea level rise can lead to the same total water level and same level of flooding. By using this approach, the maps illustrate the need to plan for both near and long-term flood risks.

SHORELINE OVERTOPPING ASSESSMENT

Shoreline overtopping can occur when Bay water levels rise higher than the shoreline, allowing water to flow inland. The Flood Explorer depicts shoreline type and elevation, and labels where overtopping may occur and how deep the water may be. Shoreline overtopping is powerful information that is unique to the ART maps and the Bay Area Flood Explorer. Coupled with the depth of flooding for each “Total Water Level”, shoreline overtopping maps help users quickly identify the shoreline locations and pathways that could lead to inland flooding. This helps prioritize where additional analysis, investigation, and adaptation strategies can be focused to address locations with the greatest vulnerability.

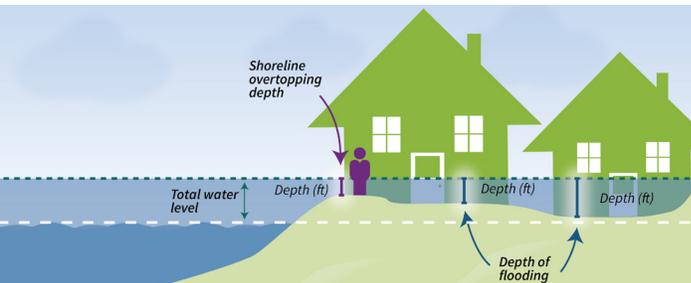


FIGURE 3 | Visual representation of shoreline overtopping presented in the Bay Area Flood Viewer on the “Learn” page. Flooding concepts are explained in this section, including visuals to accompany descriptions and explanations.

DISCLAIMER

The inundation maps and the associated analyses provide a regional-scale illustration of coastal flooding due to specific sea level rise and storm surge scenarios, and are intended to improve sea level rise awareness and preparedness to support regional adaptation planning efforts. The maps are not detailed to the parcel-scale and should not be used for navigation, permitting, regulatory, project review, mitigation, or other legal uses. Flooding due to sea level rise and storm surges is possible in areas outside of those predicted in these maps, and the maps do not guarantee the safety of an individual or structure. While the maps use the best data available to capture topographic features (e.g., berms, tide gates) they may not capture other infrastructure improvements (e.g., pumps) designed to reduce future flood extent. The maps do not model flooding from other sources, such as groundwater intrusion and riverine or surface water flooding from rain-fall-runoff events.