Adapting to Rising Tides
Bay Shoreline Flood Explorer

The **Bay Shoreline Flood Explorer** is a website designed to help Bay Area local governments and communities access interactive maps of current local flood risks due to rising sea level and storms. These maps highlight what the Bay Area could look like without implementing current and future local and regional plans to minimize those risks. They also will help inform and empower Bay Area citizens to connect with ongoing efforts and community organizations working to minimize those impacts.

WHO IS THE FLOOD EXPLORER FOR?

The Bay Shoreline 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 Shoreline Flood Explorer displays maps of the San Francisco Bay shoreline's current and future flood risk based on recently completed work by the Adapting to Rising Tides (ART) Program and the Metropolitan Transportation Commission (MTC). The maps are uniquely suited to help raise awareness of flooding hazards and support planning because of three key features.

- **Stakeholder Review:** An intensive stakeholder review process solicited on-the-ground expertise to make the maps highly accurate and allow continued improvements.
- **One Map, Many Futures:** Flooding can and will occur due to a variety of factors, leading to permanent and temporary flooding. The website enables users to identify how much water (i.e. "total water level") it would take for an area to flood based on the current Bay shoreline.
- **Shoreline Overtopping:** A unique analysis that identifies low points in the shoreline that can lead to inland flooding. This enables users to identify shoreline locations and pursue additional investigations, analyses, and adaptation strategies to minimize flood risk, encouraging limited resources to be directed to the locations that pose the largest risks 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 Shoreline Flood Explorer. Users can choose a "Total Water Level" from the slider 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 technical report on methods that generated the flood maps for all nine counties of the Bay Area are available online at: explorer.adaptingtorisingtides.org/download.

Learn more by visiting the website at **explorer.adaptingtorisingtides.org**

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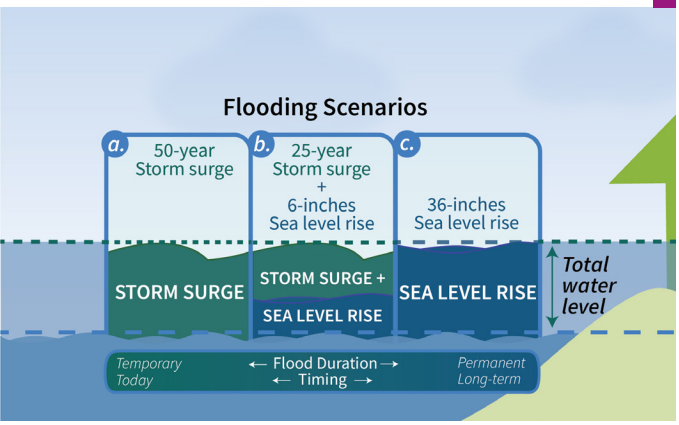

FIGURE 2 | Visual representation of "One Map, Many Future" approach, which emphasizes how different combinations of extreme tides, storm surge, and sea level rise can lead to the same total water level and extend of flooding. By using this approach, the maps illustrate the need to plan for both near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

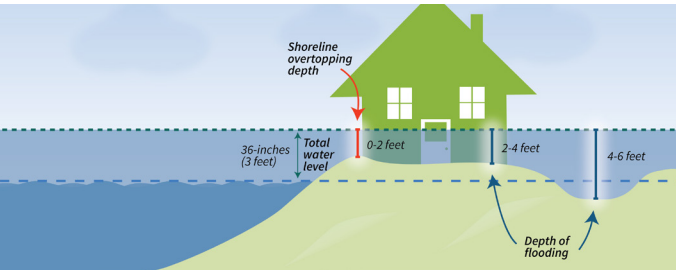

FIGURE 3 | Visual representation of shoreline overtopping presented in the Bay Area Flood Viewer on the "Learn" page. Flooding concepts are explained in this section, including visuals to accompany descriptions and explanations.

"These maps are designed to help all of us build a more resilient Bay shoreline. We hope that all community and neighborhood leaders, schools, and policy makers take advantage of this website's tools to better understand and plan to minimize the risks of flooding where they live, work, and play."

– Zack Wasserman, BCDC Chair

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 depth of flooding and flood extent, 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 sea level rise *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.

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.

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Learn more by visiting the website at **explorer.adaptingtorisingtides.org**

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