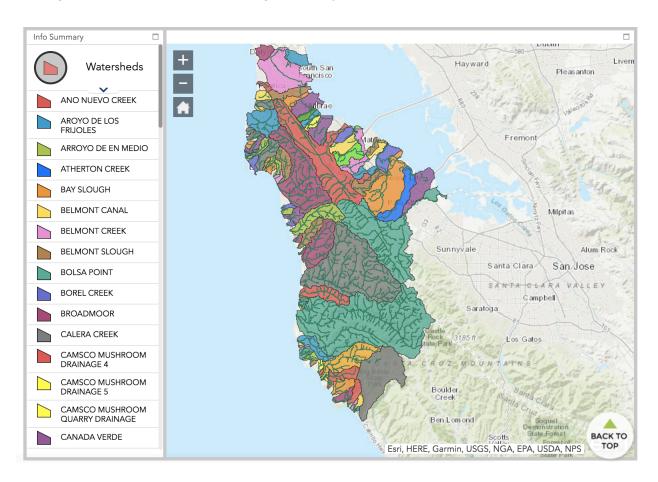
Scenario Three: Stormwater Flooding

Core Problem

San Mateo County contains 34 watersheds (56 with unincorporated), all of which are relatively small and drain into the Pacific Ocean or San Francisco Bay. Historically, floods have regularly affected San Mateo County, with noteworthy flooding about once a year, and flash floods about every 2 years. Climate change will increase the duration and intensity of heavy winter rains and El Niño storms that cause flooding. This flooding impacts school communities most directly with building infrastructure and road blockage, but may also cause other isolated incidents.



Background Information

There are several different types of storm induced floods that can take place within the county:

- Stormwater runoff floods: a result of local drainage issues and high groundwater levels.
- Riverine Floods: overbank flooding of rivers and streams.
- <u>Flash Floods</u>: a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within 6 hours of the causative event (e.g., intense rainfall, dam failure).
- <u>Coastal Floods</u>: characterized by inundation of normally dry land by ocean waters, often
 caused by storm surge associated with severe storms, tsunamis, or extreme high tide
 events that result in shallow flooding of low lying coastal areas.

Heavy rains are the most frequent cause of flooding within San Mateo County jurisdictions, although coastal jurisdictions may also undergo flooding as a result of high winds, high tides,

storm surge, and tsunami events. Average rainfall in the rural regions can range from 30 to 45 inches per year, depending on locality. Its urban areas receive much less rain; for instance, Redwood City averages around 19 inches of rain per year (San Mateo County Sheriff 2015).

Principal flooding sources for San Mateo County include the following streams and waterbodies:

- Colma Creek
- San Bruno Channel
- Crystal Springs Channel
- Lomita Channel
- Belmont Creek
- Holly Street Channel
- San Francisquito Creek
- Montara Creek
- San Vincente Creek
- Denniston Creek
- El Granada Creek
- Woodhams Creek
- La Honda Creek
- Alpine Creek
- San Gregorio Creek
- Pescadero Creek
- Butano Creek

Design Challenge: Adaptation Solutions

Your team has been asked by city engineers to design an infrastructure solution to deal with this increase in storm related floods. Examples of infrastructure solutions for flooding include: water catchment systems, systems, enhanced draining river-floodplain systems, rain gardens. bioswales. permeable pavements. etc. The solution should focused on your school community, but could scale up to other parts of the city or residential neighborhoods.

This will be your first brainstorming session, and you have been asked to brainstorm ideas and then rapid prototype one of the ideas. It is recommended you use your time in the following way:

- Brainstorm Ideas: 5 minutes
- Make 2-3 ideas visible with a drawing: 10 minutes
- Create a 3D prototype: 15 minutes

NEAR TERM MID-LONG TERM Assess risks Build new buildings with sea level Elevate or adapt to critical individual structures for rise in mind, i.e. elevate above flood buildings continued operations in levels and use flood-proof materials and sites at-risk areas. and practices. MID-LONG TERM Develop emergency response Adopt new Reduce flooding through plans, flood monitoring development nature-based solutions, and alert systems, support standards and including vegetated, Community Emergency ordinances for permeable, and tree-covered Response Teams, and prioritize at risk areas. surfaces in neighborhoods, areas and populations with the water detention systems, and least capacity to respond in a creek and habitat restoration. flood or erosion event. NEAR TERM MID-LONG TERM Undate building Develop a plan of action Relocate assets design standards or adaptation strategy to inland and convert and codes to prepare for sea level rise, vulnerable land uses. incorporate flood with near, mid-and longrisk best practices. term strategies. Introduce a barrier or buffer like artificial reefs, wetlands or sea walls between critical infrastructure and the bay or coast. NEAR TERM MID-LONG TERM Work collaboratively Work with neighboring to implement large cities to develop a scale wetland or menu of strategies to regional shoreline protect our County's protection projects. infrastructure and people from future flooding and sea level rise risks.

Resources: EPA: Manage Flood Risk; San Mateo County Hazard Mitigation Plan; SMC Sheriff's Office Resources