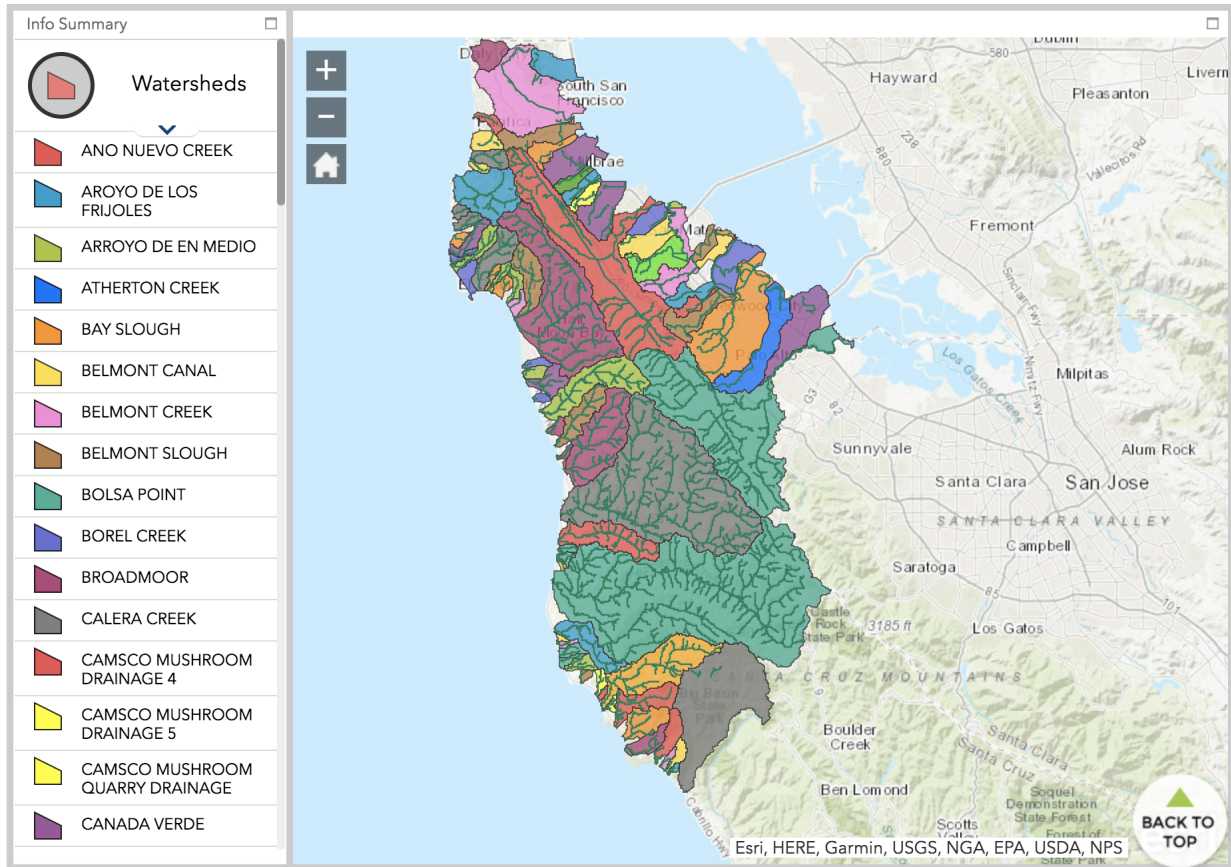


Scenario Three: Stormwater Flooding

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.
- **Flash Floods:** 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).
- **Coastal Floods:** 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 Vicente 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, enhanced draining systems, river-floodplain systems, rain gardens, bioswales, permeable pavements. etc. The solution should be 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

Resources: [EPA: Manage Flood Risk](#); [San Mateo County Hazard Mitigation Plan](#); [SMC Sheriff's Office Resources](#)

