

Improving Monitoring and Forecasting of Precipitation and Coastal Flooding in the San Francisco Bay Area

SF Bay Area AQPI Project Update

Spring 2023

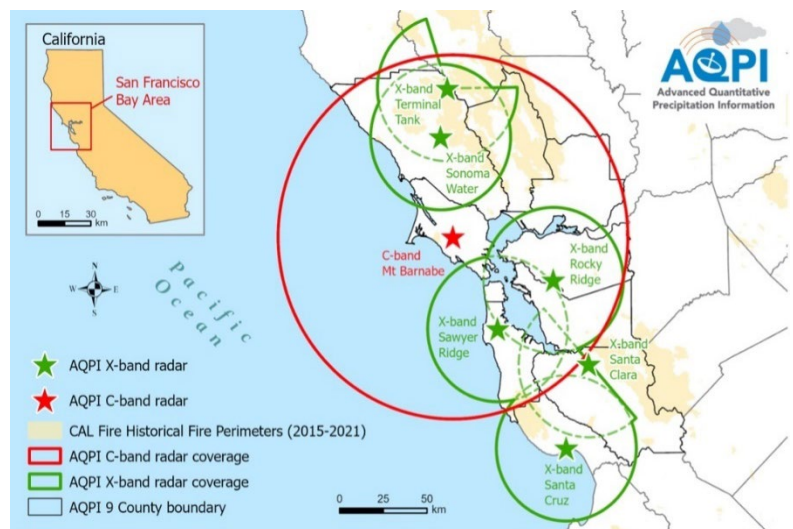
Background

The Advanced Quantitative Precipitation Information (AQPI) system is a regional project that uses enhanced weather radar to track precipitation associated with atmospheric rivers. AQPI was funded in 2016 by a grant from the California Department of Water Resources (DWR) Integrated Regional Water Management Program (IRWM) awarded to Sonoma Water and participating Bay Area agencies. National Oceanic and Atmospheric Administration (NOAA) and Colorado State University’s Cooperative Institute for Research in the Atmosphere (CIARA) are building the AQPI system and delivering the AQPI end-product to these agencies. When completed, the goal of the AQPI system will be to provide X-Band and C-Band weather radar information that will increase the accuracy of weather forecasting and response systems throughout the Bay Area. Improved forecasting will assist flood agencies, emergency responders, wastewater plant managers, reservoir operators, and water managers in responding to extreme weather events in a timely fashion. A Local Partner Agency Committee (LPAC) has formed to develop the SF Bay AQPI framework for regional collaboration. The University of California San Diego, Scripps Institution of Oceanography, Center for Western Weather and Water Extremes (CW3E) is working with the LPAC member agencies to develop an operations plan and transition plan for the AQPI system. CW3E will operate the system when the DWR grant period ends in early 2024.

SF Bay Area AQPI Radar Locations

When completed, the DWR-funded project will have deployed four X-Band radars and one C-Band radar that will cover most watersheds in the Bay Area (Figure A). Two additional X-Band radars funded through other sources will send data to the AQPI system. When the radar deployments are completed, a total of six X-Band radars and one C-Band radar will provide data to the AQPI system.

Figure A. Map of SF Bay Area AQPI X-Band and C-Band radar locations and coverage when deployments are completed.



Timeline for Radar Deployment

As of Winter 2022, four X-Band radars are operational. These radars are located in Sonoma, Santa Clara, Contra Costa, and Santa Cruz Counties. Additional X-Band radars will be deployed in San Mateo and Sonoma County in 2023 and 2024 respectively. The C-Band radar is planned to be located on the Mt. Barnabe in Marin County in 2023. Radar locations include:

- **Sonoma Water** – Operating a temporary X-band radar since 2018, located near the Sonoma County Airport. A permanent X-Band radar was deployed in March 2023 on the same site, the Sonoma Water Treatment Plant.
- **Valley Water** - Since 2016 has operated a temporary X-Band radar at the Penitencia Water Treatment Plant. A permanent X-Band radar was deployed in July 2019 at the same location.

- **San Francisco Public Utilities Commission (SFPUC)** – Plans to deploy a permanent X-Band Radar on Sawyer Ridge in San Mateo County by summer 2023.
- **East Bay Agencies Partnership** – In December 2022, a partnership of East Bay agencies deployed an X-Band radar on Rocky Ridge, adjacent to the Las Trampas Wilderness area. The Rocky Ridge radar will be operational in 2023. This partnership includes East Bay Municipal Utility District, East Bay Dischargers Authority, Contra Costa County Flood Control & Water Conservation District, Alameda County Flood Control & Water Conservation District, Alameda County Water District, and Zone 7 Water Agency.
- **Santa Cruz County Flood Control and Water Conservation District** deployed an X-Band radar on a county building in August 2022, funded through a grant from DWR’s Statewide Flood Emergency Response Grant program. The radar will send data to the SF Bay Area AQPI system.
- **Sonoma Water** received a grant from FEMA’s Hazard Mitigation Grant Program to deploy an X-Band radar at the Geysers Recycled Water Tank site, managed by the City of Santa Rosa. This radar will send data to the SF Bay Area AQPI system.
- **C-Band Radar** - Regional partners are collaborating to deploy a C-Band radar on the peak of Barnabe Mountain in western Marin county. The C-Band radar will cover the Pacific Coast and also areas inland to complement the X-Band radars, improving precipitation and stream flow forecasting throughout the region.

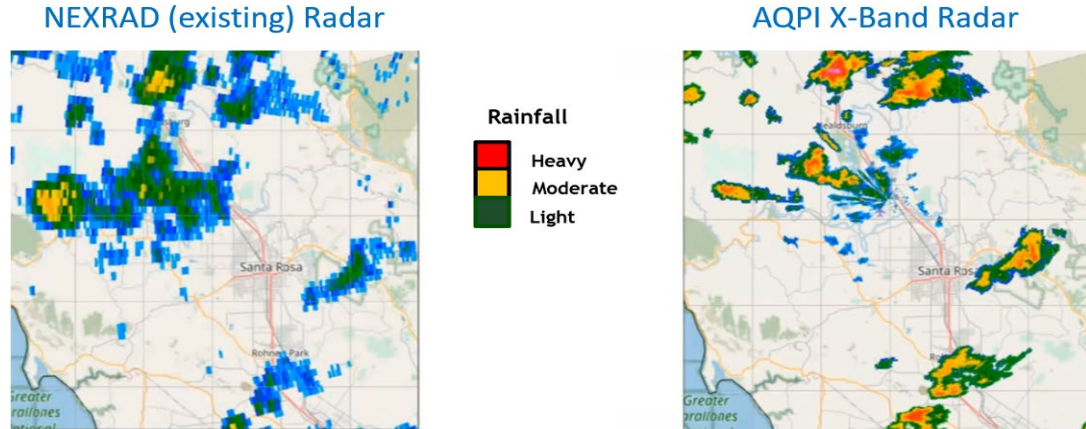
SF Bay Area AQPI Benefits: AQPI Radar Imagery from 2021 Atmospheric River Storm

Flooding is a major concern in the Bay Area. See below in Figure B, where AQPI radar provides a more accurate picture of rainfall in Santa Rosa, to better assess the potential for flooding. Note - Warmest colors represent highest rain volume.

Figure B. NEXRAD vs. AQPI Radar Imagery

Comparison of Radar Imagery

Atmospheric River Rain Event on January 27, 2021 In Sonoma County



FOR MORE INFORMATION:

Dale Roberts, Sonoma Water, Dale.Roberts@scwa.ca.gov

Rob Cifelli, NOAA Earth System Research Laboratory, rob.cifelli@noaa.gov

Watch the radars in action now! [Real-Time Radar Display](#)

NOAA AQPI website: <http://www.esrl.noaa.gov/psd/aqpi/>

Sonoma Water AQPI website: <https://www.sonomawater.org/aqpi/>