Introduction

The Advanced Quantitative Precipitation Information System is a collaboration between federal, state, and local agencies to develop and deliver a state-of-the-art system for improved monitoring, prediction, and alerting of precipitation events in the San Francisco Bay Area to aid water resource managers in their operational response.

Approach

1. Improved Monitoring
   - Leverage existing networks.
   - Fill gaps in existing networks.
   - Added improved monitoring systems.
   - Improve quality checking of observations.

2. Improved Science
   - Improved monitoring used to initialize models.
   - Improvements to models focused on initialization, SF Bay area orography, and types of precipitation events.
   - Tighten coupling atmospheric, watershed, and coastal models.

3. Improved delivery
   - Centralized access to observations and model outputs.
   - Automated alerting based on thresholds set by user.
   - Products tailored to meet water agency requirements and directly feed agency applications.

4. Iterative refinement

First Steps

Monitoring

- Leverage the NWS’ operational MADIS (Meteorological Assimilation Data Ingest System) for the collection, integration, quality control, and delivery of SF-Bay area in situ observation networks.
- Work with local agencies to determine what monitoring networks are missing.
- Start work on adding missing networks to MADIS.

QPE, Nowcast, and Modeling

- Establish AQPI product domains for QPE, nowcast, and model outputs working with model developers, radar system developers, and AQPI water agency users.
- Blue boxes are components of the AQPI system that are built in an operational counter part.
- White boxes are the desired operational components of the AQPI system.

Risk Reduction

- To replace the dashed data flow line with a solid line from the radars to the NCEP MRMS application the AQPI development team and management will be working with MRMS developers at the National Severe Storms Laboratory (NSSL) to show that the radars add value to precipitation products generated by the MRMS system which will little cost to NOAA operations.
- The first step with reducing risk for the Coastal Storm Modeling System (CoSMoS) and the Radar Control and Processor system is to get them working and operationally stable as part of the AQPI system. For CoSMoS this will also require getting all required inputs ingested into the AQPI system and formatted correctly for CoSMoS usage.
- Development of the data, display, monitoring, and alerting services will continue to evolve over the life cycle of this project with continued refinements to the system based on the AQPI spiral development process. We will be working with local NWS Weather Forecast Offices and the California Nevada River Forecast Office to help ensure consistent messaging from the AQPI system and the Forecast Offices.

Possible Operational System Outcomes

We believe that Bay area sponsors should maintain operational control of the radar systems being installed as part of this project and currently any concept of operations between blue sky and mostly cloudy are possible operational scenarios.