Proposal to offset increased costs affecting the RMP/USGS Continuous Monitoring Project

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I. Description of the program and how the data support the RMP

Tides and wind waves are constantly moving water and altering the water quality of San Francisco Bay. The USGS California Water Science Center provides the RMP water quality measurements at the tidal time scale through continuous monitoring of suspended-sediment concentration and dissolved oxygen at multiple locations in the Bay (figure 1). At each station, turbidity and dissolved oxygen sensors are deployed in the water column and automatically collect measurements every 15 minutes. Approximately every 3 weeks technicians visit the stations to clean the sensors, check their calibrations, and download data. Data are processed and edited to remove values that are corrupted by biofouling. Data are available at http://waterdata.usgs.gov/ca/nwis/sw/. Data are analyzed and the resulting reports are available at http://ca.water.usgs.gov/projects/baydelta/publications.html.

Because of concern about potential eutrophication and lack of continuous dissolved oxygen data, we added dissolved oxygen sensors to some of our instruments in 2012. This increased operational costs, mostly for data management. SFEI has contributed $10,000 to USGS to help pay for DO analysis and incurred costs of the installation of SFEI nutrient sensors at Dumbarton Bridge, San Mateo Bridge, and Alviso Slough.

The overarching goal of the RMP is to collect data and communicate information about water quality in the San Francisco Estuary to support management decisions. Specific examples of achieving this goal are given in the *2003 Pulse of the Estuary* and more recent examples include:

- Collection of SSC data showing sudden clearing of Bay waters in 1999 and analyses of the data to identify the cause and expected future trajectory. This led to a paradigm shift in the role of sediment, from being considered a nuisance to being a valued resource. In addition, this finding contributed to concern about increased potential for eutrophication.
- Collection of water discharge and cross-sectional SSC data used to calculate suspended-sediment flux at the Dumbarton Bridge which showed that the annual net direction of sediment and associated contaminant transport was determined by freshwater flow from the Delta into Central Bay in spring. USGS and RMP have prepared a fact sheet on this finding.
- Numerical models of tidal marsh restoration projects, construction projects, contaminant fate, and habitat are calibrated with continuous SSC data provided by this project.
- Responding to information requests from resource managers, we began collecting the first long-term continuous dissolved oxygen data in the Bay in 2012. So far we have found that low dissolved oxygen is common in tidal sloughs adjacent to the Bay but less

common in open Bay waters. We are collaborating with SFEI on a new nutrient continuous monitoring project for the RMP.

II. Consequences of funding short fall

If there is a funding shortfall we must reduce the number of sensors or stations, reduce or eliminate analysis of data, or service instruments much less frequently. These options are not preferred since they would reduce the quantity or quality of data or eliminate our ability to communicate information about the Bay. This project has had level funding since the late 1990s ($250,000 per year directly from the Corps of Engineers). Inflation increases costs, requiring us to either discontinue an observation station or transfer it to another funding stream every few years. The last time this was done was in 2011 when the US Bureau of Reclamation began funding the Mallard Island station because of its significance to Delta sediment studies. In addition to inflation, the addition of dissolved oxygen monitoring in 2012 and the loss of salt pond and some USGS funding for Dumbarton Bridge sediment flux measurements in 2014 have led to the funding shortfall.

III. Funding request

a. Requested amount

We request an additional $60,000 per year. This is roughly the cost to operate one station that must be accessed by boat.

b. Date when funding is needed

January 2015

c. Duration of funding

The requested increase in funding is an adjustment for increased costs due to inflation and adding dissolved oxygen, so the duration is as long as these data continue to be collected.

IV. Options for alternative funding or cost savings

The Interagency Ecological Program is mandated to support continuous monitoring of salinity and temperature in the Bay which takes place at most of the RMP continuous monitoring stations. Thus, RMP and IEP already share the costs of continuous Bay monitoring.

USGS is asking the US Bureau of Reclamation to take over funding the Benicia Bridge station because it is at the seaward boundary of Suisun Bay where endangered delta smelt, which prefer turbid water, reside in summer.

The South Bay Salt Pond Restoration Project is seeking funding to continue collection of SSC, water discharge, and suspended-sediment flux data at the Dumbarton Bridge and Alviso Slough (a non-RMP station that may close October 1, 2014).

As described in the consequences section above, cost savings can be achieved by reducing the number of sensors, closing stations, elimination of data analysis and reporting, or servicing instruments less frequently.

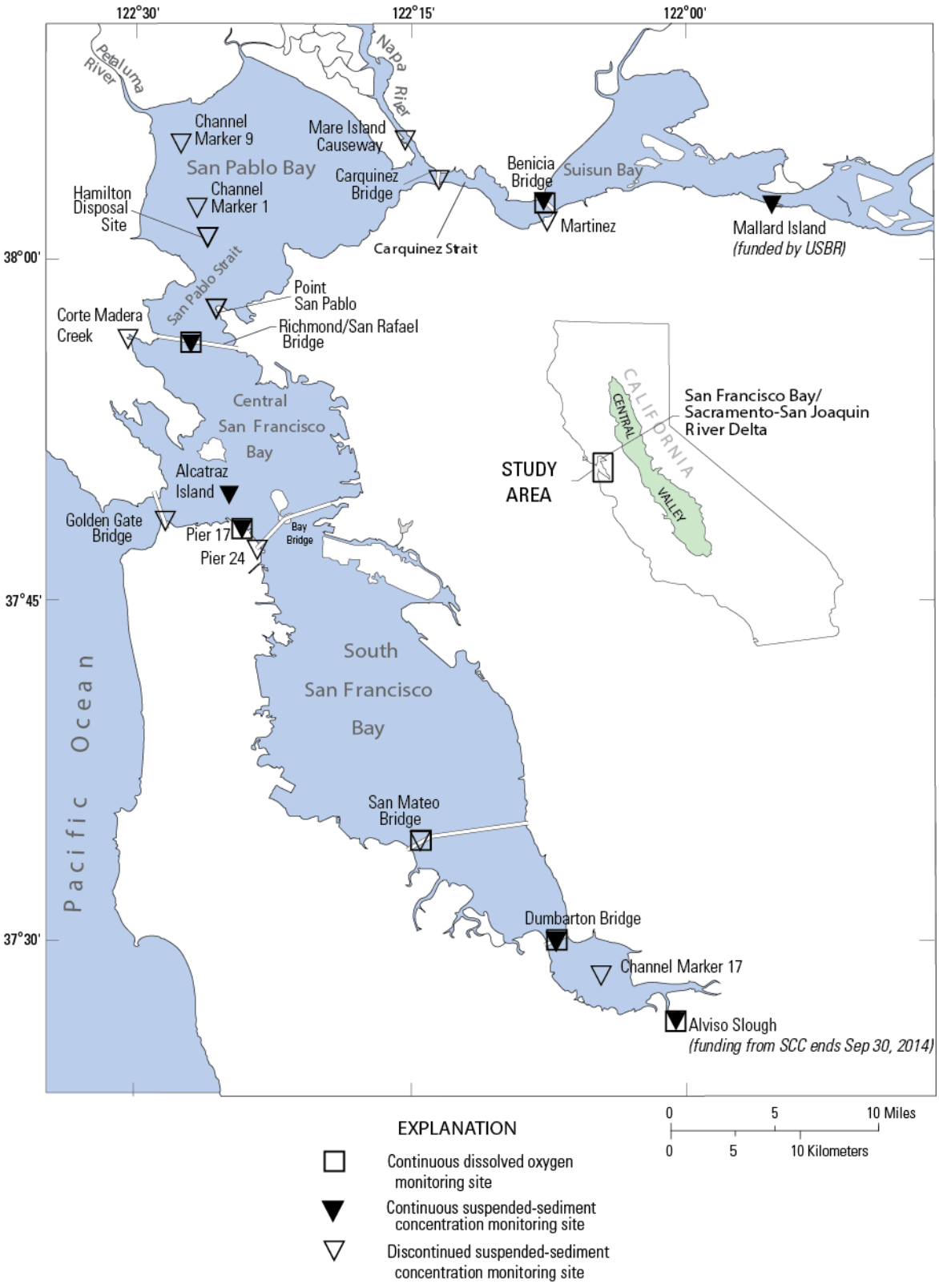

Figure 1. San Francisco Bay study area.