REGIONAL MONITORING PROGRAM FOR WATER QUALITY IN SAN FRANCISCO BAY

sfei.org/rmp

RMP Sediment Workgroup Meeting

March 18, 2021
1:00 pm to 4:00 pm

San Francisco Estuary Institute
4911 Central Avenue, Richmond, CA
REMOTE

Meeting Summary

Attendees

Name	Affiliation
Scott Dusterhoff	SFEI
Sam Shaw	SFEI
Lester McKee	SFEI
Melissa Foley	SFEI
Jeremy Lowe	SFEI
Theresa Fregoso	USGS
Bruce Jaffe	USGS
Sarabeth George	SFBRWQCB
Paul Work	USGS
Carole Foster	Valley Water
Setenay Bozkurt Frucht	SFBRWQCB
Julie Beagle	USACE
Tom Hall	EOA Inc.

Tan Zi	SFEI
Brian Garrity	USACE
Derek Roberts	SFEI
Renee Spenst	Ducks Unlimited
Jessie Lacy	USGS
Aaron Bever	Anchor QEA
Craig Jones	Integral Consulting
Donna Ball	SFEI
Dave Halsing	South Bay Salt Pond Restoration Project
David Schoellhamer	USGS. ret. (technical advisor)
Don Yee	SFEI
Patricia Wiberg	University of Virginia (technical advisor)
Rachel Allen	USGS
Scott Bodensteiner	BPC and Haley & Aldrich
Luisa Valiela	EPA Region 9
David Hart	USGS
Sanda Scoggin	SF Bay Joint Venture
Bridgette DeShields	Integral Consulting (Technical Review Committee Chair)
Karen Thorne	USGS
Michael MacWilliams	Anchor QEA
Tom Mumley	SFBRWQCB (Steering Committee Chair)
Xavier Fernandez	SFBRWQCB
Christina Toms	SFBRWQCB
Judy Nam	Valley Water
Brenda Goeden	BCDC
Cristina Grosso	SFEI

1. Meeting Overview & Introductions

Scott Dusterhoff started the meeting by welcoming workgroup participants, and stated that the goal of the day's meeting was to develop proposal ideas for RMP funding for 2022. These proposals will be presented at the May workgroup meeting. He then reviewed the meeting agenda, which consisted of the following items:

1. Meeting overview and introductions;
2. A presentation by Bruce Jaffe (USGS) on the nearly-finalized Bay bathymetry update study, and a discussion on remaining data gaps and estimated costs for filling them;
3. A breakout group session for workgroup members to discuss their prioritized study areas for 2022 funding;
4. A discussion of breakout group priorities and overall desired directions for 2022 special study proposals; and
5. Wrap-Up: A review of decisions and action items, as well as announcements from workgroup members.

Scott then introduced workgroup members by their affiliations as RMP stakeholders, government agencies, consultants, SFEI staff, and other groups. He then reviewed the goals and purpose of the RMP Sediment Workgroup, and it's mission *to provide technical oversight and stakeholder guidance on RMP studies addressing questions about sediment delivery, sediment transport, dredging, and beneficial reuse of sediment.*

He then presented the workgroup multi-year plan (MYP) for review. The MYP shows work that has been done in the past, and some prioritized funding efforts for the future. He also reminded workgroup members of the recent and ongoing sediment studies funded by the RMP and Supplemental Environmental Projects (SEP):

2020 Special Studies:
- Development of the Sediment Monitoring and Modeling Strategy (SMMS)
- Golden Gate flux modeling study
- Bathymetric Change analysis (year 2)
- Sediment bioaccumulation threshold study

2020 SEP studies:
- Bay Sediment Conceptual Model
- Quantifying flow and sediment flux from selected tributaries
- Suspended sediment settling velocity study, South SF Bay
- Benicia Bridge sediment flux and flocculation study

2021 Special Studies:
- Temporal variability in sediment delivery to a South SF Bay salt marsh
- DMMO San Francisco Bay Floating percentile method update
- DMMO database enhancements

Scott then reminded attendees that the goal of the meeting was to choose projects like those listed above and write proposals for consideration by the workgroup in May, to then be

considered by the Technical Review Committee (TRC) for selection in June, and consideration by the Steering Committee (SC) in July. He reminded the workgroup that completed and published studies can be found at the RMP website:

https://www.sfei.org/programs/sf-bay-regional-monitoring-program

2. Discussion: Bathymetric Data Gaps

Bruce Jaffe then presented updates to the SF Bay bathymetry map. He emphasized this is a first step, and that his presentation consists of a high-level overview of data gaps. He noted that Theresa Fregoso is the main worker behind this effort.

Bruce displayed a digital elevation map (DEM) of the updated bathymetry, with grey areas showing where no data have been collected around the fringes of San Pablo Bay, in large parts of Suisun Bay, and some eastern Central Bay and eastern peninsula margins. The DEM is 1 m resolution and can be found at the following DOI: https://doi.org/10.5066/P9TJTS8M

He then showed a map of different types of bathymetric data gaps in the Bay. Areas with zero coverage were mainly located in Suisun Bay and along the eastern SF peninsula, while northern San Pablo Bay margins had 2010 lidar coverage. Costs associated with filling these data gaps are dependent on water depth (shallower water leads to thinner survey swaths, which requires more boat runs and higher costs), boat speed, and swath overlap. Cost estimates are based on an assumed cost of $8000 per boat day. For total coverage and complete data processing, Bruce Jaffe estimated the following costs for filling SF Bay bathymetric data gaps:

- Suisun Bay: $650K-675K +
- San Pablo Bay: $250K-400K +
- Central Bay: $350k-450K+
- South Bay: $275K-425K +

Bruce then introduced several guiding questions to guide the group decision of whether and where to fund addition bathymetric surveys:

- How will bathymetric data be used?
- Is total coverage needed?
- Does lidar meet our data needs?
- What are high priority areas?
- What are next steps?

Prompted by questions from workgroup members, Bruce Jaffe and Theresa Fregoso made the following clarifications:

- The cost estimates for most spatial data gaps are not directly comparable to the 2015 bathymetric survey because they are in shallower water and would have higher costs associated with equivalent areal coverage. The 2015 survey also did not have 100% coverage -- there was some elevation interpretation between swaths. The amount of coverage would scale directly with the cost of surveying: if filling data gaps required only 50% coverage, for example, then cost would be 50% of the above estimates.
- LiDAR data may not suffice because low slopes in shallow areas make for a high possibility of mismatch between datasets, leading to miscalculations of net storage change on the order of megatons.
- The last complete survey of Suisun bay was in the early 1990s, making it nearly 30 years old.

Further discussion by workgroup members highlighted the importance of filling data gaps in Suisun Bay. Calculations point to a high amount of net erosion from Suisun, but there is no bathymetric data to back up those results. Vegetation corrected lidar for Suisun marshes and other SF Bay marshes have been released by the USGS, and there was much enthusiasm for the possibility of creating a seamless DEM of shallow water bathymetry and baylands. Workgroup members agreed that resolving sediment budgets and transport mechanisms in Suisun Bay in particular is highly desirable due to focus on marsh resilience there.

Overall, it was determined that the costs associated with filling bathymetric data gaps in Suisun were too high for the Sediment Workgroup to sponsor alone. Smaller data gaps can be funded in conjunction with other geographically related projects. There was also a suggestion to collaborate with the WRMP, the Delta Science Program, and Department of Water Resources (DWR) to leverage studies and grants towards filling necessary gaps.

Since the scale of funding bathymetric surveys alone by the Sediment workgroup is too great, it was decided to leave further bathymetric surveys on the SEP list, but entertain the idea of filling smaller, high-leverage data gaps in conjunction with other studies.

3. Discussion: Priorities for 2022 Special Studies

Scott Dusterhoff introduced the next agenda item, which was to get input from workgroup members on special study priorities for 2022 funding. Many priorities are outlined in the newly completed Sediment Monitoring and Modeling Strategy (SMMS) and the Multi-year Plan (MYP). The sediment workgroup is tasked with creating and prioritizing proposals before submitting them to the TRC, with ~70% of available funds likely to be awarded. Studies not funded would go onto the SEP list for potential later funding.

Scott displayed the MYP, which highlighted previously identified priorities for workgroup funding by year. For 2022, the MYP highlights several possible studies and their costs:

- $40,000 for refinement of toxicity reference values
- $75,000 for beneficial sediment reuse placement and planning studies
- $100,000 for monitoring sediment fluxes into the Bay at key tributaries
- $60,000 for monitoring deposition at key locations (already funded through a marsh accretion study by Karen Thorne and Jessie Lacy at USGS)
- $100,000 for modeling of current and future deposition dynamics in the Bay

Priorities detailed in the SMMS consisted of:

- Sediment flux on the shoals and wetlands: modeling changes in suspended sediment flux, modeling changes in sediment delivery for future conditions
    - Tan Zi (SFEI) noted that the Sources, Pathways and Loadings Workgroup (SPLWG) is working on the regional watershed sediment model this year, which could be used as a tool to estimate the future sediment delivered to the Bay.
- Golden Gate Bridge flux: Develop a proxy for estimating long term suspended sediment flux at GG
    - Anchor QEA and the USGS just published reports on sediment flux at the Golden Gate Bridge, which identify additional work to be done
- Whole Bay: developing tools to track pathways, sinks and sources
- Sinks and reservoirs: filling bathymetric data gaps
- Sediment character: improving bed erodibility estimates across the bay
    - Jessie Lacy noted that the USGS has a project measuring bed erodibility in San

Pablo and Grizzly Bays funded by the Priority Ecosystem Program for SF Bay

- Bay water column characteristics:
    - Derek Roberts (SFEI) explained that the NMS is supporting three monitoring stations on the eastern shoal of the South Bay (north of the San Mateo Bridge). Stations include turbidity measurements, and SSC samples are being collected during monthly servicing. There are not yet sufficient samples for a solid turbidity-to-SSC calibration, and these signals don't directly represent fluxes, but they may be of value in guiding thinking about channel-shoal sediment exchange.

- Bay water column: Using satellite imagery to analyze turbidity
- Beneficial Reuse and strategic placement: Julie Beagle (USACE) summarized a new Army Corps study on strategic placement:
    - Pilot study section 1122: Brenda Goeden (BCDC) and the Coastal Conservancy put together a proposal on how to investigate ways to get dredged sediment onto marshes.
    - The USACE made it into a smaller project looking at shallow water placement in nearshore areas next year. It will be used to encourage the Corps to use clean dredged materials in the Bay, and would benefit from leveraging and partnership with other studies.

The workgroup then split into Zoom breakout groups of 5-6 people, facilitated by RMP staff, in order to determine highest priorities for 2022 Special Study funding, based on the suite of potential studies detailed above.

3B. Discussion: Report back on 2022 Special Study Priorities

After 30 minutes of discussion and a 10 minute break, workgroup members reconvened to report back overall priorities for 2022 Special Studies funding.

After all groups reported, several study themes emerged as preferences across the workgroup:

- Modeling sediment transport from the deeper bay axis to bay shallows and marshes
- Predicting sediment delivery to the bay for future conditions
- Continuous suspended sediment monitoring in the shallows to support model calibration and verification
- Bed erodibility estimates across the Bay to support model calibration and verification
- Flux at Golden Gate and between subembayments

The group also discussed potentially supporting the USACE strategic placement study with special study funding. However, it was determined that the RMP funding was very small in comparison to the $2.6M USACE budget. The Workgroup was supportive of funding special studies regarding monitoring and modeling the movement of sediment from the Bay onto marshes, whose findings could be used to answer a range of questions and also help address key knowledge gaps associated with strategic placement. The Workgroup also suggested that the Corps should be open to study input from other expert groups like the RMP, which is not the current dynamic.

4. Discussion: Proposal Logistics and Timing

The workgroup heard input from the two technical advisors, David Schoellhamer and Pat

Wiberg. David Schoellhamer asked if the ongoing study by Karen Thorne and Jessie Lacy would be useful for modeling sediment transport from the Bay axis to shallows. They clarified that data collection is ongoing and won't be available until June 2022 at the earliest, but it would be potentially useful. Dave also pointed out that filling bathymetric data gaps seems like an important topic that could be addressed in some way with studies. Finally, he noted that with regards to the USACE beneficial reuse project, the Corps has to recognize it is in their interest to collect a large amount of data to justify further pilots or disposal programs for the Bay.

Pat Wiberg offered that the modeling efforts that would be most valuable are those that leverage monitoring and extrapolate the results from a single study. There should be an emphasis on monitoring efforts that could inform future models as well.

Some modelers in the workgroup (Michael MacWilliams, Craig Jones) pointed out that for large complex models that would estimate sediment transport from the Bay axis to shallows, there needs to be more data for validation, or results may have non-unique solutions. There is a need for more suspended sediment concentration and grain size distribution data in key areas throughout the Bay.

Lester McKee (SFEI) suggested that workgroup priority special studies should be aimed at collecting more monitoring data for sediment transport modeling validation. Workgroup members largely agreed that more data is necessary to support future modeling. Scott Dusterhoff offered that SFEI staff would follow up with discussions with workgroup members to prioritize monitoring special studies with the aim of supporting future modeling.

Scott reminded workgroup members of the timeline for proposal writing and submission:
Proposal Development Timeline:

- Between now and mid-April, decide upon and develop proposals
- April 15-29, proposals will be reviewed by Scott Dusterhoff, Melissa Foley, and Jay Davis
- April 30 - May 12, Draft proposals will be revised
- May 13, Final proposals are sent to WG members to review before May 20 meeting

5. Wrap up: Review Action Items and Decisions, Announcements

Workgroup members then made announcements on ongoing actions and projects, which are summarized below:

Bruce Jaffe:
PG&E is replacing towers in Lower South Bay (200 towers). One of the next places is pond A18 in the Alviso slough complex. Bruce has been asked if there's interest in a complete survey of that area since it's within that scope of work. PG&E will likely replace footings as well as towers.

Brenda Goeden:
During the 2015 sand mining permitting period, BCDC required funds for studies on sand mining. BCDC has accepted proposals from three different entities that include some members of the SedWG. There are three scopes of work:

1. A literature review and sand budget with focus on tributary as well as Golden Gate sand contributions
2. Using existing sediment cores to assess in-bay sand sources
3. Using modeling to determine how sand mining affects coarse transport through the Golden Gate

Also, Brenda Goeden, Jessie Lacy, and others working on a tech transfer workshop for those interested in the marsh edge and how marshes accrete during sea level rise (NERR funding).

Brian Gerrity:
USACE is embarking on a Regional Dredged Material Management Plan (DMMP). Five charrettes were held last fall. A Program Management Plan will be finalized in the next month. USACE is contracting out for gap analysis. The aim is to get a baseline of the state of the science.

Jessie Lacy:
The Bay-Delta Science Conference (BDSC) is being held Tuesday 4/6 to Friday 4/9. The full program is online. Maureen Downing-Kunz and Jessie Lacy are convening a session on 4/8 from 10-12 pm on sediment. Poster presentations are on 4/6.

Scott Dusterhoff:
SFEI is releasing a report on sediment supply and demand in the Bay for marshes. “Sediment for Survival” will be released Tuesday April 13, and results will be presented at the BDSC conference on Thursday April 8.

6. Adjourn