



RMP

REGIONAL MONITORING
PROGRAM FOR WATER QUALITY
IN SAN FRANCISCO BAY

sfei.org/rmp

RMP Sediment Workgroup Meeting

May 20, 2021

10:00 AM – 3:00 PM

Attendees

Name (Affiliation)
Alex Braud (SFEI)
Brenda Goeden (BCDC)
Brian Gerrity (USACE)
Brian Mulvey (USACE)
Brian Ross (EPA)
Bridgette DeShields (Integral Consulting)
Bruce Jaffe (USGS)
Christina Toms (Water Board)
Craig Jones (Integral Consulting)
Cristina Grosso (SFEI)
Dave Halsing (So. Bay Salt Pond Restoration)
David Hart (USGS)
David Schoellhamer (advisor)
Derek Roberts (SFEI)
Don Yee (SFEI)
Donna Ball (SBSPRP/SFEI)
Jen Siu (EPA R9)
Jeremy Lowe (SFEI)
Jessie Lacy (USGS)
Josh Gravenmier (BPC/Arcadis)
Judy Nam (Valley Water)
Julie Beagle (USACE)
Karen Thorne (USGS)
Lester McKee (SFEI)
Melissa Foley (SFEI)
Michael Connor (BACWA)
Patricia Wiberg (UVA, Advisor)

Paul Work (USGS)
Rachel Allen (USGS)
Renee Spent (DU)
Sam Shaw (SFEI)
Scott Bodensteiner (BPC/Haley & Aldrich)
Scott Dusterhoff (SFEI)
Setenay Bozkurt Frucht (Water Board)
Tan Zi (SFEI)
Theresa Fregoso (USGS)
Thomas Mumley (Water Board)
Xavier Fernandez (Water Board)

Item 1. Introduction and Goals for Today's Meeting

Melissa Foley (SFEI) started the meeting by welcoming the workgroup members and participants, and by giving an indigenous land recognition: she acknowledged that the San Francisco Estuary Institute and most of the stakeholders of the regional monitoring program located throughout the SF Bay reside on the ancestral homeland of many indigenous people, including the Patwin, Coast and Bay Miwok, and the Chochenyo, Karkin, Muwekma, Ramaytush, Tamyen, and Yokuts Ohlone.

She then reviewed the zoom meeting rules and protocols, and introduced workgroup advisors Pat Wiberg and Dave Schoellhamer, and asked attendees to identify themselves as steering committee and technical review committee members, academics, consultants, SFEI staff, RMP stakeholders, and government agency-affiliated. She then reviewed the day's agenda, which was as follows:

1. Introductions and meeting goals	10:00
2. Information: Sed WG meeting #1 recap	10:15
3. Information: Bathymetric change analysis	10:30
4. Information: Workplan	11:00
5. Information: Overview of special study proposals	11:15
Lunch	11:30
6. Discussion: Special study proposals	12:00
7. Decision: Special study prioritization	1:25
8. Report out	2:10
9. Information: Overview of other sediment efforts in the Bay	2:20
10. Wrap up: Review action items and decisions	2:50

Melissa then reviewed the RMP mission and structure for the assembled workgroup. The RMP's mission is to **collect data and communicate information about water quality in San Francisco Bay in support of management decision**. It has a budget of \$4M, which is split between special studies, program management, and status and trends monitoring, with about 1/3 allocated for special studies. For 2022, \$1.1M in budget is allocated directly to funding special studies related to SF Bay water quality and associated management questions.

Melissa stated that the goals of the day's meeting were to discuss and prioritize special study proposals for 2022 funding, as well as review findings from completed SedWG studies. The SedWG has a 2022 special study planning budget of \$375K, with a likely allocation of \$200K after accounting for funding of the second year of a USGS sediment transport and deposition study at Whale's Tail Marsh. For all proposed special studies, SedWG members were also encouraged to identify options to reduce budgets and maximize scientific findings by scaling projects, exploring phasing options, archiving, and leveraging existing efforts and agencies.

Tom Mumley (Water Board, RMP Steering Committee Chair) reminded the group that the SedWG and the priorities being identified are bigger than the RMP, with diverse stakeholders with many

affiliations and interests. Additional funding sources outside of RMP special studies will be needed to investigate SF Bay sediment transport.

Item 2. Information: Review of March 18 Meeting

Scott Dusterhoff (SFEI) then reviewed takeaways from the previous SedWG meeting, held on March 18, 2021. The goals of that meeting were to re-engage SedWG members, as well as decide on proposals to write for the May meeting (current meeting). To guide proposal decisions, SedWG members used the Multi-Year Plan (MYP) and the Sediment Monitoring and Modeling Strategy (SMMS) as guidance to identify specific priority study areas. In the March meeting, SedWG members used these documents to identify further ranking and priorities in breakout room discussions, with the following two guiding questions:

1. What priority studies from the SMMS should be ranked highest for 2022 funding?
2. Are there other studies not listed that should be considered?

After synthesizing discussion summaries from the breakout groups, it became clear that SedWG members overall held interest in pursuing modeling of sediment transport from the Bay axis to the shallows and marshes. It also became clear that there was currently insufficient monitoring data in Bay shallows to successfully calibrate numerical models. The group concluded that 2022 special study proposals should prioritize collecting monitoring data in this transport pathway to inform future modeling priorities.

Item 3. Information: Presentation on 2021 Sediment Workgroup Study

Theresa Fregoso (USGS) presented the results of the SF Bay bathymetric change analysis. She noted that the project continues the story of bathymetric change in the SF Bay. Bathymetry of the Bay has been surveyed in some capacity since the 1850s though the last full-bay survey was in the 1980s. In 2014/2105, the Ocean Protection Council contracted for 93 bathymetric surveys of large portions of the Bay. Forty three additional surveys were completed by six sources from 1999 to 2020 (BCDC, NOAA/Fugro, NOAA/CSUMB, NOS, USACE, USGS). Together, these surveys comprised mostly complete coverage, except for a large portion of Suisun Bay.

Theresa and Bruce Jaffe (USGS) combined and refined these surveys of different densities into a continuous bathymetric surface map. Missing portions include large swaths of Suisun Bay and northern San Pablo Bay. The data release is still awaiting approval but will be available soon.

Bruce Jaffe then detailed the patterns of bathymetric change since the 1980s. Overall, changes throughout the Bay were quite complex. There were some places with more than 10 m of positive and negative bed elevation change. There was a net loss in San Pablo Bay and in the portion of Suisun Bay that was surveyed. Overall loss in the North Bay is likely due to ongoing correction from high deposition in the late 19th century due to hydraulic mining. The Central Bay had a net gain of sediment, but there have been areas of acute loss and acute gain within that portion. This will likely require an evaluation of possible errors. The South Bay is similar to before, but with a net loss of 10 million cubic meters. Overall, the Bay experienced a net loss overall of 50 M cubic meters from the 1980s. This was less than expected, and is a lower rate of loss than that which was calculated from the 1950s to the 1980s.

Next steps include a thorough error analysis, an assessment of the volumes and patterns of spatial bathymetric change to infer causes of change, and publishing the results in a USGS Open-File Report (draft in June, publication in the fall).

Theresa and Bruce then took questions from SedWG members. Jessie Lacy (USGS) asked how the mass bathymetric loss compares to gains in accretion. Bruce stated that bathymetric loss is an order of magnitude greater than the gain from accretion on marshes and deposition in breached salt ponds.

After a question from Rachel Allen (USGS), Bruce Jaffe clarified that areas with over 30 cm gain are mostly at the margins of Bay axis channels where lateral migration makes for high local change but little difference in the overall sediment budget.

Christina Toms commented that it is interesting that the western portion of San Pablo Bay appears to have accreted while much of the shoreline itself has been retreating. She also wondered how much of the lowering of tidal flats is due to erosion versus tectonic subsidence. Bruce replied that it is likely primarily erosion, since most subsidence happens during earthquakes.

Dave Halsing (SBSPRP) noted that net accretion on the mudflats and channels of the far South Bay/overall South Bay is in addition to several successful marsh restoration areas (former salt ponds A6, A17, A21, A20, A19) that have been meaningful sediment sinks on their own. Those areas don't appear to be on these figures.

Dave Schoellhamer noted that the Benicia Bridge and Mallard Island flux data show that Suisun Bay usually is depositional except during really big flow years, when it erodes a lot. Timing of surveys may affect results, especially if they occur after big flows.

Item 4. Information: Overview of Sediment Monitoring and Modeling Work Plan

Melissa noted that this proposed work plan will not be considered as a special study for purposes of funding prioritization, but rather as a strategy that is necessary to the ongoing functioning of the workgroup. SFEI staff requested feedback if anyone has major issues and does not support this work.

Scott Dusterhoff briefly presented a proposed funded work plan to guide monitoring and modeling efforts. He stated that while the SedWG has the SMMS, a work plan is needed to guide our work. The SedWG has an interest in flux from Bay axis/pool to the marshes, and the SMMS addresses the general data needs, but not the specifics of where or how studies should be conducted. To do so, appropriate models, calibrations data, and study areas need to be identified.

The proposed work plan would be a coupled modeling/monitoring plan that centers around three marsh locations that focuses on: 1. monitoring sediment flux through channels and across the marsh edge, 2. monitoring flux from the contributing watersheds, 3. monitoring flux from the bay axis to shallows adjacent to marsh, and 4. modeling sediment flux from the Bay to the margins using monitoring data for calibration.

Development of the work plan will involve SedWG members. Meetings will be held in early 2022. Coordination with the WRMP will be essential. A draft work plan would be ready for use by the May 2022 WG meeting. The overall budget for this effort would be \$10,000

Item 5. Information: Overview of Special Study Proposals

Scott presented an overview of considerations for proposals for 2022 special studies funding. He reminded the workgroup that the planning budget for special studies is \$375K, but workgroup available funds will likely be closer to \$260K, with \$60K already devoted to year 2 of Whales Tail study, leaving \$200K. For all proposals, Sed WG members need to identify options for scaling, phasing, and leveraging.

Dave Helsing mentioned that there are a number of different studies and ways for the South Bay Salt Pond Restoration Project to possibly help leverage studies.

LUNCH

Item 6. Information: Presentations of 2022 Special Study and SEP Proposals

Workgroup members with special study proposals then presented their project ideas, including r expected outcomes, deliverables, and budgets:

Proposal 1: Upload Data to Dredged Material Management Office (DMMO) database - Cristina Grosso (SFEI)

Cristina Grosso (SFEI) presented her proposal for funding to upload backlogged sediment testing results to the DMMO database.

The DMMO database is an integral data source for beneficial reuse of sediment, and there is a current backlog of reports in pdf format that were submitted before SFEI took over management of the database in 2018 and required spreadsheet formats for sediment testing data. The pdf data is not available currently for data synthesis or studies. Due to a limited budget, focus has centered on uploading data in templates, leaving a backlog of ~80 datasets.

Relevant Sed WG management questions for this proposal are:

- Question 1: What are acceptable levels of chemicals in sediment for placement in the Bay, baylands, or restoration projects?
 - Application to question: Use of the DMMO database to explore options for updating the draft beneficial use sediment screening guidelines.
- Question 2: Are there effects on fish, benthic species, and submerged habitats from dredging or placement of sediment?
 - Application to question: Review DMMO toxicity data to help inform appropriate management thresholds for dredge sediment placement and disposal.

The proposed project consists of three tasks:

Task 1: Prioritize list of datasets to upload (\$1,357)

Task 2: Transcribe and upload backlogged datasets (\$36,718)

Task 3: Make testing results accessible on DMMO website (\$1,925)

Total proposed budget: \$40,000

The floor was then opened up for questions and comments.

Brenda Goeden (BCDC) said that as part of the LTMS management team and the DMMO, she could confirm that these data are very valuable.

Paul Work (USGS) asked what is involved in the transcribing and if extraction could be automated. Cristina clarified that unfortunately pdf reports were not in a standard format, and so couldn't be automated. Jen Siu (EPA R9) confirmed that all future data inputs will be automated. Cristina also noted that currently data are lacking regarding the PCB threshold analysis that SFEI is conducting now. The intent of that analysis is to determine whether further PCB testing is required by dredgers, or if testing can be reduced.

Rachel Allen asked if this project is pertinent to multiple agencies. Are other agencies able to pitch in? Brenda Goeden responded that these data are used by BCDC, USACE, Waterboard, and EPA, but there are no additional funds available from these agencies. The funding in the RMP comes from the dredger fees.

Lester Mckee (SFEI) asked if there are grain size data in the database, and if consumers of that data weighed in on how to make sure it's usable for modeling in the future. Cristina answered that there are grain size measurements, but modelers have not seen if it's in a useful format.

Tom Mumley said that he questioned the need for this proposal. He asked what would be the consequences if this didn't happen? Brenda Goeden answered that the SedWG and managers would fall farther behind. Every year the dredging community provides previous data for reference. The main loss would be not knowing the geographic sources of contaminants in sediment like PCBs, and if their content is changing.

Renee Spent (Ducks Unlimited) wondered whether this database would also be useful for forecasting dredging locations, frequencies, amounts, etc. Brenda clarified that the database is focused on sediment physical and chemical characteristics, as well as results of bioassays, and bioaccumulation results. However, a query could be built that can help with that. If this doesn't get funded, we can look at frequency of dredging fairly easily through other means.

Proposal 2: Watershed Sediment Loads in the Whale's Tail Marsh - Lester McKee (SFEI)

Lester McKee presented a proposal to monitor watershed sediment loads into Whale's Tail Marsh from Old Alameda Creek (OAC):

Motivation for this project lies in the unknown sediment supply to marshes, and what it's contribution is to accretion in keeping pace with sea level rise (SLR). An unknown amount of sediment is supplied from adjacent watersheds and tributaries to marsh plains.

This project would pair with the current Whale's Tail study led by Karen Thorne and Jessie Lacy (both USGS), which explores sediment delivery to the marsh from the Bay. The supply from adjacent watersheds is not tracked.

Objectives of this study are:

- To provide watershed sediment supply data to directly compare with supply to the marsh from the Bay.
- To help constrain source/sink mass balances for the Lacy/ Thorne marsh accretion study (along with bathymetric change data and the water column SSC data [Derek Roberts proposal])
- Improve interpretation of water column SSC Bay data by helping to differentiate when water-column SSC is likely to be watershed vs. benthic sourced

Methods for the proposed study consist of:

- Selection of field site

- Installation auto samplers
- Field velocity measurements during storms
- Lab analysis of suspended sediment concentrations (SSC) and grain size distributions
- QA/QC using established RMP protocols for discrete and continuous data collection

Products of this study would be:

- A short technical report describing field and lab methods, basic results, and comparisons to existing model estimates
- A presentation of results to the SedWG

Total budget is **\$53,510**

The floor was then opened for questions and comments.

Paul Work asked how long the monitoring would last, and if the watershed would be monitored for discharge for a longer term perspective. Lester replied that monitoring would last just one wet season, aligning with work at Whale's Tail marsh. There is not a current flow monitoring gauge in this watershed but there may be interest by the Alameda County Flood Control Water Conservation District (ACFCWCD) and a possibility of continuing the study for additional years or match funds for one year. However, this is speculative at this time since RMP staff have not recently spoken to ACFCWCD about this possibility.

Dave Schoellhamer observed that with one year of overlap with USGS study, if it's a drought year, measured sediment flux would be near zero. He asked if Karen Thorne and Jessie Lacy could clarify how they will use these measurements. Jessie clarified that winter data collection will start in December 2021 through the wet season (proposed field equipment will be deployed in Oct. 2021). Discharge in Old Alameda Creek is low compared to Alameda Creek, so it is unclear how it will be utilized directly. The Old Alameda Creek is an indirect but near-field input to Whale's Tail.

Lester emphasized that most tributaries are not a direct input to one marsh but a near-field feed to several. Old Alameda Creek is a pulsed flow into the bay vs the larger Alameda Creek watershed which is a more attenuated flow, which could allow for more temporal resolution on direct watershed contributions to the marsh.

Dave Halsing added that Old Alameda Creek bisects the north and south Whale Tail "flukes." The Alameda Creek Flood Control Channel is some distance to the south. The OAC watershed is much smaller, but it would be very helpful to know about sediment supply to northern and southern Eden Landing from either or both of those watersheds.

Christina Toms (Water Board) noted that the WRMP TAC hasn't identified Whale's Tail as a site to prioritize the study of watershed-derived sediment. Those sites are Brown's Island, Fagan Marsh/Older Coon Island, Heerdt Marsh, Wildcat Creek Marsh, and Older Warm Springs Marsh. Though that doesn't mean these data would not be useful.

Donna Ball (SFEI/SBSPRP) added that these studies would still be really beneficial for the WRMP. Eden Landing has restoration plans in 2022/2023, and this would be very helpful.

After Tom Mumley asked him to characterize the watershed more, Lester summarized that the RMP has already funded a sediment model, and if we trust it then we can already estimate a sediment load into that area. This would offer a calibration locally to that model. There is plenty of upper watershed sediment supply from this watershed and therefore the watershed is likely to have quite a high load per unit area, and it's flashy on the timescale of a tide (~7 hours).

Proposal 3: Continuous SSC Monitoring in South and Lower South San Francisco Bay - Derek Roberts (SFEI)

Derek Roberts (SFEI) presented his proposal on expanding SSC monitoring in the South Bay by leveraging efforts in the Nutrient Management Strategy (NMS) in order to expand datasets for future modeling:

The motivation for this study is that continuous water column SSC measurements are essential for sediment transport model validation, characterization of background conditions for empirical sediment studies, and characterization of light attenuation for biogeochemical studies. Continuous SSC datasets are sparse in the South and Lower South Bay, with one USGS station at the Dumbarton Bridge.

The Nutrient Management Strategy (NMS) is currently operating an array of 7 stations measuring continuous turbidity throughout the South and Lower South Bay, which could be calibrated to SSC. Derek proposed three different options to expand continuous SSC monitoring in the area:

Proposal Item #1:

Expand SSC sampling to 3 additional NMS stations, and calibrate turbidity-SSC relationships at 7 NMS stations.

Proposal Item #2:

Add two more SSC/turbidity stations, likely at the eastern South Bay between the Dumbarton and San Mateo bridges

Optional Item #3

Include wave height and period at two shoal stations, using bursting wave pressure sensors.

Project outputs would include the expansion of continuous SSC time series data from one station to 10, with a report detailing the turbidity to SSC relationships across all stations, and a continuous updating platform of SSC datasets and relationships.

This study would span 2 years, since at least 2 years of SSC sampling would be necessary to accurately calibrate turbidity-SSC relationships for monitoring stations. With initial setup and equipment costs, the first year would cost \$46-55K across the three proposal options, and the second would cost \$27-30K across the three options. These costs would not include additional field/boat days (covered by NMS), and would include new turbidity sensors at only two sites.

The floor was then opened up for questions and comments.

Paul Work (USGS) noted that grain size analysis may be very useful to add in order to calibrate models. Rachel Allen noted however that measuring particle size distribution (PSD) for collected SSC samples is most useful when conducted alongside in-situ particle size distributions (like LISST data). A lot of the sediment in the shallows is flocculated, which wouldn't be captured by lab-measured PSDs.

Paul Work noted that USGS requires 3 years of SSC data (or roughly 30 samples) in order to publish SSC-turbidity relations and derived SSC time series, with some deviation if enough variability in conditions is captured in a shorter amount of time.

Dave Schoellhamer noted that some of the stations located near each other could be “clustered” for SSC-turbidity calibration, and also asked if this study could be timed to collect data near the ongoing Whale’s Tail study area. Derek replied that a station could be set up before the end of 2021 if funding came in early.

Proposal 4: Temporal Variability in Sediment Delivery to a Central Bay Marsh - Karen Thorne (USGS) and Jessie Lacy (USGS)

Karen Thorne and Jessie Lacy presented their proposal on a one-year study at two marsh sites to measure SSC in the intertidal and subtidal shallows adjacent to the marsh, and monthly marsh sediment accretion over the course of a full year, with variation across vegetation density and type. This study differs from the ongoing Whale’s Tail study in its greater spatial coverage (two sites instead of one), longer data collection (full year rather than seasonal), and lower spatial and temporal resolution (fewer SSC sampling locations and accretion measured monthly).

Marsh sites will be selected to capture a range of environmental factors, such as subembayment location, wave exposure and wind direction, and proximity to tributary sediment inputs. Each marsh would be sampled monthly for sediment accretion on sediment tiles across four 30-60 m transects stratified by elevation and vegetation type. Sediment would be analyzed for mineral mass and organic matter and bulk density.

Vegetation would be surveyed and characterized across sediment deposition transects for dominant plant species, density, and elevation. SSC data would be collected continuously over the year, and downloaded and maintained every 60 days. Intertidal SSC stations would also monitor water level and wave height and period. Subtidal SSC stations would monitor water level, tidal currents, and wave height, period, and velocity. Both stations would be sampled for grain size distribution and bulk density of local bed sediments.

The two proposed sites for the study are a NWR marsh in San Pablo Bay, and Corte Madera marsh in the Central Bay. The two sites have different histories, geometries, wind/wave exposure, and tributary sediment inputs. Between the two, the study aims to address the following questions:

- How is marsh deposition related to SSC in the shallows?
- What is the best measure of shallows SSC for predicting deposition (average, high tide, ...)?
- How is SSC in the subtidal shallows related to the closest channel SSC monitoring station?
- Is this relationship the same across the estuary?
- How does mineral deposition on the marsh surface vary by a) distance from sediment source, b) vegetation composition characteristics, and c) % time inundated (elevation)?
- How do wave energy, local watershed discharge, Delta outflow, and vegetation density influence these relationships?

Deliverables from this study would include a data release from each of Karen and Jessie’s research groups in September 2023, a draft report by the end of 2023, and presentations to the SedWG and the Bay Delta Science Conference or State of the Estuary Conference in 2023.

The total budget for this proposed project is \$235K for the full 12-month study, or \$188K for 9 months, and \$133K for 6 months.

The floor was then opened up for questions and comments.

Paul Work asked if Karen and Jessie had considered using one of the process-based models for the Bay to pick the sites to be monitored, and then make a predictive relationship to test.

Jessie replied that there is no baywide model that includes the marshes -- this is a task that still needs to happen. Karen reminded the workgroup that this is a goal of the proposed workplan (see above) -- to come up with the best modeling approach to use this type of data.

Dave Schoellhamer noted that the data collection would last one year or less, and asked if there would be enough resolution on the marsh tiles to get good sedimentation data. Karen replied that they would sample monthly. In a previous study, they were able to measure deposition over the course of the year.

Brenda Goeden noted that this study can be directly influential on management activities to inform the need for additional placed sediment. Corde Madera marsh, in particular, could be informed in real time.

SEP Proposal: Estimation of Future Sediment Loading from Local Tributaries - Tan Zi (SFEI)

Tan Zi (SFEI) presented a proposal to be considered for approved inclusion on the Special Environmental Projects (SEP) list, rather than the 2022 Special Studies list.

This study is a proposed update to SF Bay tributary sediment supply models to account for predicted changes in rainfall intensity and soil erosion with climate change. It's necessary to estimate the supply from tributaries, to determine the amount of sediment available to deposit on marshes to keep pace with rising sea levels. Highest soil losses were obtained in a few high-intensity rainfall events, and quantifying the predicted future increase in these events will help determine appropriate sediment rating curves and supply.

This modeling efforts would combine downscaled rainfall prediction from four different global climate models (GCM) with the Bay regional watershed model (Zi et al., 2021, in progress) to predict sediment loading at the event scale for Bay tributaries.

This effort would yield a report on tributary sediment loads across 237 Bay subwatersheds for four different climate scenarios over two timescales: mid-Century (2040-2059) and end-Century (2070-2099).

This project would last one year and has a proposed budget of \$70K.

The floor was then opened up for questions and comments.

Christina Toms noted that the California Air Resources Board (CARB) group is planning a GCM downscaling study to get a better sense of carbon and nitrogen in runoff in a dozen select watersheds. It could be worthwhile talking to that team to see if this overlaps.

Tom Mumley requested more resolution on the \$70k budget before submittal to the SEP list.

Item 7. CLOSED SESSION

Decision: Ranking of 2022 Special Studies Proposal

Project proposal writers were then sent to a waiting room while SedWG voting members deliberated ranking and modifying the proposed projects. Bridgette DeShields (Integral Consulting, RMP Technical Review Committee Chair) led the discussion.

First, an anonymous poll was held for Sed WG voting members to rank their top two studies. Results yielded studies in this order of priority:

- 1. Sediment delivery to Central and North Bay Marshes (Thorne & Lacy, USGS)**
- 2. Continuous SSC monitoring in South Bay (Roberts, SFEI)**
- 3. DMMO data upload (Grosso, SFEI) TIED FOR THIRD**
- 4. Watershed sediment loads to Whale's Tail at Old Alameda Creek (McKee, SFEI) TIED FOR THIRD**

Workgroup members acknowledged that funding both the highest ranked studies may not be tenable with the proposed budgets, and that reductions in each project's budget may have to be entertained. These may include reducing the frequency of sampling sediment tiles in the marsh accretion study, while maintaining the 12-month sampling length, or possibly reducing the number of sites from two to one. Both projects would benefit from input from modelers.

Members of the South Bay Salt Ponds Restoration Project said they may be able to leverage funds from their sources to augment these two projects, since they have overlapping interests. Julie Beagle (USACE) also noted that USACE has been pursuing a monitoring partnership with Karen and Jessie that could support their work at Whale's Tail and other marshes, which may be able to support their proposed study.

Brian Ross expressed disappointment about how the value of the DMMO work was portrayed. These data need to be uploaded to inform studies. This is one of the things that most directly benefits dredgers who pay into the RMP. The PCB study would directly change and affect ongoing regulation. He suggested that the group needs a more systematic approach in talking about all of these equally. Brian suggested the budget could be modified to a lower level of funding to make progress. Even \$10,000 would be hugely beneficial.

A few WG members agreed that discussion on proposals during the open and closed sessions should be more consistent between proposals in the future, and that the DMMO data upload proposal was not given equal measure of consideration in the open session. As a result, two members of the workgroup did not agree with the final ranking of the proposals, but would allow the ranking to stand with the recognition that the DMMO database updates provide value to the dredging community and that there be future consistency in proposal consideration.

Item 8. Report Out of Proposal Idea Ranking and Recommendations to Principal Investigators

The full workgroup including project proposers reconvened, and voting results and next steps were reported out.

Proposals from Thorne/Lacy and Roberts were prioritized. For the former, budget refinement will be necessary before the Technical Review Committee voting in July. For the latter, consultation with modelers will be key to determining monitoring station locations. Grain size distributions would be beneficial, and wave sensors are a lower priority. DMMO data uploads are not prioritized, but a modified budget could get support later on.

Item 9. Information: Overview of Bay Sediment Efforts - Brenda Goeden, Brain Gerrity, Sam Shaw

Three WG members presented updates from ongoing studies related to sediment processes in the Bay.

1. Sand Budget and Transport Studies - Brenda Goeden (BCDC)

Brenda Goeden presented on ongoing and incipient studies on Sand transport and budget studies in the Bay:

Approximately 426 million cubic yards of sand are permitted to be mined from the Bay annually, though that number has been exceeded in the past, specifically in the late 1990s and early 2000s. As-needed mining has matched construction demand and by association, economic trends. Current mining locations are in Suisun and Central Bay lease areas, with specific areas extensively mined within leases, while others remain largely undisturbed.

To track and predict the effects of sand mining on Bay bathymetry and sediment budgets, sand transport studies have been commissioned, and a sand science technical advisory committee has been convened, as well as an independent science panel. Management questions prioritized by these groups are:

1. Is sand mining at existing lease areas, at permitted levels, having a measurable or demonstrable impact on sediment transport and supply within San Francisco Bay or the outer Coast?
2. What are the anticipated physical effects of sand mining at permitted levels on sand transport and supply to San Francisco Bay and the outer coast?

Three scopes of work were determined to address these management questions, and project leads were selected after a RFQ:

1. Literature review and sand budget – SFEI, Deltares, USGS
2. Stratigraphy (volume, layers and depth of sand) – University of Texas at Austin, USGS
3. Sand Transport Modeling – Anchor QEA

All of these studies are underway.

2. Regional Dredge Material Management Plan - Brian Gerrity (USACE)

Brian Gerrity then presented the recently-initiated Regional Dredge Material Management Plan (DMMP):

The USACE's mission is to maintain safe navigation in the Bay, which requires the movement and disposal of 2.5 million cubic yards of dredged sediment a year. There is an acute sediment deficit in the Bay for deposition on marshes, and the DMMP is an effort to identify specific measures necessary to manage this dredged sediment over the next 20 years.

The DMMP was previously worked on from 2004-2010, and this effort is restarting from that time. This effort is seeking input and involvement from several non-federal interests, and five charrettes were hosted last year. The latest draft on stakeholder comments was just completed.

The DMMP effort is currently in the phase of a sediment reuse knowledge gaps analysis. The USACE is partnering with SFEI to identify knowledge gaps with respect to dredged sediment management, to ultimately guide studies on sediment transport, strategic placement, and beneficial reuse. An internal draft will be completed by the end of July and presented to an interagency workgroup in October 2021.

3. Bay Sediment Conceptual Model SEP - Sam Shaw (SFEI)

Sam Shaw updated the workgroup on progress on the Bay Sediment Conceptual Model, an SEP-funded project to guide sediment management and studies for various end users.

The Conceptual Model is a 1-year project, with a final product in the form of a technical report. It will consist of nested conceptual models, reflecting different geographical and temporal scales of interest to managers, stakeholders, and researchers. The temporal scales consist of current and predicted future conditions, transport processes, and magnitudes of sediment flux. Geographical scales focus on a Bay-wide scale and a upland-marsh-shallows scale. The conceptual model will highlight known processes and fluxes, but also highlight important data gaps within sediment transport pathways.

Visual conceptual sediment transport models will be paired with a narrative highlighting relevant studies and knowledge, as well as previously mentioned data gaps and uncertainties. Drafts of each of these model scales have been completed, and a synthesis of literature and knowledge gaps into a narrative form is underway.

Next steps include a continued literature review and consultation with an expert subgroup composed of select SedWG members.

Item 10. Wrap Up: Review Action Items and Decisions

Scott and Melissa then thanked the assembled workgroup, confirmed that they would follow up with proposal leads, and ended the meeting.