Flood Control 2.0 (Sediment Reuse Study)
and
Floodplain Infrastructure Mapping
Progress Update

BAFPAA Annual Conference
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San Francisco Estuary Institute

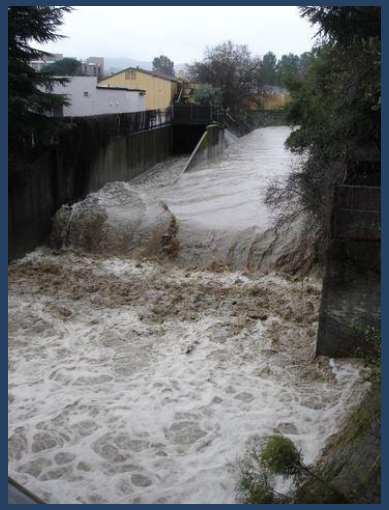
Presentation Outline

- **Flood Control 2.0**
  - **Project** overview and progress on sediment portions
- **Floodplain Infrastructure Mapping**
  - **Project** overview and progress
- Ideas for focusing data collation and synthesis efforts
- Next steps for BAFPAA participation
- Q&A

FLOOD CONTROL 2.0:

Rebuilding Habitat and Shoreline Resilience through a New Generation of Flood Control Channel Design and Management

= Channel Redesign + Sediment Reuse



San Francisquito Creek

Novato Creek

Walnut Creek

Why are we doing it?

Flood control channels at the Bay interface:
A unique challenge and opportunity

Increasingly high economic costs and risk

- Maintenance dredging
- Flood protection
- Aging infrastructure
- Complex infrastructure setting

Significance to Bay ecosystem

- High ecological diversity and complexity
- Weak link for steelhead migration and rearing
- Delivery of sediment to tidal marshes and Bay
- Delivery of freshwater and nutrients

21st Century Drivers

- Increasing challenges with SLR and regulatory context
- Current designs often date from 50-100 years ago
- Increasing value of sediment

→ How can we make our flood control channels function better at Bay interface? *(both economically and ecologically)*

- Need to advance the science
- Need to facilitate restoration process regionally
- Need to negotiate regulatory processes efficiently
- Need to share lessons and approaches regionally

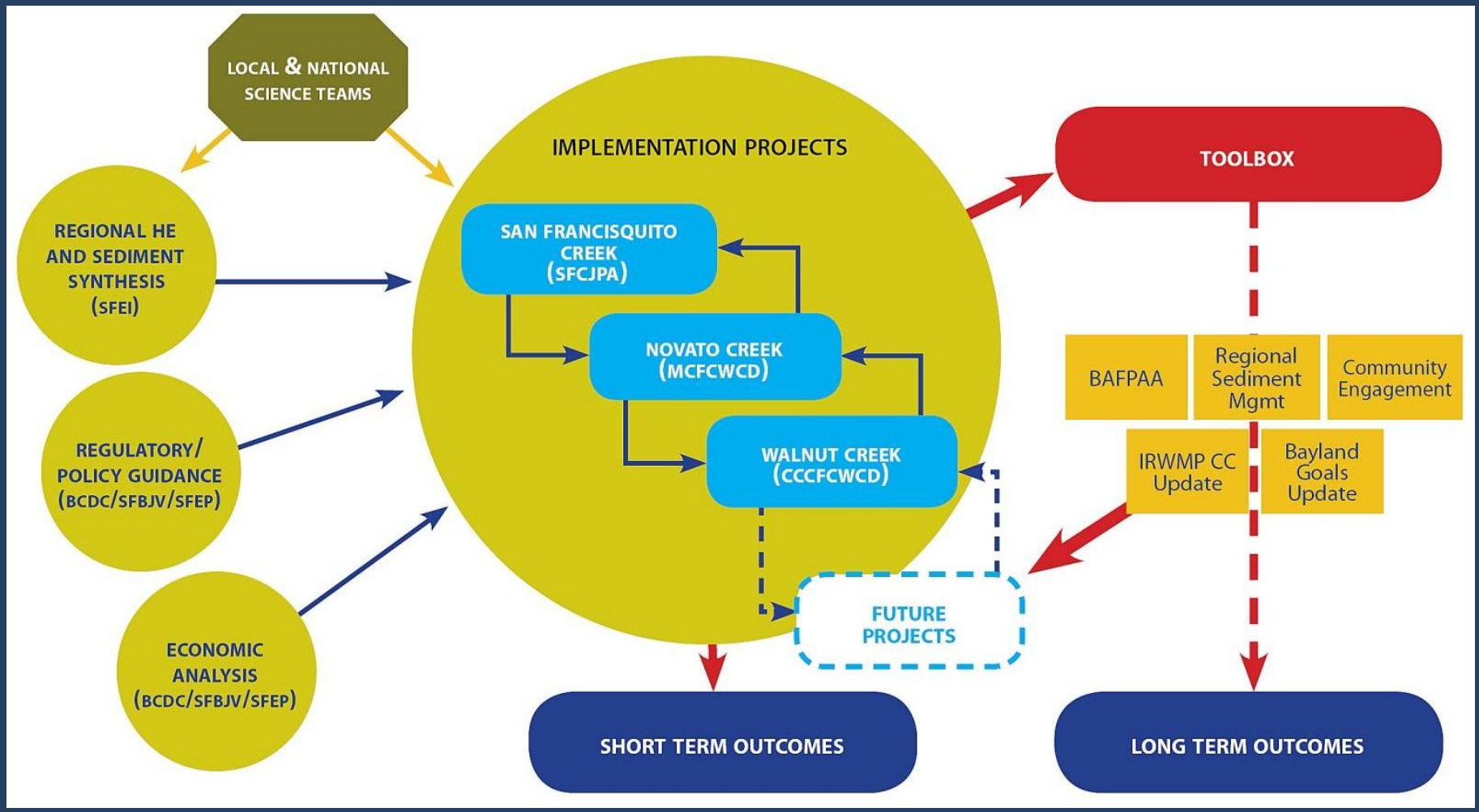
Who is involved?

Partnership

- EPA Water Quality Improvement Fund grant
- Project team
  - SFEP (grant recipient), SFEI, BCDC, SFBJV, SFCJPA, MCFCWCD, CCCFCWCD
- Project regional partner
  - BAFPAA
- Project science oversight
  - Local and national technical experts
- Project regulatory context
  - RWQCB, USACE?, NMFS? CDFG?

Project Structure

- 4 year project, $3 million (½ grant, ½ match)



What are our endpoints?

Project Outputs

- Regional classification scheme and conceptual models for FC 2.0 redesign and sediment re-use,
- Connection to experts on issues and challenges of multi-partner, multi-benefit projects (minimize risks-identify solutions),
- Regional economic analysis of incentives for FC2.0 approaches,
- Planning and regulatory guidance blueprint based on a regional scale analysis of laws and policies,
- Documentation of lessons from three demonstration projects,
- Development and maintenance of a “Sediment website”, match those with technical information & sediment with those in need.

How will we get there?

3 Major Components

1. **Technical Tools**
   - Historical ecology synthesis
   - Coarse sediment synthesis

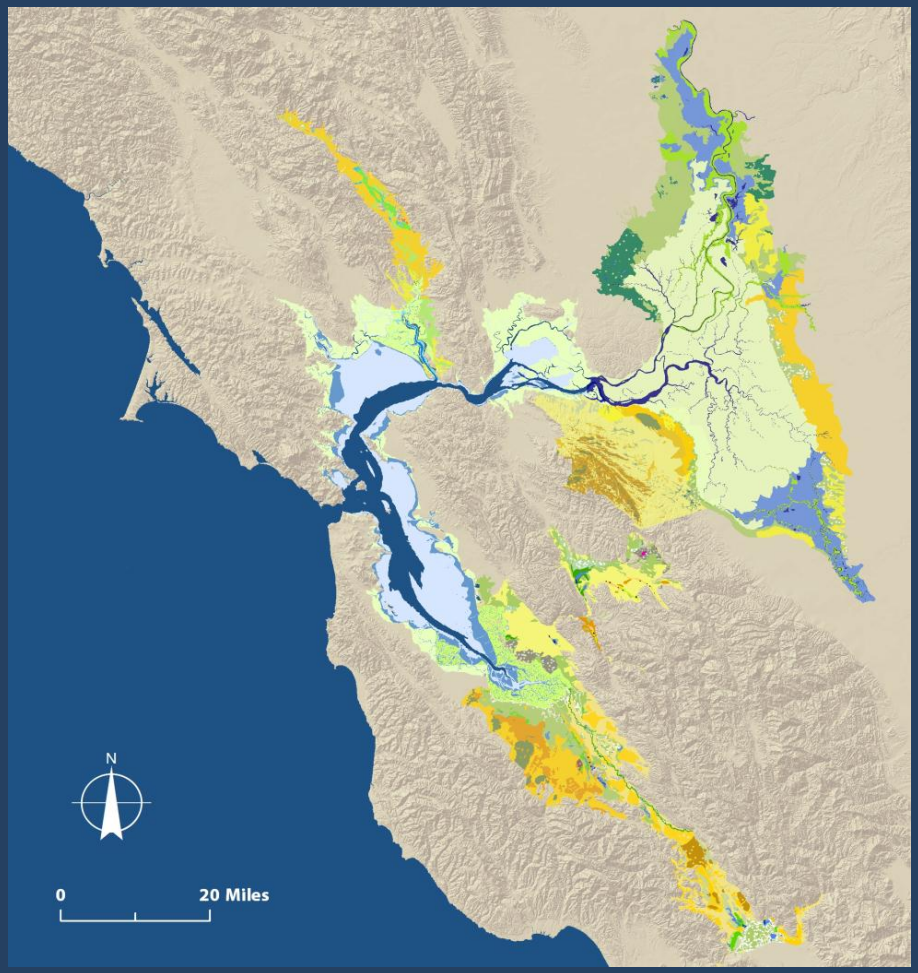
2. **Policy Support**
   - Planning and regulatory guidance blueprint
   - Regional economic analysis

3. **Implementation/Demonstration Projects**
   - San Francisquito Creek
   - Novato Creek
   - Walnut Creek

Implementation Projects

- San Francisquito Creek
  - SFCJPA
- Novato Creek
  - MMFCWCD
- Walnut Creek
  - CCCFCWCD

Task 2.1 – Historical Ecology Synthesis



Historical Ecology Synthesis Subtasks
(Undertake analysis of the historical fluvial-tidal interface on Bay Area streams)

1. Determine key attributes/functions to assess (e.g. channel pattern/width, fluvial-tidal connectivity, dominant flow regime, riparian extent)

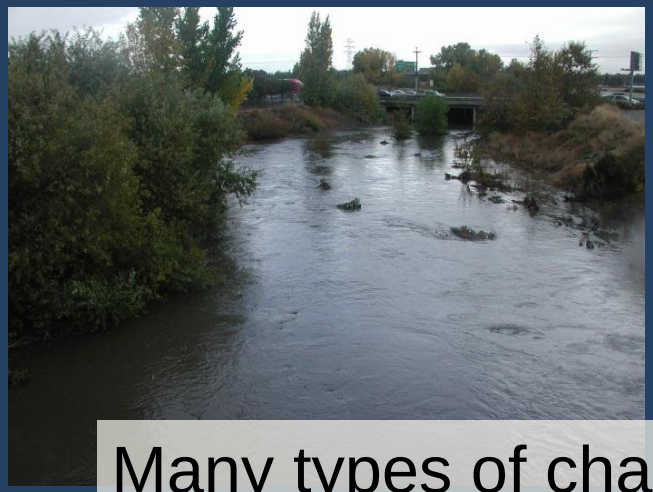
2. Develop initial fluvial-tidal interface classification scheme for FC 2.0 channels (→ in concert w/ sediment synthesis)

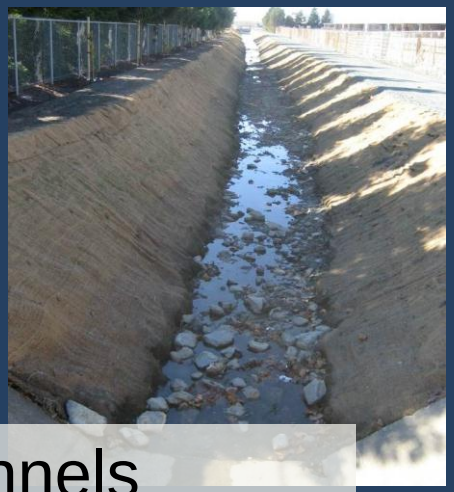
3. Identify available existing datasets (e.g. full and partial HE studies)

4. Synthesize data into database (floodplain infrastructure ideally)

5. Create draft conceptual models as part of 2.3 (in coordination with Delta Landscapes)

Task 2.2 – Sediment Synthesis





Many types of channels

culvert, trapezoidal, ‘natural,’ etc.

Coarse Sediment Supply Subtasks

1. Collate sediment supply and deposition data
   a) Develop BAFPAA data request process
   b) Collect BAFPAA FC 2.0 channel sediment data
   c) Complete GIS data base (BAARI & IRWM Floodplain Infrastruct. Mapping)

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3. Compute first order sediment budgets for each FC 2.0 channel (% storage of each sediment texture class)
   a) Draft interpolation method for channel coarse sediment supply
   b) Receive Regional Science Forum (RSF) review
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4. Complete regional restoration design conceptual models
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   b) Receive Regional Science Forum (RSF) review

What will we need from BAFPAA?

- Develop BAFPAA interaction/ data request process
  - Interface with IRWM/SFEI Floodplain Infrastructure Mapping Project
- Collect/collate BAFPAA FC 2.0 channel sediment data
  - Channel characteristics (slope/ grade controls, geometry/pinch points)
  - Sediment volume (stored volume, location, texture)
  - Sediment removal via dredging (date, vol., loc., text.)
    - Sediment delivery timing (episodic/chronic transport, storage, deposition)
    - current spending on coarse sediment
- Help select and be part of the local review process

Sediment time line

- Q1/Q2 2013
  - Develop BAFPAA interaction/ data request process
- Q2/Q3 2013
  - Collect BAFPAA FC 2.0 channel sediment data
  - Complete GIS data base (BAARI & IRWM Floodplain Infrastructure Mapping)

FLOODPLAIN INFRASTRUCTURE MAPPING and COMMUNICATION

- IRWM grant
- DAC focus
- Flood protection
- Integrated strategies for mitigating climate change impacts

For more information:
kristen@sfei.org

What are our endpoints?

1. Regional GIS base map of Flood Protection and Stormwater Infrastructure
   - Standardized inventory based on existing maps, aerial imagery or LiDAR interpretation
   - Added value with structure information, e.g. ownership, maintenance, construction materials, etc.
   - Database that integrates with other regional data collection efforts
     - Bay Area Aquatic Resources Inventory
     - Flood 2.0
     - Creek Mouth Project (SFEP)
     - Adapting to Rising Tides and Living with a Rising Bay (BCDC)

What are our endpoints?

2. Data Visualization and Access
   - Presentation of flood infrastructure data in useful and meaningful ways
   - On-line access with critical functionality to support flood management and DAC assessment

What are our endpoints?

3. Assessment of Disadvantaged Communities vulnerable to flooding
   - Regional definition of DAC
   - GIS analysis of DACs in the Bay Area
   - Detailed, local-level assessment of flood infrastructure for one DAC

Why are we doing it?

To provide flood managers with information to:

- Identify and prioritize opportunities for integrated flood management,
- Identify low-lying, underserved communities with high flood risk not captured in earlier assessments,
- Assess regional flood protection needs to respond to climate change, and
- Coordinate with state and federal flood management strategies (FloodSAFE and ACOE)

How will we get there?

1. Convene a Technical Advisory Team
2. Analysis of key infrastructure data gaps
3. Fill data gaps
4. Augment with additional data, e.g. land use, hydrology, census, SLR scenarios
5. Perform DAC analysis and incorporate identified DAC data
6. Develop communication tool

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Project Status and Timeline

- Developing our Technical Advisory Team
- Started data collection and continue through Q3 2013
- Q4 2013 – Q3 2014 fill data gaps
- Q3 2014 – Q1 2015 DAC analysis
- Q2 2014 – Q2 2015 develop communication tool

FLOODPLAIN INFRASTRUCTURE MAPPING and COMMUNICATION

Thank you

kristen@sfei.org

Ideas for focusing data collation and synthesis efforts?

- How best to exchange information efficiently and accurately between BAFPAA and the two projects?
  - Written or on-line survey form
  - Face-to-face meeting/interview
  - Web upload, e.g. share point site
  - Email
  - Combination of above
  - Other?

Next steps for engagement with BAFPAA

- Identify BAFPAA members interested in participating in either of the two projects - provide data, develop data exchange process, TAC member, tool development team
  - Flood 2.0 contact → **lester@sfei.org** or **robin@sfei.org**
  - Flood Infrastructure Mapping and Communication contact → **kristen@sfei.org**

- Begin to roll out the data exchange process and refine process as needed

- Begin to develop base map with acquired data

Questions?

Thank you

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robin@sfei.org