Southern Laguna de Santa Rosa Watershed

Sediment Source Assessment

SFEI
SAN FRANCISCO ESTUARY INSTITUTE

Scott Dusterhoff

December 9, 2025

Background

- The Laguna de Santa Rosa is impaired by excess fine sediment loading from contributing watershed
- Regional Board is in the process of developing a sediment TMDL
- Need focused, field-based analyses to
    - support/corroborate sediment TMDL loading analysis
    - inform appropriate source control and restoration actions

Southern Laguna de Santa Rosa Watershed Sediment Source Assessment

Goal

Determine average annual channel erosion rates in the southeastern tributaries and identify dominant sediment sources

Funder

Federated Indians of Graton Rancheria

Partners

SFEI & Laguna Foundation

Timeline

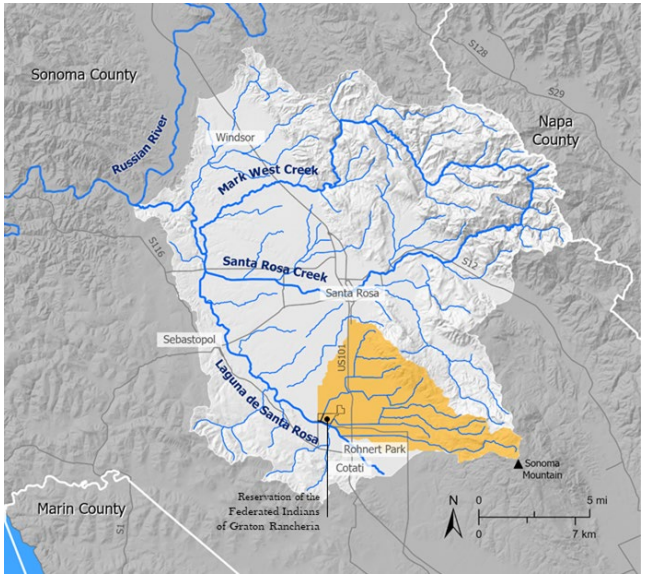
September 2019 - ongoing

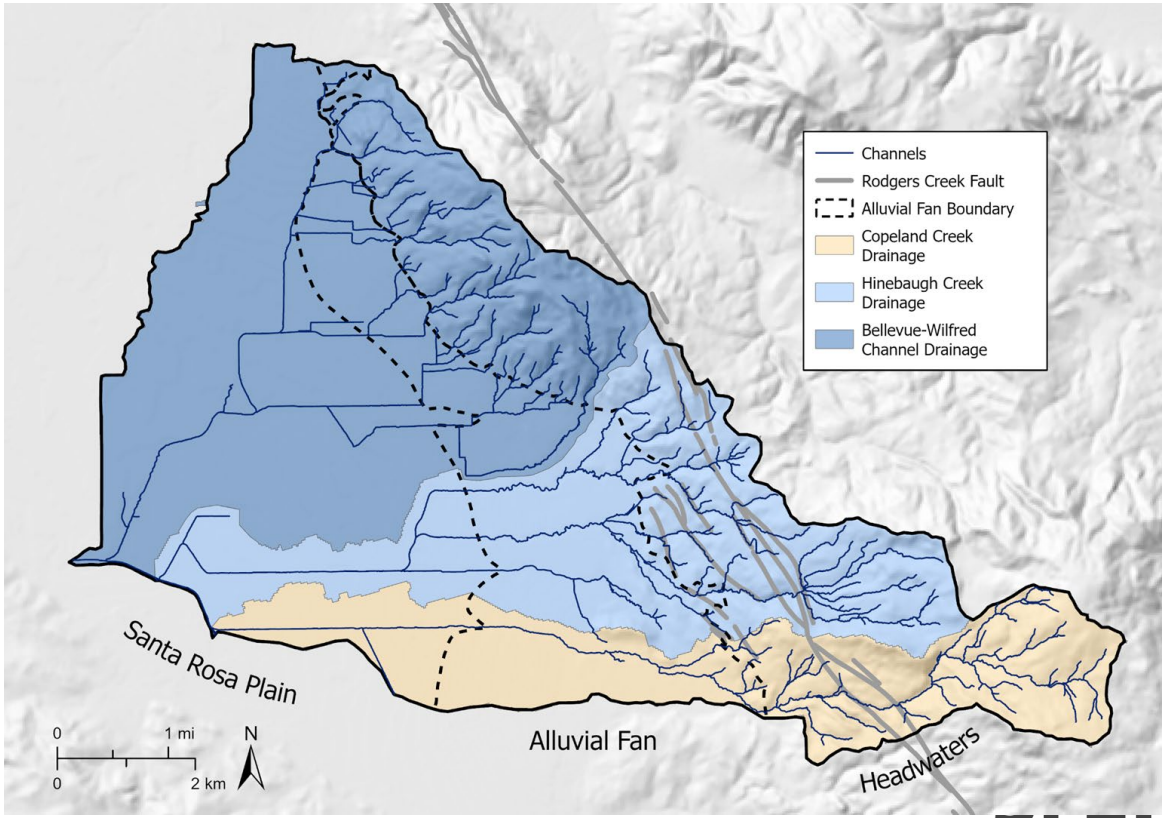
FEDERATED INDIANS OF GRATON RANCHERIA

SFEI

Laguna de Santa Rosa Foundation

Study Area

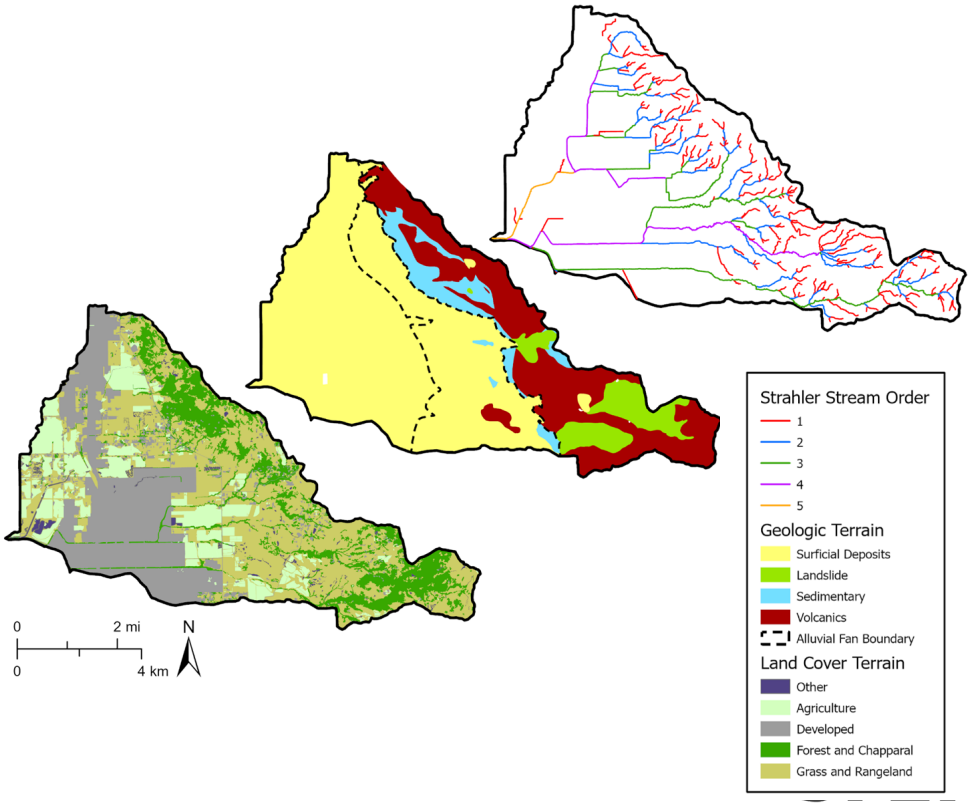

Sonoma County
Napa County
Marin County
Windsor
Russian River
Mark West Creek
Santa Rosa Creek
Santa Rosa
Sebastopol
Laguna de Santa Rosa
Rohnert Park
Cotati
Sonoma Mountain
Reservation of the Federated Indians of Graton Rancheria
US101
S116
S12
S128
S29
N
0
5 mi
0
7 km


Channels
Rodgers Creek Fault
Alluvial Fan Boundary
Copeland Creek Drainage
Hinebaugh Creek Drainage
Bellevue-Wilfred Channel Drainage
Santa Rosa Plain
Alluvial Fan
Headwaters
0
1 mi
0
2 km
N

Approach

Channel GLU approach

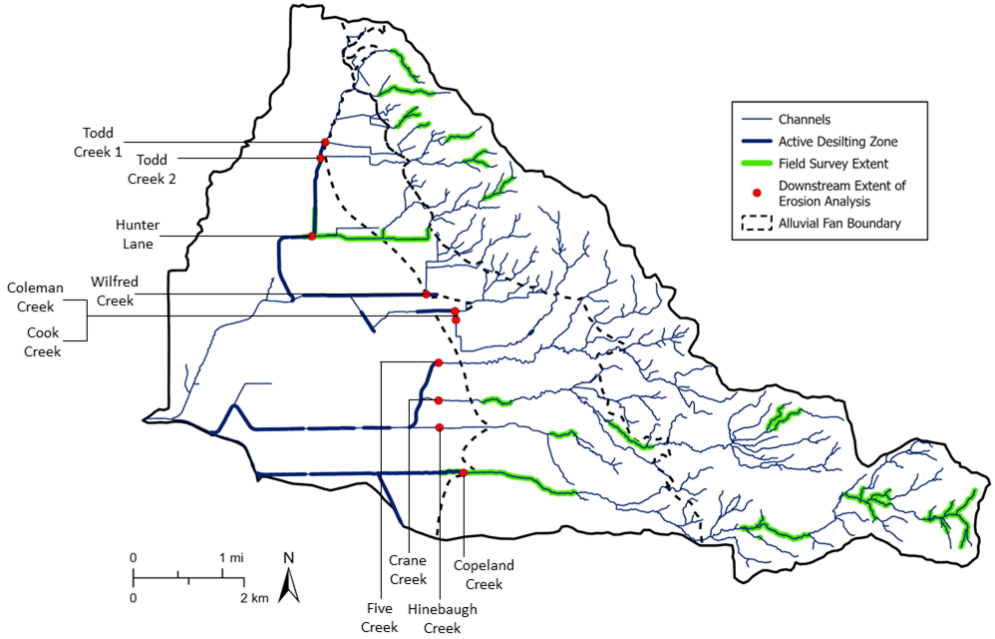
- Label all channel reaches by combination of Stream Order, Geology, and Land Cover to determine channel Geomorphic Landscape Units (or GLUs)
- Conduct intensive field surveys to determine GLU-specific erosion rates in representative channel reaches
- Apply erosion rates to unsurveyed channel reaches
- Combined erosion rates to get sediment supply by subwatershed



Approach

Field Survey

- Assessed **bank and bed erosion** on 22 km of channels (or 12% of total channel length) between June 2021 and March 2022
    - Bank retreat
    - Bank failure/shallow landslide
    - Gully erosion
    - Channel incision
- Focused on area upstream of SMP activities



SFEI

Field Survey

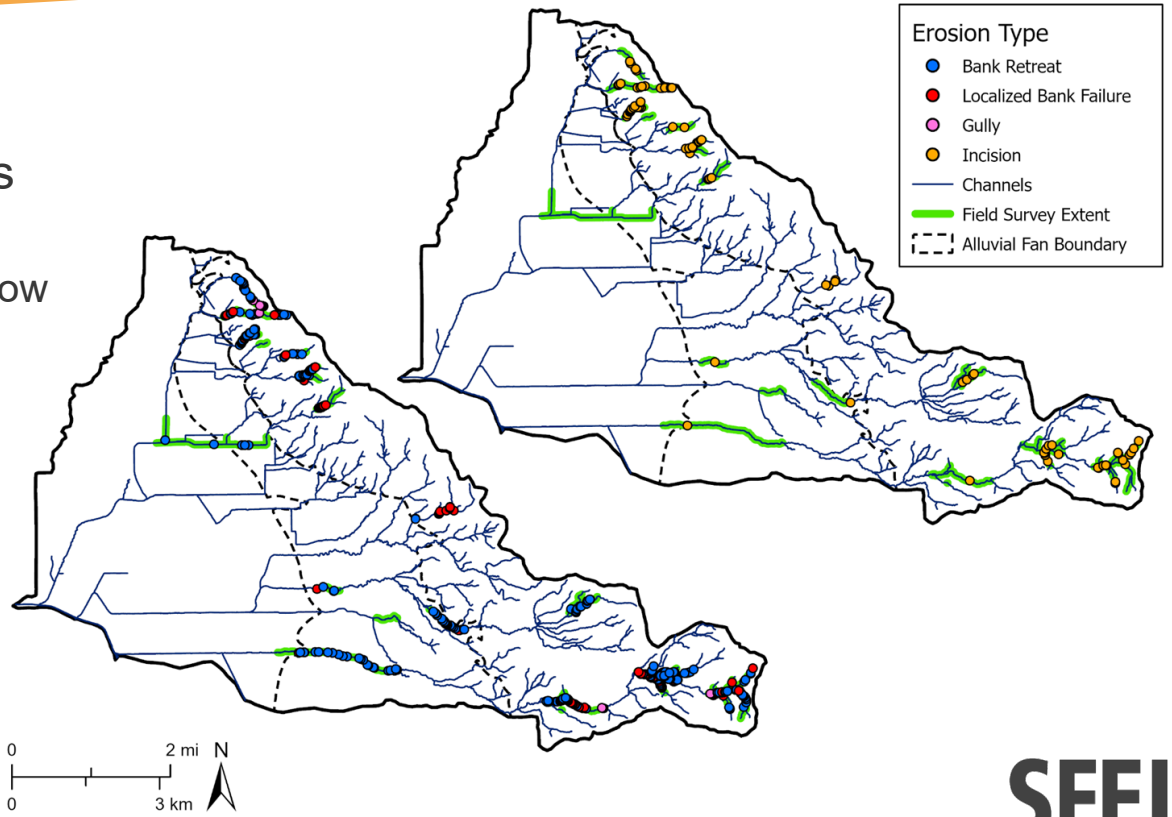
Bank erosion

Shallow landslide

Channel incision

Field Survey

- 614 erosion observations
  - 378 bank retreat
  - 135 local bank failures/shallow landslides
  - 13 gullies
  - 88 incision observations

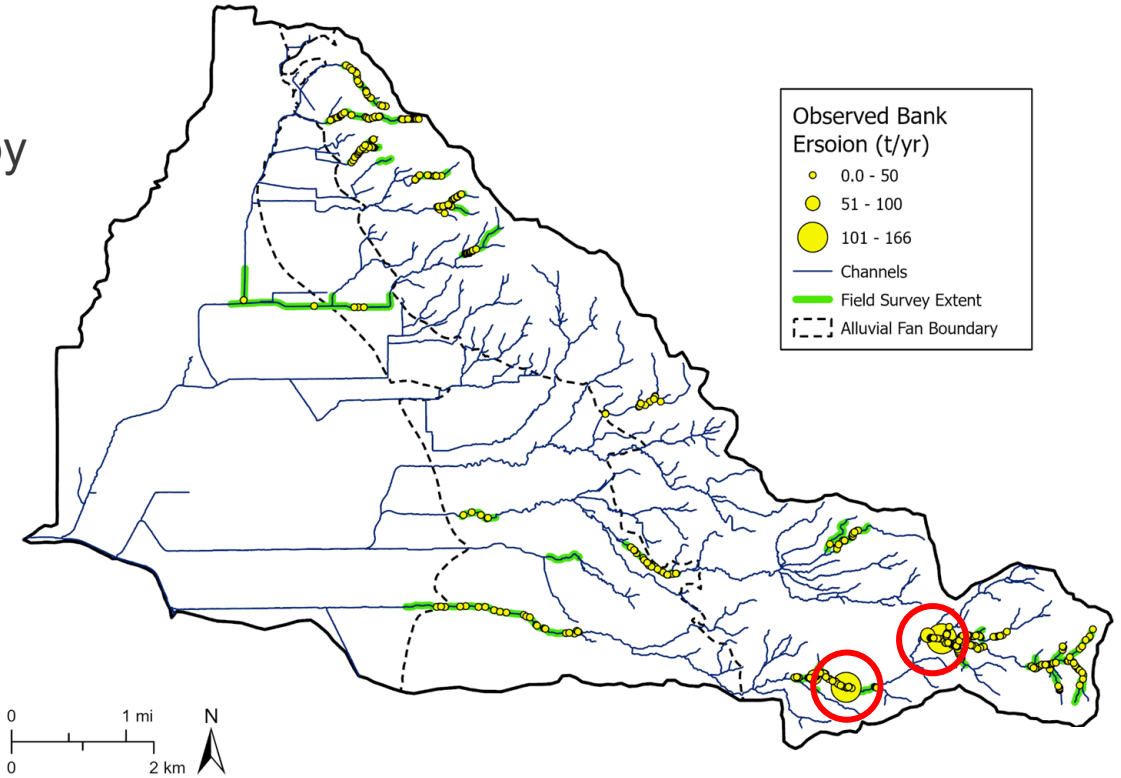


SFEI

Results: Bank Erosion

Largest bank erosion features by far were in the Copeland Creek Drainage

- Valentine's Day Slide
- Unnamed landslide



Results: Bank Erosion

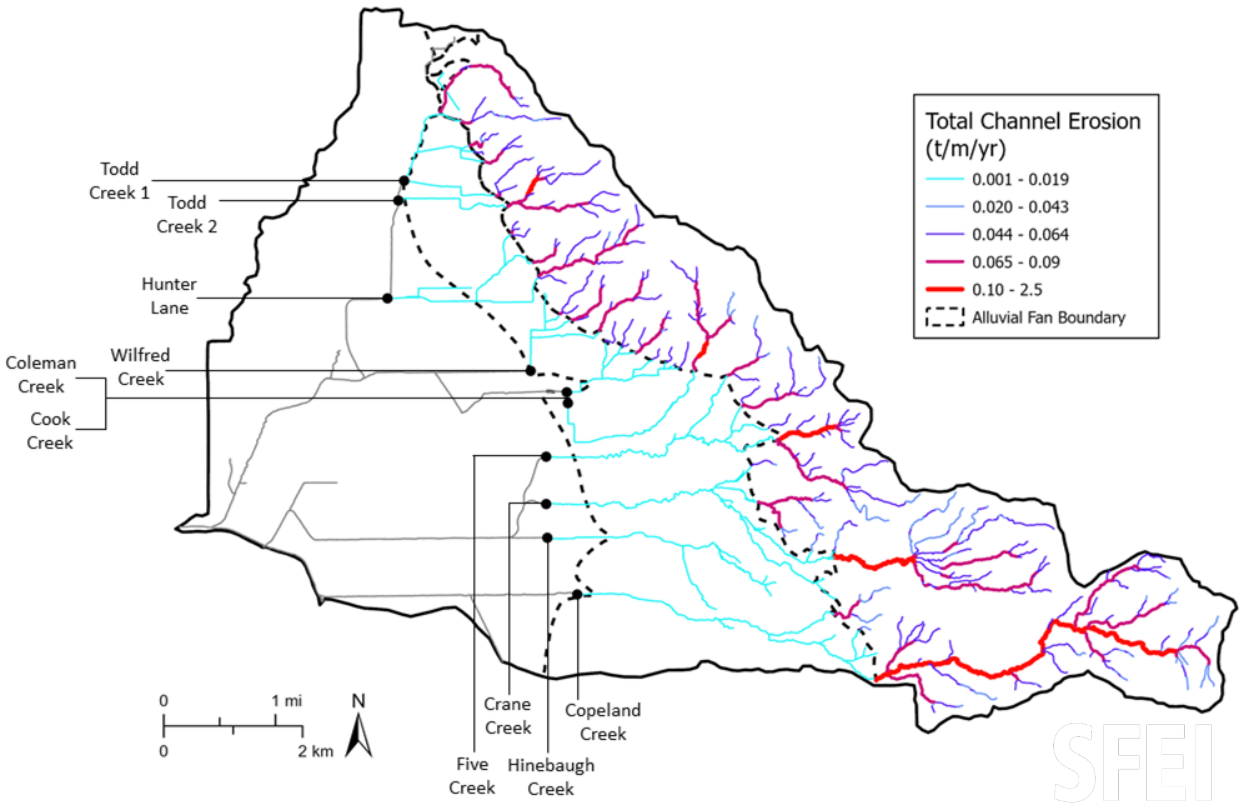
Valentine's Day Slide

Unnamed landslide

Results: Total Channel Erosion

Key findings

- Over 90% of channel erosion occurred in Headwaters Zone
- Bank erosion and bed erosion each supply about ½ of the total annual sediment supply
- Highest erosion rates in SE corner due to high ann precip and erosive geology

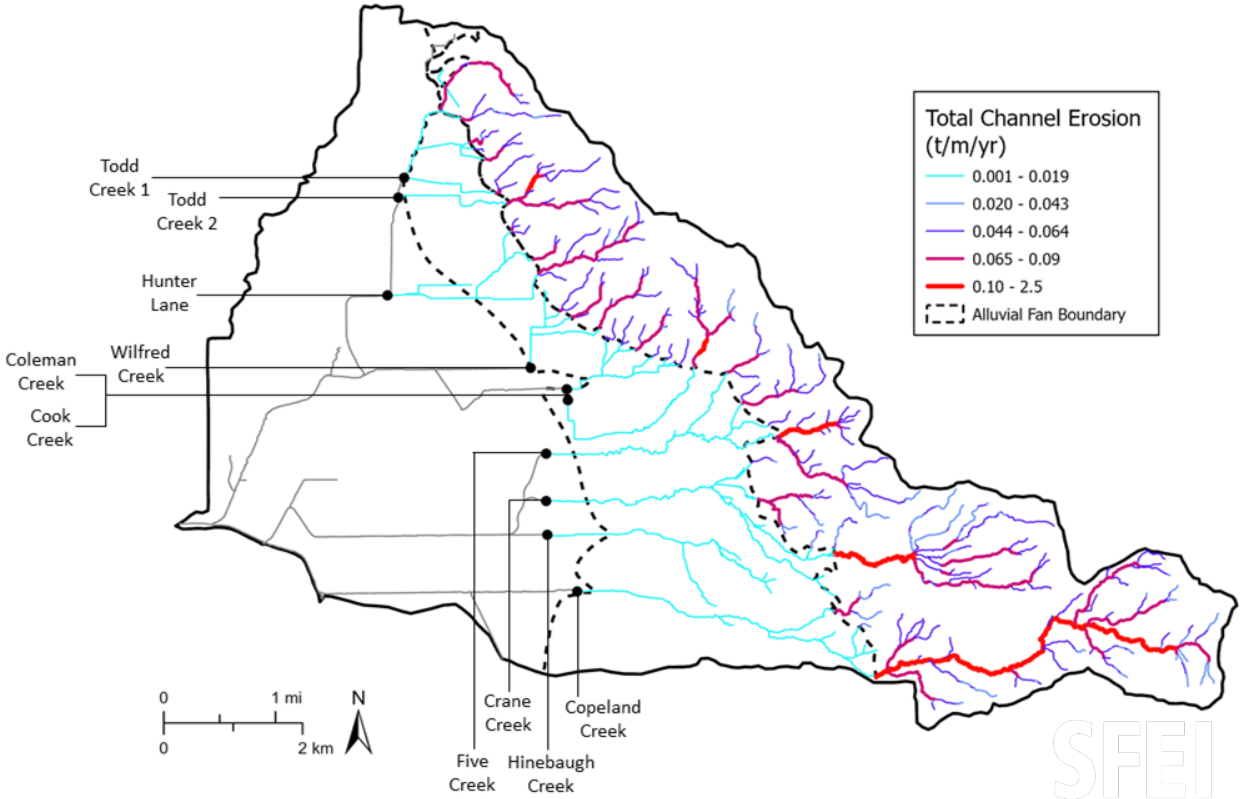


Results: Total Channel Erosion

Key findings

Total avg ann sed supply from channel erosion

- Copeland: 4,000 t/yr
- Hinebaugh: 3,800 t/yr
- B-W Chan: 2,500 t/yr



Management Implications

Range of sediment management options

- **Copeland Creek**
  - Massive landslides limit sediment control actions
  - Capture flow and sediment on alluvial fan (alluvial fan restoration)
- **Hinebaugh Creek**
  - Alluvial fan restoration
  - Upper reaches - channel stabilization
- **Bellevue-Wilfred Channel**
  - Upper reaches - channel stabilization

Acknowledgements

Federated Indians of Graton Rancheria
Buffy McQuillen
Hector Garcia

Sonoma Water
Chase Takajo
Neil Lassettre

Fairfield Osborn Preserve
Suzanne DeCoursey

Technical Advisory Committee
Michelle Goman (SSU, ret.)
Brian Cluer (NOAA, ret.)
Andy Collison (ESA)

Laguna Foundation Team
Wendy Trowbridge
Asa Voight
Annie Madden
Brett Reed

SFEI Team
Sam Shaw
David Peterson
Kyle Stark
Katie McKnight
Sarah Pearce
Scott Walls
(walls land + water)

THANK YOU!

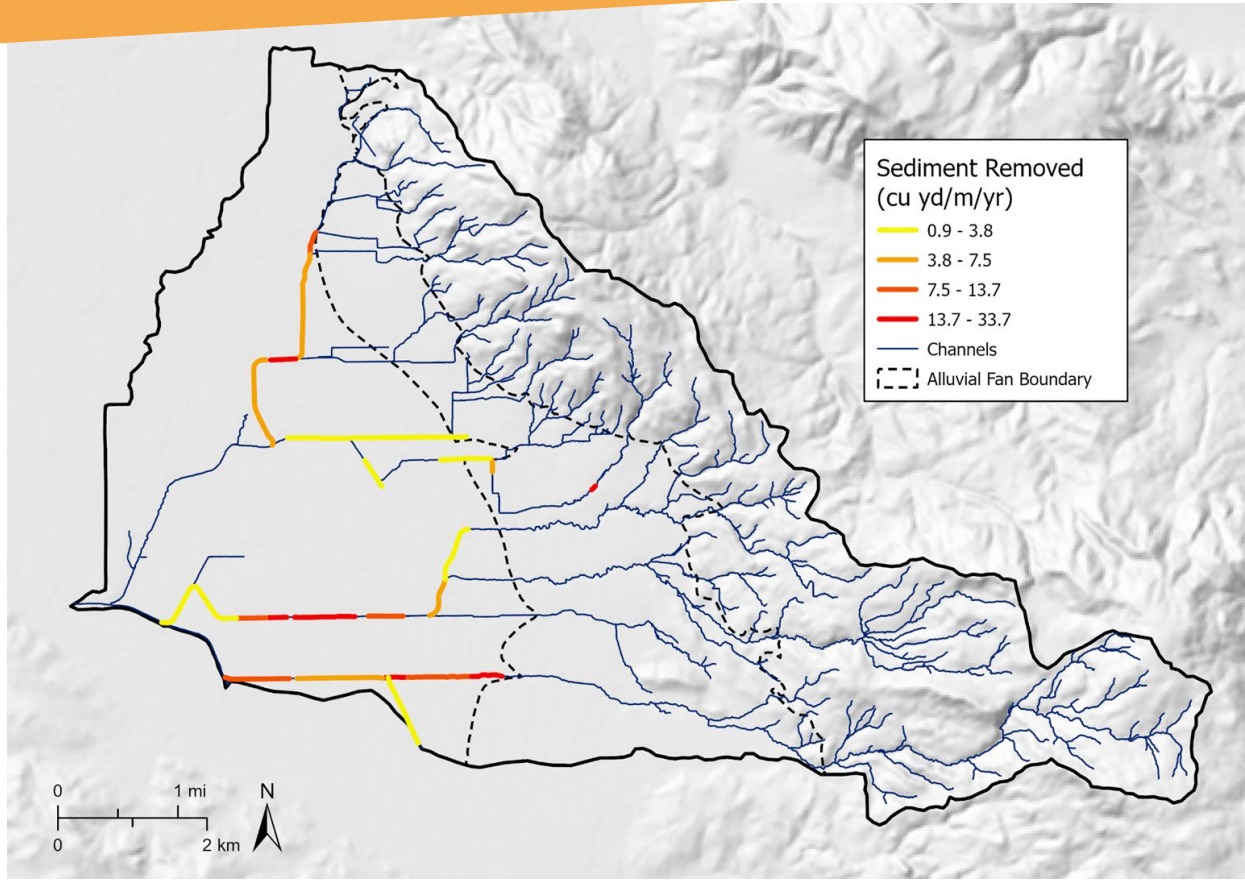
scottd@sfei.org

SFEI
SAN FRANCISCO
ESTUARY INSTITUTE

sfei.org

SMP Activity

Sediment Removal rates in active desilting zones from 2012-2022



Study Area

SFEI

Field Survey

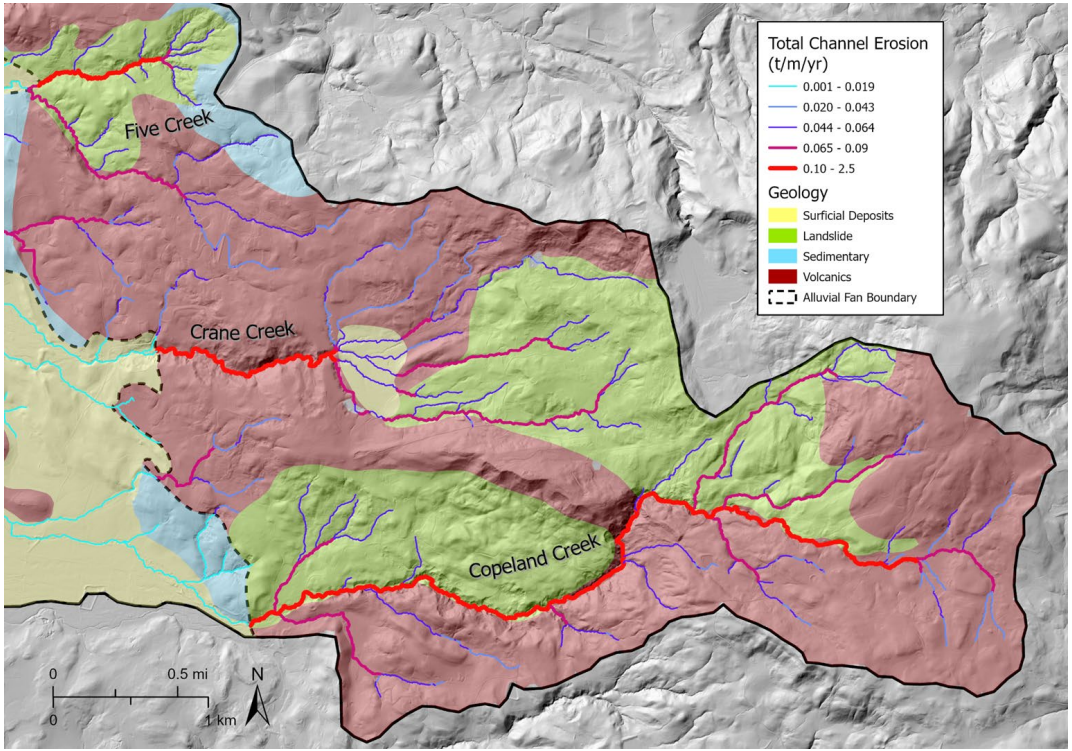
SFEI

Field Survey

SFEI

Results

Content goes here



SFEI