Petaluma River Watershed **Sediment & Riparian Assessment**

Scott Dusterhoff

Program Managing Director & Senior Scientist

October 24, 2024 | Napa County Watershed Information & Conservation Council Meeting

SFEI San Francisco Estuary Institute

About SFEI

- **Scientific nonprofit** with over 70 interdisciplinary staff (scientists, engineers, landscape architects) working in the Bay Area and throughout California
- **Provide essential data and knowledge** to improve water quality & protect human and ecological health since 1986
- **We envision resilient ecosystems** where people and wildlife thrive

Project Motivation

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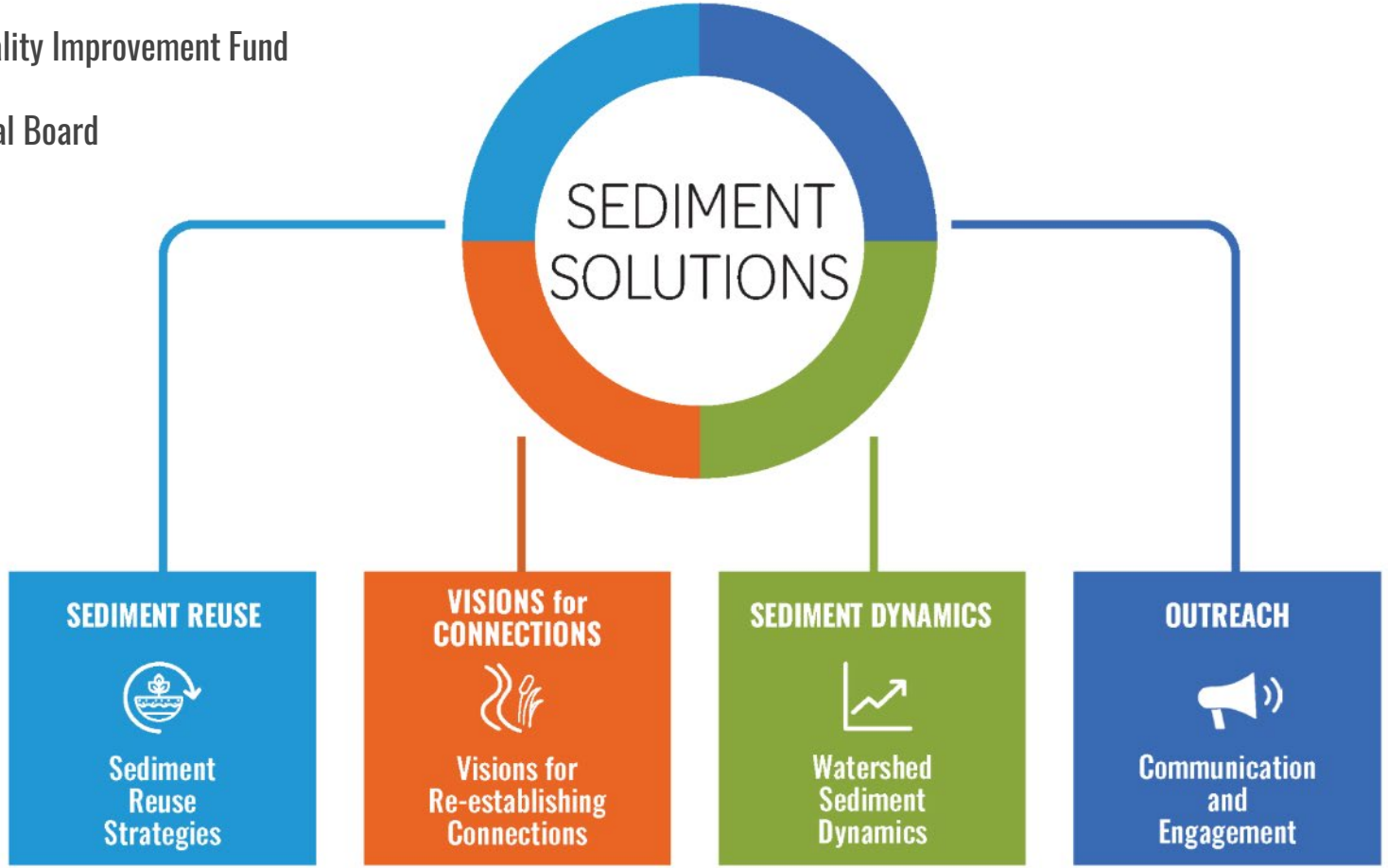
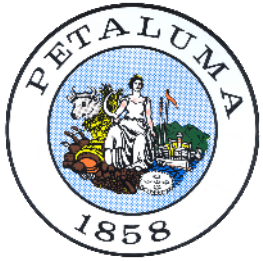
- Baylands will need more sediment to survive as sea level continues to rise
- Increasing air temperatures and large storm frequency will impact watershed ecosystems
- We need to develop management solutions that support the resilience of both baylands and watersheds under a changing climate

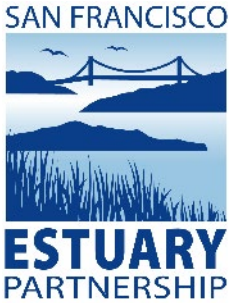
Funded by

EPA Water Quality Improvement Fund
Sonoma Water
SF Bay Regional Board



Project Funders & Partners





Petaluma River Watershed
Sediment Dynamics

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Main Research/Management Questions

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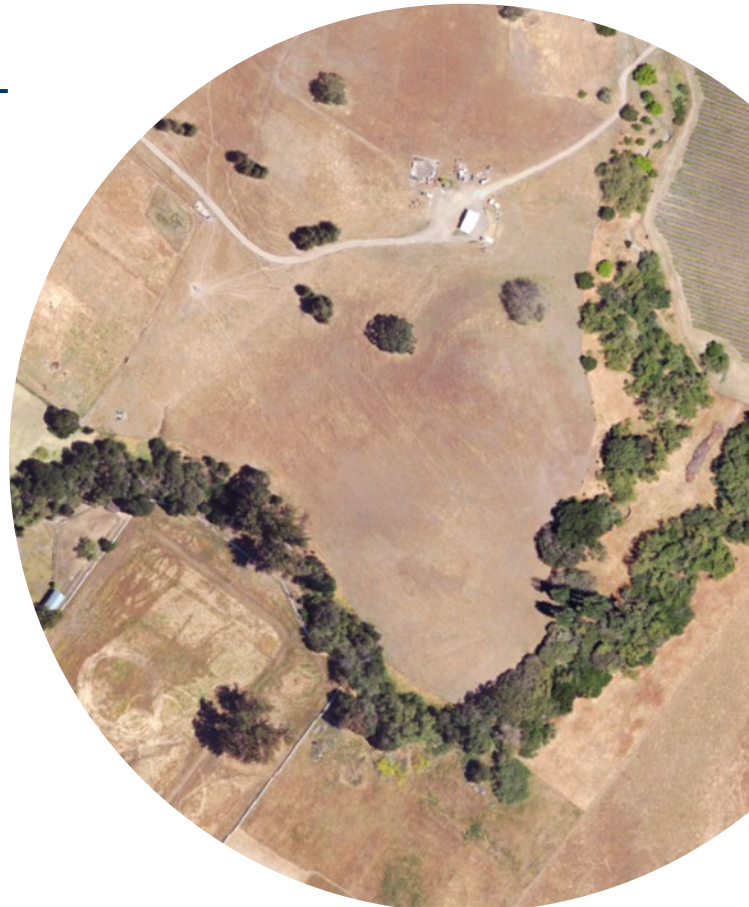
- How much sediment from the Petaluma River watershed currently reaches the Bay and where are the erosion “hotspots” in watershed?
- How will climate change impact watershed erosion and sediment delivery?
- What watershed management actions could support bayland sediment supply AND watershed ecosystem health AND flood management objectives?

Petaluma River Watershed
Riparian Ecosystem Dynamics



Petaluma River Watershed
Riparian Ecosystem Dynamics

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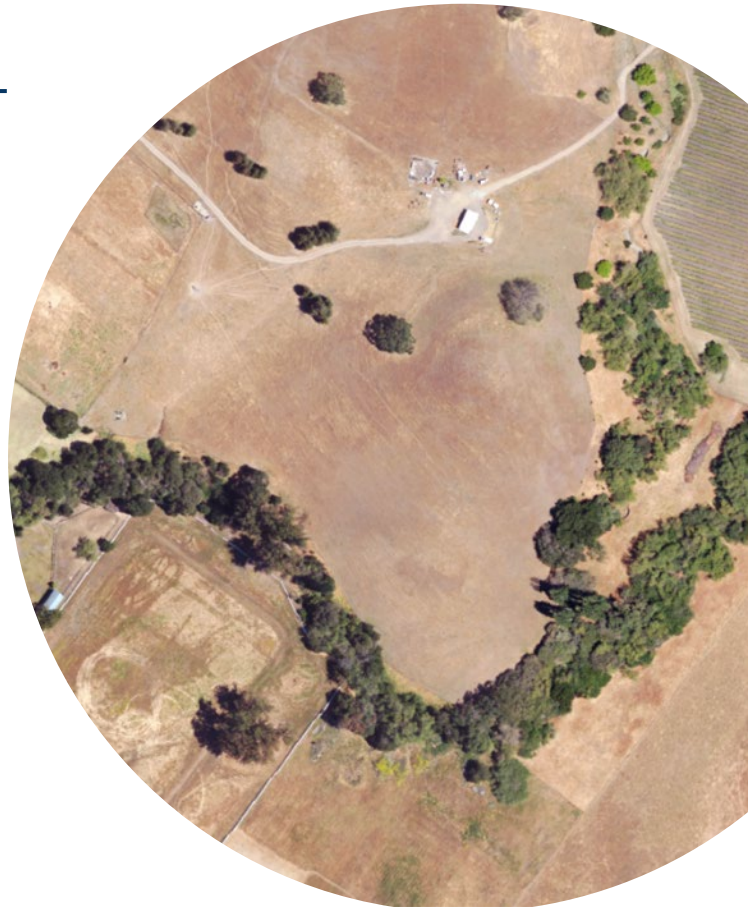
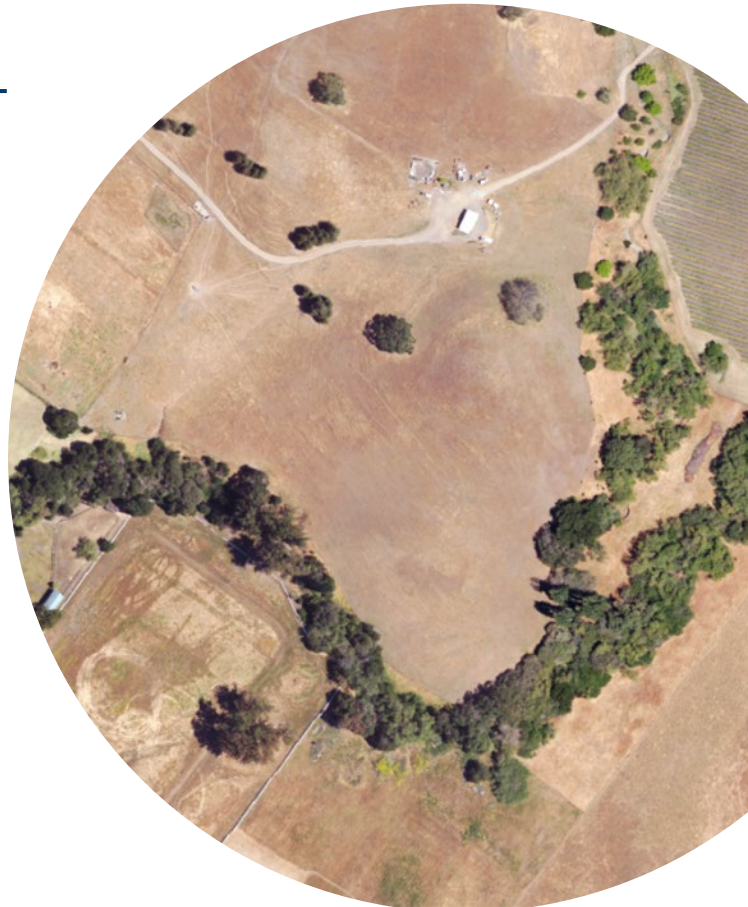


Petaluma River Watershed
Riparian Ecosystem Dynamics

Main Research/Management Questions

- What are the current riparian characteristics, functions, and major controlling factors (or drivers) in the Petaluma River watershed?



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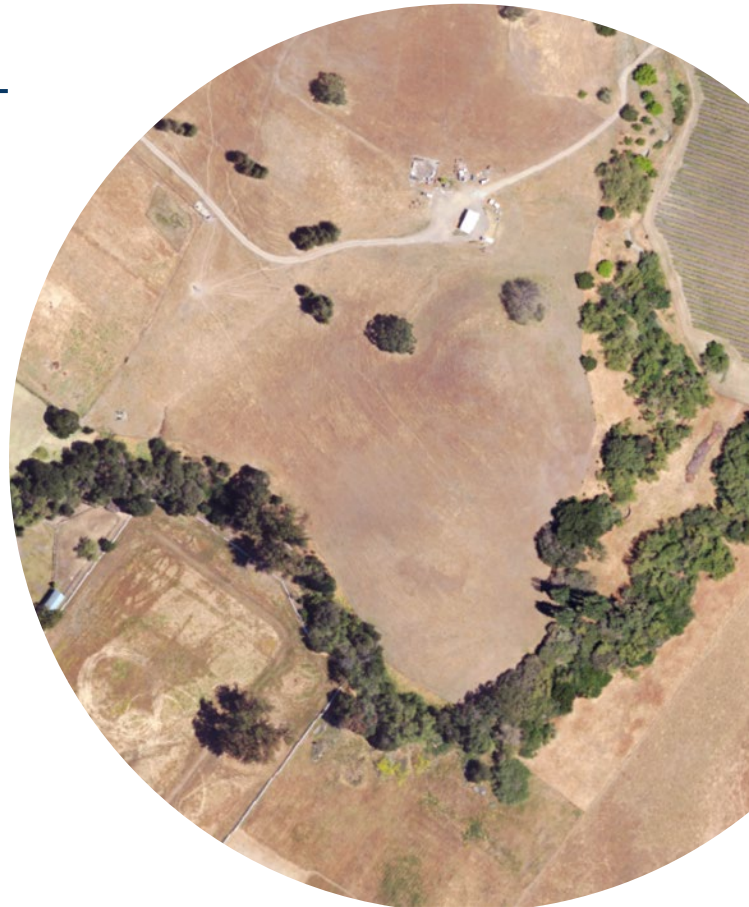

Petaluma River Watershed
Riparian Ecosystem Dynamics

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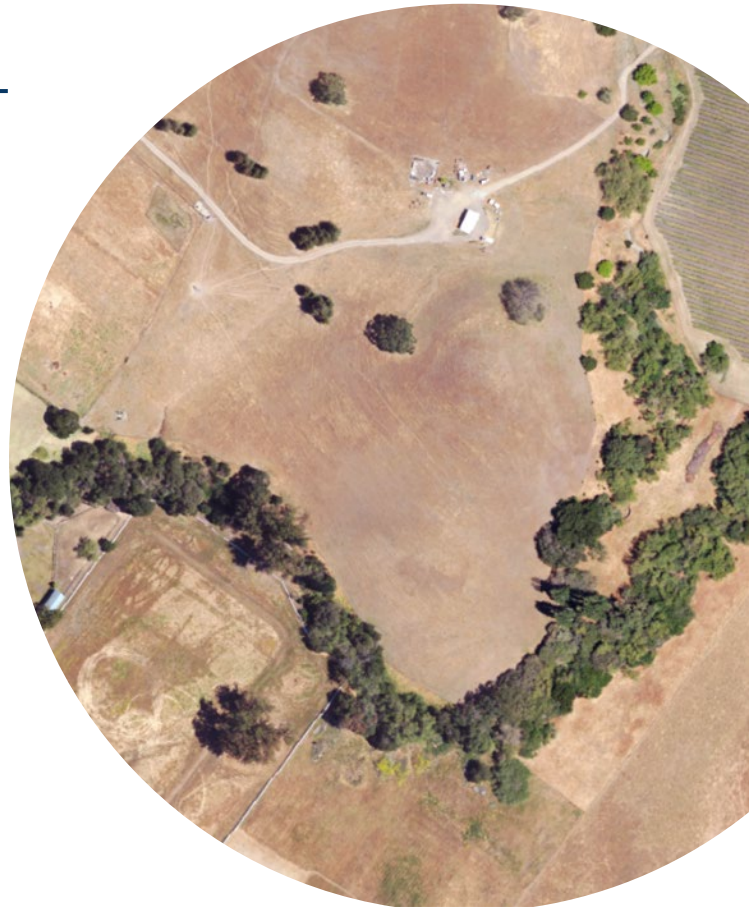
- What are the current riparian characteristics, functions, and major controlling factors (or drivers) in the Petaluma River watershed?
- How will climate change impact the major drivers and riparian ecosystem characteristics and functions?
- What are appropriate adaptation measures for promoting riparian ecosystem resilience?



Petaluma River Watershed Sediment & Riparian Assessment

Main Elements

- **Riparian conditions assessment**
- **Field-based sediment source assessment**
- **Modeling climate change impacts** on precip and air temperature riparian conditions, flow, erosion, and sediment transport
- **Modeling of management/restoration scenarios** to assess impacts to flow, erosion, and sediment transport
- **Developing management recommendations** for supporting riparian ecosystem resilience and flow/sediment transport that benefits watershed and baylands ecosystems

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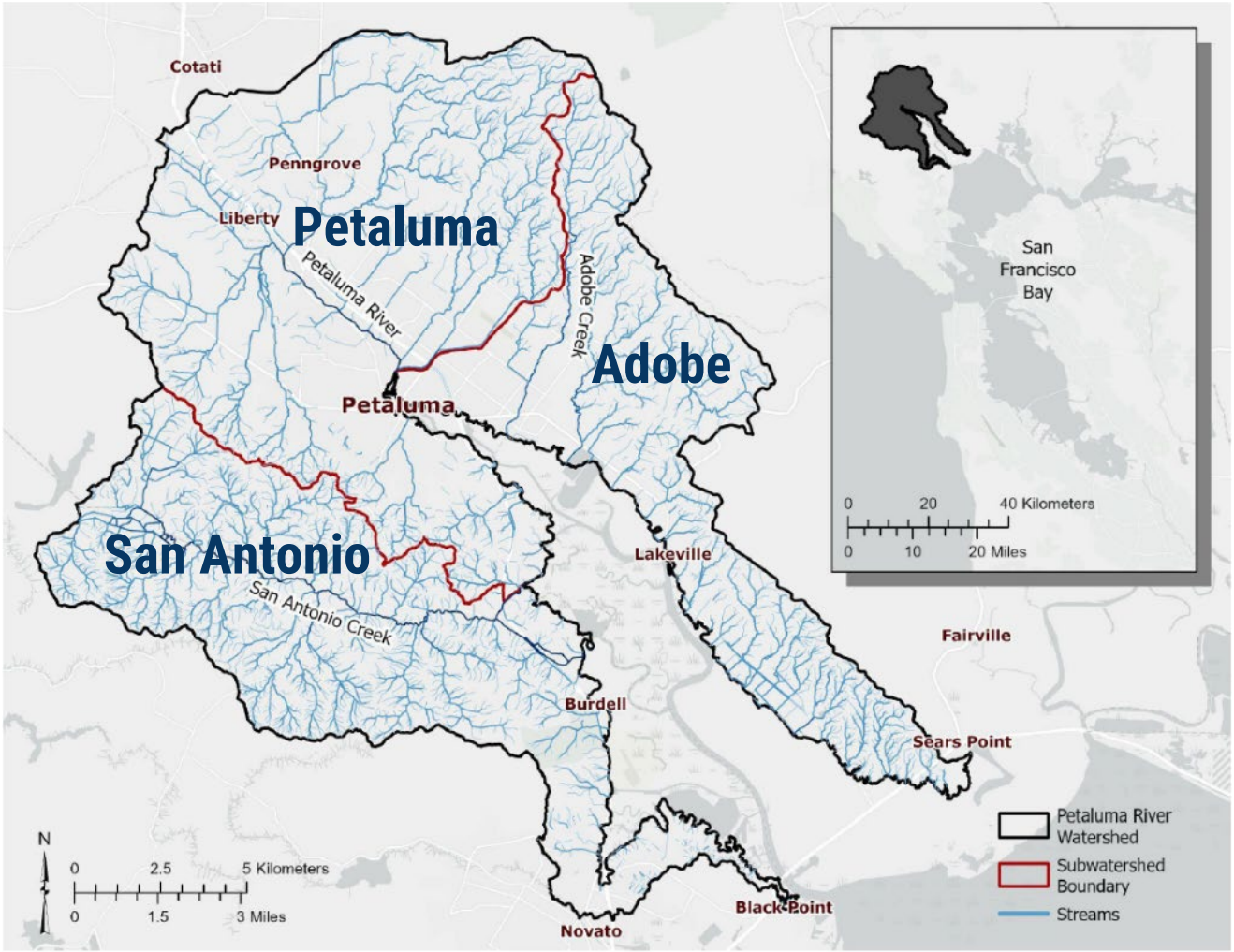
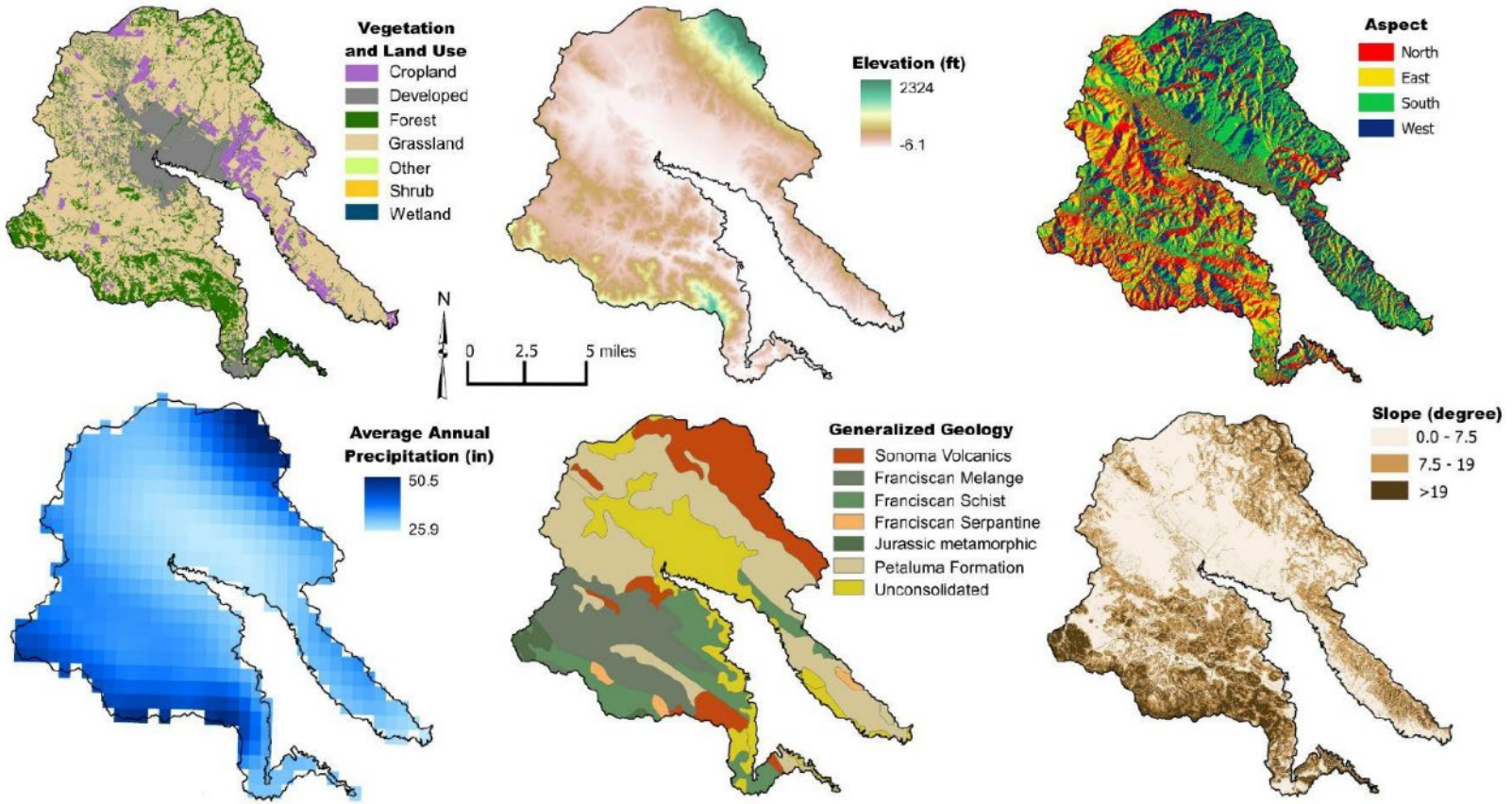
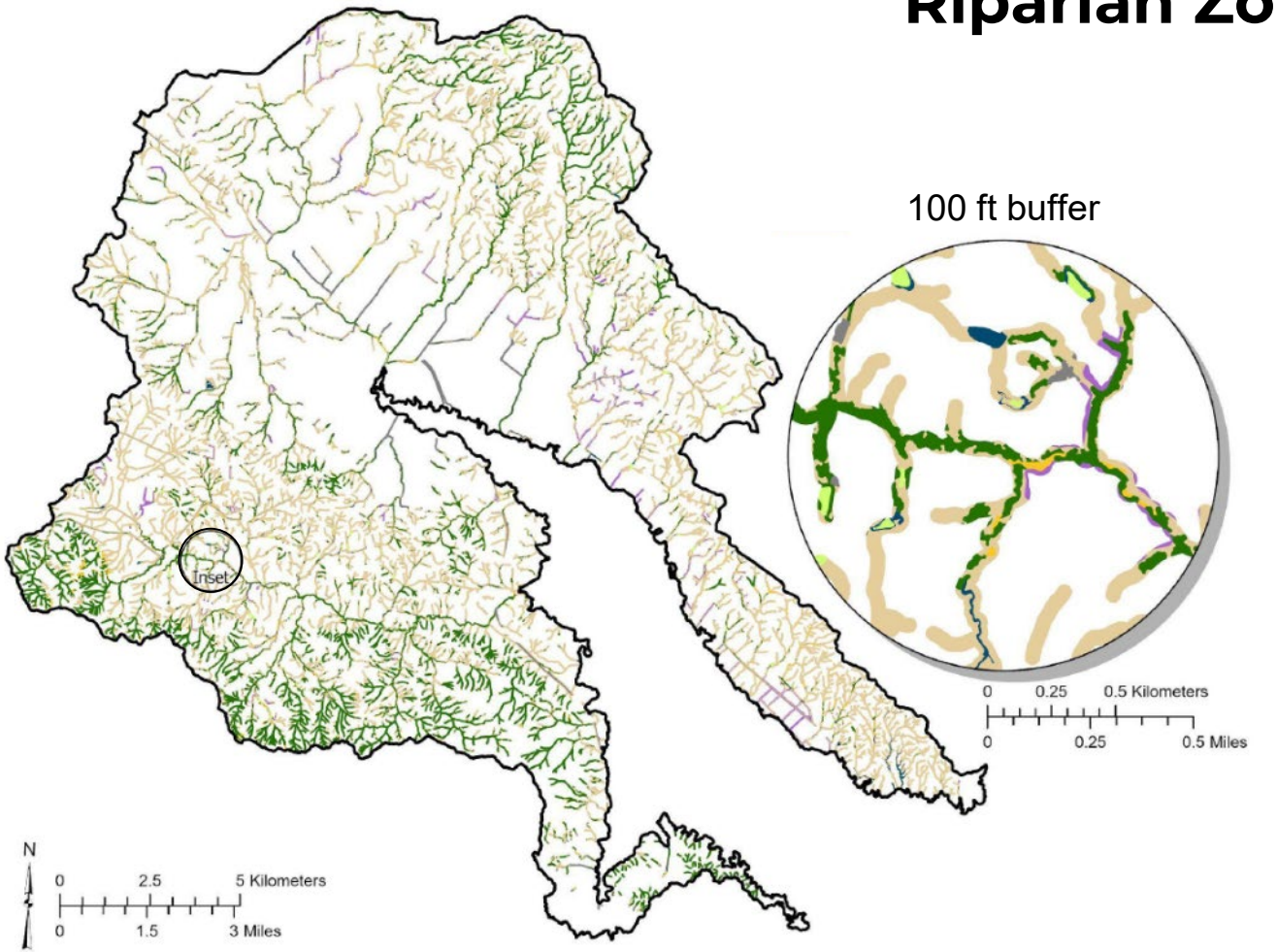
Study Area


Cotati
Penngrove
Liberty
Petaluma
Petaluma River
Adobe Creek
Adobe
Petaluma
San Antonio
San Antonio Creek
Lakeville
Fairville
Burdell
Sears Point
Black Point
Novato
San Francisco Bay
0 20 40 Kilometers
0 10 20 Miles
N
0 2.5 5 Kilometers
0 1.5 3 Miles
Petaluma River Watershed
Subwatershed Boundary
Streams

Key Drivers for Riparian Structure



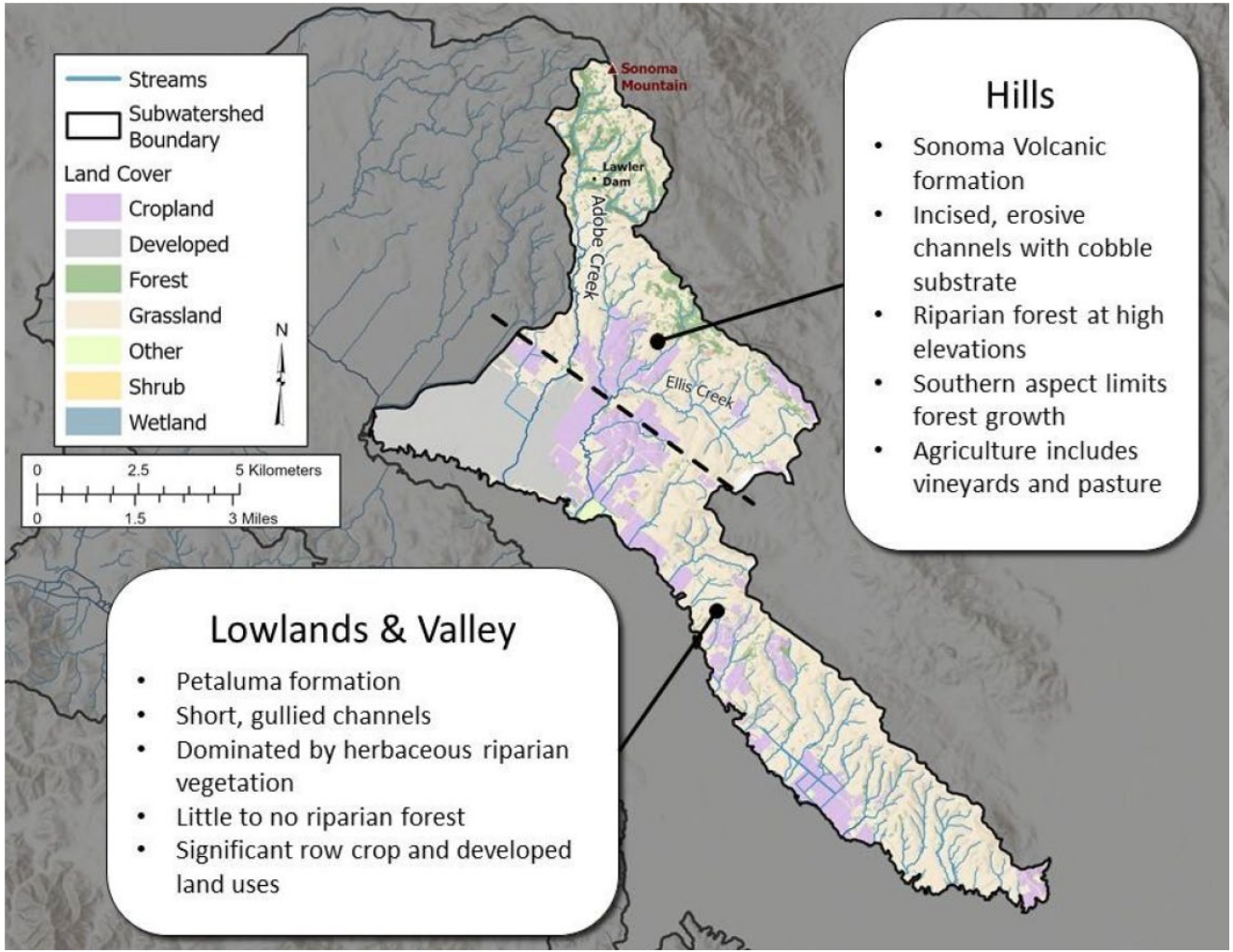
Riparian Zone Land Cover



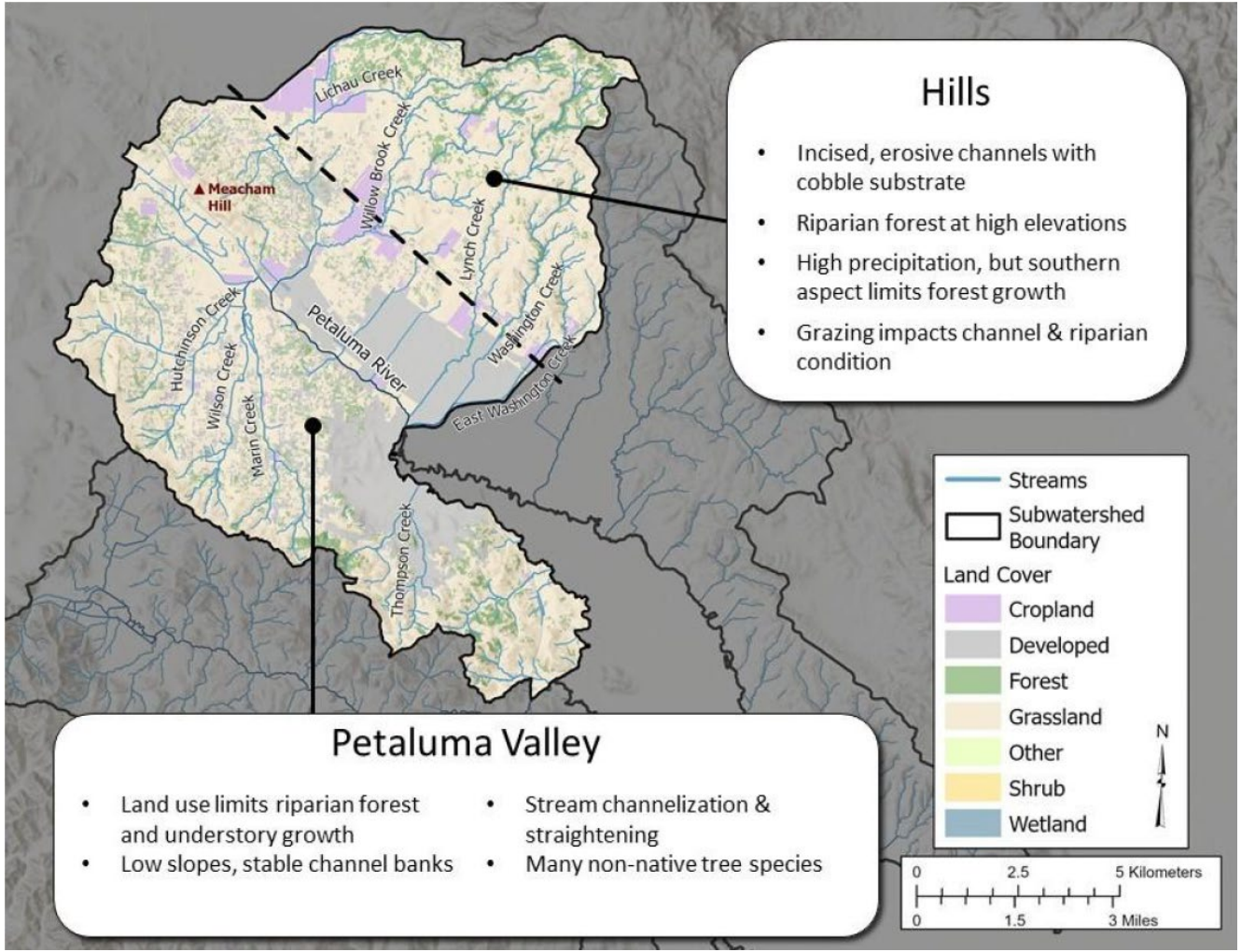
100 ft buffer

Land Cover Type

- Wetland (1%)
- Forest (30%)
- Shrub (1%)
- Grassland (60%)
- Cropland (3%)
- Developed (4%)
- Other (1%)

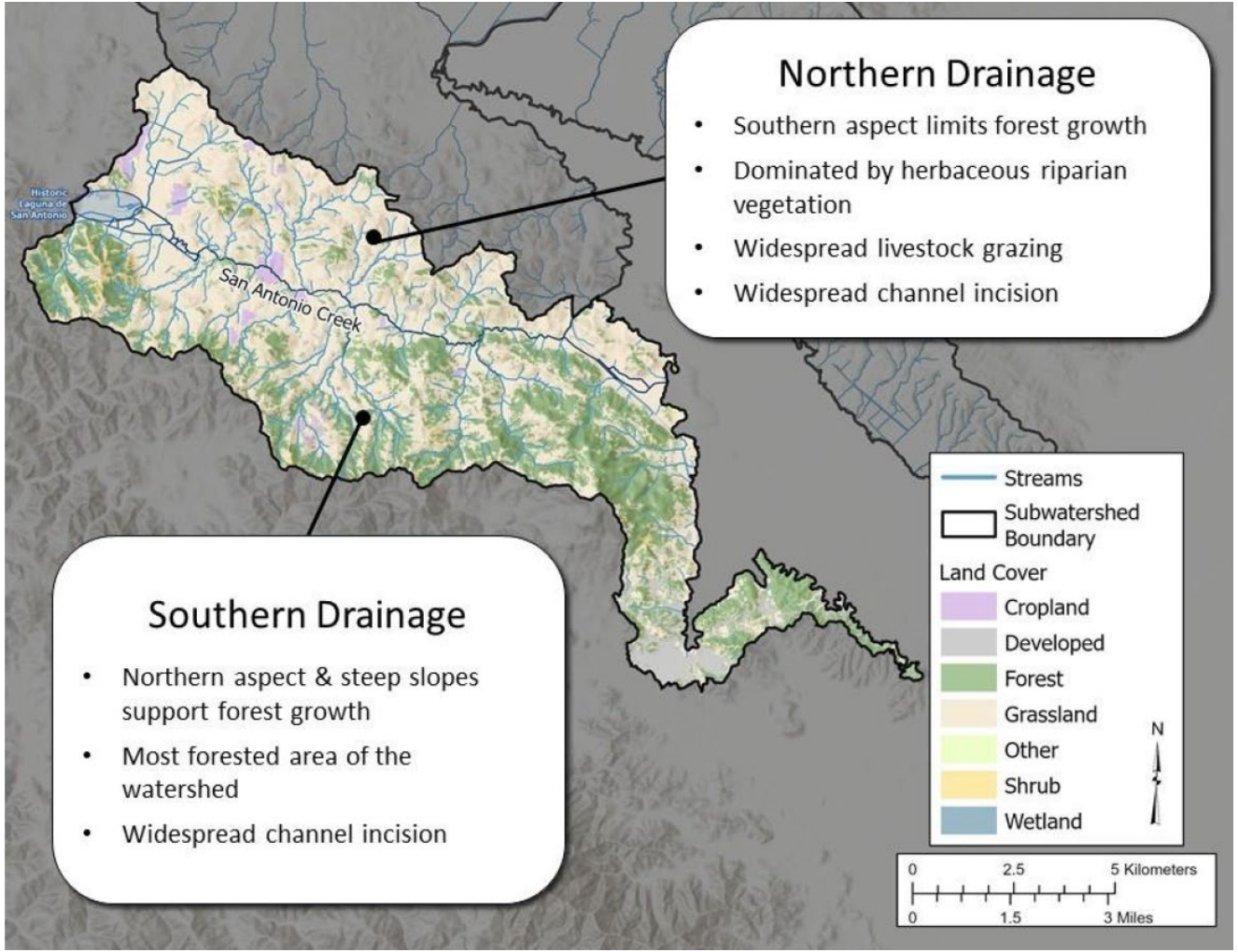


Petaluma
Subwatershed



Adobe

Subwatershed



San Antonio Subwatershed

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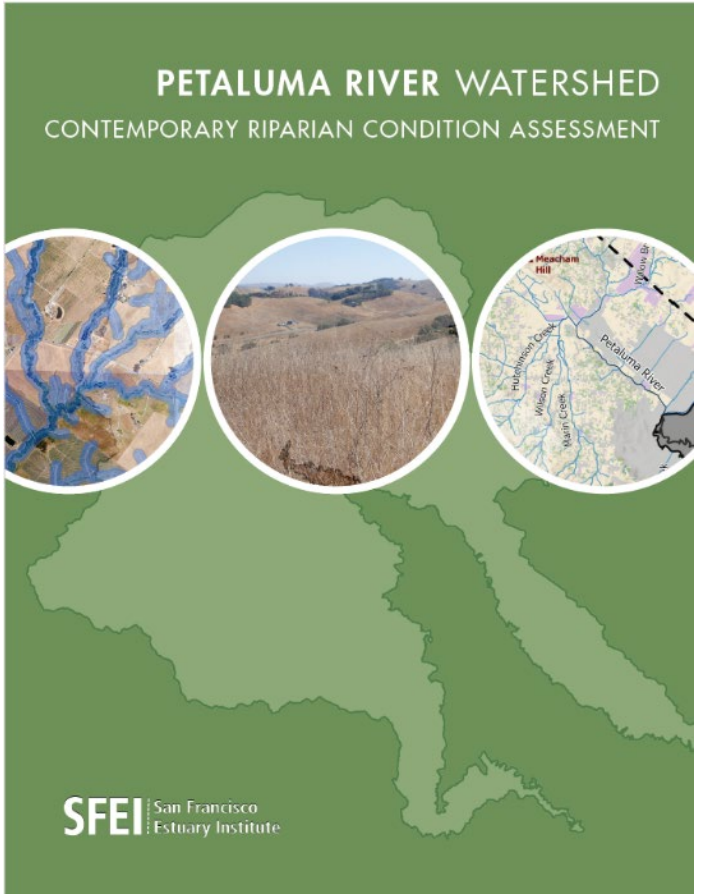

Thank you!

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