

ASSESSING RIPARIAN CONDITION ON THE CENTRAL COAST



CWMW Meeting

November 21, 2016



GOALS OF PROJECT

- Create a “Map” of riparian resources on the Central Coast
- Develop a riparian condition assessment tool for areas with various levels of access
- Support development of a monitoring/assessment strategy to report on current condition of RB3 riparian resources
- Support State/regional wetland/riparian protection efforts

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RAPID RIPARIAN ASSESSMENT METHOD

PROCESS TO DEVELOP A RIPARIAN CONDITION ASSESSMENT TOOL

- Define levels of access (direct, bridge/road)
- Evaluate available assessment tools
- Select a set of appropriate assessment tools
- Test efficacy of tools for different access
- Develop new RAM based on tested metrics
- Compare new RAM to CCAMP data at sites in RB3

REQUIREMENTS OF SELECTED METHODS TO TEST

- Rapid
- Strong focus on Riparian, not streams or wetlands
- Reproducible
- Address as many functions as possible

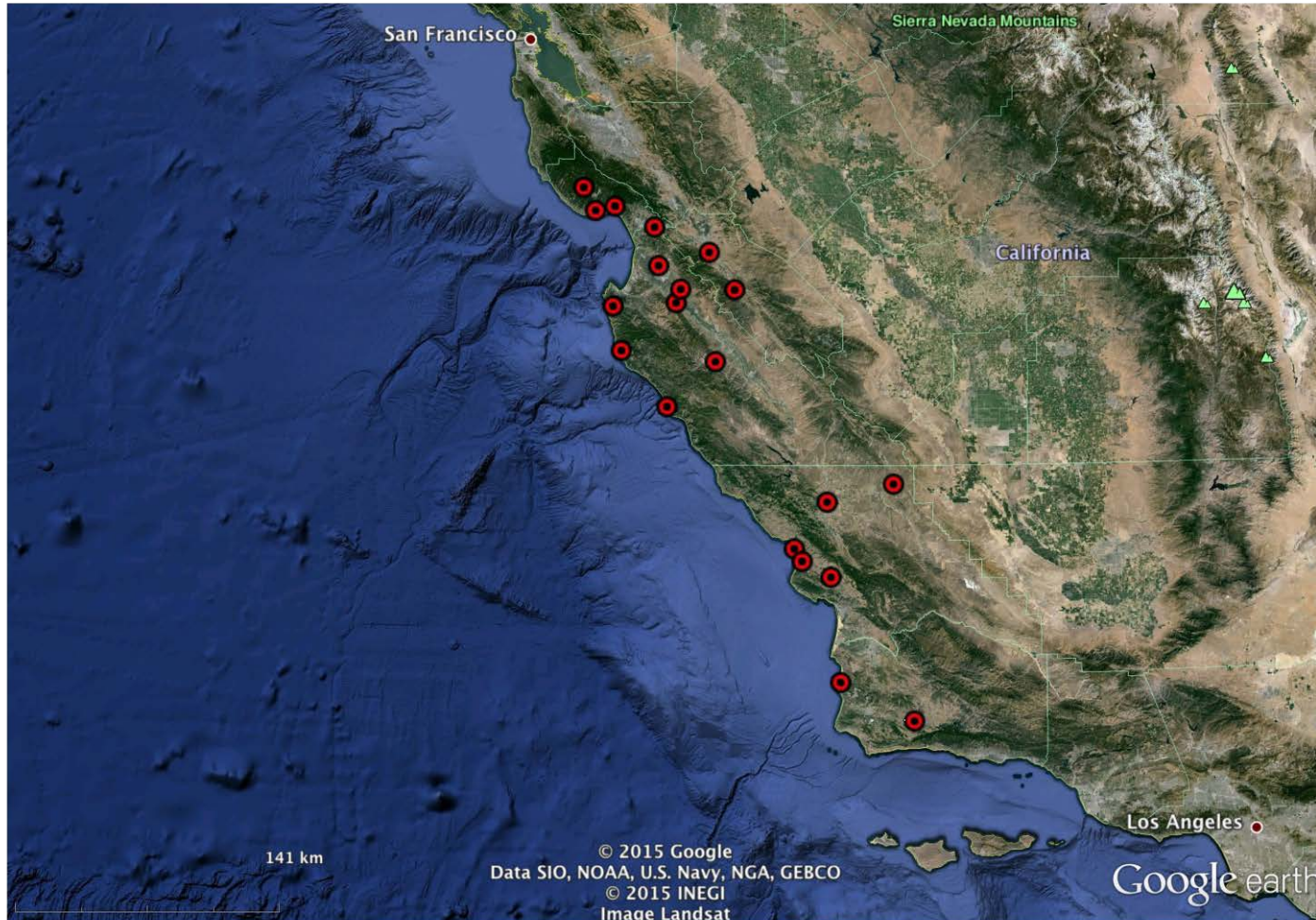


FINAL LIST OF TESTED METHODS

- Index of Riparian Quality (QBR)-Spain
 - O-QBR (Ohio version)
- Rapid Appraisal of Riparian Condition (RARC)-Australia
- Riparian Quality Index (RQI)-Spain
- Rapid Stream-Riparian Assessment (RSRA)-Arizona
- Visual Assessment of Riparian Health (VARH)-California

- **PLUS CRAM!**

RIPRAM DEVELOPMENT SITES



Google Earth Pro

miles
km



NEW RIPARIAN RAM METRICS (8)

Combination of:

- O-QBR: Total Riparian Cover, Cover Structure, Cover Quality
- RQI: Age Diversity and Regeneration of Woody Species, Dimension of Land with Riparian Vegetation, Substratum and Vertical Connectivity (infiltration capacity)
- *VARH: Macroinvertebrate Habitat, Fish Habitat

*these are in-channel metrics and may be removed in the final version of RRAM

RRAM V.1

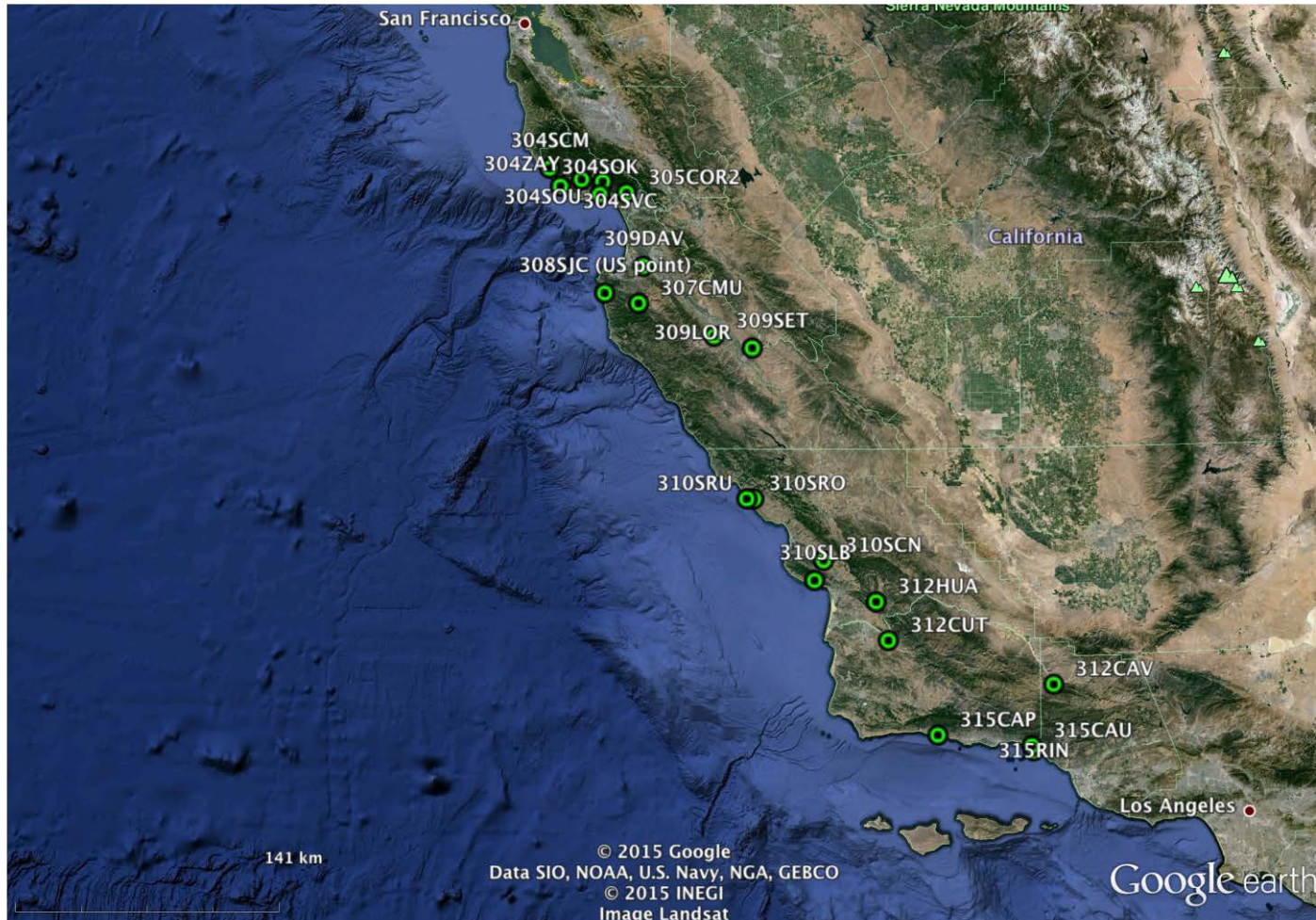
California Riparian Rapid Assessment Method

Central Coast Wetlands Group, 2015

Version 1.0



RIPRAM VERIFICATION SITES



RRAM V.1.3

Riparian Rapid Assessment Method for California

Central Coast Wetlands Group, 2016

Version 1.3 – Bridge/onsite scale strategy





WATERSHED ASSESSMENTS USING RIPRAM

SITE SELECTION

- A partnership with Santa Cruz County to look at riparian condition in streams with salmonids
- 20 bridge crossing sites were selected from each watershed based on accessibility
- In the event that a particular site could not be assessed, due to either access issues or incompatibility with our protocol, the nearest accessible site was chosen as a replacement

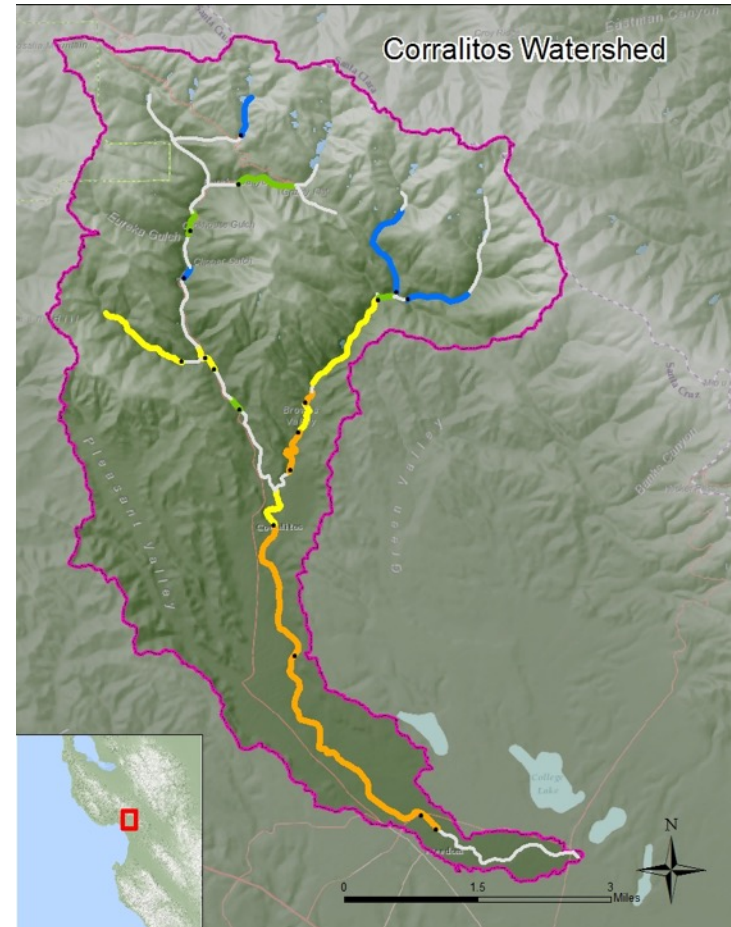
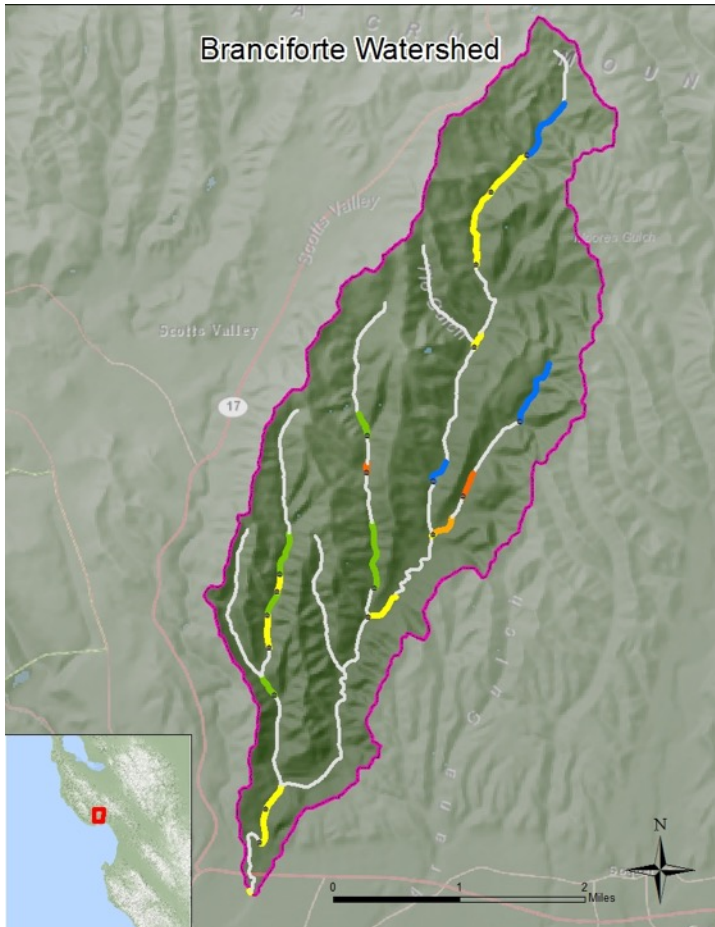
SITE ASSESSMENTS

- When conditions permitted assessments were performed within the stream across the entire reach of the AA.
- In instances where conditions did not allow access to the stream (i.e. high flows, poison oak thickets/ thick vegetation, private property etc.) the assessments were done from the original stream crossing and surrounding vantage points.
- Sites took between 30-60 minutes to assess meaning an entire watershed could be completed, including data entry, in roughly one week.

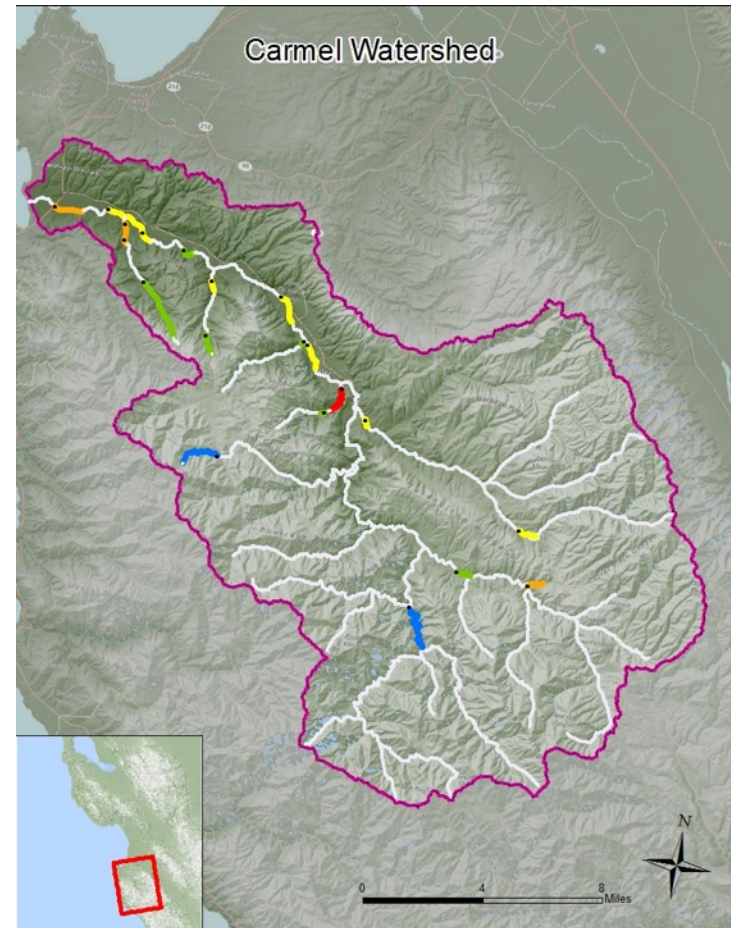
SCORE PROJECTION

- An effort was made to determine how far the RipRAM score for a particular assessment area continued upstream.
- Differences in *land use, hydrologic regime or density of invasive plant species* were used to establish break points in the score projection
- If no roadway was available, locations of score change were estimated using Google Earth and ArcGIS.
- These score projection points allowed us to create maps characterizing the riparian quality for a large portion of the four watersheds.

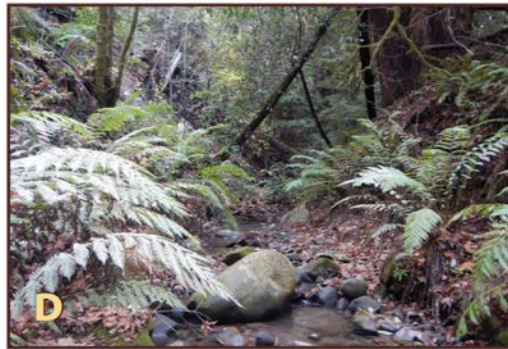
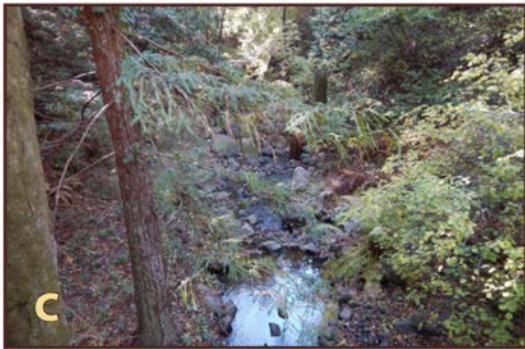
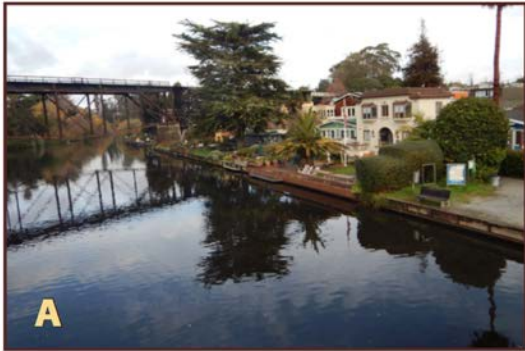
SMALL WATERSHEDS



LARGER WATERSHEDS



EXAMPLE SITES AND RIPRAM SCORES



A) Soquel creek mouth, index score of 24. B) An unnamed creek in Carmel, index score of 15. C) Branciforte creek, index score of 98. D) An unnamed creek in Corralitos, index score of 93.

Study Area: Morro Bay



REMOTE RIPARIAN ASSESSMENT

GIS-BASED TREE MAPPING

Comparing Supervised Classification
Using RapidEye and NAIP CIR Imagery



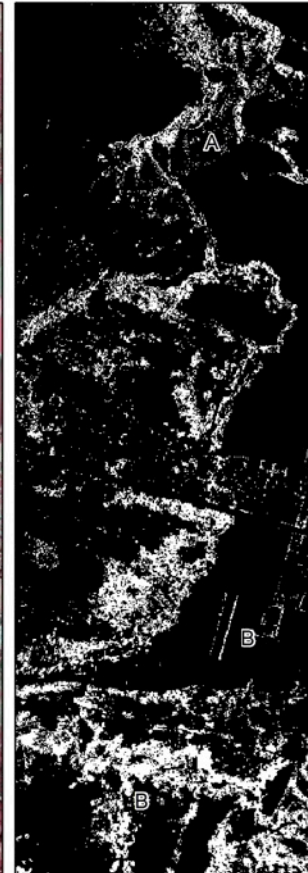
RapidEye Imagery: bands 4-3-2

Supervised Classification

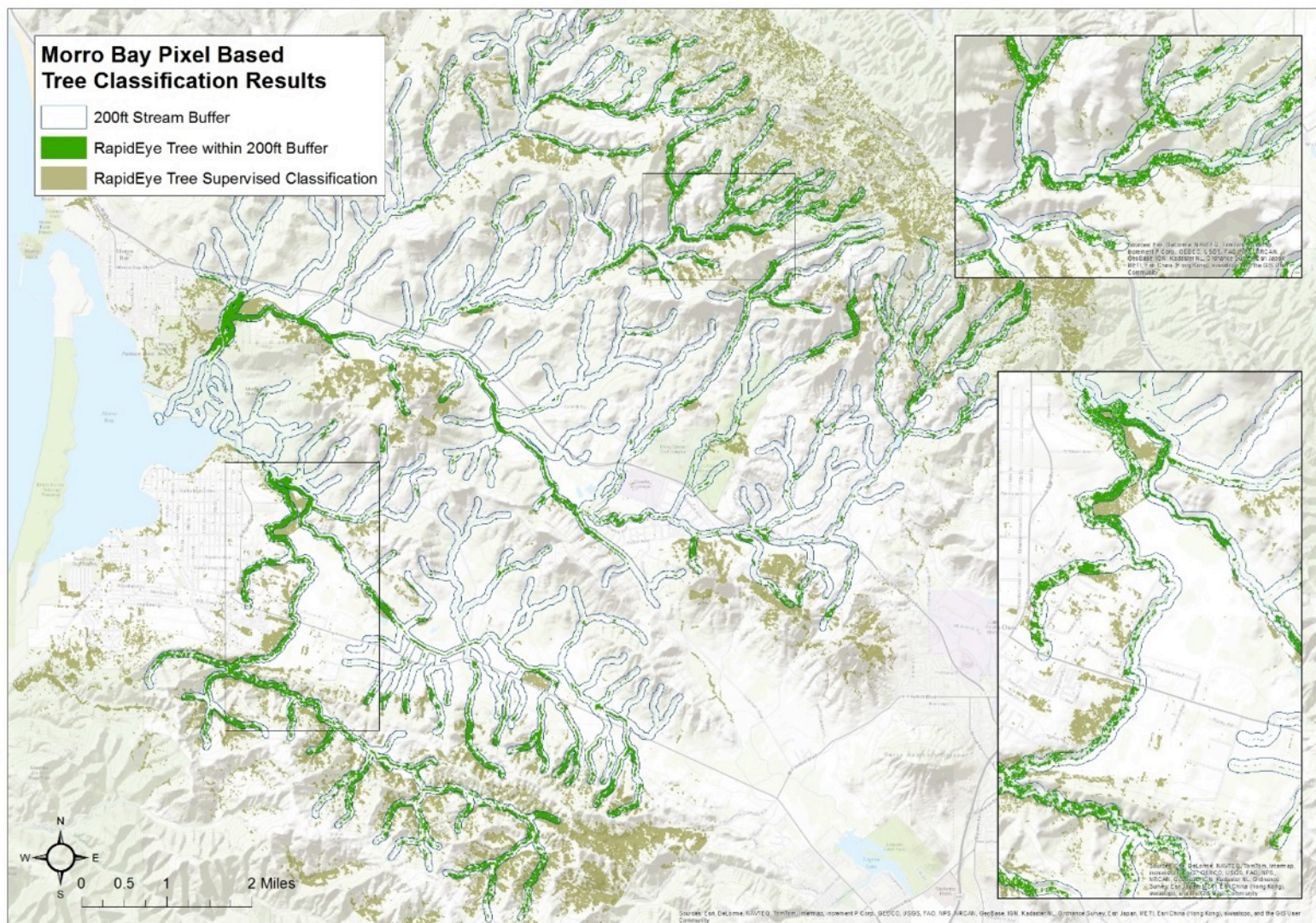


NAIP CIR Imagery

Supervised Classification

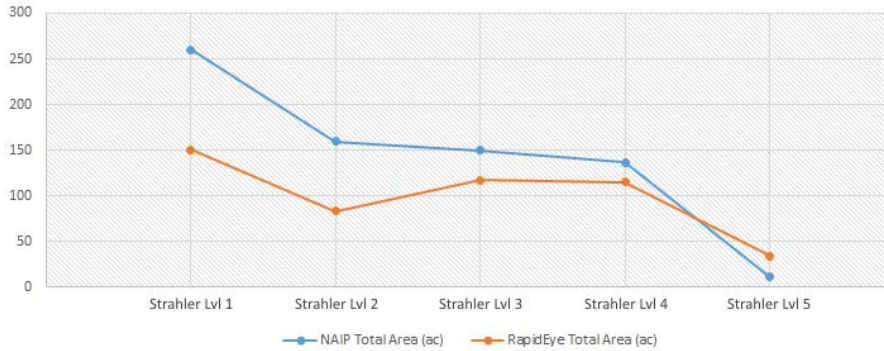


MORRO BAY TREE COVER

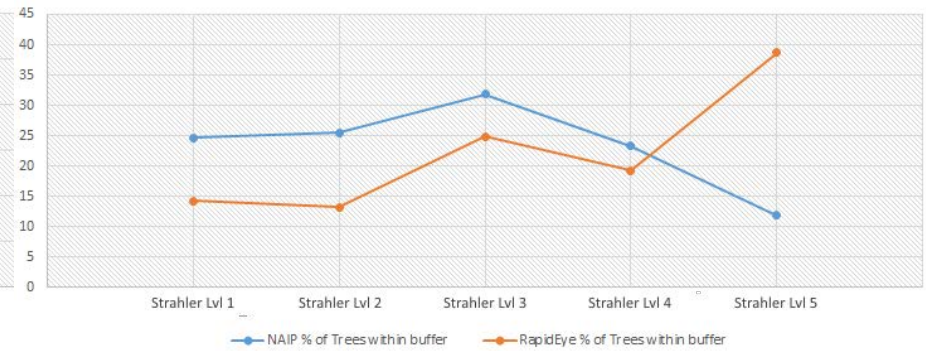


RIPARIAN EXTENT IN MORRO BAY

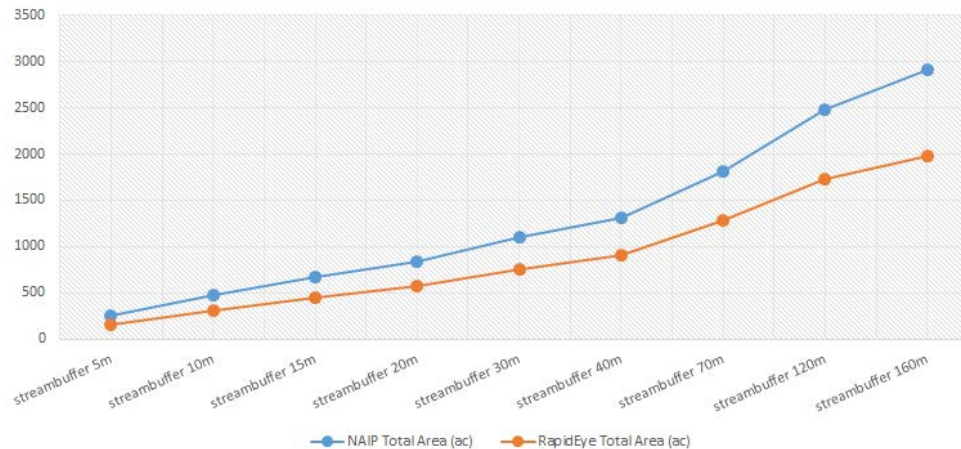
Acres of Trees by Strahler Buffer (10m x Strahler Order)



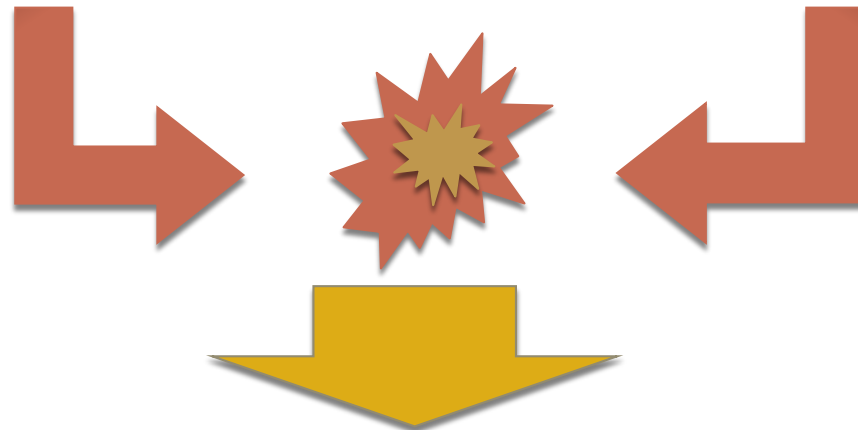
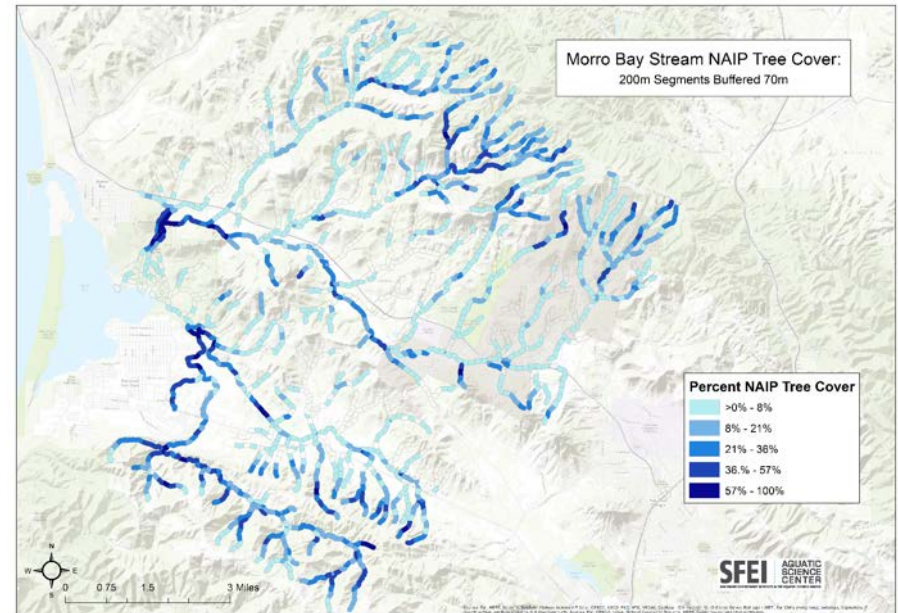
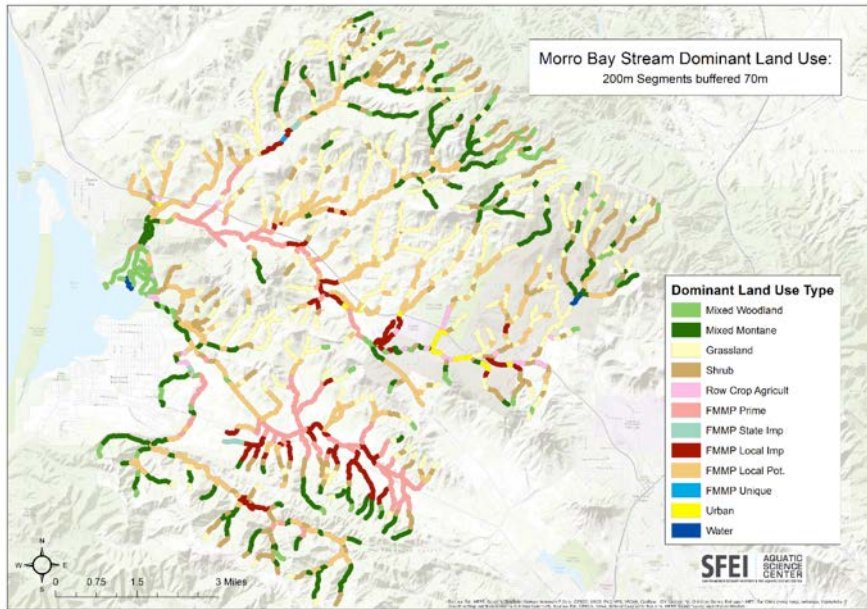
Percent Tree cover by Strahler Buffer (10m x Strahler Order)



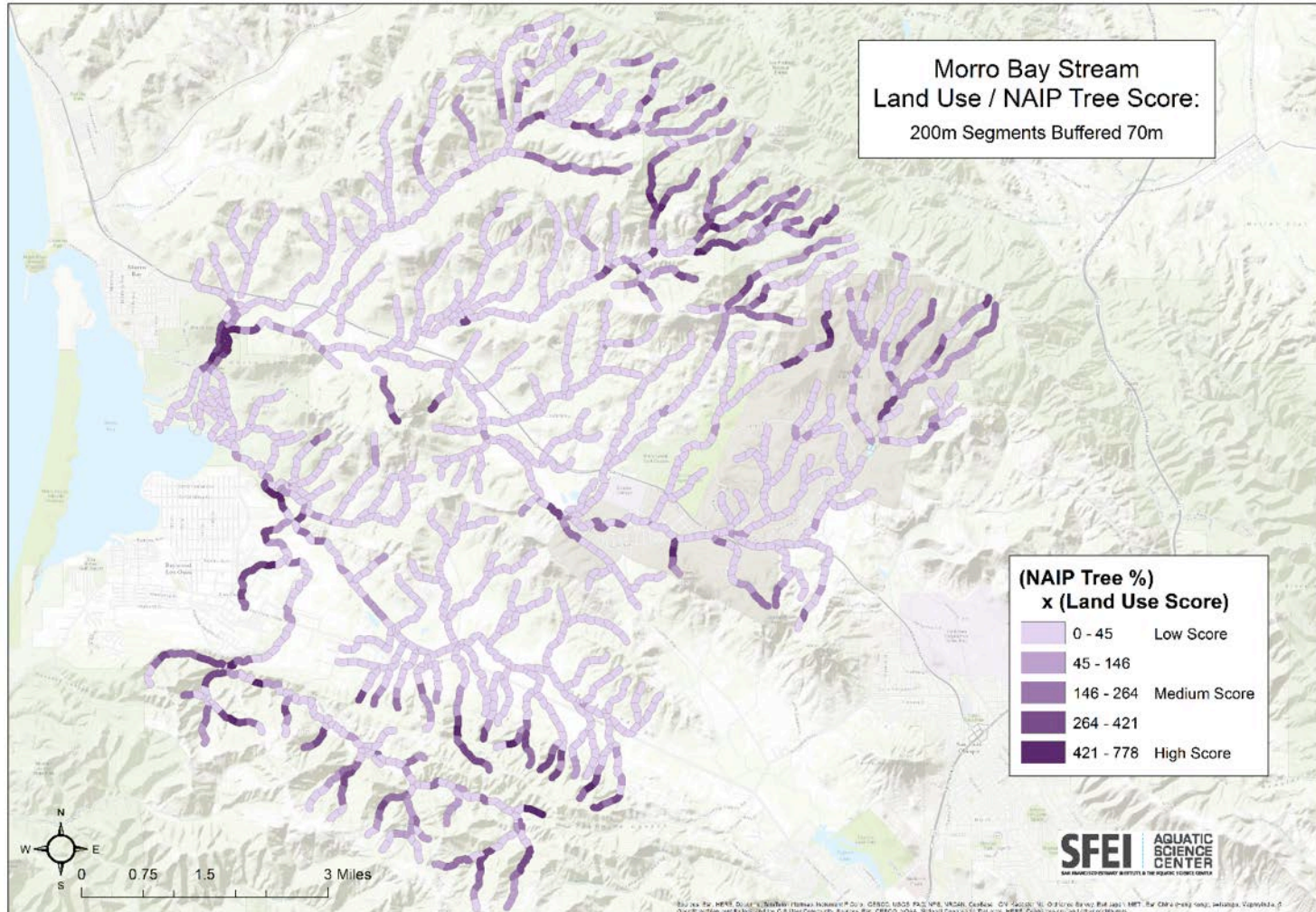
Average of Pixel Based Supervised Classification of Trees by Buffer Width



LAND USE STRESS AND TREE COVER

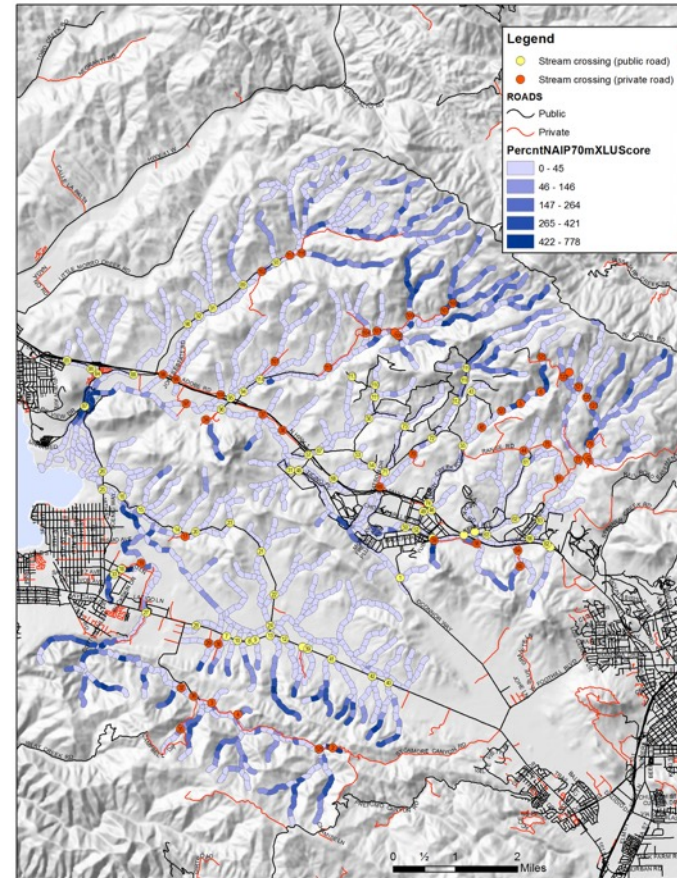


REMOTE ASSESSMENT



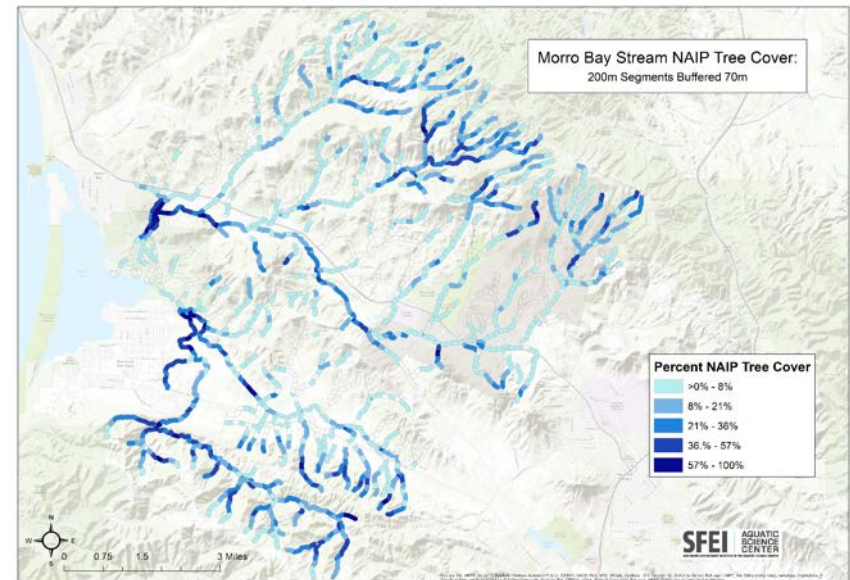
STREAM CROSSINGS

- Selected 24 public stream crossings sites representing a range of scores from the Remote Assessment (tree cover and landuse stress)
- Assessed each site using RipRAM



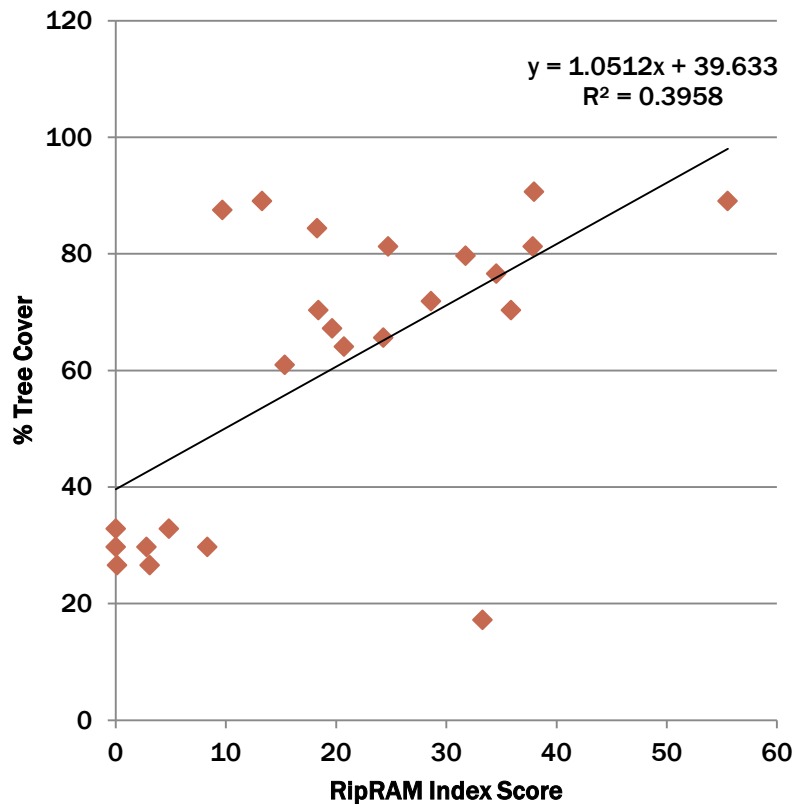
PERCENT TREE COVER AT DIFFERENT BUFFER DISTANCES

- Buffer distance based on:
 - 30m
 - 70m
 - 10x Strahler stream order
 - RipZET Veg and Slope output

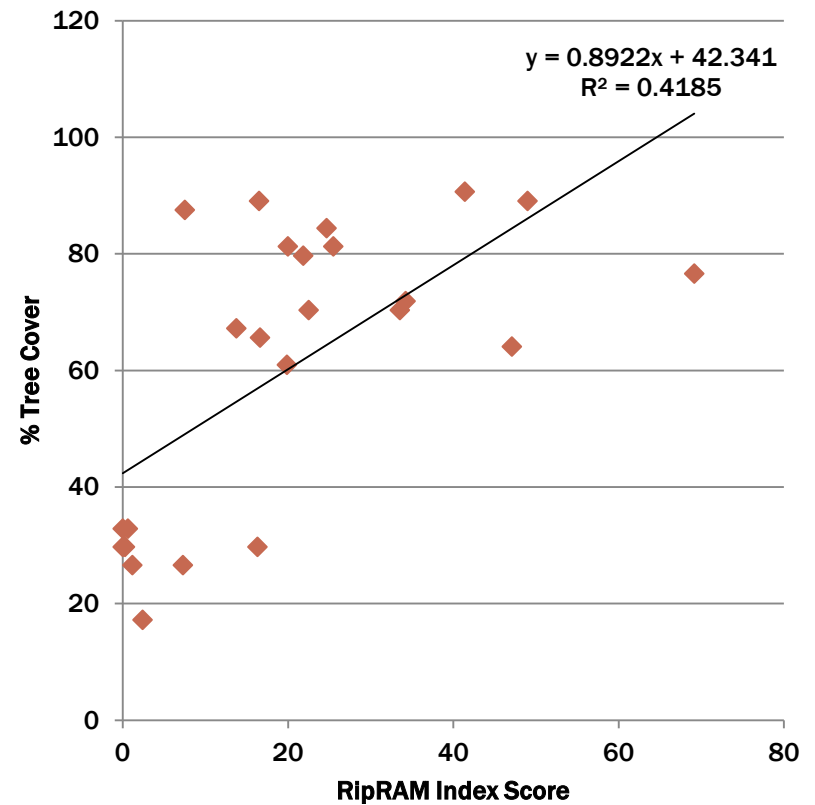


PERCENT TREE COVER AT DIFFERENT BUFFER DISTANCES

Index Score Vs strahler

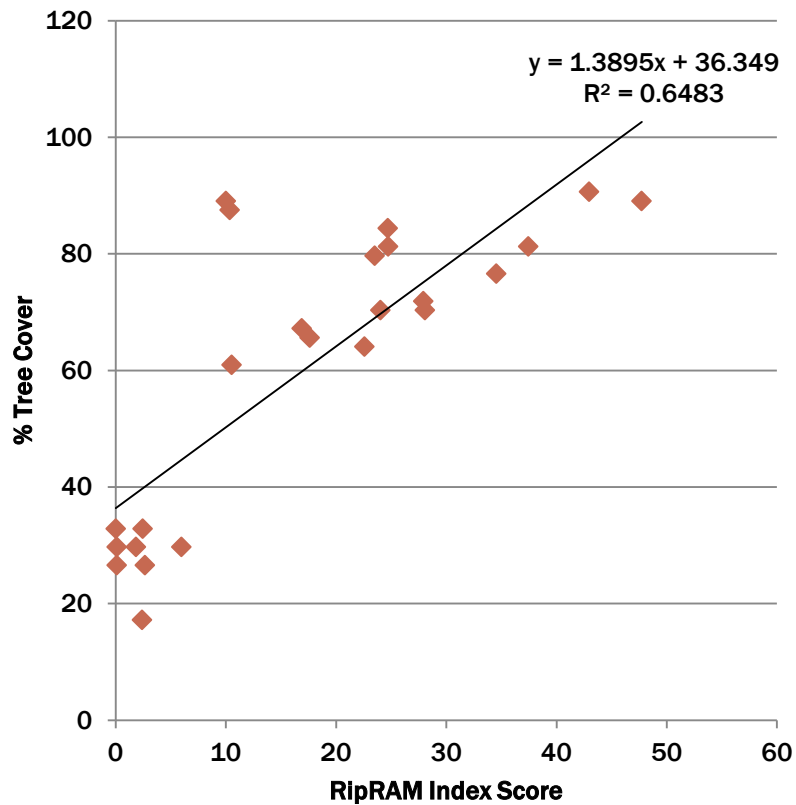


Index Score vs RipZet

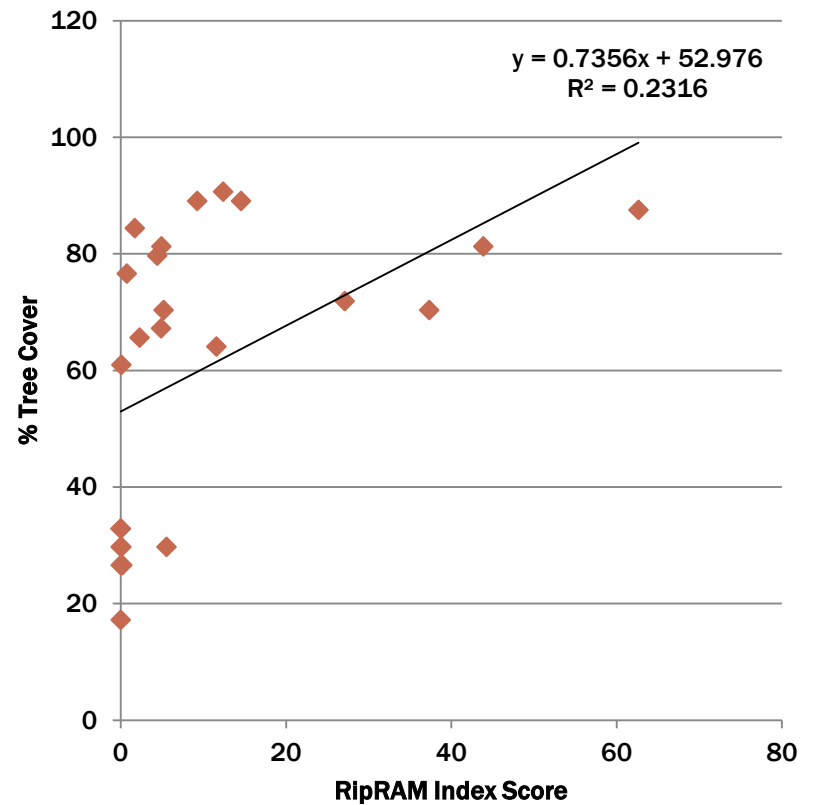


PERCENT TREE COVER AT DIFFERENT BUFFER DISTANCES

Index Score vs 30m

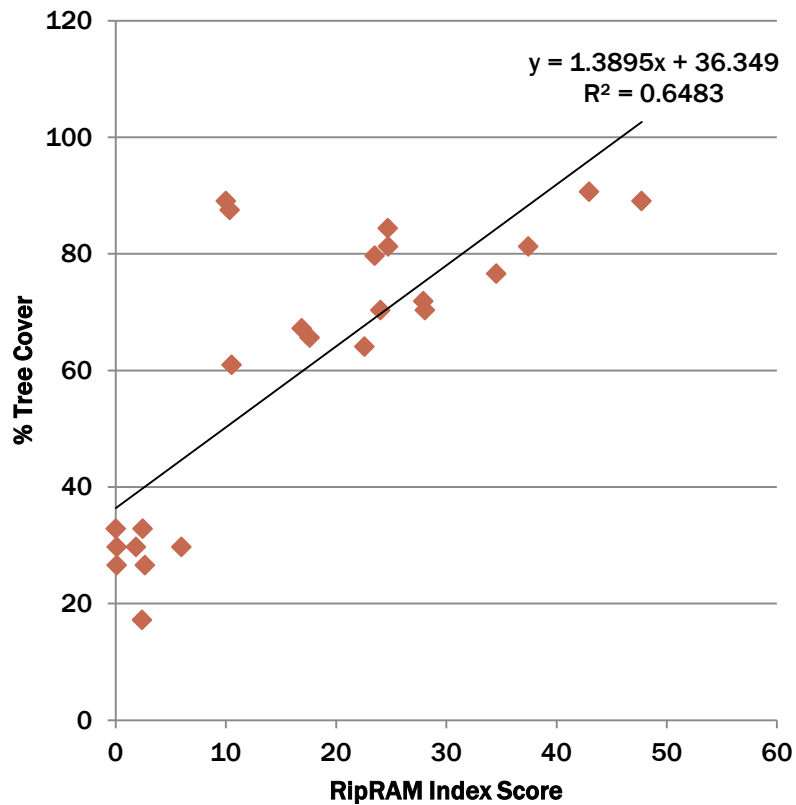


Index Score vs 70m

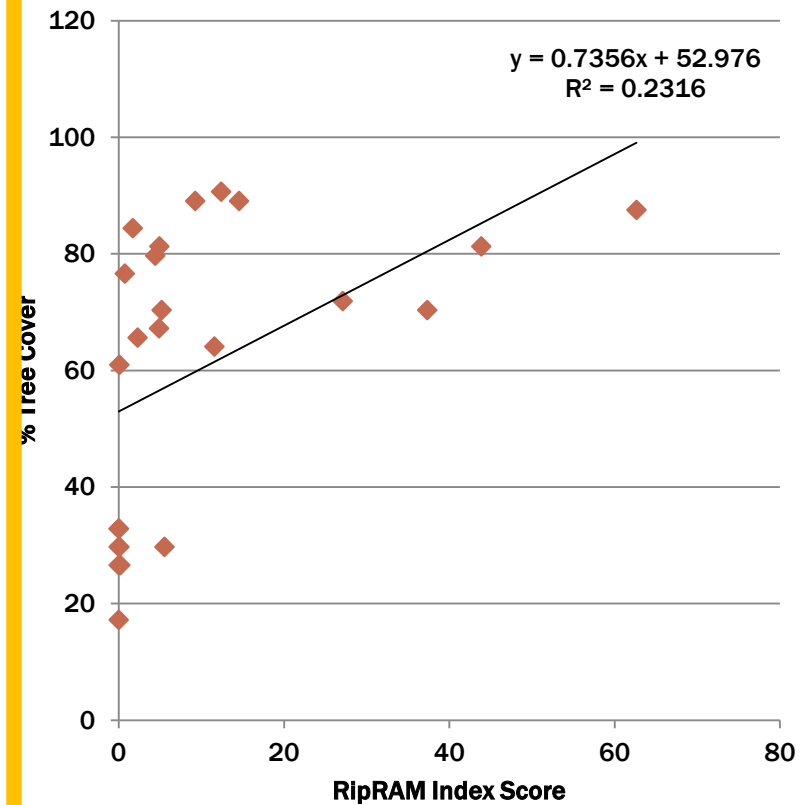


PERCENT TREE COVER AT DIFFERENT BUFFER DISTANCES

Index Score vs 30m



Index Score vs 70m





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**SUPPORT MONITORING
OF RIPARIAN
CONDITION BY RB3**

RIPARIAN HEALTH IN RB3



California Environmental Protection Agency
Central Coast Ambient Monitoring Program
 Central Coast Regional Water Quality Control Board

Home

Riparian Habitat

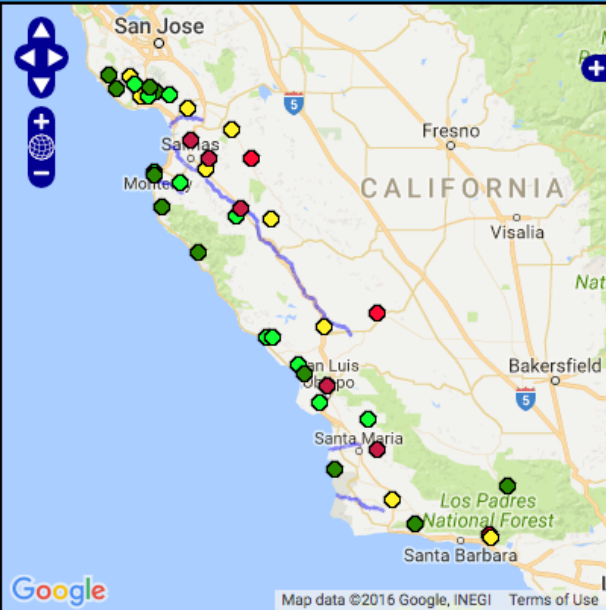
Analytes

Aquatic Life

Watersheds

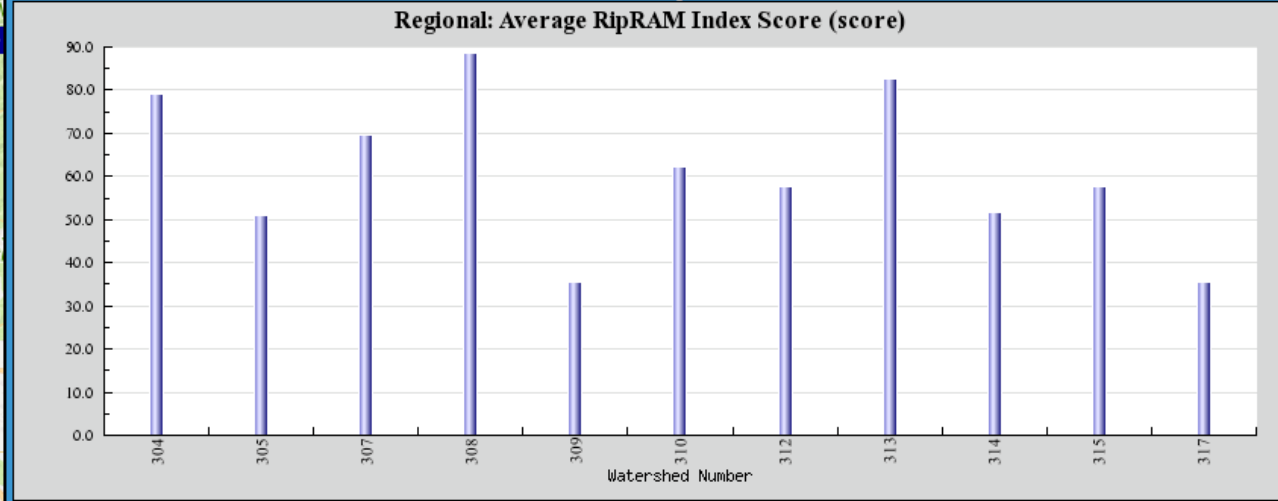
Waterbodies

Monitoring Sites



Watershed: Regionwide

Regional: Average RipRAM Index Score (score)



Map Overlays

Chart Options

More Information

Get Data

● = Excellent ● = Good ● = Fair ● = Poor ● = Very Poor ↑ = Getting Better ↓ = Getting Worse ○ = No change
 When no goal is available Lowest ○ = 0-25% ○ = 25-50% ○ = 50-75% ○ = 75-100% Highest ▲ = Increasing ▼ = Decreasing

NEXT STEPS

- Refine the remote riparian assessment method with additional work in reference watersheds
- Validate RipRAM throughout the state
- Complete additional watershed assessments in partnership with other Regional Boards and Counties