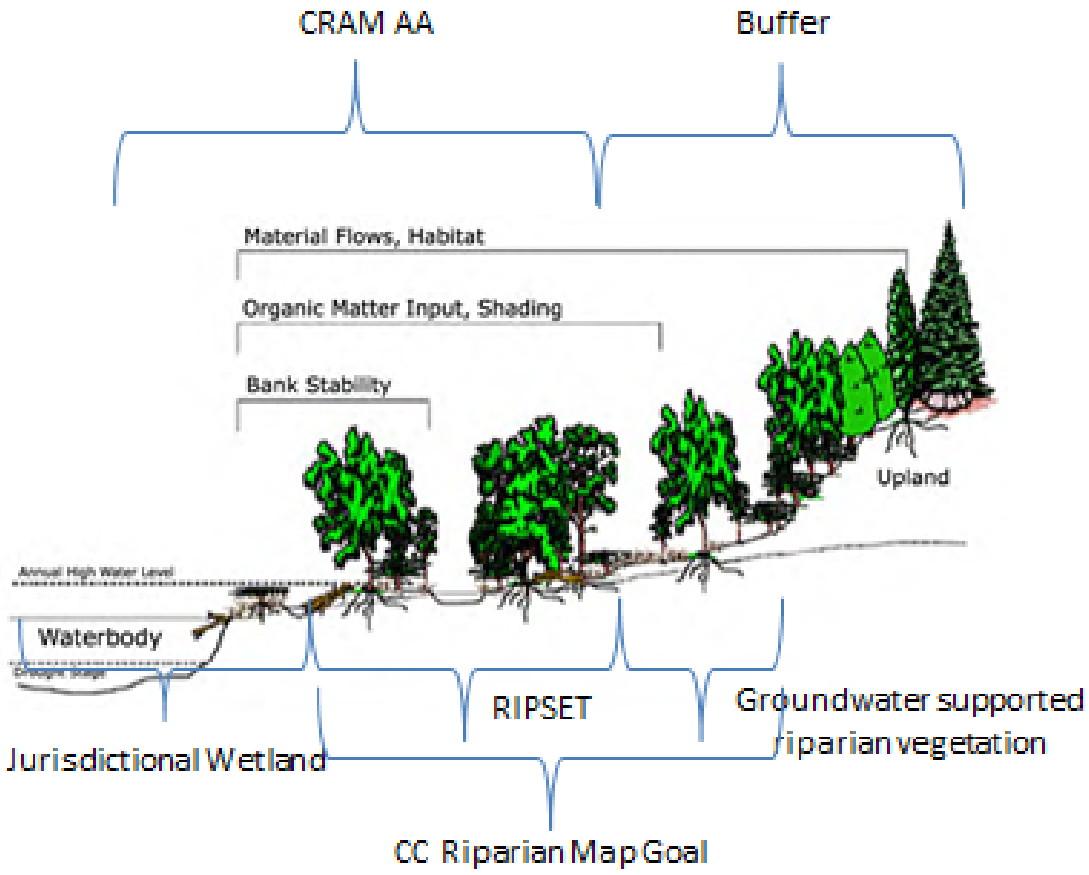
CENTRAL COAST RIPARIAN MAPPING AND ASSESSMENT PROJECT

GOALS

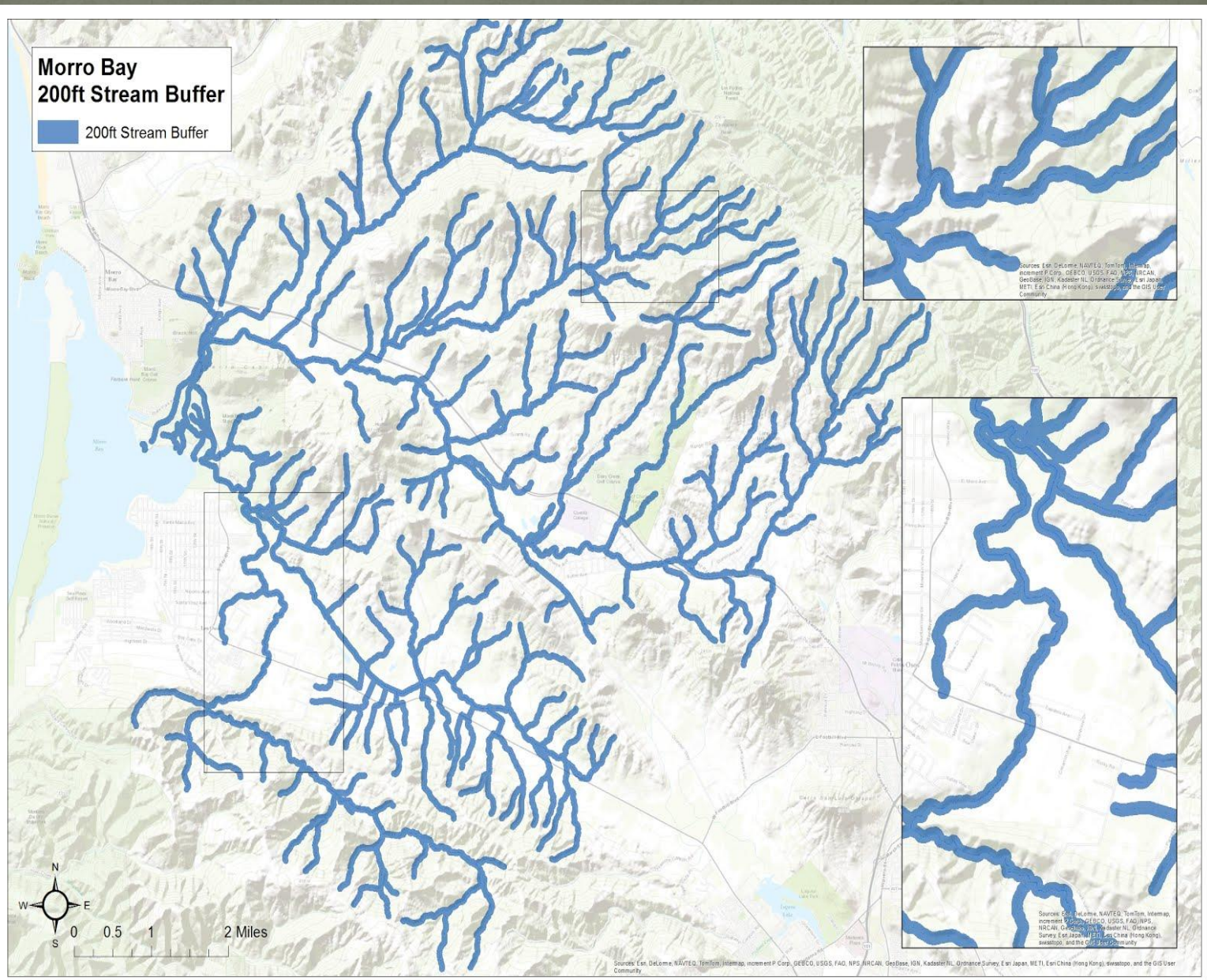
- Create a "Map" of riparian resources on the Central Coast
- Develop riparian condition assessment tools for areas with various levels of access
- Develop assessment strategy to report on current condition of RB3 riparian resources

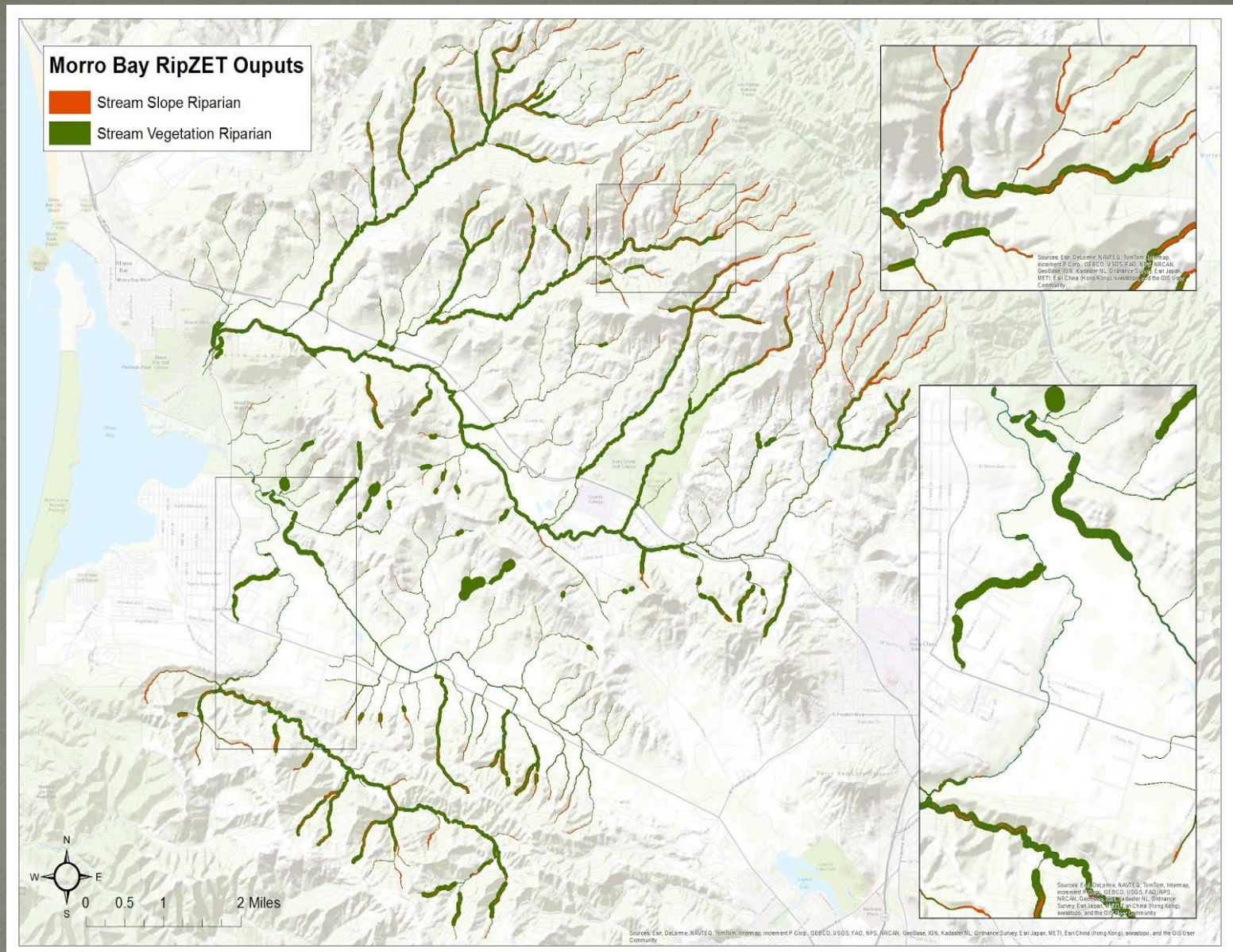
Riparian Areas Defined by Functions

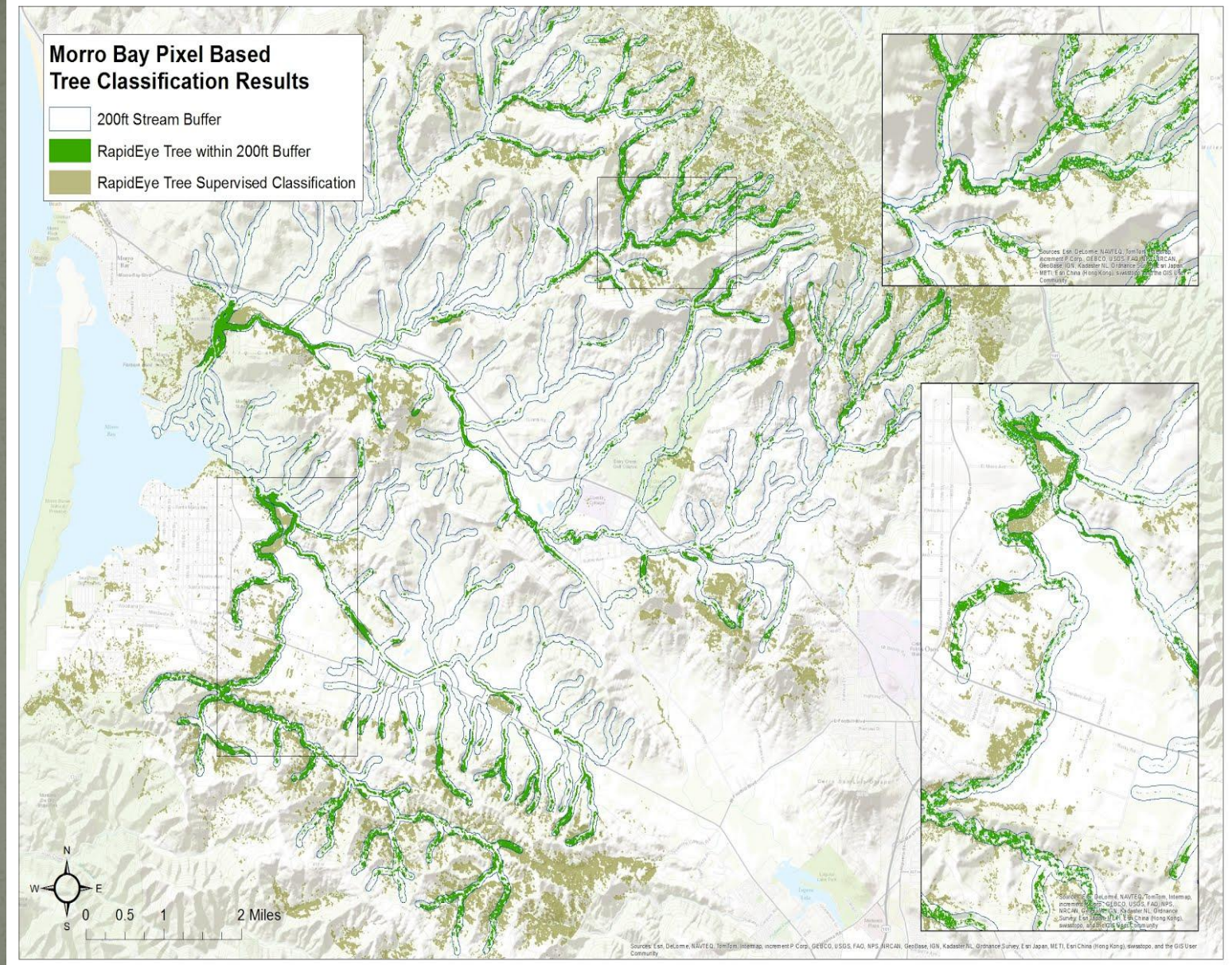


Three Riparian Mapping Methods

- Standard buffer from streams (200ft) - Region
- RipZET Riparian Function Models - Region
- Pixel Based Image Classification (trees) – Morro Bay Pilot


Morro Bay
200ft Stream Buffer
200ft Stream Buffer
N
W
E
S
0
0.5
1
2 Miles


Morro Bay RipZET Ouputs
Stream Slope Riparian
Stream Vegetation Riparian
N
W
E
S
0
0.5
1
2 Miles


Morro Bay Pixel Based
Tree Classification Results
200ft Stream Buffer
RapidEye Tree within 200ft Buffer
RapidEye Tree Supervised Classification
N
W
E
S
0
0.5
1
2 Miles
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordinance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Comparing Three Potential Estimations of Riparian Habitat: Rapid Eye Supervised Classification, RipZET Modeling, and a 200ft Buffer

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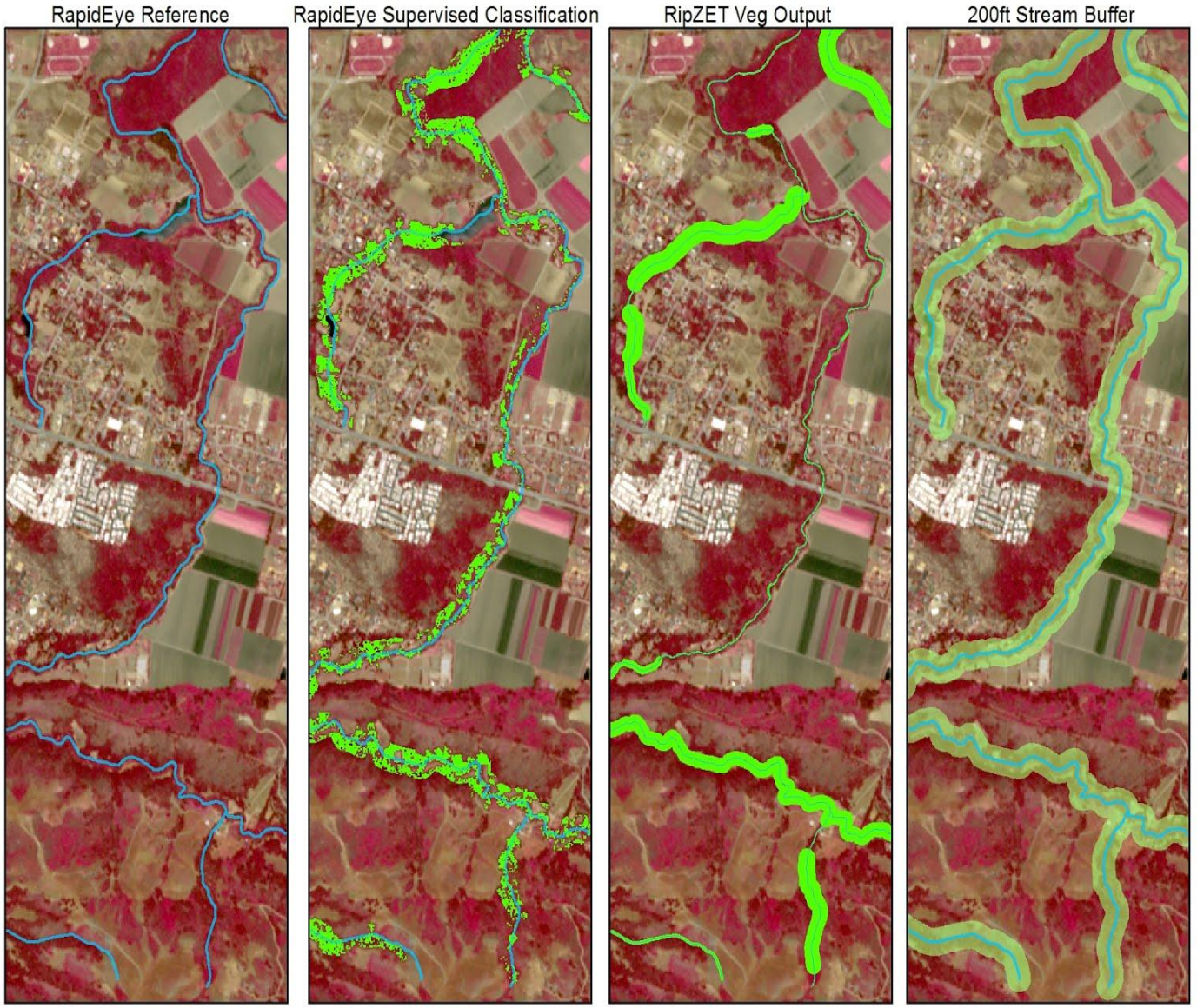

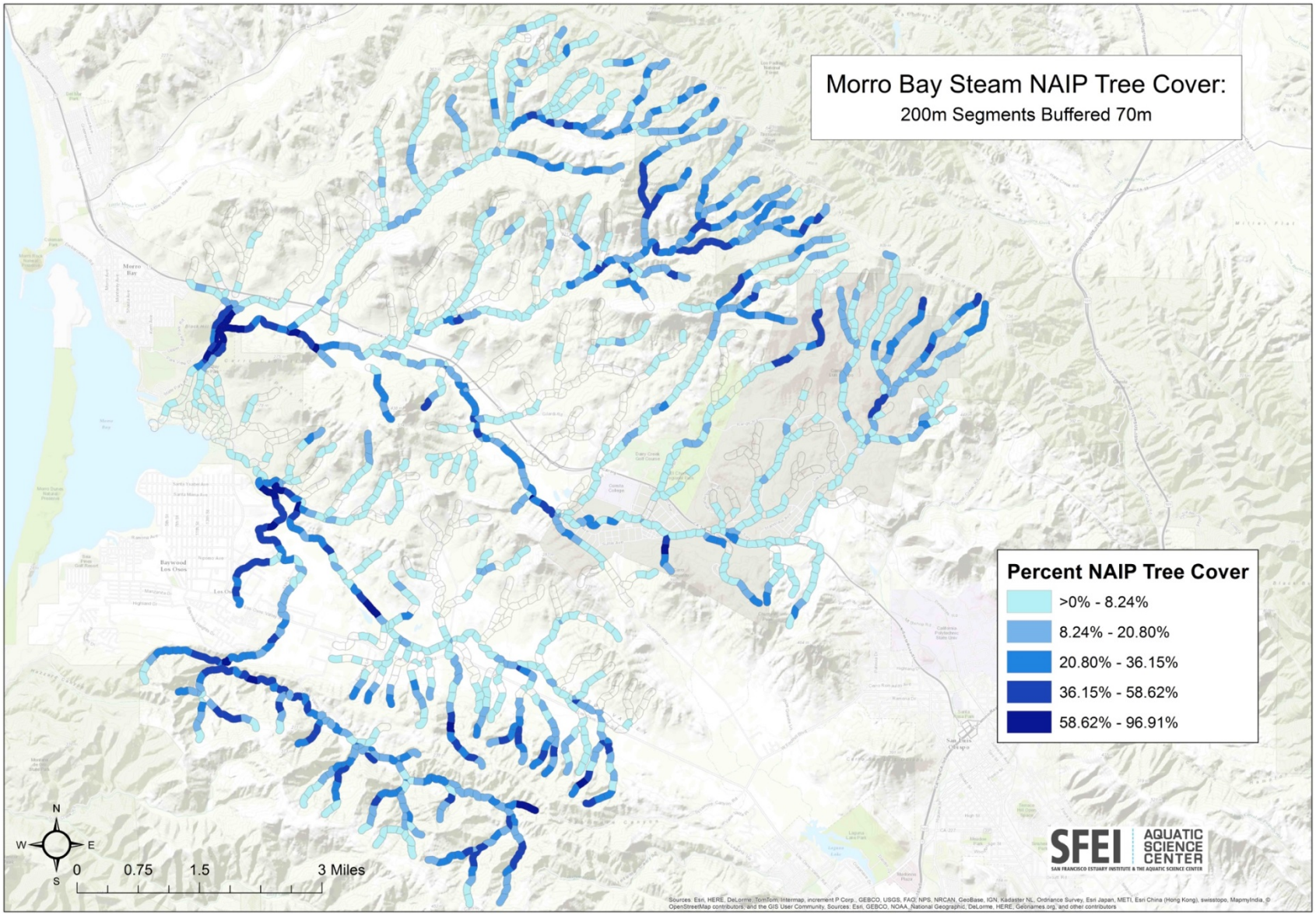
Morro Bay Steam NAIP Tree Cover:
200m Segments Buffered 70m
Percent NAIP Tree Cover
>0% - 8.24%
8.24% - 20.80%
20.80% - 36.15%
36.15% - 58.62%
58.62% - 96.91%
N
W
E
S
0
0.75
1.5
3 Miles
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SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

Riparian Assessment

RAM Development

Riparian Functions to Include

Based on TAC recommendations, literature review & Collins 2007

- Tree Shading (water cooling and microclimate control)
- Structural Shading in Stream
- Large Wood Input to Stream
- Leaf Litter Input to Stream
- Bank/Channel Stabilization
- General Biodiversity and Vegetation Species Complexity
- Habitat/Riparian Wildlife Support
- Stream/Wildlife Corridors and Habitat Connectivity
- Human Benefits: Recreation
- Human Benefits: Water Quality (nutrient and sediment capture)
- Human Benefits: Flood Attenuation

Requirements of Selected Methods:

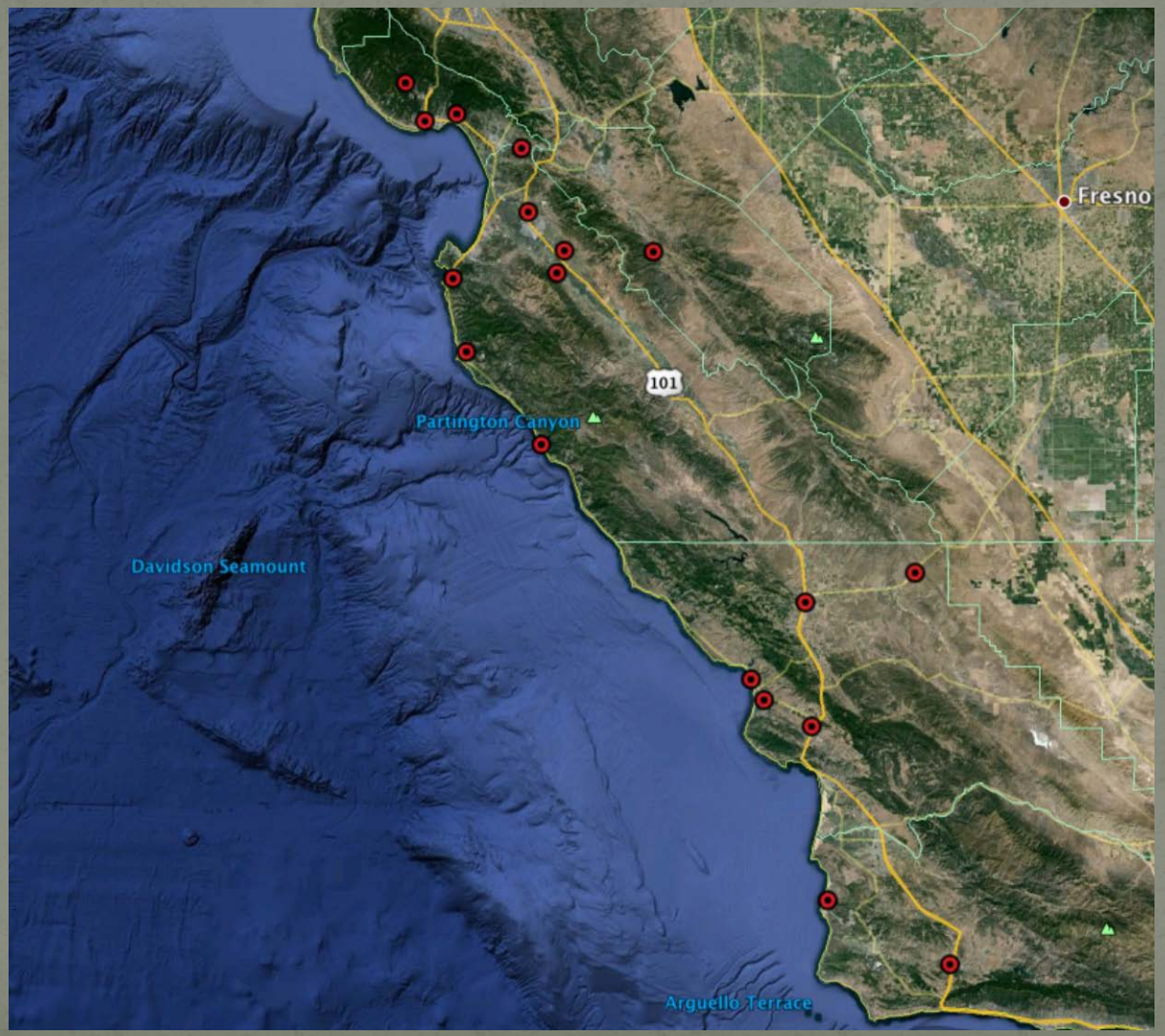
- Rapid
- Strong focus on Riparian, not streams or wetlands
- Reproducible
- Address as many functions as possible

Final List of Tested Methods

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

- + CRAM & CCAMP Water Quality

Riparian Assessment Locations



Procedure Followed

- Use RB3 Sample locations (at bridge crossings)
- Run 6 riparian assessments and CRAM at each site
- Complete each Protocol on Bridge (limited access) and in situ (full access)
- Establish Standard assessment length (100 m)

Santa Rita Creek

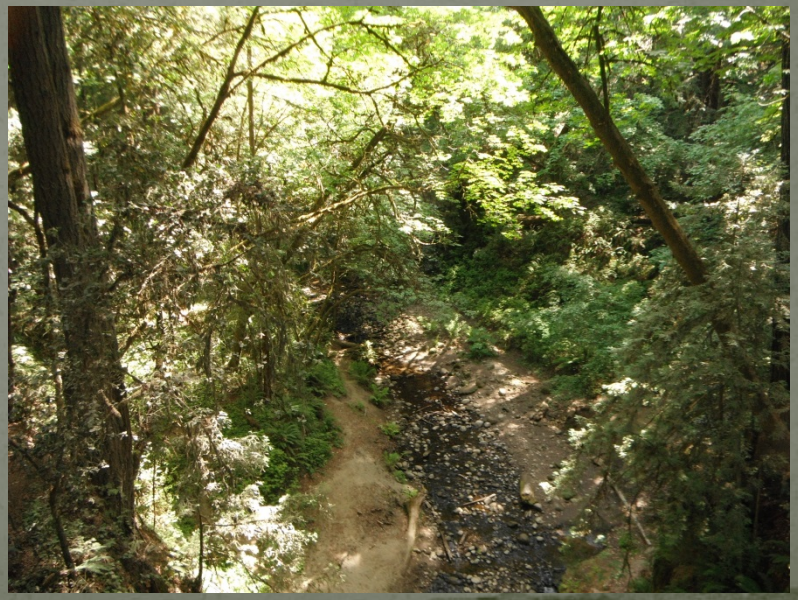
- Urban
- Agriculture upstream

Pajaro River

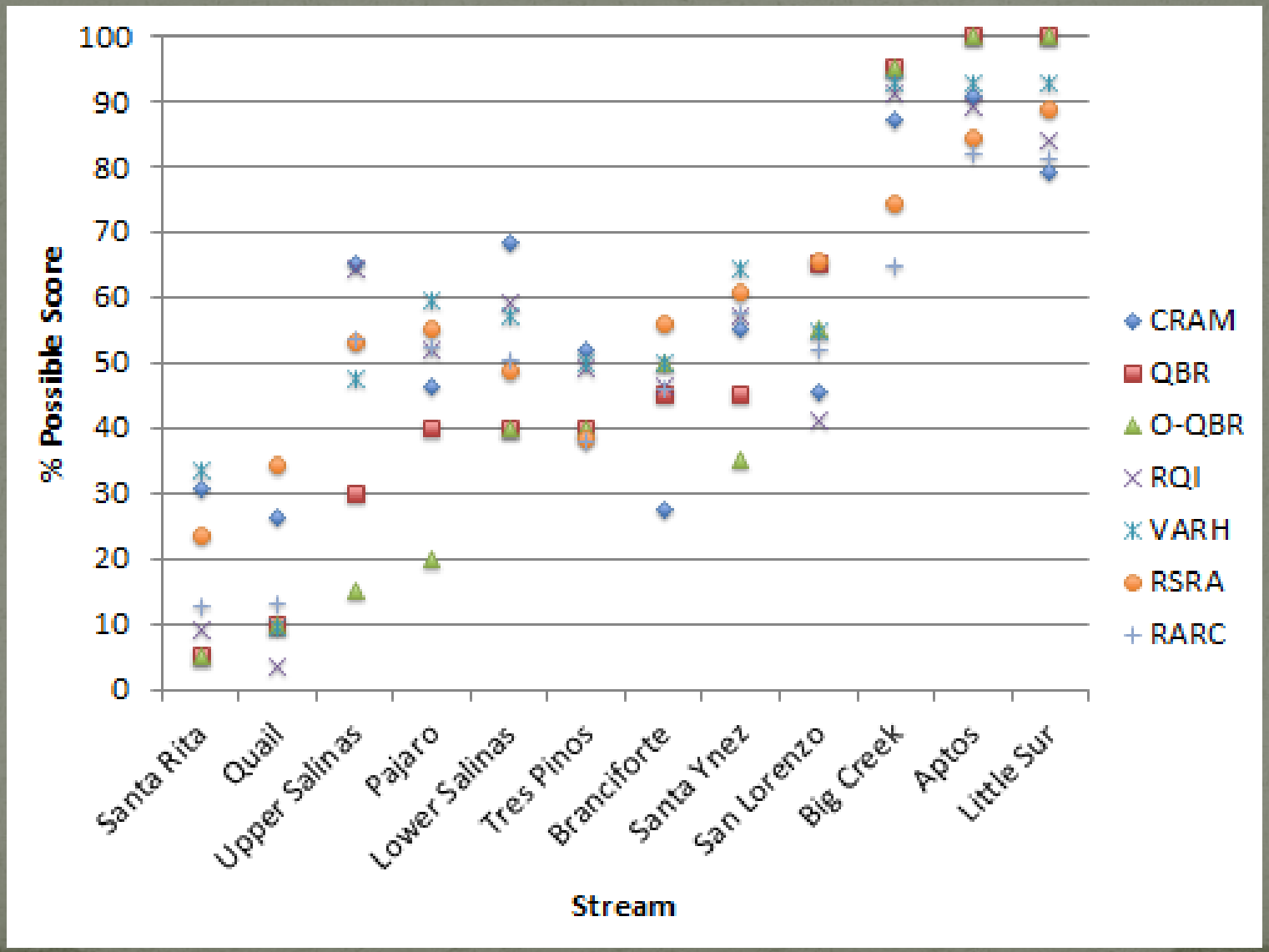
- Agriculture
- Urban and Ag upstream

Aptos Creek

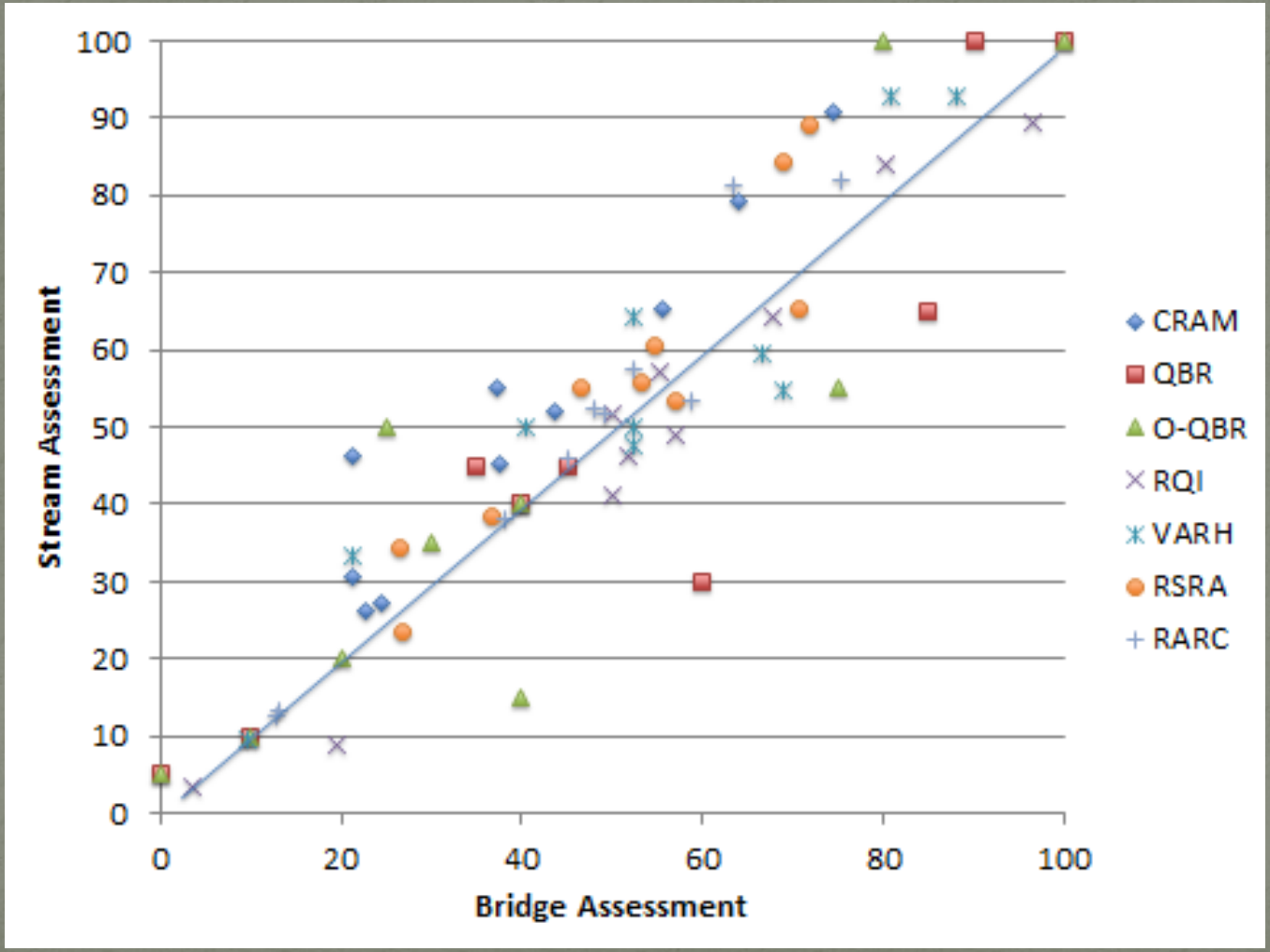
- Open space/rural
- Open space upstream



Distribution of Scores Among Methods



Bridge vs. Wet Survey Results

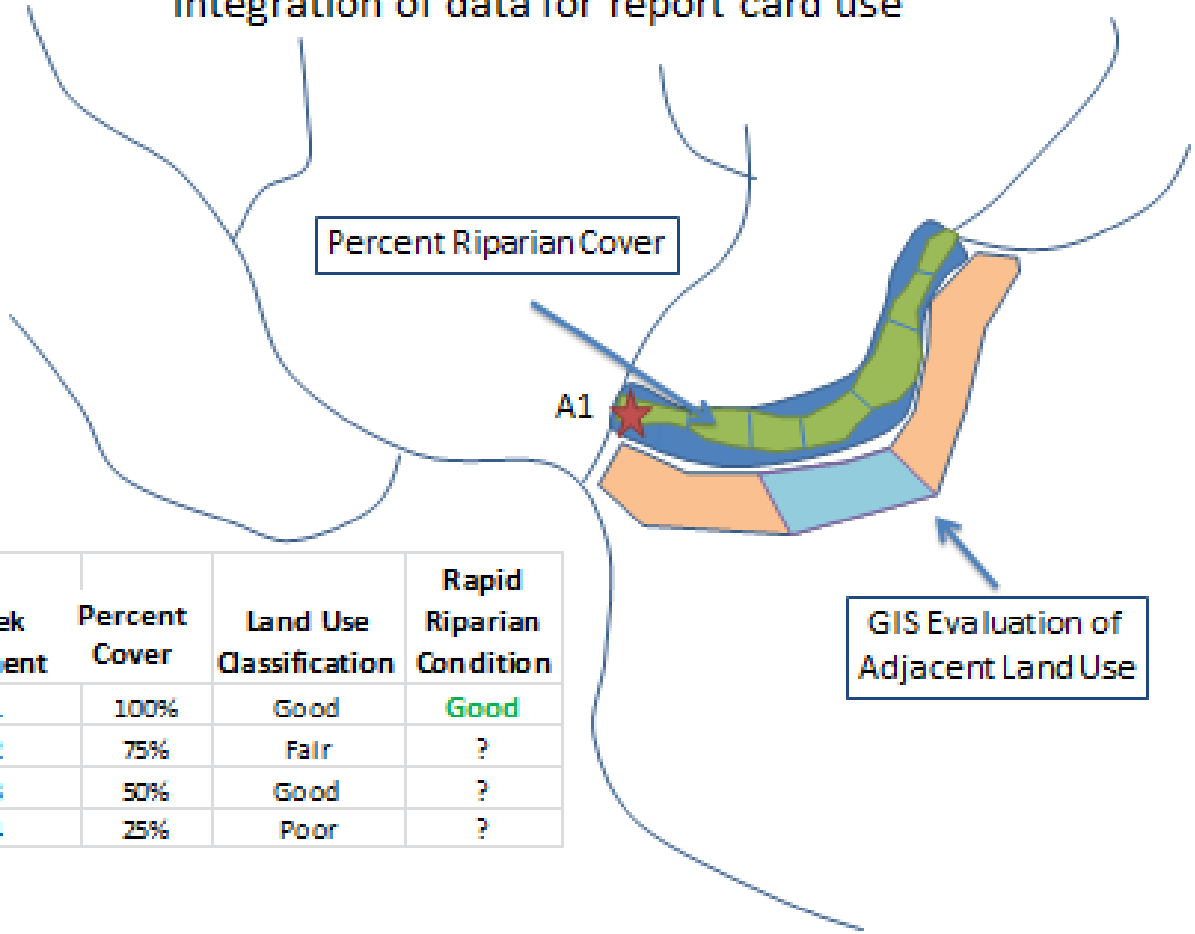


Develop a Monitoring/ Assessment Strategy

- Map Resource
- Define metrics for use in assessing resource condition
  - RRAM
  - Land-use information
  - Presence of riparian services within mapped area
- Integrate data into condition “score”
- Establish methods to extrapolate information into unassessed areas (up stream)

Integrating habitat and land use indicators to estimate upstream condition

Buffer condition Evaluation and
Integration of data for report card use



Creek Segment	Percent Cover	Land Use Classification	Rapid Riparian Condition
a1	100%	Good	Good
a2	75%	Fair	?
a3	50%	Good	?
a4	25%	Poor	?

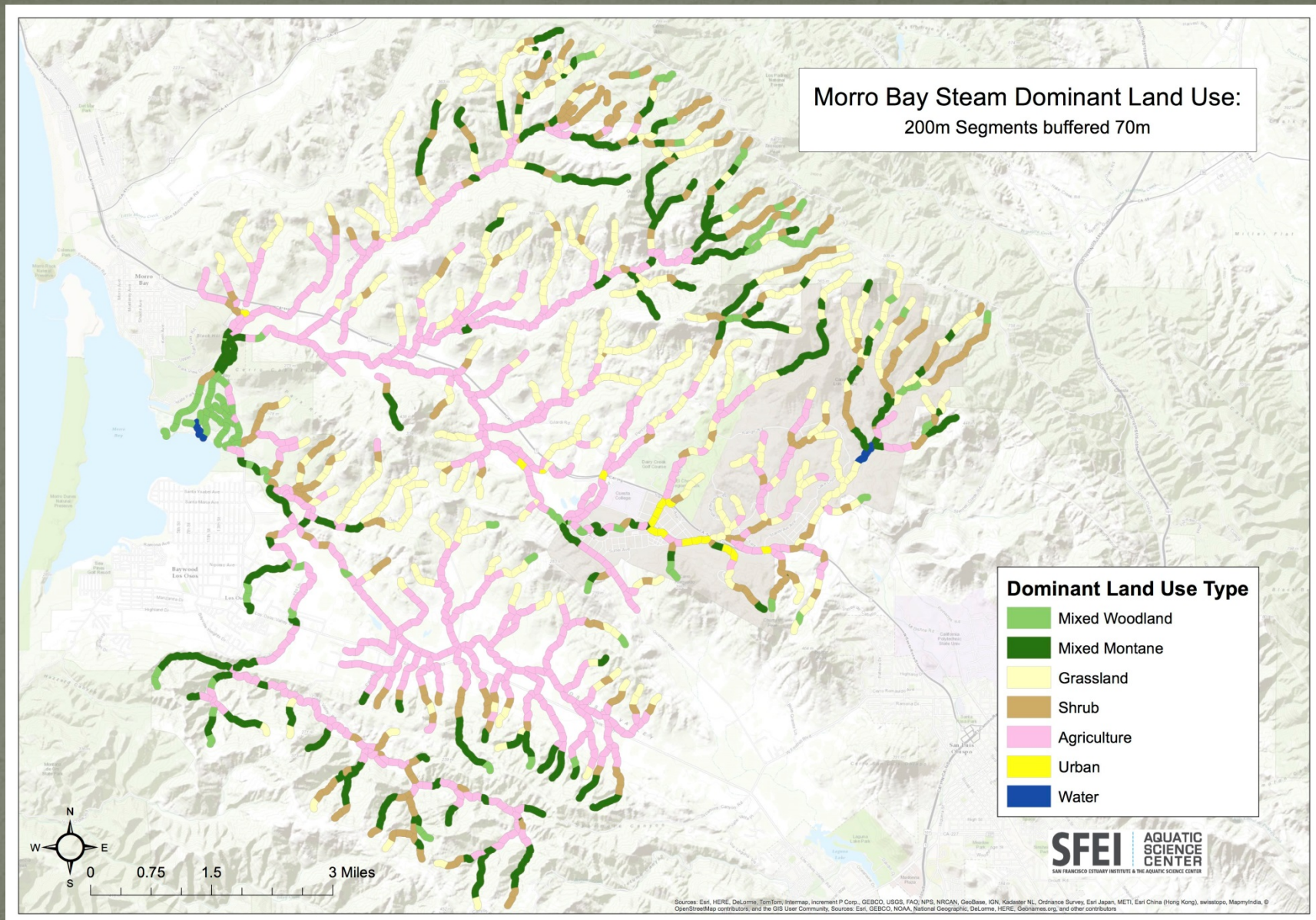
Riparian Tree cover

Adjacent Land Use stress

Rapid Riparian Condition

CCAMP Water Quality Datasets

Reach Level Riparian Condition Assessment


Morro Bay Steam Dominant Land Use:
200m Segments buffered 70m
Dominant Land Use Type
Mixed Woodland
Mixed Montane
Grassland
Shrub
Agriculture
Urban
Water
N
W
E
S
0
0.75
1.5
3 Miles
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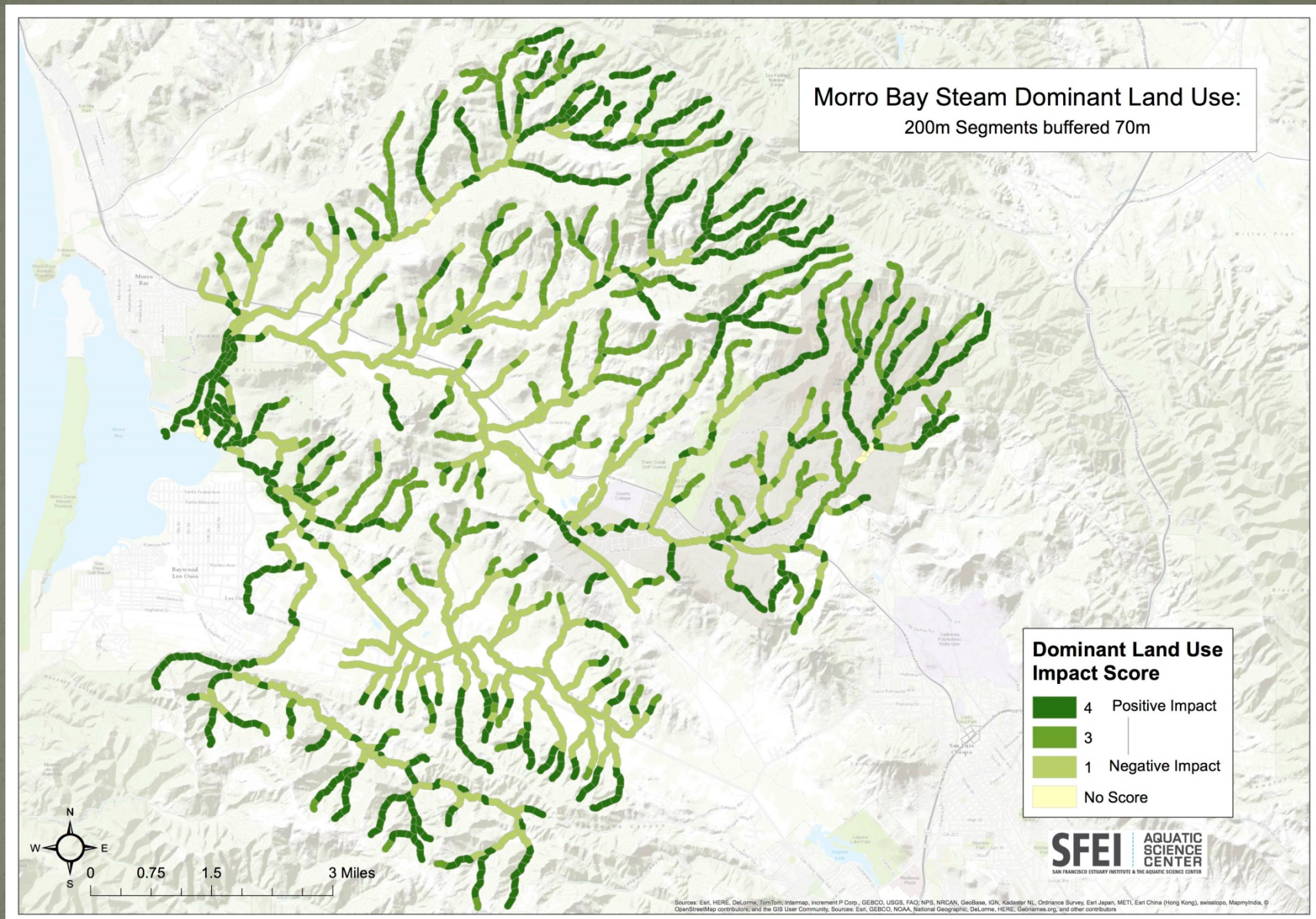
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors


Morro Bay Steam Dominant Land Use:
200m Segments buffered 70m
Dominant Land Use Impact Score
4
Positive Impact
3
1
Negative Impact
No Score
N
W
E
S
0
0.75
1.5
3 Miles
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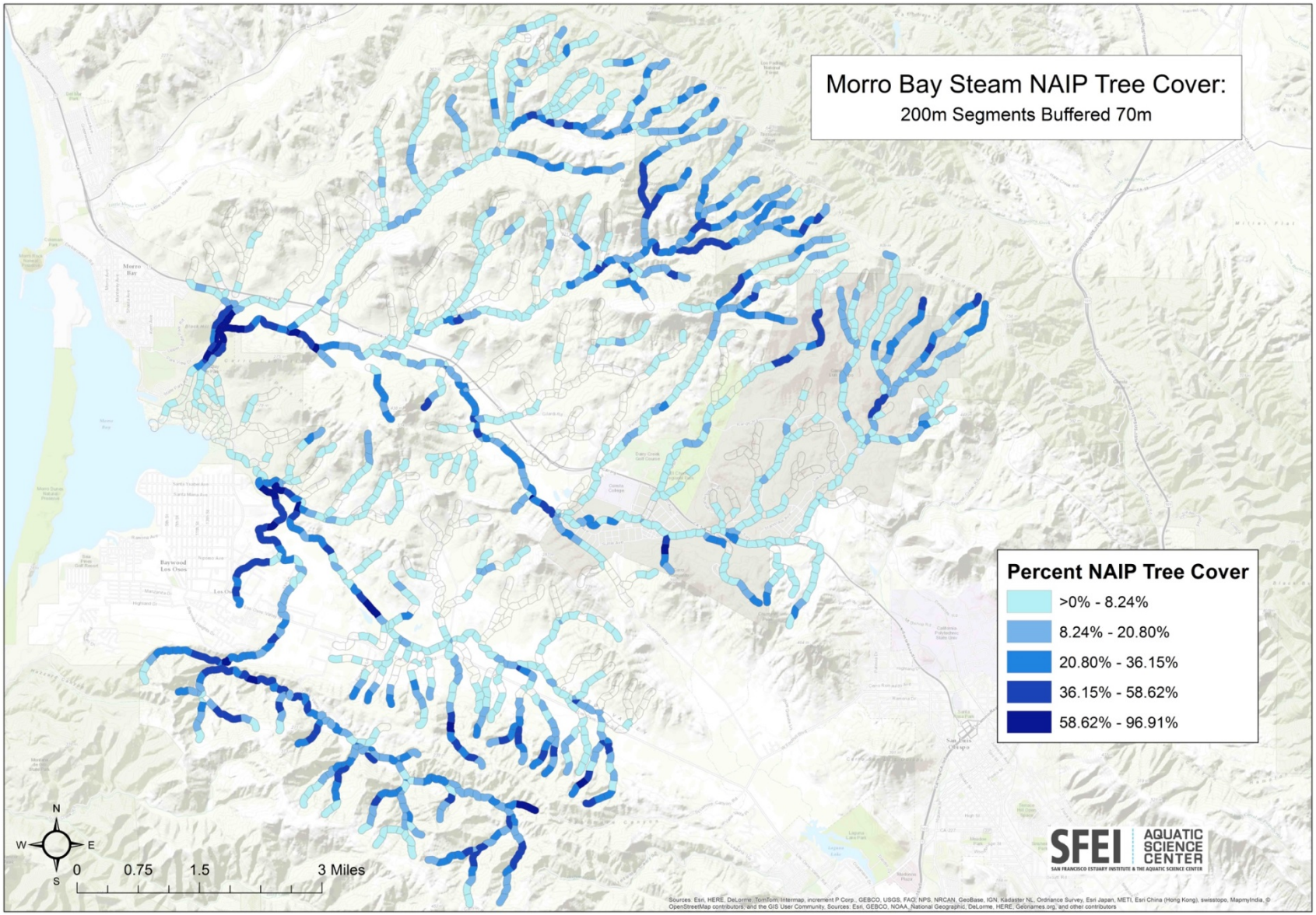
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors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8.24% - 20.80%
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58.62% - 96.91%
N
W
E
S
0
0.75
1.5
3 Miles
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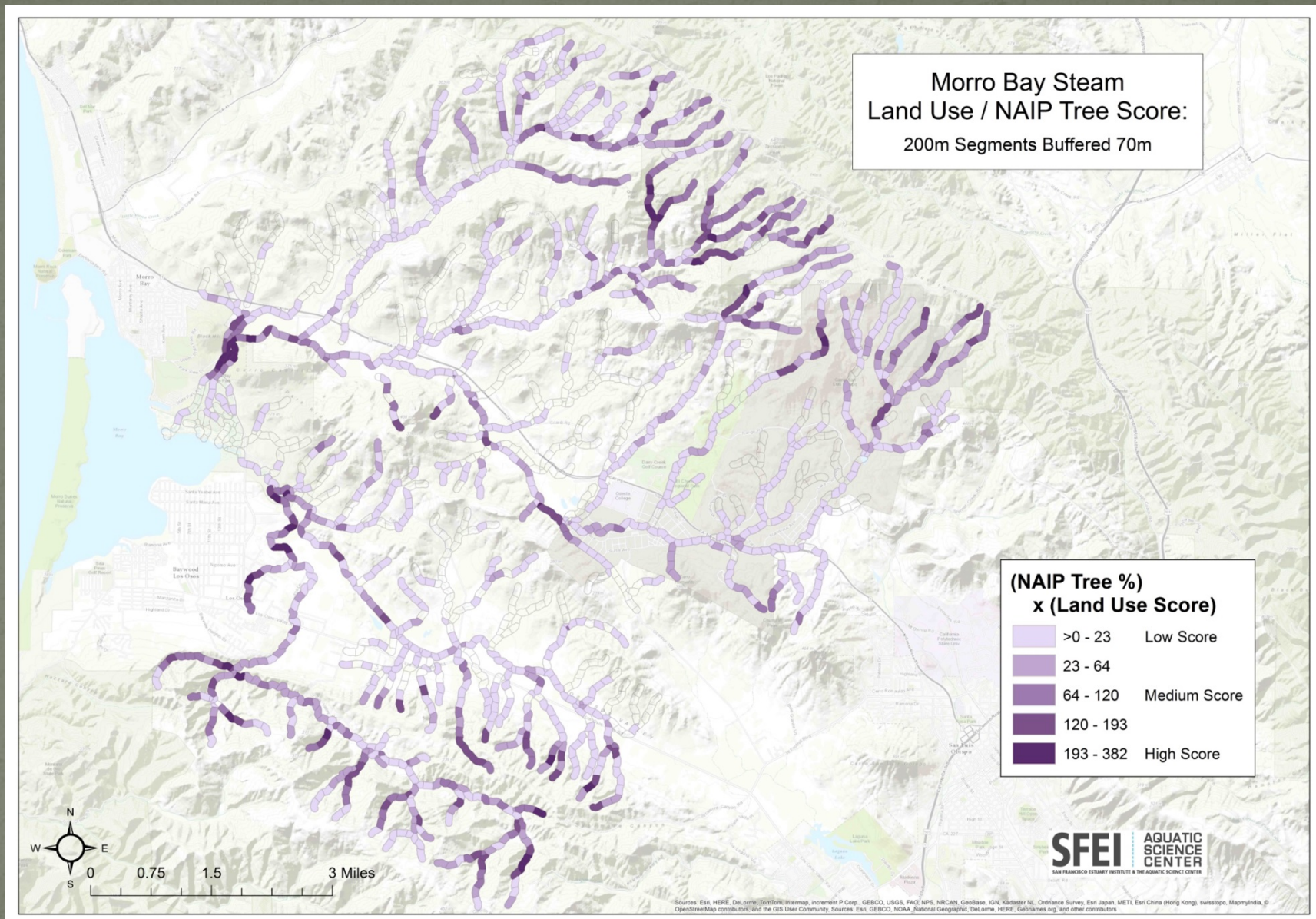
Morro Bay Steam
Land Use / NAIP Tree Score:
200m Segments Buffered 70m
(NAIP Tree %)
x (Land Use Score)
>0 - 23
Low Score
23 - 64
64 - 120
Medium Score
120 - 193
193 - 382
High Score
N
W
E
S
0
0.75
1.5
3 Miles
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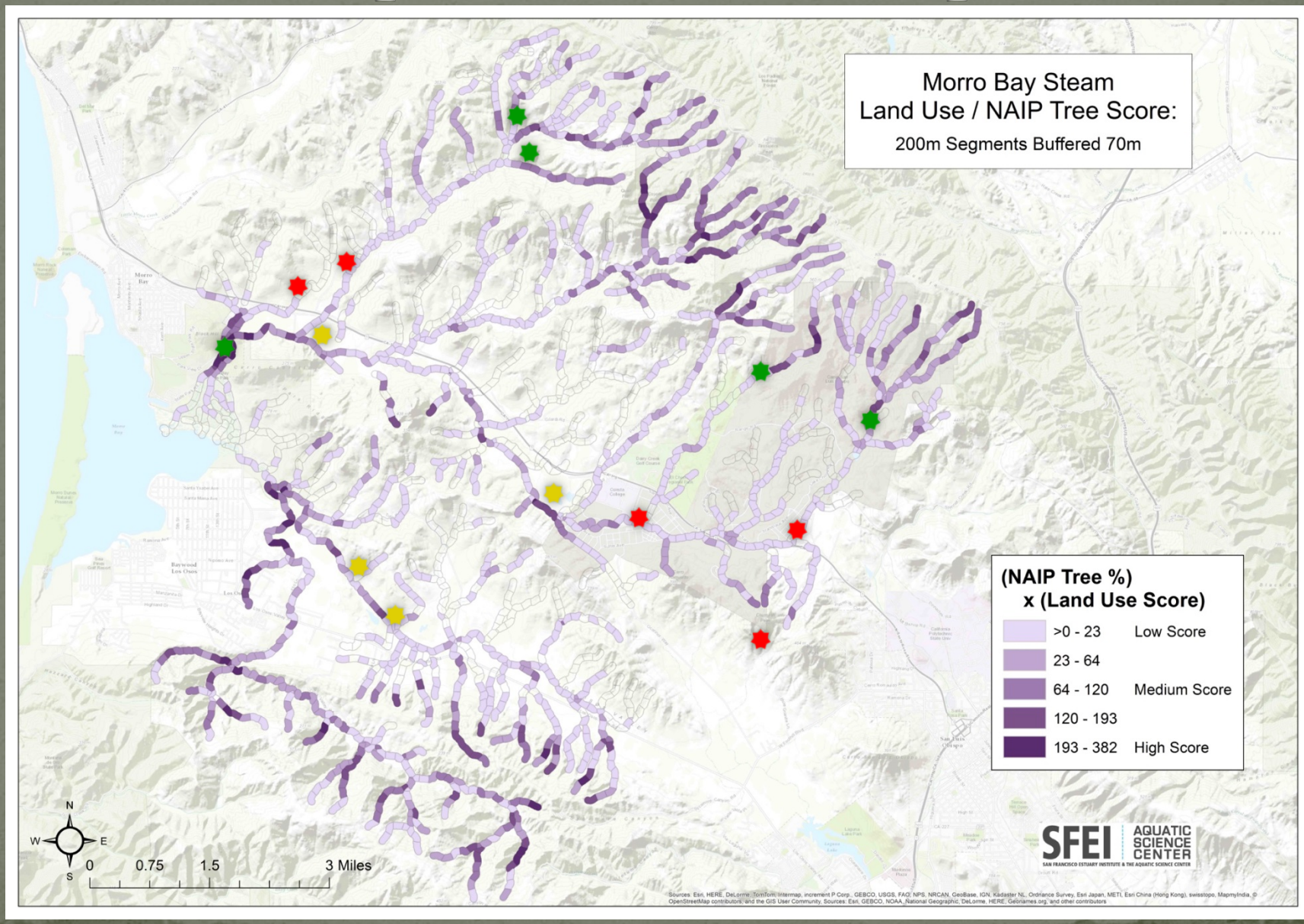
Next: Extrapolation of Site Specific Data



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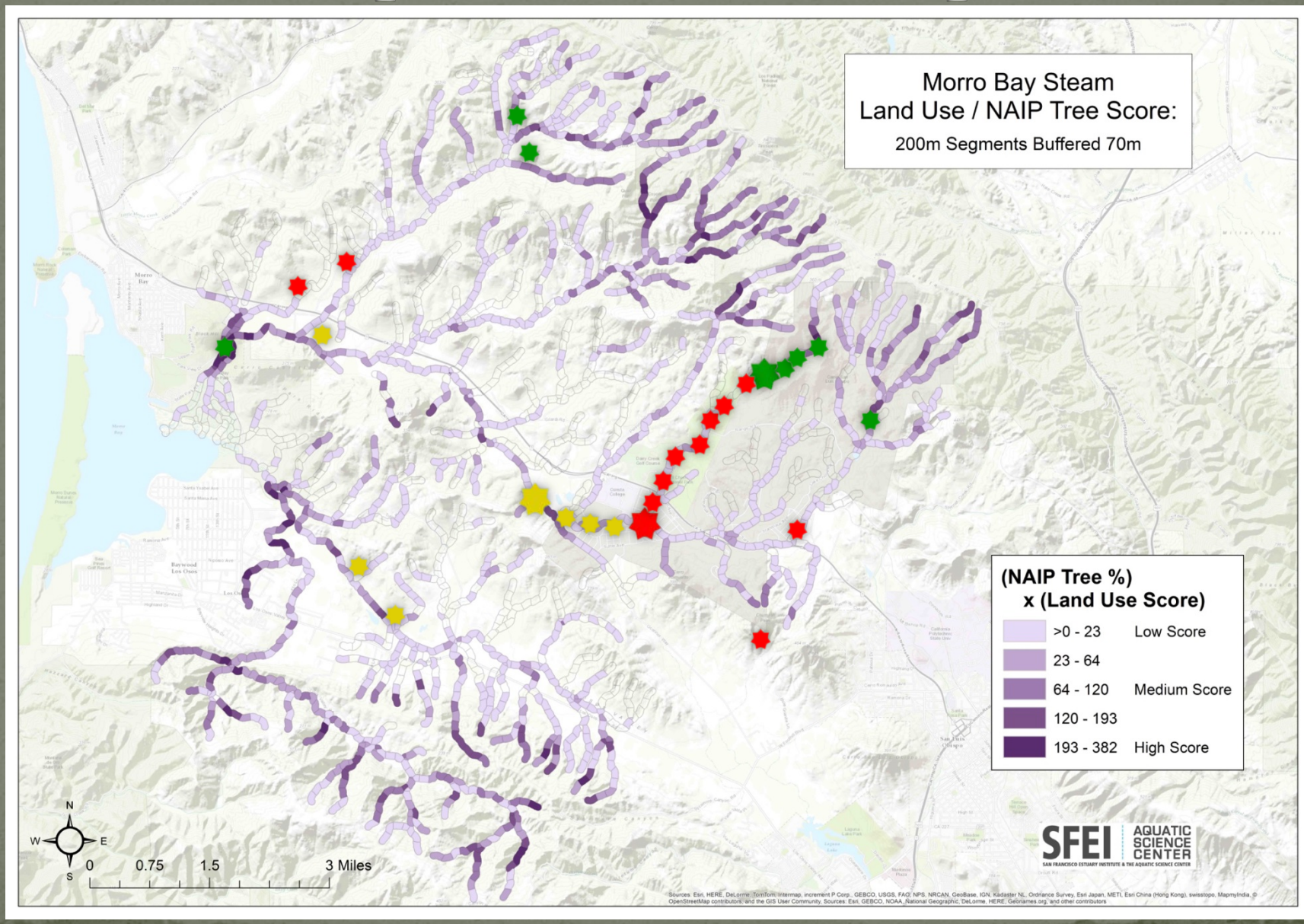

Watershed / Habitat Report

Central Coast Ambient Monitoring Program

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARD

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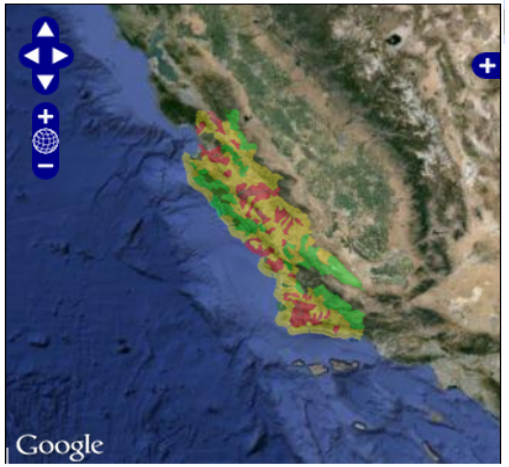

Aquatic Life

Watershed Function

Human Health

View Report Cards

Grades: = **A+** Outstanding = **A** Excellent = **B** Good = **C** Fair = **D** Impacted = **F** Severely Impacted

Central Coast Regionwide Watershed Report

Healthy Aquatic Habitat – By 2025, 80 percent of Aquatic Habitat is healthy, and the remaining 20 percent exhibits positive trends in key parameters.

Aquatic Life Grades

Proper Land Management – By 2025, 80 percent of lands within a watershed will be managed to maintain proper watershed functions, and the remaining 20 percent will exhibit positive trends in key watershed parameters.

Watershed Function Grades

Clean Drinking Water – By 2025, 80 percent of groundwater will be clean, and the remaining 20 percent will exhibit positive trends in key parameters.

Human Health Grades