Nutrients Trends in Central Coast Watersheds

Central Coast Water Quality Data
Synthesis,
Assessment and
Management (**SAM**) Project
http://www.ccamp.net/sam/index.php/Main_Page

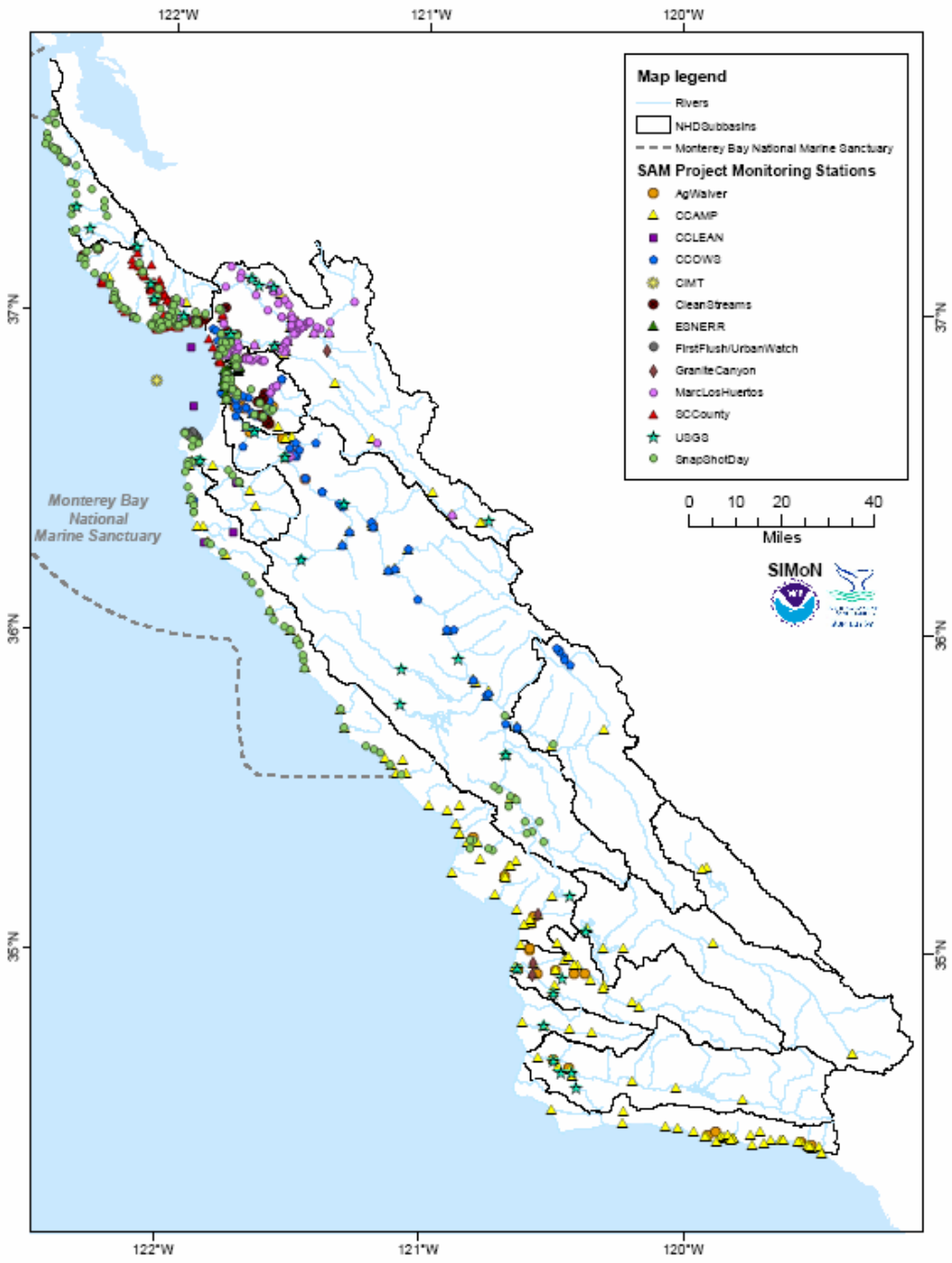
SAM Project Mission

Facilitate water quality monitoring coordination, data management, and data analysis to understand the sources, status, and trends of non-point source pollution on the Central Coast.

Photo: Becky Stamsky

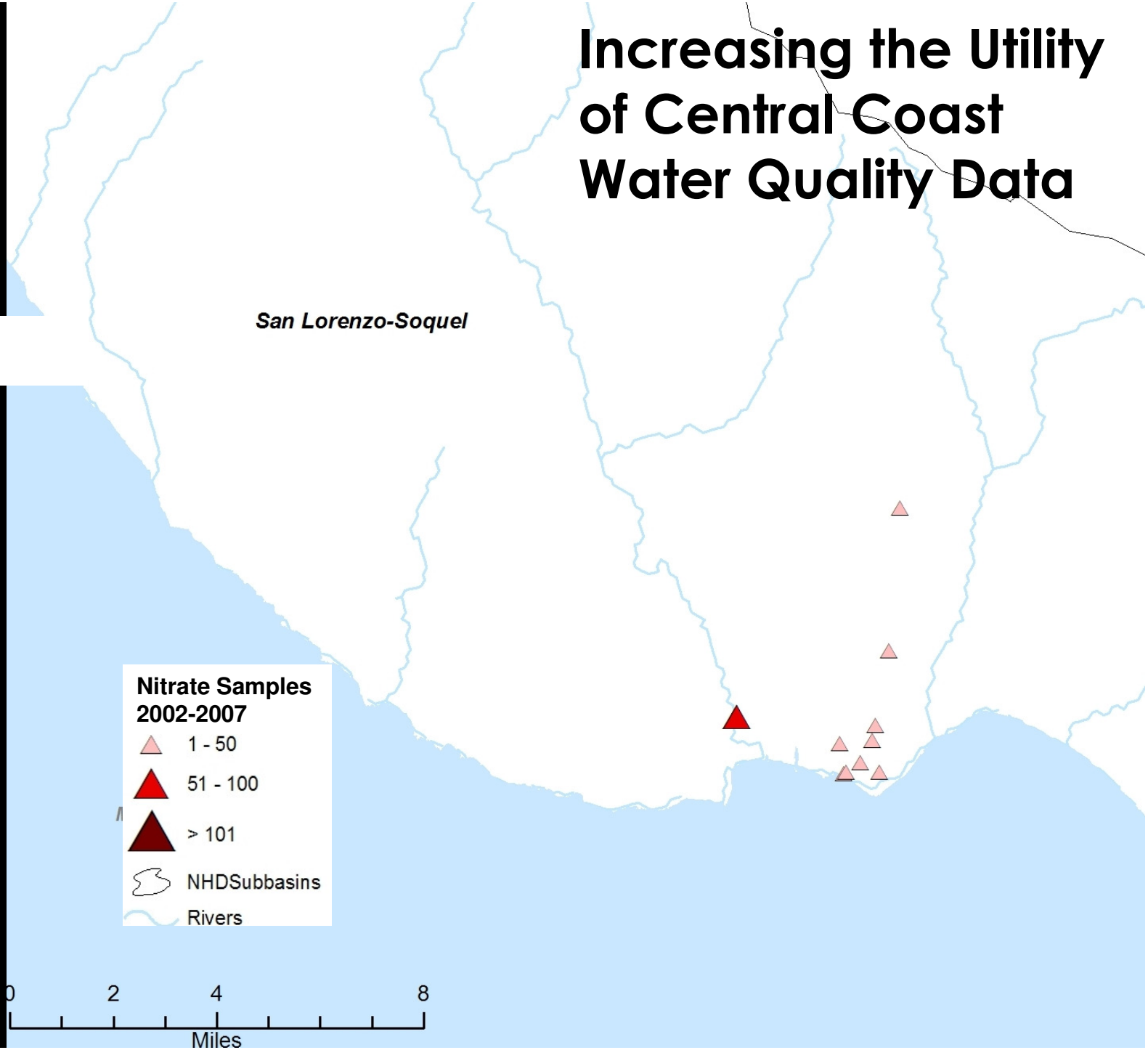
SAM Pilot Regional Data Integration

- 16 Programs
- ~450,000 measurements 1980 – 2007 in a SWAMP compatible database
- ~109 analytes
- 898 stations
- Coupled to a GIS



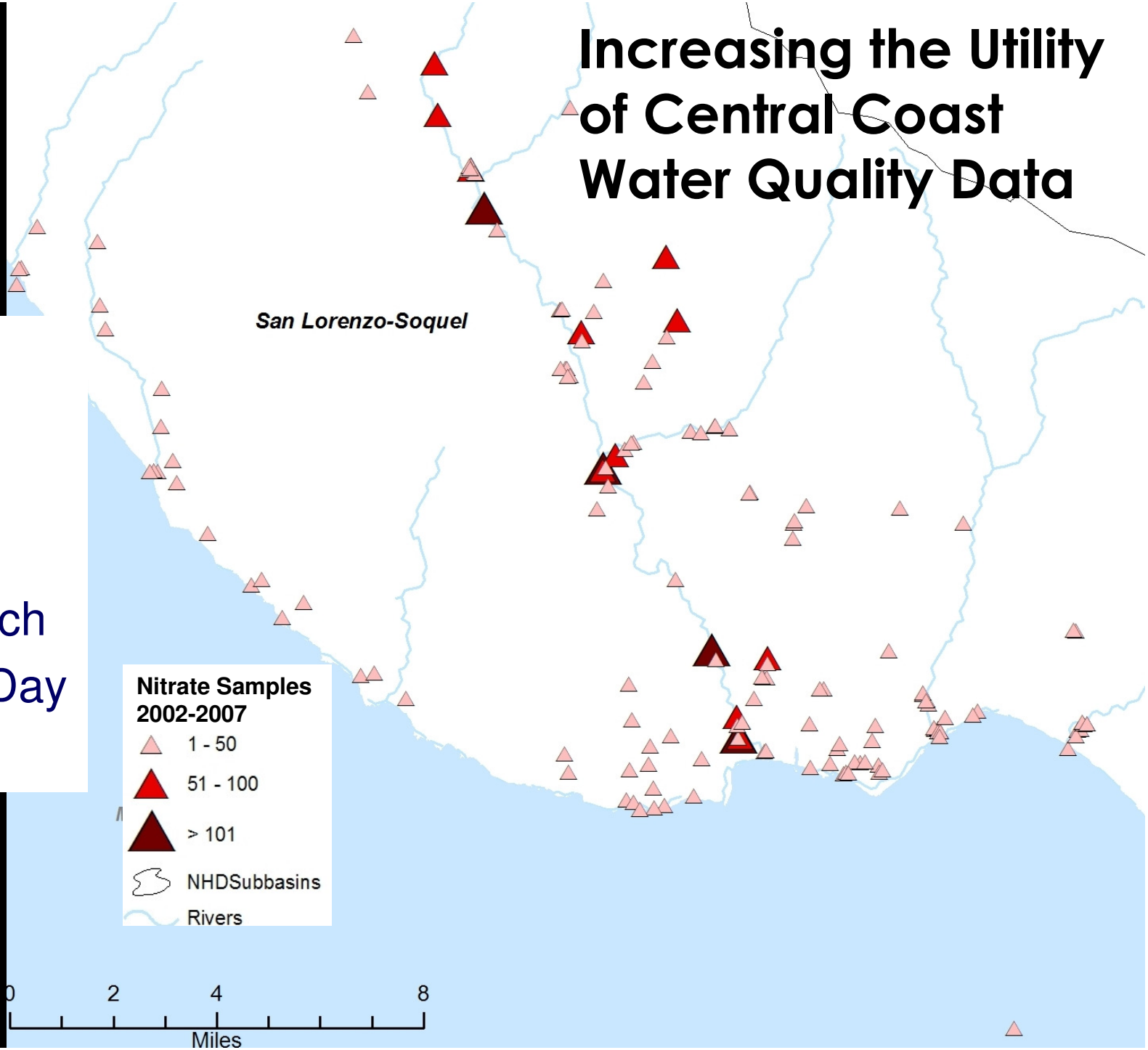
Increasing the Utility of Central Coast Water Quality Data

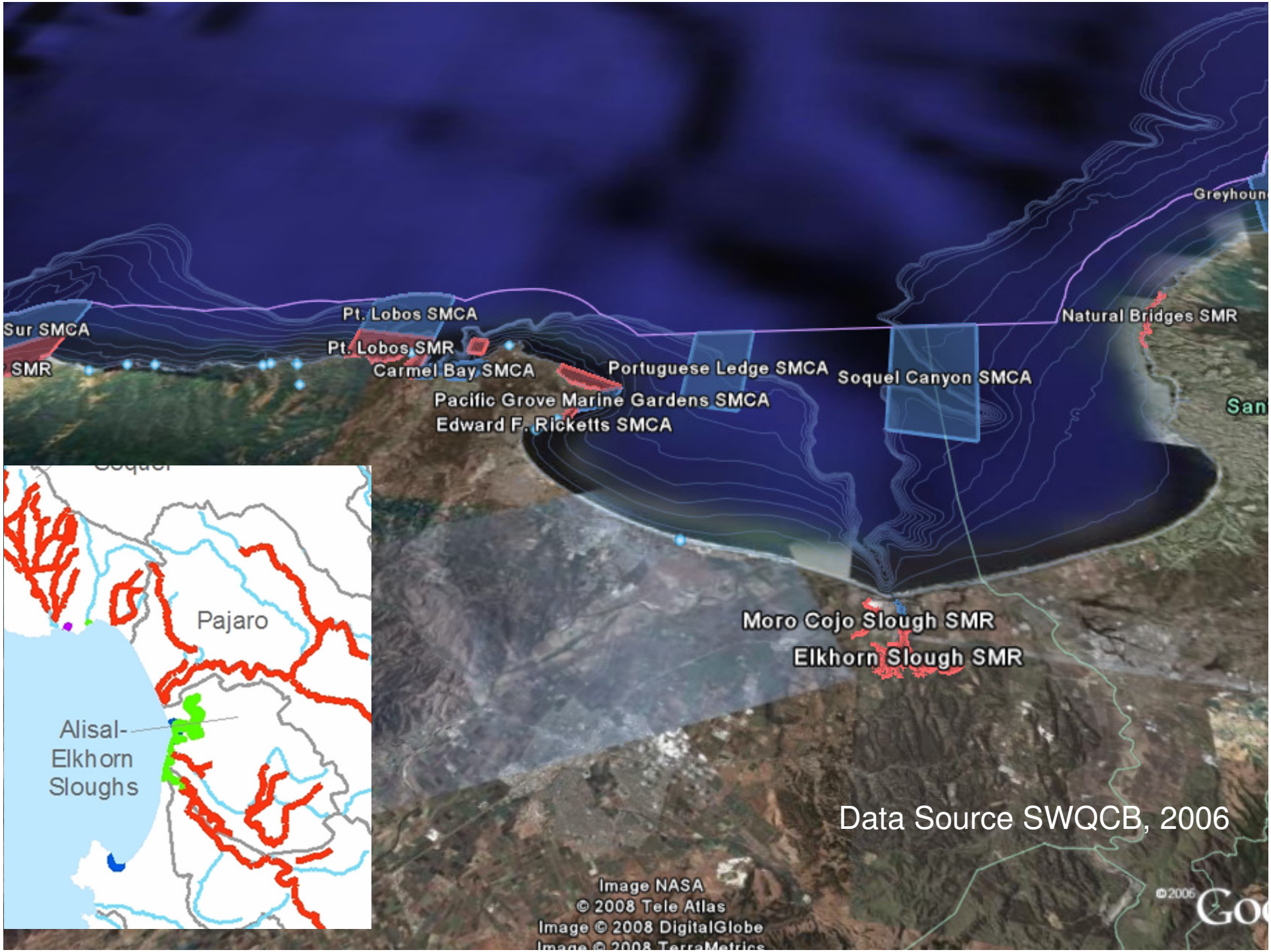
MarcLH



Increasing the Utility of Central Coast Water Quality Data

MarcLH
CCAMP
SCCounty
FirstFlush
UrbanWatch
SnapshotDay
CCLEAN




Sur SMCA
SMR
Pt. Lobos SMCA
Pt. Lobos SMR
Carmel Bay SMCA
Portuguese Ledge SMCA
Pacific Grove Marine Gardens SMCA
Edward F. Ricketts SMCA
Soquel Canyon SMCA
Natural Bridges SMR
Greyhoun
San
Moro Cojo Slough SMR
Elkhorn Slough SMR
Pajaro
Alisal-
Elkhorn
Sloughs
Data Source SWQCB, 2006
Image NASA
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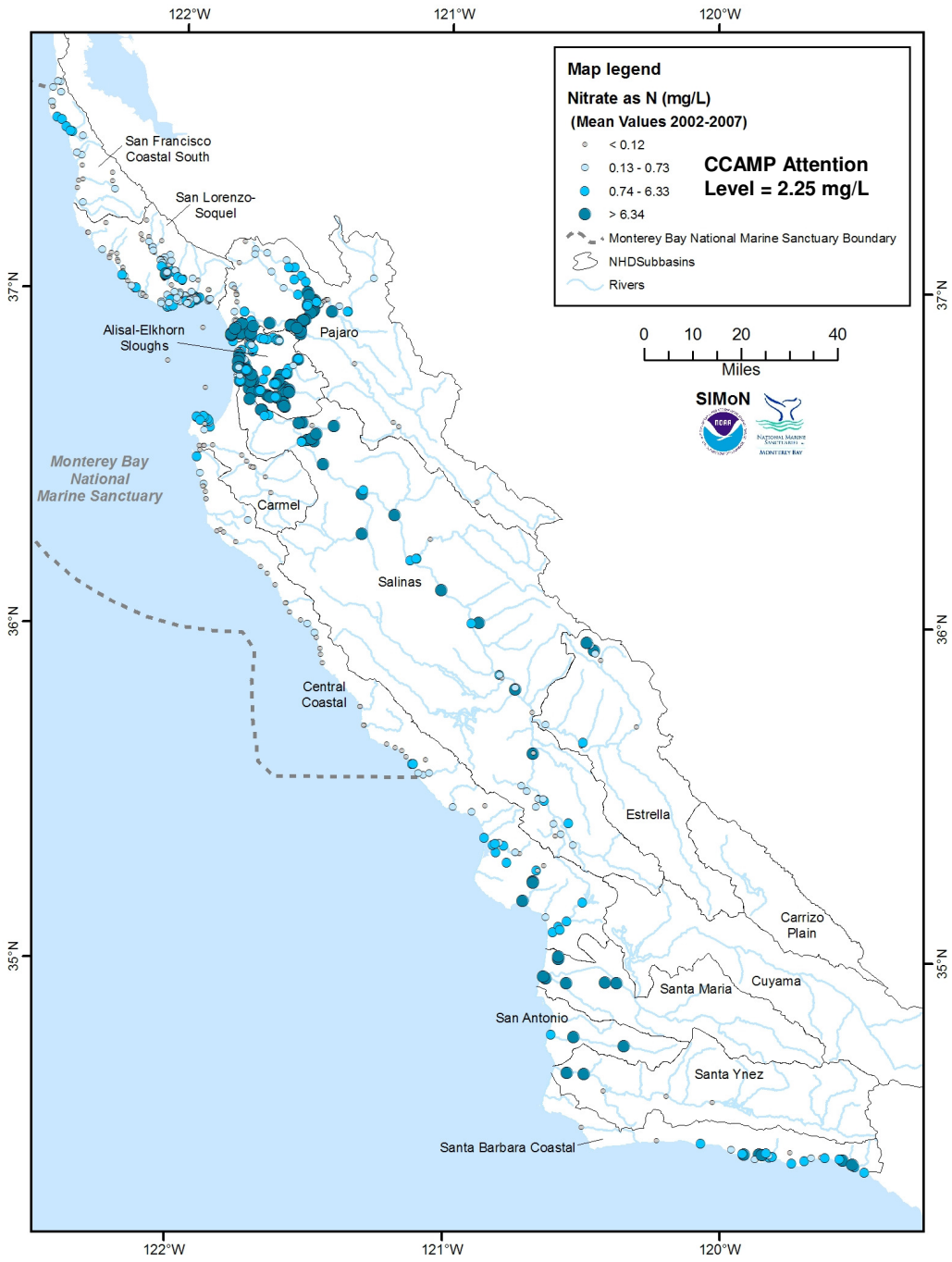
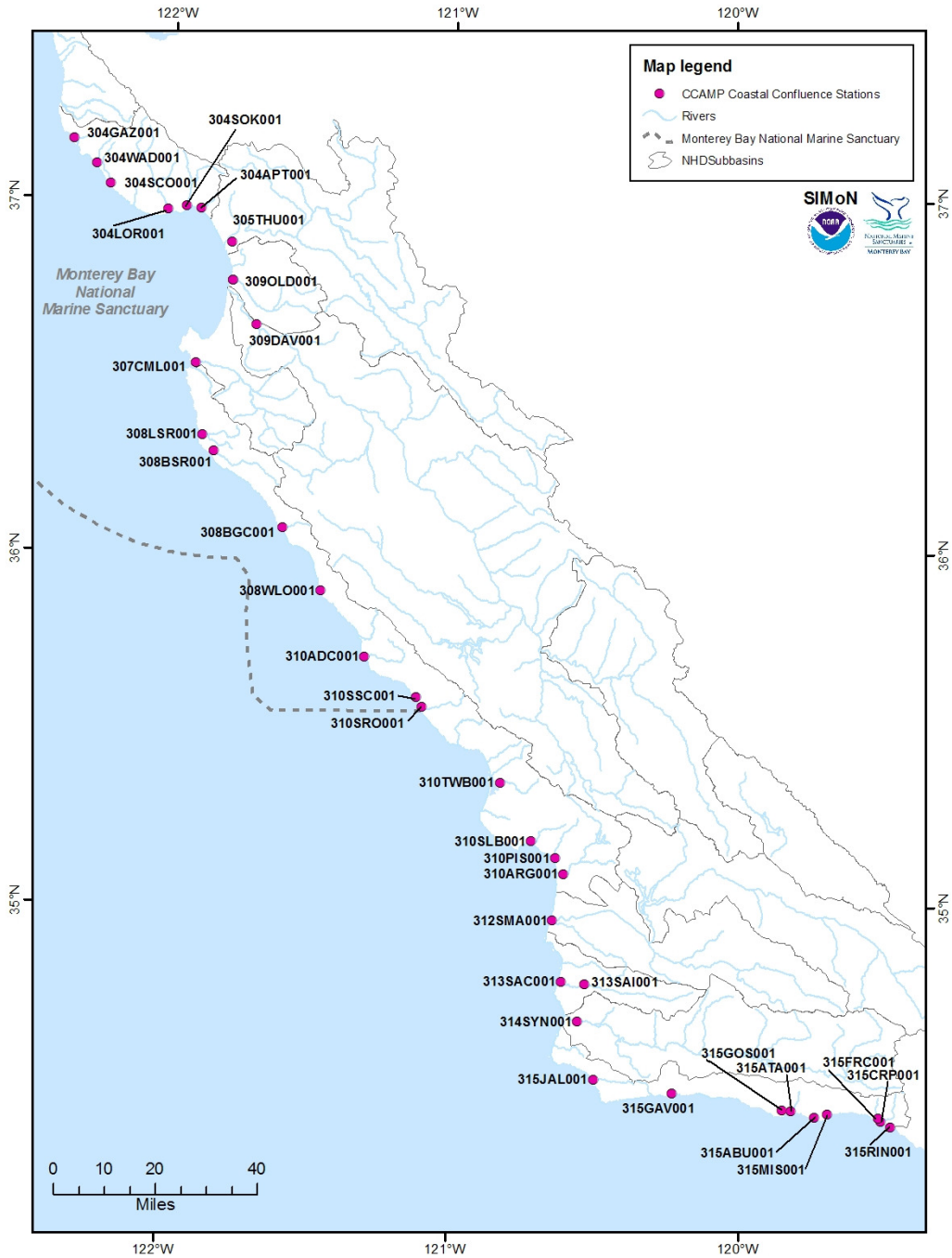
Central Coast Nitrate Levels



Nutrients Data

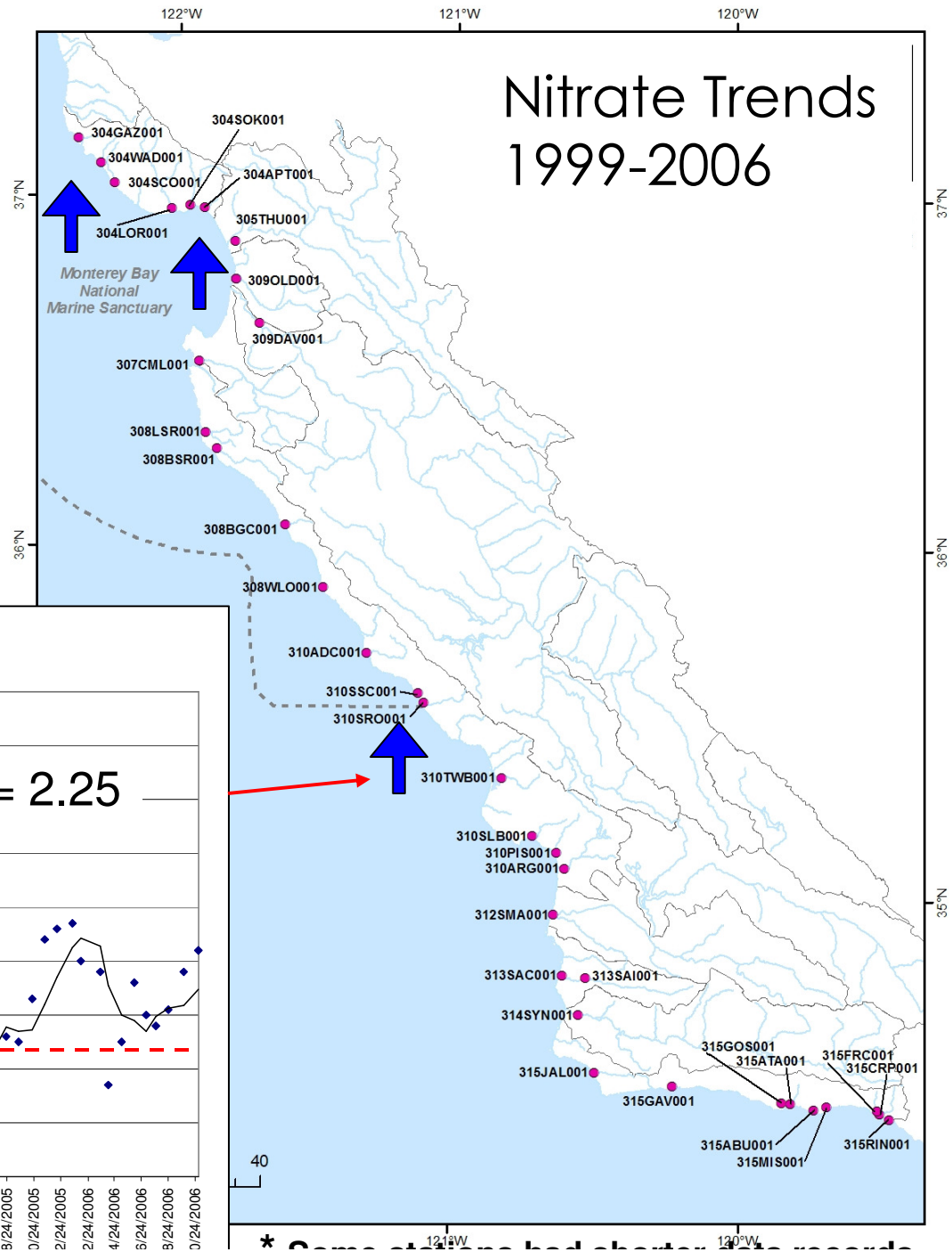
- CCAMP Coastal Confluence Stations
- Tests performed for
  - Ammonia
  - Nitrate
  - Orthophosphate

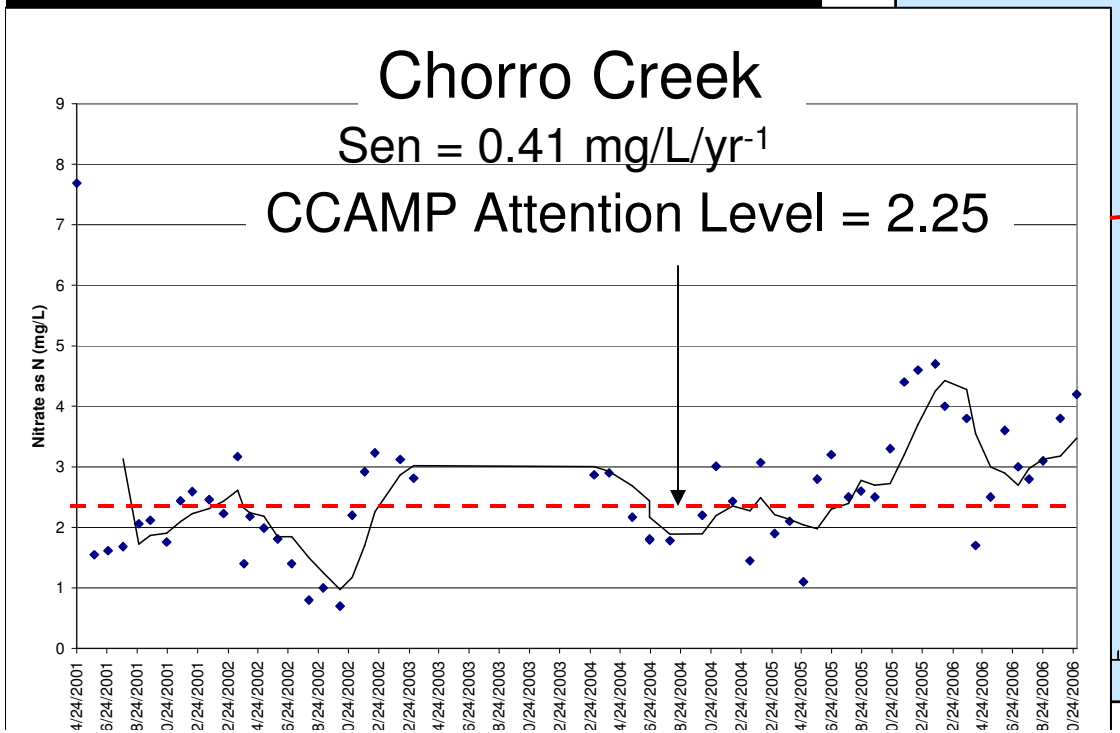


Statistical Tests

- Seasonal Kendal Test (significance of trend)
- Sen's Slope Estimator (quantifies magnitude of trend)
- Regional Kendal Test (significance of trend within a region)
- Non-detects tied to the ½ value of highest detection limit

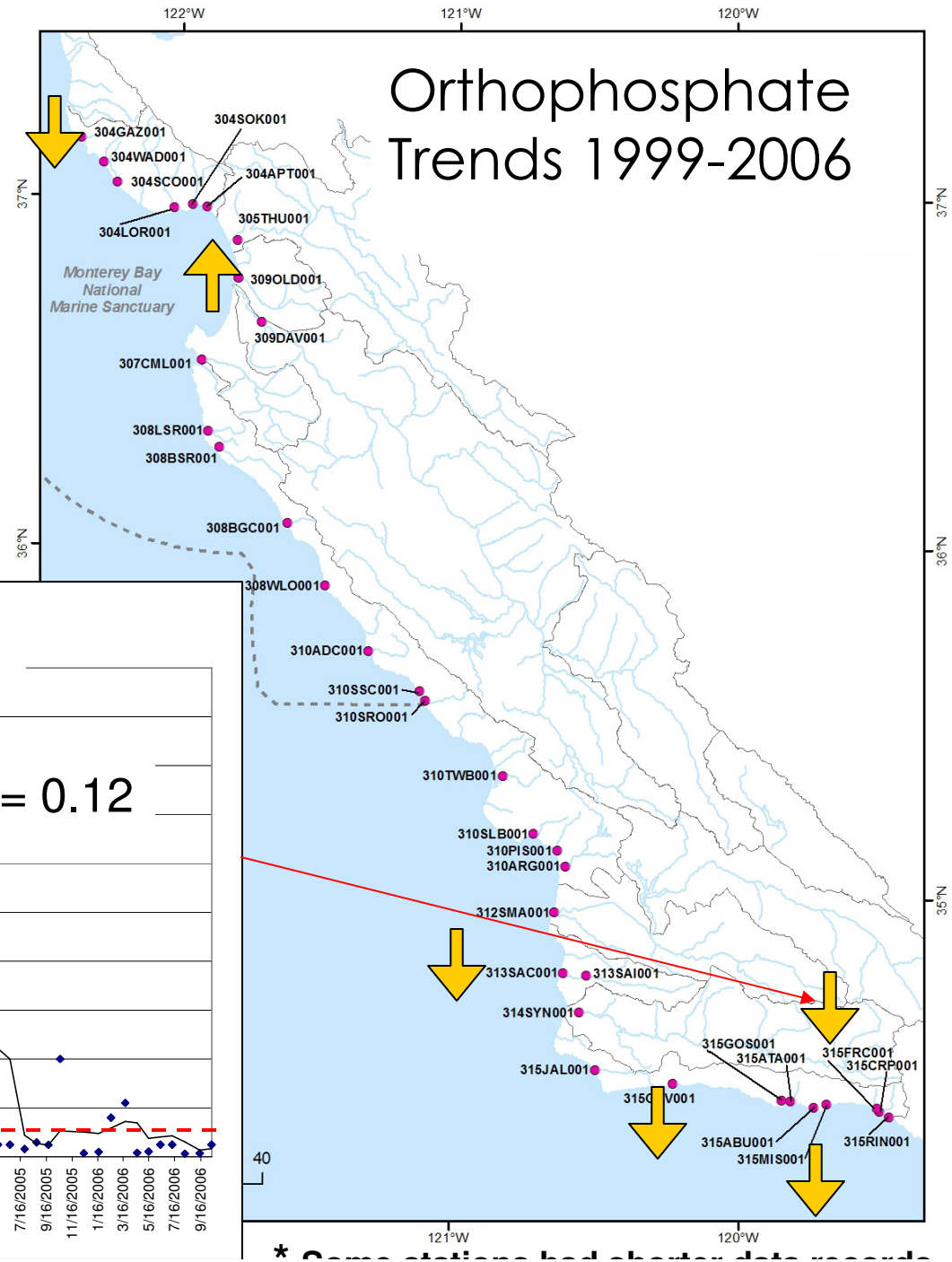
- No significant trends for Ammonia
- Nitrate increases at
  - San Lorenzo River
  - Old Salinas River
  - Chorro Creek

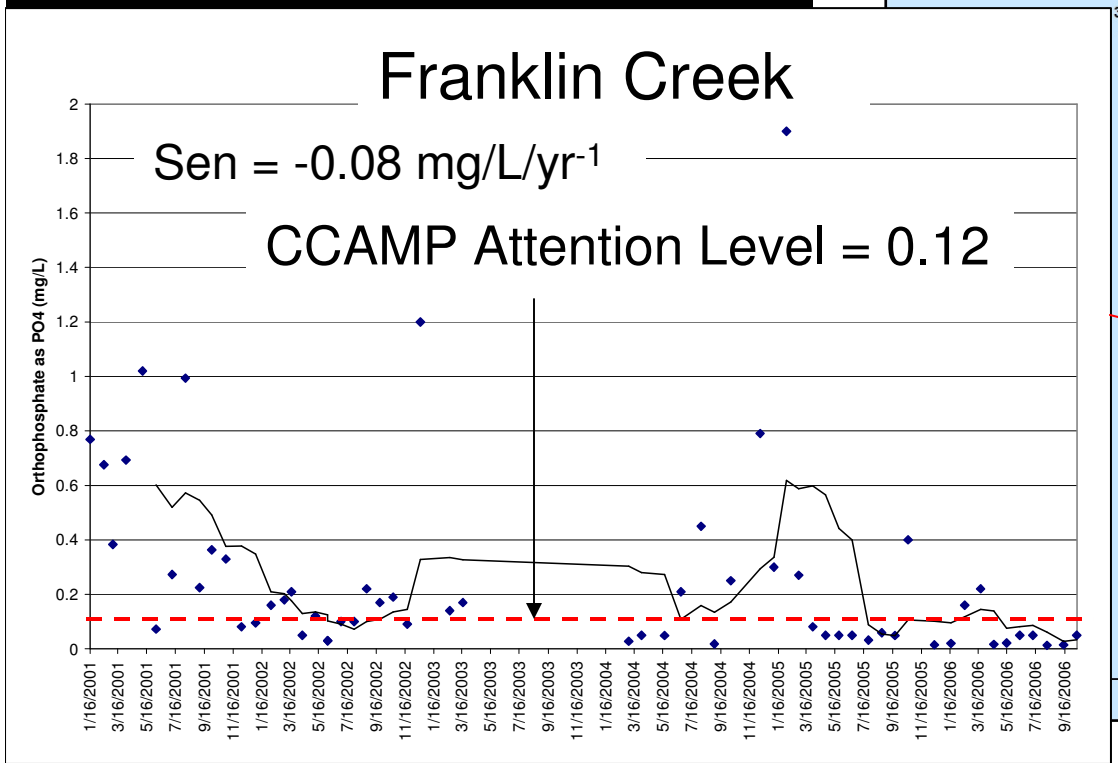




* Some stations had shorter data records

- Increasing OrthoP at
  - Old Salinas River
- Decreasing OrthoP at:
  - Gazos Creek
  - San Antonio Creek
  - Gaviota Creek
  - Mission Creek
  - Franklin Creek*





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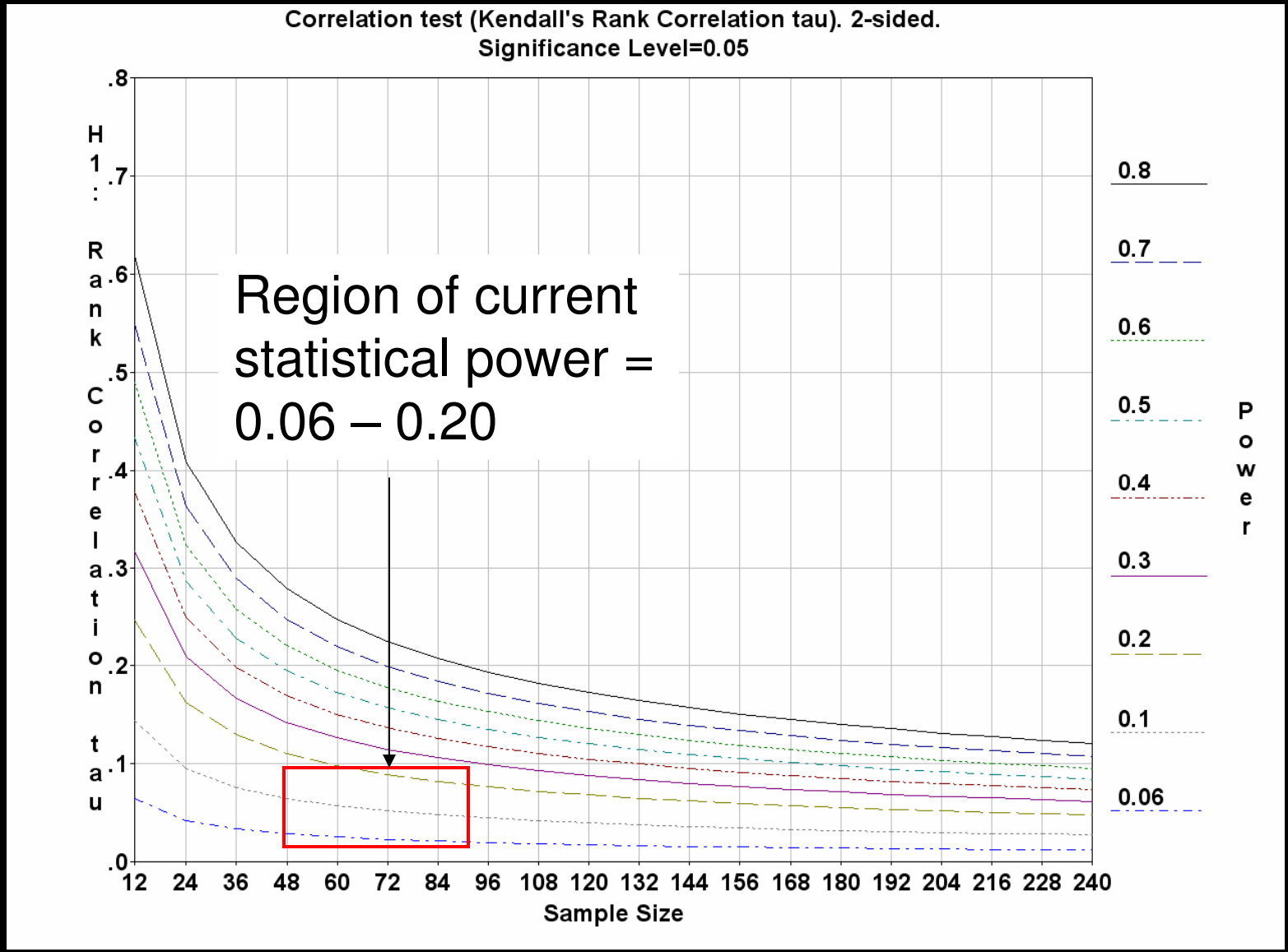
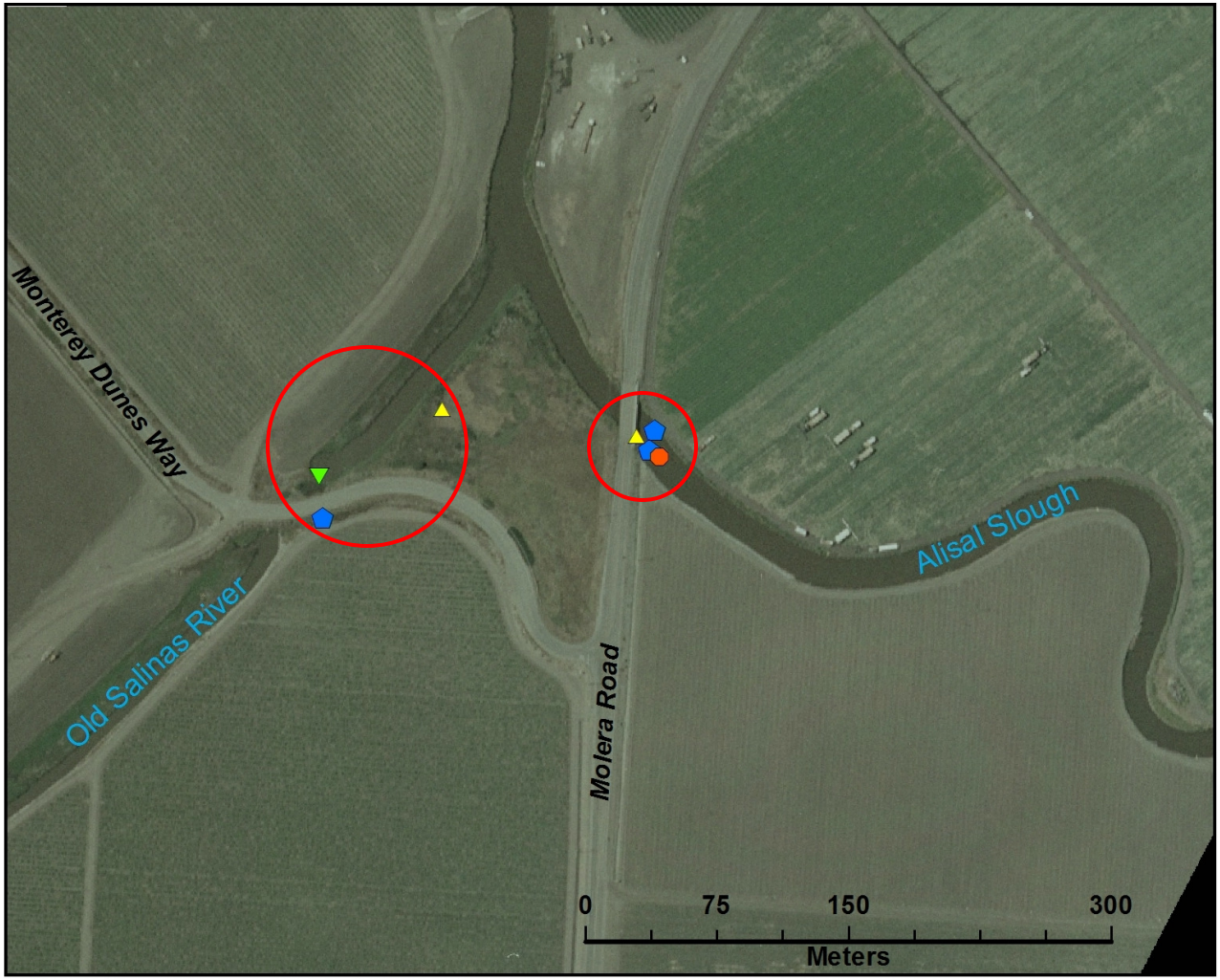
Got Power?


Correlation test (Kendall's Rank Correlation tau). 2-sided.
Significance Level=0.05
H1: Rank Correlation tau
.0
.1
.2
.3
.4
.5
.6
.7
.8
12 24 36 48 60 72 84 96 108 120 132 144 156 168 180 192 204 216 228 240
Sample Size
Power
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.06
Region of current statistical power = 0.06 – 0.20

Regional Trend Tests

- Time extent and sample count differences
- Detection limit changes



Background image is a 2-foot ground resolution orthophoto from 2003 (CCJDC)

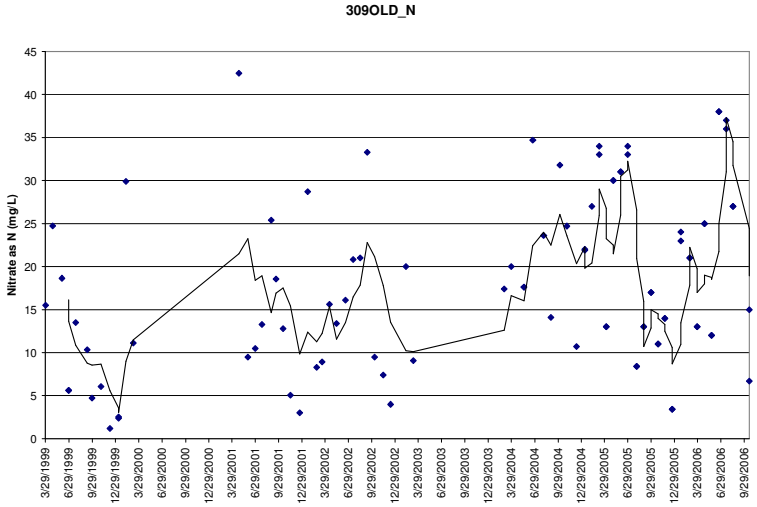
Map legend

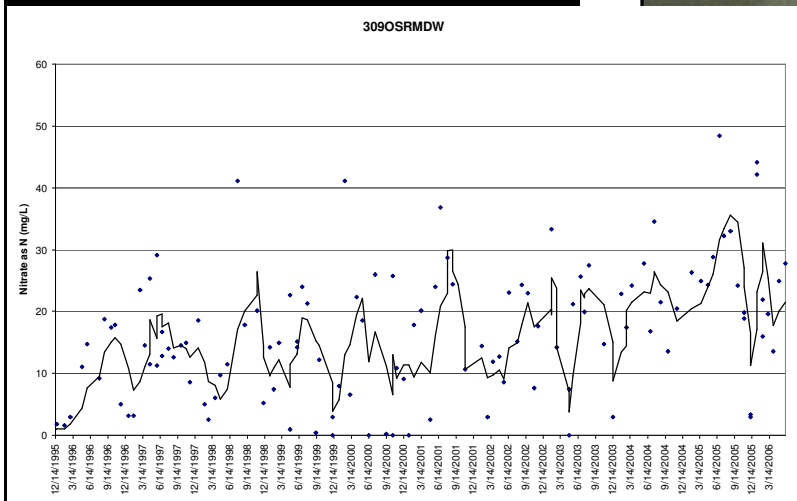
SAM Project Monitoring Stations

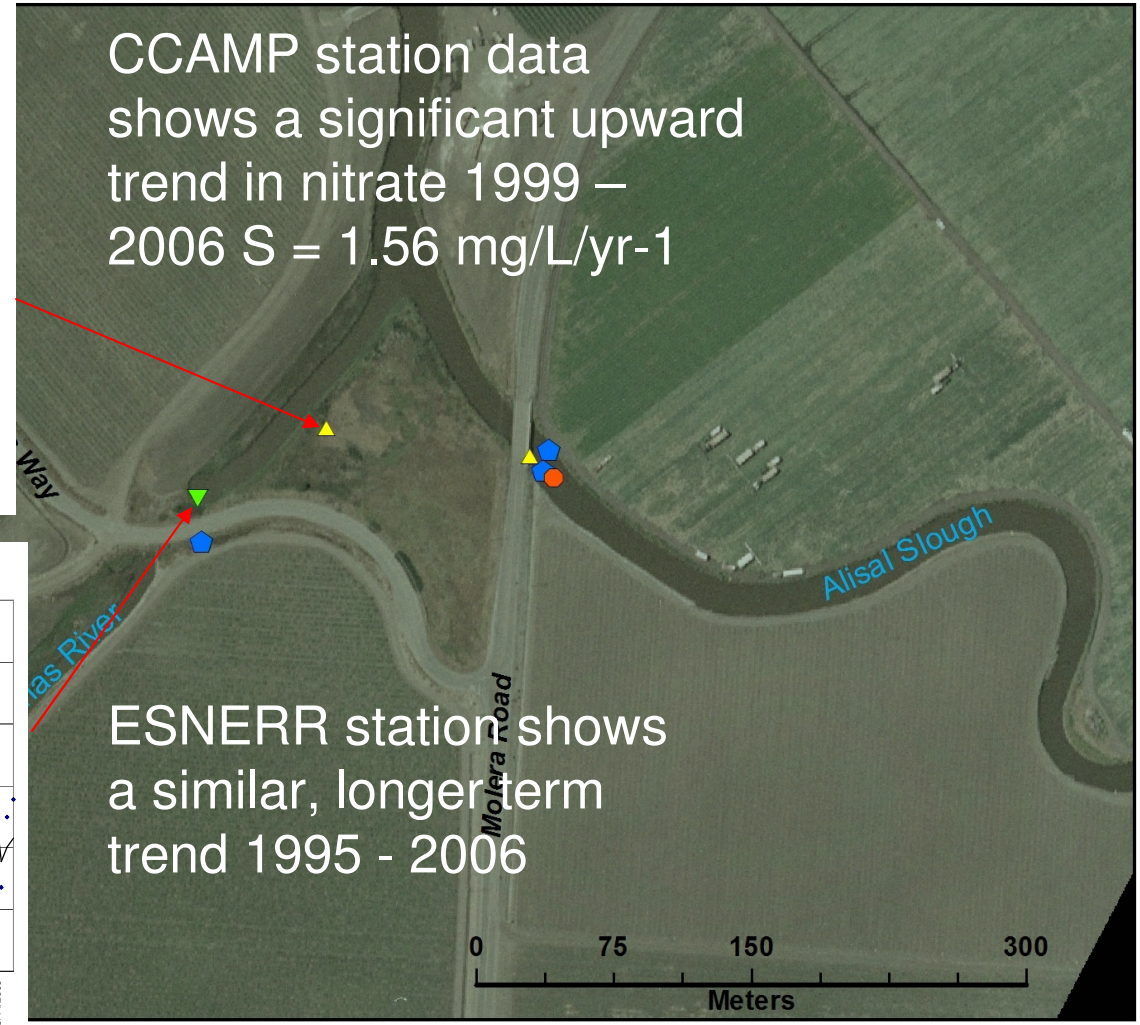
- Central Coast Ambient Monitoring Program (CCAMP)
- Elkhorn Slough National Estuarine Research Reserve (ESNERR)
- Central Coast Watershed Studies (CCoWS)
- Snapshot Day (MBNMS/CWC)

SIMoN

N







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SIMoN

N

Conclusions

- Nutrient level changes occurred at some locations 1999-2006.
- Maintaining commitments to long term monitoring programs should be a regional priority
- Good data management and development of trend detection techniques are key
- Monitoring coordination will help to optimize the effectiveness of the regional monitoring network.

A SAM with a Plan

- A SAM Project Strategic Plan in the works!
  - Monitoring coordination
  - Data integration and exchange
  - Data analysis and reporting

- More info on SAM at:
  http://www.ccamp.net/sam/index.php/Main_Page
  or contact Gary Conley at gary.conley@noaa.gov

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