

Linking land surface processes and water quality in the Elkhorn Slough

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Background

DS421 “Data Science for the 21st Century

- NSF Training program focused on using data science to address global environmental issues

All based in UC Berkeley, from variety of fields/departments

Leading Questions

1. What are the principal factors that determine when and where nutrient spikes (phosphates and nitrates) occur?
2. How do these major factors correlate with surrounding land surface processes?

Hypotheses

1. Precipitation and runoff events are correlated with nutrient spikes
2. Green-up of crops could be correlated with nutrient spikes
3. These events may be correlated with spikes through time lags

Sites of Interest

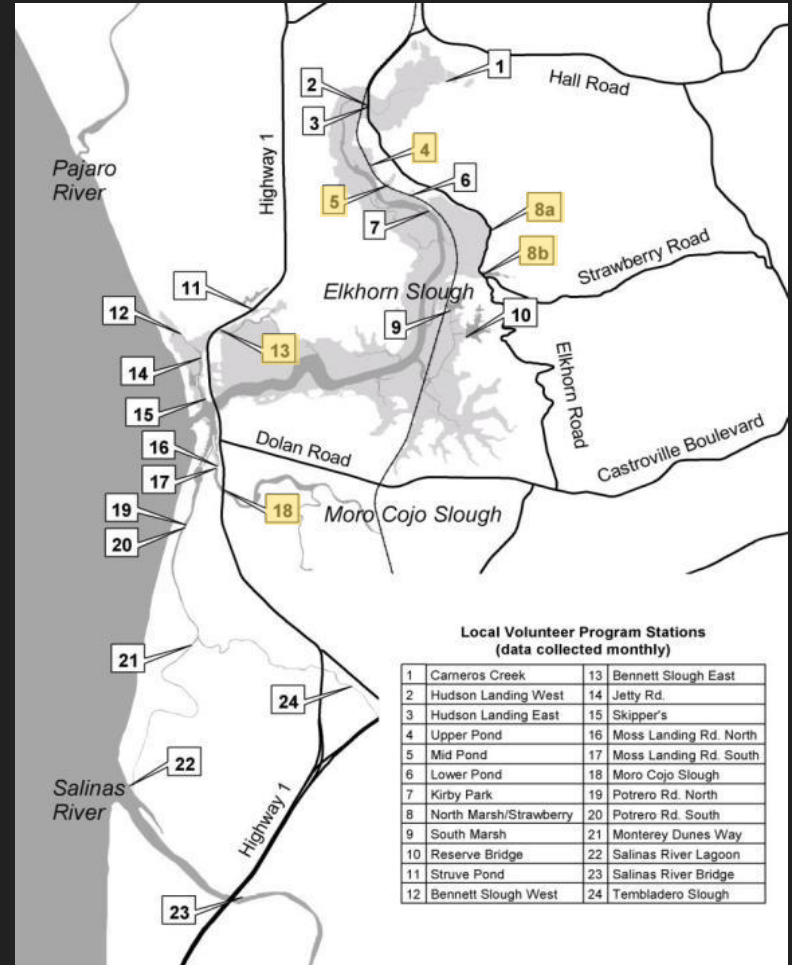
4. Upper Azevedo

5. Middle Azevedo

8. North Marsh

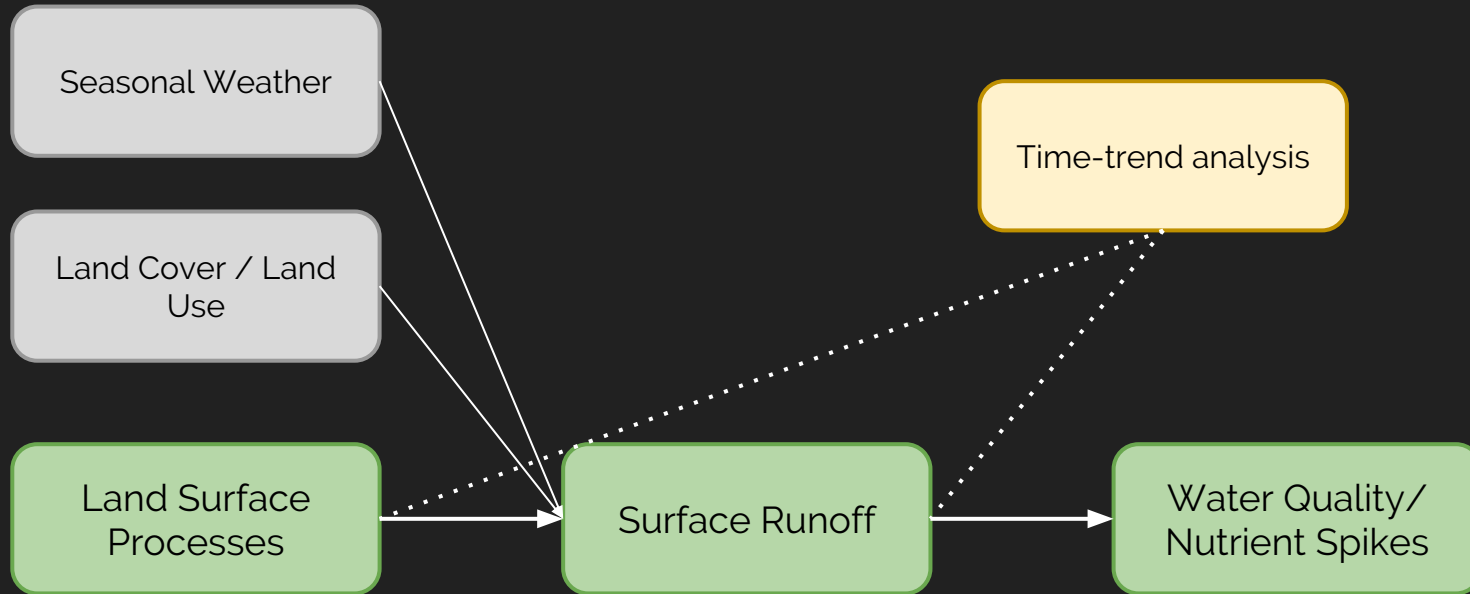
13. East Bennet

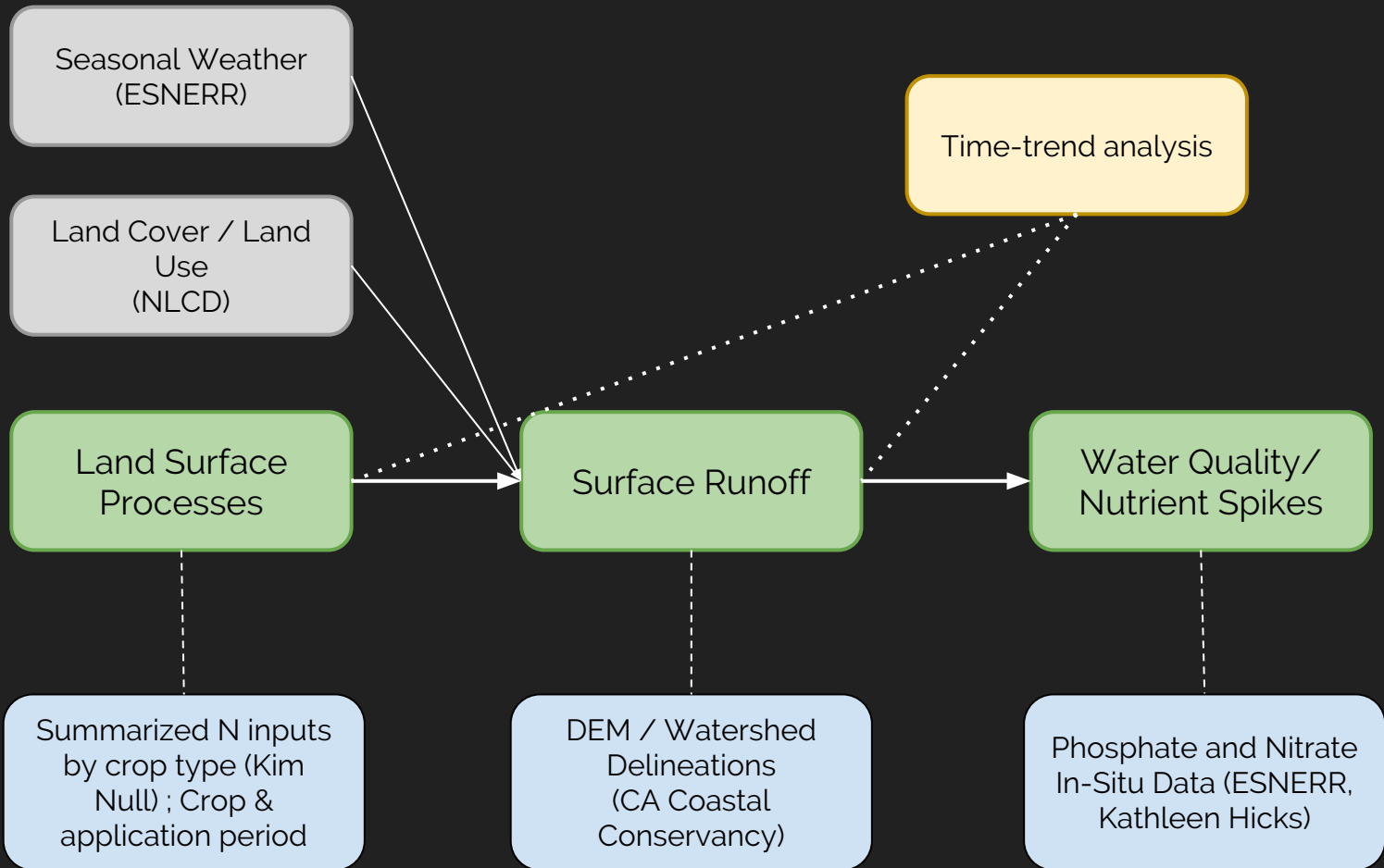
18. Moro Cojo



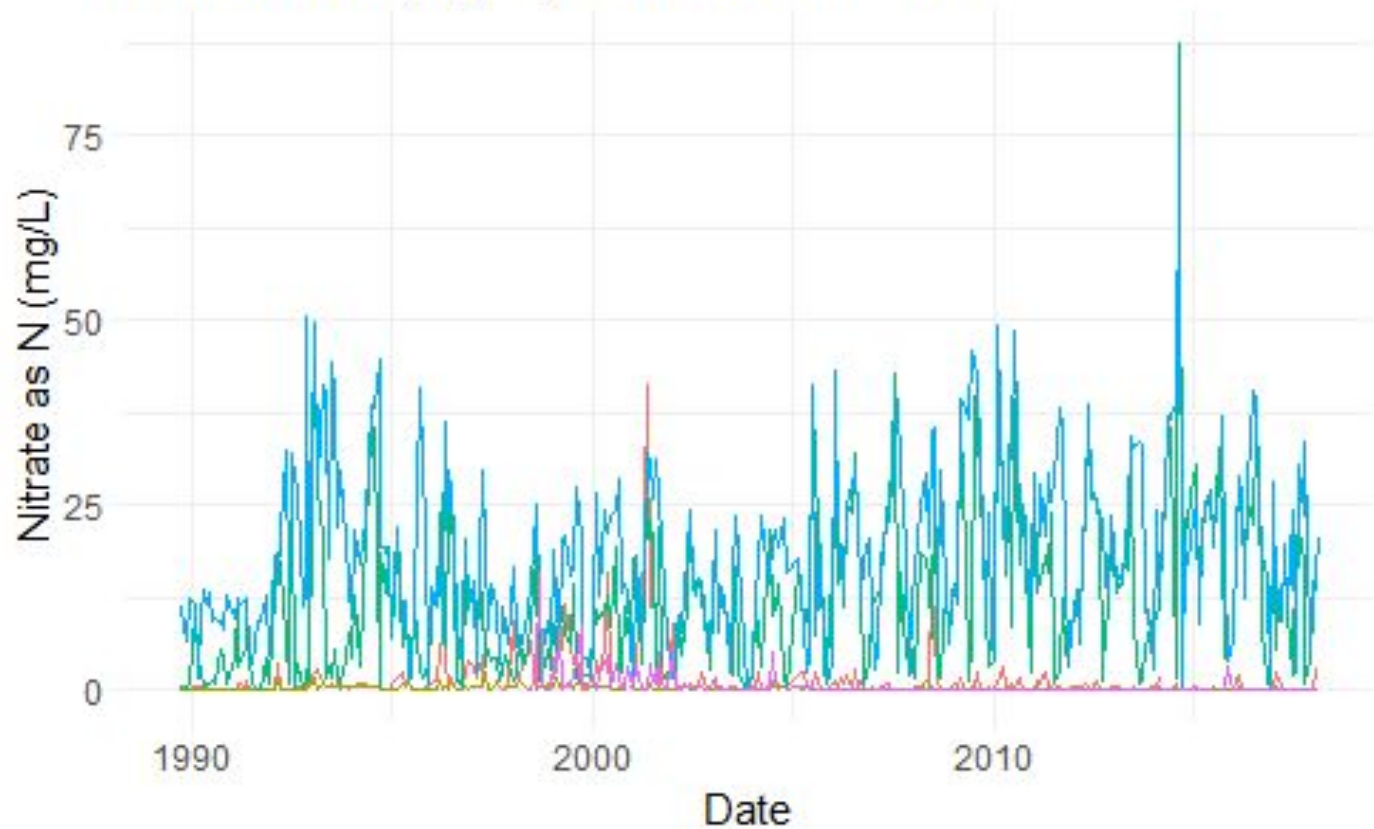
* All sites tidally restricted

Concept Flowchart





Nitrate as N (mg/L) for Selected Sites



NumberCode 13 18 4 5 8

Top 2 Nitrate spikes for each of the 5 sites

- 4: Upper Azevedo

- August 2014 – 87.51 mg/L
- January 1993 – 46.78 mg/L

- 5: Middle Azevedo

- August 2014 – 74.73 mg/L
- November 1992 – 50.62 mg/L

- 8: North Marsh

- August 1998 – 15.82 mg/L
- September 1999 – 9.04 mg/L

- 13: East Bennett

- April 2001 – 41.36 mg/L
- May 2000 – 15.82 mg/L

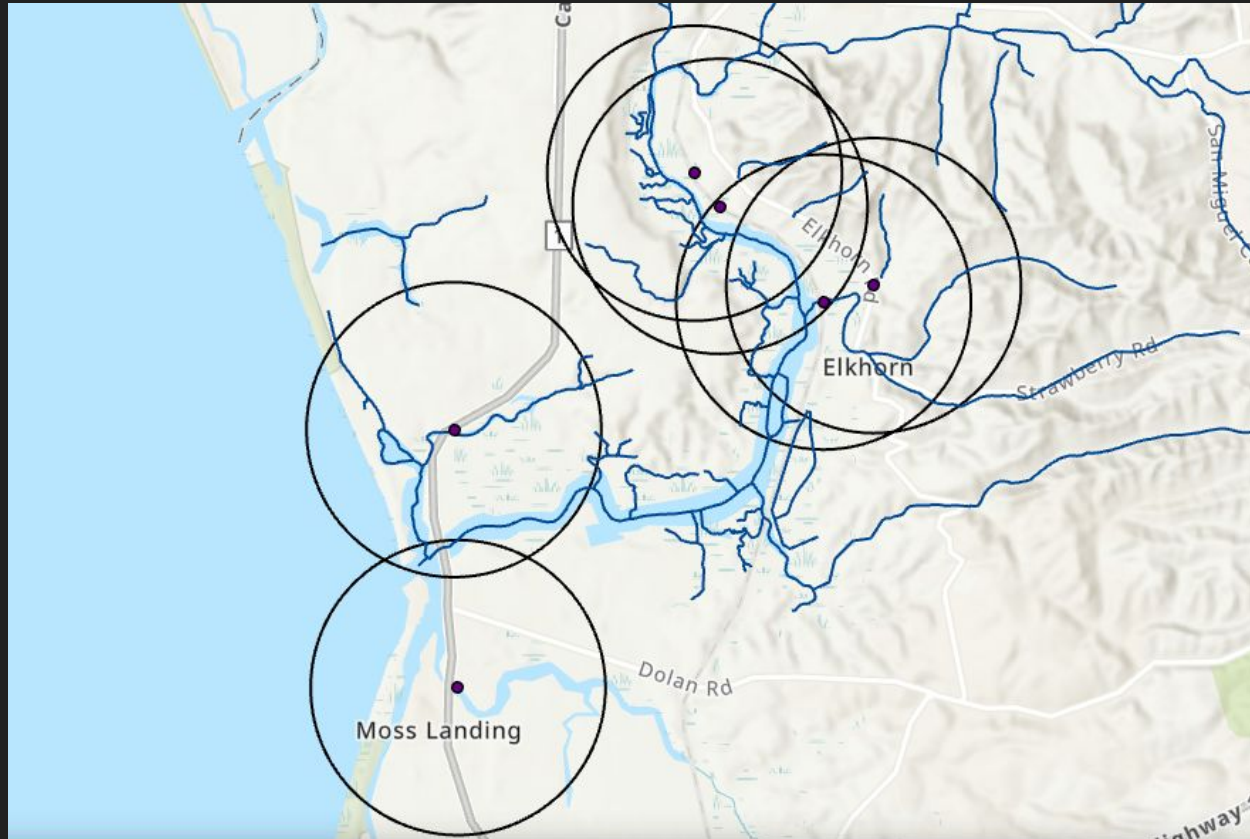
- 18: Moro Cojo

- April 1997 – 2.26 mg/L
- February 1992 – 1.70 mg/L

Average Nitrate Level (mg/L) by Month, Site



Buffer Zones - 1 mile

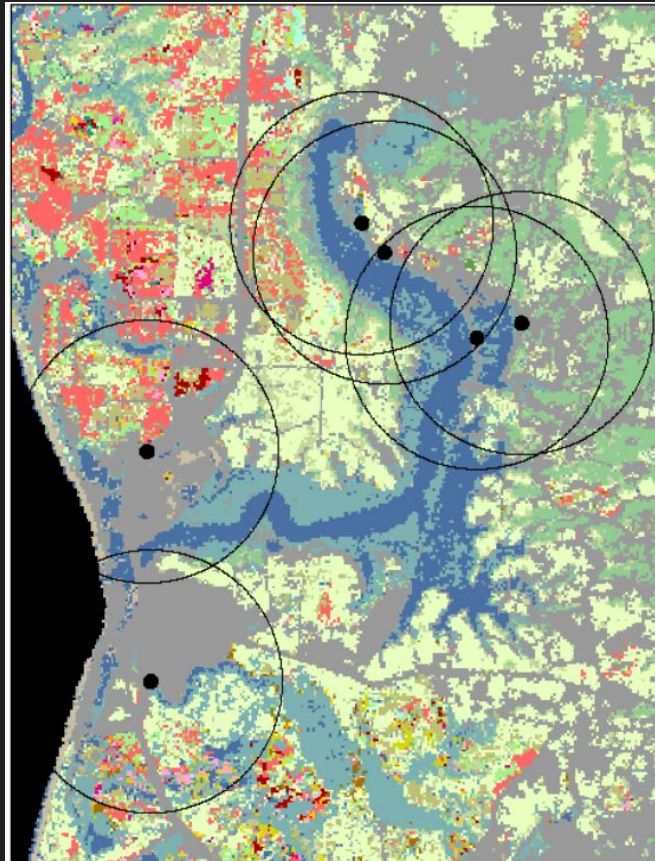


Upper / Central Azevedo

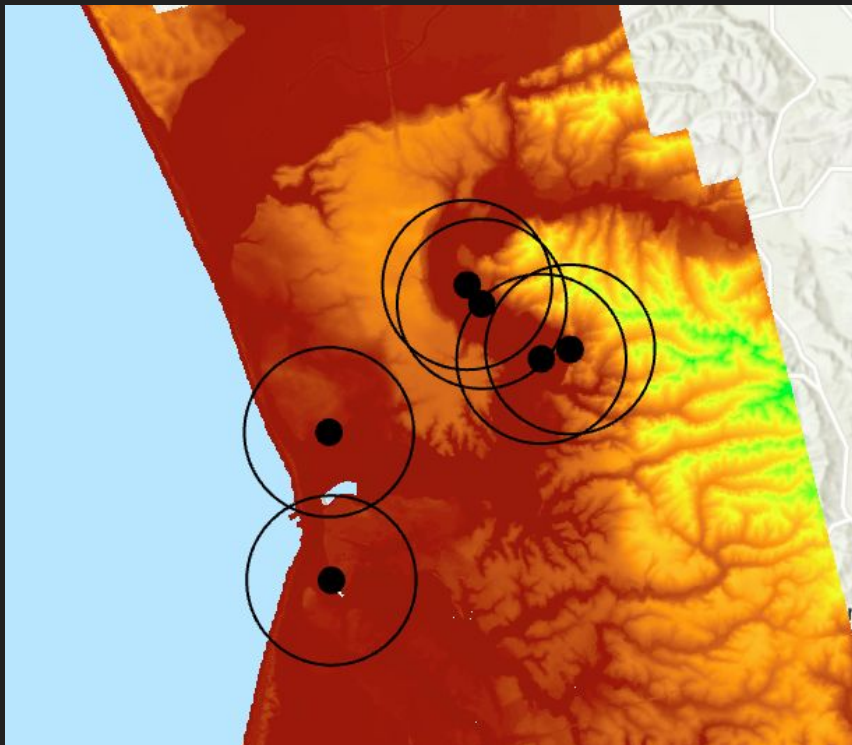
July 24, 2014
Landsat 8, 30m



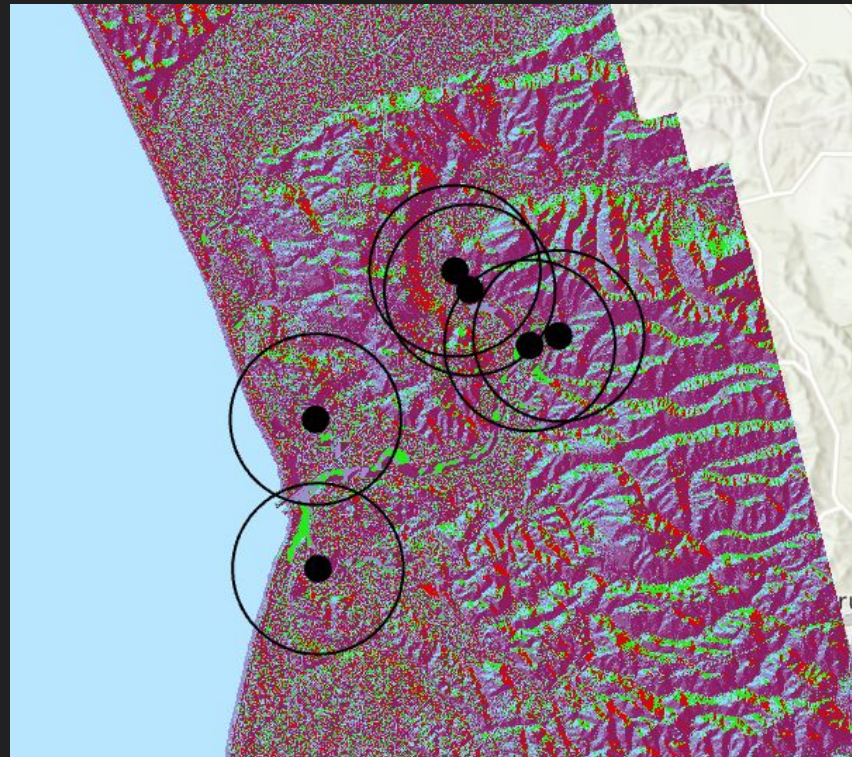
CropScape Data - 2018



Digital Elevation Model - 3m



DEM (-3 to 617 meters)



Flow Direction

Next Steps and Questions?