Application of an Index Model to Predict Dissolved Nitrate Levels in Groundwater in San Joaquin Valley, California

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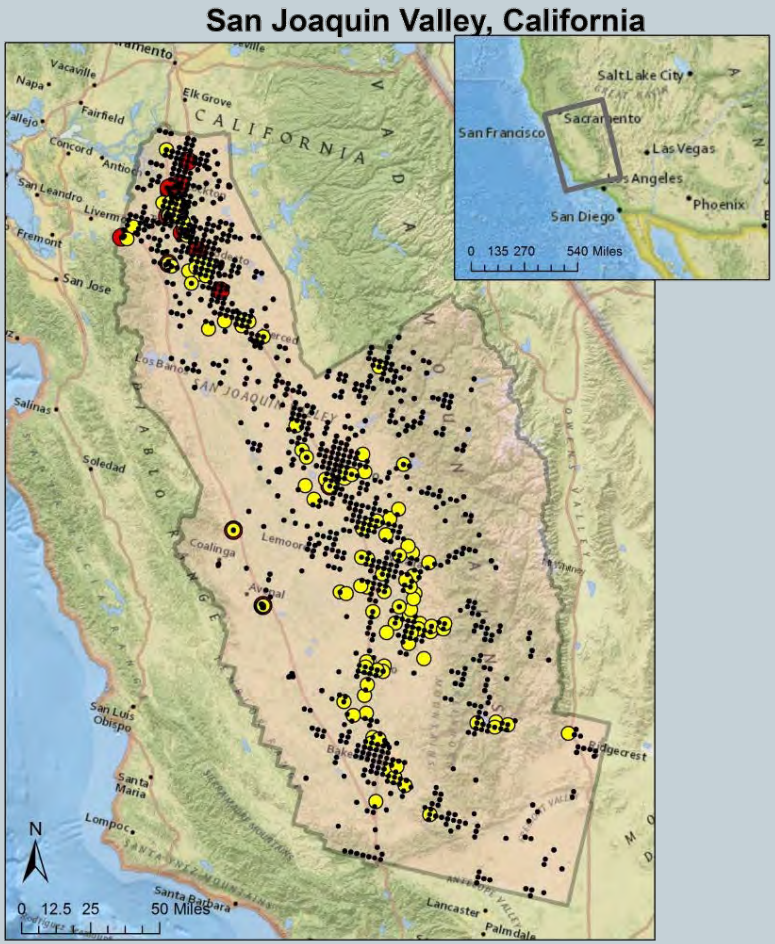
https://sites.google.com/site/centralvalleypollution/

Nitrate most common contaminant in San Joaquin Valley

- Irrigated agriculture and over-application of fertilizer
- One in 10 at risk of exposure to nitrate-contaminated drinking water

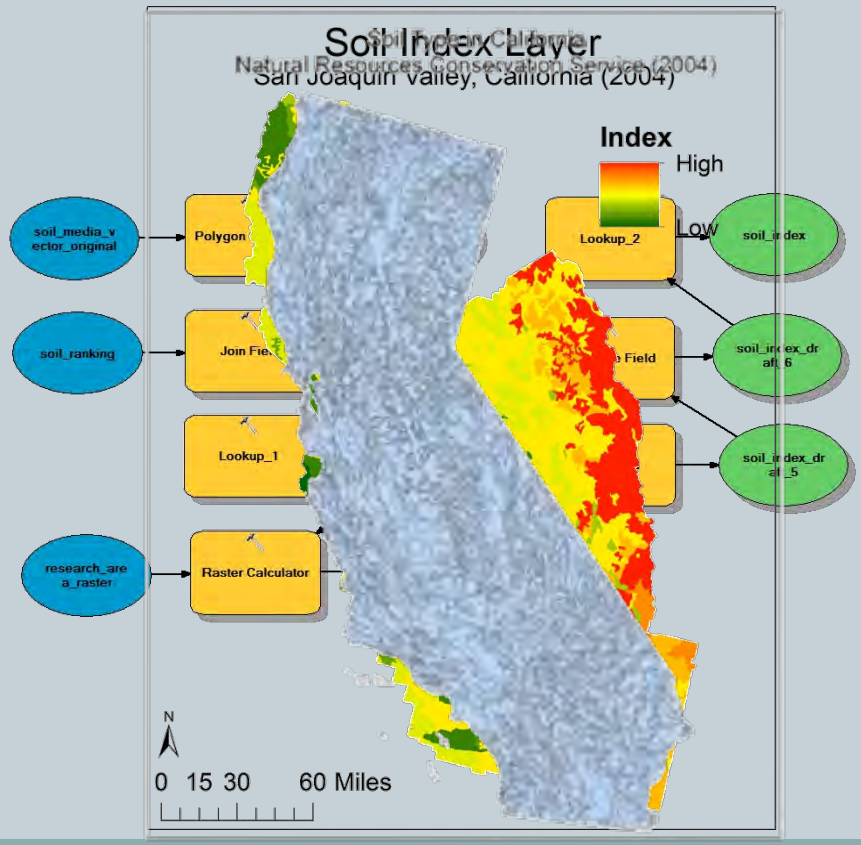
Assess nitrate contaminant vulnerability using an index model



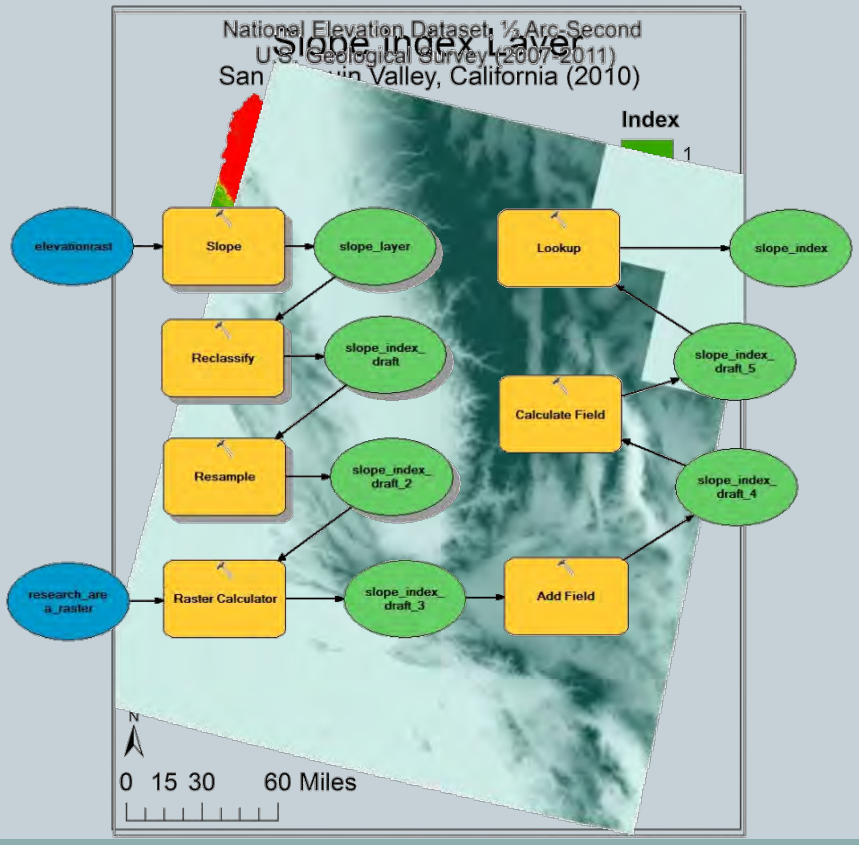
- Determine locations where nitrate contamination is most likely to occur
- Correlate likelihood of nitrate contamination with actual nitrate levels measured

Index layers borrowing from DRASTIC Model

Vulnerability of nitrate contamination due to soil permeability

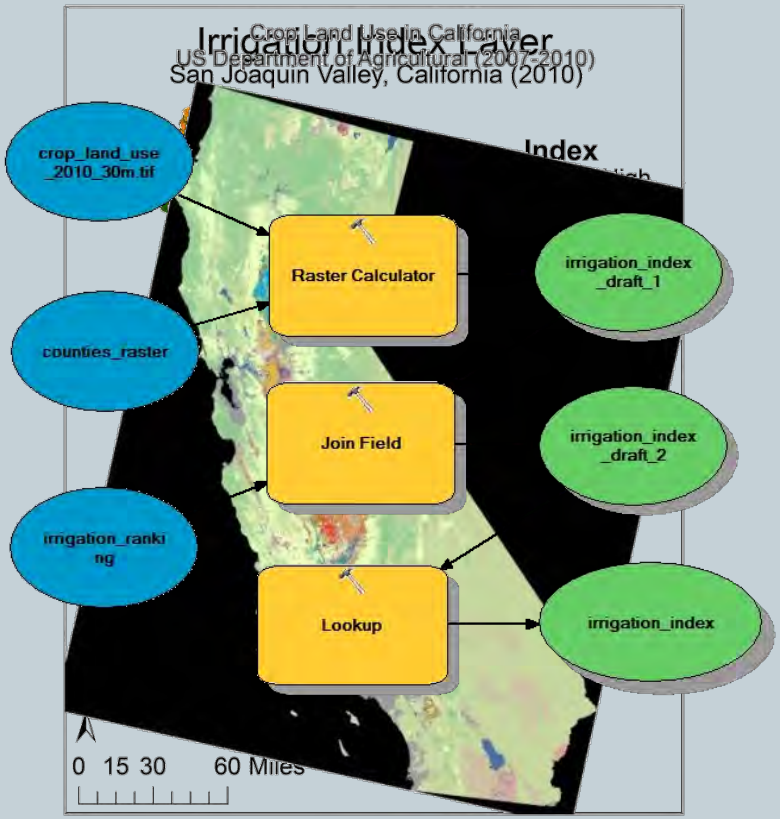


Vulnerability of nitrate contamination due to percent slope



Index layers borrowing from Nitrate Hazard Index

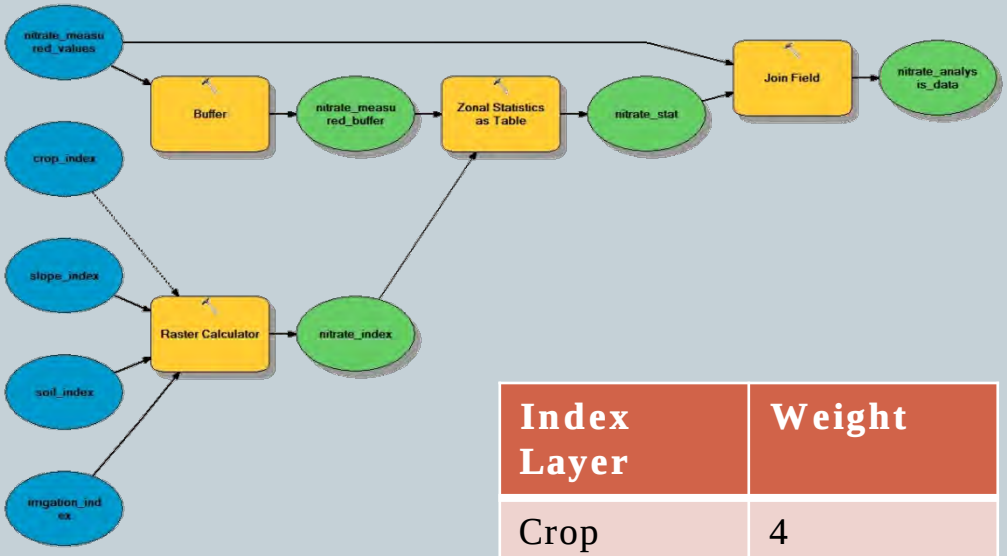
Vulnerability of nitrate contamination due to irrigation of various crops



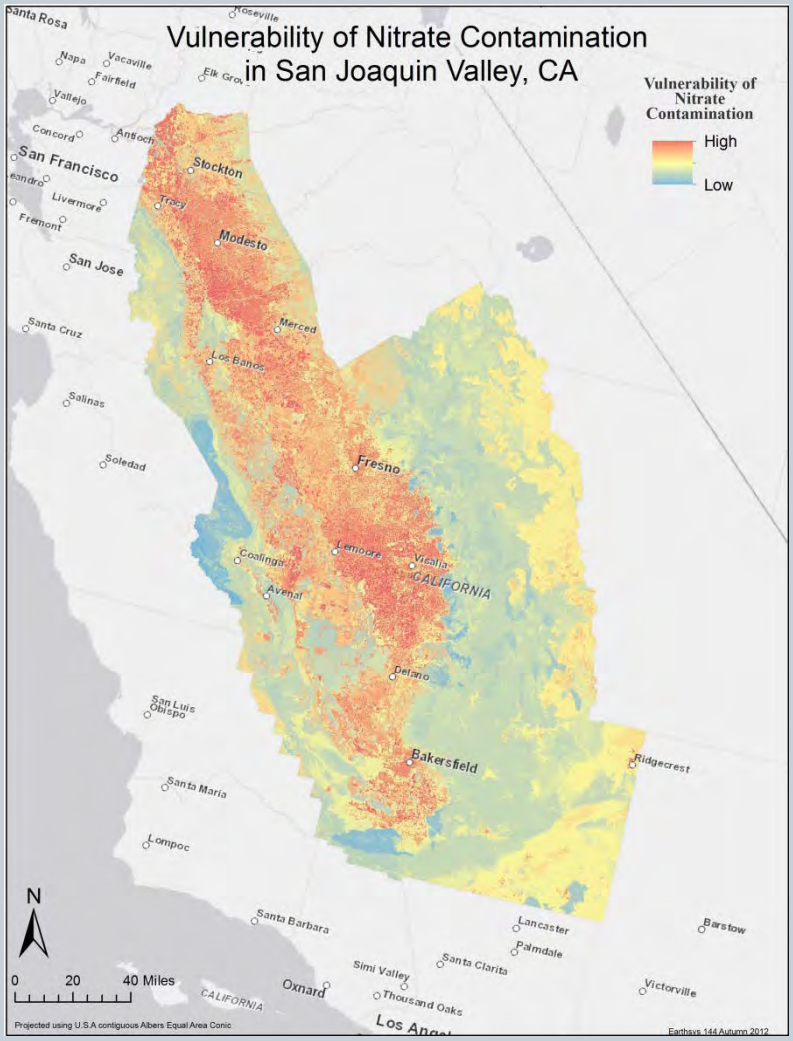
Vulnerability of nitrate contamination due to crop type

Building the vulnerability index layer

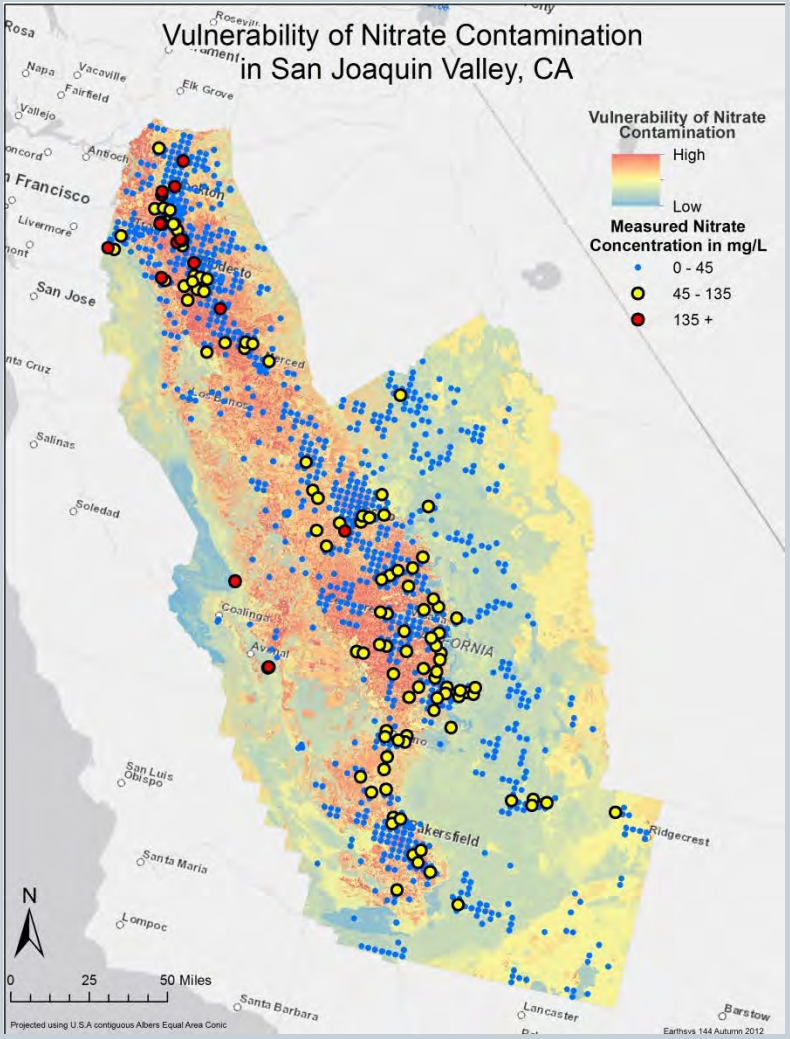
$$NI = w_c C + w_i I + w_{so} So + w_{sl} Sl$$



Index Layer	Weight
Crop	4
Irrigation	2
Soil	3
Slope	1



Relating vulnerability index to measured nitrate levels



- No correlation between vulnerability index to measured nitrate levels
  - Many underlying assumptions made in computing vulnerability index
  - Low location precision of measured nitrate levels dataset
- Inform community members about the susceptibility to nitrate contamination

Next Steps

- Research on a different method to build the nitrate-vulnerability index
- Research on a smaller research area to obtain more detailed data and analysis
- Obtain more thematic layers to make a more complete DRASTIC model
- Search for more measured nitrate levels to correlate with vulnerability index

References

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Questions?

HTTPS://SITES.GOOGLE.COM/SITE/CENTRALVALLEYPOLLUTION/