# Analysis of River Plume Remote Sensing Data

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# Northern California Sediment Plumes:

Wet winters drive outflow from coastal estuaries

- *Supply 81% of shelf sediments (Griggs and Hein, 1980)*

Sediments are integral to life on and offshore

- *Light attenuation*
- *Species & Nesting Habitat*
- *Land Buffer*

Human Impact Sediment Supply Cycles

- Climate Change
- Development

# Large Plumes:

Primarily Coriolis driven

Some wind impacts, but less the larger they get

# Small Plumes:

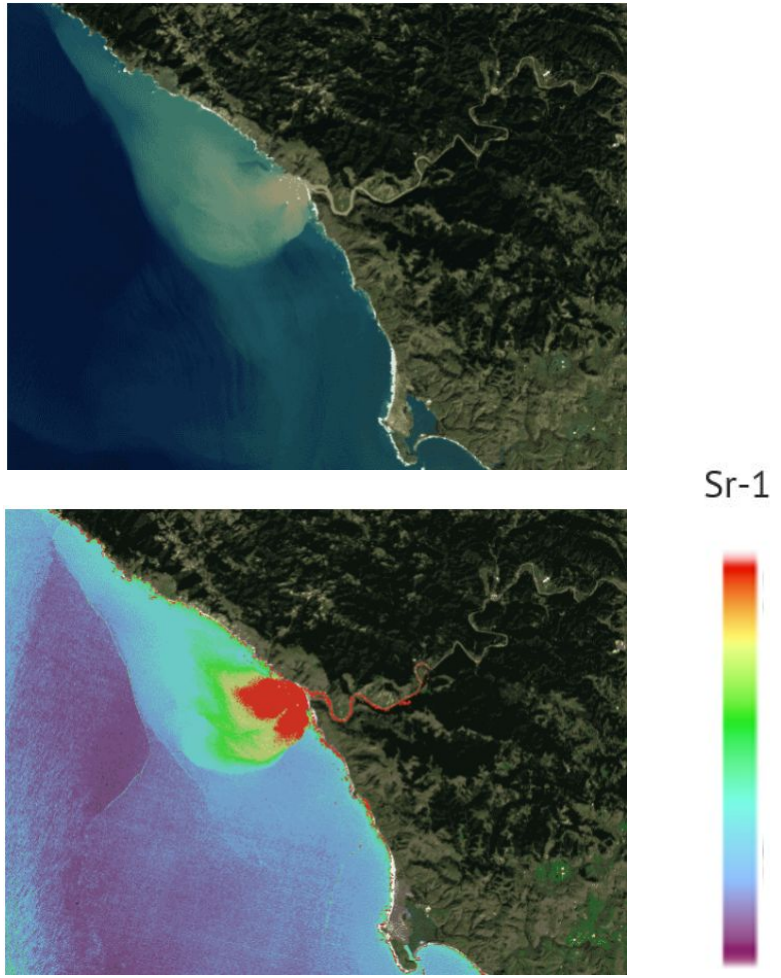
Less controlled by Coriolis, more by variable, non rotational forces

More typical and impactful in CA (Warrick and Fong, 2004)

Less Documented and modeled

# Data Background: Suspended Sediment Reflectance

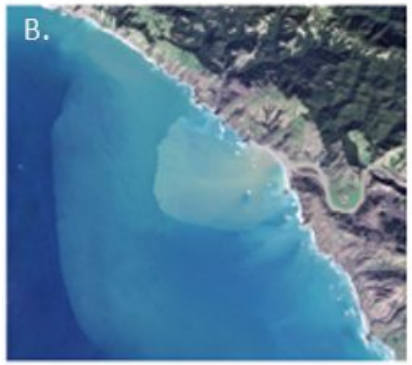
- Remote sensing great for ground truthing spatial models
- *Multispectral satellites:* multiple sensors that measure radiance of different wavelengths of light (red, green, blue, non-visible)
- For nearshore processes, *red color reflectance magnitude (**Sr**) correlates with suspended sediment turbidity*

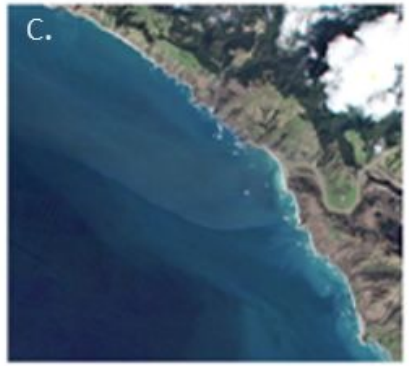


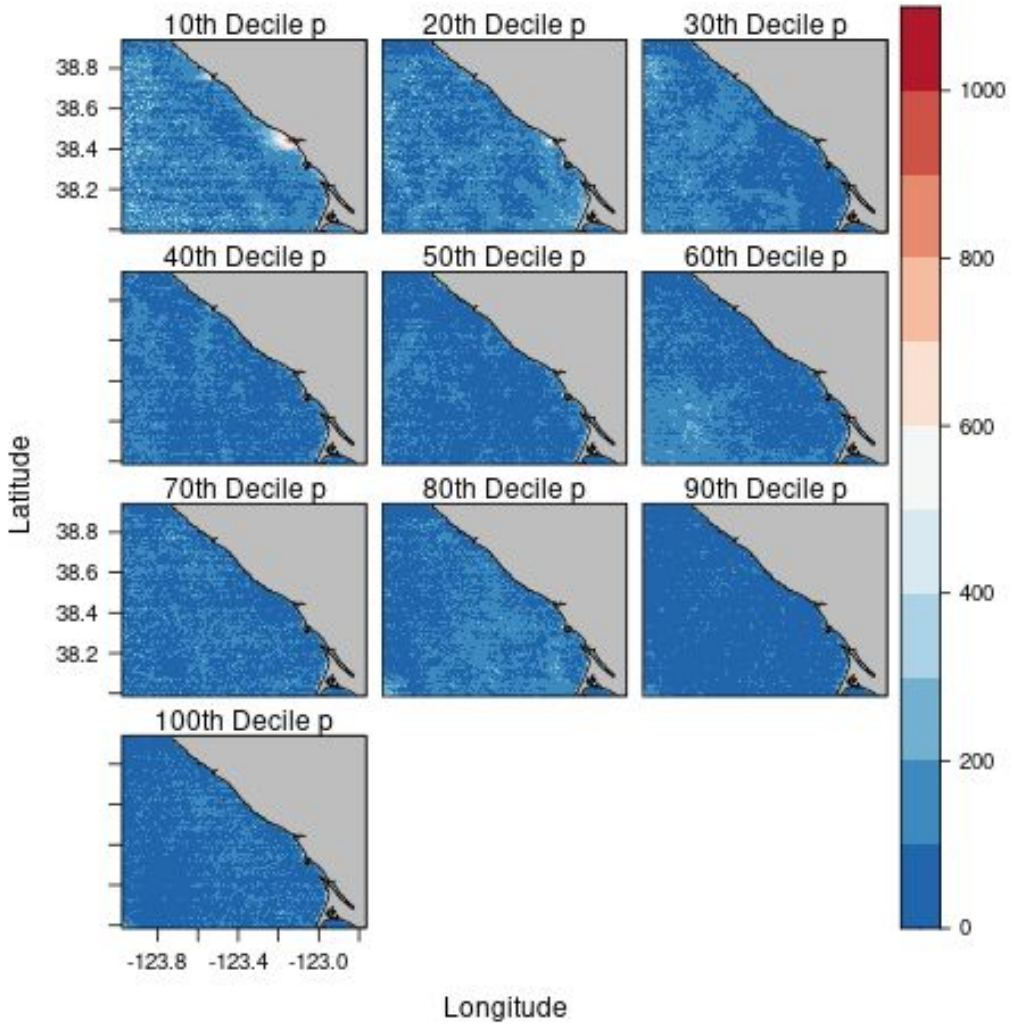
# Methods: Average Composites

Average composites of data catalogues to look at average plume responses

For example: when does wave energy overcome river momentum?



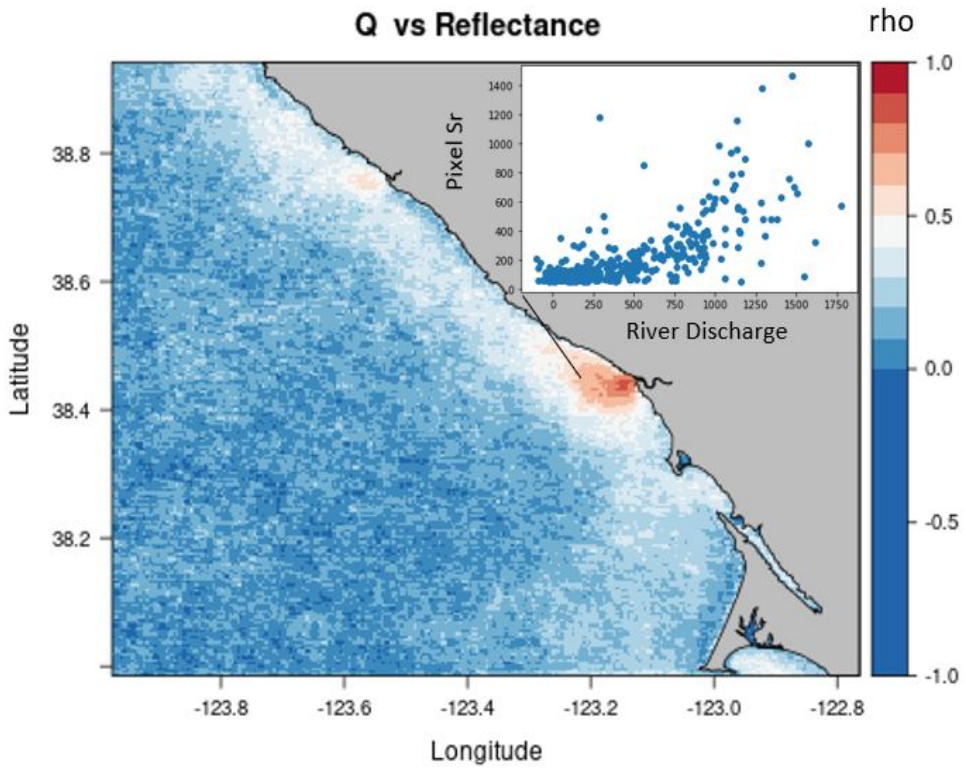



# Methods: Pixelwise Statistics

Analysis of timeseries pixel data at each position vs monitoring data

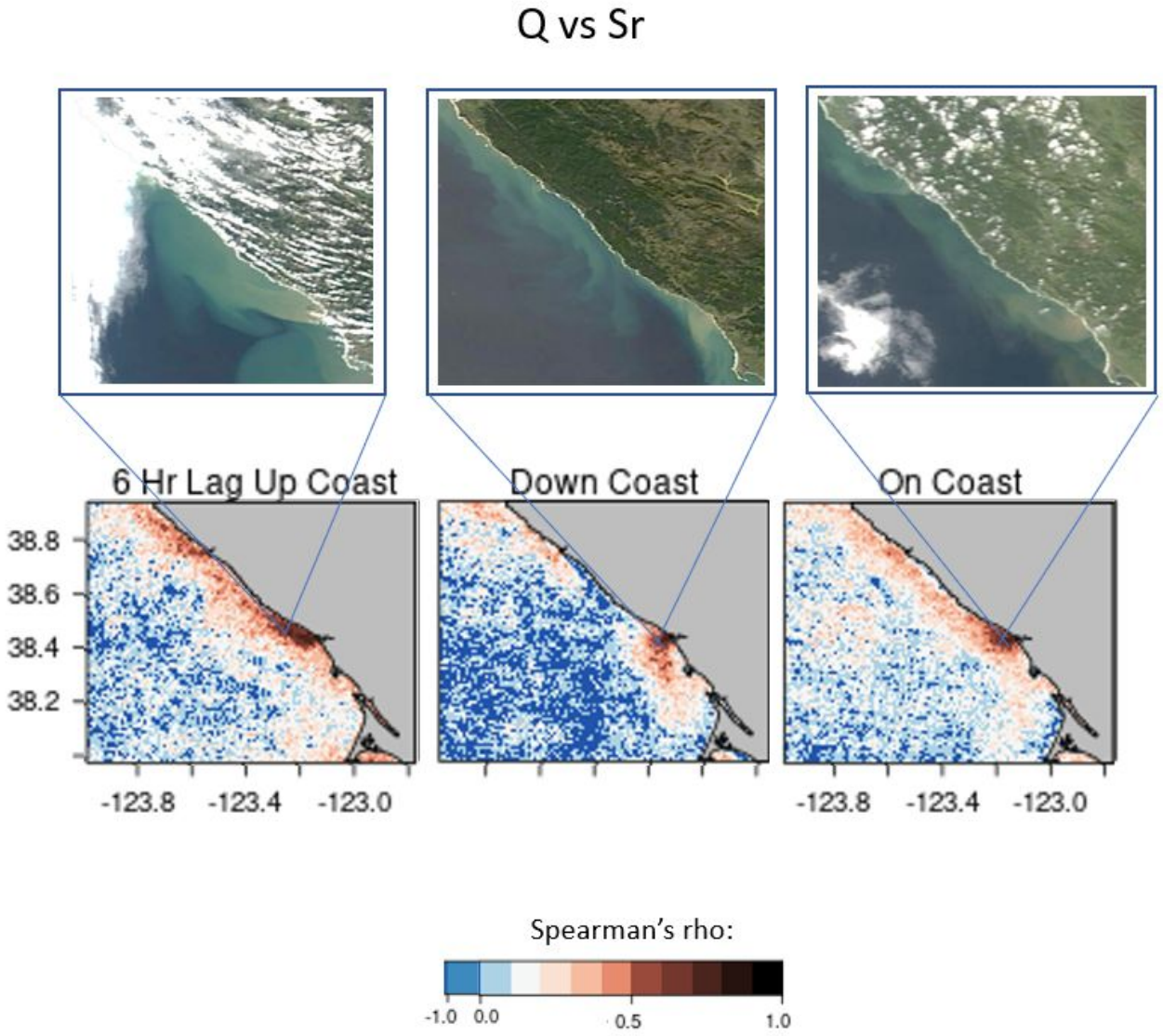
E.g.: Pixelwise Spearman's rho: Sr vs River Discharge



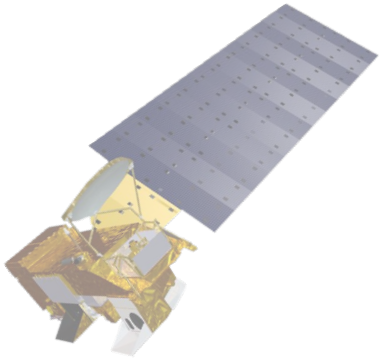
# Small Plume Wind Response

Can observe these correlations in conditional subsets:

E.g.: Q vs Reflectance, subset by wind direction



# Thanks so much for listening!



Questions?

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