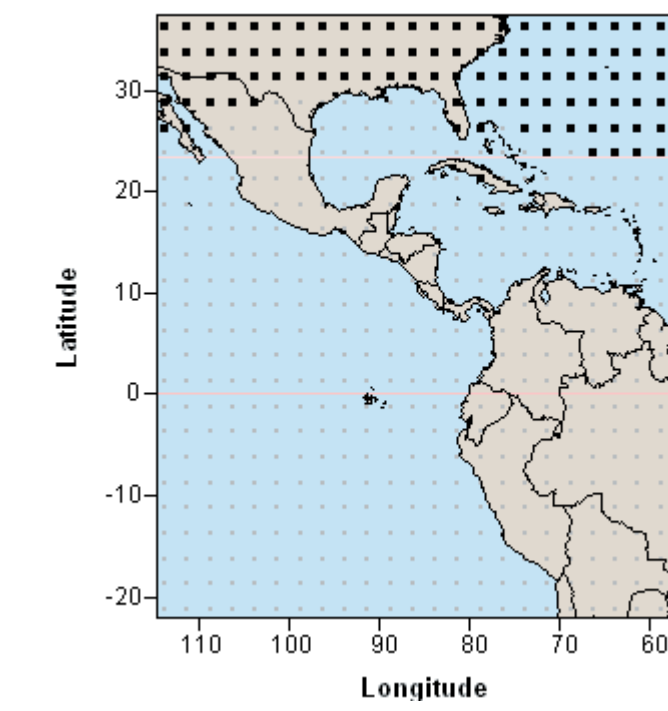
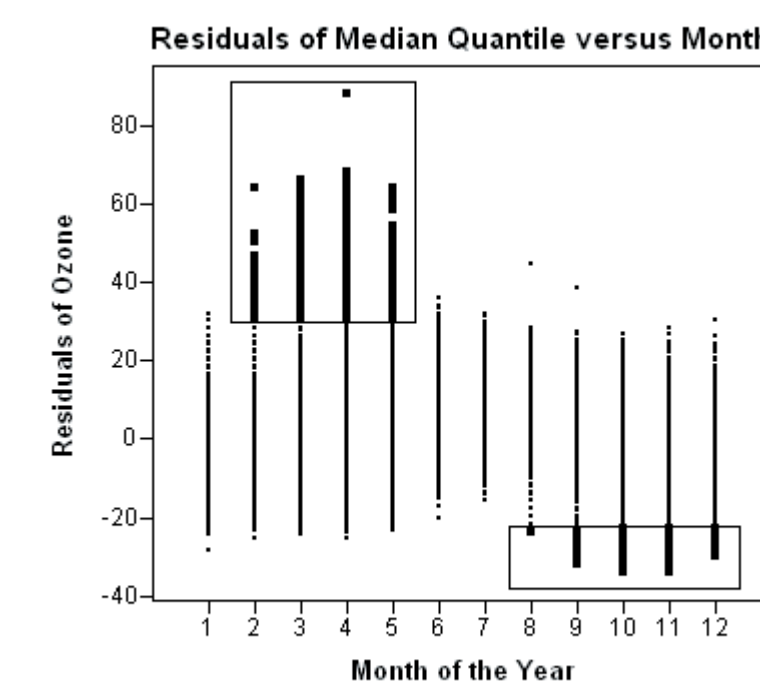
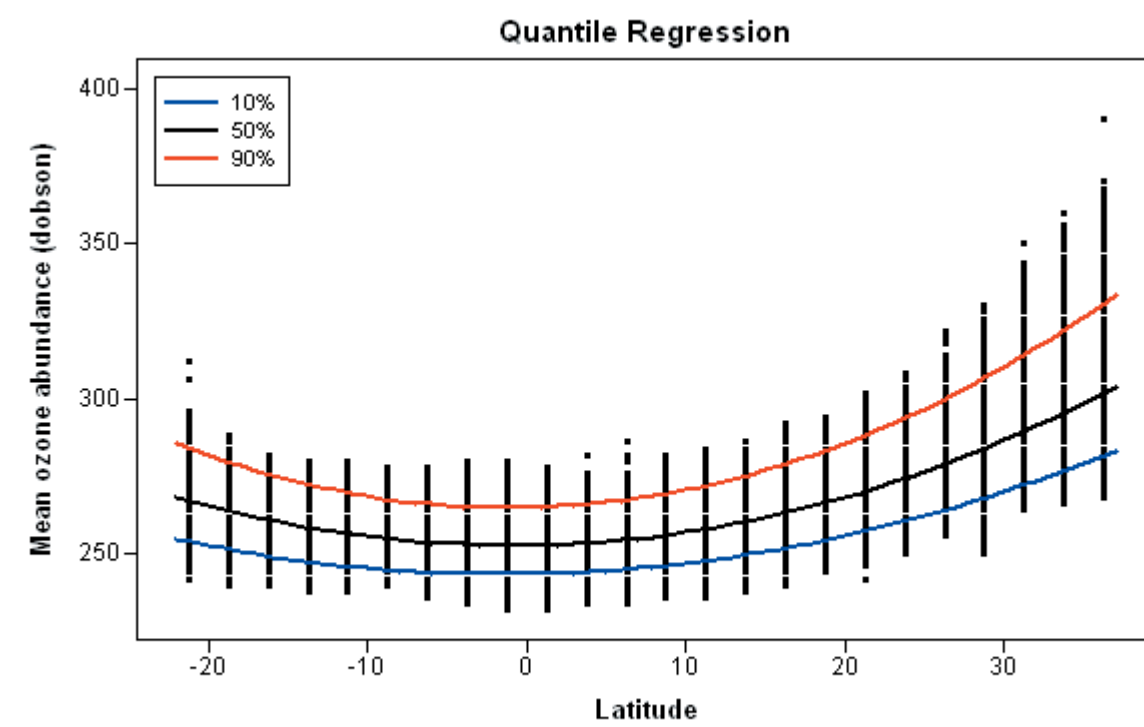


Building Statistical Models: A Model of Ozone

Exploratory data analysis reveals that locations with similar latitudes have similar time series for ozone. Plotting ozone versus latitude reveals a quadratic relationship.

Model ozone as a quadratic function of latitude

- Best model when considering only geographic regressors
- Investigate residuals, note temporal dependence
- Largest positive residuals: February–May, extreme northern latitudes
- Largest negative residuals: September–December, extreme northern latitudes



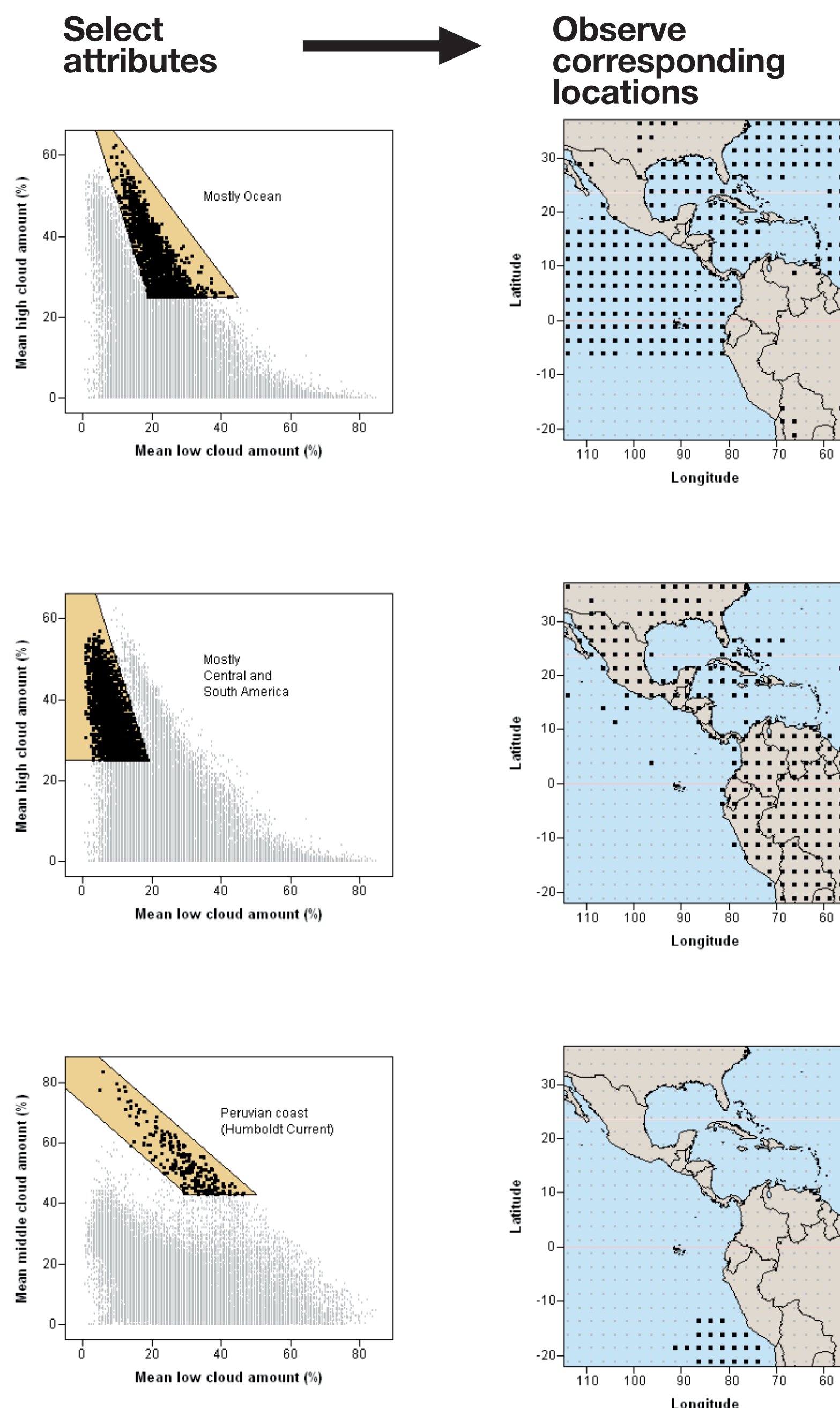
Revise model by adding temporal regressors

- Add variable to assign months to season {DJF, MAM, JJA, SON}
- Similar residual structure, but much smaller residuals
- Including interactions between season and latitude improves fit

Determine Geographic Regions with Similar Attributes: Cloud Cover

The data set includes variables specifying the percentage of the sky covered by clouds in the low, medium, and upper levels of the troposphere. (Note: The sum of the three variables is always ≤ 100 percent.)

Are features in scatter plots of these variables associated with physical geographic features? Conversely, do geographic regions share similar patterns of cloud coverage?



Play the Identification Game!

Each card on the table shows the cloud coverage over a six-year period for one of the locations marked on the map. Compare each card with the general patterns in the Pacific, Atlantic, US, or South America.

Can you determine the location (A, B, C, D, or E) for each card?

