Role and choice: **Faculty – poster presentation**

Title: **Why Regional Flood Frequency Analysis Isn’t Like Diamonds on the Soles of Your Shoes**

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Abstract:

Flood frequency analysis (FFA) estimates the magnitude and frequency of floods by fitting a continuous probability distribution to the annual maximum instantaneous peak discharge of a station record. The magnitude of a flood event of a particular frequency provides the basis for designating areas of high flood risk, e.g. the 100-year flood plain. An underlying challenge in FFA is that short record periods may produce inaccurate flood magnitude estimates, especially for large flood events. Updated Federal guidance requires that station-specific skewness of the annual flood series is combined with regional skewness to obtain a more stable and representative flood magnitude estimate. However, neither Federal nor State guidance provides a mechanism for calculating a robust regional skewness coefficient. The purpose of the study is to identify clusters of similar gaging stations from which to calculate regional skewness coefficients for stream discharge gages on Tribal lands in the Great Plains ecoregion. Exploratory data analysis of the available gage data in unglaciated watersheds did not identify clear boundary conditions from which to subset the dataset. The available gage data consists of an initial set of ~1,100 gages within the Great Plains ecoregion, with approximately half of the gages containing greater than 20 years of peak flow data. Final selection identified a response variable set of ~330 gages with greater than 20 years of peak flow data that are unaffected by flow regulation or substantial withdrawals. Regional scale explanatory data includes location, nested categorical data on ecoregion type, altitude, average temperature, and length of growing season.