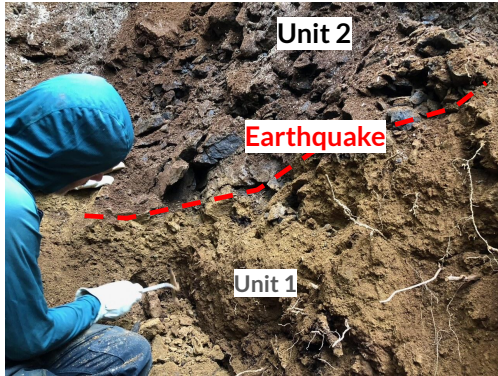
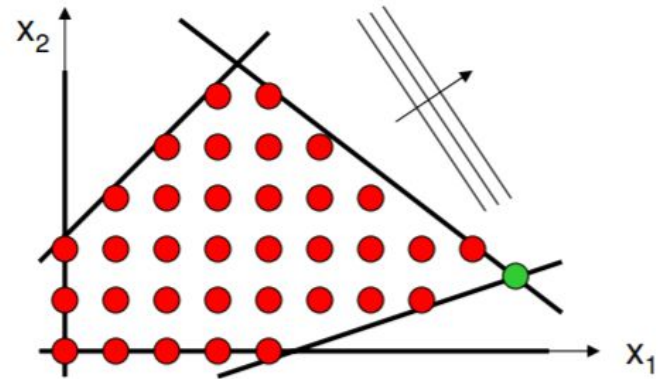


Paleoseismic Event Correlation with Integer Linear Programming

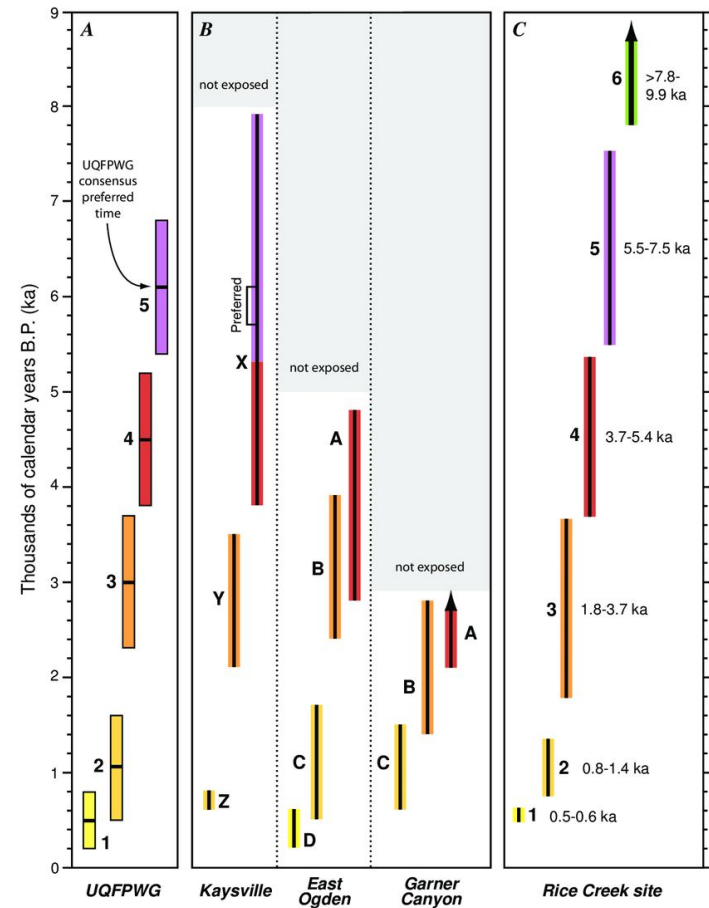


Erik Perkins



The Question:

How can we create an earthquake history for a fault using its paleoseismic sites?

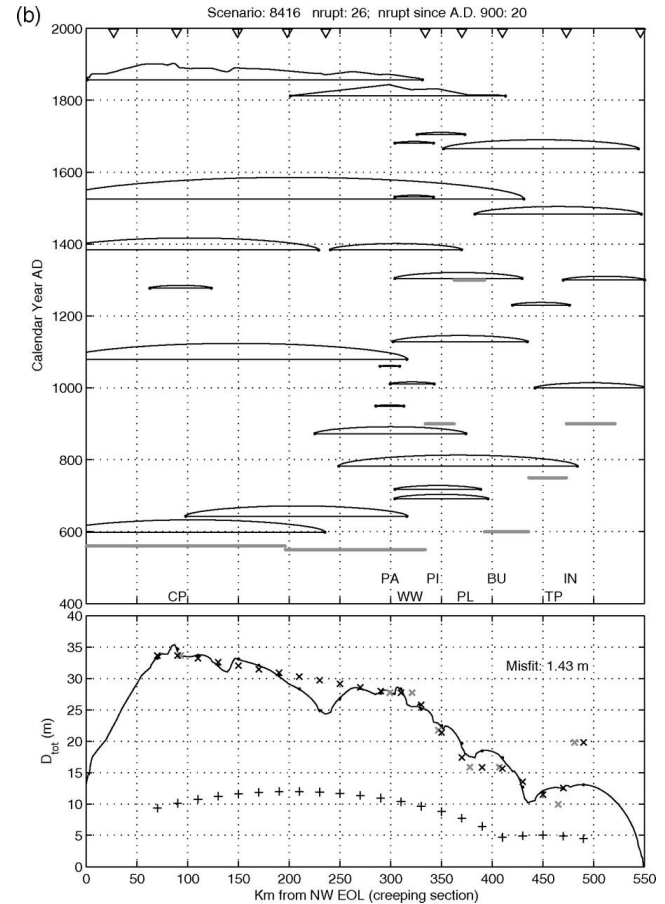


Adapted from DuRoss et. al (2009). *Paleoseismic investigation of the northern Weber segment of the Wasatch fault zone at the Rice Creek trench site, North Ogden, Utah Models*. *Paleoseismology of Utah*.

The Goal:

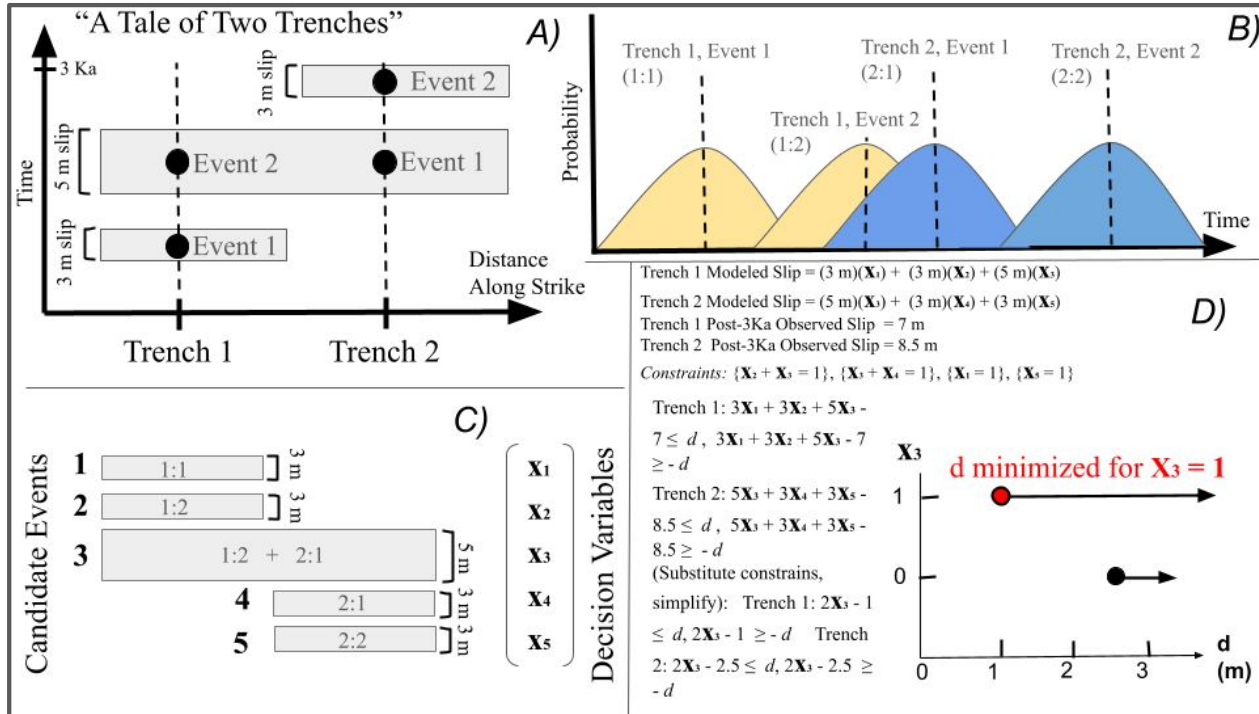
Find the most likely paleoseismic history for a fault using slip rate data and slip-per-event estimation

- Slip rates can be estimated using offset landforms
- Earthquake displacement can be estimated using earthquake length

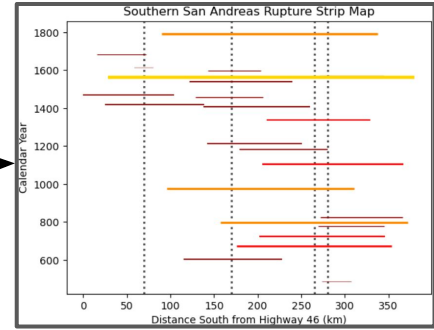


The Solution:

Create a linear programming-based model that finds the most likely paleoseismic history by minimizing the difference between **estimated fault displacement** (for each paleoseismic site) and **fault displacement of modeled history**

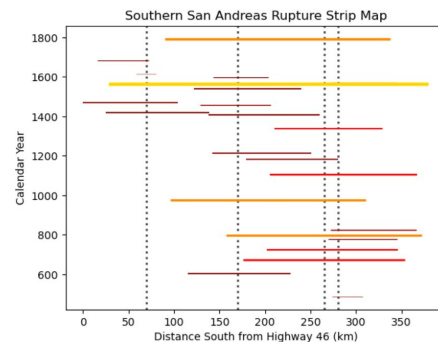
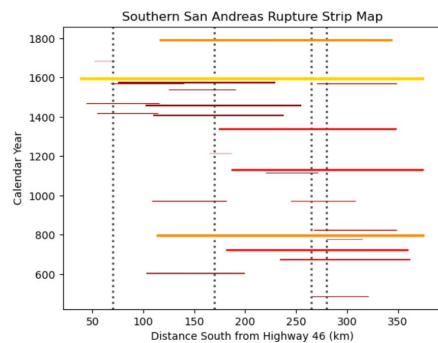
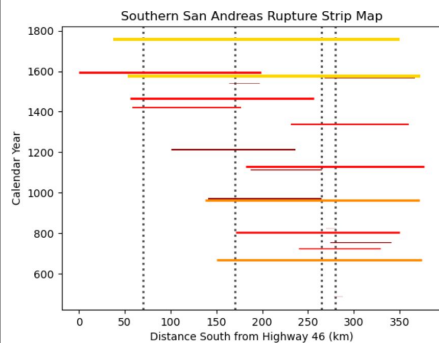


outputs



Preliminary Results

Version 1: Randomize endpoints of candidate events



Version 2: Optimize endpoints of candidate events

