What are we trying to get at with “uncertainties”?

Uncertainty in a chronology vs a reconstruction

Sample chronology vs population chronology (Wigley et al., 1984; SSS, EPS, MS)

Confidence intervals of mean value chronology based on sample depth (bootstrapped RMSE)

Validity of RE and CE stats in high- vs low-frequency domains (Macias-Fauria et al., 2012)

**Moving forward in time blocks:**

**Lit review**

Modern Overview: Cook and Pederson (2011). Uncertainty, Emergence, and Statistics in Dendrochronology

SEA uncertainty: Rao et al. (2019). A double bootstrap approach to Superposed Epoch Analysis to evaluate response uncertainty

**Choosing Scope**

Individual measurement error

Requires 2+ measurements per increment

Captures measurement uncertainty

Taking the standard deviation and multiplying by 1.96 to attain 95% CI on the increment widths assumes that the measurement technician measures an increment at a location of average width such that the ring is not pinched or elongated outside of the 1σ range at that location 68% of the time (and 95% of the time within the 2σ range, etc.).

Crossdating error

Interseries correlation

Rbar

Captures error due to false/missed rings

Detrending error

Eps and adjusted eps

Compare Cofecha-detrended chronology to purpose-detrended chronology

Captures error due to detrending

Mean value function error

Standard deviation at each year

Robust biweight mean, robust median, etc.

Captures error related to collapsing the chronology to mean value series

**Coding Uncertainty Calcs**

Load chronology

Analyze crossdating to calculate uncertainty of individual measurements

Run MEboot for individual measurement series

Perform interactive detrending

Analyze chronology metrics and compare stats for various detrending methods

Calculate bootstrapped confidence intervals of master chronology based on sample depth, interseries correlation, and etc.

**Building Shiny app**

Start with ChronBuildR (D:/Lab Backup/ChronBuildR) \*\*\*resume work at line 60