

NRES 779
Presentation

Griffin Shelor

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Data

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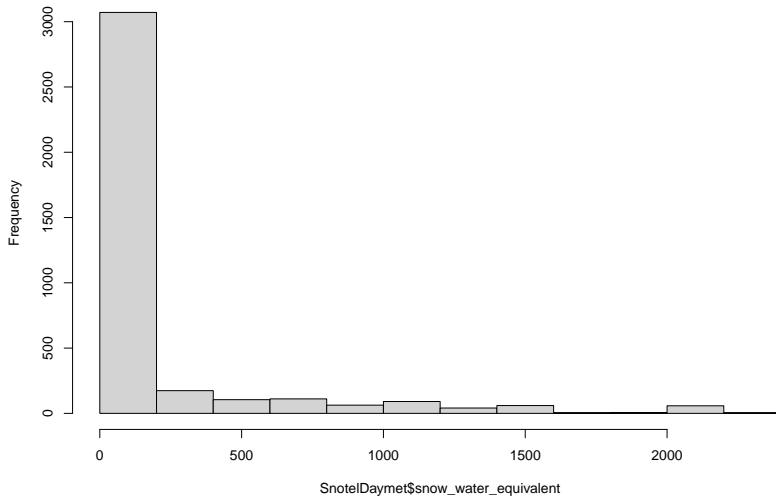
- SNOTEL
- Daymet

Histogram of SNOTEL Data

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SWE Values at 2 California SNOTEL Sites between 2010 and 2022



Model Development

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- Lognormal distribution
- Tried and failed to use gamma
- Truncated normal

Bayesian p-values

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- Every single model had a value of 1 for the mean and variance.

WAIC of Top 4 Models

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WAIC for Top Models

calculated with Loo package

MODEL ID	WAIC	DELTA WAIC	ELPD_DIFF
Model 3	12,604.448	0.0000	0.000
Model 4	13,087.522	483.0739	-241.537
Model 1	13,165.115	560.6662	-280.333
Model 2	14,112.091	1507.6431	-753.822

Figure 1: WAIC Table

Best Performing Model

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- Model statement: $y \sim \text{lognormal}(\mu, \sigma^2)$
- where $\mu = \beta_0 + \beta_1 x_1$
- x_1 is max temperature
- Prior for the betas: $b_n \sim \text{normal}(0,10)$
- σ prior: $\sigma \sim \text{gamma}(1,1)$

Traceplot of Best Performing Model

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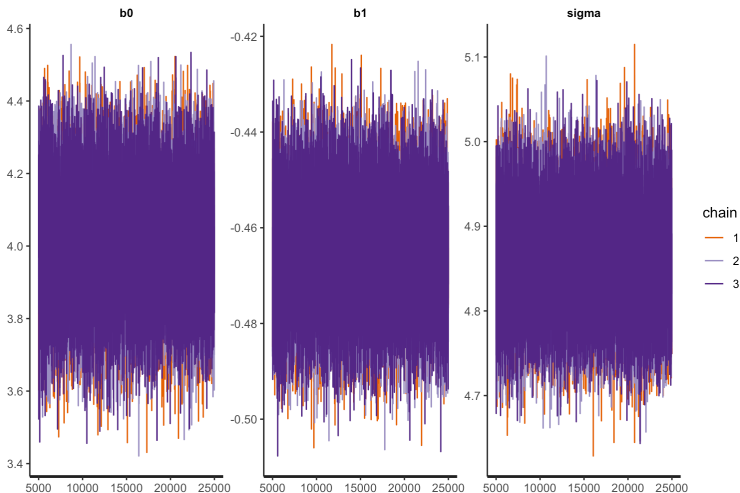


Figure 2: Traceplot

Some Things to Consider in the Future

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- Adding more data with more time for models to run
- Looking at site random effects
- Figure out how to use gamma distribution
- Add in additional topographical variables (slope, aspect) and possibly land cover
- Adjust priors