

# MCMC for PCAx

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## MCMC for PCAx

We have data for  $n_s = 159$  counties and  $n_t = 57$  years. We're going to let the marginal parameters for the GEV be defined as follows

$$\begin{aligned}\mu(s, t) &= \sum_{l=1}^L \{w_l(s)[a_l + b_l z(t)]\} \\ \log[\sigma(s, t)] &= \sum_{l=1}^L w_l(s) c_l \\ \xi(s, t) &= d\end{aligned}$$

where  $w_l(s)$  are the basis functions from the smoother, and  $z(t) = (t - 28.5)/20$  is a standardized value for the year. We use independent  $N(0, 100)$  priors for all  $a_l, b_l, c_l$  terms, and a  $N(0, 0.5)$  prior for  $d$ .

## Questions/clarifications

1. I know we had originally discussed a CAR model, but I wasn't sure how that fit in exactly with the formulation we had using the basis functions above. Do you anticipate issues with what I wrote down?
2. We talked about using  $\log(\text{acres burned})$  as the response with values censored at  $q(0.95)$  for each site. So, after conditioning on the random effects, we'll be using a partially censored joint likelihood where the contribution to the likelihood for a censored value is  $F(x)$  and the contribution for an uncensored value is  $f(x)$  where  $F(x)$  is the CDF, and  $f(x)$  is the PDF of the generalized extreme value distribution. Is this what you were thinking?