

Class 2: Stochastic volatility models and heteroskedasticity

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Learning outcomes

- ▶ Show you some of the things that Bayes can do that forecast can't
- ▶ Switch to Stan rather than JAGS
- ▶ Show you how Stan differs from JAGS
- ▶ Mix-up some of the methods we've used so far
 - ▶ An AR(1)-SVM model
 - ▶ A repeated measures time series
- ▶ Do some model comparison with Stan
- ▶ Show we can do shrinkage rather than model selection

Which method should I use?

- ▶ If your time series is pretty straightforward and you're interested in the results/application then forecast is probably your best choice
- ▶ If your time series is more complicated and you want to go for

Plot the best fit model

```
with(geese, plot(int_days[o], scale(d13CP1[o]))[,1],  
          ylab = 'd13C',  
          xlab = 'Day of year'))  
mu_post = summary(stan_run_rm, pars = c("mu"))$summary[,c(  
  lines(1:365, mu_post[,1], col = 'red', lty = 2)  
  lines(1:365, mu_post[,2], col = 'red', lty = 1)  
  lines(1:365, mu_post[,3], col = 'red', lty = 2)
```

