Spatial Modelling
Part 2

Earl Duncan

Bayes on the Beach Conference
13-15 Nov 2017

- Part 1:
  - What is spatial data?
  - How does the spatial nature of data impact modelling/inference?
  - General modelling framework
  - Common Bayesian spatial models
  - Fitting models in R using CARBayes
- Part 2:
  - Model checking
  - Summarising model output (maps, scatterplots)
  - Making inferences
- Part 3:
  - Sharing our results with the other groups

- So far we have:
  - Defined a spatial weights $\mathbf{W}$
  - Fit the ICAR, BYM, and Leroux models in R using the CARBayes package. (Some may have also tried fitting in JAGS/WinBUGS)
  - Summarised the posterior (parameters estimates)

- Today's tasks:
  - Model checking (y vs $\hat{y}$, WAIC, MSPE, Moran's I, …)
  - Providing further graphical summaries using `ggplot2`
    - y vs $\hat{y}$
    - Observed data with prediction bands
    - Risk surface and deconstruction
  - Understanding what these results tell us
    - Do we need to refine our models? Priors too vague/conflicting?
    - Are there any areas which are not well predicted?
    - Which model performs best?

- Summary output (for checking):
  BYM