Introduction to Bayesian statistics with R

6. Conclusions

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This workshop

Objectives

- Try and demystify Bayesian statistics, and what we call MCMC.
- Make the difference between Bayesian and Frequentist analyses.
- Understand the Methods section of ecological papers doing Bayesian stuff.
- Run Bayesian analyses, safely hopefully.

What's on our plate?

- Section 1 - Motivation and Bayes theorem.
- Section 2 - Markov chain Monte Carlo algorithms (MCMC).
- Section 3 - Introduction to NIMBLE and brms.
- Section 4 - Priors.
- Section 5 - Case studies and GLMMs.
- Section 6 - Conclusions.

Conclusions

Advantages

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- Pbs complexes avec MCMC, mais attention non-identifiability.
- Ajouter les bons tuyaux du papier quick tips.
- Pourquoi c chouette le bayésien, voirs section 3.3.3, 3.3.4 et 3.3.5 ici
  https://bookdown.org/steve_midway/BHME/Ch2.html#put-another-way
  (intervalle de confiance / crédibilité)

Frees the modeler in you (M. Kéry)

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- Uses probability to quantify uncertainty for everything (propagation of uncertainty).
- Allows use of prior information ('better' estimates).
- Can fit complex (hierarchical) models with same MCMC algorithms.

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- Checking convergence is painful.
- Specifying priors might be tricky.
- Model adequacy should be checked (posterior predictive checks - not covered; check out Dharma).
- Computational burden can be high.

So what?

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- Make an informed and pragmatic choice.
- Are you after complexity, speed, uncertainties, etc?
- Talk to colleagues.