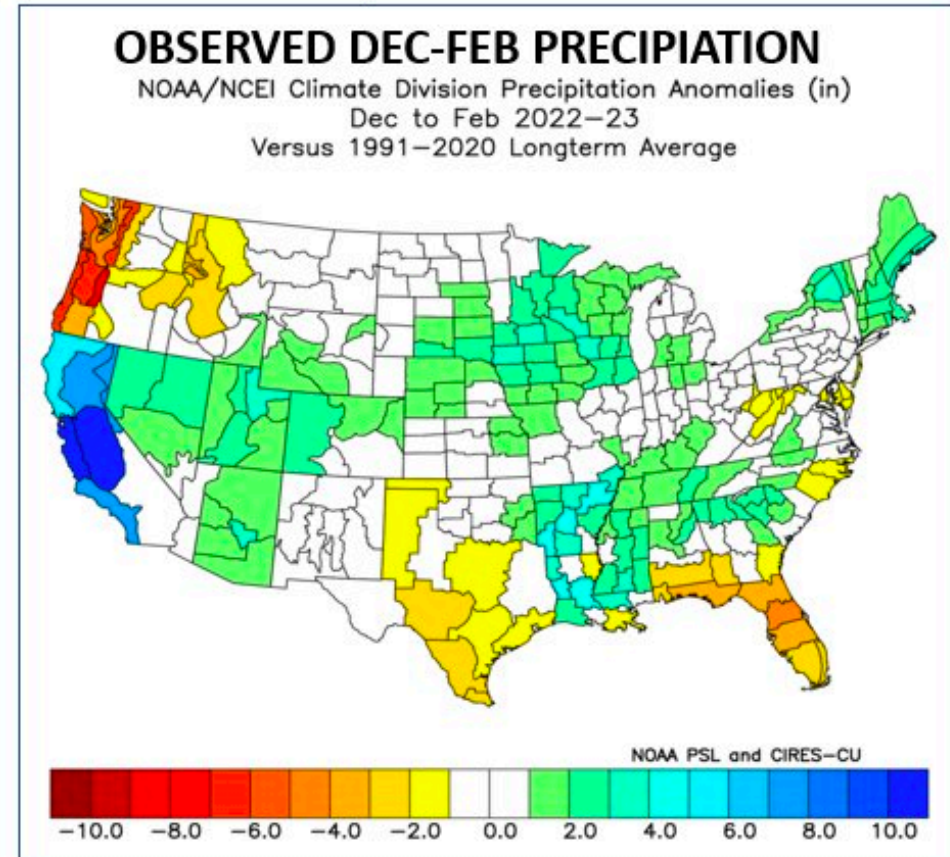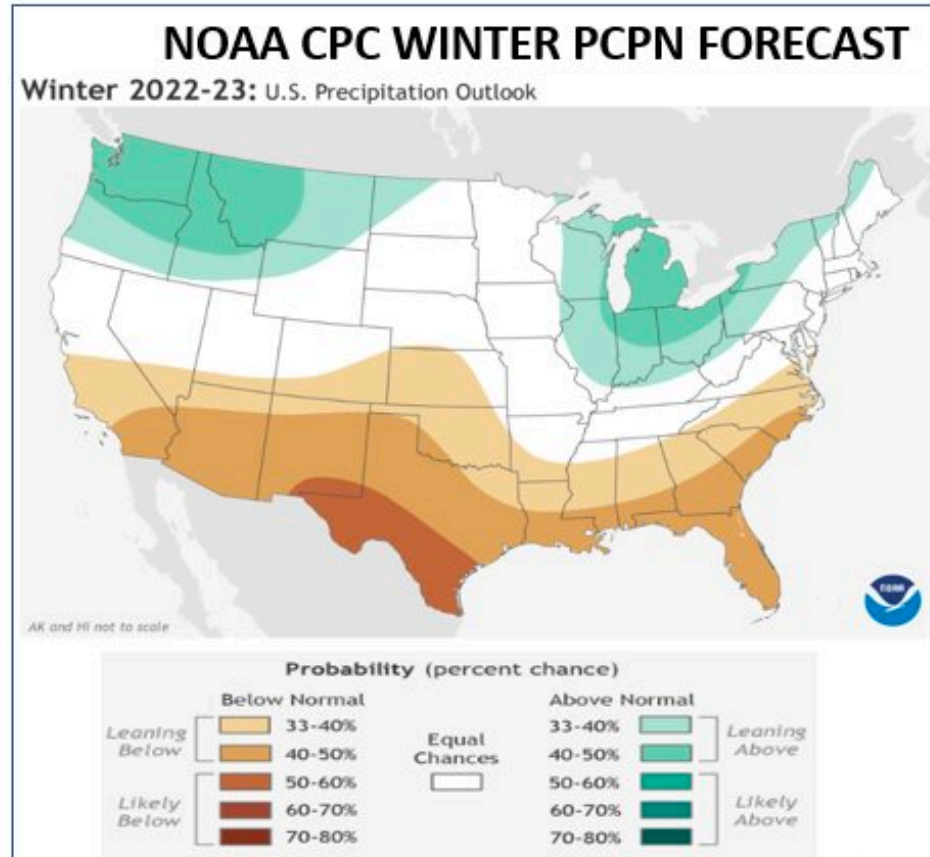# Comparison of the NOAA 2022-2023
# Winter Outlook and Observed Precipitation

Choosing among models

"there is currently no consensus in the statistics community about what constitutes correct practice, and there likely never will be. On the other hand, there is broad consensus on what constitutes poor practice, providing guidelines for model selection that we discuss here"

"Each research problem and statistical analysis is unique, and shortcuts can never replace critical thinking."

Exploration | Prediction | Inference

Independent studies
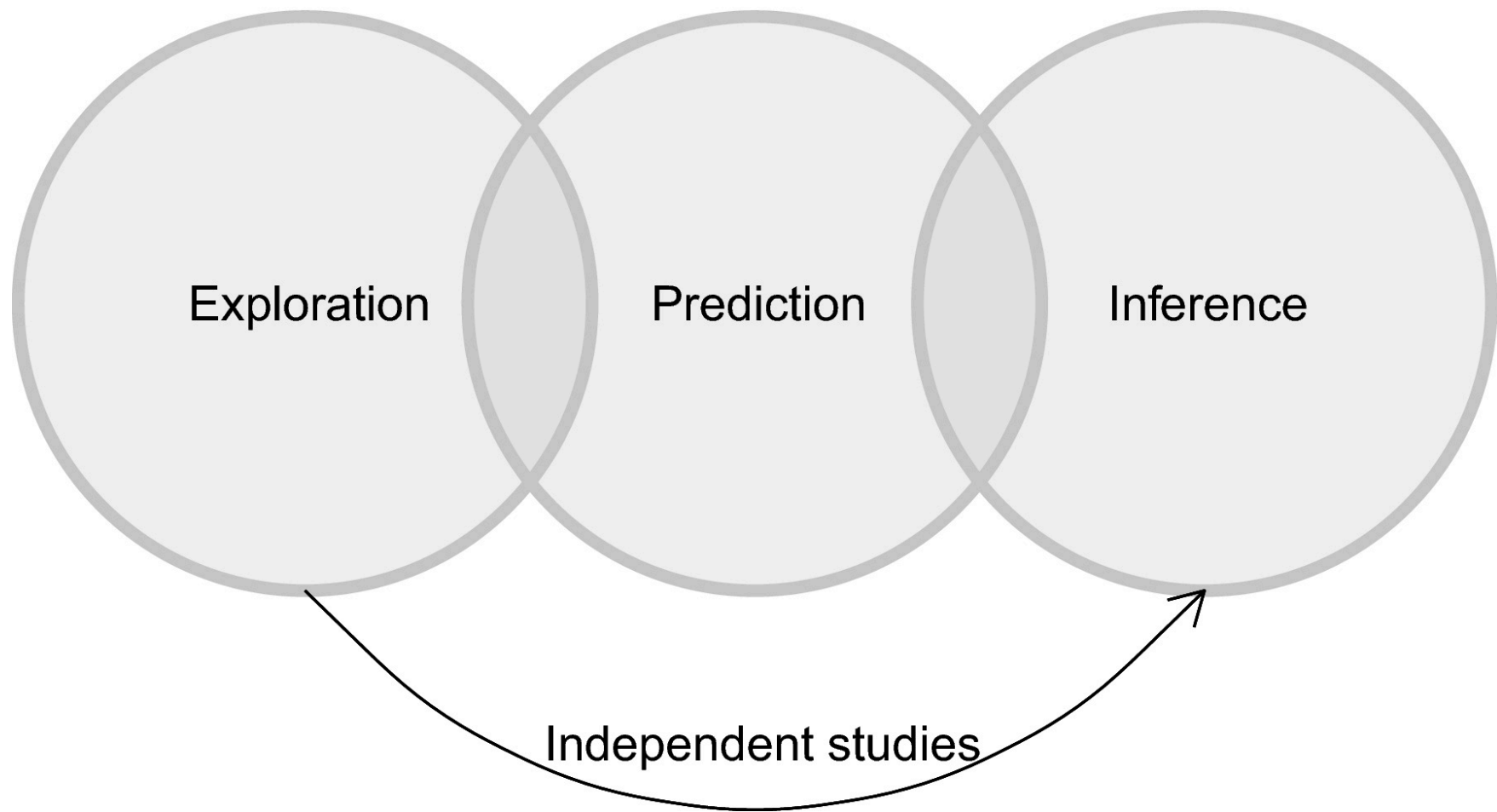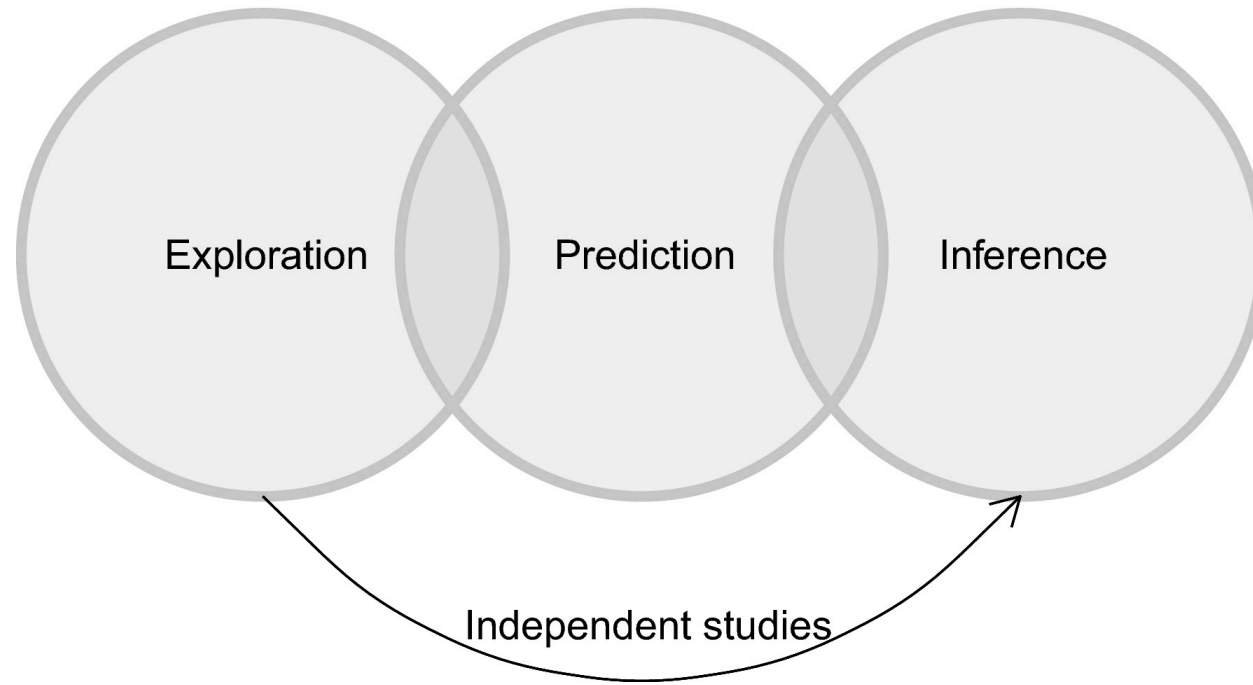
How do the authors define each of these?

How are they different?

Why are independent studies needed to move from exploration to inference?

Bayesian regularization

- A simple way to identify the best trade-off between bias and variance in regression-type models.
- Steps:
    1. Normalize covariates you want to regularize (i.e. subtract out mean, divide by SD)
    2. Start of using relatively wide normally distributed priors for regression coef. (e.g. N(0,100)). **Does not include intercept or AR terms.**
    3. Fit model leaving some portion of the data out.
    4. Check predictions using withheld data using MSPE
    5. Reduce variance of priors for regression coef. (e.g. N(0,10)) and repeat 2 and 3.
    6. Repeat with sequentially smaller prior variance until you ID the amount of prior variance that leads to the best predictions.
    7. Refit model with entire data using the "best" prior variance.

CD

A

B
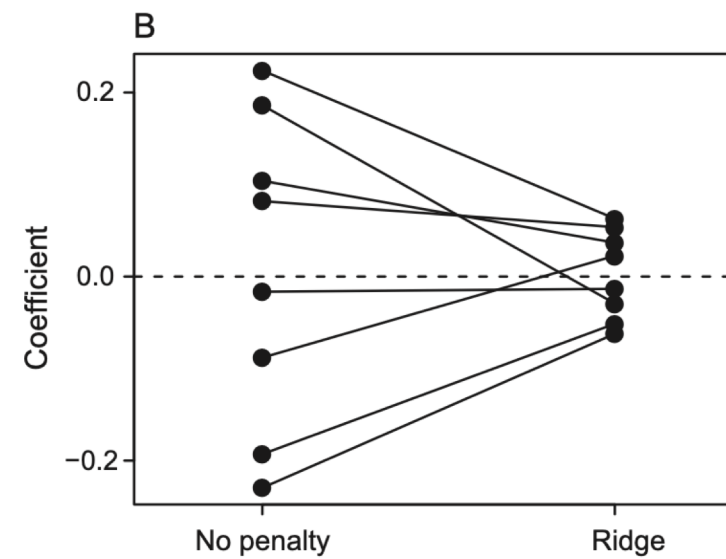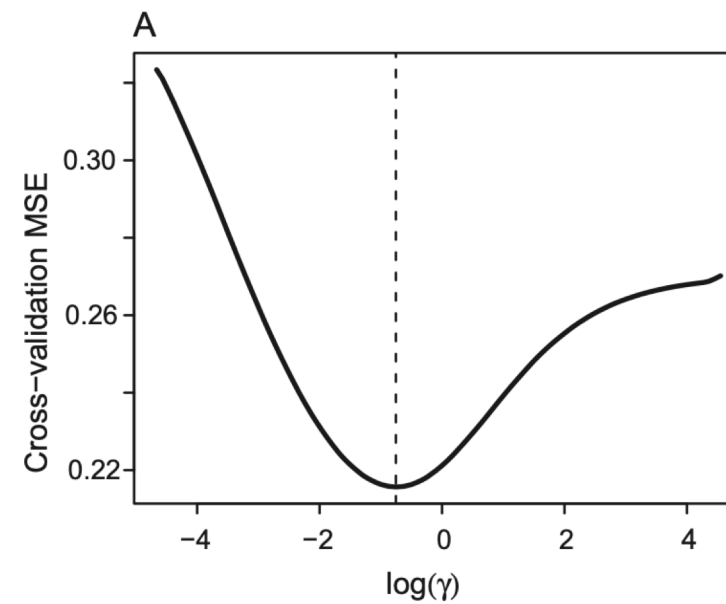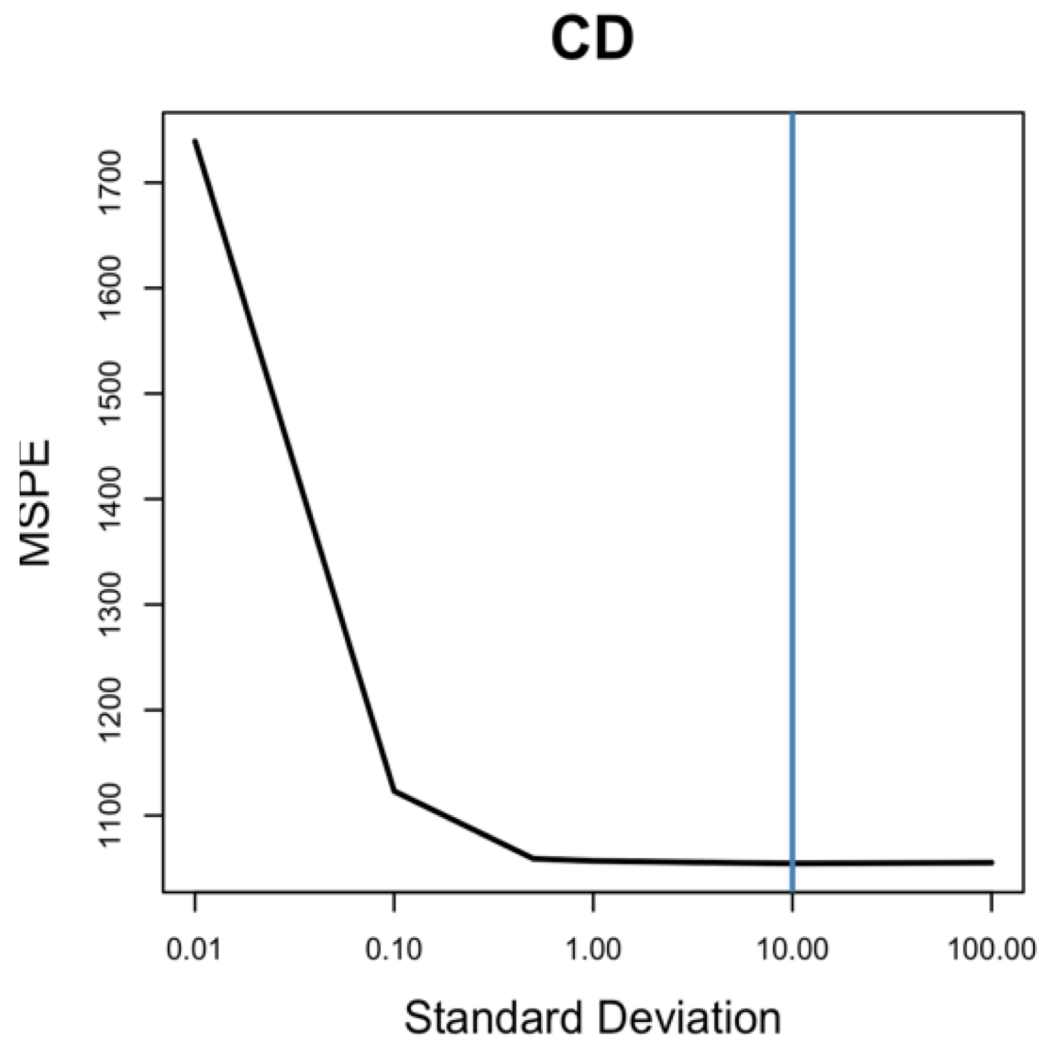
Araújo and New describe four sources of uncertainty that ensembling can help account for:

Initial conditions, Model Classes, Model Parameters, Boundary conditions.

In what ways were these already included in your forecasting challenge models?

How would/could you change your approach?