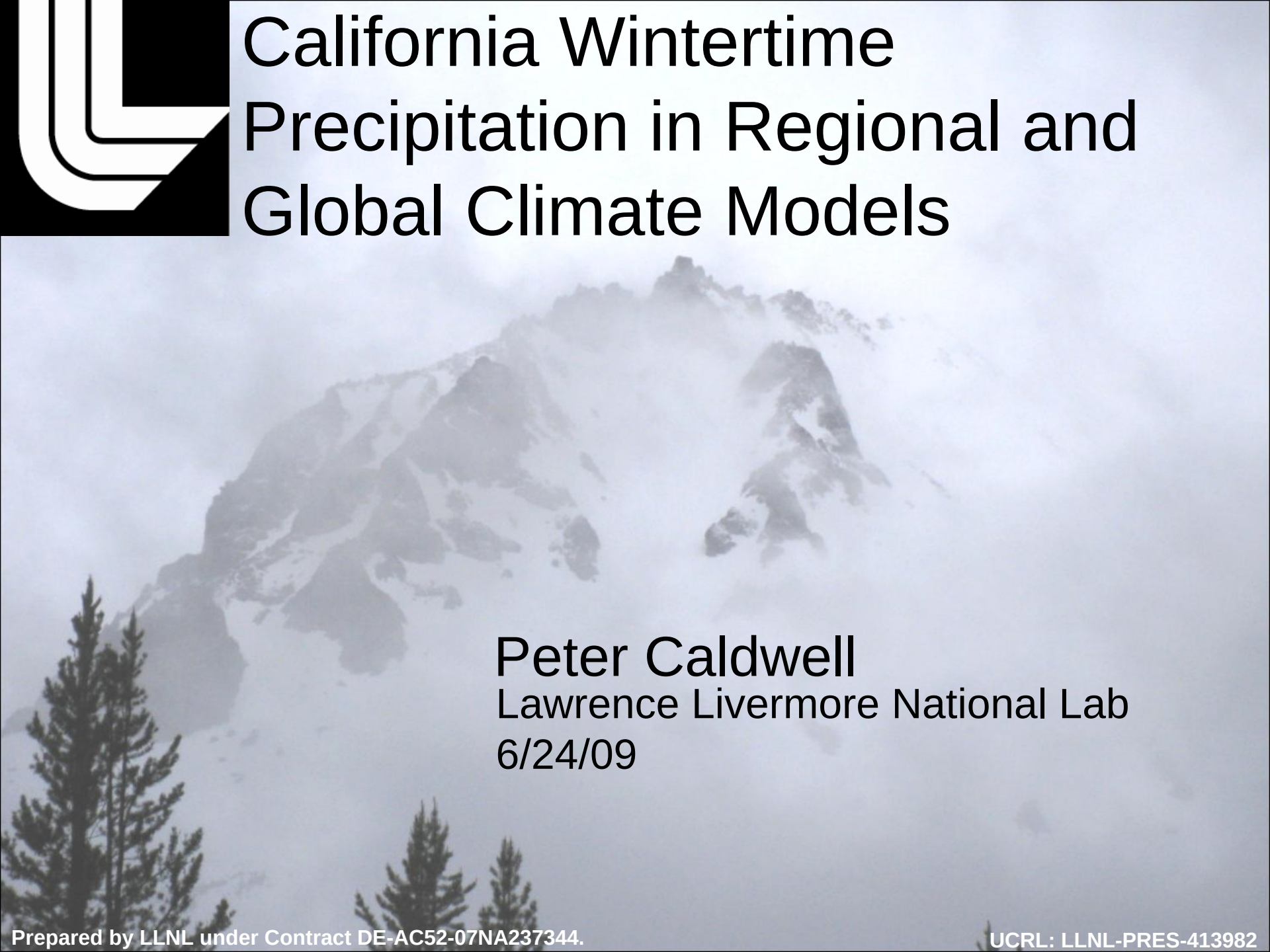
California Wintertime Precipitation in Regional and Global Climate Models



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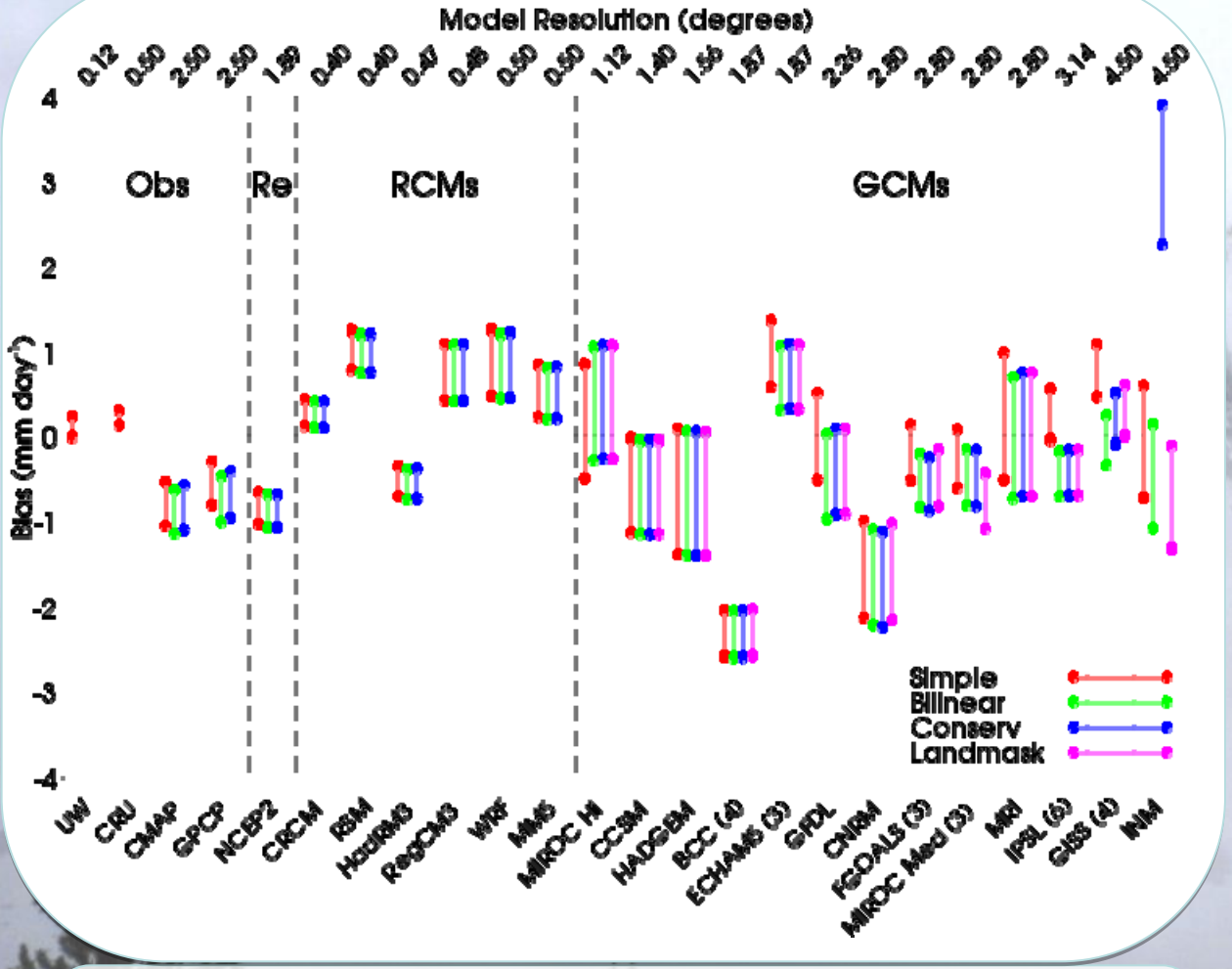
Motivation:

1. Regional models are generally assumed to provide better precip estimates – but do they?
2. Previous studies suggest that regional models overpredict wintertime precip over the W. coast of the US. How widespread is this bias?
3. If bias is consistent across models, can we isolate its cause?

Methodology

- Compare regional model runs from NARCCAP against CMIP3 AGCM simulations from Nov-Mar of 1981-1998.
- Average all models over CA (using 4 different techniques to check robustness).

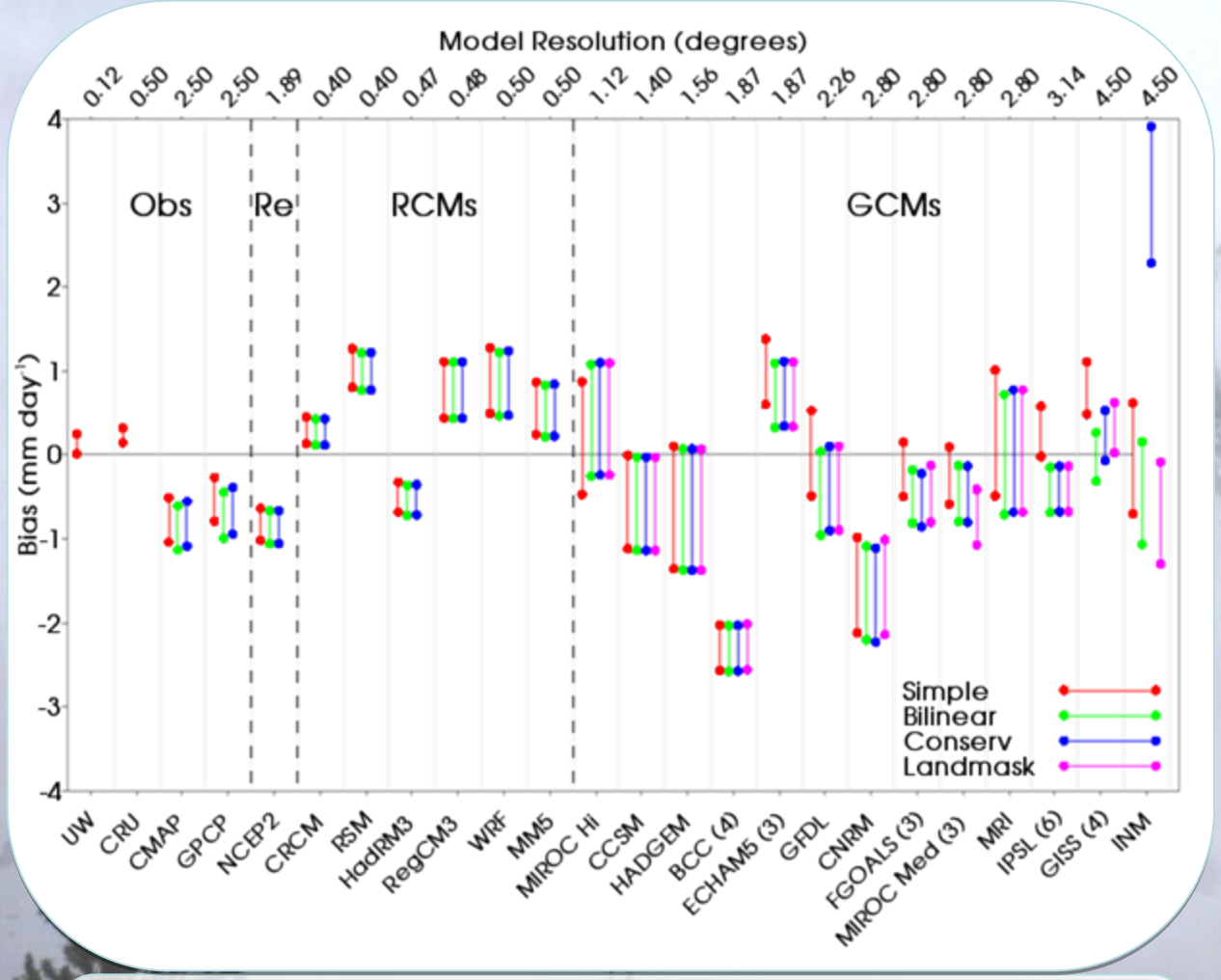
Model Precip Bias



Bias in Nov-Mar CA-average precip (model – NOAA obs) for each model. Errorbars = t-statistic 95% confidence intervals. Different colored errorbars indicate different averaging techniques.

1. Changing averaging method (color) doesn't make a difference for dx<~3°
2. All RCMs except HadRM3 are significantly too wet.
3. In general, resolution is not a good indicator of model skill.

Model Precip Bias



Bias in Nov-Mar CA-average precip (model – NOAA obs) for each model. Errorbars = t-statistic 95% confidence intervals. Different colored errorbars indicate different averaging techniques.

4. **Using UW or CRU as "truth" (instead of NOAA) would yield similar results. Using CMAP or GPCP would underpredict.**

5. **GCM performance varies, but often too *dry*. Previous studies suggesting wet bias were based on CMAP, GPCP…**

Questions?

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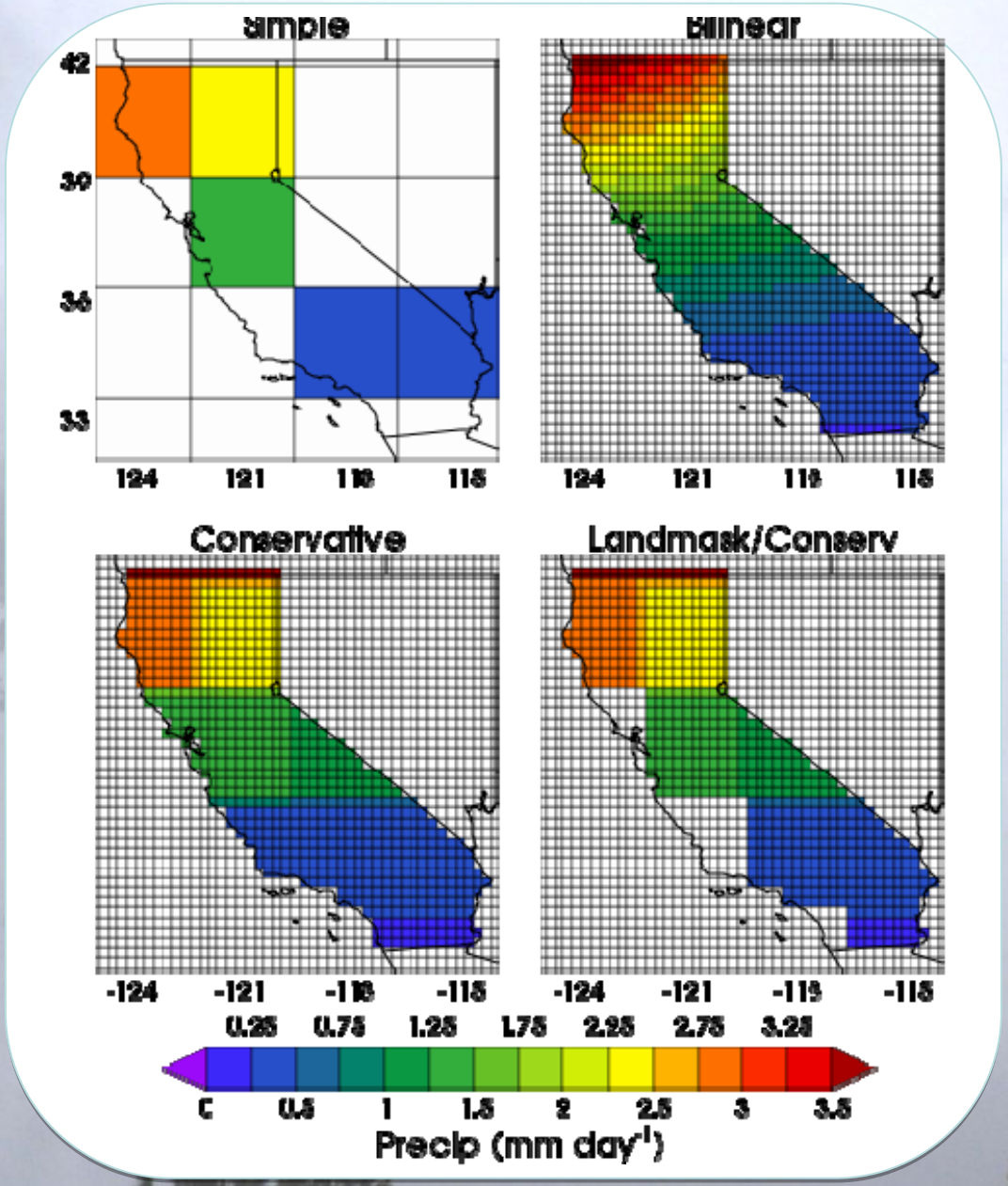
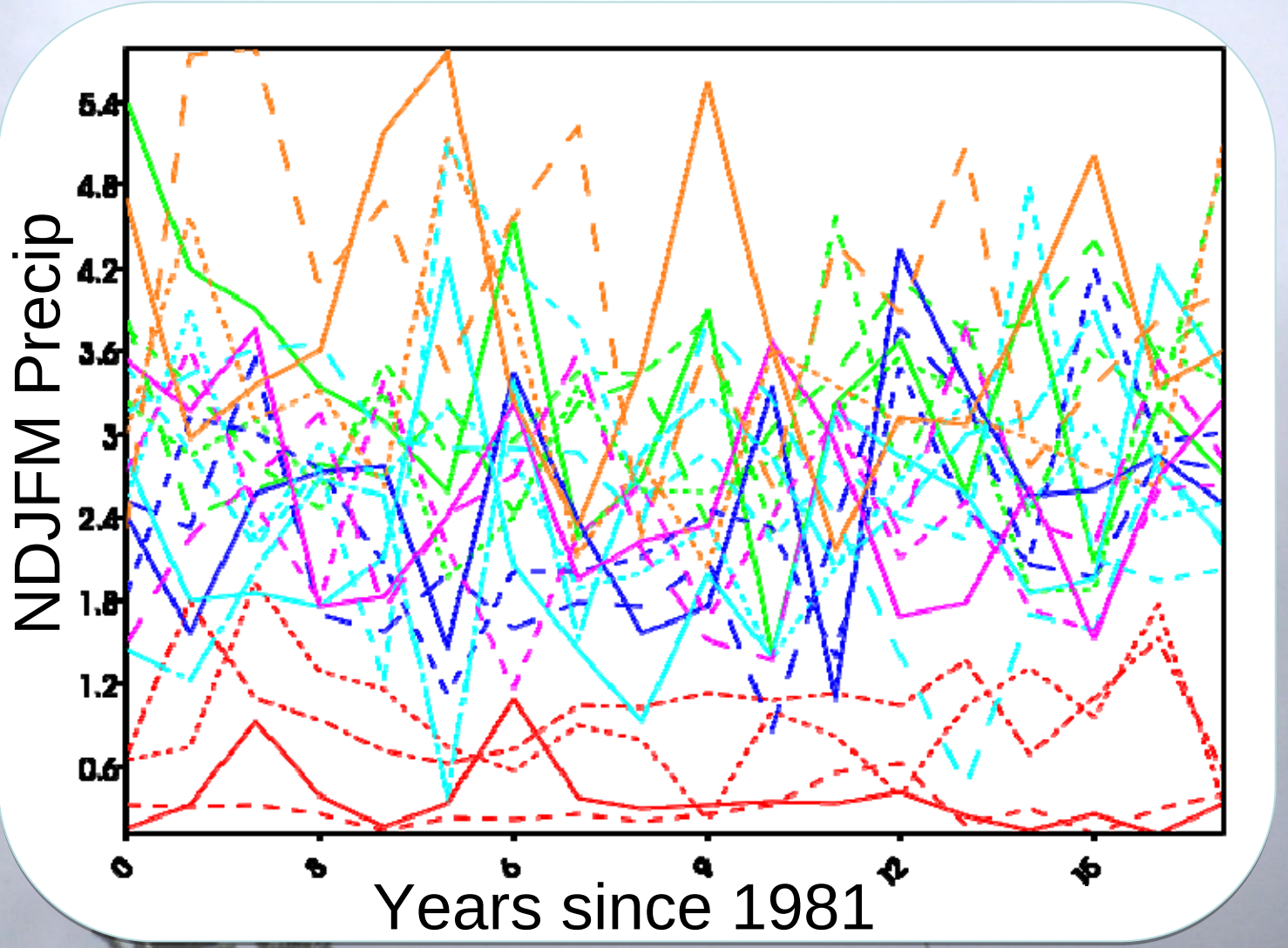
How to make CA average?



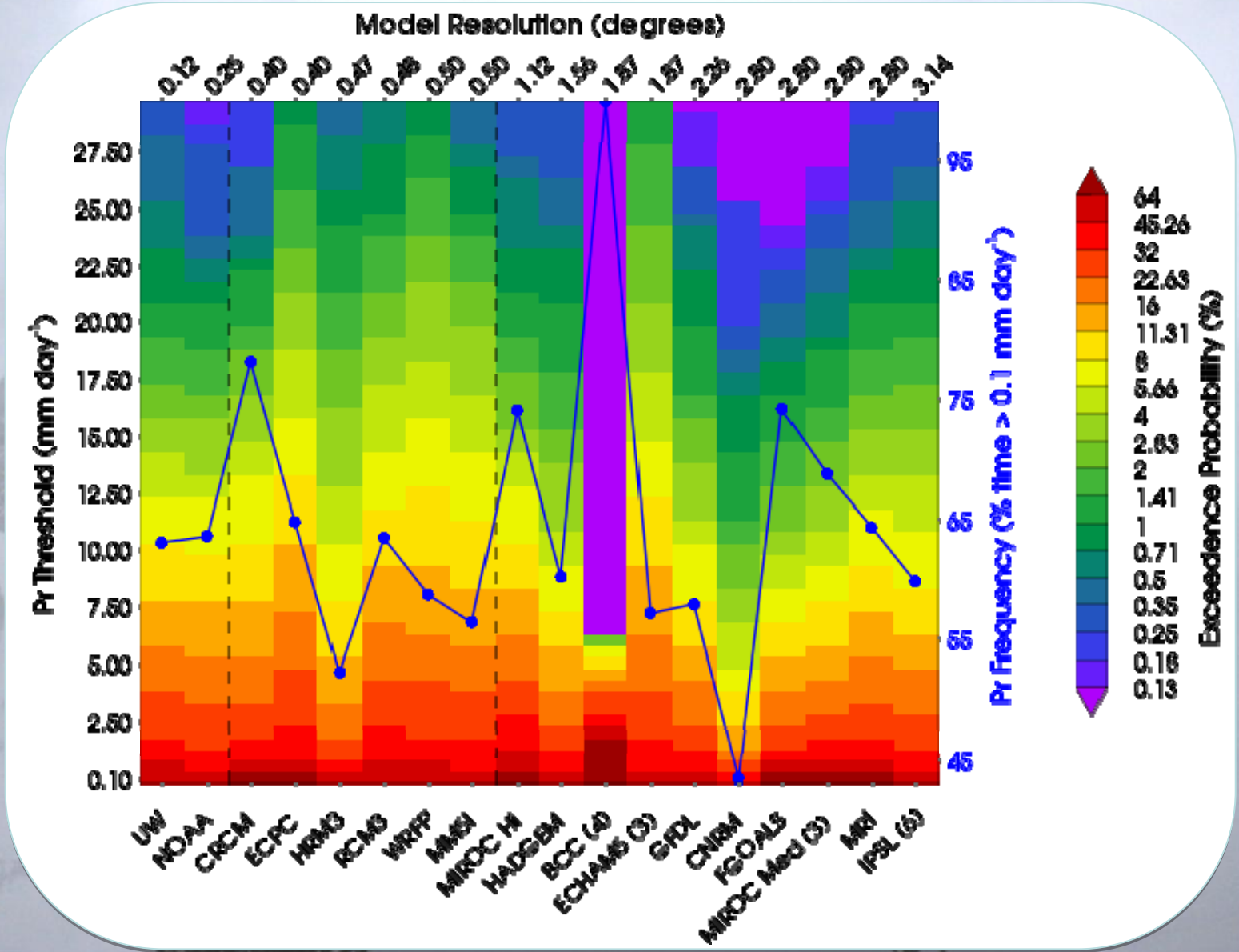
NDJFM-Ave Pr: Comparison of Ensemble Members

•Other than Fgoals (corr=0.34), all models have correlation < 0.072.

BCC
GISS
FGOALS
IPSL
MIROC Med
ECHAM5



Pr Exceedence Prob by Model



Wintertime Pr Variability by Model