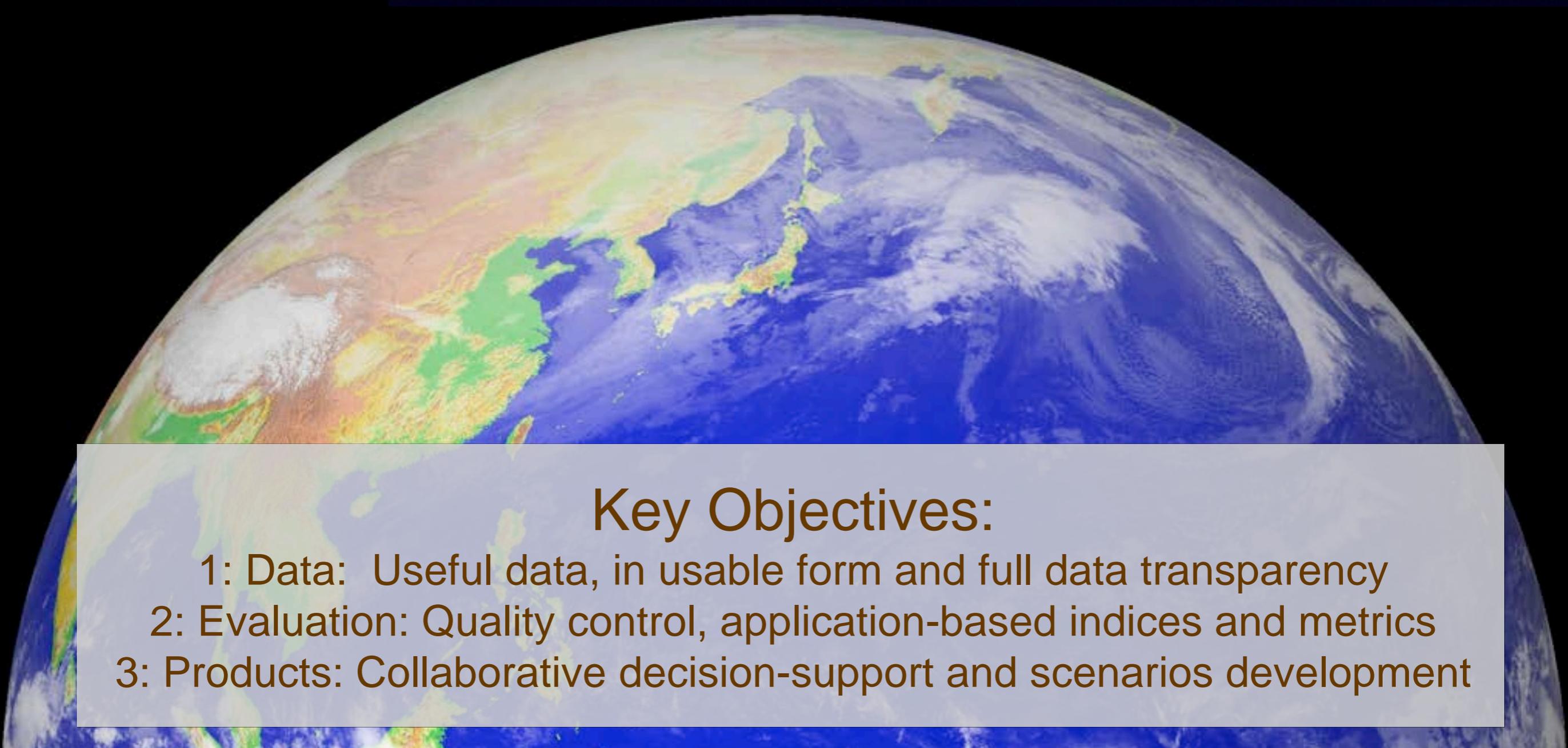


Refocusing and Translating Climate Science for Adaptation

Deliver and translate sound climate science to serve local adaptation needs, to promote sustainability, and to reduce human system vulnerability to regional and local climate change.

Caspar Ammann, NCAR

Denver, April 2, 2013

A satellite view of the Earth showing the Western Hemisphere, with North and South America visible. The image is overlaid with a semi-transparent white box containing text.

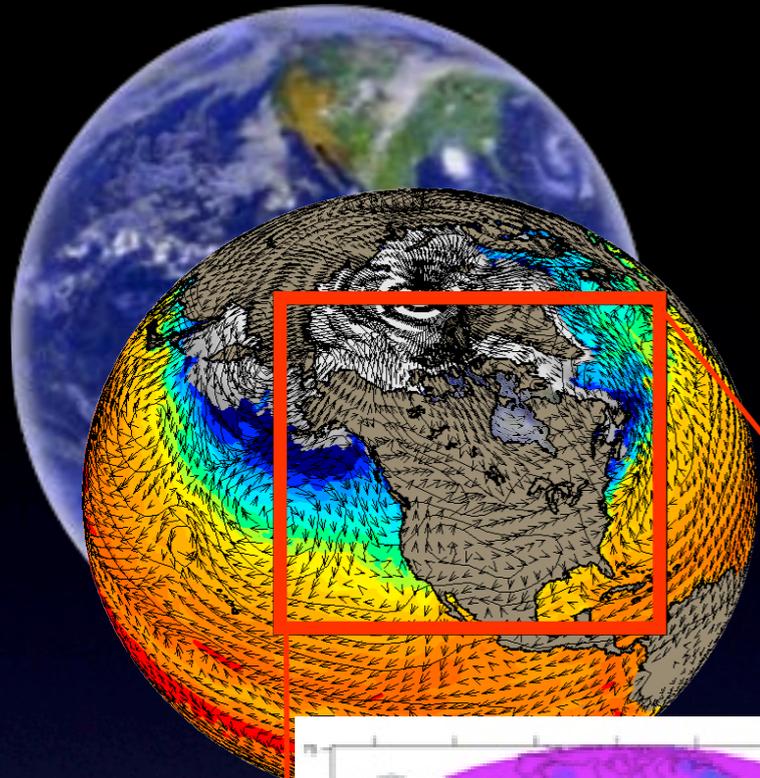
Key Objectives:

- 1: Data: Useful data, in usable form and full data transparency
- 2: Evaluation: Quality control, application-based indices and metrics
- 3: Products: Collaborative decision-support and scenarios development

Users: Is there an App for Local and Regional Climate Change?

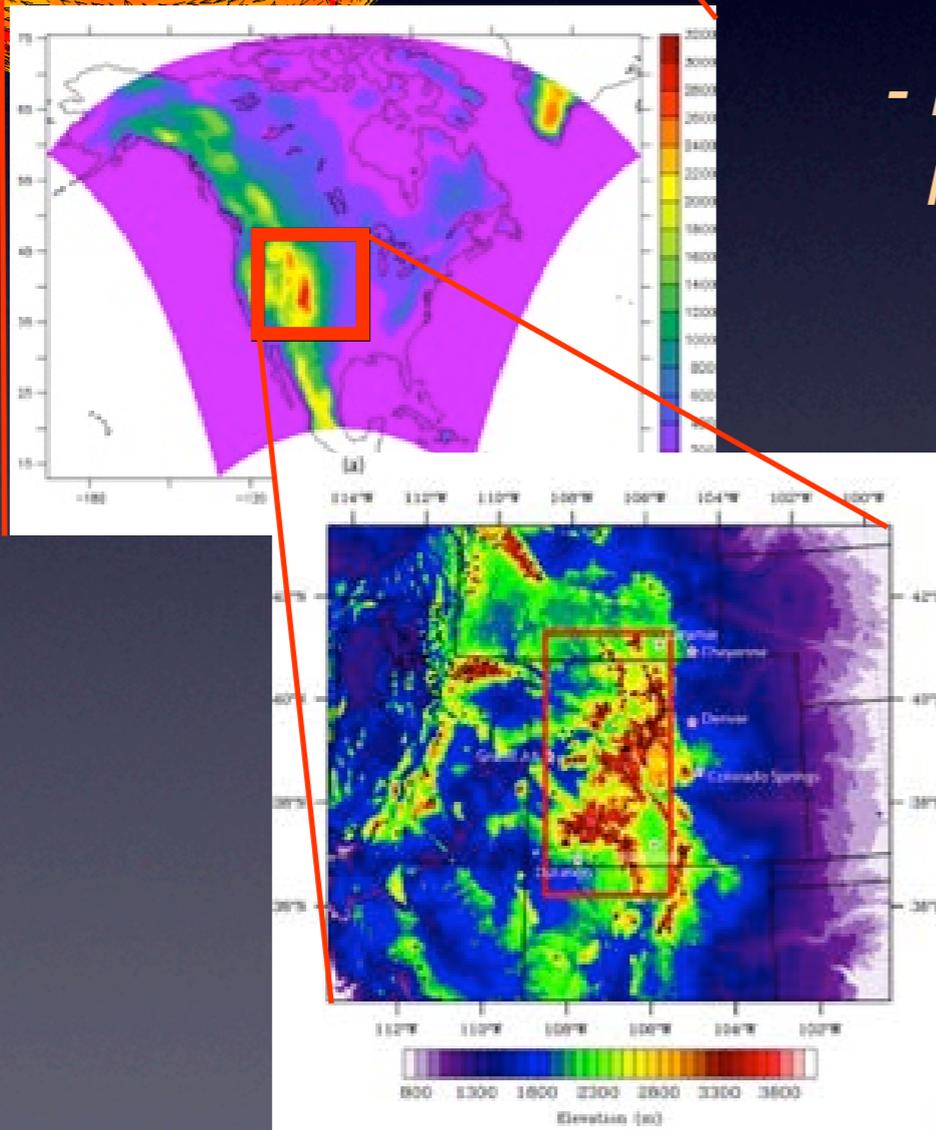


Current modeling approach: handing down data, but:

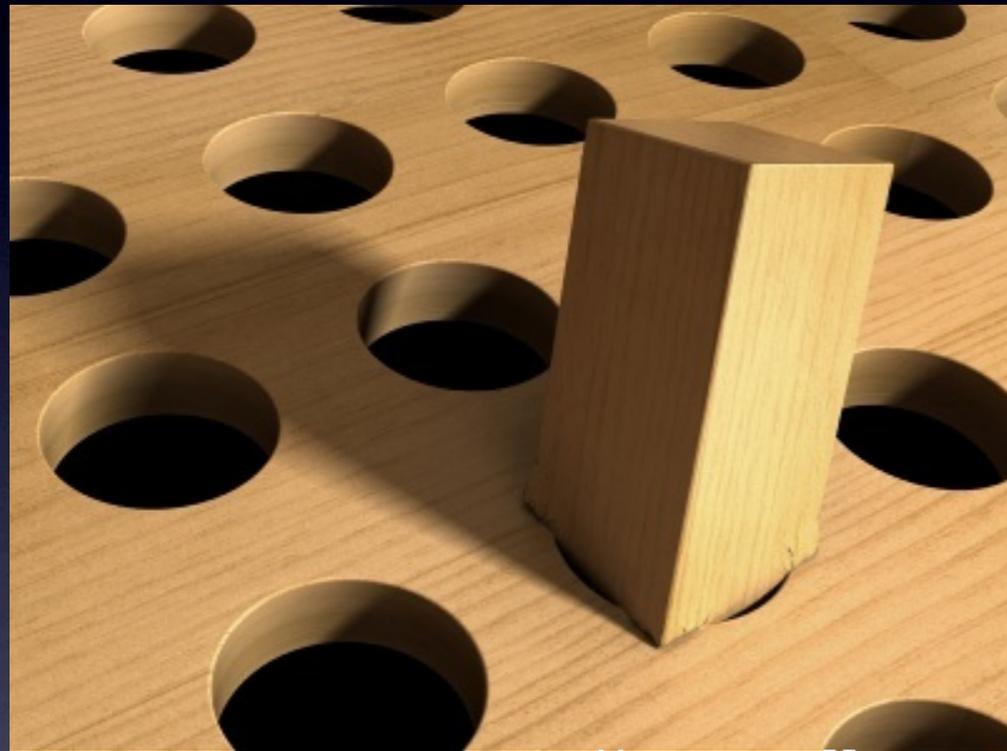


- *no link for users to the science and knowledge of each stage*

- *no insight for scientists to the specific needs of applications*



Challenges to make science more useful



Current “App”

- **Data** accessibility, in application-oriented, useful form (format, index, resolution)
- **Information about the data:** QC / evaluation across the production “chain” vs observations, ensemble
- **Translation of Scientific Knowledge** for exploration of impacts of change, guidance of use
- **Community of Practice** that collaboratively develops data requirements and scenarios

ADB: A regional Climate Scenario Library



Scenario Library

- Infrastructure for Data
- Product Dissemination (weather and climate indices)
- Run/Coordinate Scenarios for various needs
- Observational Reference



Data: Precipitation \neq Precipitation



Gorakhpur : Monsoon



Nebraska : Drought



Hex River : Flash Flood



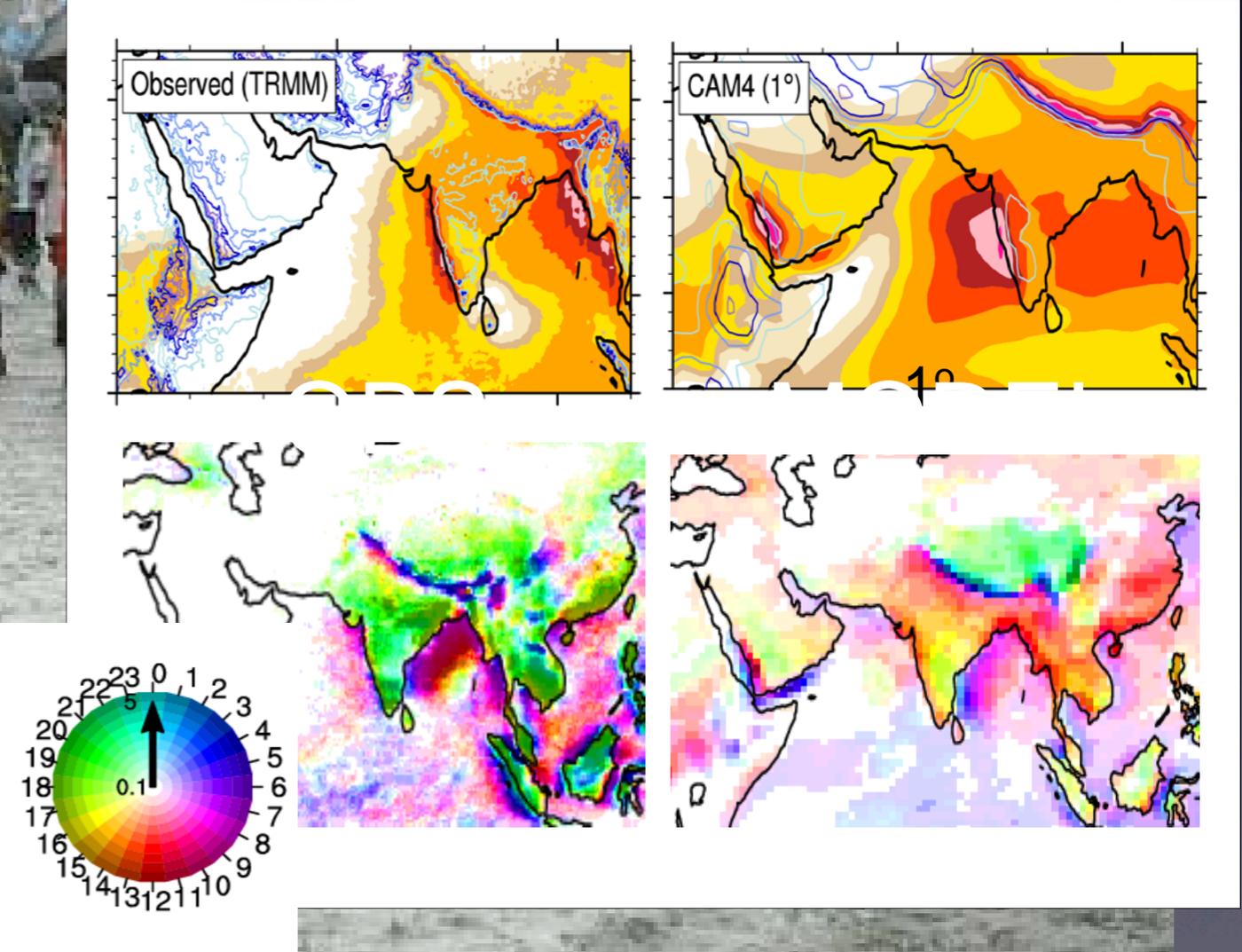
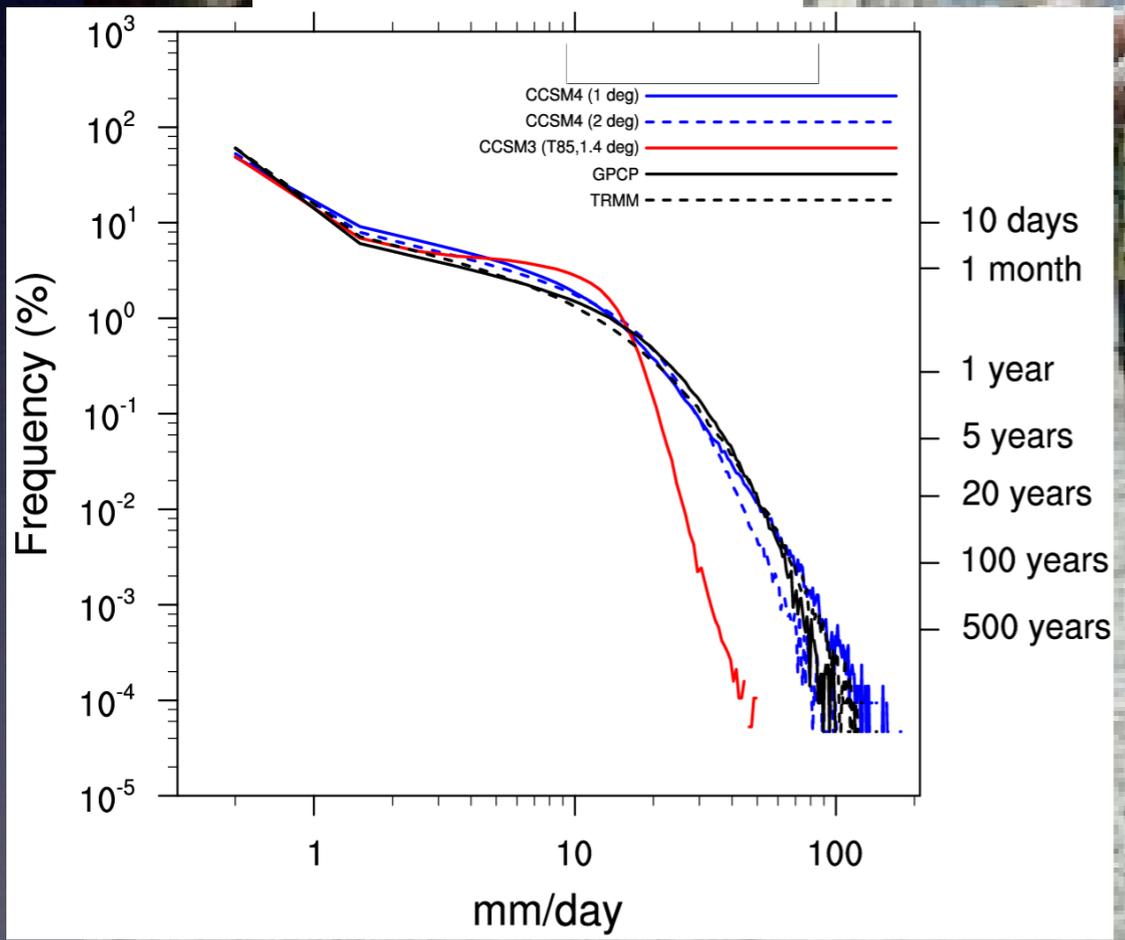
DaNang : Typhoon

Critical Need for Translation and Guidance



Extremes

Space / Time



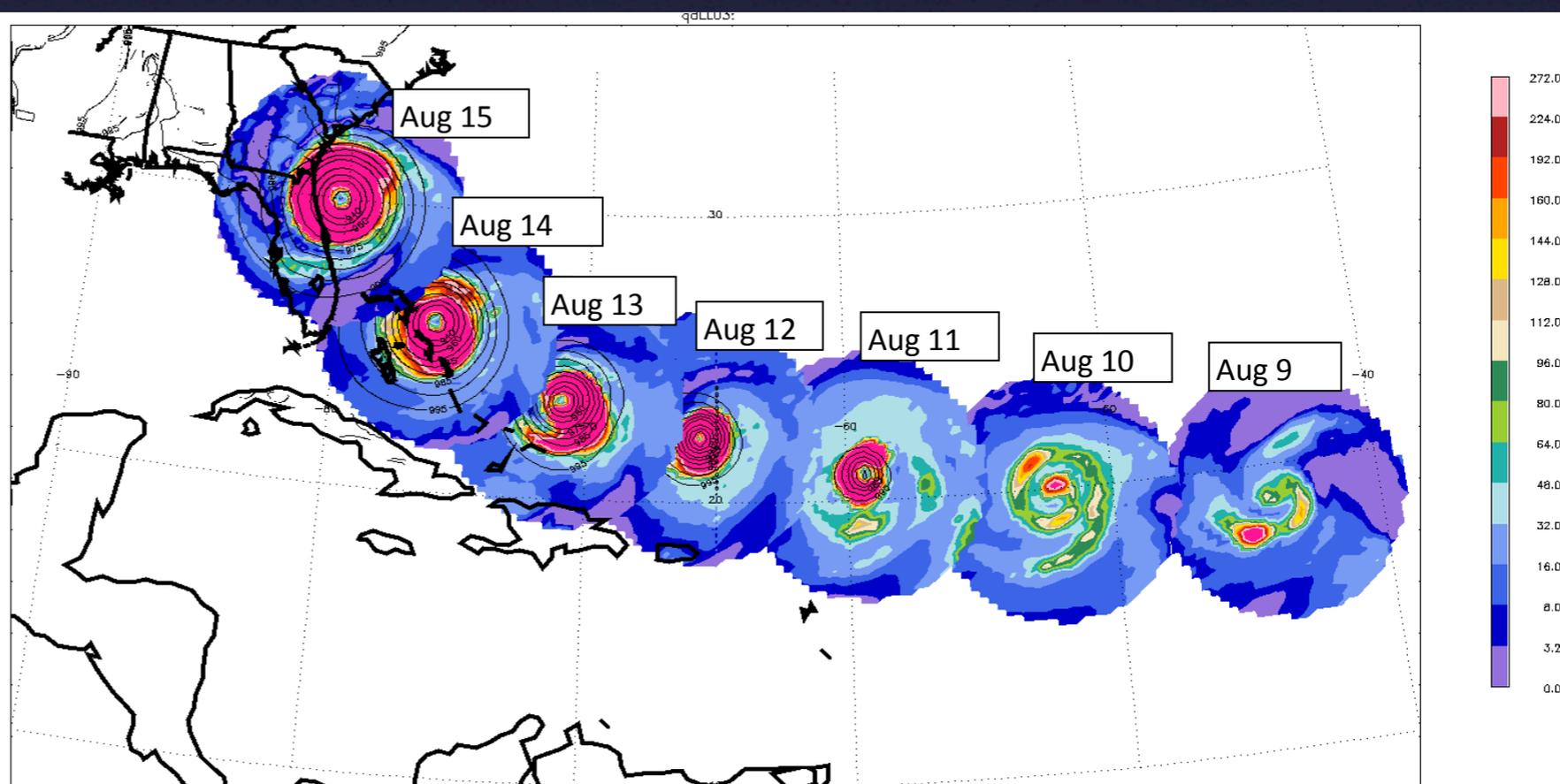
Need for Translation and Guidance



DaNang : Typhoon

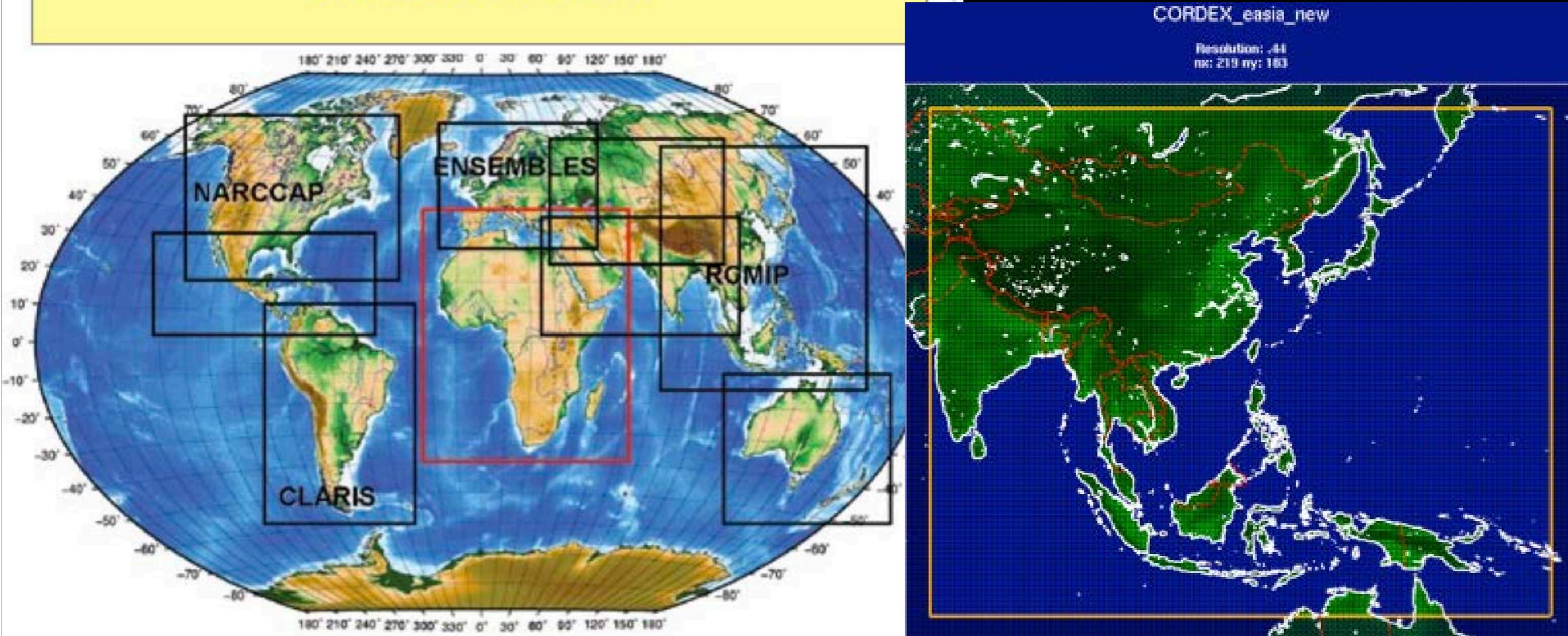


Experimental Design



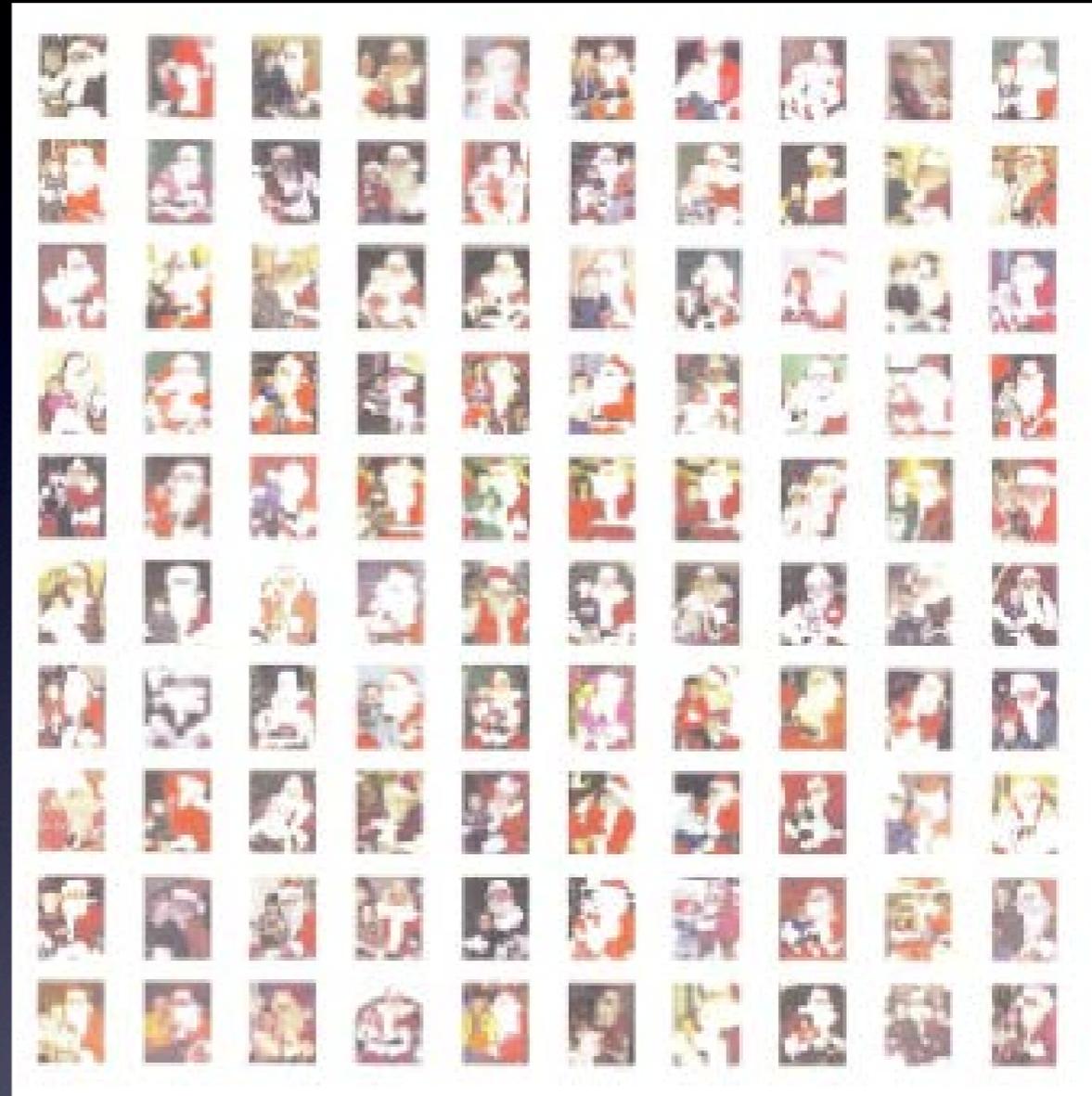
Coordinated Regional Downscaling Experiment CORDEX

CORDEX domains



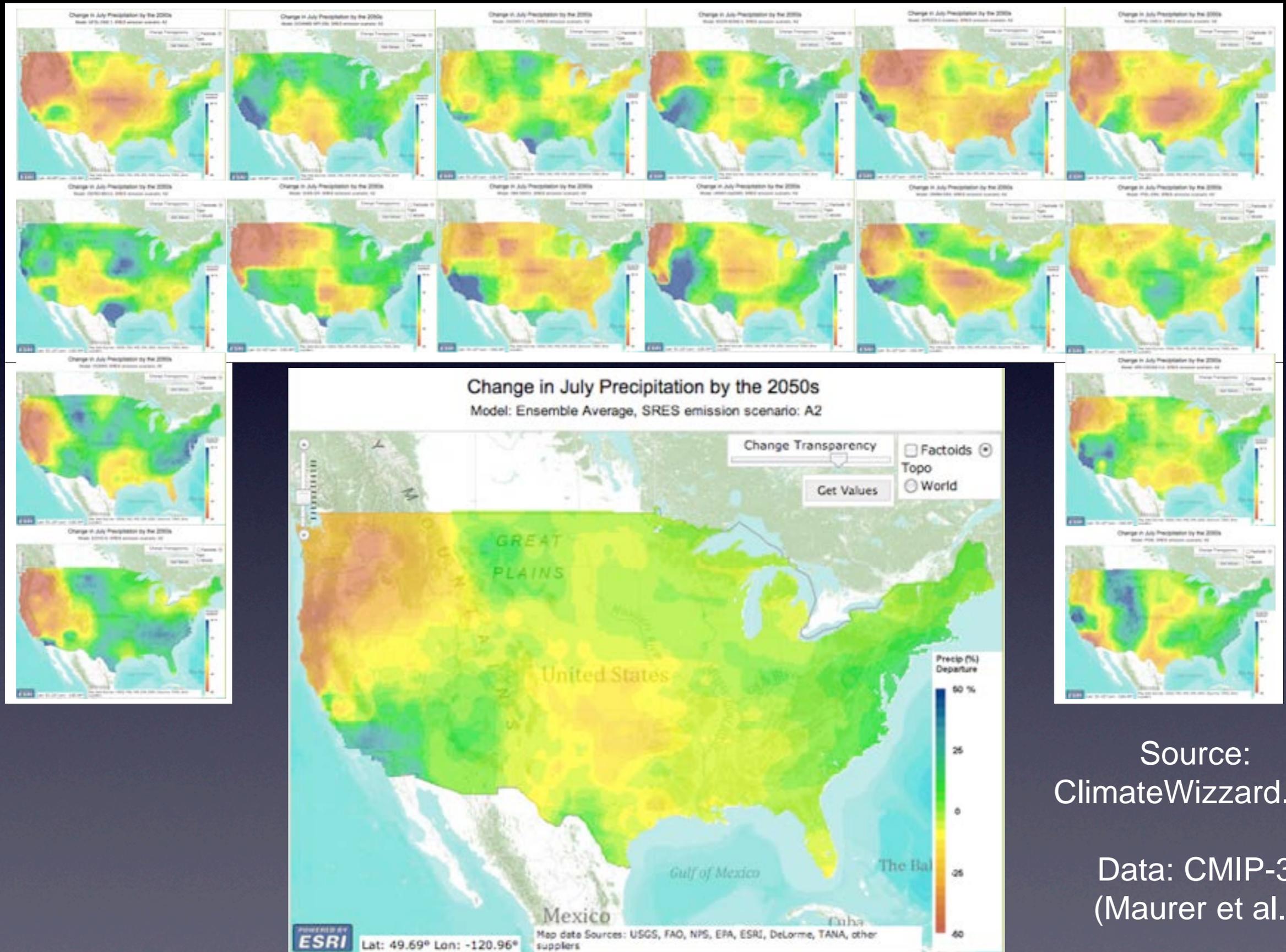
Regional: CORDEX
Multi-region downscaling experiments

Issues with interpreting an ensemble



Ensemble : pixels are independent point-wise expected values
Requirement: sampling from same “process”, no “Easter Bunny”

Significant Model Differences at Regional Scale



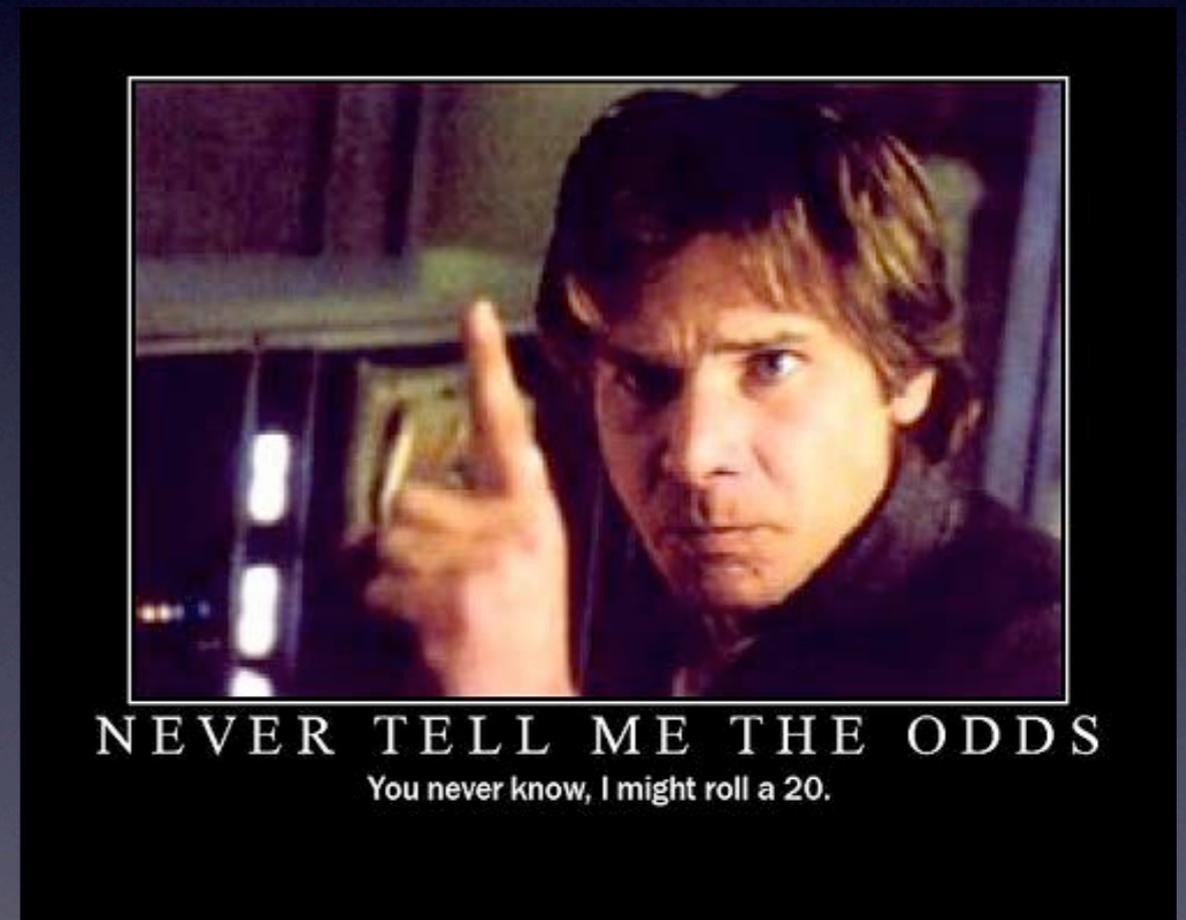
Source:
ClimateWizzard.org

Data: CMIP-3
(Maurer et al.)

Different Perspectives on Projections

What is Likely?

What is Possible?



Making Climate Information Useful

Key Librarian Functions to Enable Communities of Practice

Scenario Library

- Infrastructure for Data
- Product Dissemination (indices)
- Run/Coordinate Scenarios for various needs
- Observational Reference

Coordination

Translation/Librarian

- **Data: User-Oriented Products**
Indices: identification, design, development
- **Data Evaluation Capability**
quality control, characteristics, and user guidance on uncertainties and use
- **Translation/Adaptation Guidance**
Explain Data in Adaptation Context
- **Community of Practice**
identify data requirements, design scenarios

Developing Communities of Practice

Helping Gorakhpur: "Climbing Everest"



- Map: Define climate/weather vulnerabilities
- Base-camp: Get all obs. / other data
- Khumbu: Iteratively identify relationships
- South-Col: Test models, scenarios
- Summit: Integrated impact analysis
- Get back safely: Translate, guide

Establishing Climate Services: Bridging science to local needs

“The timely production and delivery of useful climate data, information and knowledge to decision makers”

(NRC, 2001)

“Give me information in such a way that I can make decisions at a local level. What does this mean for me in the next N years”

- Jargon-free, clear,
 - actionable,
 - expose the uncertainties
 - Science-brokers/translators are important
- (Pew Report “Lost in Translation”)

“Official” climate products & processes allow planners to make major, climate-informed, infrastructure decisions
....and stay out of court.

CLIMATE SCIENCE AND APPLICATIONS PROGRAM



Thank you!
Any Questions?

*Enhancing adaptive capacity for society
in the context of changing weather and climate*

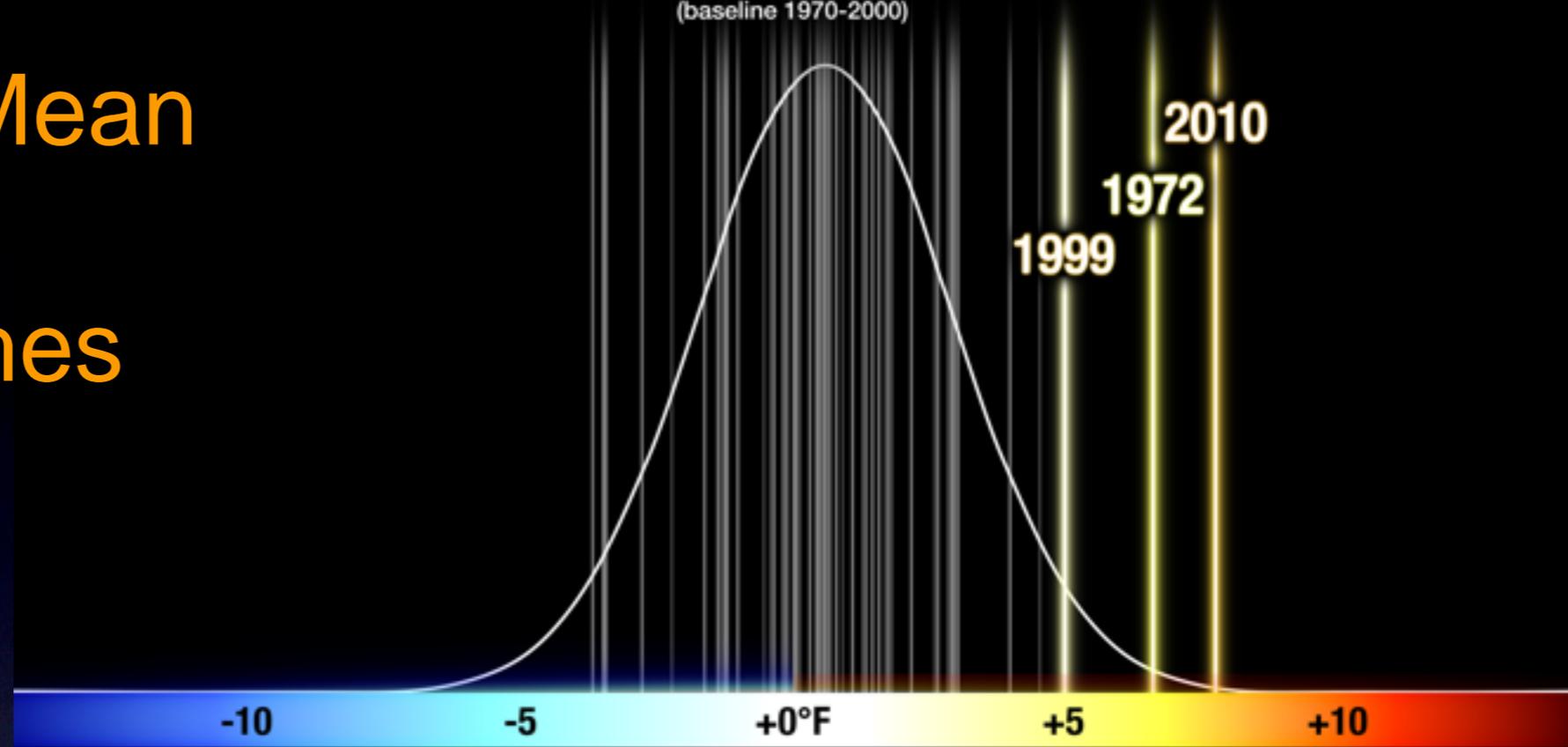
Caspar Ammann, National Center for Atmospheric Research
email: ammann@ucar.edu



Evolution of Mean Change New Extremes

June-July-August Temperature Anomalies in Moscow since 1950

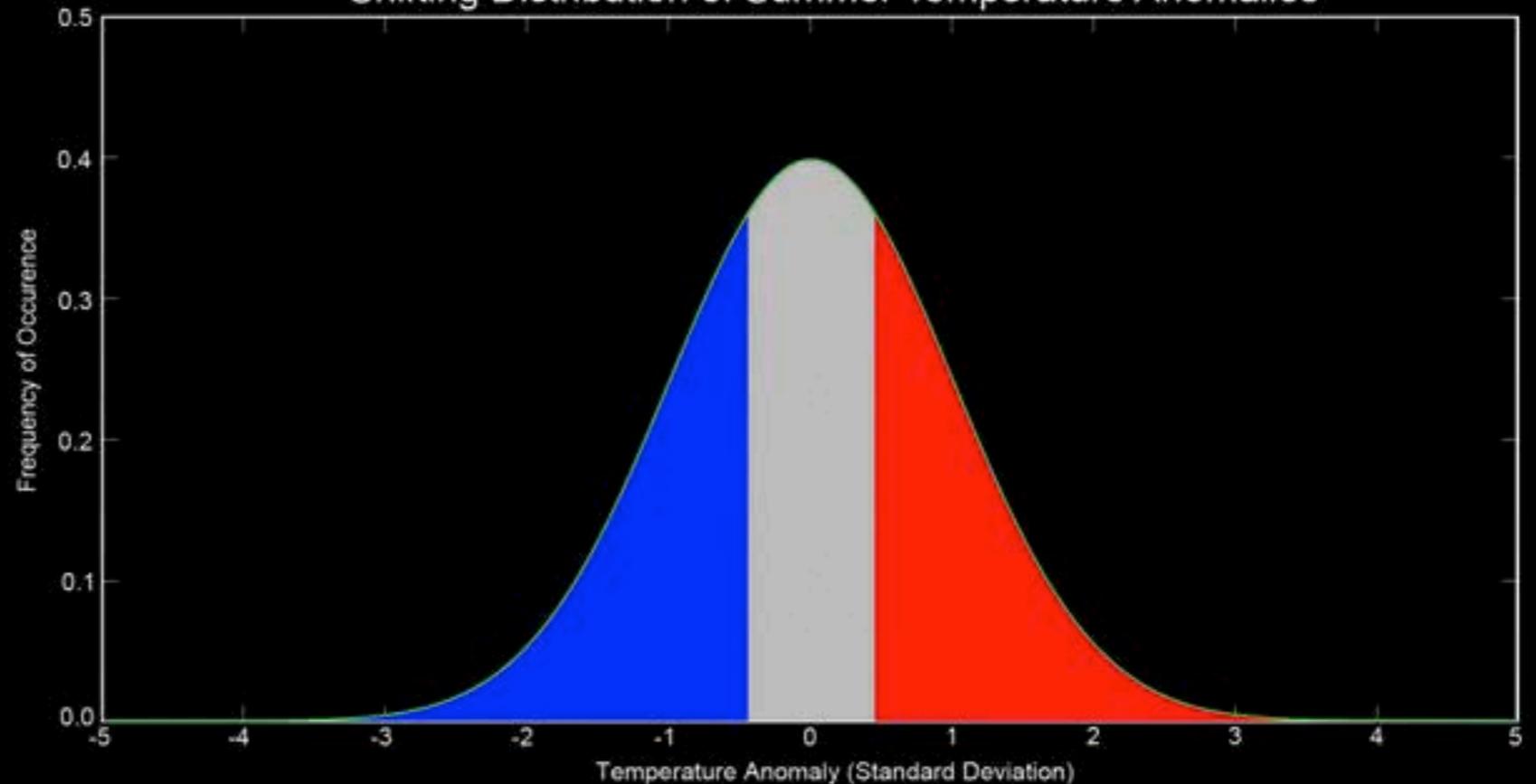
(baseline 1970-2000)



Sources: NOAA NCEP CPC CAMS DATA - FROM IRI/LDEO ONLINE DATA LIBRARY

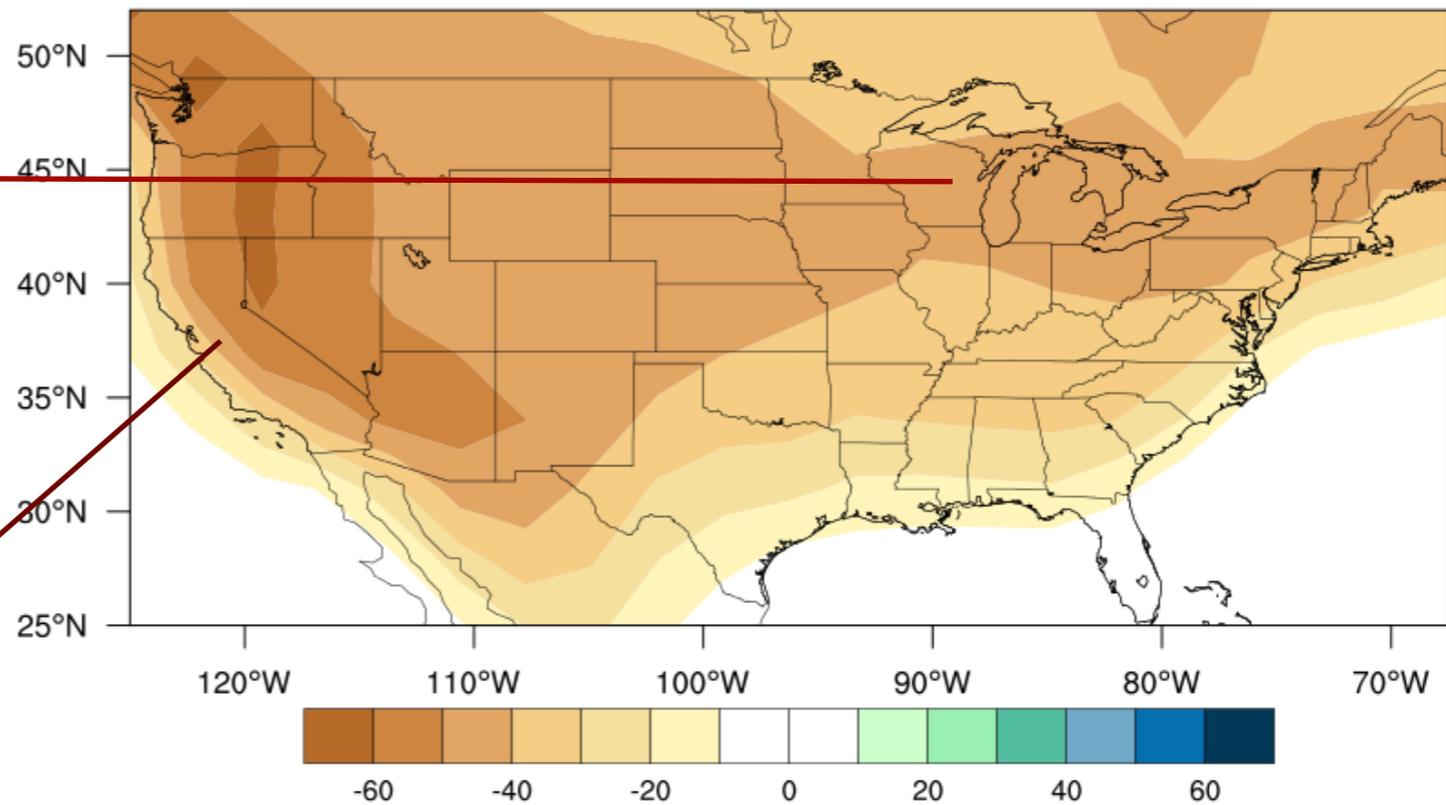
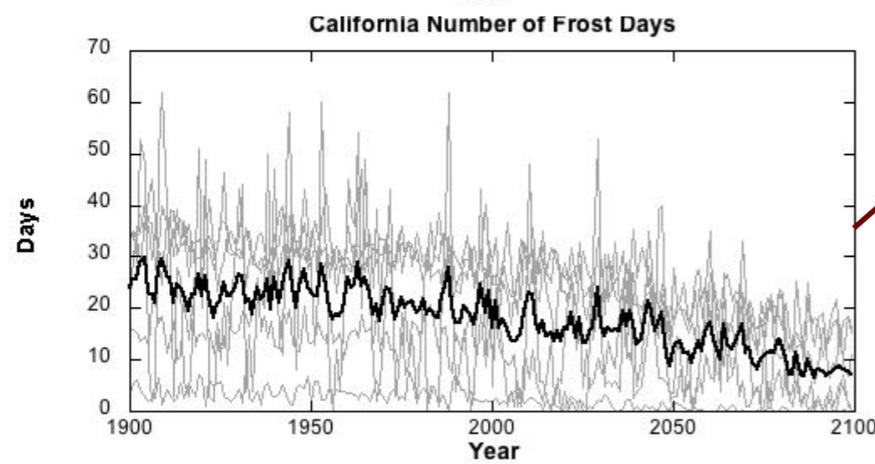
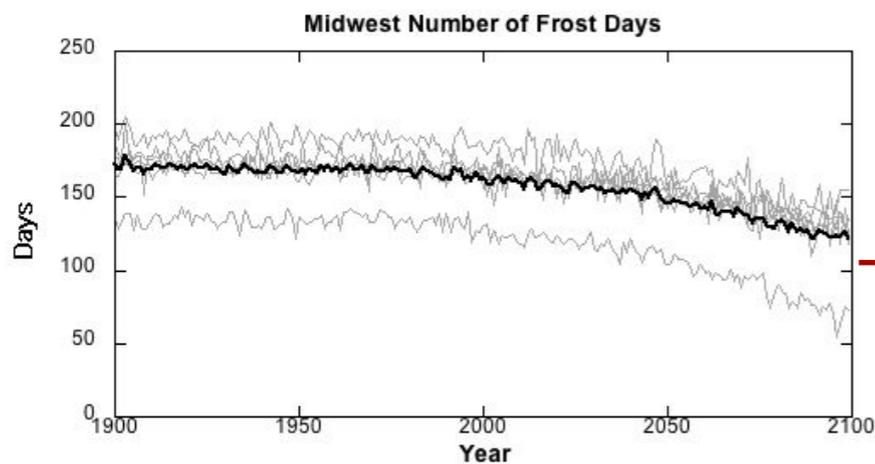
climatecentral.org

Shifting Distribution of Summer Temperature Anomalies



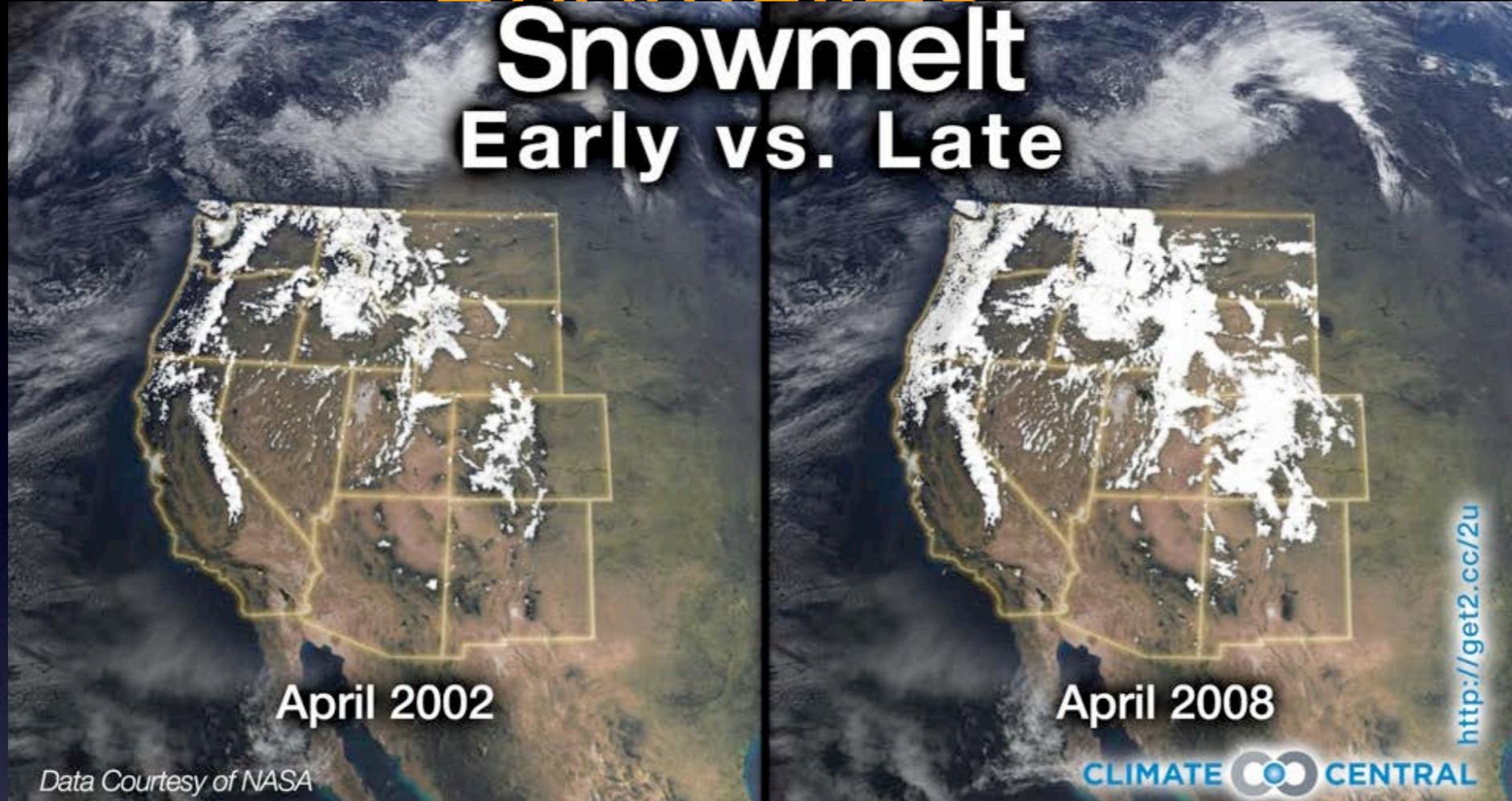
Information about the data

e.g.: Change in Number of Frost Days across models



Anomalies

Snowmelt Early vs. Late



Wildfires when snowmelt is...

Early

Late

