

# The WCRP Grand Challenge on Water Availability

## Water for the Food Baskets of the World



- ▶ **Water Cycle the Main Driver of Food Production (~70% of water usage worldwide)**
- ▶ **A Warmer Climate Pushes the Water Cycle into Unknown Territory**
- ▶ **The Terrestrial Water Cycle is not Natural Anymore**
- ▶ **Urgency to Understand the New State of the Water Cycle and Food Production in which Natural and Anthropogenic Processes Interact**

# Proposed Effort: Conduct Convective Permitting Simulations over the central U.S. foodbasket for 50 years at 4 km grid spacing with and without agriculture

## Motivation :

- Understand the interactions between water management and climate variability and change.
- Improve our modeling capabilities of human water management.
- Regional re-analysis that includes the evolution of water usage and land use ... thus reproducing the real water cycle.

## Why the central U.S. foodbasket?

- High importance to the U.S. and global food supply
- Availability of data and models to verify and run the model

## Methodology :

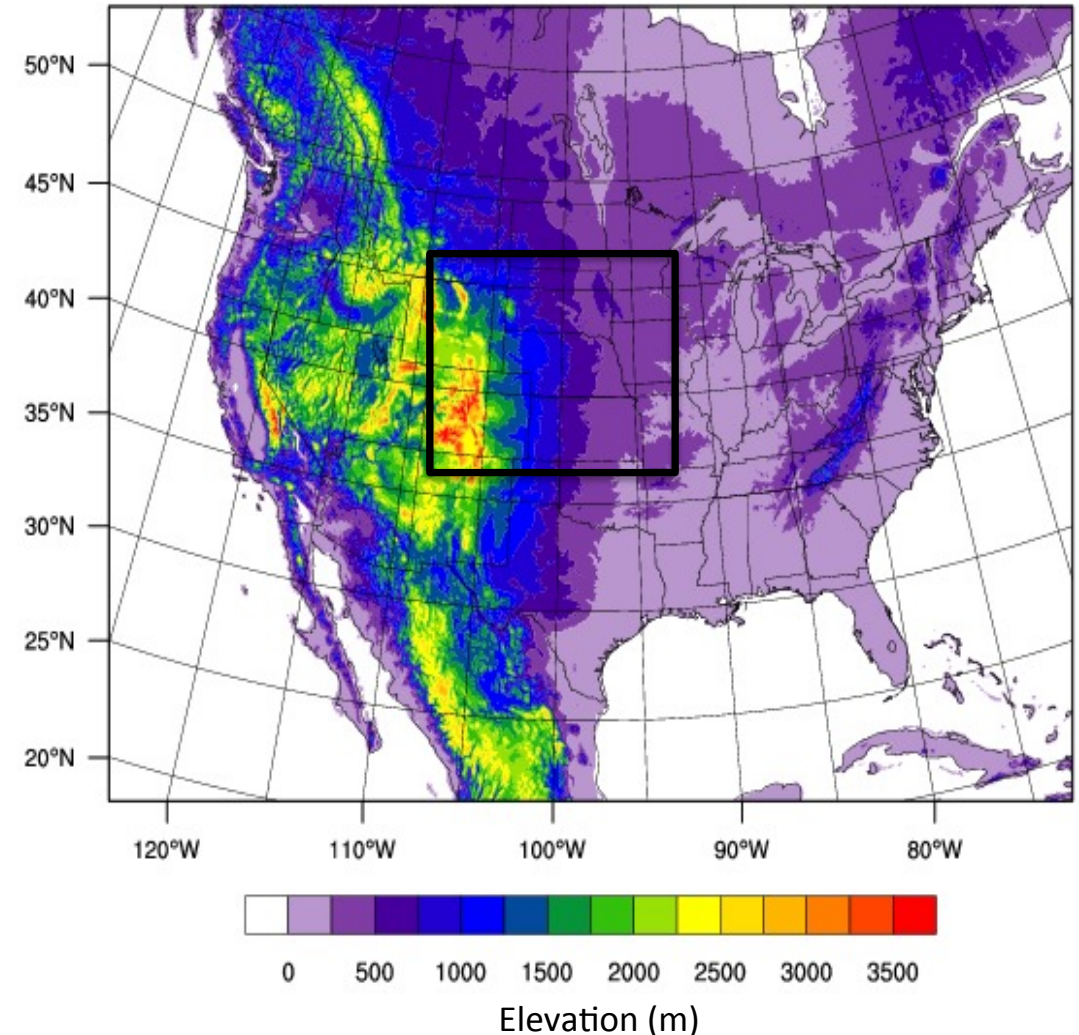
- Dynamical downscaling with convection permitting models driven by re-analysis
- Encourage multiple groups to perform the same simulation and inter-compare at workshops and on web sites
- Re-visit the last 50 years over a region with a large expansion of irrigated crops.

## Prospectus:

Effort just starting. If interested in participating please contact:  
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[pvanoevelen.gewex.org](mailto:pvanoevelen.gewex.org)) or Jan Polcher ([jan.polcher@lmd.jussieu.fr](mailto:jan.polcher@lmd.jussieu.fr))

Website: <http://www.gewex.org>

Black Outline Indicated Domain for 50 year simulations



# Discussion on Water for Foodbaskets Efforts

- Proposed Future Activities:
  - Monthly telcons of interested participants starting in 2019
  - Presentation at September Convective Permitting Climate Modeling workshop in Sept. 2018, Boulder
  - Side meeting at AGU (current)
  - Complete white paper by the end of 2018 (close to final).
  - Create a powerpoint deck that can share with participants
  - Present concept to NASA, NOAA, DOE and other potential agencies potentially willing to support
  - Engage crop modelers with the effort (AGMIP, Alex Ruane (NASA GISS))
  - Engage with LUMIP effort (Dave Lawrence, NCAR)