

# Ahmed Tawfik

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Climate and Global Dynamics



## **Knowledge Gaps**

Which water-related limitation(s) in process-understanding, modeling, and monitoring in the Western U.S. and Canada require a large, 5-10 year integrated and interdisciplinary team approach?

## **Goals and Roadmap**

What do you see as the key objectives and tasks?

## **Justification**

Which resultant social, economic, and/or environmental benefits justify the associated capital investment?

## **Justification**

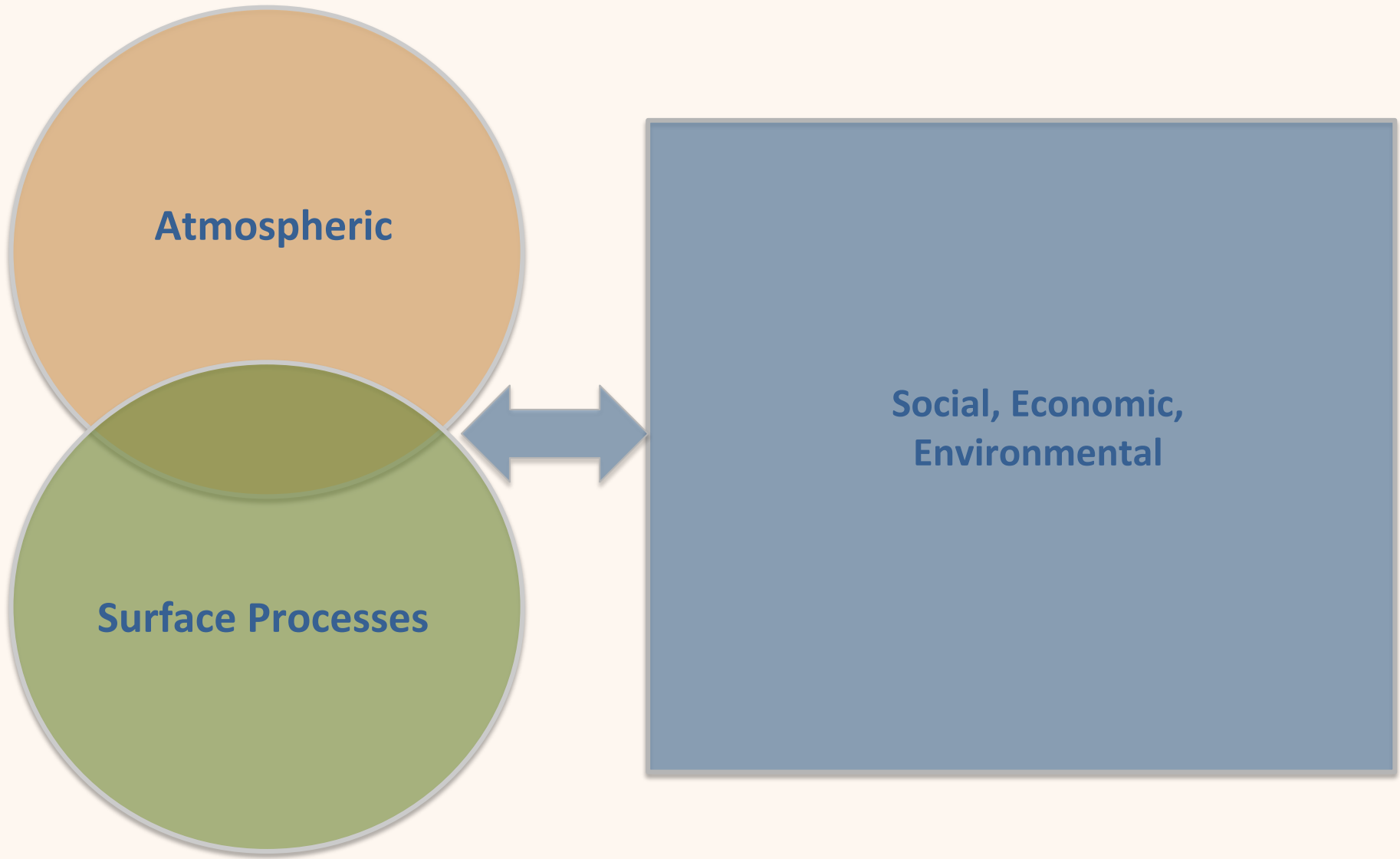
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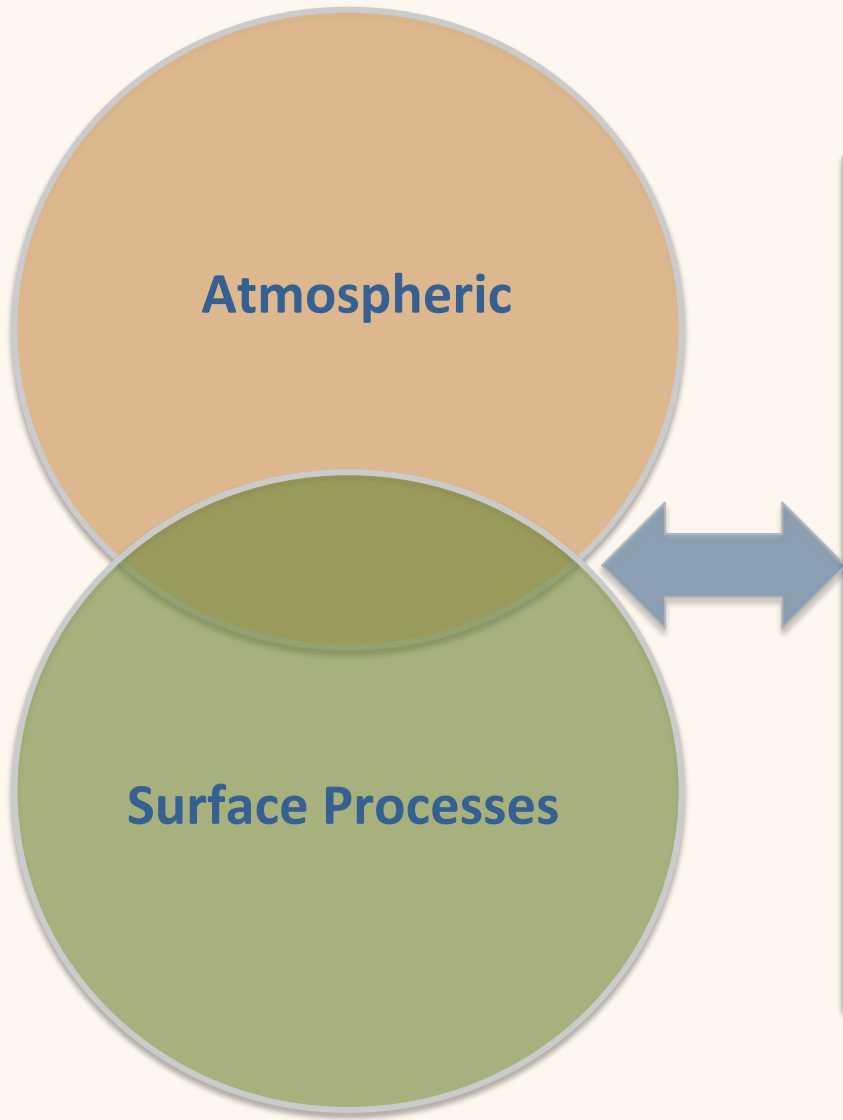
## **Knowledge Gaps**

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## **Goals and Roadmap**

What do you see as the key objectives and tasks?





**Food Security?**

**Crop Yields?**

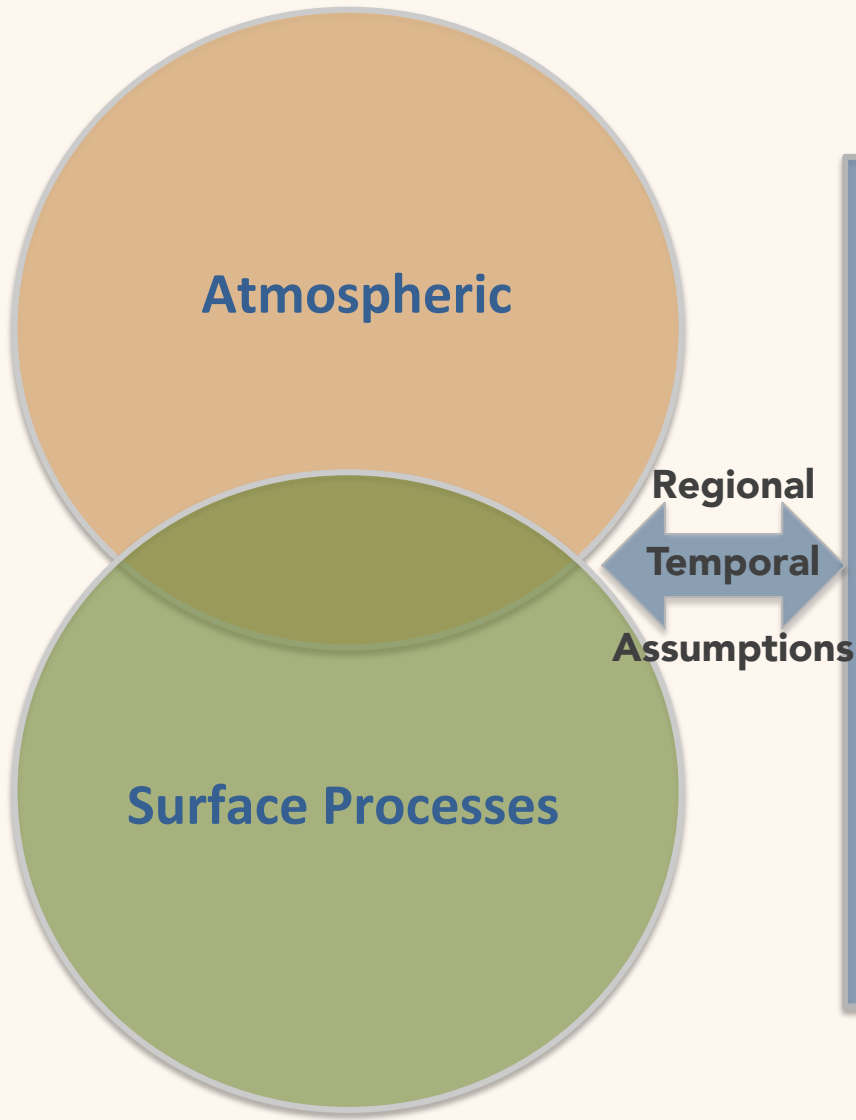
**Shift to Pasture?**

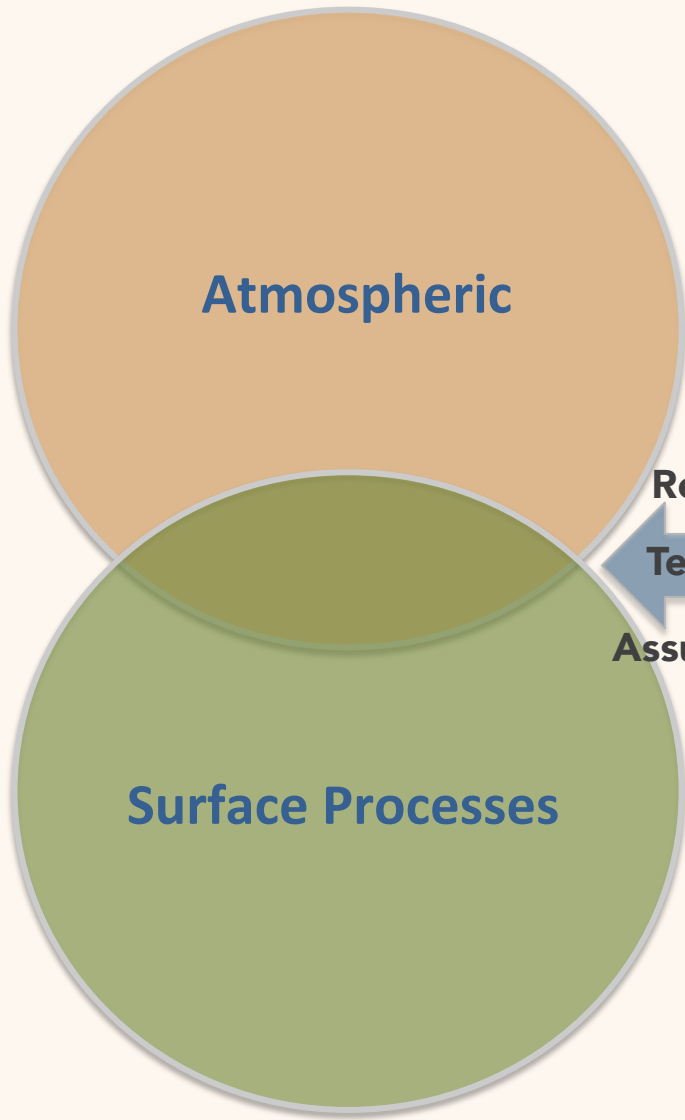
**Social, Economic,  
Environmental**

**Feasibility of  
Irrigation?**

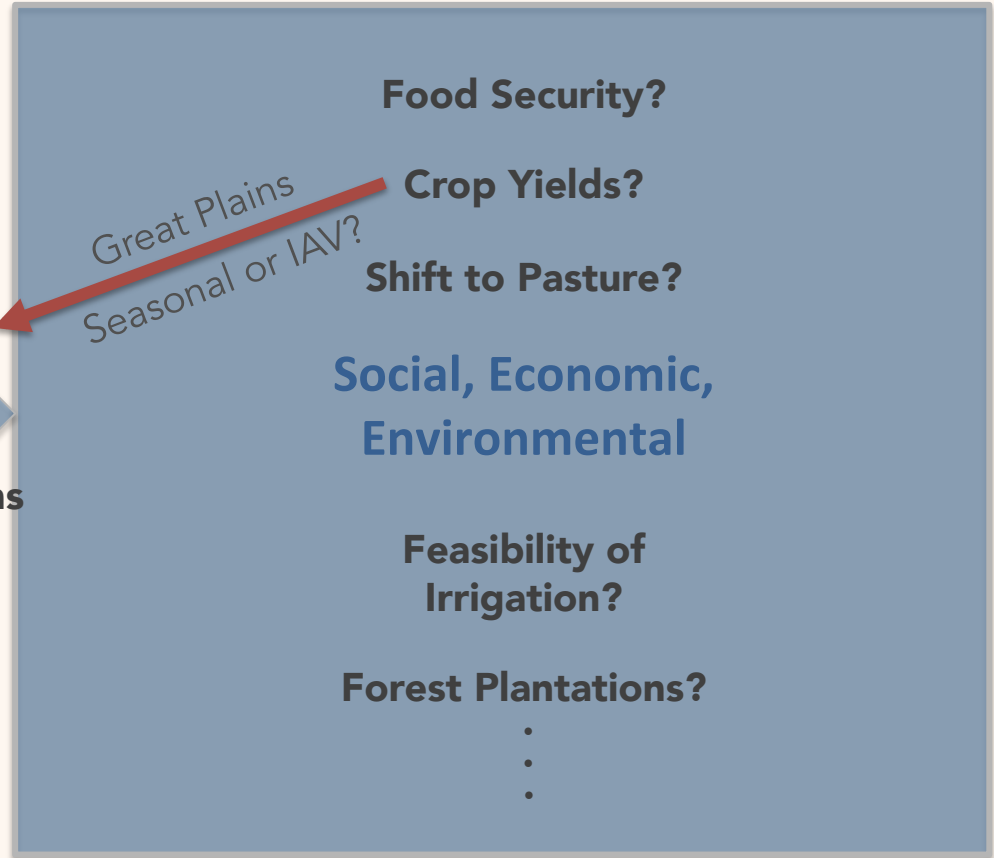
**Forest Plantations?**

⋮

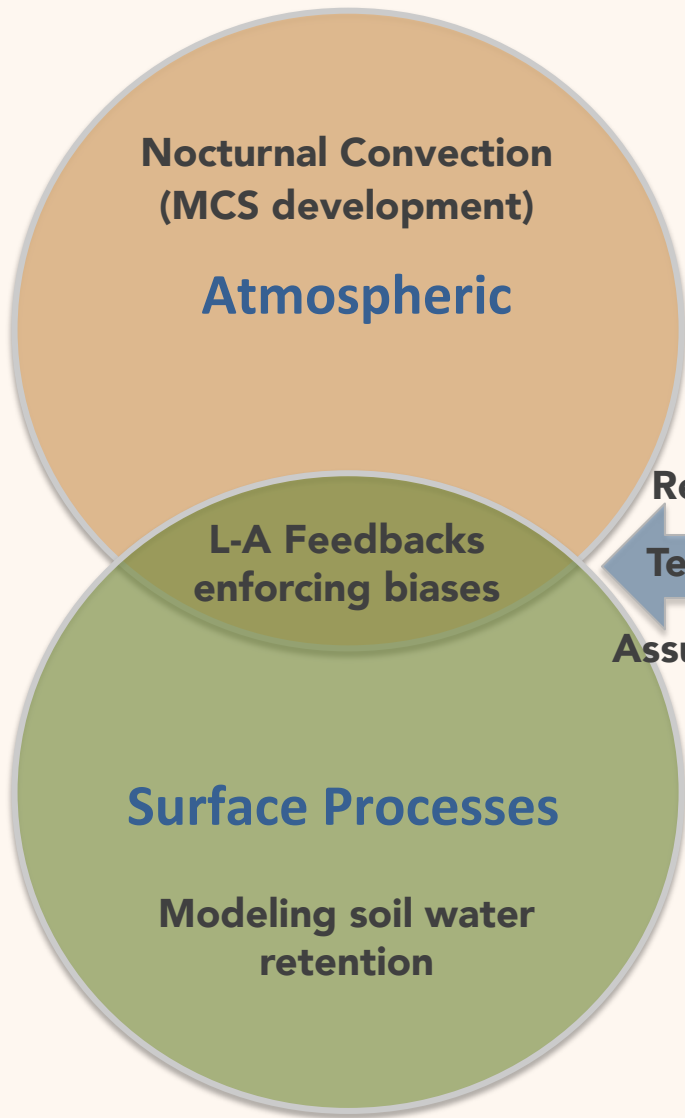




**Regional**  
**Temporal**  
**Assumptions**

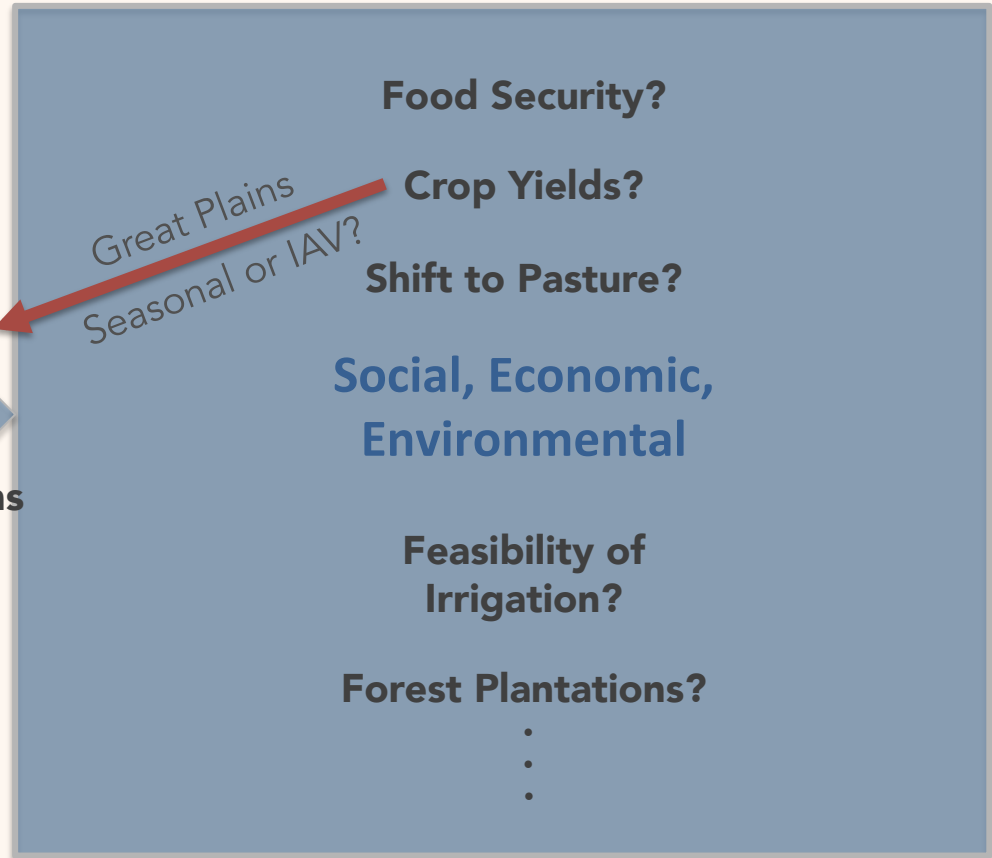


*Great Plains*  
*Seasonal or IAV?*

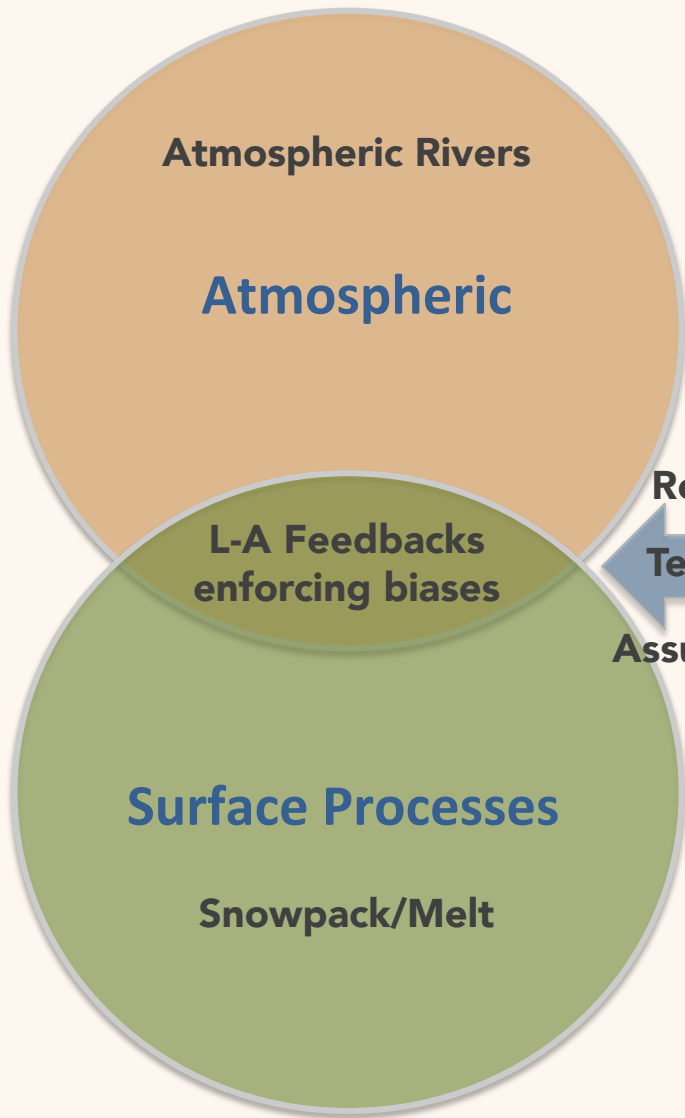


**Regional  
Temporal  
Assumptions**

A blue double-headed arrow points horizontally between the two circles and the right-hand box. The text 'Regional Temporal Assumptions' is centered over the arrow.

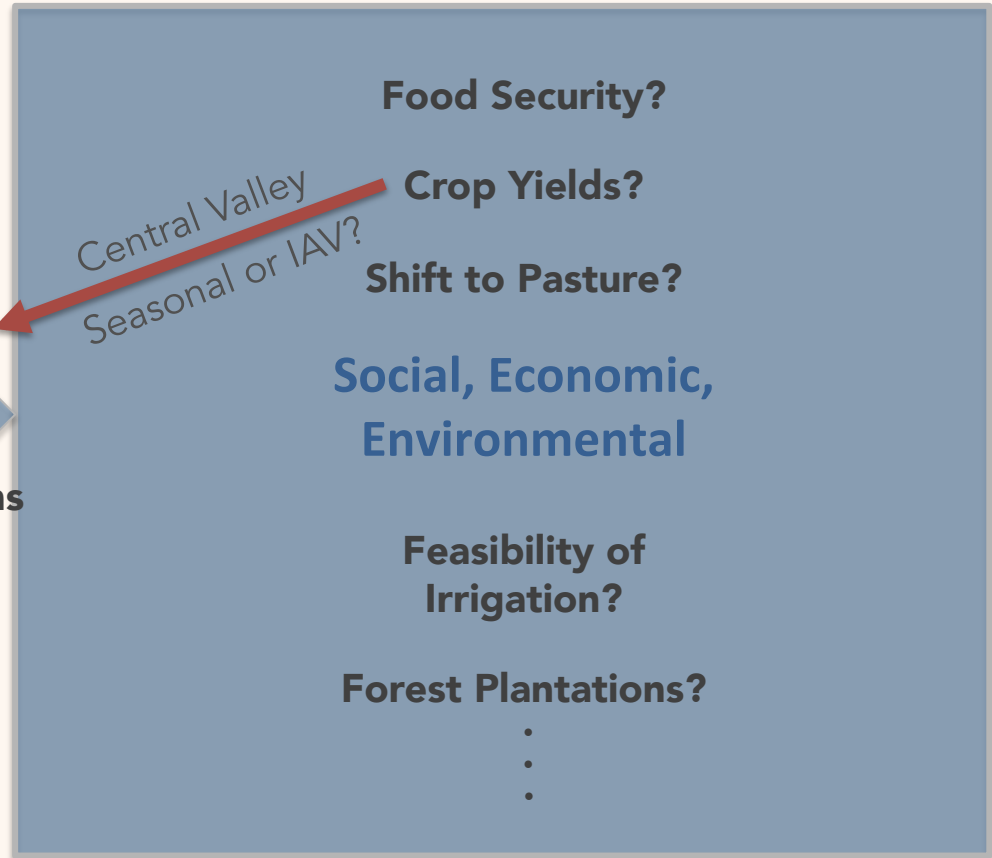




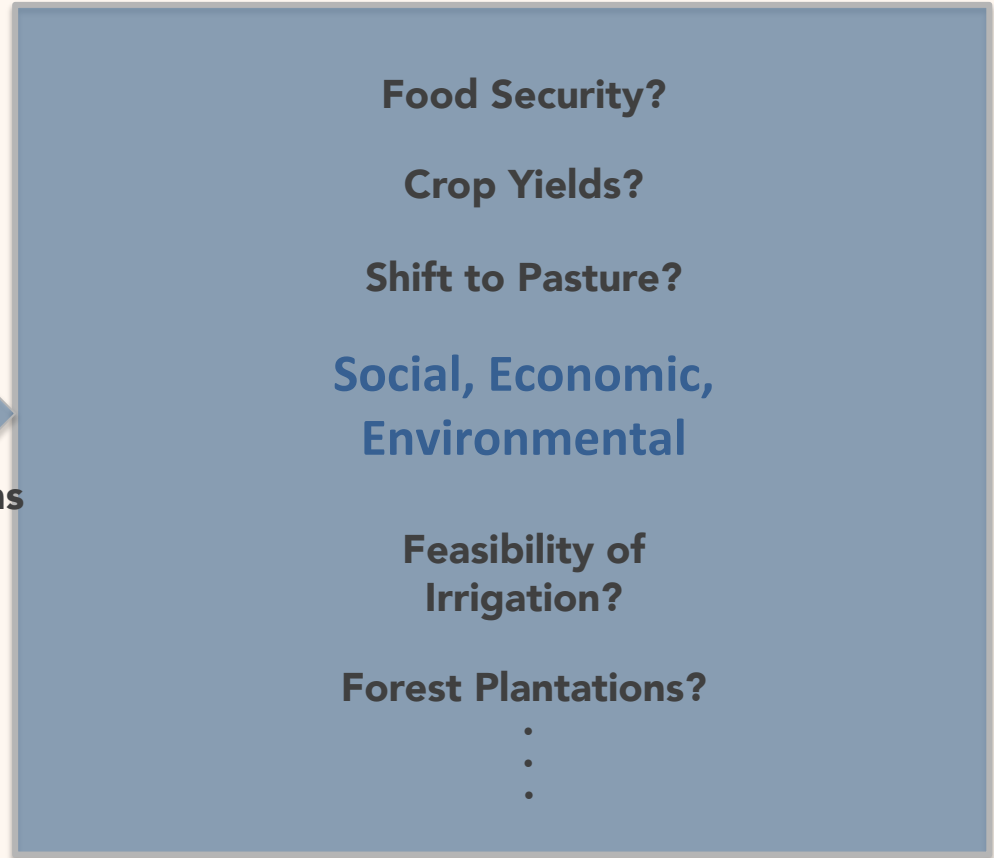
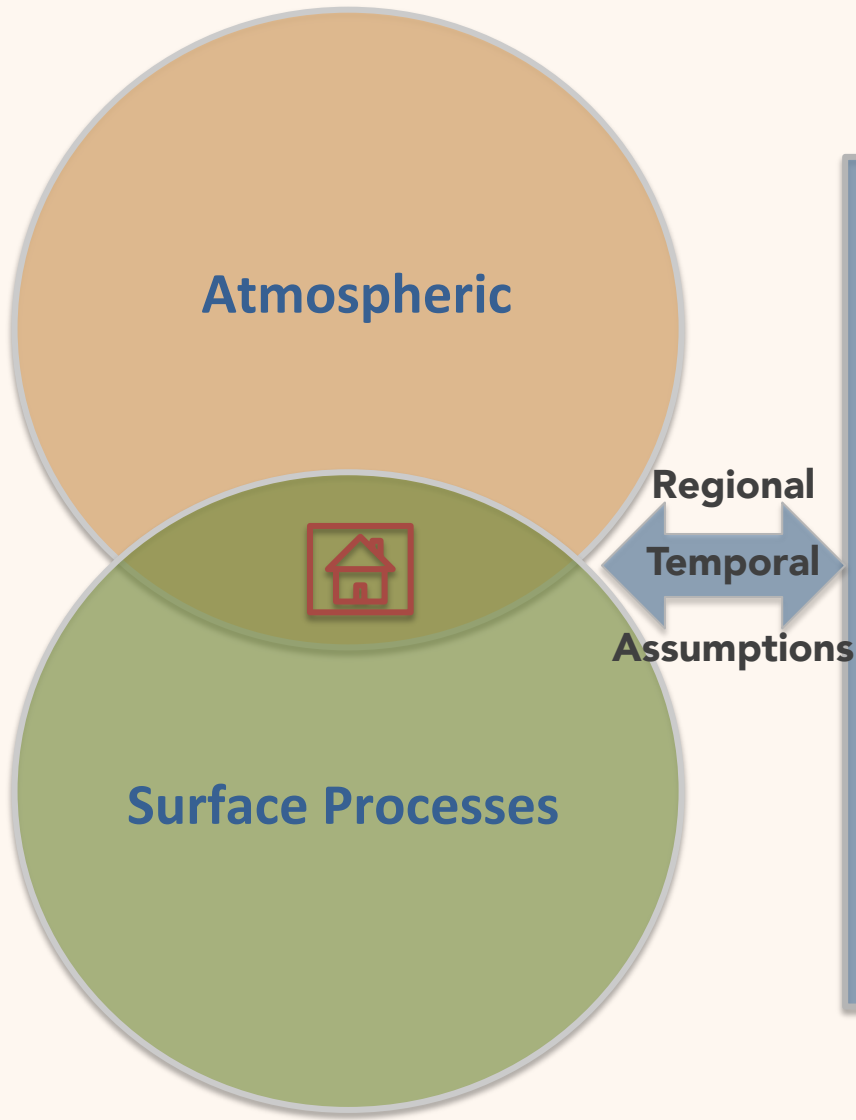


**Regional**  
**Temporal**  
**Assumptions**

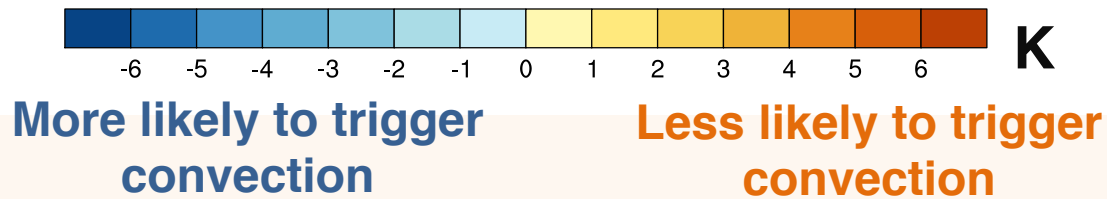
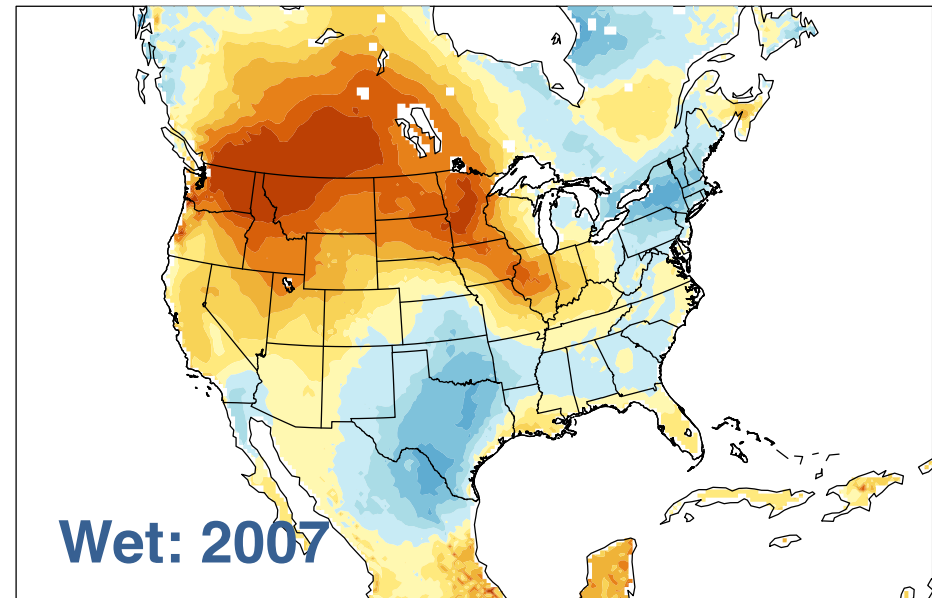
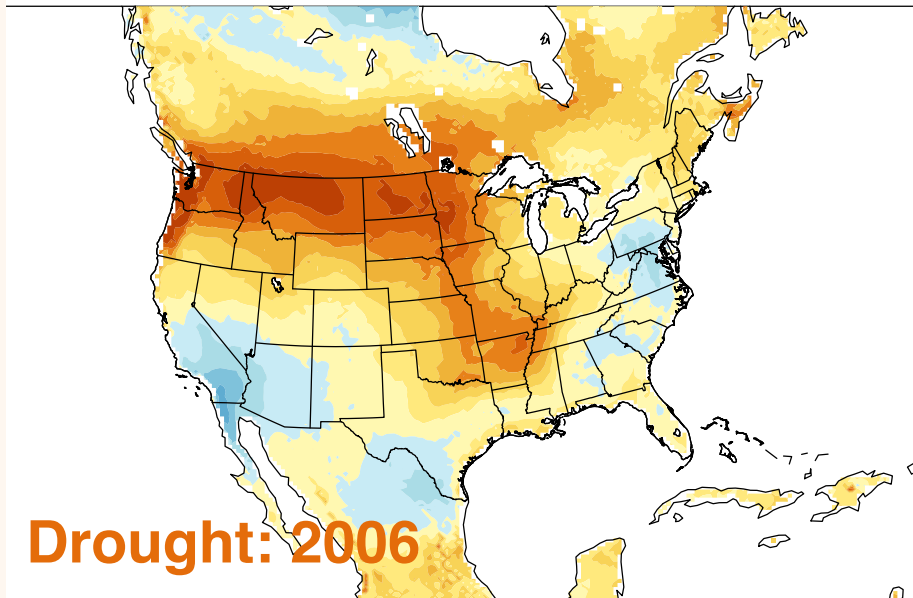
A blue double-headed arrow pointing left and right, with the text 'Regional Temporal Assumptions' centered over it.



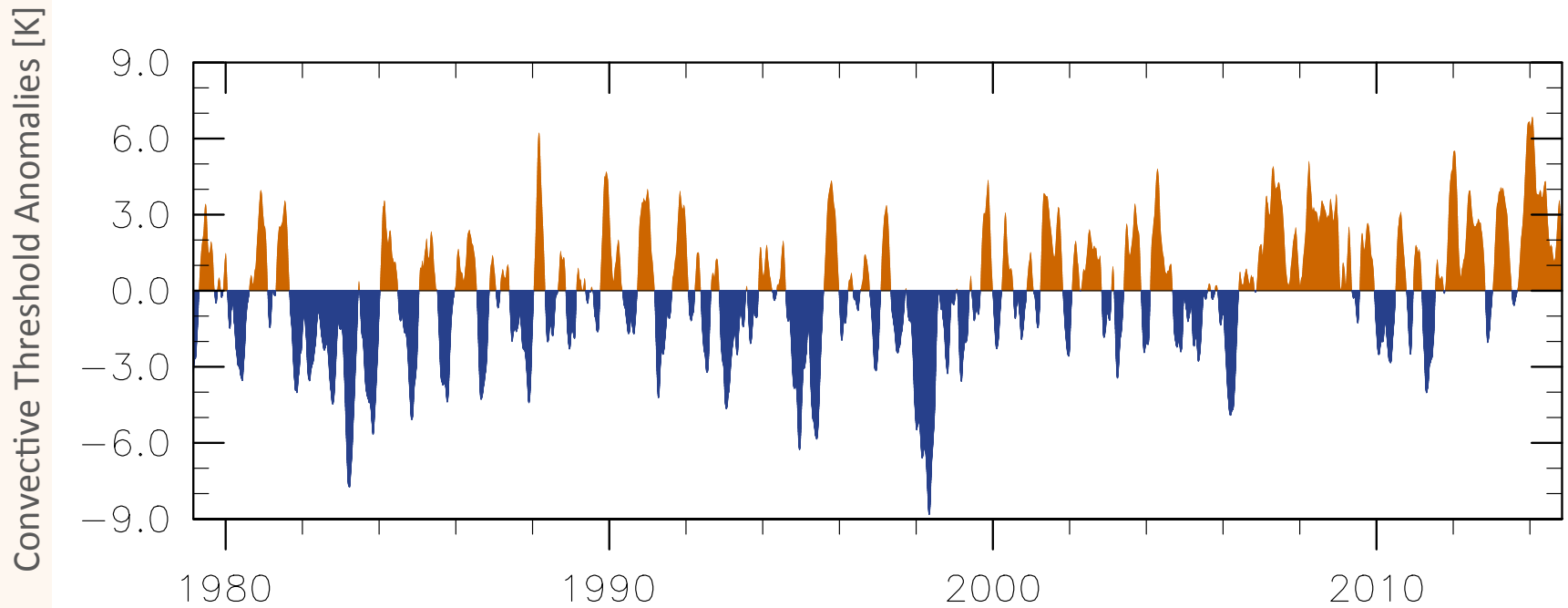
*Central Valley*  
*Seasonal or IAV?*



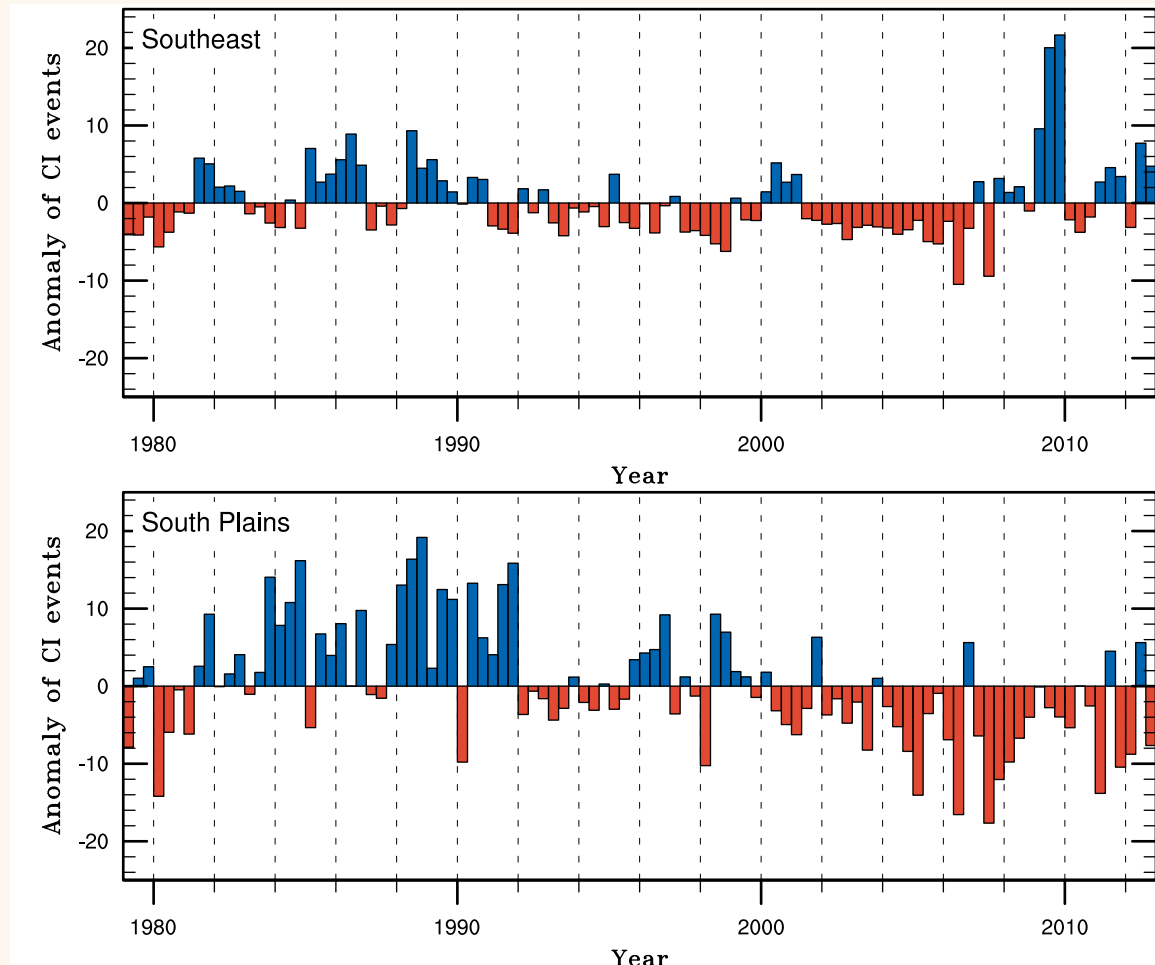
# Drought Year versus Wet Year



# California Drought

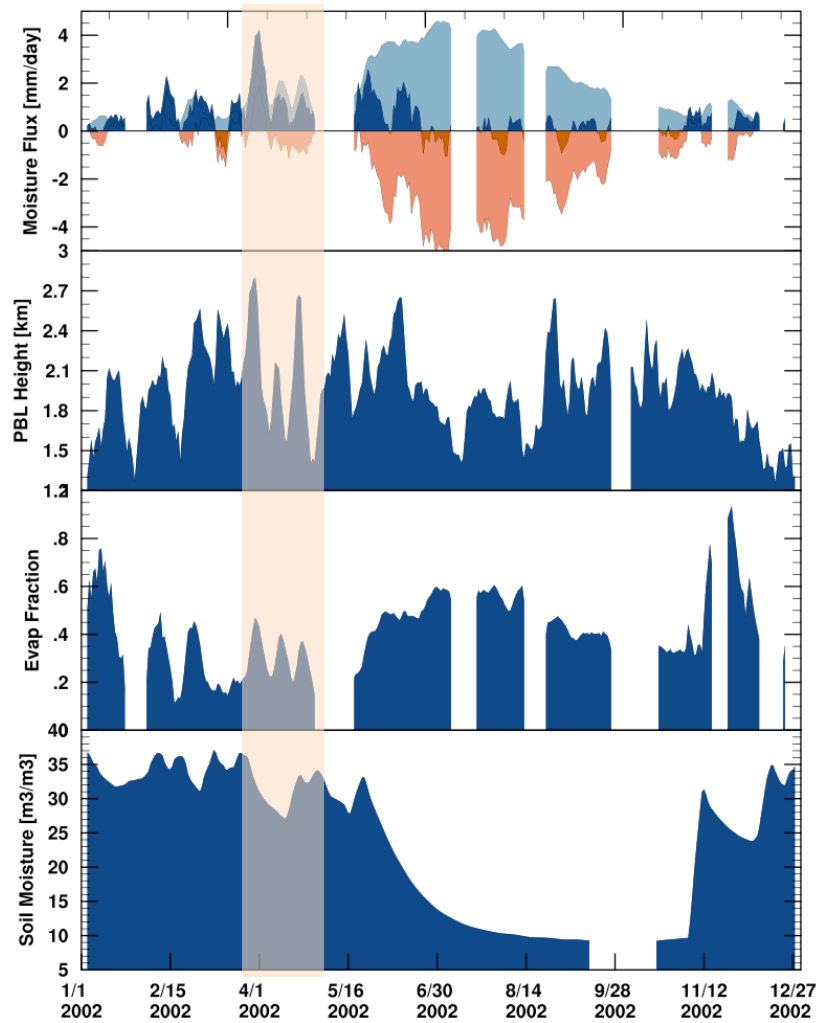


# Climate: Interannual Variability of CI Events



# Mechanism: Land Cover Comparison 2002

## Pine Forest



## Grassland

