

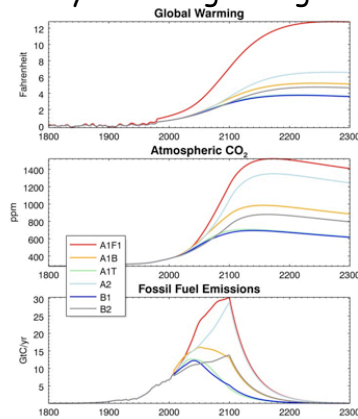
### Common Misconception #2

"When we reduce or stop the burning of fossil fuel, the CO<sub>2</sub> will go away and things will go back to normal"

CO<sub>2</sub> from fossil fuel will react with oceans, but only as fast as they "mix"

Eventually, fossil CO<sub>2</sub> will react with rocks

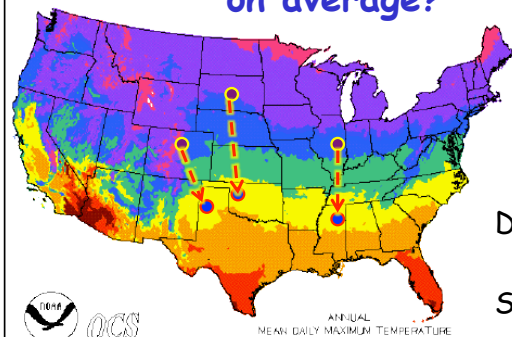
About 1/3 of today's emissions will stay in the air permanently!



So What?

### Where is it 10°F Warmer

"on average?"



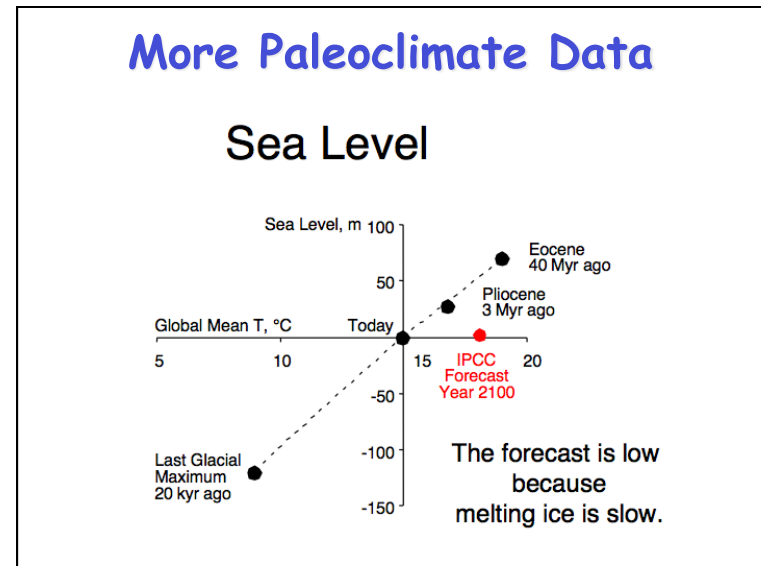
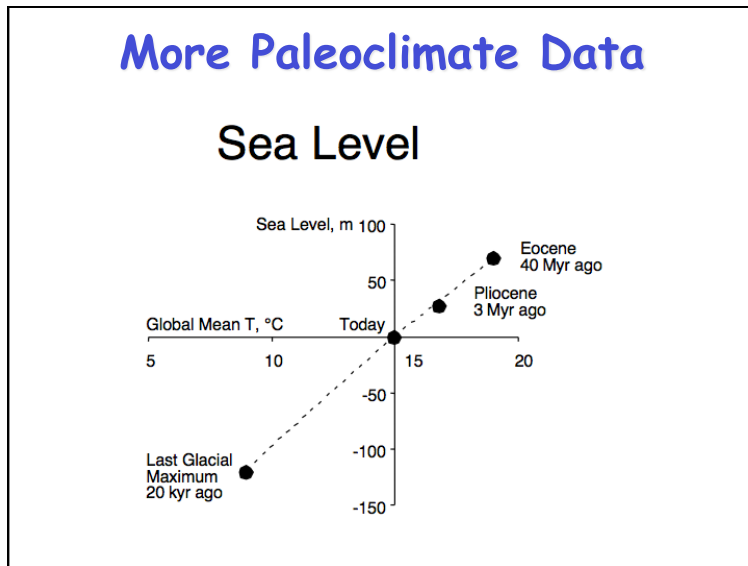
Water? Crops?  
Real Estate? Health?

Denver → Amarillo  
South Dakota → Oklahoma  
Illinois → Mississippi

### A Region on the Edge

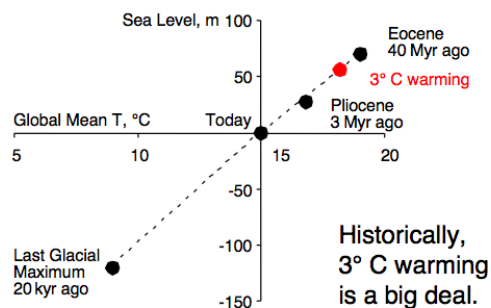






## More Paleoclimate Data

### Sea Level



## Historical Perspective



Climate change, CO<sub>2</sub>, and energy will likely be dominant themes in human history for centuries, much as religious wars, feudalism, colonialism, and industrialization in the previous millenium

## Climate Skeptics

- Observed warming in the past is caused by something else
  - Natural cycles (e.g., recovery from Little Ice Age)
  - Changes in the sun
  - Volcanos
  - Etc
- Climate system is too complicated to be predicted, and climate models are too simplistic to represent real physics
- "Conspiracy theories"

## Responding to Skeptics

- **Observed warming not caused by humans:**
  - There hasn't been much warming yet, because CO<sub>2</sub> hasn't increased very much (about 30%)
  - Does that mean that there won't be warming when CO<sub>2</sub> increases by 300%?
- **Models are insufficiently complicated:**
  - Predictions of warming don't require complicated models, just simple physics
  - Predicting that climate will not change if we double or triple CO<sub>2</sub> requires some kind of huge offsetting forcing ("follow the energy")
  - Complicated models don't show any such thing
  - Observations favor the simple solution