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Presentation Notes

1 General:

- Remember to say meaning of axes and colors
- Talk slower
- Less detail in results, more in intro?

2 Title

3 Introduction

Climate Change and Variability

- Climate change: long term trends in temp, etc (fig: red line)
- Climate variability: short (a few years) change in climate (fig: blue line)
 - May be cyclical or random

Climate Forcing

- External factors that affect climate change and/or variability
- List factors, ghg, aer, bmb, lulc
- Sources:

- ghg: industry, livestock
- aer: industry, volcanoes (smoke, dust, sulphites?)
- bmb: wildfires
- lulc: deforestation, agriculture, desertification
- Greenhouse effect
 - gasses and particulates affect atmospheric chemistry and sunlight reflection/absorption
 - ghg absorbs “blanket” trapping heat (fig: orange arrows)
 - aer reflects in upper atmosphere blocking heat out. (fig: yellow arrows)
 - bmb, lulc affect reflection, absorption on surface (fig: yellow arrows)

El Niño (ENSO)

- Temperature of the pacific ocean
- Cold -> La Niña
- Hot -> El Niño
- Entire cycle: ENSO (El Niño/Southern Oscillation)
- Affects humans: hot year, dry year, cold year, wet year
- Figure: temperature differences between strong La Niña year and strong El Niño year
 - Blue=colder, red=warmer
 - Point out California hot for El Niño (wildfires)

Method: Climate Simulation

- Main way of making predictions
- Predictions of forcing levels are fed to computers
- Computers simulate climate on a grid of data containing temperature and much more
- Predictions are usually run many times

- My contain biases but are quite well tested

Review of Literature

- Slide is notes

Gap

- Slide is notes

Questions

- What, why, how
- Slide is notes

4 Data, Methods, and Results

Methods Overview

- Slide is notes

Role of Mentor and Student

- Slide is notes

Model Setup

- Slide is notes

Measuring ENSO Intensity

- Make sure you talk about what Niño 3.4 index is: number that represents how strong El Niño is at each time
- Windowed variance calculates amount of variability of the Niño 3.4 index ie how intense the ENSO cycle is

ENSO is Becoming Stronger

- Graph axes and colors CESM1 and CESM2
- Both have increase in ENSO intensity
- Slowdown/decrease after 2050
 - Aerosol emissions

Influence of Aerosols and Greenhouse Gasses

- Data source: single forcing ensembles
- Explain figure axes, subplots
- Biggest, constant increase in GHG
- Significant changes in AER, but not one direction
- Insignificant changes for others
- Takeaway

Correlation With Ocean Temperature

- Calculated correlation coefficient with ocean temp. and ENSO amplitude
- CESM1 only so far
- Plot:

- Cross section of pacific along equator, x:lon, y:depth, color:correlation
- Positive coefficient in surface layer, negative coefficient in subsurface layer
- Stratification
- More work necessary

Wavelet Analysis

- WA = mathematical process that takes a signal and derives changes to each frequency over time
- Plot:
 - axes, color, subplots
 - Confirm results from previous steps

5 Conclusion

Conclusions and Discussion

- Slide is notes

Application, Limitation, and Next Steps

- Slide is notes

Acknowledgments

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References