

Climate Modelling in-class worksheet 8- CESM LENS version (week 9)

Group members:

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2. _
3. _
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If you are planning to use CESM LENS or CESM LENS2 data in your project, this worksheet will help you get familiar with accessing the data. By the end of the worksheet, you should know that you can access all of the data you will need for your project. If there are variables/experiments/times that you want to use that you cannot find from the AWS server, talk to the instructors before the end of class today.

There is a new jupyter notebook under: https://phaustin.org/climate_2022/resources/loading-CESM-LENS-data.html that will help you with this worksheet.

1. We'll start off looking at the CESM LENS 1 dataset. Given the information already printed in the loading-CESM-LENS-data notebook about sea level pressure, what are time periods (years of simulation) for the 4 different experiments (20C, CTRL, HIST, RCP85)? Use the monthly data.
2. Looking at the future (RCP85) data for the 6-hourly data, what time periods are available? Why do you think this is restricted relative to the daily or monthly data?
3. For the answer to question 1, you should have found that the years for the 'CTRL' simulation are 0400-2200. What year in the history of Earth do you think this experiment is representative of? Look at the Table 1 in this paper (<https://journals.ametsoc.org/view/journals/bams/96/8/bams-d-13-00255.1.xml>) to help. Note that it seems that the experiment has been extended from when the paper was written, so there are more years available.
4. For your project are you going to use CESM LENS, or CESM LENS2? Why?

You're now going to start exploring the CESM LENS dataset that you will use in your project. Make sure you select the appropriate URL (CESM LENS1 or CESM LENS2). If you are using CESM LENS2 there are some cells that will help you familiarize yourself with the slightly different experiment names etc. Your worksheet answers may now diverge from those of others in your group if you are looking at different LENS versions and different variables.

5. Pick one of the variables that you want to study in your project. What is its: long_name, variable name and what time resolutions are available for this variable? (daily? Monthly? 6-hourly?).

6. Make two plots of this variable, showing the spread between different ensemble members
7. Make at least one plot of this variable showing trends over time (either for a global mean, for a single grid point, or a regional mean).
8. If you have any remaining questions about how to access the data for your project, now is the time to ask the instructors!