Working Group 1: Tropical Systems

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Climate Change Impact in Tropical Cyclones for Mesoamerican and Caribbean Regions

Methodology (from first meeting…)

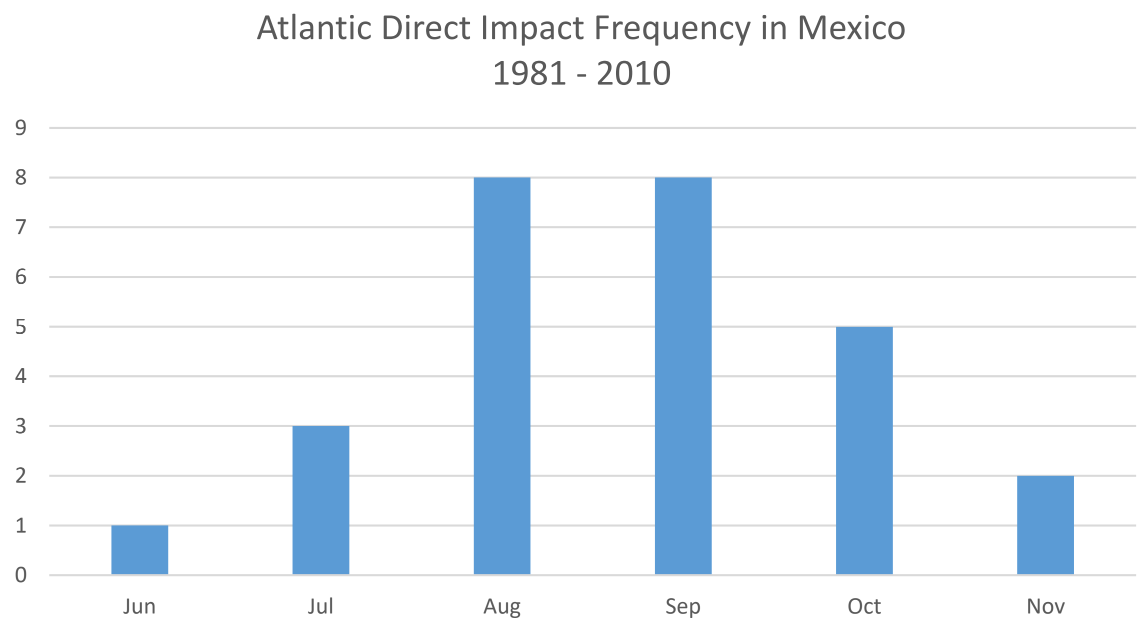
Step 2 Catalogue all Tropical Systems that occurred historically within the domain of interest.

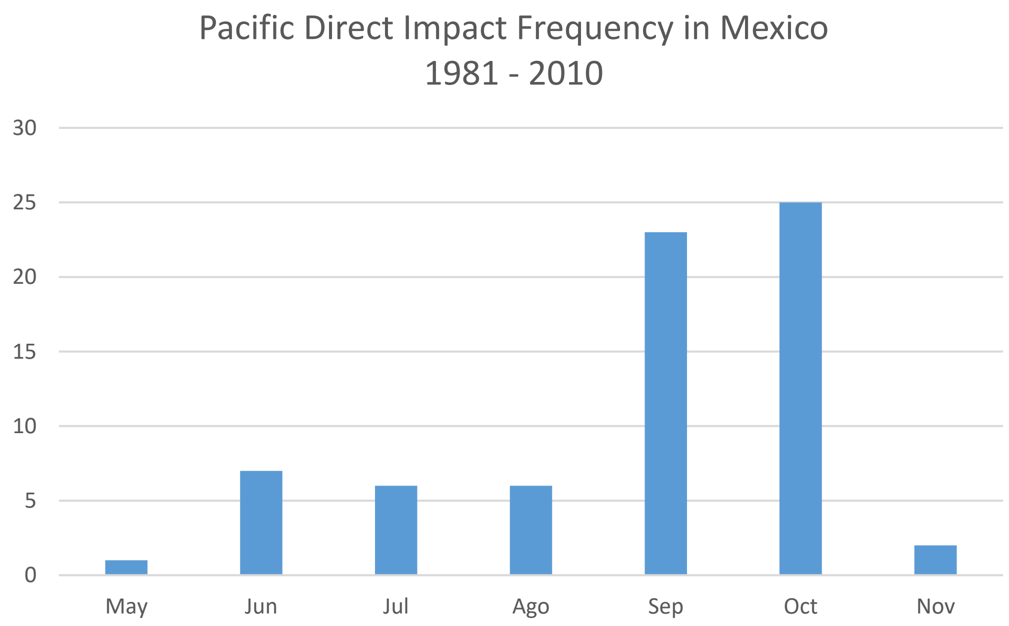
- Sub-divide the storms into Atlantic and Pacific occurrences.
- For each domain
- For each basin (Atlantic and Pacific)
- Select the highest intensity Tropical System for each year of the period of interest.
- To facilitate detection in tropical step 4 the storm must existed within domain of interest for approximately 48 hours.

Methodology

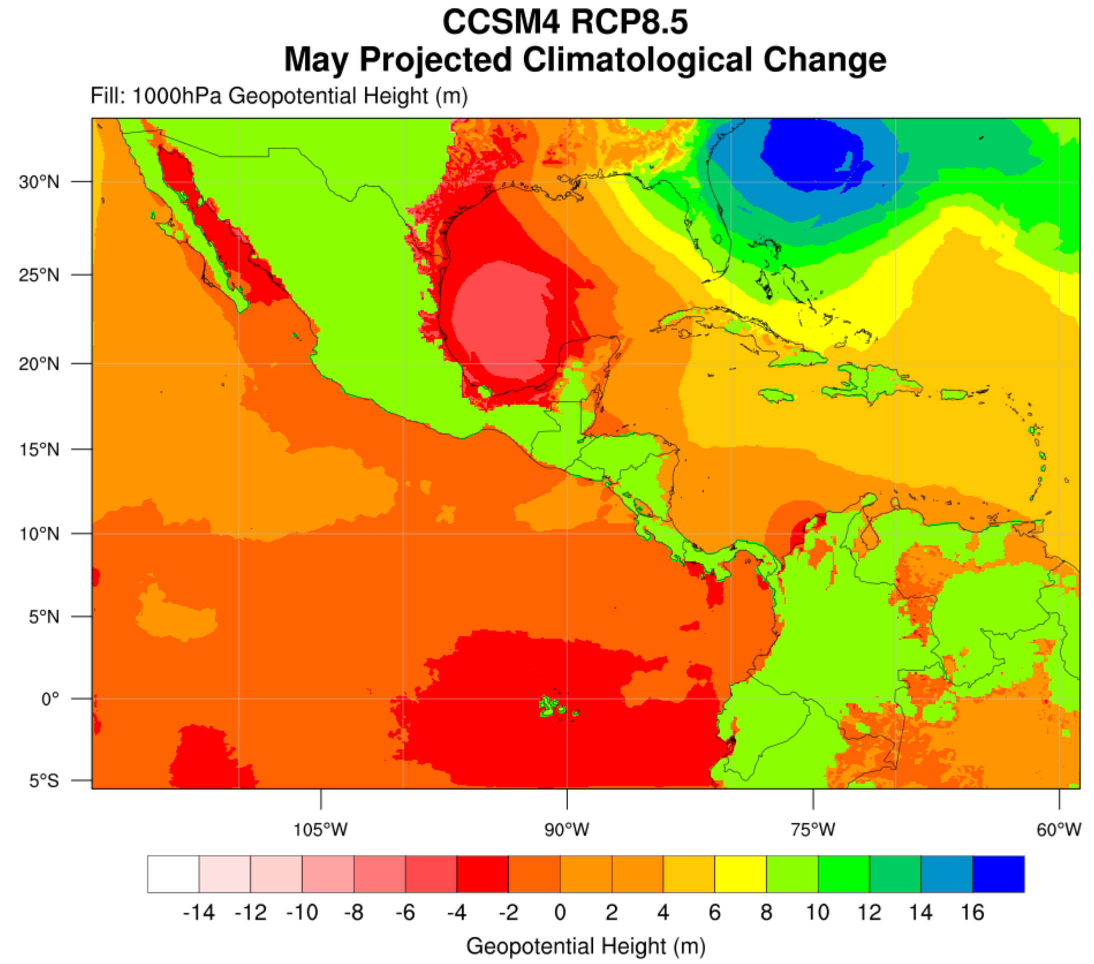
- Attempt to identify individual TC's identified in Step 2.
- For each Domain. (Gualdi et al. 2008)
- We assume that a model TC is active over a certain gridpoint A if the following conditions are satisfied:
- in A, relative vorticity at 850 hPa is >3 x 10^-5 s^-1 ; there is a relative minimum surface pressure and wind velocity is >14 m s^-1 in an area of **2.25°** around A; **(metric to be adjusted for each domain)**
- the wind velocity at 850 hPa is > wind velocity at 300 hPa;
- the sum of temperature anomalies at 700, 500, and 300 hPa is > 2°K, where the anomalies are defined as the deviation from a spatial mean computed over an area of **13 grid points in the east–west and 2 grid points in the north–south direction**;
- the temperature anomaly at 300 hPa is greater than the temperature anomaly at 850 hPa;
- the above conditions persist for a period longer than 1.5 days.

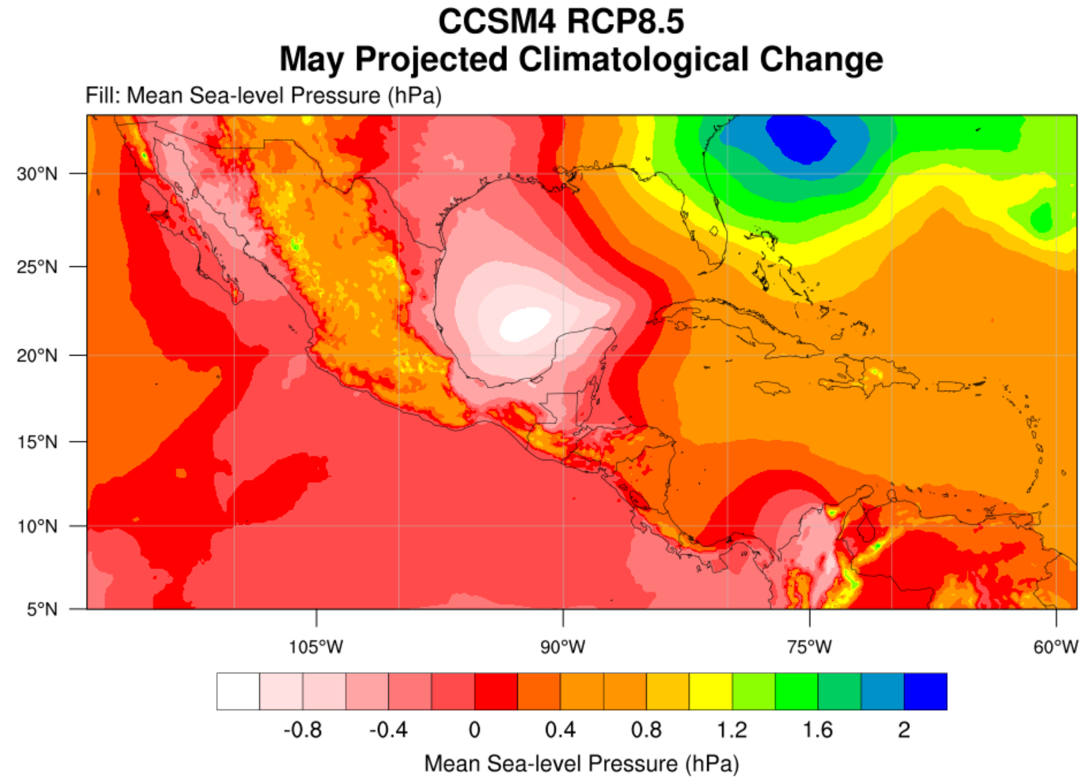
Historic Impact of Hurricanes in Atlantic and Pacific Basins



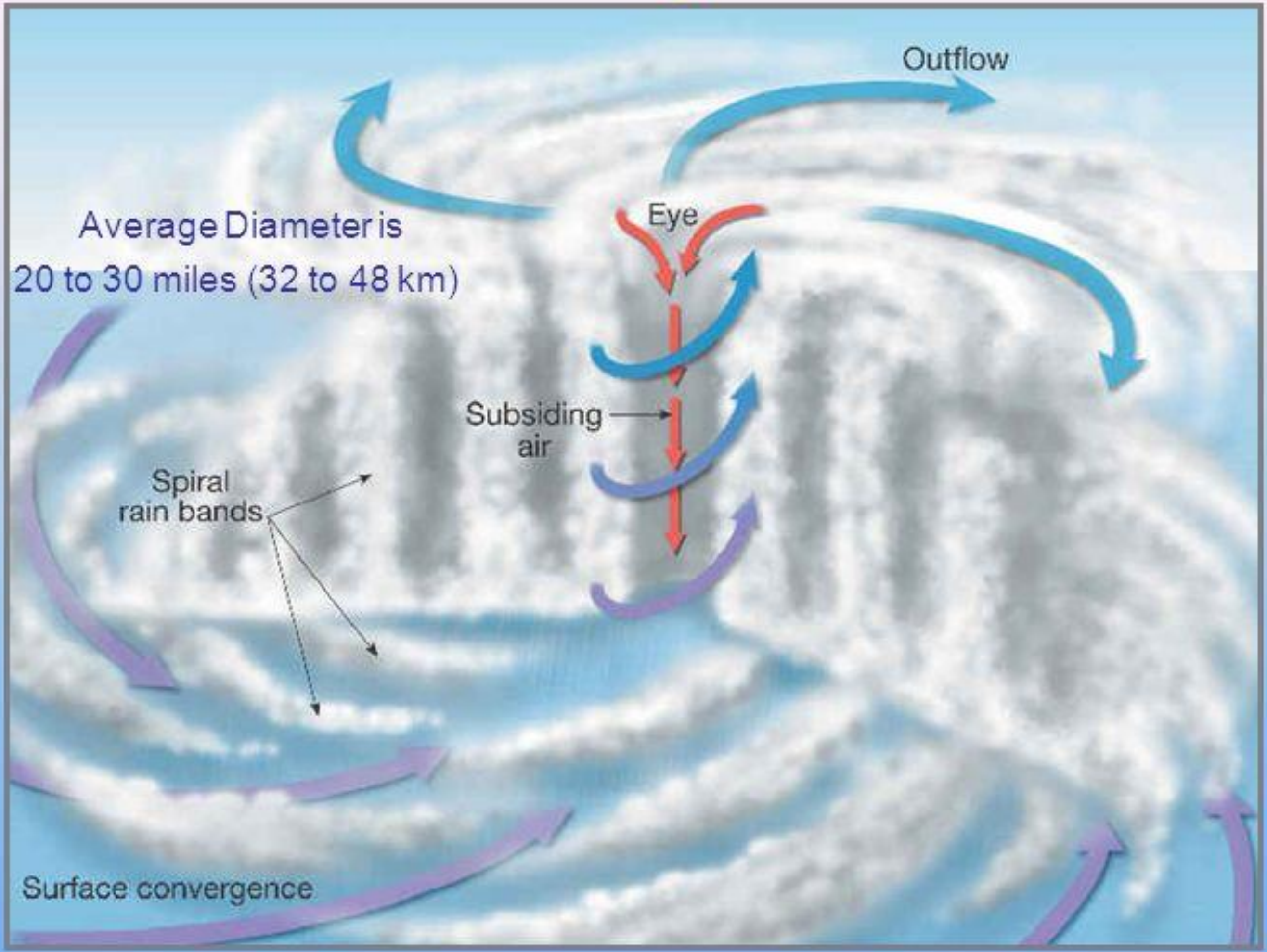


Changes in May



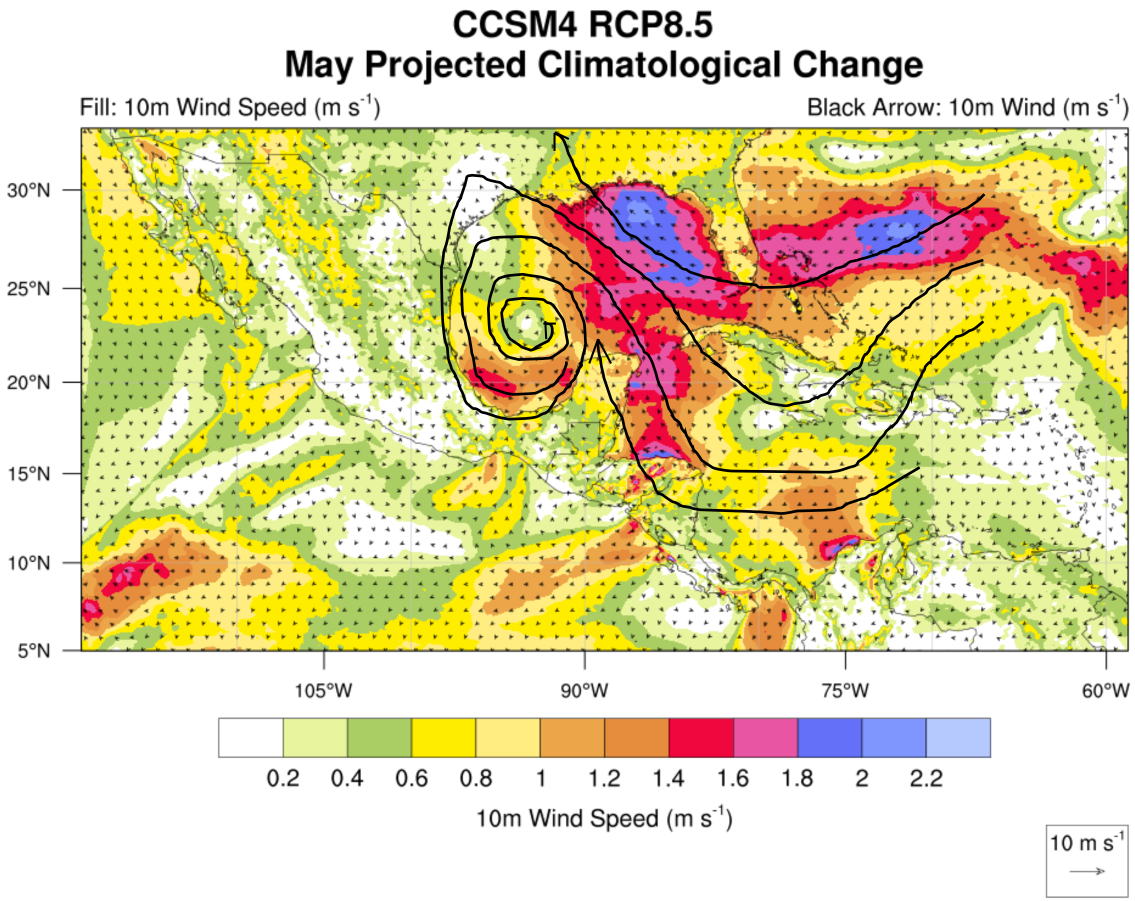


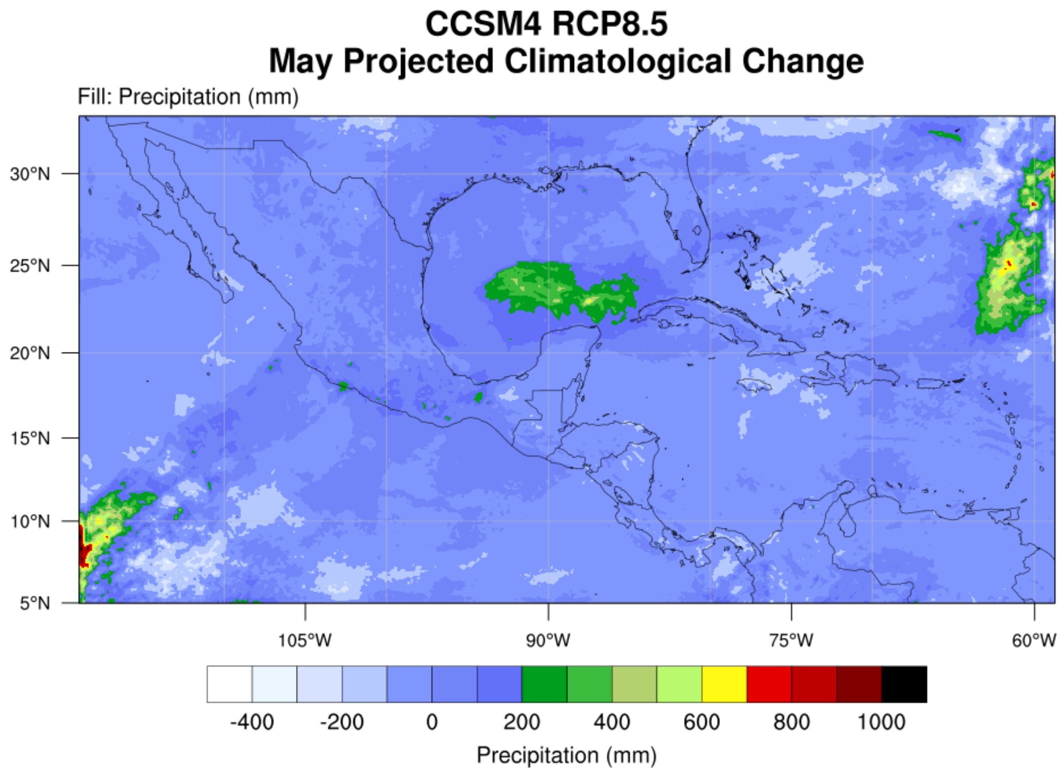
The Structure of a Hurricane:
The Eye



- A quasi-circular or quasi-oval region of light winds and skies that are clear to partly cloudy and free of rain.
- Caused by descending air that heats by compression, making it the warmest region of the storm.

Changes in May





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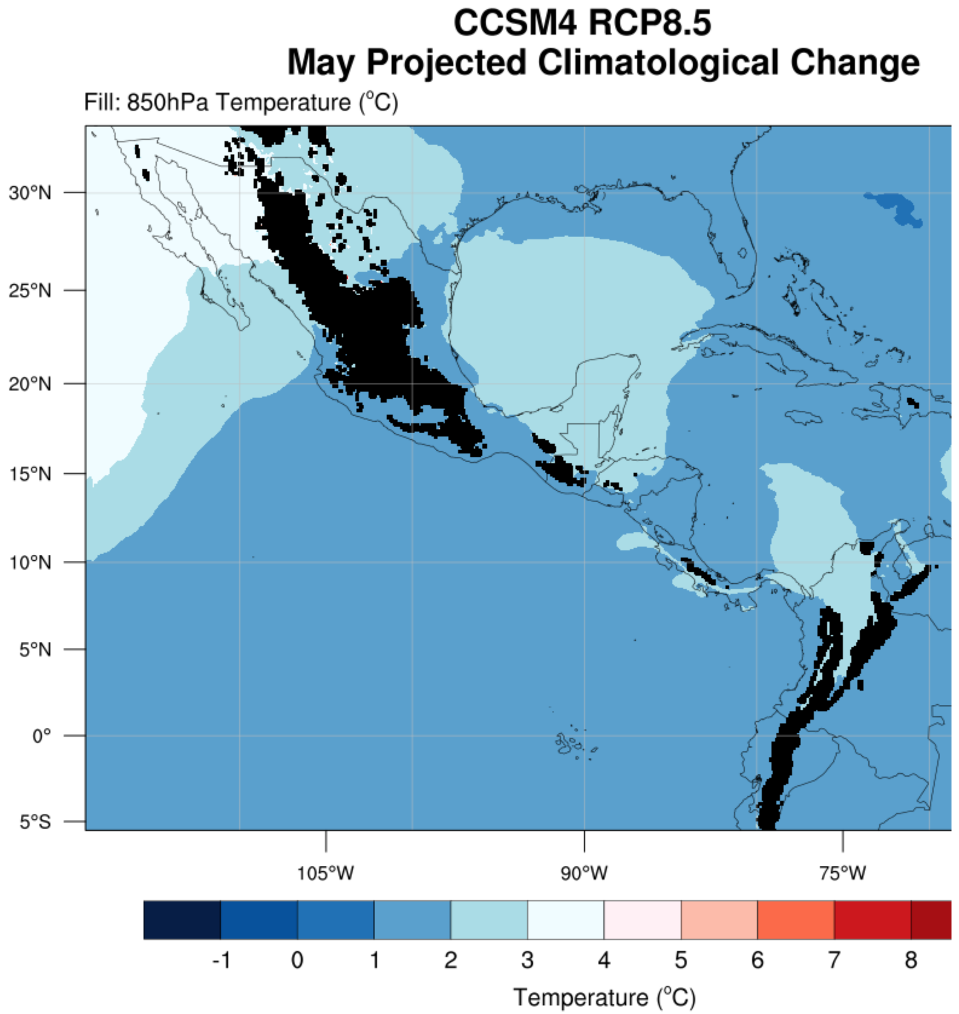

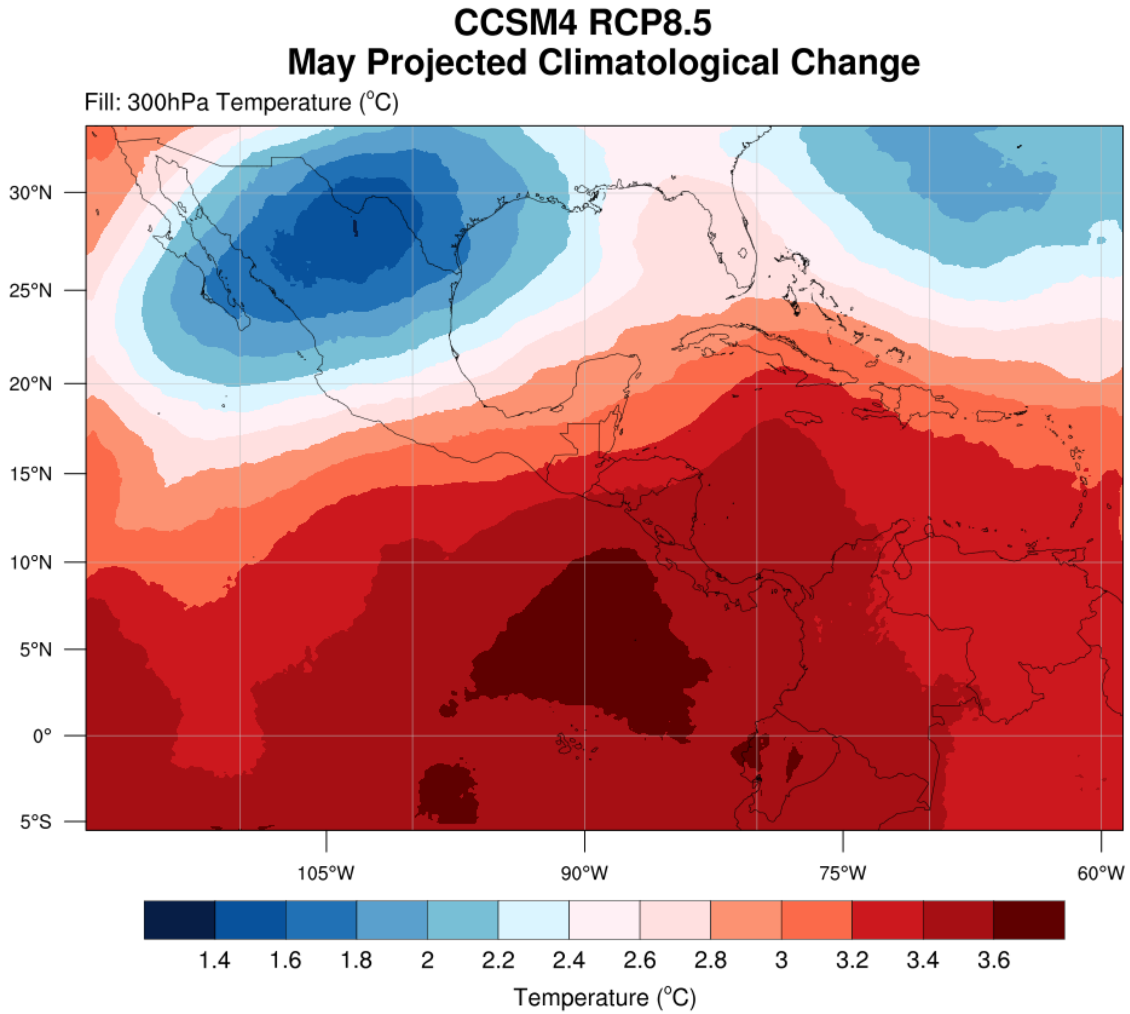

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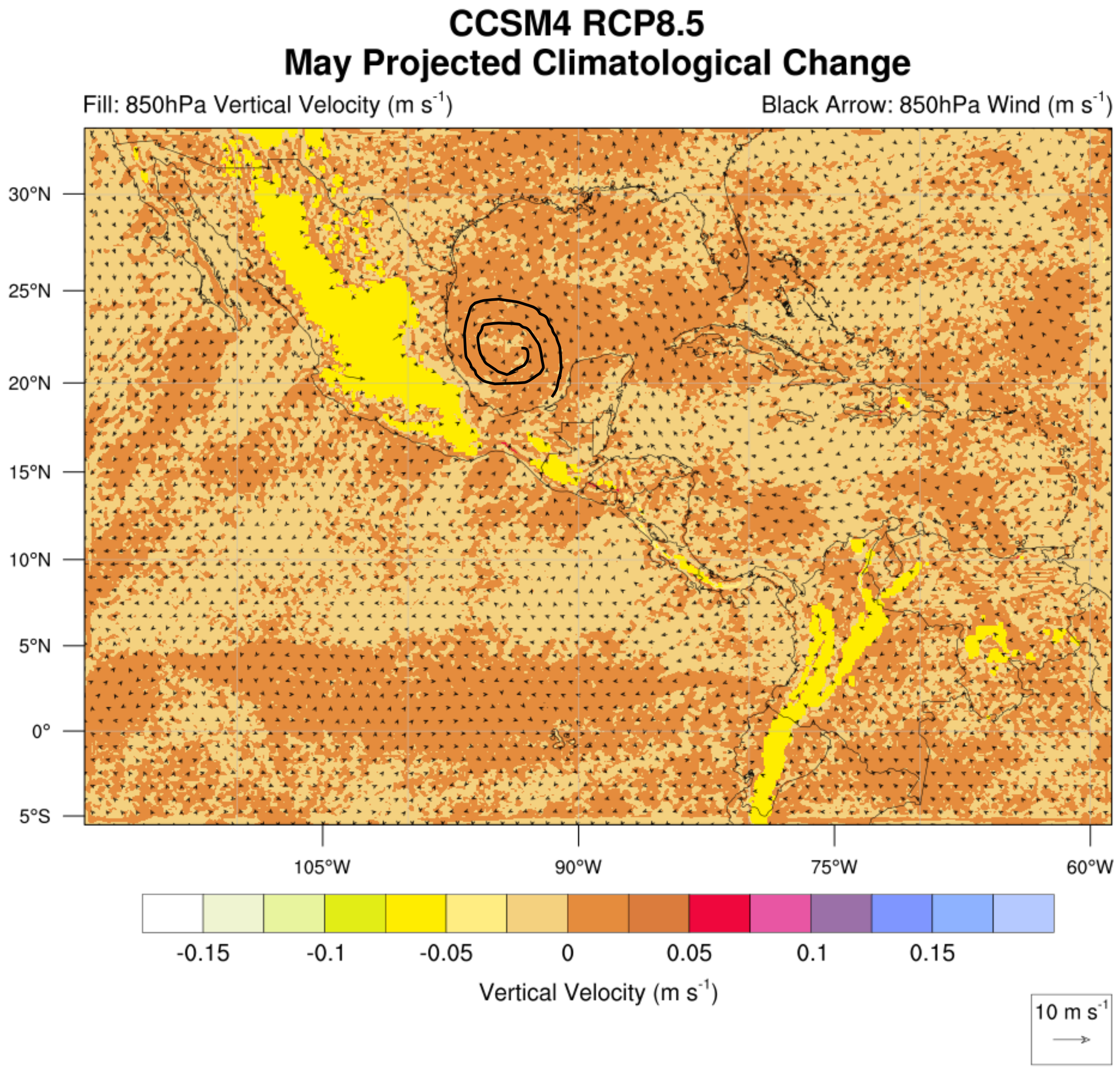

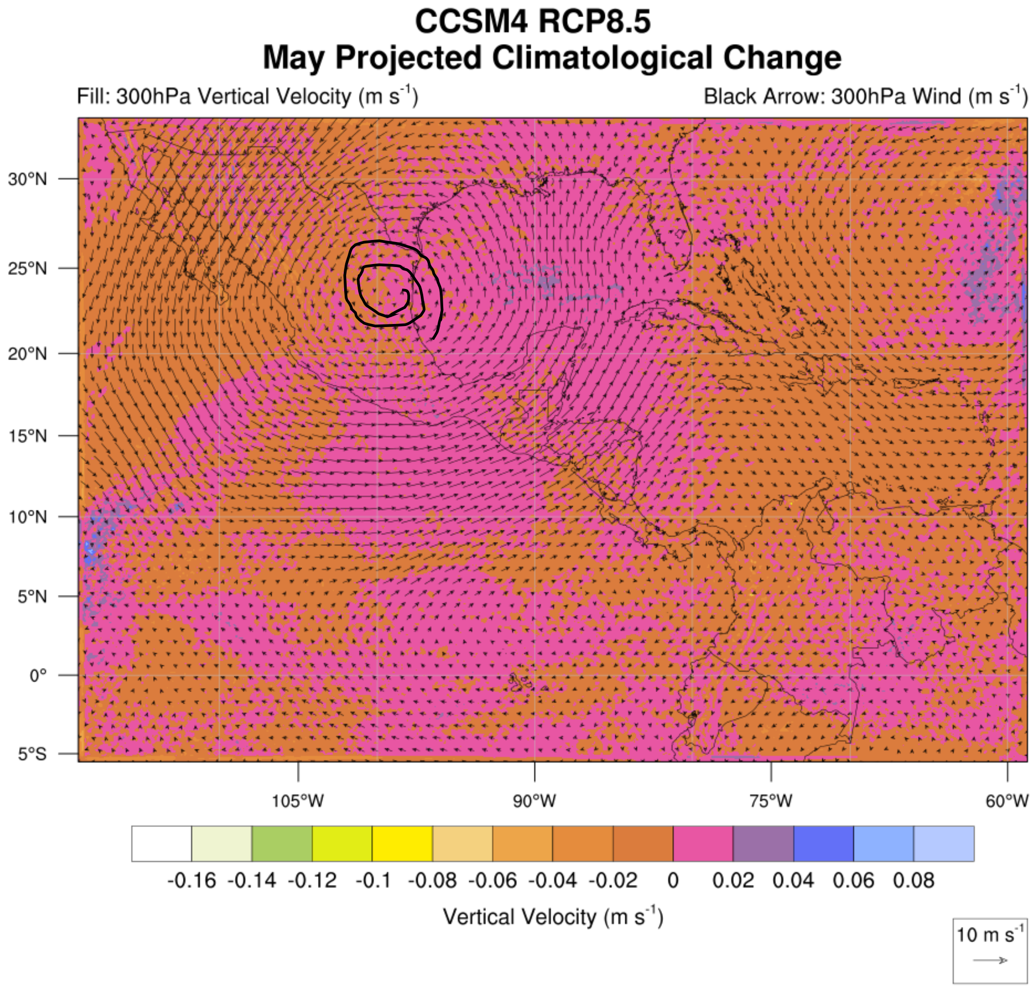

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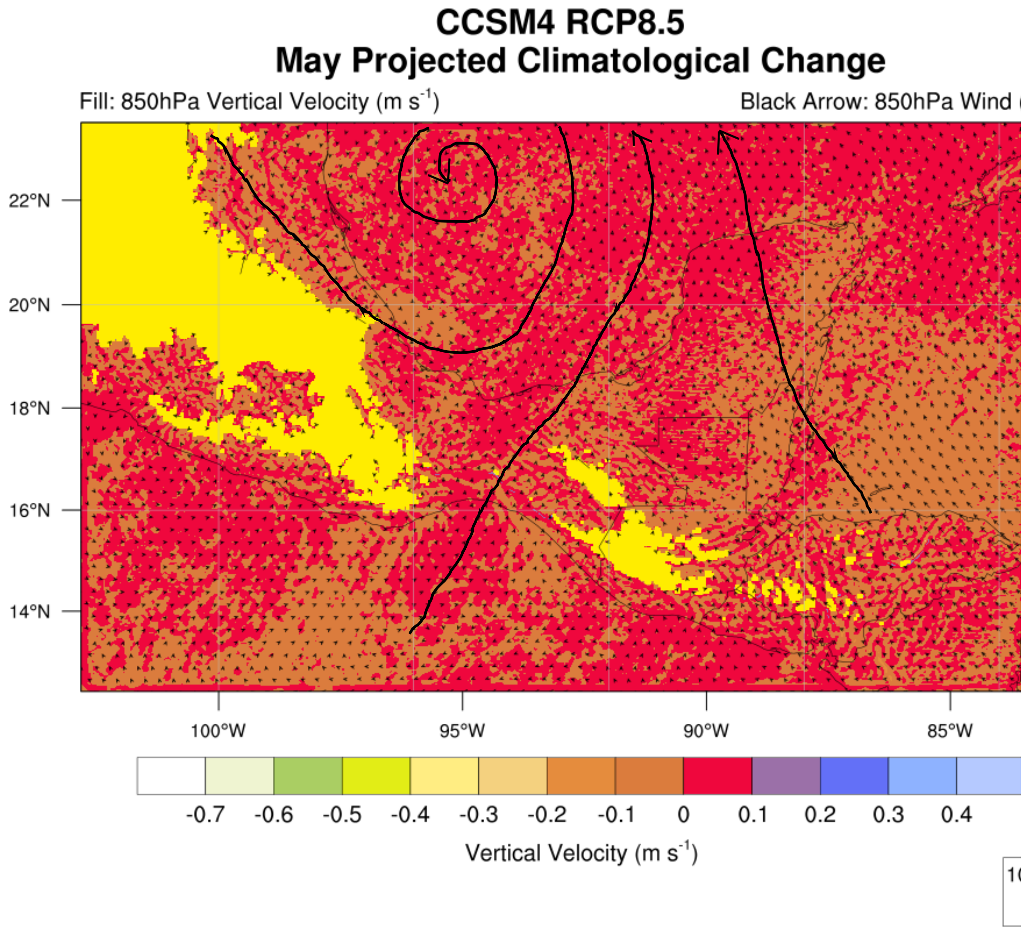

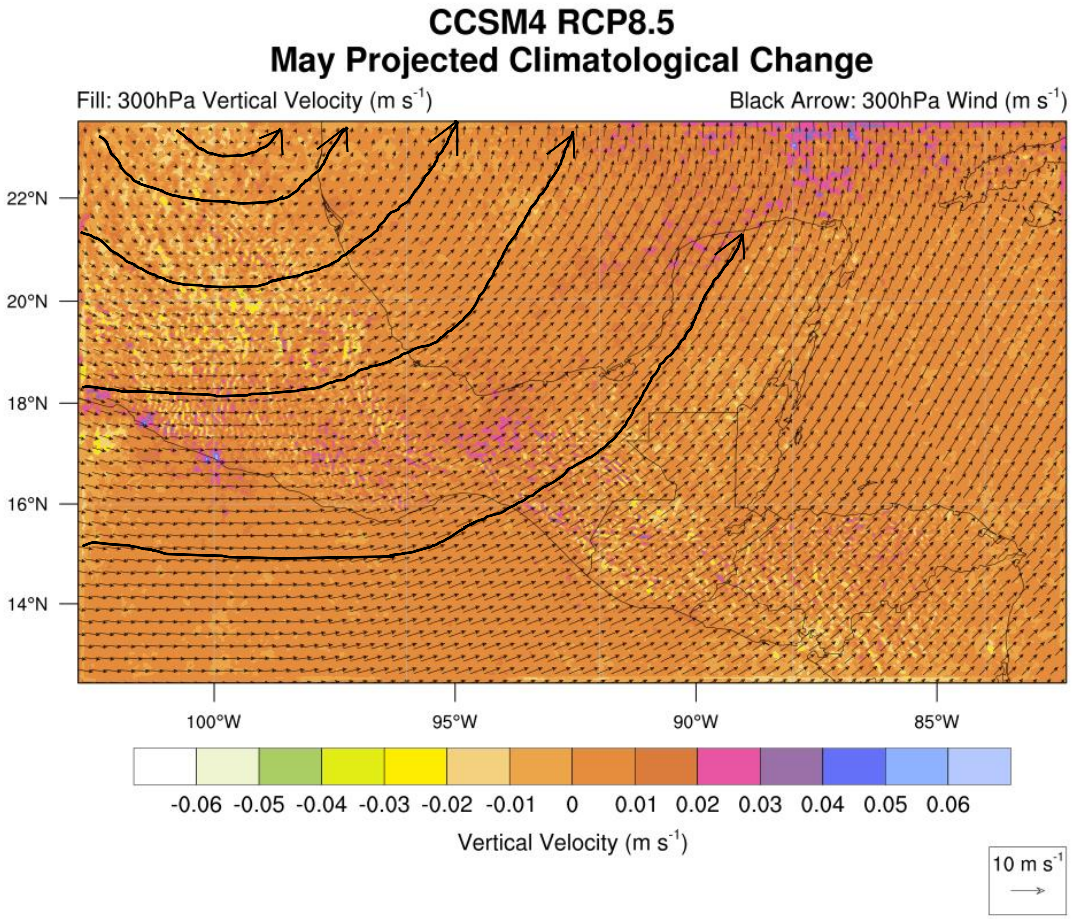

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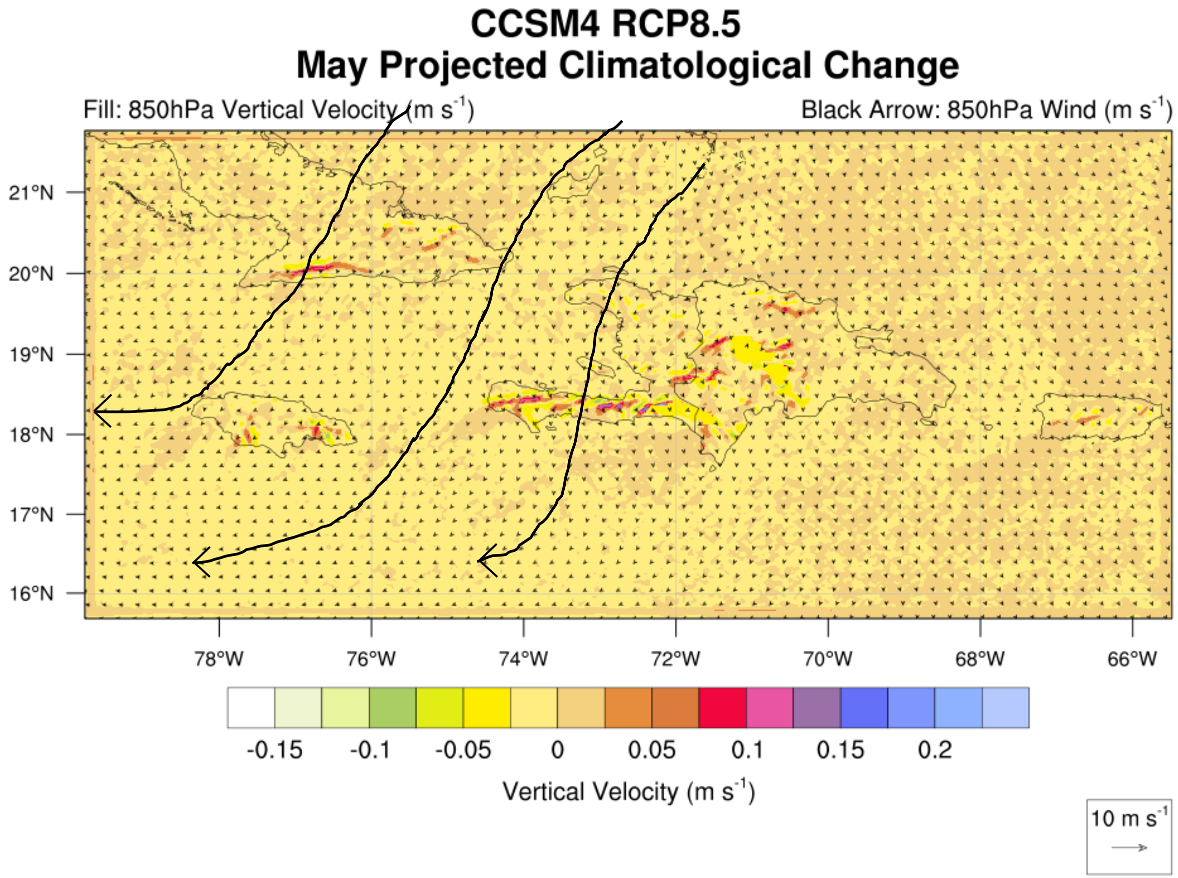
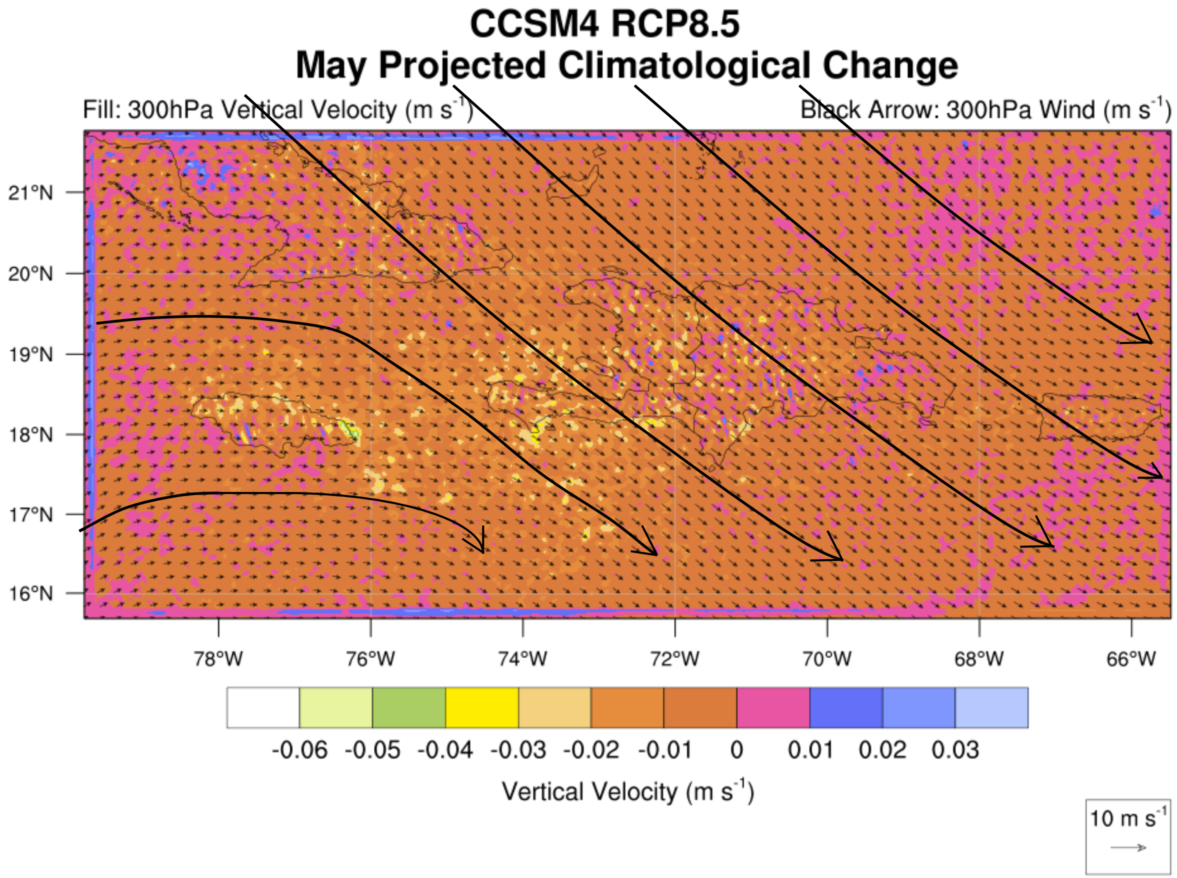
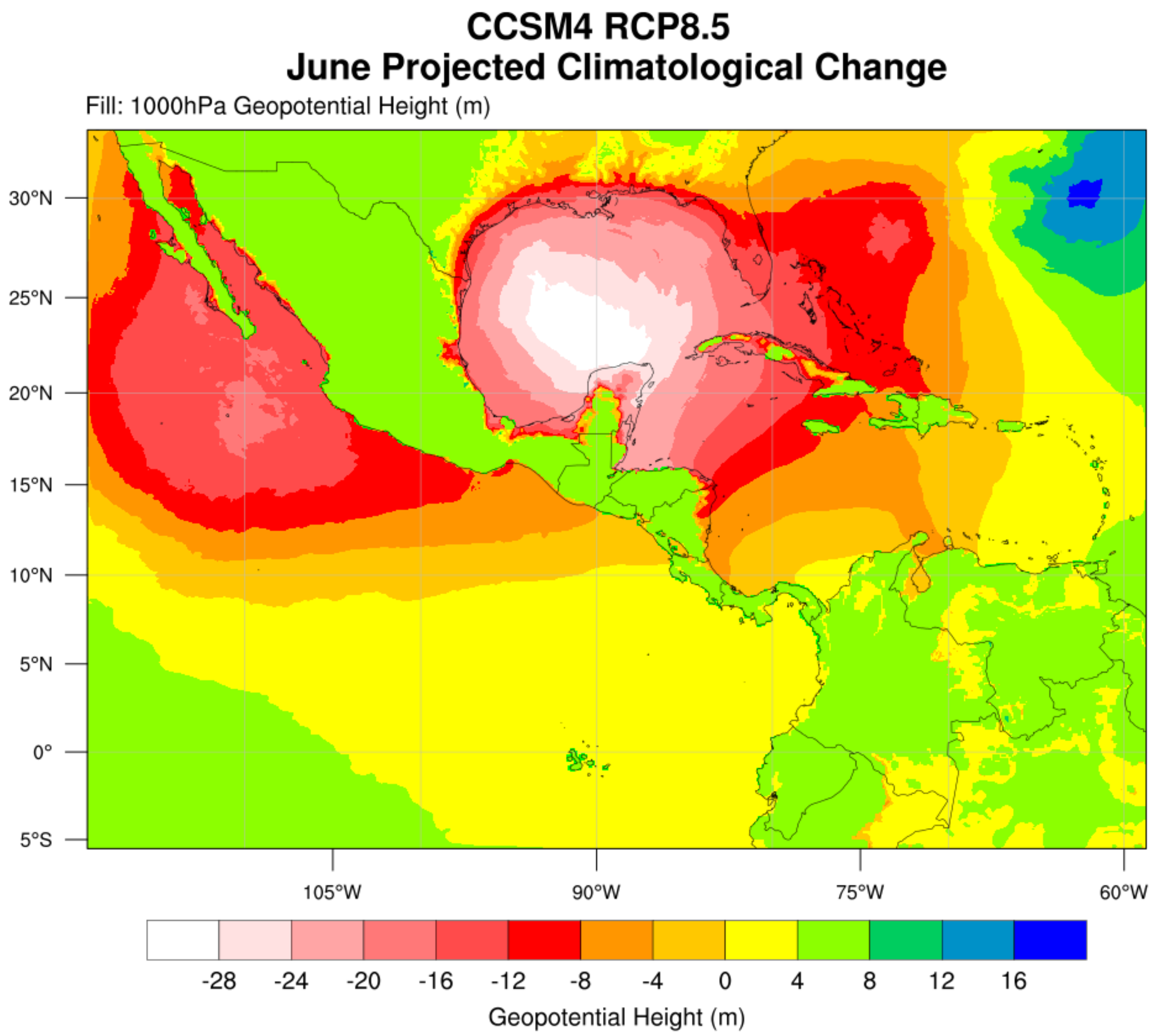
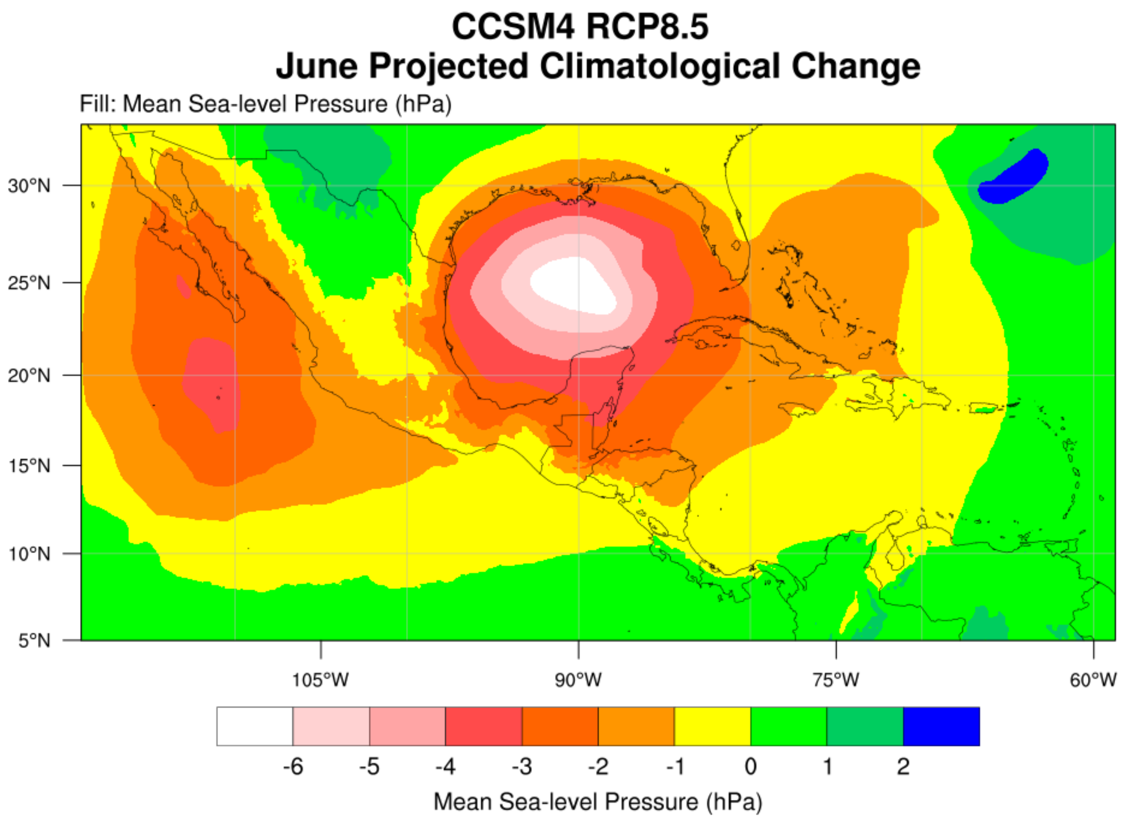




Changes in June





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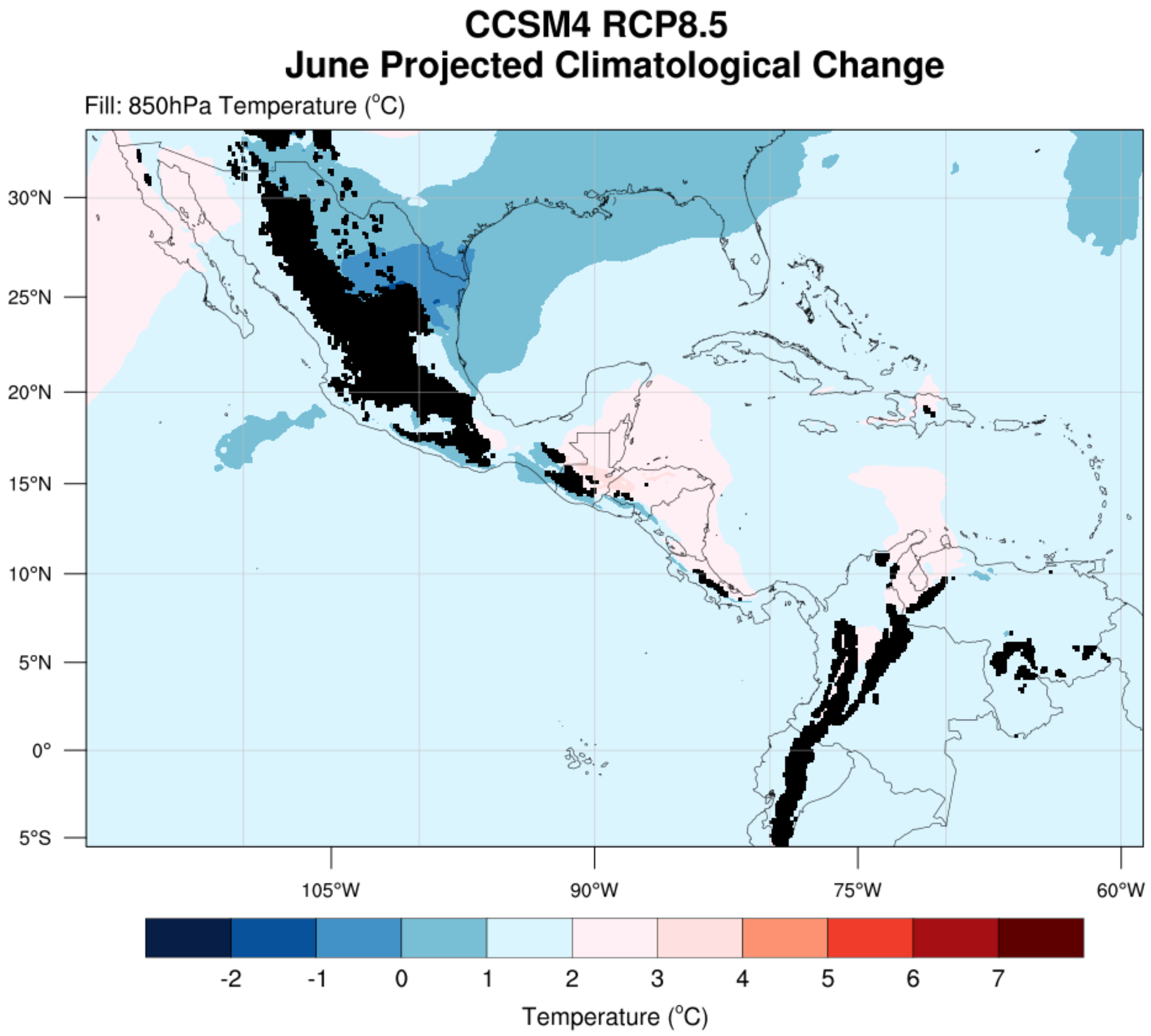

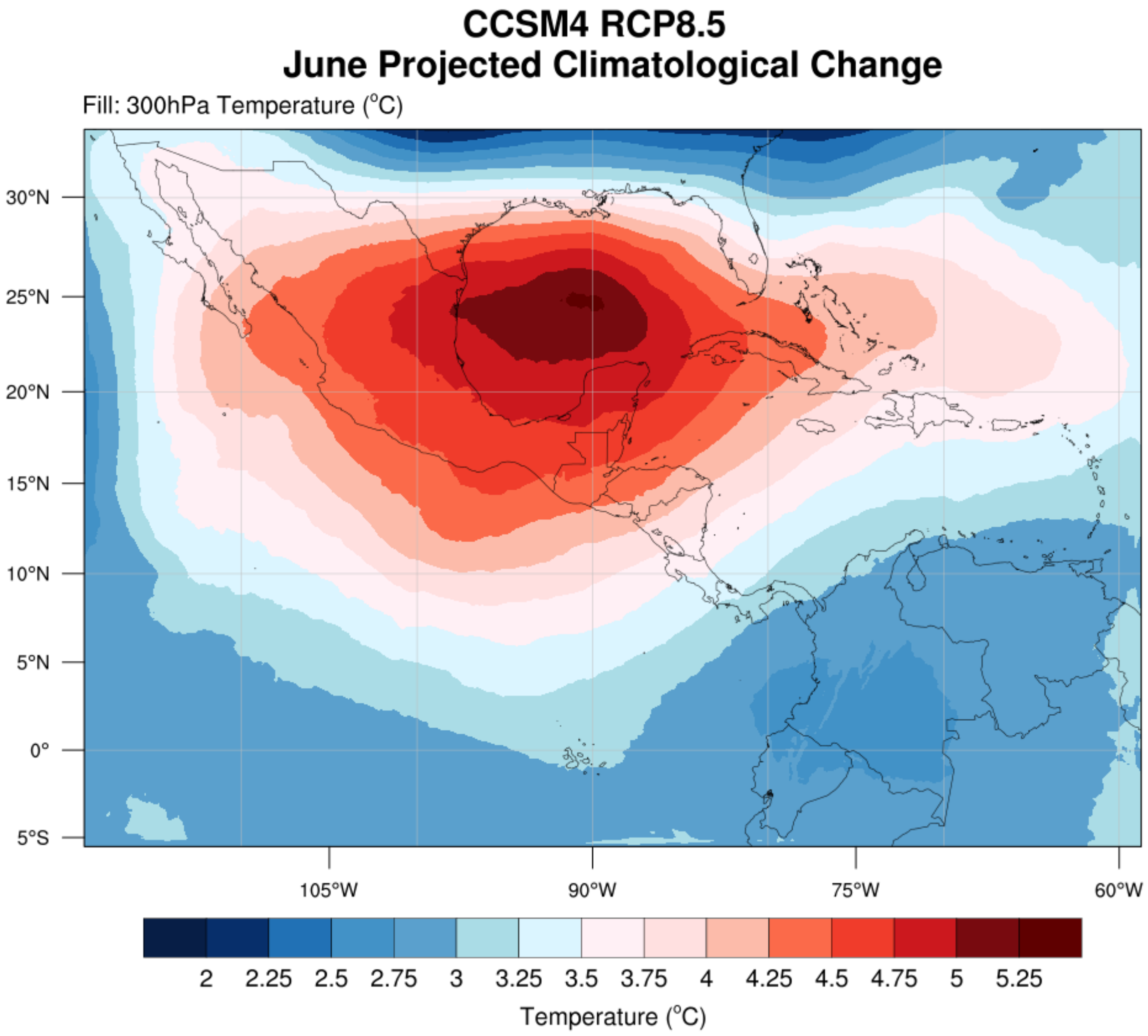

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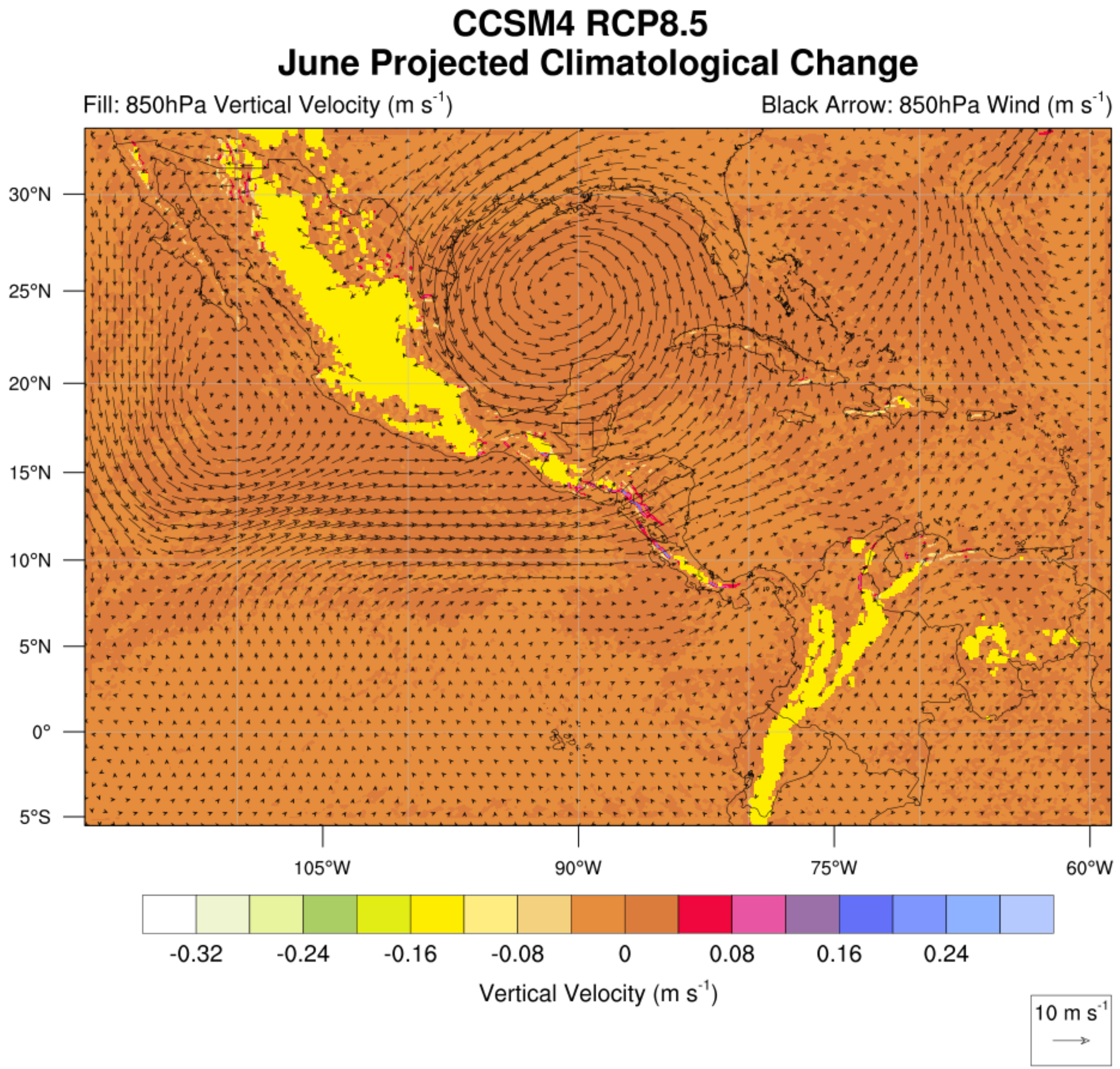
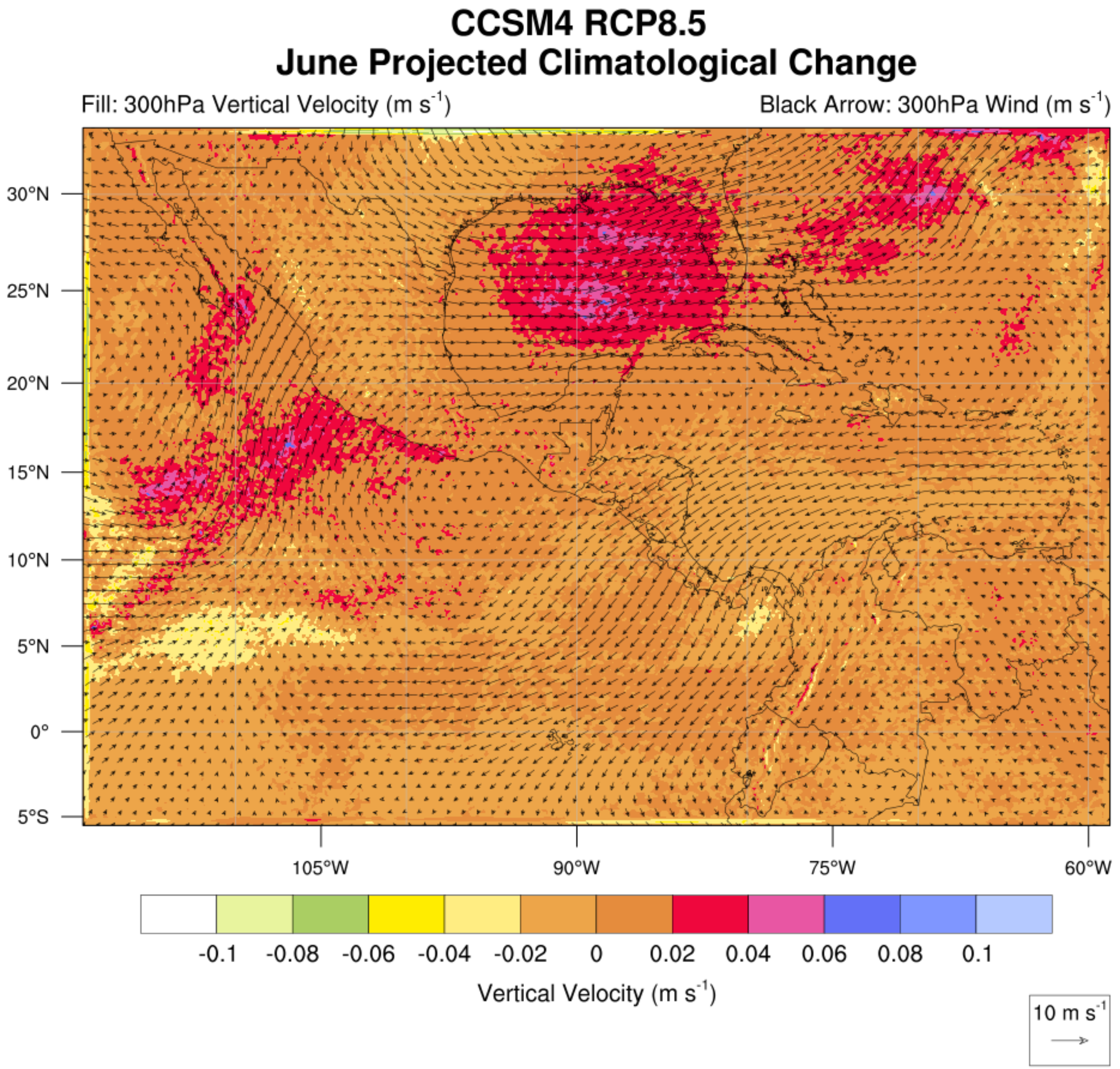
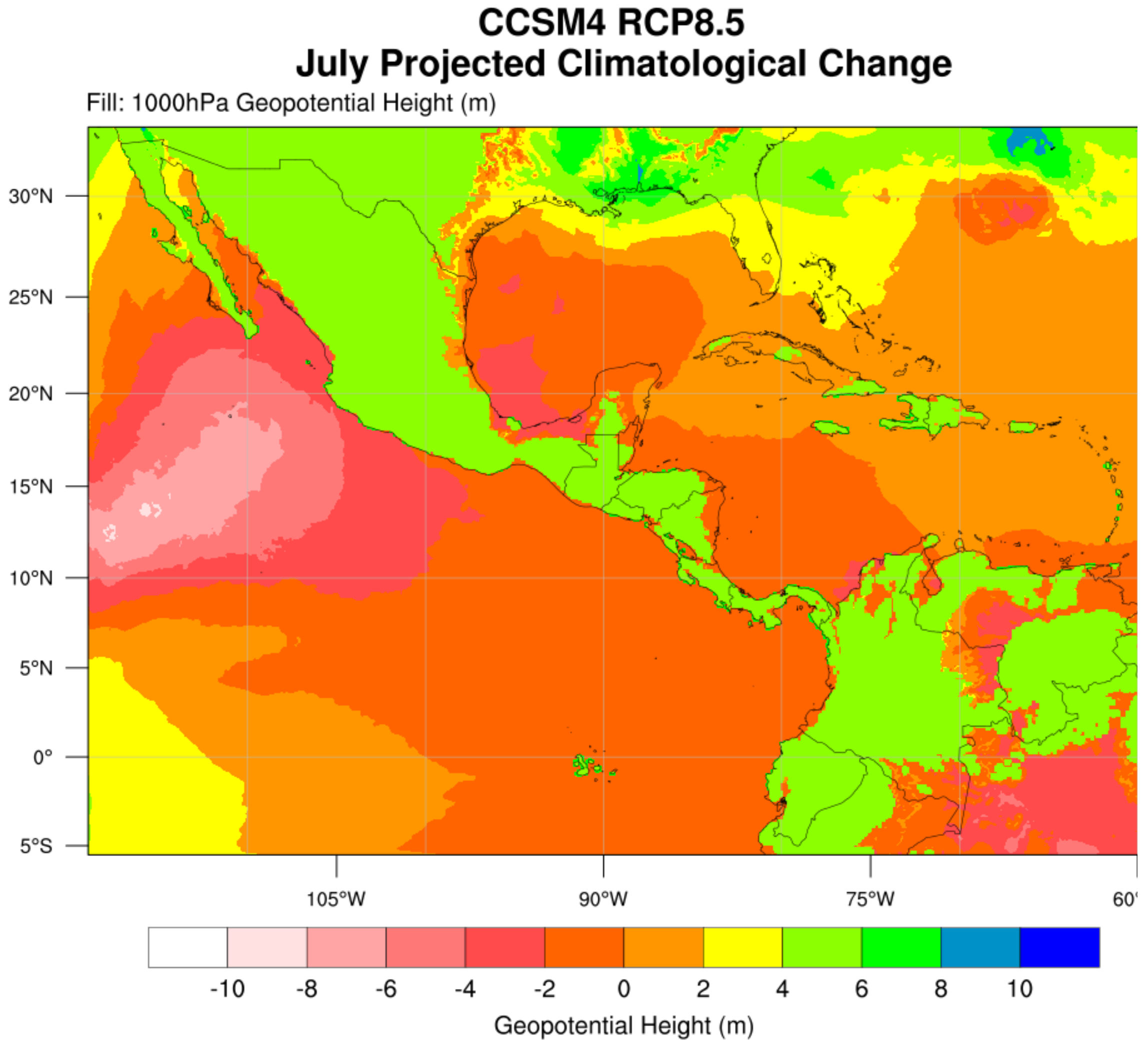
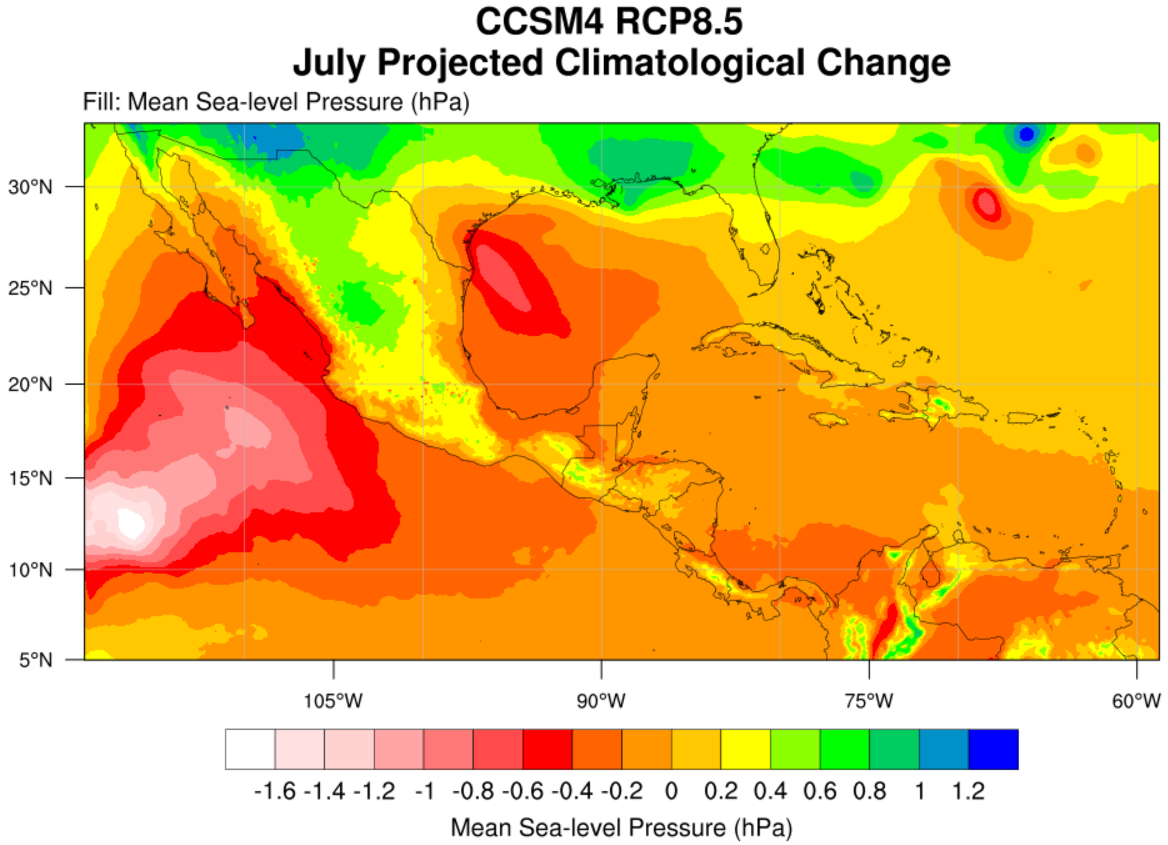




Changes in July





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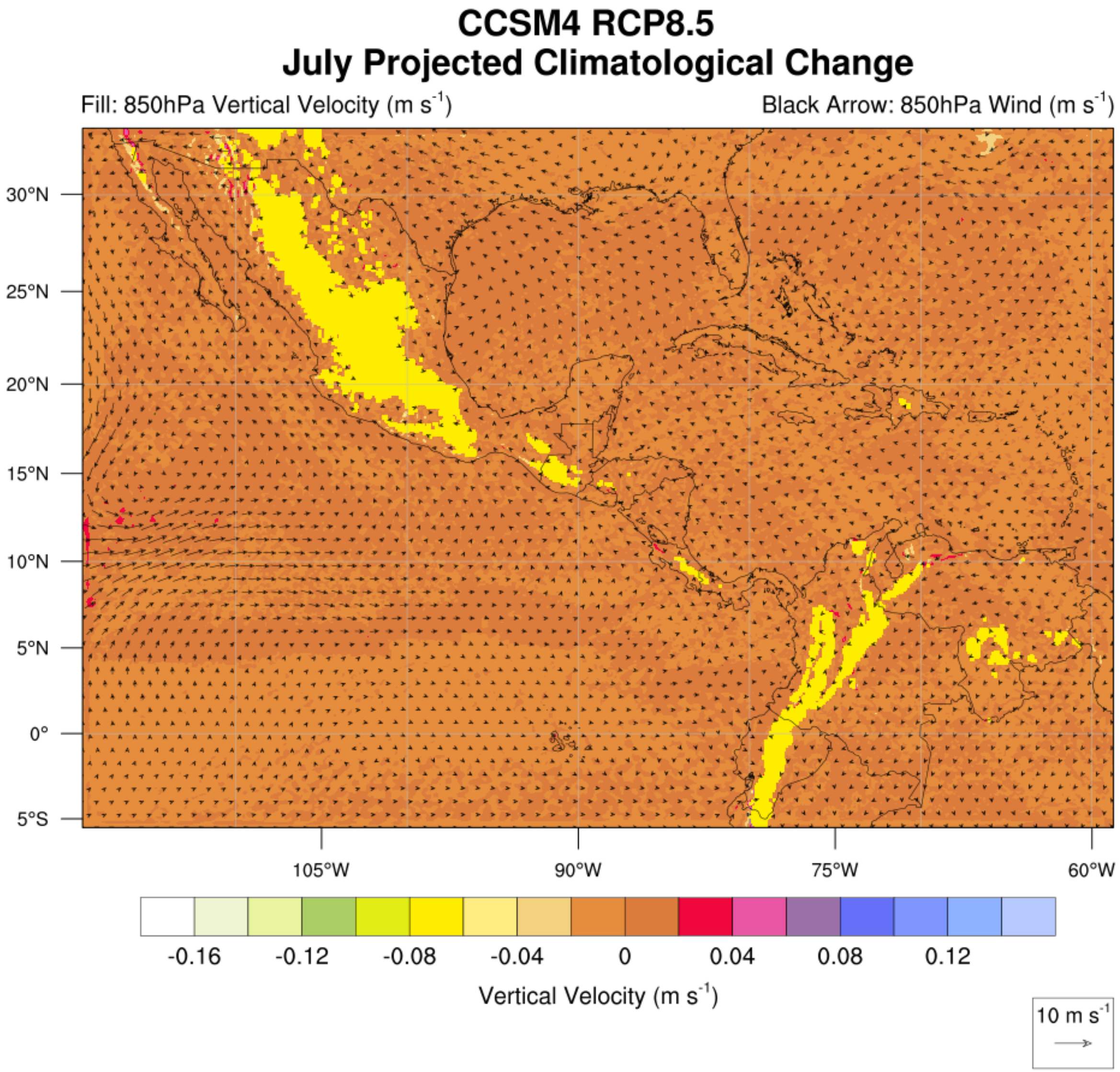
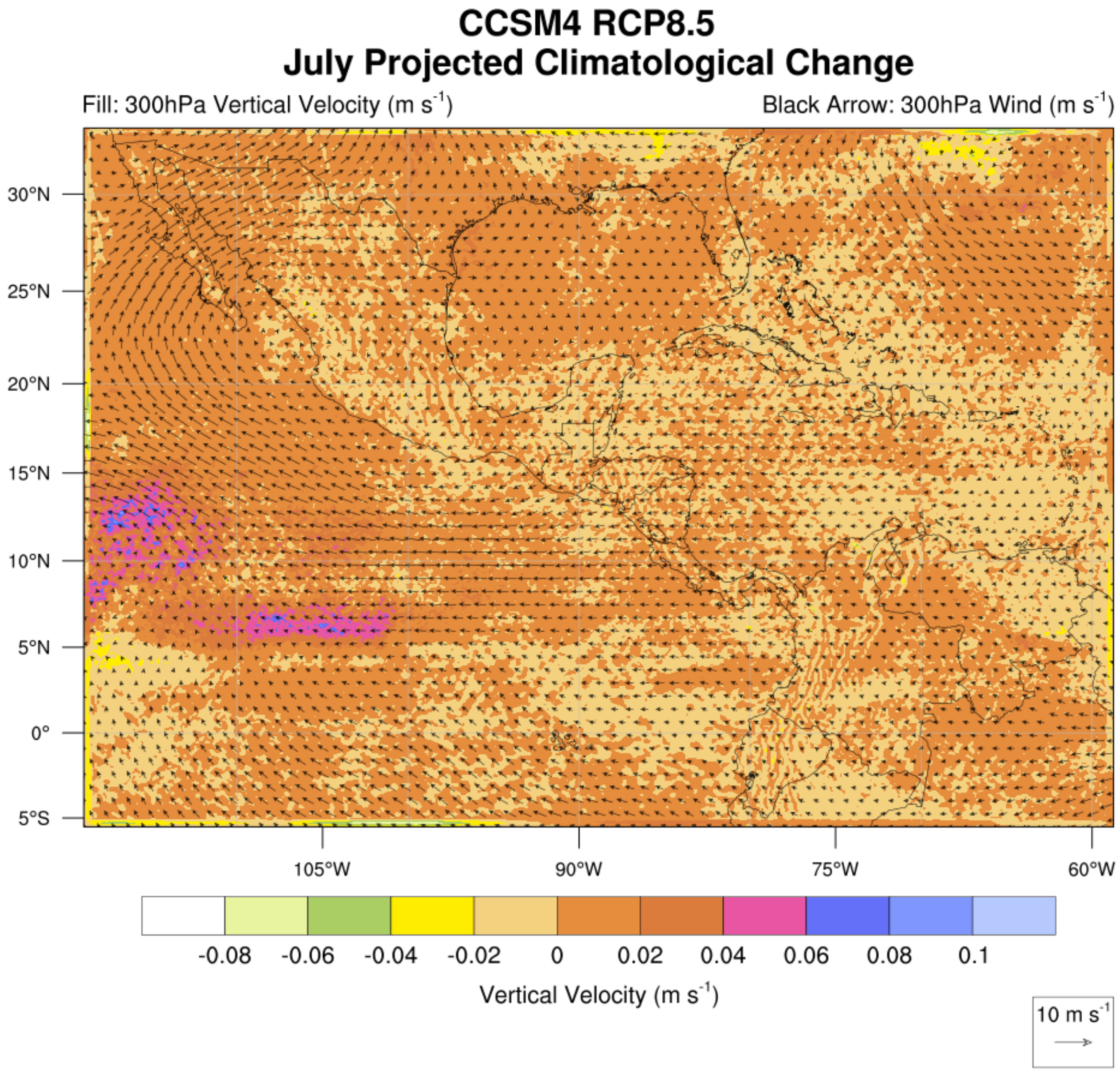
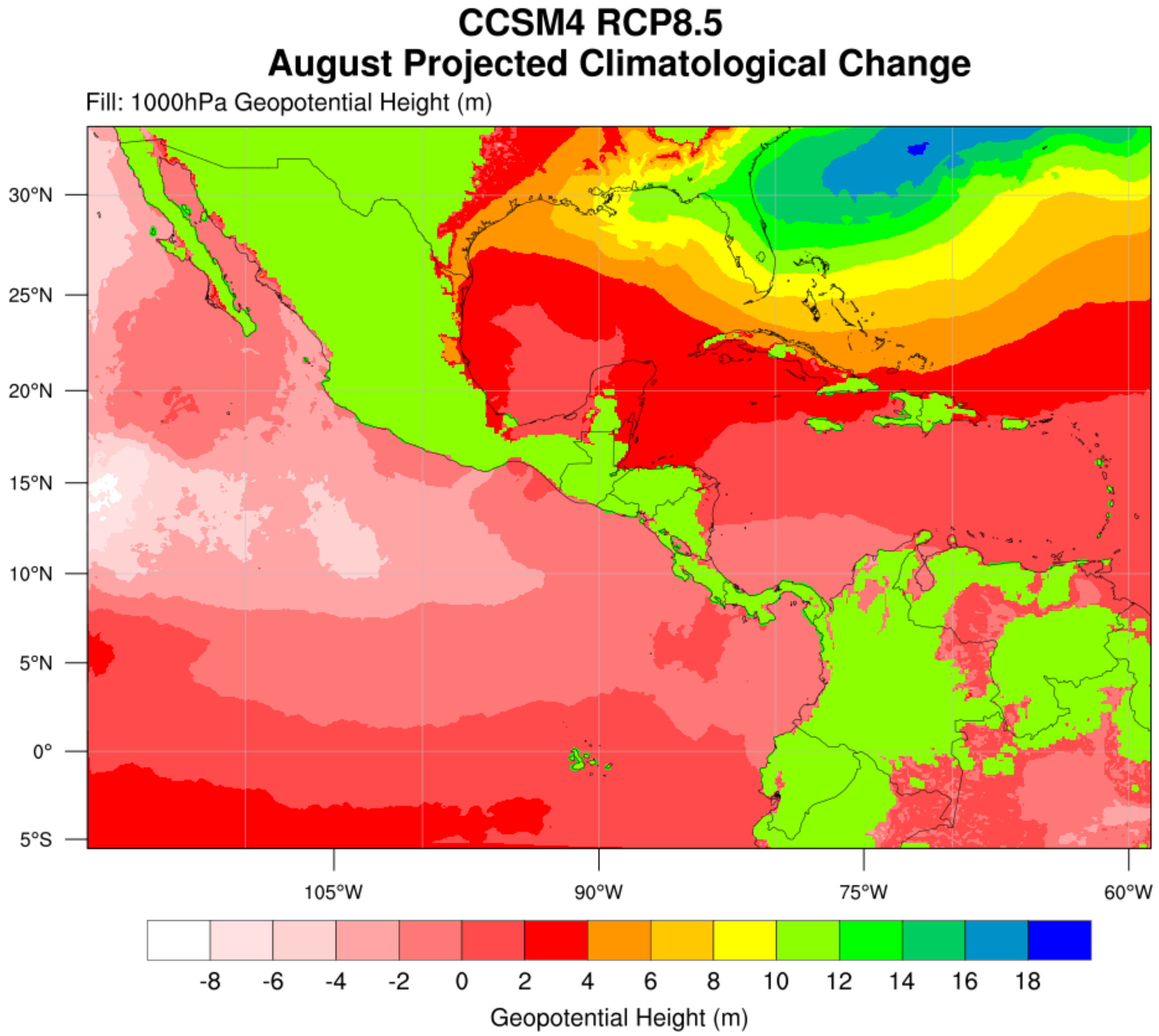
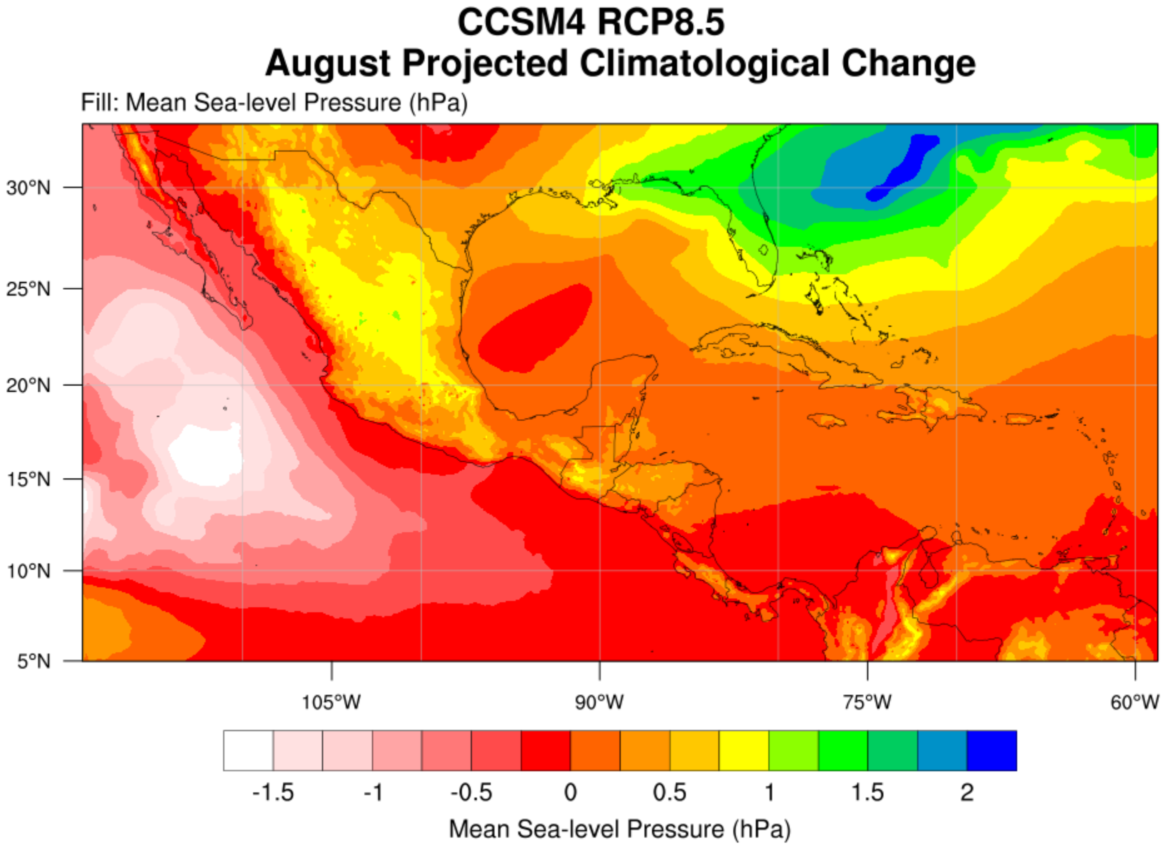




Changes in August





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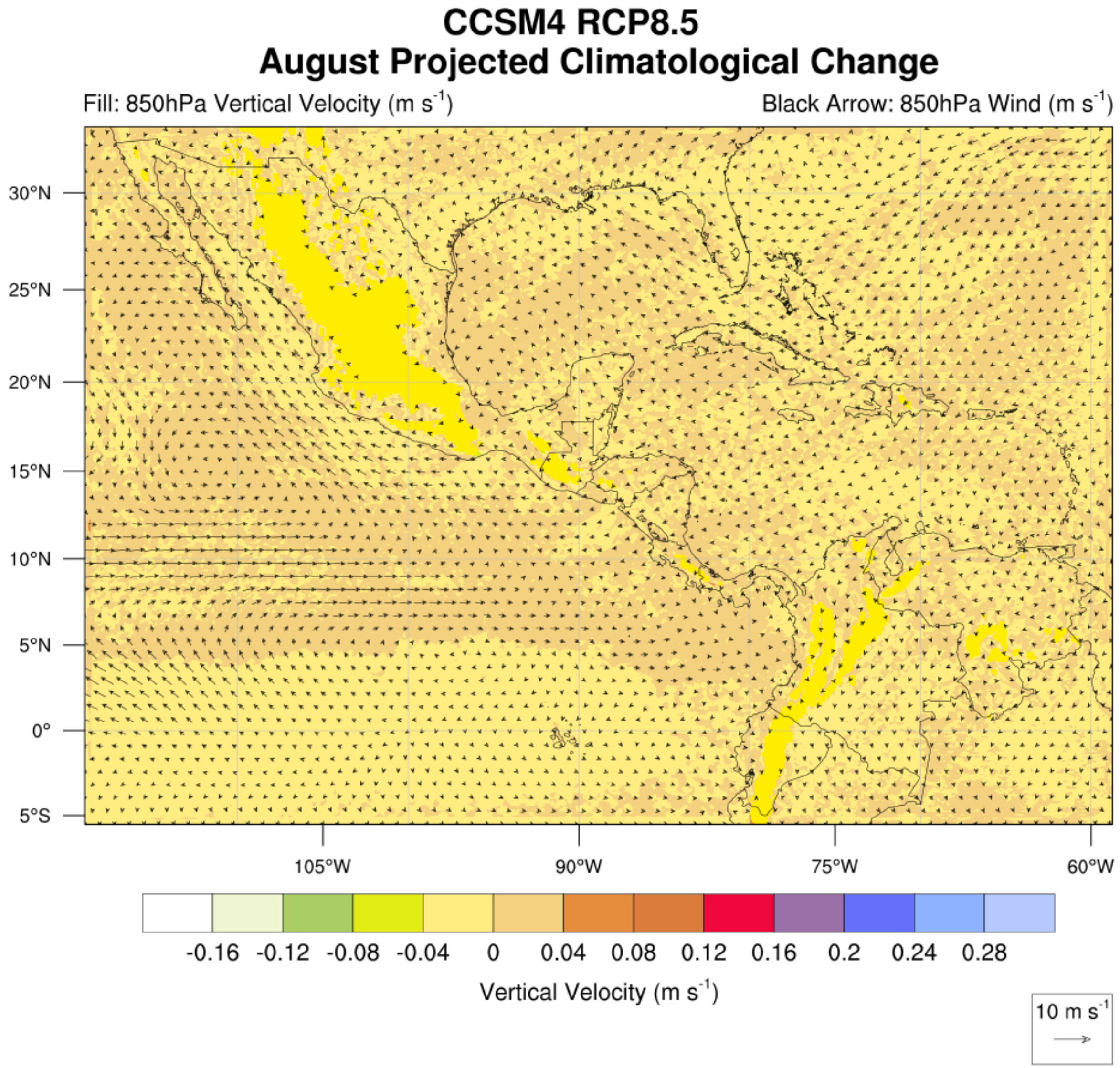
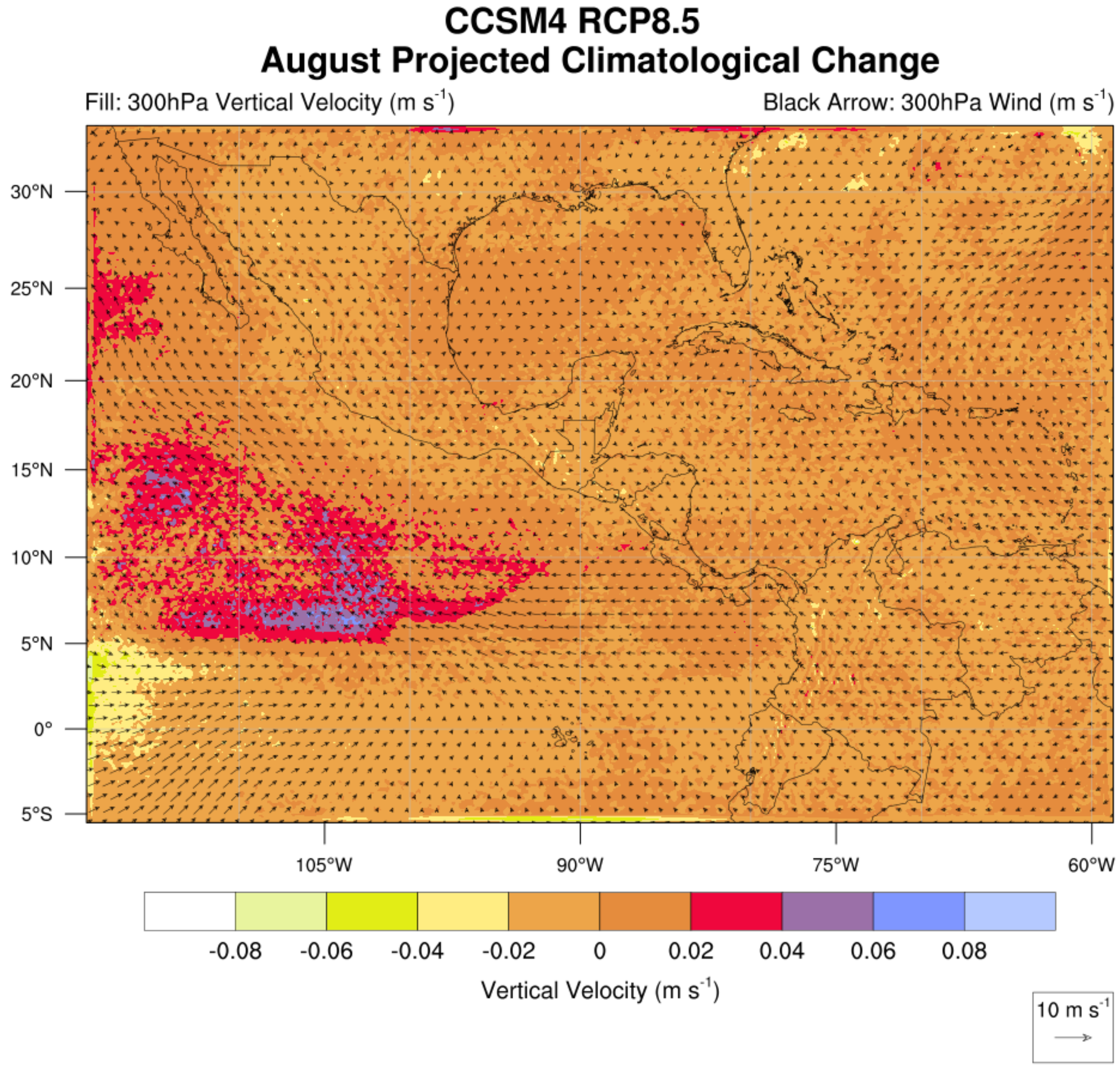
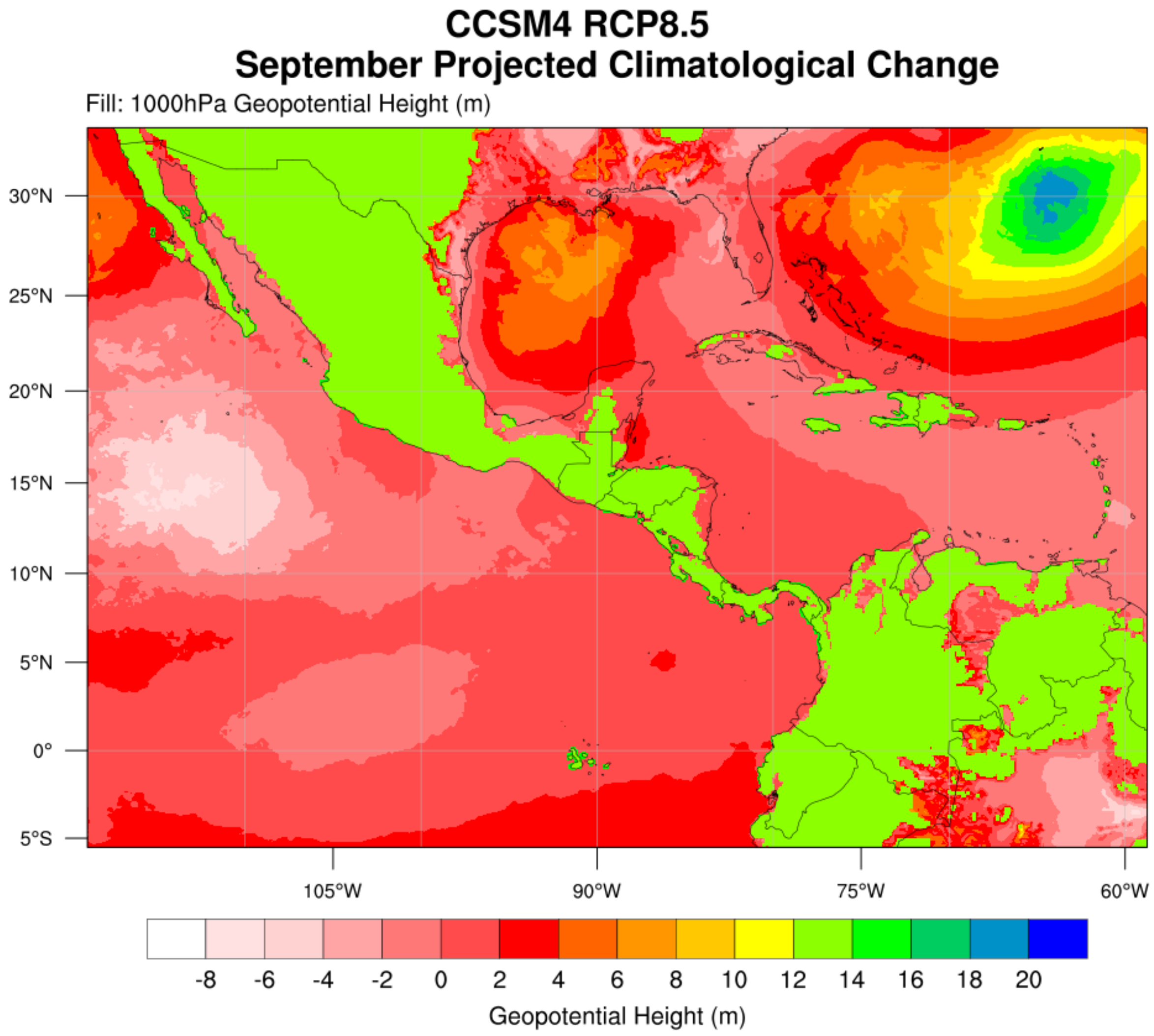
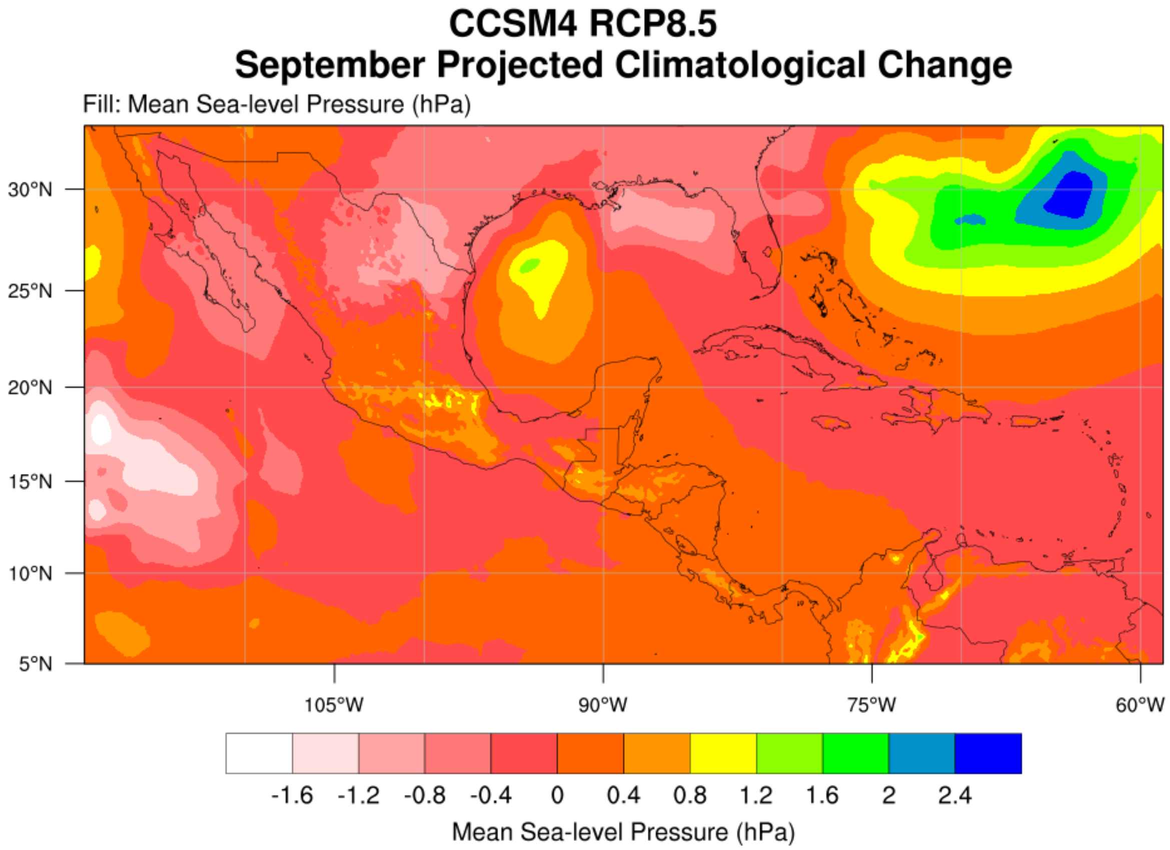




Changes in September





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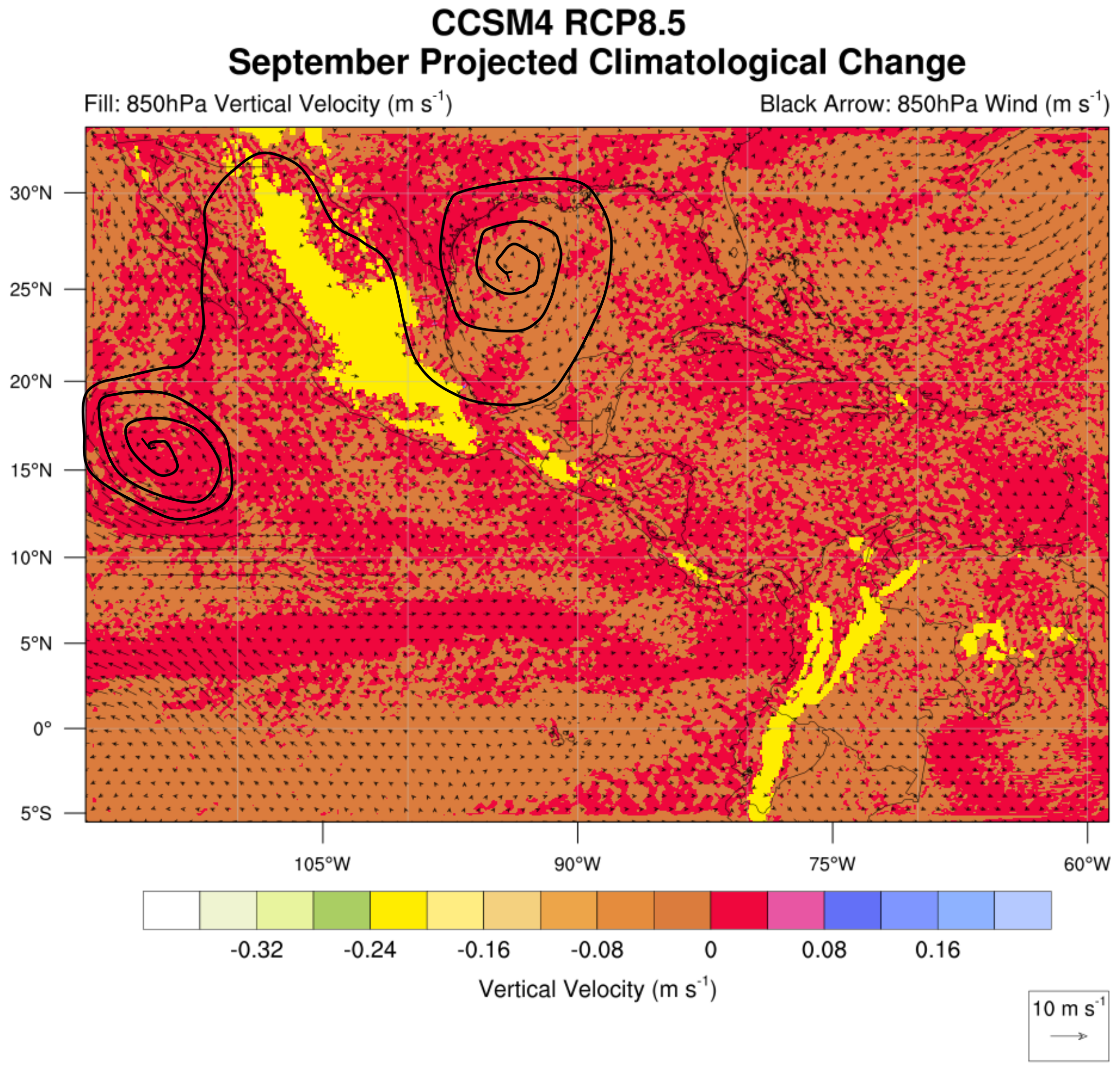
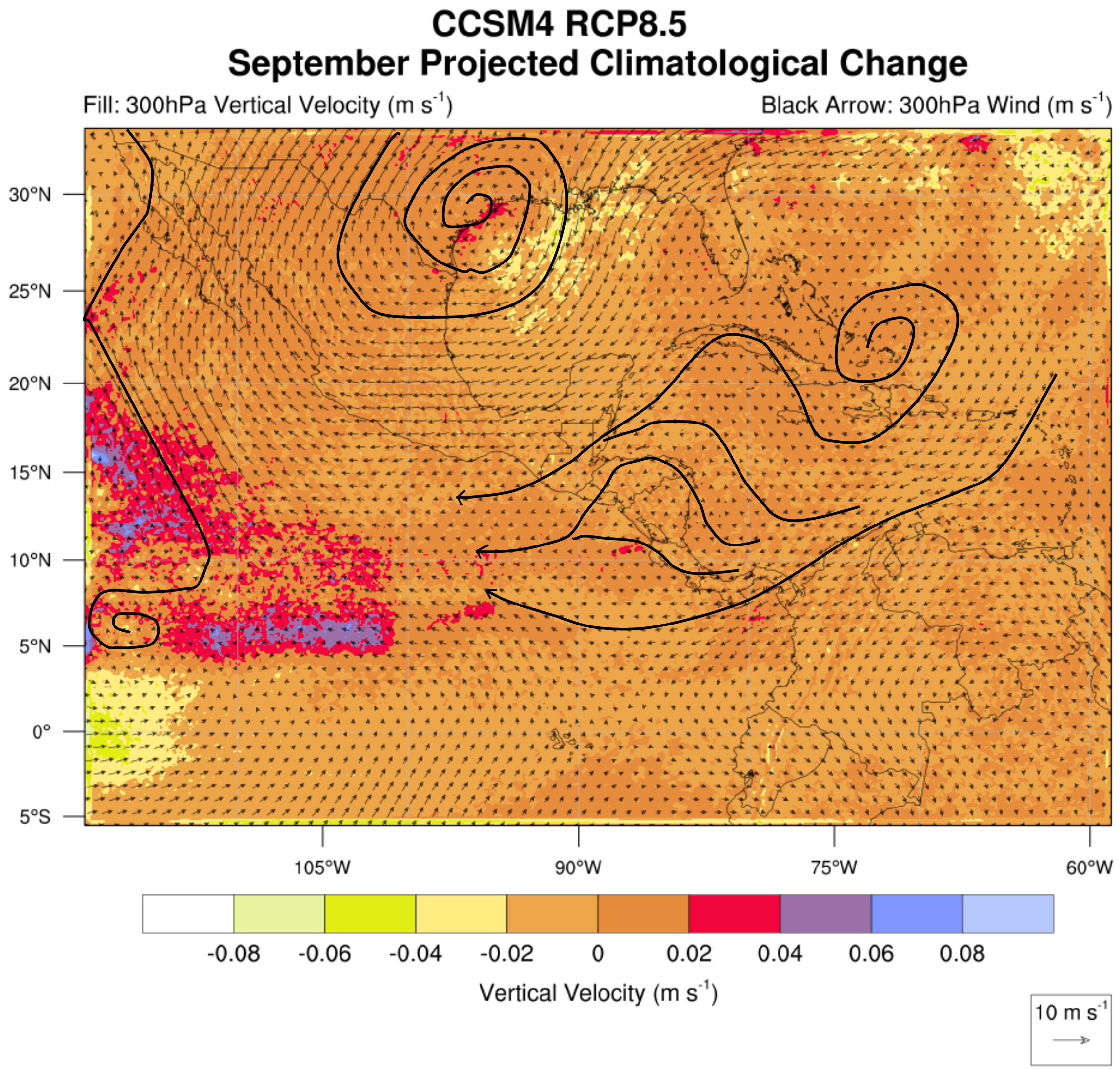
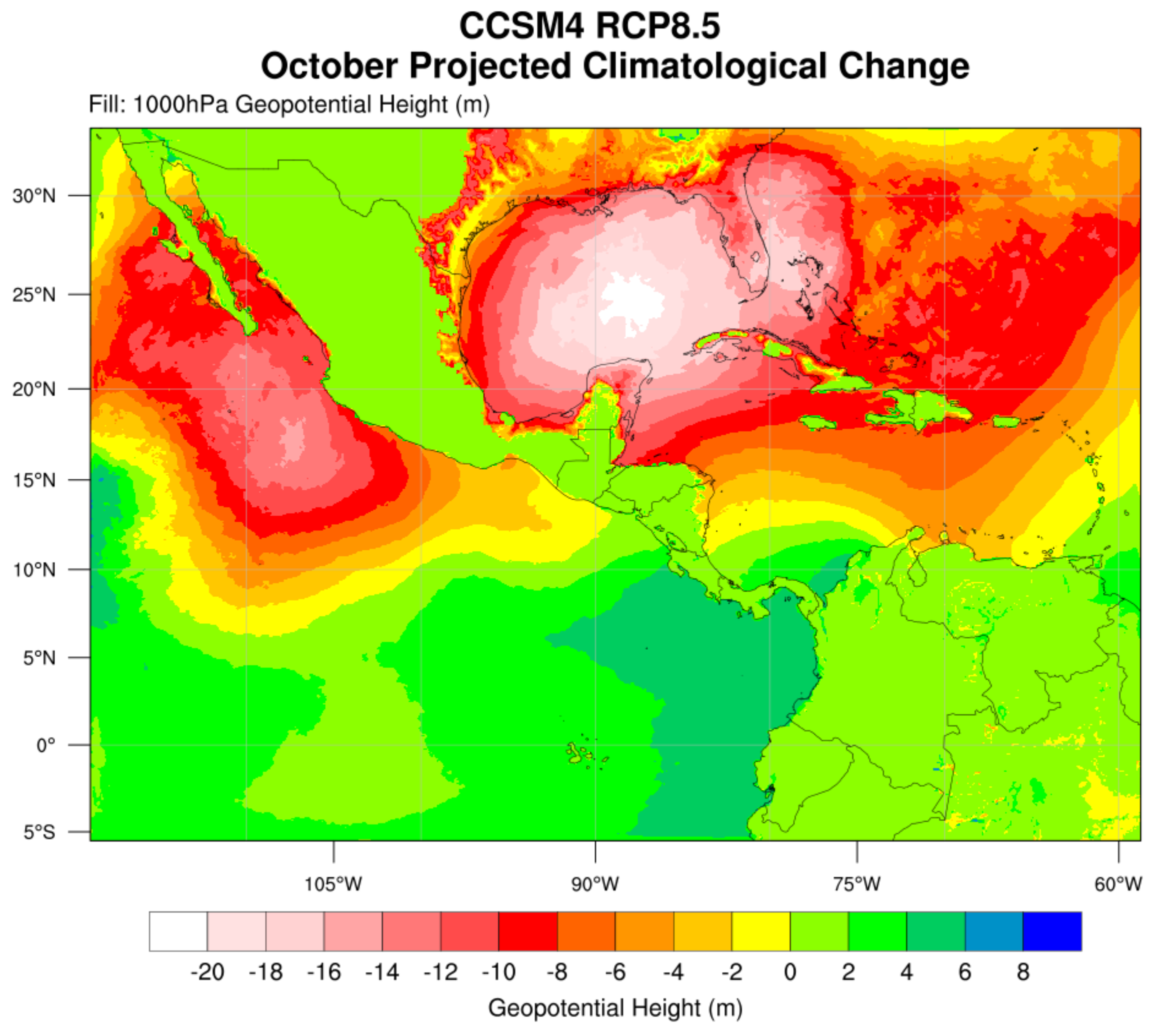
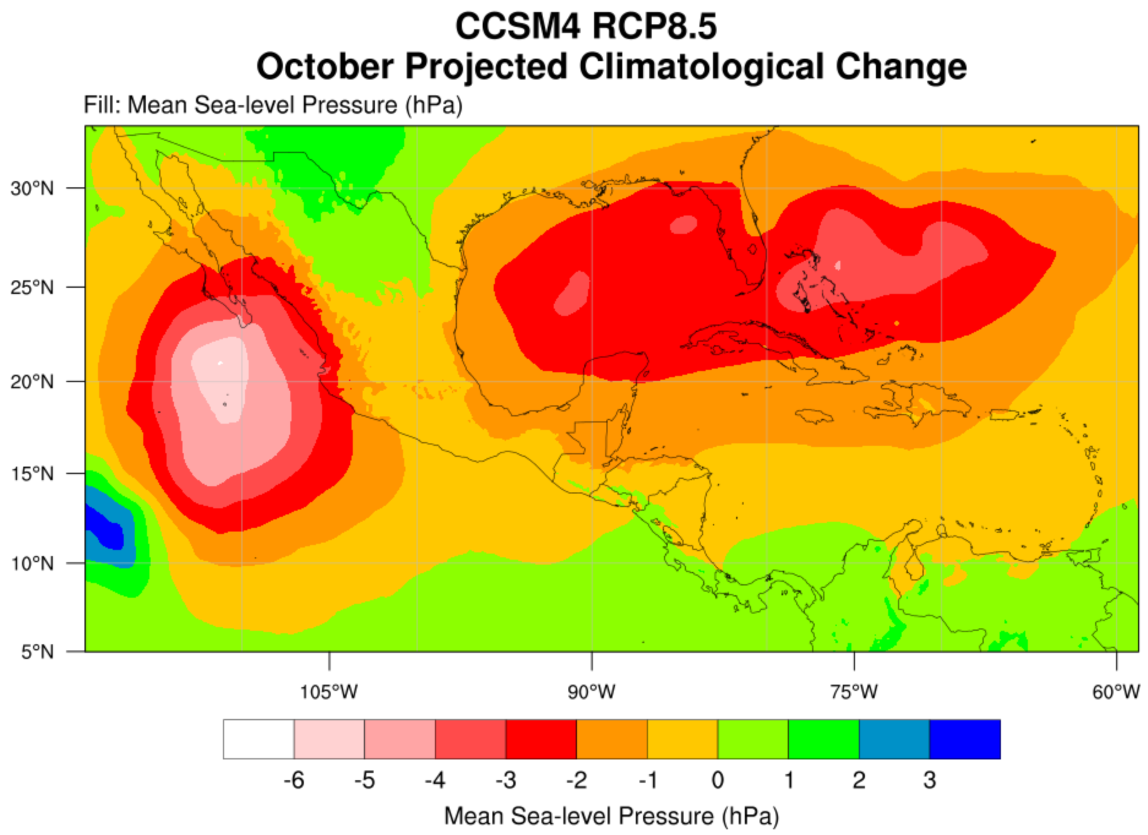




Changes in October





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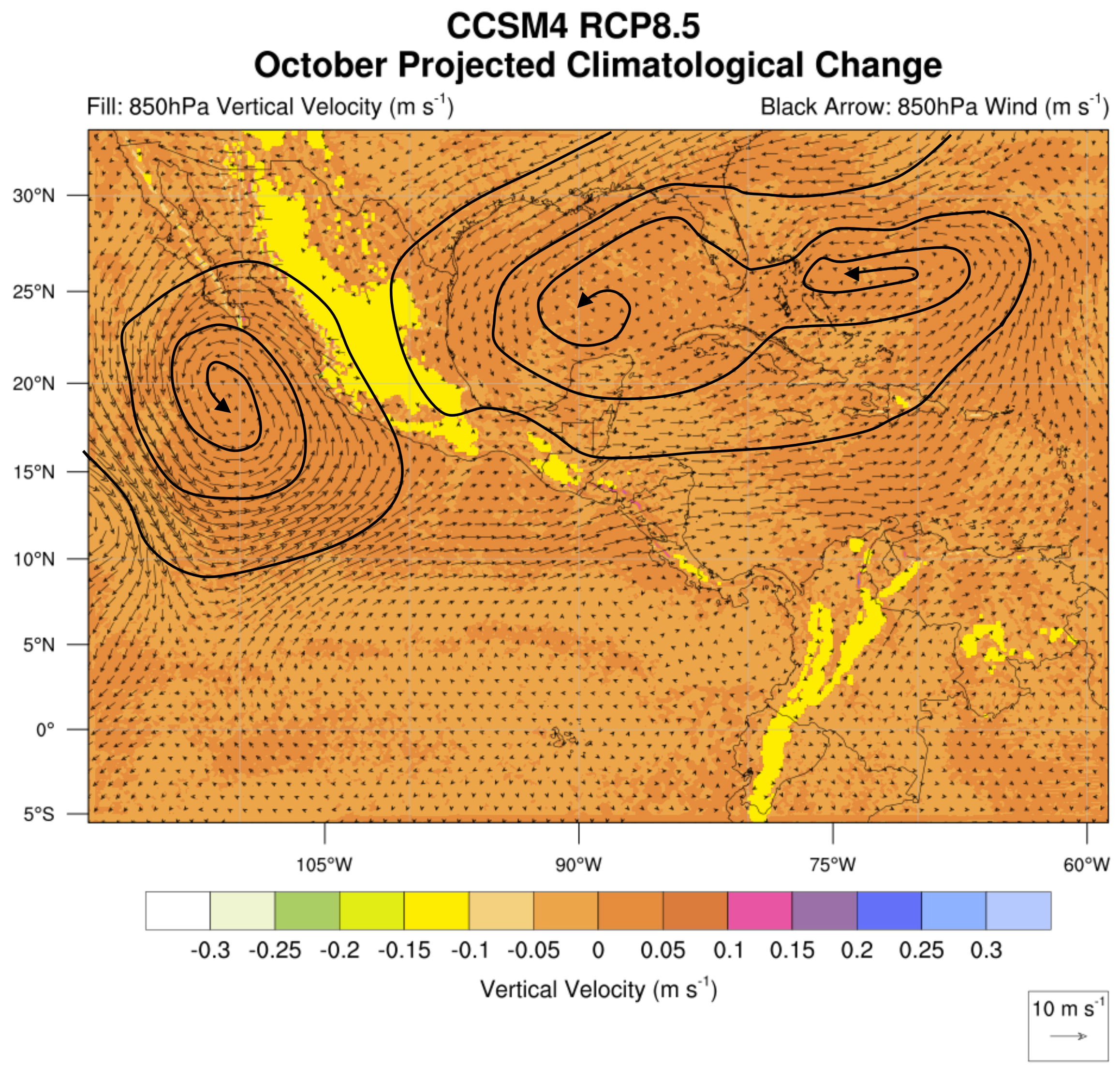

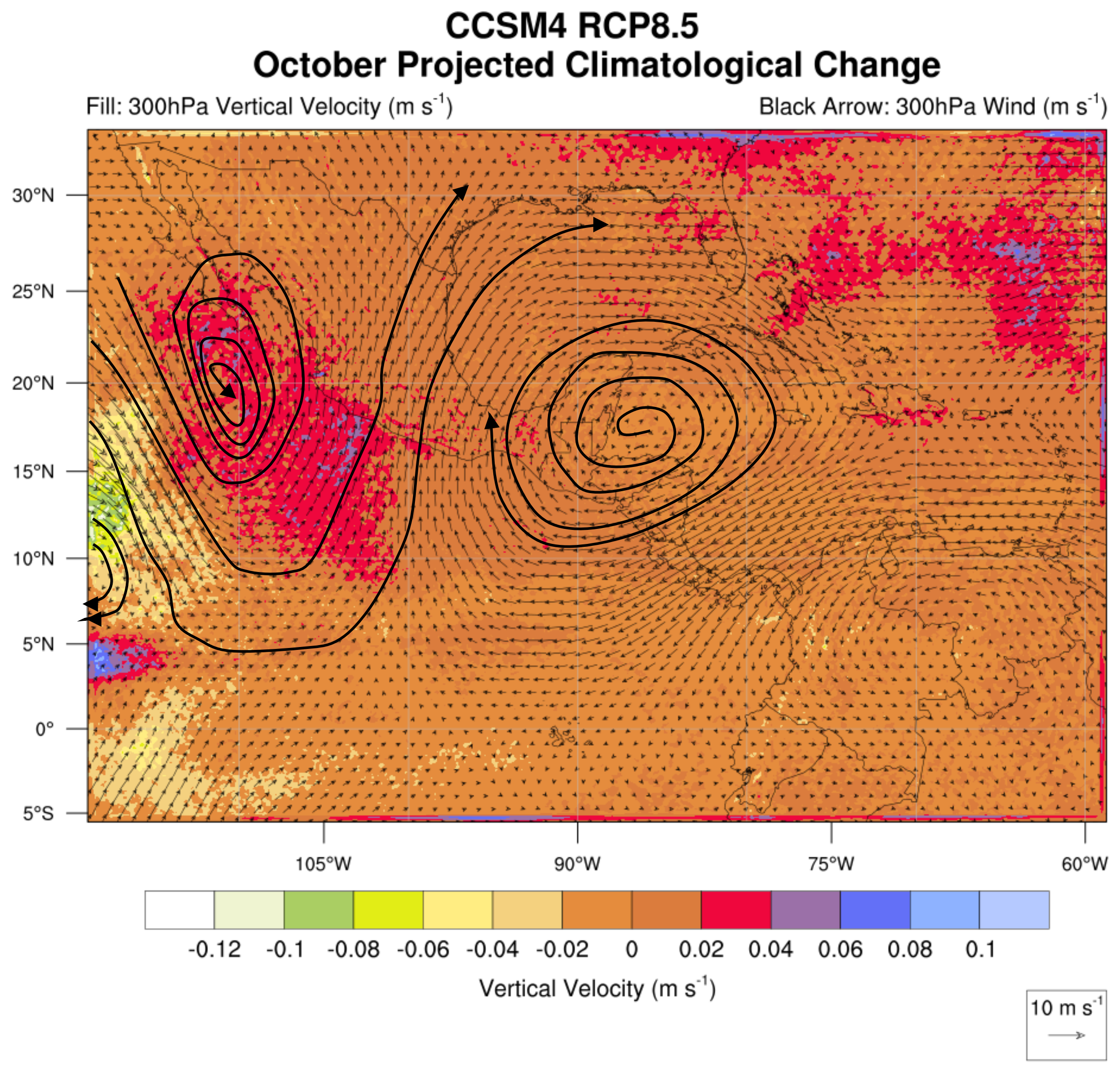

Recommendations

- Add tropospheric data
- Add SST data and graphics
- Explore the possibility to add Skew T Diagrams
- Recalculate humidity change, there is an error