

# Conservation of dry air, water, and energy in CAM and its impact on tropical rainfall

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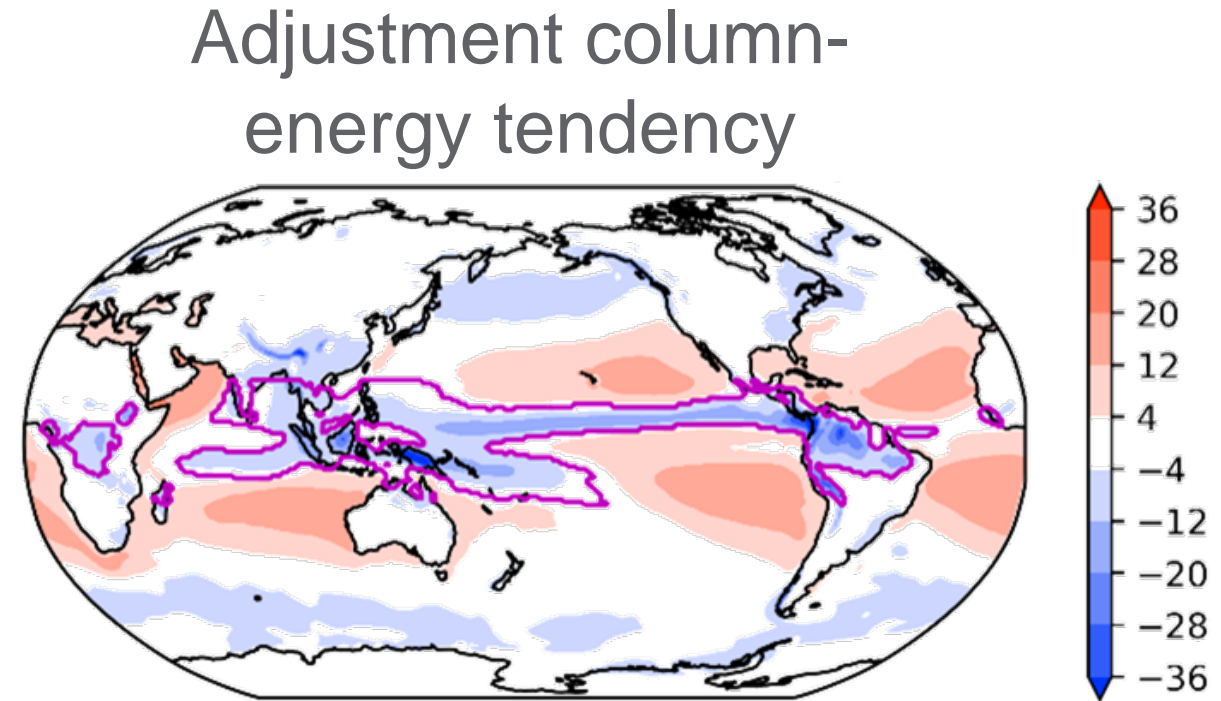
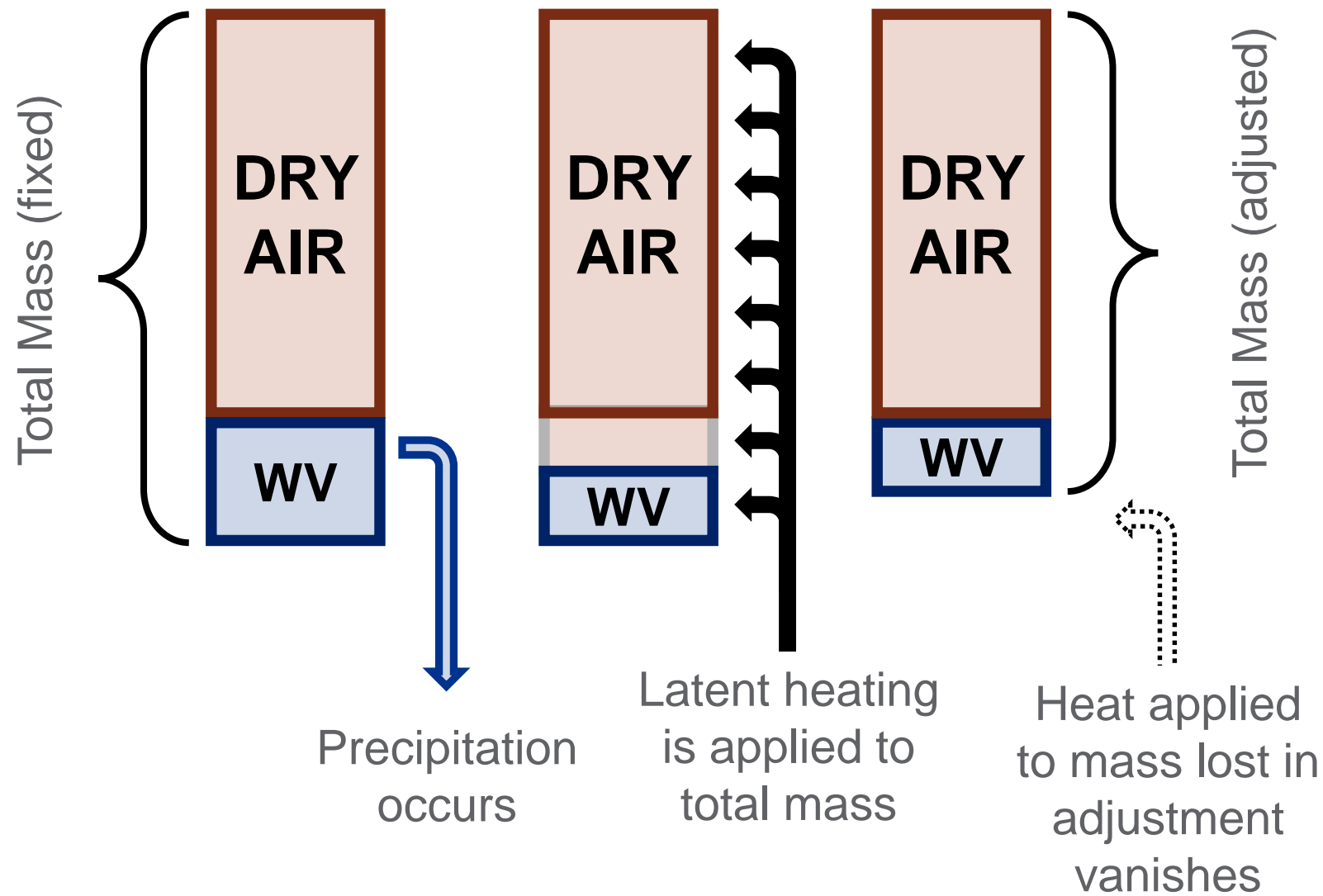
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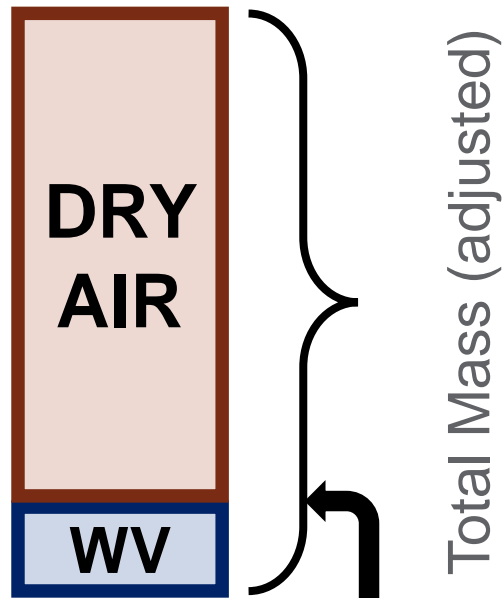
<sup>3</sup>NCAR



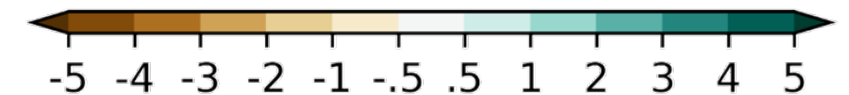
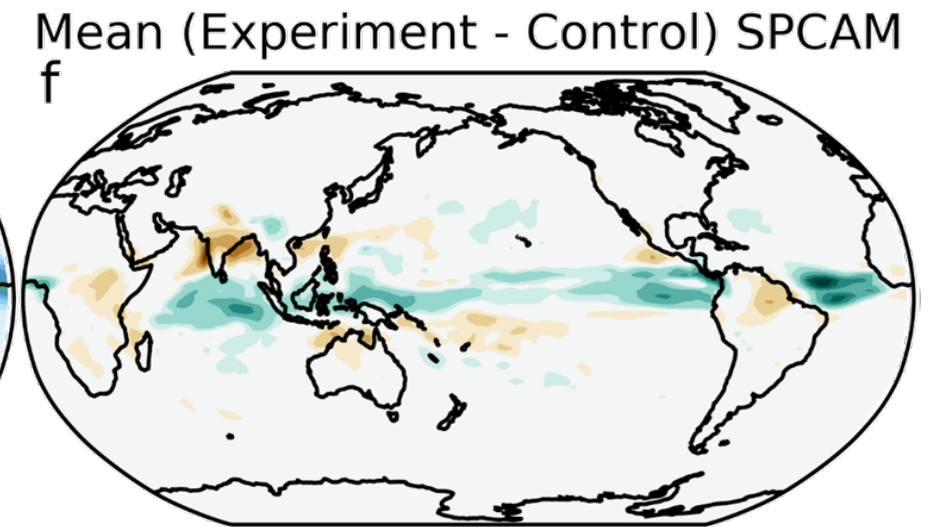
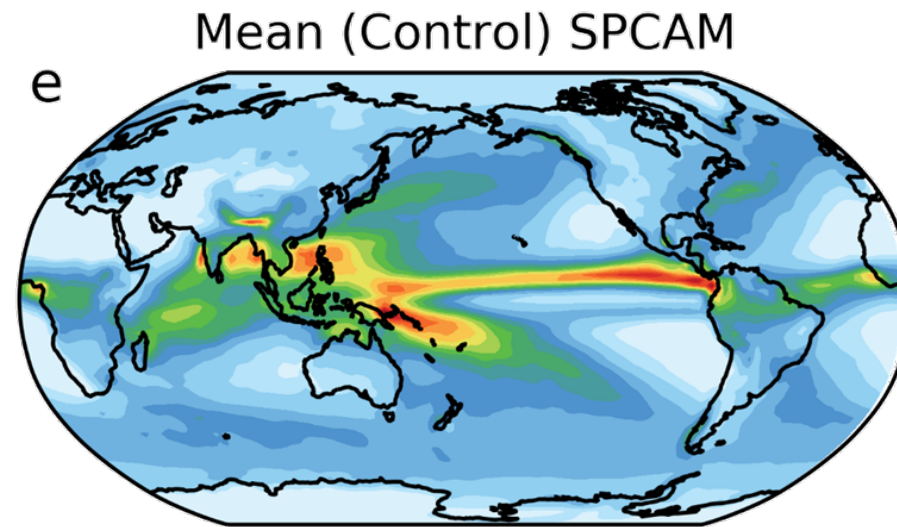
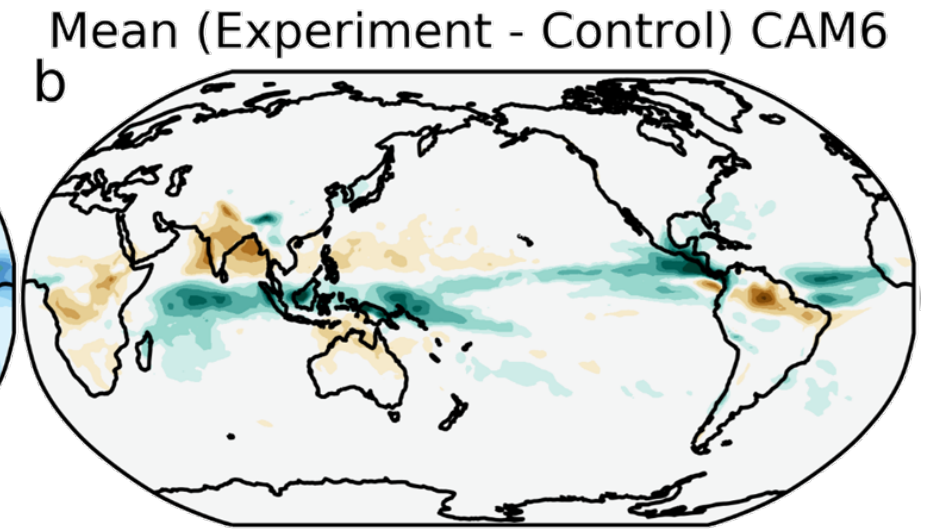
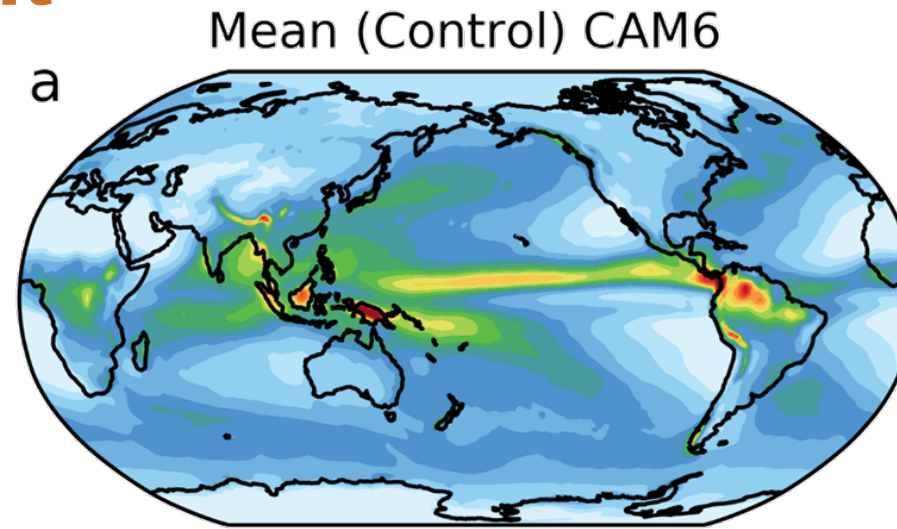
# What is the CAM adjustment and why does it have an energy tendency?



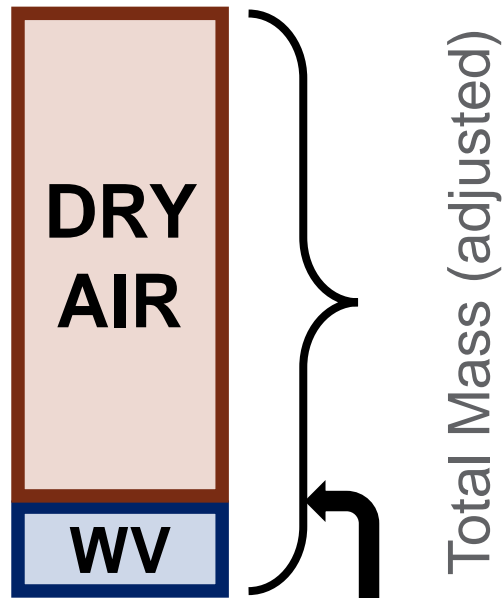
# Experimental setup: return energy lost during adjustment



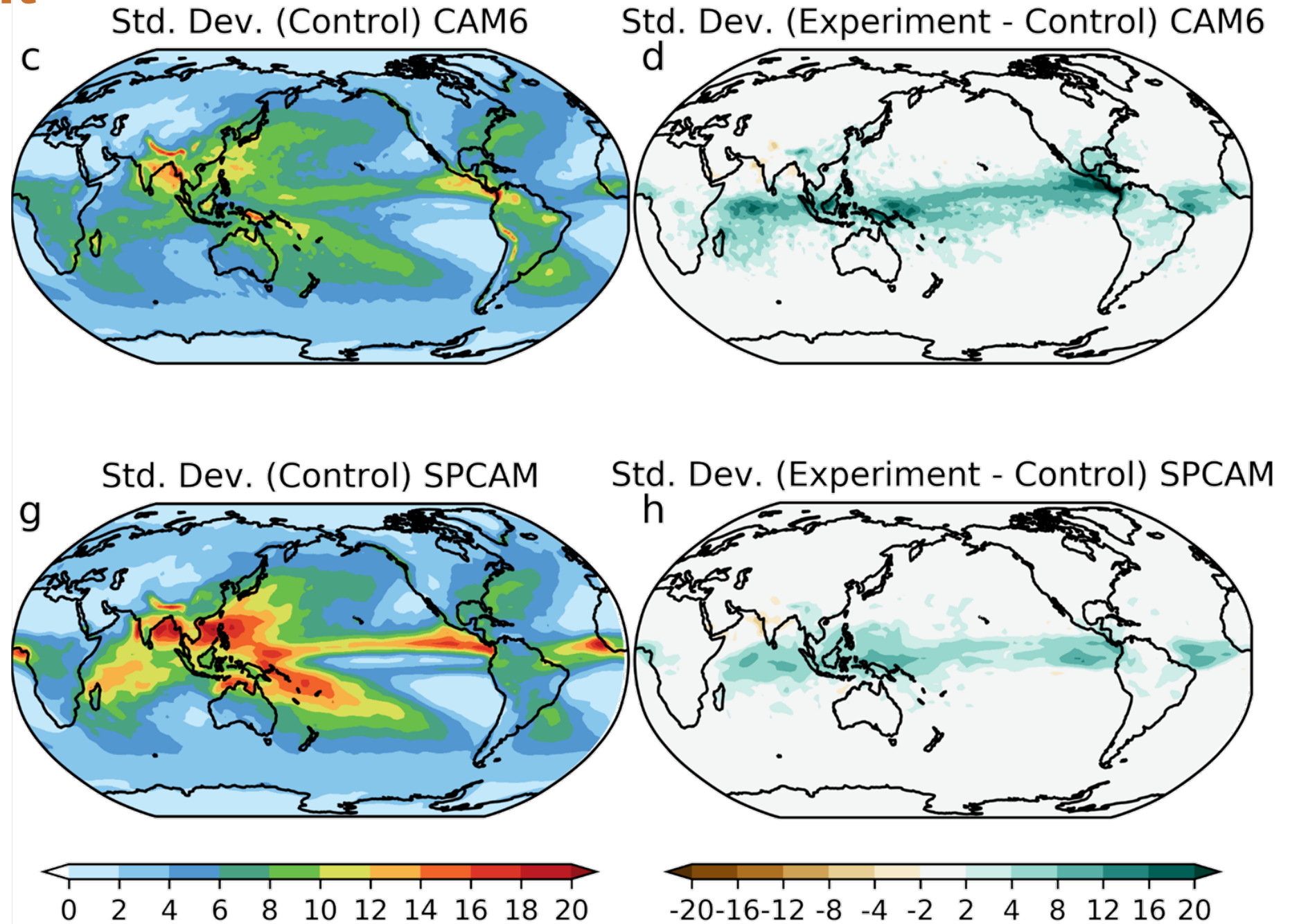
Heat lost during adjustment returned to remaining dry air and water vapor



# Experimental setup: return energy lost during adjustment



Heat lost during adjustment returned to remaining dry air and water vapor



# How should we move forward?

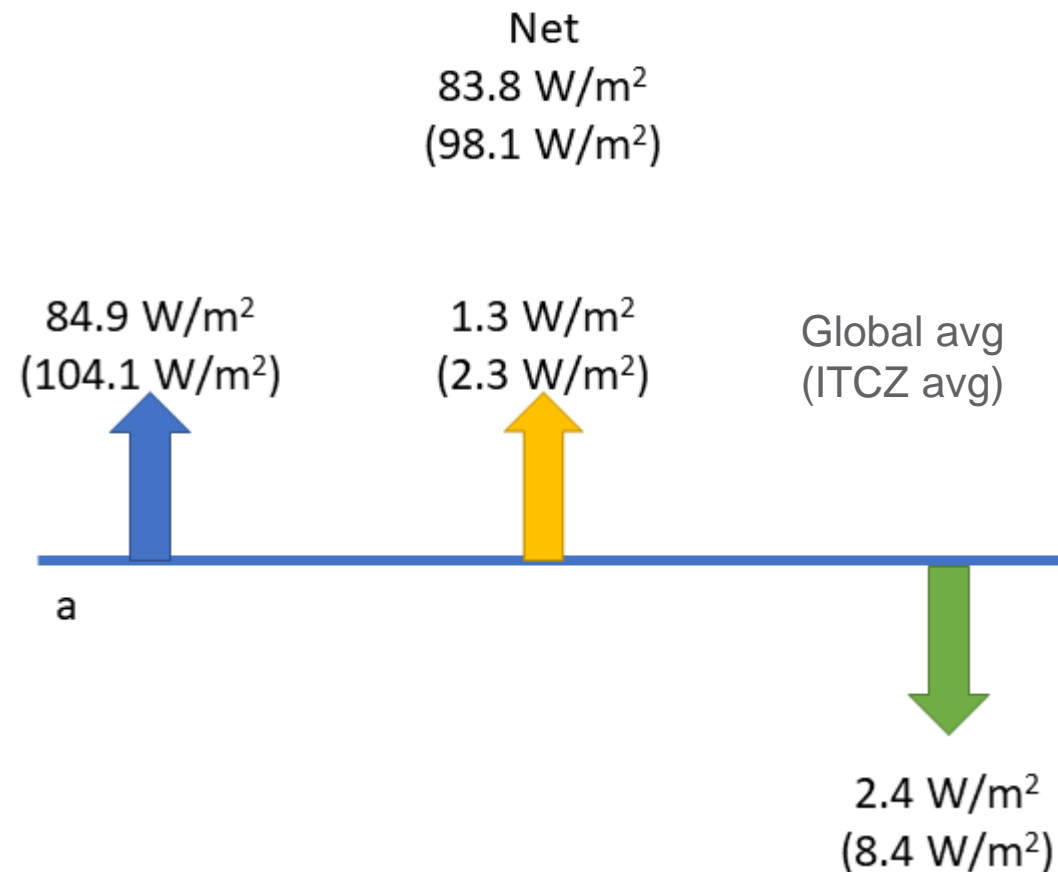
$$F_{lw} = L_s(T_R)E - L_f(T_R)P_{rain}$$

$$+c_{pv}(T_{sfc} - T_R)E - c_l(T_{atm} - T_R)P_{rain}$$

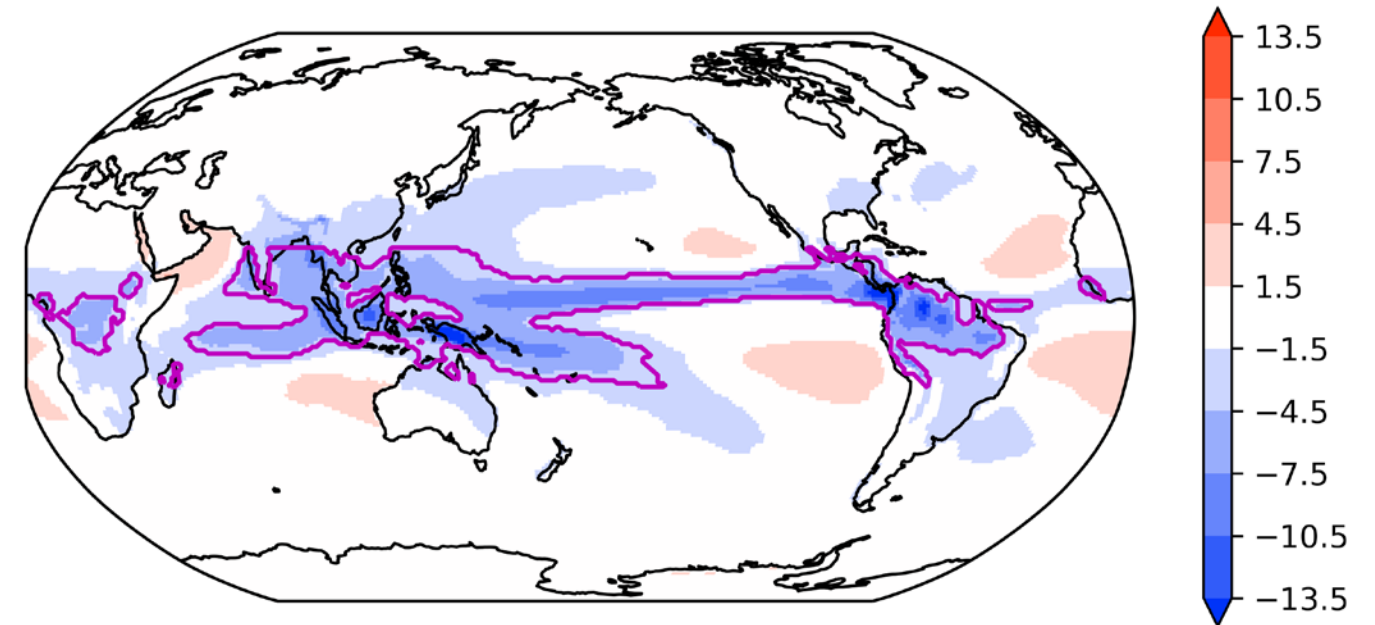
$$-c_i(T_{atm} - T_R)P_{snow}$$

What CAM6 includes

What CAM6 is missing



Surface Missing Enthalpy Flux



Feel free to reach out to me with questions or comments at [bryce.harrop@pnnl.gov](mailto:bryce.harrop@pnnl.gov)