The current literature provides compelling evidence suggesting that an eddy-resolving (as opposed to eddy permitted) ocean component model will significantly impact the simulation of the large-scale climate. The purpose of this talk is to document how increased ocean model resolution impacts the simulation of the large-scale climate variability. The model used for this study is the NCAR Community Climate System Model version 3.5 (CCSM3.5) - the forerunner to CCSM4. Two experiments are reported here. The first experiment (i.e., control, referred to as LRC) is a 155-year present-day climate simulation of the 0.5° atmosphere (zonal resolution 0.625° meridional resolution 0.5°) coupled to ocean and sea-ice components with zonal resolution of 1.2° and meridional resolution varying from 0.27° at the equator to 0.54° in the mid-latitudes. The second simulation is carried out in two phases with the same atmospheric model coupled to 0.1° ocean and sea-ice component models. The initial condition for the first phase (referred to as HRC03) is the same as the control simulation except that the ocean state has been interpolated to the 0.1° grid. The second phase begins at year-102 of HRC03 using the same resolution and parameters except in this case the polar winds have been filtered to reduce computational instability. This phase of the experiment extends to year-155. The simulations are compared in terms of how ocean eddies impact the mean and variable climate. Emphasis is placed on the tropical Pacific and the North Atlantic Ocean, and specifically how the resolved eddies impact air-sea feedbacks.