Title:

Analysis of atmosphere-ocean surface flux feedbacks in recent satellite and model reanalysis products

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Abstract:

Recent investigations have examined observations in an attempt to determine when and how the ocean forces the atmosphere, and vice versa. These studies focus primarily on relationships between sea surface temperature anomalies and the turbulent and radiative surface heat fluxes. It has been found that both positive and negative feedbacks, which enhance or reduce sea surface temperature anomaly amplitudes, can be generated through changes in the surface boundary layer. Consequent changes in sea surface temperature act to change boundary layer characteristics through changes in static stability or turbulent fluxes. Previous studies over the global oceans have used coarse-resolution observational and model products such as ICOADS and the NCEP Reanalysis. This study focuses on documenting the atmosphere ocean feedbacks that exist in recently produced higher resolution products, namely the SeaFlux v1.0 product and the NASA Modern Era Retrospective-Analysis for Research and Applications (MERRA). It has been noted in recent studies that evidence of oceanic forcing of the atmosphere exists on smaller scales than the usually more dominant atmospheric forcing of the ocean, particularly in higher latitudes. It is expected that use of these higher resolution products will allow for a more comprehensive description of these small-scale ocean-atmosphere feedbacks. The SeaFlux intercomparisons have revealed large scatter between various surface flux climatologies. This study also investigates the uncertainty in surface flux feedbacks based on several of these recent satellite based climatologies.