Using ENSO to analyse Cloud Radiative Feedback

Allison Kolly and Yi Huang

McGill University, Montreal, Canada (allison.kolly@mail.mcgill.ca)

When attempting to diagnose the climate sensitivity, clouds are the cause of much uncertainty as they are highly variable. There exists a discrepancy between climate models and observations on the sign and magnitude of cloud radiative feedback. For example, Dessler (2013) shows that models predict a very strong, positive feedback response to ENSO sea surface temperature anomalies in the central Pacific which is not present in observations. To better understand these discrepancies we are using radiation data from the CERES satellite and ERAi reanalysis data to look at the most recent El Nino events. By looking at temperature and humidity anomalies in the central Pacific which are associated with these events, and using radiative kernels, we can calculate their radiative effects. We extend previous work by not only performing an analysis of TOA but also analysing the surface and atmospheric radiation budgets. Additionally we analyse the latest GCMs (e.g. CMIP5 models) and compare them to observations.