Kelvin waves in the Pacific Ocean have been associated with the Madden-Julian Oscillation. During a few Kelvin wave events, atmospheric convection slows down to the eastward phase speed of the oceanic wave, and the convection and the wave then move eastward together for up to several weeks. This pattern suggests that these waves couple to atmospheric convection, allowing them to interact actively with the global atmospheric flow.

This presentation describes the composite global flow associated with 23 such Kelvin wave events during the northern hemisphere cool season. These events are identified by comparing reconstructed and TAO dynamic height data with outgoing longwave radiation anomalies. Fields of data are then averaged over the dates that the waves crested at the dateline to generate a composite event.

Enhanced moist deep convection and westerly wind anomalies near the surface move eastward together with the dynamic height anomalies. The convection associated with these waves redistributes mass in the tropical atmosphere, yielding extratropical Rossby wave dispersion across the globe. I will present a brief overview of the composite oceanic structure followed by a discussion of the evolution of the associated extratropical flow.

A large portion of the global response pattern associated with these events is distinguishable from the response patterns to the MJO and ENSO, and may be useful for long range prediction of mid latitude weather.