

## **Global Water and Energy Cycle**

The Earth's oceans are the largest reservoir for water and energy (heat) on the planet. This class will review what we know (and don't know) about the water and energy budgets for seasonal, yearly, interannual, and longer time-scales. In particular, we will study how close we are to closing the budgets on all these time-scales, the relationships between the water and energy cycles, regional effects of the water/energy cycles on the ocean circulation and sea level, and methods to measure the various components of both the water cycle (e.g., precipitation, evaporation, water storage) and the energy cycle (e.g., sensible heat flux, latent heat flux, outgoing longwave radiation, etc), especially using new satellite sensors. We will also discuss how the water and energy cycles are expected to change with a warming climate, and discuss recent papers to see if there is any evidence for this. The class will consist mainly of lectures and reading articles and discussing them as a class, two take-home exams (one on the water cycle/one on the energy cycle), and a student presentation at the end of the semester.