ATS/CIRA Colloquium

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from CIRA

Tiger by the tail: observing the carbon budget of planet earth

Hosted by Steve Miller

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ATS room 101; Discussion will begin at 3:30pm
Refreshments will be served at 3:00pm in the coffee lounge

From Keeling's original measurements of CO2 concentration at Mauna Loa in 1958, we now have networks of flask sampling stations, continuous CO2 monitors, flux towers, regular airborne observations and even measurements from satellites. At the same time, the simple box (reservoir) models of the carbon budget developed by the pioneers of the field have evolved into complex assimilation systems, ingesting not only the concentrations of greenhouse gases and their isotopes but also inventories of anthropogenic and natural emissions in order to understand the processes controlling the carbon budget, and ultimately to predict future climate. These models are beginning to ingest data from Japan's Greenhouse Gases Observing Satellite (GOSAT) launched in 2009, and are preparing for the launch of NASA's Orbiting Carbon Observatory (OCO-2), NASA's second attempt after the failure of the launch vehicle for OCO-1 in 2009. While we remain confident that observations from space will provide a global view, interpolating between the much sparser surface and airborne sampling, the value of observations of CO2 from space still has not been proven conclusively. Nevertheless, planning already is underway for constellations of greenhouse gas satellites in low earth orbit, geostationary satellites that will watch the planet breathe with high spatial and temporal resolution, and expanded networks of surface instruments to check the satellites for bias. Many of the new proposals appear to be driven more by economic and security issues, such as monitoring the power plant emissions of other nations to ensure compliance with treaties, than the original science questions, many of which remain unanswered. Are we holding the tiger by the tail, or do these developments open new, exciting possibilities for science? This presentation will outline how we have arrived at this position, and explore some of the options for the future.