



CLIM Program Transition Workshop

May 14-16, 2018

Lecture: *Incorporating Spatial Dependence in Remote Sensing Inverse Problems*

Speaker: Jonathan Hobbs

Abstract:

The remote sensing working group has investigated methodology for atmospheric remote sensing retrievals, which are mathematical and computational procedures for inferring the state of the atmosphere from remote sensing observations. Satellite data with fine spatial and temporal resolution present opportunities to combine information across satellite pixels using spatio-temporal statistical modeling. We present examples of this approach at the process level of a hierarchical model, with a nonlinear radiative transfer model incorporated into the likelihood. In this framework, we assess the impact of various statistical properties on the relative performance of a multi-pixel retrieval strategy versus an operational one-at-a-time approach. The prospect of adopting the approach is illustrated in the context of estimating atmospheric carbon dioxide concentration with data from NASA's Orbiting Carbon Observatory-2 (OCO-2).