Date: **February 21**

Time: **11:00 AM**

Location: **Ames 234**

Speaker: **Dr. Darryn W. Waugh**
Department of Earth and Planetary Sciences, JHU

Title: **"Diagnosing transport timescales in geophysical flow from tracers"**

Abstract

Quantifying the timescales of transport in the stratosphere, oceans, lakes, and groundwater is important for understanding the cycling of chemicals and nutrients and the infiltration of pollutants. Insight into these timescales can be obtained from measurements of time-dependent tracers, from which "tracer ages" can be defined. However, a major problem with interpreting these tracer ages is that different tracers can yield different ages. Here we present the concept of a distribution of transit times, which provides a framework for analyzing tracer ages. This framework will be applied to measurements in the stratosphere, oceans and a lake. In each reservoir the measurements constrain the distribution of transit times and indicate that mixing plays a major role in the transport. Furthermore, from these transit time distributions it is possible to infer changes in ozone-depleting species in the stratosphere and the buildup of anthropogenic carbon in the oceans.