

## Fire in the Earth System

**Christine Wiedinmyer**

NESL/ACD

**Monday, March 12th, 2012**

**3:00 p.m. – Refreshments & Socializing**

**3:30 p.m. – Seminar**

**Foothills Lab 2, Room 1022**

### Abstract

Biomass burning is an important component of the Earth System. Open burning, which includes wildland fires, prescribed forest and agricultural burning, and waste burning, emits significant amounts of greenhouse gases, reactive trace gases, and particulate matter to the atmosphere. Once released to the atmosphere, emissions from open burning play an important role in local and regional air quality, global atmospheric chemistry, and climatic processes. Fires contribute significantly to the carbon dioxide released to the atmosphere annually, and are comparable to anthropogenic non-burning sources in some regions. Further, fires are a globally dominant source of carbon monoxide, non-methane organic compounds and carbonaceous particles. Recent advances from laboratory and field studies coupled with remote sensing observations have enabled improvements in our estimates of these emissions. However, large uncertainties remain, and many challenges hinder our ability to evaluate and constrain the estimates.

Fire emissions can contribute to elevated particle concentrations in the atmosphere and impact the chemistry that controls ozone formation, thus affecting human health, visibility and ecosystems. Not only can fires affect atmospheric composition and air quality, but these disturbances can influence the climate system in various ways. For example, particulate matter emitted to the atmosphere from fires has direct radiative effects that can influence both local meteorology and atmospheric chemistry. The quantification of these effects is required for accurately simulating atmospheric composition, climate, and even for the development of effective forest management strategies. This presentation will highlight advances in our ability to predict fire emissions, to quantify the impacts of fire on atmospheric processes and in the Earth System, and to use this knowledge for societal benefits.