

CGD SEMINAR SERIES



DATE: Tuesday, 22 April 2008

TIME: 3:30 p.m.

LOCATION: MESA LAB, MAIN SEMINAR ROOM
NCAR, 1850 Table Mesa Drive

SPEAKER: GERALD A. MEEHL
NCAR - CGD

TITLE: THE INFLUENCE OF THE SUN ON
THE DYNAMICALLY COUPLED
OCEAN-ATMOSPHERE CLIMATE
SYSTEM

ABSTRACT: It has long been recognized that fluctuations in solar forcing likely influence the earth's climate, though the mechanisms have been unclear. One mechanism has emerged from recent analyses of global coupled climate model simulations. The increase in solar forcing in the early part of the 20th century was manifest as a cooling in the eastern equatorial Pacific in climate model simulations. This response was almost totally due to coupled ocean-atmosphere interactions in the tropics since the models have poorly resolved stratospheres, and was comparable to observed trends during that time period. A similar cold event or La Nina-like response to peaks in solar forcing in the 11 year cycle subsequently has been described in observations and two global coupled climate models. However, other studies have argued for an El Nino-like response to solar forcing with a lag of a couple of years to peaks in the 11 year solar cycle. Analyses of observations and models show this is not inconsistent with the initial cold event-like response. Off-equatorial wind stress curl anomalies and ocean Rossby waves contribute to a transition cold event to warm event-like conditions in the tropical Pacific with a lag of a couple of years to the peaks in solar forcing. These dynamically coupled ocean-atmosphere responses could work in the same sense as other proposed mechanisms involving solar-forced ozone-stratospheric processes.