



The University of Chicago
Department of Statistics

MASTER'S THESIS PRESENTATION

FEIFEI LIU

Department of Statistics
The University of Chicago

**The Relationship Between CO₂
and Temperature in Climate Simulations**

WEDNESDAY, November 10, 2010, at 12:30 PM
110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

The continuing increase in the atmospheric CO₂ concentration is predicted to have significant impact on global temperature. The relationship between CO₂ and temperature was investigated over multi-centuries in Community Climate System Model Version 3 (CCSM3) climate simulations. Temperature over lands and over oceans were separately studied, given their distinct climatic roles in determining the rate of warming induced by CO₂. Two CO₂ weighting models were proposed in light to the notion of climate feedbacks to fit the simulation data. Both models capture more than 99% of the total variation in the temperature time series. Moreover, the model estimates can represent important climatic concepts such as ocean thermal inertia. This paper reaffirms the predictability of the radiative forcing for climate response in yearly mean temperature over lands and oceans and provides a statistical analysis tool to similar climate simulation data.

Information about building access for persons with disabilities may be obtained in advance by calling Sandra Romero at 773.702-0541 or by email (sandra@galton.uchicago.edu).