

# “Human-Climate Interactions”

## EOS795/895



This course will focus on the climatic impacts of human activity (land use changes and fossil fuel/other emissions), as well as the feedbacks between climate change and the land/sea surface, hydrology, productivity, etc. The conceptual feedback loop is closed by reactive policy-making in response to observations and modeling of the consequences of anthropogenically-induced climate changes (e.g. storm frequency, SSTs, floods/droughts, sea level rise, etc.). The tools developed in this course bear on "societally relevant" problems now being touted by congress, funding agencies, and others. As such, this course will place the science in the context of public needs and human impacts. As more emphasis is placed on the "relevance" of science, and as policy-makers turn more frequently to the scientific community for input through the IPCC and other fora, these issues will become more and more critical in the coming years.

**The major topics on which the course is to be based are as follows:**

### **I. Anthropogenic perturbations**

- Emissions- Industrial development, biomass burning; Quality; Quantity; Projected trends- socioeconomic issues: population, industrialization.

- Land Use- History and Deforestation extent; Vegetation-climate interactions; Agricultural methods; River input to marine systems; Projected trends- socioeconomic issues: population, agricultural productivity.

### **II. Climate Impacts on natural and social systems**

- Global impacts- Storms, Coastal vulnerability; Ozone; ecosystem migration; Sea level rise; Integrated Assessment models

- Local and regional impacts- Floods/droughts; agricultural consequences; Coastal erosion; Local economic impacts (tourism, agriculture, insurance, etc.)

### **III. Policy and Conventions-**

- Introduction, Game theory, discounting, political pressures;

- Montreal Protocol; Rio; Kyoto; IPCC (3rd assessment); Smaller-scale policy issues