Atmos 6250: Mountain Meteorology Course Overview

Jim Steenburgh
Department of Atmospheric Sciences
University of Utah
jim.steenburgh@utah.edu
801-581-8727
488 INSCC (In Suite 488)

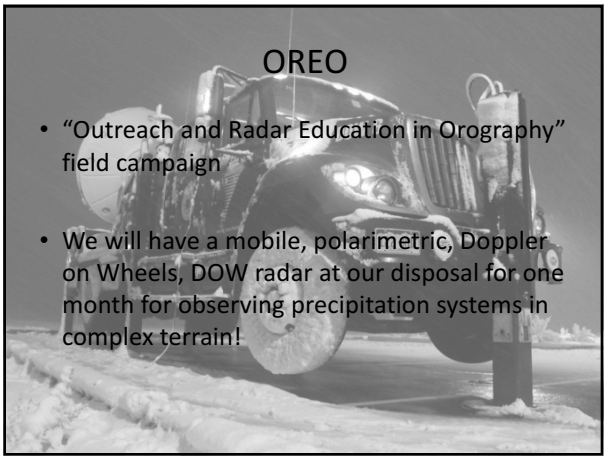
Introductions

- Name
- Where you are from
- Why you are interested in mountain weather and climate
- Major/Academic Year
- Great mountain weather anecdote (or non-mountain weather anecdote if necessary)

Learning Objectives

- At the end of this course, students should:
  - Possess foundational knowledge of the influence of complex terrain on atmospheric phenomena spanning from the boundary layer to the synoptic scale
  - Be able to utilize and critically evaluate scientific literature applicable to research in mountain meteorology and related environmental fields

OREO



- "Outreach and Radar Education in Orography" field campaign
- We will have a mobile, polarimetric, Doppler on Wheels, DOW radar at our disposal for one month for observing precipitation systems in complex terrain!

Learning Objectives

- At the end of this course, students should:
  - Understand the capabilities and limitations of scanning precipitation radars in complex terrain
  - Be able to successfully deploy and operate a mobile radar to address scientific objectives and hypotheses related to precipitation processes in complex terrain

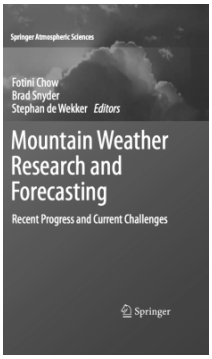
Format

- Two classes per week (1:25–2:45 MW)
  - 820 WBB
  - Class will meet irregularly in November
    - Plan on participating in field activities as your schedule permits

Schedule

- Large-scale topics
  - Orographic cyclogenesis, front-mountain interactions, atmospheric rivers, climate change in mountainous areas
- Cold pools and terrain-forced flows
  - Thermally driven flows, winter inversions in the Salt Lake Valley, dynamically driven flows
- Orographic and lake-effect precipitation
  - Radar fundamentals and applications in complex terrain, orographic precipitation, lake-effect in complex terrain
- Dessert
  - OREO

Text and Materials



- *Mountain Weather Research and Forecasting*
  - Available as e-book
  - Freely accessible online through Marriott Library
- Additional readings from peer reviewed literature
- Online learning modules
- Course notes

Expectations

- Course is for self-motivated, fully engaged graduate students
- Expectations
  - Miss no more than 2 classes
  - Read assigned materials prior to class
  - Drink from the fountain of knowledge during class
  - Contribute to group learning through active participation
  - Give high quality presentations
  - Contribute enthusiastically to OREO field-planning and execution
  - Participate in 2-3 IOPs totaling ~10 hours of field time
    - Quality of participation more important than quantity

Grading

- 20% in class participation
- 20% student science presentation
- 20% written and oral field-program proposal
- 20% OREO contributions
- 20% post-OREO presentation

Student Science Presentations

- Each student will give a presentation in one of two topic areas:
  - Sep 13: Large-scale topics (orographic cyclogenesis, front-mountain interactions, atmospheric rivers, climate change in complex terrain)
  - Oct 4: Terrain-forced flows and cold pools (Thermally driven flows, dynamicall driven flows, cold pools)

Student Presentations

- Should be 15 min in length
- Can take the form of
  - A traditional conference style presentation
    - E.g.: Intro, Data and methods, Results, Conclusions
  - Summary of case study undertaken for class
  - Literature review
  - Discussion of recent advances, an unsolved problem, or a paradox in the topic area
- Cannot be a presentation of thesis/dissertation research

Volunteers

- Sep 13: Large-scale topics (orographic cyclogenesis, front-mountain interactions, atmospheric rivers, climate change in complex terrain)
- Oct 4: Terrain-forced flows and cold pools (Thermally driven flows, dynamicall driven flows, cold pools)

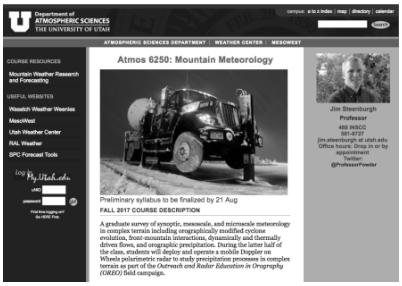
OREO

- Classroom and field research experience
- Instruction in radar meteorology and orographic precipitation
- Preparation of (short) research proposal (written and oral)
- Educational Observing Periods
  - Close to campus
- Intensive Observing Periods
  - Various locations depending on objectives
- Post OREO oral report by teams

OREO Requirements

- Everyone must complete and sign liability form
- Everyone must complete and pass driver training video and test
- Provide documentation to Nola Lucke (nola.lucke@utah.edu) in 484 INSCC

Course Web Page & Syllabus



http://www.inscc.utah.edu/~steenburgh/classes/6250/

Syllabus, links to text and reading materials, schedule

ADA Accomodations

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangement for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.