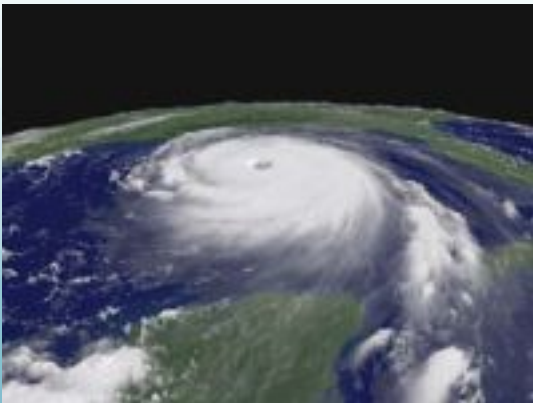


Weather and the Atmosphere

ATOC 1050-001

Professor Sarah Tessendorf
Tues/Thurs 9:30-10:45am



Class goals

- Gain an understanding of how the atmosphere works
- What processes are responsible for shaping the weather that we experience?
- Relate what you learn in class to the weather that you observe
- Explore types of weather data available on the internet

What brings you here?

- Have you always had an interest in weather?
- Do you need to take a science class to graduate?
- What category of majors are you majoring in?
 - A. Physical science, Engineering, Math, Architecture
 - B. Fine arts, Music
 - C. Business, Law, Journalism
 - D. Social science, Humanities
 - E. Education

Who is in this class?

- Where are you coming from?
 - A. Colorado native
 - B. West coast
 - C. East coast
 - D. Central U.S.
 - E. International student
- What year in school are you?
 - A. Freshman
 - B. Sophomore
 - C. Junior
 - D. Senior
 - E. Post-graduate/other

A little bit about me...

- National Center for Atmospheric Research
 - Study effects of aerosol (pollution, dust, other atmospheric particles) on cloud and rain formation
 - Test cloud modeling parameters using weather radar observations and other measurements to improve numerical cloud models
 - Work with teachers and students participating in science research in the GLOBE program
<http://www.globe.gov>
- I also like to travel and go storm chasing

About the class...

- Two course lectures each week
 - Lecture
 - Clicker questions
 - In class demonstrations
 - Discussions
 - Clicker quizzes
- Lectures will be recorded and posted online for your viewing enjoyment 😊
- We have a course website:
<http://atoc.colorado.edu/~saraht/atoc1050>

Course materials

- Textbook:
 - Severe and Hazardous Weather: An Introduction to High Impact Meteorology, 3rd Ed., by Robert Rauber, John Walsh, and Donna Charlevoix
- i>clicker
 - **You must register your clicker for this class by following the *Clicker Info* link on the class web site!**
- Other materials will be available on the class website
 - Homeworks, syllabus, links to other resources, etc.

What we will cover

Basic Principles

- Atmospheric temperature, pressure, and moisture
- Meteorological measurements
- Weather maps
- Atmospheric stability
- Clouds
- Atmospheric forces
- Air masses and fronts
- High and low pressure systems

Weather scenarios

- Extratropical cyclones
- Blizzards
- Mountain snowstorms
- Mountain winds
- Thunderstorms
- Tornadoes
- Lightning
- Tropical cyclones

What is expected of you

- Attend class regularly, arriving on time, listen actively and participate in class discussions
- Bring your clickers and participate in all clicker questions (especially the clicker quizzes!!)
- Read the chapter assignments before class
- Turn in all homework assignments on time, at the beginning of the class on the day it's due
 - **NO late homeworks will be accepted!**
- Visit office hours or email us with questions
- Check the course website at least once per week for updates, announcements, class news
- Keep track of your grade online throughout the course to avoid a low or failing grade

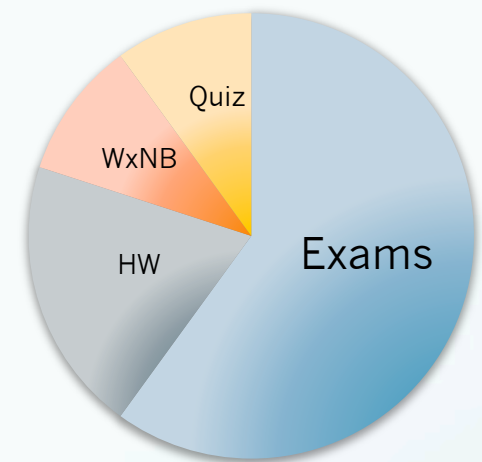
What you should NOT do

- Do NOT use cell phones or other electronic devices that could distract yourself and other students from the lecture
- Do NOT engage in private conversations during lecture time
- Do NOT miss exams
- Do NOT use a clicker other than your registered clicker!
 - **This is considered cheating for those students not attending class but that have clicker answers being recorded!**
- Do NOT cheat on homeworks or exams

Any acts of cheating or other honor code violations can and will be reported to the Honor Code Council and will result in a final course grade of an F!

How you will be graded

- Two in-class multiple-choice exams and one final exam
 - (20% each = 60% of final grade)
- Approximately ten in-class i>clicker quizzes
 - (10% of final grade)
- Two homework assignments
 - (10% each = 20% of final grade)
- One weather notebook assignment
 - (10% of final grade)
- Answering other (non-quiz) clicker questions asked during class can only help improve your grade!
 - Make sure to participate with your clicker!
- **See the syllabus for more details on grading**



Exams

- **Bring your student ID or a valid photo ID to all exams!**
- Exam 1: **Thursday February 10**, in class
- Exam 2: **Tuesday March 15**, in class
 - Exams will on all material covered in class since the last exam and prior to the exam date (see syllabus for details)
- Final Exam: **Wednesday May 4th 4:30-7:00pm**
 - The final exam will not be comprehensive!
 - It will be on the material covered since Exam 2
- Make-up Exam: **Thursday March 17**, in class
 - If for some reason you have to miss an in class exam, contact me beforehand and you will be allowed to take the make-up exam.
 - It is comprehensive, in that it will be on all material covered on both exams 1 and 2.
 - There is only one make-up exam
 - There is no make-up exam for the final exam.

Homework

- There will be two homework assignments
- All must be turned in at the beginning of class only
- **No late homeworks will be accepted**
- Homework due dates:
 - Tuesday February 8
 - Thursday March 10
- Answer keys to the homeworks will be posted after class on the due date
- You may want to make a copy of your homework to help you study for exams
- Homeworks that are not legible will receive a grade of zero!

Weather Notebook

- The weather notebook is designed to increase your awareness of the weather happening around you
- Will include:
 - Weather summaries
 - Weather web site descriptions
- Weather notebook will cover two weeks beginning Sunday April 3-Saturday April 16
 - Due in class **Tuesday April 19**
- **Weather notebooks must be typed!**
- **No late weather notebooks will be accepted**

Clickers

- We have begun using clickers today
- Clickers will be used in class for
 - Discussion and non-quiz questions
 - Clicker quizzes
- Answering non-quiz clicker questions can only help your grade
 - Will be asked throughout the course
 - Each worth 2 points: 1 for answering the question, and an extra point for answering the question correctly (if applies)
 - Non-quiz clicker participation can replace up to 10% of your exam grade (6% of your final grade)
- There will be approximately 10 unannounced clicker quizzes in class **beginning Tuesday Jan 18—register clicker ASAP!**
 - These will make up 10% of your final grade
 - Lowest two quiz scores will be dropped

How to get help

- Come to our office hours or email us questions
 - Professor Tessendorf
 - Stadium 255-25 (ATOC office, gate 7)
 - Tuesday 8:30-9:30am
 - Thursday 10:45-11:45am
 - Email: saraht@colorado.edu
 - TA Connie Bottenberg
 - Engineering Center
 - Monday and Wednesdays 3-4pm
 - Email: connie.bottenberg@colorado.edu
- Connie will hold a review session prior to each regular in class exam and the final exam

Why do we care about the weather?

- Have you ever been in or seen a ...
 - Snow storm?
 - Blizzard?
 - Hurricane?
 - Tornado?
 - Hailstorm?
 - Flash flood?

Weather in your life

- Think about what aspects of your lives have been impacted by weather...
 - Has your flight been delayed or cancelled due to weather? If so, what kind of weather caused the problem?
 - Has a sporting event you're attending or participating in been postponed or cancelled due to weather? If so, what kind of weather caused the problem?
 - Has your car slid around on (or off!) the road when it's snowy and icy?
 - Have road closures due to weather impacted your road trip, maybe even for holiday travel? If so, why were the roads closed?
 - Has weather ever impacted your school schedule (closures, or early release)? If so, what kind of weather?
 - Have you been on a hike in the mountains when thunderstorms start to develop?

Careers and the weather

- What kinds of jobs are affected by the weather or benefit from having an understanding of weather information?
 - Aviation: Airport crew, air traffic controllers, pilots
 - Ground transportation: truck drivers, local delivery drivers, shuttle/bus drivers
 - City planners/engineers: maintenance crews (especially road crews), architects/engineers, construction crews, water resource managers
 - Utility companies: heating/cooling needs, water needs, renewable resource management (wind, solar, hydroelectric power)
 - Insurance companies

The power of knowledge

- Have you ever used weather information and forecasts to avoid negative impacts of weather on your plans?
 - What resources did you use?
 - Forecasts, weather reports, weather websites, webcams, The Weather Channel or local TV meteorologist information? Airline/aviation websites? State Department of Transportation websites?
- Ways to avoid weather-related headaches:
 - Airline travel waivers
 - Alternate travel routes
 - Allow extra travel time to drive slower
- Sometimes we can't avoid having our plans be affected by the weather no matter what we know and/or do in advance
 - **Weather can have a powerful influence on our lives!**
 - **This is why it's so important for us to know as much about weather and weather safety as possible!**

Example of recent weather impact

- Colorado Springs pile up Dec. 31, 2010
- http://www.huffingtonpost.com/2010/12/31/colorado-snow-car-pileup-colorado-springs_n_803113.html