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Severe Weather Forecasting Field Trip
Summer 2022 (Session I) – 3 Credits

Purpose

The purpose of this course is to provide students with experience forecasting, observing, and analyzing severe convection in the field. By verifying their forecasts with their own eyes, students will better understand the dynamics and thermodynamics that lead to some of the most beautiful yet complex atmospheric circulations on Earth. While we may see tornadoes during the field trip, this cannot be guaranteed.

Timeline

Orientation	May 31, 10 AM, ENR 323
First Day of Field Trip	June 1 or June 2
Last Day of Field Trip	No later than June 15
Final Presentations	June 23, 1 PM, ENR 223

The course fee has been budgeted to allow for a 14-day trip, but if expenses run higher than expected, or if the weather at the end of the trip is not promising, the trip may end early.

Field Trip Activities

Students will be grouped into forecast teams of three, with one or two teams of two. These teams will be determined and placed into a rotation at random during the orientation. The rotation will determine which forecast team is in charge of choosing our target for each day of the trip. The ideal target is a location where isolated supercells are forecast to occur collocated with a dense road network, few trees, far from urban areas, and near where severe convection is forecast for the subsequent day. Often some of these ideals will need to be compromised, but this is the challenge set forth to each forecast team. Regardless of whose turn it is to be on the forecast team, all students will keep field trip diaries documenting their experiences and will perform other duties (e.g., two-way radio operator, meteorological instrumentation operator, weather radio monitor).

Should the team's forecast prove accurate and we observe interesting weather (i.e., a warned storm) on that team's day, that team will move out of the rotation, and they will deliver a presentation and write a chase report regarding that particular day. Some teams, by luck of the draw and uncooperative weather, may never have interesting weather on their days. In that case, the team will be charged with picking one of their days to write about and present what went wrong, what they learned, why conditions were unfavorable, etc.

Alternate activities have been planned in the event of a long stretch of inactive weather.

Grading

Participation and Punctuality	30%
Final Presentation	30%
Diary	25%
Final Paper	15%
Eligible Driver	5% extra credit
Trained Spotter	5% extra credit

90+	A
85–89	B+
80–84	B
75–79	C+
70–74	C
60–69	D
< 60	F

Assignments

Storm Chase Log / Diary

Each day of the trip, you are required to keep a log/diary of your experiences. Each day should start on a new page, and each entry should be marked with the current time, preferably in UTC. Don't worry about the fact that a new "day" starts at 0000 UTC; for our purposes a new day starts when you wake up in the morning. Be as comprehensive in your logging as possible without detracting from your overall enjoyment of the course. (In other words, if a tornado is in progress, you should be taking pictures, not writing a two-page treatise in your log!) Things to note include changes in weather conditions, the observations from the Kestrel, navigational notes (e.g., "turned west on Bob's Road"), synopses of weather discussions / target selection, and anything else you wish to write. Then, at the end of each day, write a paragraph where you reflect on the day's events (the "diary" portion).

At the conclusion of the trip, you will use your diaries to help complete your final projects (described below). I will collect them on June 23, but you will be able to get them back unmarked a few days later if you wish.

Final Project

Working with your forecast team members, you will document what happened on a particular day when you were in charge of the forecast, and why it happened. To do so, you will prepare a final paper and deliver a final presentation, each due June 23. Your paper should focus more on your analysis of why the day progressed the way it did, whereas the presentation can focus more on what happened (i.e., you can show all of

your pictures). Those who have taken Synoptic Meteorology can think of this assignment as being somewhat similar to the group project in that course.

Particulars regarding the presentations:

- 15–30 minutes total
- 15–20 minutes scientific content
- Up to 15 minutes of pictures and videos
- Must include scanned mesoanalysis

Particulars regarding the papers:

- 5–7 pages double-spaced
- Up to 10 figures (place after your 5–7 pages of text), one of which is a hand-drawn mesoanalysis
- At most one photograph
- Due at 1 PM

At the conclusion of the presentations, I will give you a moment to rate the contributions of each member of your team to the final project. I will use this information to adjust the number of points each member of the team will receive on the project, but otherwise the project scores are team scores.

Safety

Putting ourselves near severe weather is inherently a dangerous activity. Even so, the greatest danger participants in this course will face is the fact that we will be driving 7000 miles across the country. Statistics dictate that the risk of getting in a car accident is much greater than the risk presented by the severe weather itself. Indeed, car accidents have killed more chasers than tornadoes have. We minimize this risk by ensuring all drivers are aware of defensive driving practices. The largest severe weather risk is due to lightning, with flash flooding / washed-out roads being second, and tornadoes third. We will mitigate these risks by approaching no closer than five miles from any tornado in progress and by always leaving at least two escape routes from our current position. Often, five miles southeast of the wall cloud/tornado is precipitation and lightning free. Indeed, spectacular success can be had and tornadoes can be seen without ever needing to turn on the windshield wipers.