

Semester Case Study Project

You and two classmates will make use of your accumulated knowledge to perform an analysis of a severe weather case study. Your investigation will culminate in an 8 page paper and a 15–minute presentation to the class. You may choose any case **since April 1, 2008**, from any region that you like, provided that multiple severe weather reports occurred. How to pick a case? Try browsing the archive available at:

<http://www.spc.ncep.noaa.gov/exper/archive/events/searchindex.html>

Probably the single best source of data will be the SPC mesoanalysis archive:

http://www.spc.noaa.gov/exper/ma_archive/

Assignment Details and Deadlines:

1. We don't want any duplication among groups, so if you are not the first to request a particular day/event, you will have to choose a different one. Dr. Parker will serve as the "clearing house" for the case selections. As soon as you have picked the day/event that you will study, e-mail it to Dr. Parker to "reserve" it. If you are slow to the punch, be prepared with some backup cases in mind. **Due date: no later than March 23.**
2. In order to make sure that all groups are up and running, you also must submit a 1-page case overview to Dr. Parker. **Due date: April 6.** This overview should have a few sentences of summary (what happened and where), a paragraph or so describing the general setting in which the event occurred, and a few sentences explaining what questions, angles, or key pieces of data your group intends to investigate. By reading your overview, I should have an idea of what happened, and what your group plans to do to "teach" the key forecast problems of this event to the rest of the class.
3. The 8-page paper (double-spaced, 1" margins) should follow through the entire forecast process, including discussion and analysis of upper air data, surface data, satellite and radar data, soundings, etc. You should discuss where the necessary ingredients for particular kinds of storms are present, and how they came together to produce the event. You can use the convective forecasting handouts from class as guidelines for the method. The goal of this paper is to narrate the entire forecasting process from beginning to end (much like our discussions in class). The paper should focus on *physical processes*. You should include figures (more than 3, less than 3 dozen) to illustrate your points (figures do not count toward/against the 8-page guideline: put them at the end). We will follow the AMS style: refer to your figures in order (by number) in the text. Your figures should have captions that explain what is plotted (fields, units, at what level, for what time, etc.); as a corollary, the body of your text should *not* be used to explain what is plotted in the figures (it should discuss concepts). **Due date: Friday, April 17, 5 PM.**

4. The 15-minute presentation will be given by your group to the rest of the class. All three team members should participate roughly equally. Your goal is to teach your case to the rest of the class. Fifteen minutes is *not* much time, so you should focus on the key forecast problems and the data that illuminate them. A brief intro to the case (overview) as well as a look at what developed (radar, storm reports) should also be included. Finally, your talk should have a conclusion that summarizes the key ingredients/processes that characterize what developed on the day of interest. After each talk, there will be time for questions from the audience. Our goal is to have 9 separate mini-lessons that help us broaden our exposure to severe weather forecasting. A Windows laptop will be available, so please make use of Microsoft Excel for your visuals, and bring your presentation to class on a CD or USB stick. Good slides have labels and clear, attractive figures. You should not try to put too much text on your slides: use your voice to explain important concepts. Content is the most important thing, but part of your grade will be on your volume, presentation clarity, and the quality of your visual aids. **Presentations will be in-class on April 22nd and 23rd. The groups will present in the order listed below.**

Late work policy: No credit for late work (or for failing to present it to the class), except in documented medical emergencies.

Getting data:

In addition to the SPC archives (above), other good sources of archived data include:

Plymouth State's "Make Your Own" product generator:

<http://vortex.plymouth.edu/u-make.html>

NCDC's NEXRAD data viewer and exporter

<http://www.ncdc.noaa.gov/oa/radar/jnx/index.html>

NOAA's operational model archive

<http://nomads.ncdc.noaa.gov/data.php>

The above should suffice for this project, but if you're hungry for more, see links here:

http://wikis.lib.ncsu.edu/index.php/CSG_Data_Sources

Project teams

- | | |
|--------------------------------|---|
| 1) Addington/Erhardt/Mazzei | 2) Bird/Frucella/Montague/Taylor |
| 3) Bowling/Gilchrist/Moore | 4) Bozeman/Johnson/Peebles-Maxwell/Thomas |
| 5) Church/Kelly/Phelps | 6) Davis/Koltonski/Ross |
| 7) Elvington/Laureano/Sheppard | |

Guidance for an “A” project: Heed well!

- You must support your claims by **showing evidence** in your figures (patterns, ingredients, etc.). When in doubt, err on the side of including more (not fewer) figures!
- A complete project (both paper and presentation) should include a **synoptic** overview, an analysis of relevant **mesoscale** features, and an analysis of **radar** imagery (including both reflectivity and velocity data).
- You should put your facts into the context of a **narrative** (story) that includes the fundamental ingredients, how they came to be present, and **interpretation** for how things are changing and why.
- The most effective way to present your materials is almost always to **proceed chronologically**.
- For your Powerpoint presentation, the best way to show things is often using **loops/animations**, so that the audience can see things unfold.
- This is not a forecast verification project. Avoid simply comparing model forecasts to observations, and avoid lengthy discussion of how well SPC performed on the given day. **Focus on what happened and why.**
- Tread lightly on the “shock and awe” (damage statistics). One or two sentences is more than sufficient. **Focus on the atmospheric processes.**

Scoring rubric for MEA444 severe storm project

One page proposal (10 points): _____

Paper: writing and consistency with AMS style (10 points): _____

Paper: figures, captions, and use of evidence (10 points): _____

Paper: scientific content and interpretation (25 points): _____

Talk: volume, stage presence, clarity, polish (10 points): _____

Talk: Powerpoint slides, figures, and use of evidence (10 points): _____

Talk: scientific content and interpretation (25 points): _____

Overall score (100 points): _____

Groups will receive one grade for the proposal and paper. Individual group members may receive somewhat different grades for their in-class presentations, depending upon quality.