

# METR 4970 Special Topics (3 credits)

## Applications of Weather Forecasting

### *Weather Forecasting in Support of Critical Decision Making*

*Dr. Kevin Kloesel*

A blended combination of lecture, individual lab, online activities, group table-top exercises and presentations. The class will meet weekly on Mon-Tue 3:00-4:30 in the National Weather Center.



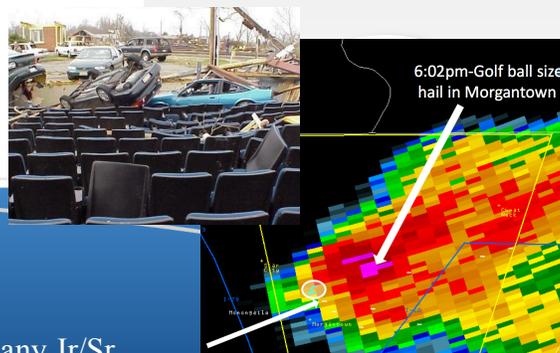
## Have you ever wondered why OU decided to delay opening instead of complete closure in the face of ice and snow?

This course will put you on the hot seat by exposing you to various types of weather forecasts, and how those weather forecasts are created, customized, and then utilized by those responsible for the life and safety of others. You will be immersed into the world of decision makers who each deal with weather as but one factor in a complex web of information streams and external demands that pit the protection of life and property against profit and enjoyment/entertainment.

How much risk are you willing to take on? What are the consequences if you are wrong? How costly was your decision? Are there available communication strategies to get your message across more effectively and efficiently? These important questions will be explored from the perspective of the meteorologists that issue the weather forecasts and the administrators, state officials, emergency managers, and other decision makers that use these forecasts to protect schools, athletic events, concert venues, transportation infrastructure and more.

## Decisions...

- NWS The coordinated warning process – severe weather.
- OU-EOC Forecasting for a football game on a college campus
- NPS Forecasting for the possibility of school closure in winter
- IAVM Forecasting for an outdoor concert complete with portable stage and pyrotechnics
- OKC Closing roads and bridges before they flood



### Target Audience:

Upper division (Jr/Sr) A&GS, Earth and Energy, and any Jr/Sr student across campus interested in how weather forecasts are made and used in decision making.

**Fall 2014 METR 4970: Applications of Weather Forecasting (3 Credits)**

*Subtitle: Weather Forecasting in Support of Critical Decision Making.*

**MWF 15:00-16:30, NWC 5600**

**Instructor:** Dr. Kevin Kloesel (longhorn@ou.edu)

**Office:** NWC 2900 (Oklahoma Climate Survey suite)

**Office Hours:** TBD (Feel free to come in if my door is open)

**Text:** *You will read stuff until your eyes hurt!*

**Course Overview:**

Have you ever wondered why OU decided to delay opening instead of complete closure in the face of ice and snow? This course will put you on the hot seat by exposing you to various types of weather forecasts, and how those weather forecasts are created, customized, and then utilized by those responsible for the life and safety of others. You will be immersed into the world of decision makers who each deal with weather as but one factor in a complex web of information streams and external demands that pit the protection of life and property against profit and enjoyment/entertainment. How much risk are you willing to take on? What are the consequences if you are wrong? Are there available communication strategies to get your message across more effectively and efficiently? These important questions will be explored from the perspective of the meteorologists that issue the weather forecasts and the administrators, state officials, emergency managers, and other decision makers that use these forecasts to protect schools, athletic events, concert venues, transportation infrastructure and more.

**Assignments and Graded Work:**

Exams (0%): There will be no tests, but you will be tested.

Quizzes (0%): You can be quizzical, but that won't be part of your grade.

The Notebook (20%): You will be keeping an individual diary. The diary details will be explained in class, and the notebook will be turned in at periodic and unannounced times during the semester. Keep up!

The Writer's Block (20%): There will be numerous writing assignments. These will range from an explanatory paragraph written in class, to more extensive, outside class 1-3 page papers summarizing topics to be determined.

Individual Activities (20%): These are lab activities that will be accomplished on your own.

Group Activities (20%): These are lab activities that will be accomplished in groups, making it impossible to grade them accurately, but I will do the best I can.

Poster (20%): This is semester project that will be developed throughout. I will show you an example and more details will be forthcoming.

The standard OU grading policy will apply (90+ = A; 80+ = B, etc.) I reserve the right to lower numerical thresholds for a given letter grade.

**Make-up Policy:**

Extensions on work might be granted on a case-by-case basis. It is your responsibility to notify me if you cannot turn in an assignment by the given deadline.

**Academic Honesty:**

Homework and programming assignments are important for your understanding of the material. Occasional help from a classmate is fine but be sure that you actually understand the material. It will help tremendously for you to make an appointment to visit if you are having trouble understanding the material. Realize that simply copying a homework assignment from any source is considered cheating and will definitely not help your understanding. If caught, such activity could result in a failing grade in the course and possible disciplinary action. All students are expected to be familiar with and abide by the OU Academic Misconduct Code. Information on this code and other student policies is located at <http://studentconduct.ou.edu>.

**Religious Holidays:**

It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required class work that may fall on religious holidays.

**Reasonable Accommodation Policy:**

The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with me as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405/325-3852 or fax only 405/325-4173.

**Weather:**

Should imminent or ongoing hazardous weather create an environment that is distracting or unsafe, class will be dismissed. Class will resume when the instructor determines that a productive environment for learning can be secured. If the weather threat requires sheltering in a best available refuge, the class will proceed in an orderly fashion to the interior of the NWC, and proceed down the interior stairs to NWC 1313 (the David L Boren Auditorium) and shelter until the danger has passed.

## Tentative Outline of Class Topics and Activities

### I. Weather Forecasts

- a. What is a weather forecast? (types of available forecasts)
- b. Role of NOAA National Centers and National Weather Service Forecast Offices
- c. Role of Private Sector (including forecast shops and broadcasters)
- d. The Forecast Process and how forecasts are made
- e. The basics of deterministic, ensembles, and probability forecasting
- f. Man vs Machine
- g. Basic forecast metrics
- h. Integrating the social sciences and how forecasts are interpreted and used by clients.

### II. Select Weather Forecast Clients (this is NOT a comprehensive listing!)

- a. Emergency Management
- b. Energy Industry
- c. Agriculture
- d. Transportation (ground and aviation)
- e. Venues
- f. Immersion therapy (Campus!)

### III. Becoming a Weather Ready Nation

- a. Warn on Forecast
- b. Threat triggers and Decision matrices

### Individual Activities

- a. How to create a digestible forecast
- b. How to customize a forecast to incorporate and communicate user needs
- c. How to forecast under external constraints and with resource contention
- d. Shadowing a forecast office (how things really work)
- e. State EOC trip
- f. Buying power on the spot market
- g. Weather derivatives and risk
- h. Forecasting to make a living (market analysis and business plans)
- i. TV station trip

### Group Table Top Activities

- a. The coordinated warning process – severe weather.
- b. Forecasting for a football game on a college campus
- c. Forecasting for the possibility of school closure in winter
- d. Forecasting for an outdoor concert complete with pyrotechnics
- e. Forecasting for a significant ice storm with power outages
- f. Closing roads and bridges before they flood