**What is the Warn-on-Forecast (WoF) project?**

1) Initiated 3 years ago; 2) Working on possibly transforming the weather warning process in the next 10-20 years; 3) Tries to provide forecasters with detailed information on the type, severity, and probability of weather threats; 4) Computer model of individual convective storms using an ensemble of forecasts.

**Why do we need WoF?**

- Have we reached the limit of our current operational paradigm?
- Warning lead times have plateaued over the last 8 years or so to 10-15 minutes
- False alarm ratio still high
- Large events need more than 15 minute lead times because they need more time to move a larger amount of people
- A one-size fits all warning approach is not as effective as it could be

**Challenges for WoF Project:**

1) What is the best assimilation technique to use; 2) Lack of quality radar data; how to value other data; 3) Errors in environmental conditions (measurements); 4) [Un] predictability of severe weather; 5) Model errors; 6) How to optimize use of storm-scale ensemble data for warning operations and decision-making by public; 7) Forecaster and public response to new warning paradigm

**WoF will hopefully:**

1) Reduce the size of the area warned; 2) Provide longer lead times; 3) Help reduce the number of false alarms; 4) Maybe estimate the intensity of tornadoes.

**Greensburg, KS Post-Event Case Study**

- WoF did well at 15 minute and 30 minute forecast times, and even some at 45 minutes, but the tornado track became widely variable beyond 45 minutes.
- Case studies show WoF could possibly help reduce the size of the tornado warning box.
Our job is to help the local [NWS] offices…

- Storm Prediction Center
  - Storm Prediction Center is part of the National Weather Service
  - Provides support to 122 Weather Forecast Offices (WFOs) nationwide
  - Focuses on severe weather
  - Staff highly experienced with severe weather
  - Does not issue warnings, but does issue watches (severe thunderstorm and tornado)
  - 3-5 forecasters on shift, including a lead, mesoscale, and outlook forecaster
  - SPC issues convective outlooks out to 8 days, watches, and fire weather forecasts

- Tornado Climatologies
  - Annual Daily Probability of Tornado(es) across the contiguous US shows a roughly > 20% probability of a tornado somewhere in US from February through December, with a peak around June 1.

The daily tornado probability peaks for cities around the SCIPP region are as follows:
  - Austin, TX: Smaller peak in mid-May
  - Dallas, TX: Larger peak in early May; secondary peak in late October (cool season)
  - Lubbock, TX: Pronounced peak late May; no real cool season peak (due to locality)
  - Oklahoma City, OK: Larger peak in mid-May; secondary peak in late September
  - Tulsa, OK: Big peak in May; lesser peak in cool season
  - Ft. Smith, AR: Broader Spring peak; broader cool season peak (November peak of cool season)
  - Little Rock, AR: Less peak in Spring; cool season peak longer and feeds into Spring
  - Nashville, TN: Similar to Little Rock, with more Spring variability

- Tornado Climatologies
  - Most people think of the “tornado season” as reflective of the national tornado climatology
  - Local tornado climatology is not necessarily the same as national climatology

- Key Point: Though the overall nationwide daily tornado probability peaks in the late Spring/early Summer, the threat for tornadoes may peak at a different time of year for your city.