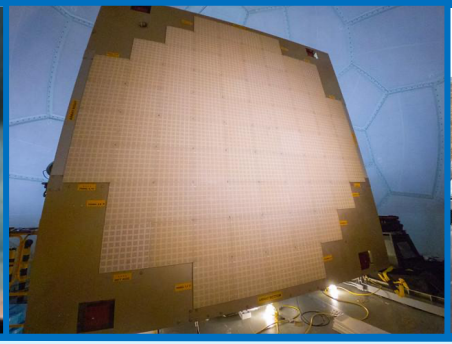
Observations and Analysis

Fieldwork and Analysis Part II Introduction

Michael Coniglio PhD, NSSL Research Scientist, FRDD






Introduction

1. Understanding Storms and Their Environments

Michael Coniglio, PhD

2. Planetary Boundary Layer (PBL) Research

Elizabeth Smith, PhD

3. Severe Weather Climatology and Sub-seasonal to Seasonal (S2S) Prediction

Kimberly Hoogewind, PhD

4. Social & Behavioral Data and Analysis

Kim Klockow-McClain, PhD

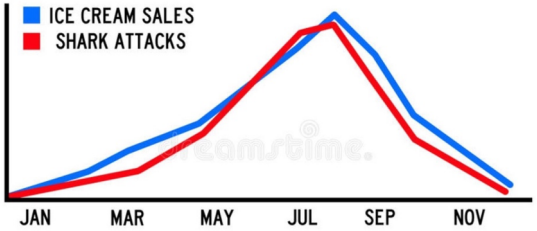
Topics span specific space/time scales to **broader, multi-scale efforts** seeing greater emphasis at NSSL

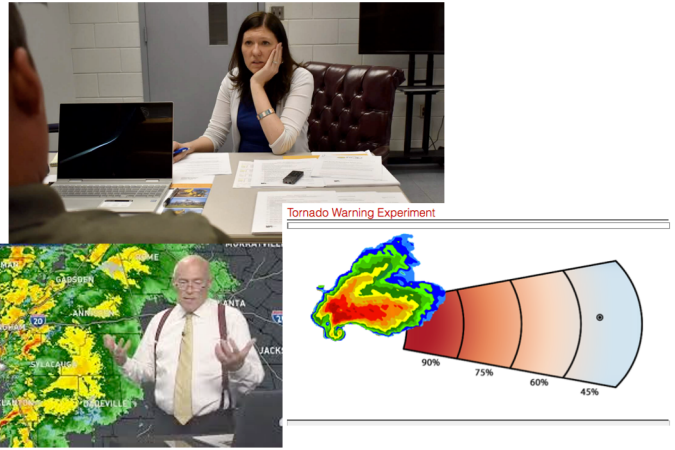
Addresses NOAA's basic science aim

NSSL mission: Conduct fundamental research to advance our understanding of processes associated with severe convective storms

NOAA mission: To understand and predict changes in climate, weather, oceans and coasts

Essential to guide applied research and operational tools; we shouldn't lose a grip on **understanding causation**



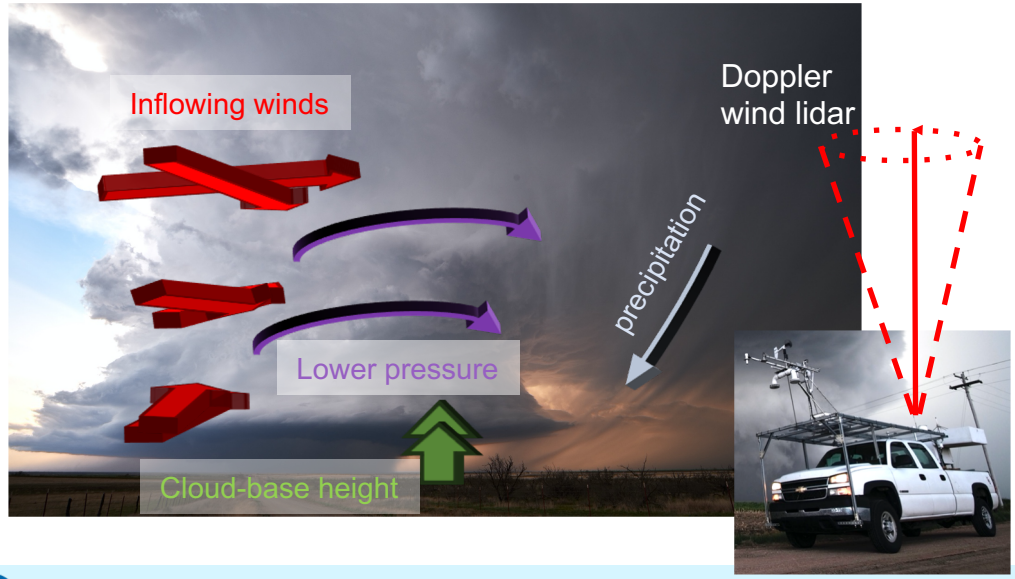


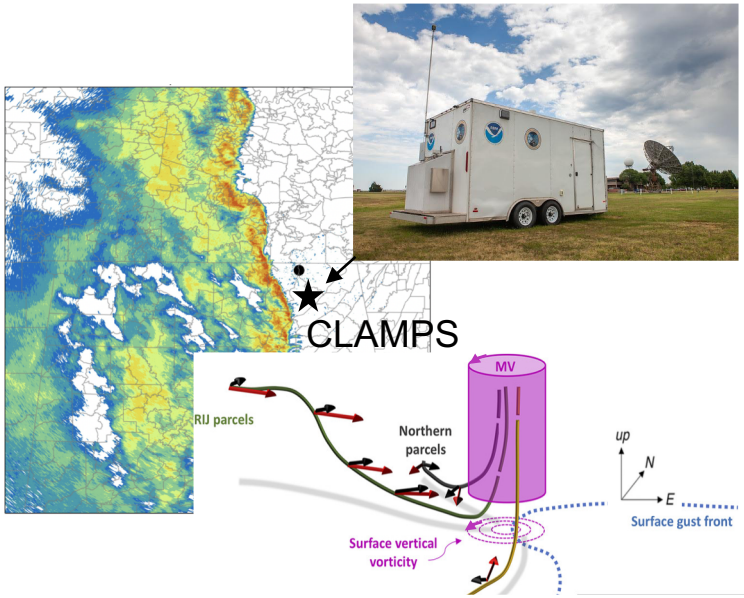
Understanding Storms and Their Environments

Michael Coniglio, PhD

https://www.nssl.noaa.gov/about/history/

Obtain measurements near severe storms and relate them to storm behavior, which has long been a tradition at NSSL.

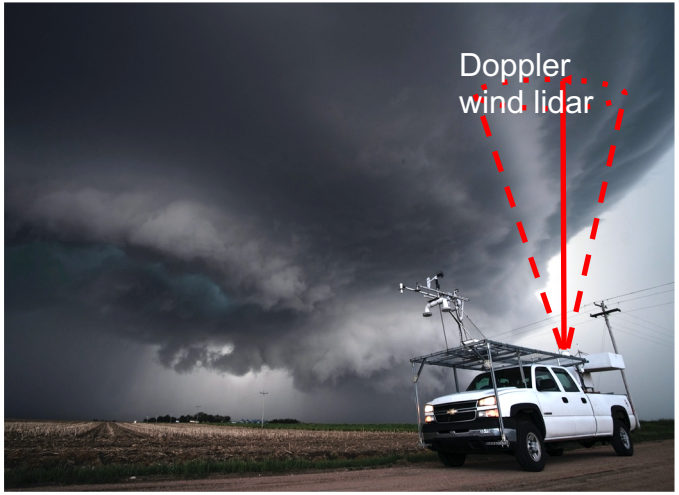


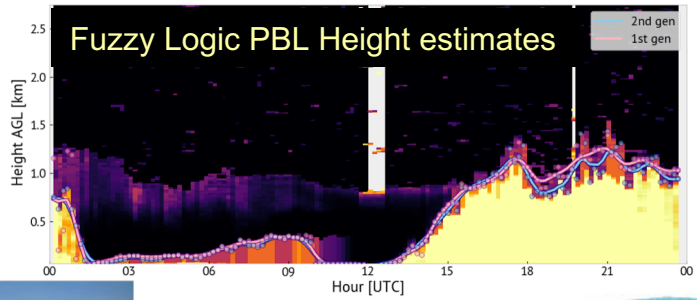


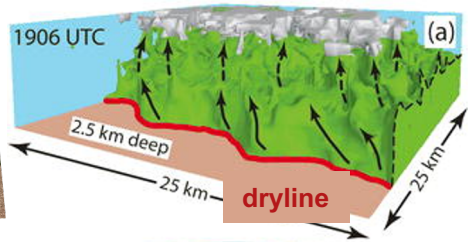
Planetary Boundary Layer (PBL) Research

Elizabeth Smith, PhD

PBL – it's close to where we live, yet direct measurements, even remotely-sensed measurements, are lacking at the scales needed to understand severe weather.

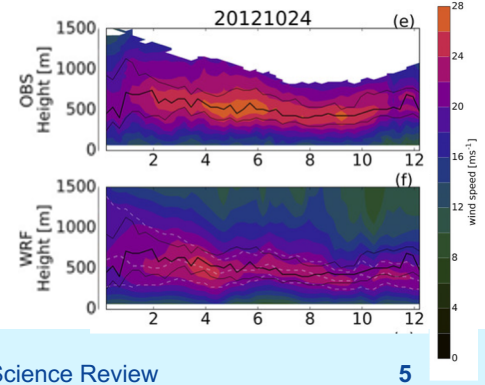






Needed when storms are ongoing, ALSO in the pre-storm environment when PBL processes are important to for CI.

Needed for longer term datasets to 1) validate PBL-schemes in regimes relevant to severe weather, and 2) for understand PBL statistics for climate

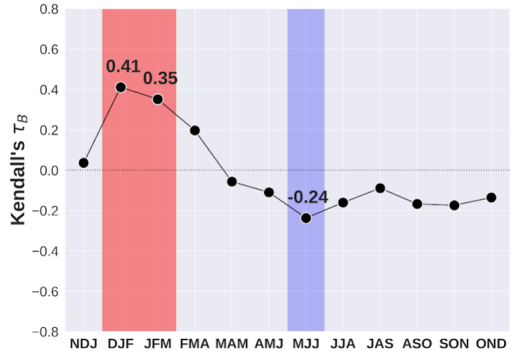


Severe Weather Climatology and Sub-seasonal to Seasonal (S2S) Prediction

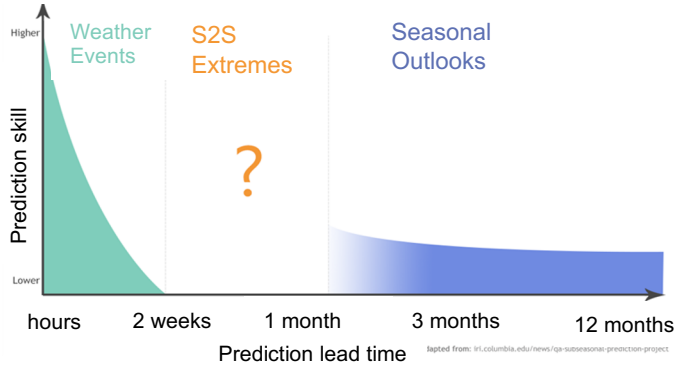
Kimberly Hoogewind, PhD

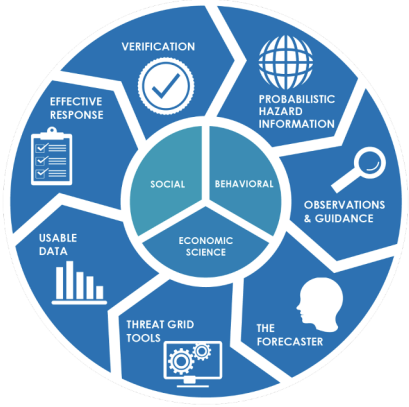
What scales and fidelity of severe weather events are predictable on week-to-month time scales?

Mean temperature vs. US (E)F-1+ tornado days

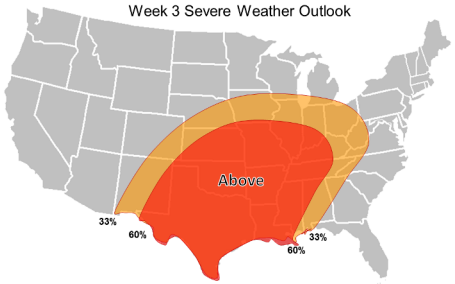


The S2S Prediction Gap





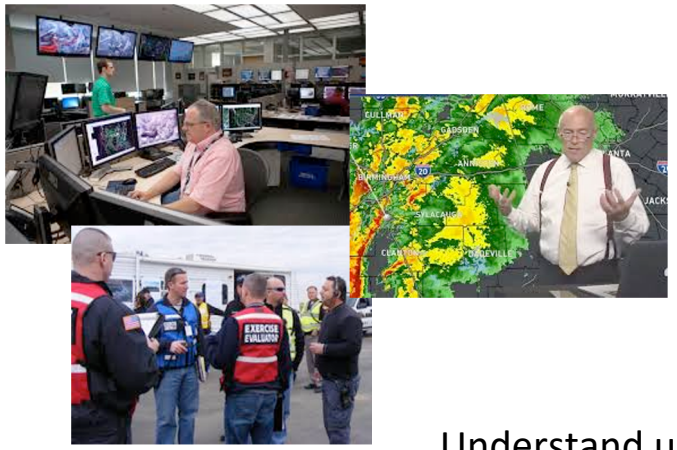
How should these forecasts best be presented and used by the community?



Kim Klockow-McClain, PhD

Social & Behavioral Data and Analysis

Producing forecasts: Physical understanding and technology development, but ALSO *understanding how the public processes and uses our information*.



Understand user decisions given forecast products and information – our longer-term databases for rigorous, scientific use for analysis is lacking here

Quality & Performance

- NOAA Distinguished Career Awards

  *Dr. **Harold Brooks (2021)** "for extraordinary scientific contributions to climatology and prediction of severe thunderstorms and tornadoes, and their societal impacts in 30 years of service to NOAA."*

  *Dr. **Qin Xu (2016)** "for exemplary service as a research scientist with extraordinary contributions to theoretical understanding and fundamental applications of atmospheric dynamics, physics, and numerical prediction."*

- White House Presidential Early Career Award for Scientists and Engineers (PECASE)

  *Dr. **Corey Potvin (2017)** "for significant and innovative contributions to observational analysis of thunderstorms, assimilation of observed storms into numerical prediction models, and groundbreaking research to predict localized thunderstorm-related threats such as tornadoes."*

- NOAA Administrator's Award

  *Dr. **Conrad Ziegler** "for outstanding effort in the design, fabrication, and validation of the next-generation airborne dual-Doppler weather radar system" that is used in understanding of severe storm processes.*

- AMS Editor Award

  *Dr. **Michael Coniglio** (Weather and Forecasting)*

Quality & Performance

- ~95 peer-reviewed publications (59 *lead* authored)
- Leadership on multiple collaborative, multi-institutional field programs

Michael Coniglio

Elizabeth Smith

Kimberly Hoogewind

Kim Klockow-McClain

Harold Brooks

Jeremy Gibbs

Erik Rasmussen

Vanna Chmielewski

JJ Gourley

Justin Sharpe

Questions for the F&A II panel?