VORTEX-Southeast

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What is VORTEX-Southeast?

- VORTEX-Southeast (VSE): Research program to better understand how environmental factors in SE US affect formation, intensity and path of tornadoes in region.
  - Builds off groundbreaking work of last 25 years, including original VORTEX and VORTEX 2 field experiments
  - VSE first field severe storms experiment with specific emphasis on addressing sociological factors contributing to large mortality in Southeast US
What is VORTEX-Southeast?

• VSE was initiated by Congressional mandate in early 2015

• NOAA and NSF are lead federal agencies, with NASA as a key partner
  • NSSL was designated as lead organization in developing VSE research program
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  - NSSL was designated as lead organization in developing VSE research program
  - Many academic and research institutions playing a key role
Why the Southeast United States?

Vulnerability (courtesy Ashley, NIU and SPC)
Why the Southeast United States?

Climatology (courtesy SPC)
Why the Southeast United States?

Climatology (courtesy Ashley, NIU)

[Map showing percentage of nocturnal tornadoes by state from 1950 to 2005]
Why the Southeast United States?

US Tornado Deaths by State since 1950

- AL: 659
- TX: 563
- MS: 480
- AR: 398
- MO: 389
- TN: 350
- OK: 339
- IN: 266
- MI: 243
- KS: 236
- IL: 222
- GA: 218
- FL: 204
- OH: 196
- LA: 157

SPC data; Graphic James Spann, ABC 33/40, Birmingham
Why the Southeast United States?
Planning

- VSE workshop was held in Huntsville in November 2015
  - Involved physical/social scientists and operational meteorologists from around country with expertise applicable to VSE research problems
  - Focused on development of a roadmap which will guide VSE supported research for 2016 and beyond

- Ongoing guidance for VSE program provided by…
  - VORTEX-SE program manager (Erik Rasmussen)
  - VSE Executive Committee (NOAA, NSF, NASA)
  - VSE Science Steering Committee (academia, physical/social science researchers, operational mets)
VORTEX-SE 2016

- Southeast United States provides challenges to the type of field work done during previous VORTEX experiments
  - Terrain/forest
  - High humidity results in low cloud bases
  - High percentage of nocturnal events
VO RTSX-SE 2016

• Southeast United States provides challenges to the type of field work done during previous VORTEX experiments
  • Terrain/forest
  • High humidity results in low cloud bases (bad for spotting)
  • High percentage of nocturnal events

• Field work will focus on observational tools that are deployable prior to an event (or stationary)
VO RTEX-SE 2016

- Field work will be based out of Huntsville, AL
  - Pre-established resources and network of radars, observational equipment, etc. (UAH, NOAA, NASA, private sector)
  - Centrally located within the Southeast US domain

- “Intense Observational Periods” – potential periods of active weather identified 4-5 days in advance to allow pre-positioning of necessary people and resources
  - IOPs will primarily be targeted in March/April
Northern AL Instrumentation
VSE Deployable Instruments

Texas Tech StickNet

NSSL CLAMPS Mobile Profiling System

Univ. Alabama-Huntsville MIPS profiler
VO RTEX-SE 2016

- Funded projects for 2016 focused on…
  - Improving computer model forecasts of severe storms and their environments
VO RTEX-SE 2016

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  • Improving computer model forecasts of severe storms and their environments
  • Addressing tornado risk awareness, response and mitigation
  • Observing tornadic storms and their environments to better understand tornadic storms and improve modeling
VO RTEX-SE 2016

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  • Addressing tornado risk awareness, response and mitigation
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• Several projects already ongoing…
  • NSSL scientists in AL in Feb working with emergency managers on project to analyze info flow and uncertainty info to EMs
  • PIs at WFO Jackson during 2/2 severe/flood episode as part of a project looking at combined tornado/flash flood events
VORTEX-SE: The Future

• Congress provided similar funding for an additional year

• New call for projects will be forthcoming
• VSE science team will guide plans for selecting additional proposals to be funded
• Close linkage between research and operational community to ensure effective integration of findings into improving operations
  • Better warnings and services
  • New initiatives such as FACETs