Outline

Why
Staffing
Relevance
History
Cross-cuts
Summary
Research Topics
WHY?

Weather Radar

- Primary severe weather observational tool
- Used to issue warnings by the National Weather Service
- Used to avoid severe weather by the Federal Aviation Administration and pilots
- Used to display the location of precipitation and associated severe weather to the public
OUR Mission...
To conduct research to advance weather radar technology and to develop and transfer applications, techniques, and new scientific understanding to the National Weather Service and other government, public and private organizations, enhancing their ability to provide short-term predictions and warnings of hazardous weather.

OUR Vision...
To lead the world in research and development focused on advancing weather radar technology for the detection of severe and hazardous weather.
Our NSSL/CIMMS Team
Weather Radar Research
Relevance

NOAA Vision: An informed society that uses a comprehensive understanding of the oceans, coasts and atmosphere in the global ecosystem to make the best social and economic decisions.

NOAA Mission: To understand and predict changes in Earth’s environment and conserve and manage coastal and marine resources to meet our Nation’s economic, social, and environmental needs.

NOAA VISION

An informed society that uses a comprehensive understanding of oceans, coasts, and atmosphere in the global ecosystem to make economic decisions.

NOAA’S MISSION

To understand and predict changes in Earth’s environment and conserve and manage coastal and marine resources to meet our Nation’s economic, social, and environmental needs.
NOAA Strategic Plan

- Reduced loss of life, injury and damage to the economy
- Better, quicker, and more valuable weather and water information to support improved decisions
- Increased customer satisfaction with weather and water information and services
20-year NOAA Research Vision

- Severe thunderstorm and tornado track forecasts at the sub-county level with one-hour or more lead time.
“committed to improving the accuracy and capabilities of its monitoring & observing systems both in situ and remotely sensed including timeliness, data quality….” page 38

“Polarized radar has shown great potential to improve Quantitative Precipitation Estimates (QPE) and Phased Array Radar (PAR) technology show promise in providing higher resolution data both spatially & temporally to help improve lead times in forecasting severe storms” page 41
NOAA 2008 Weather Radar 20-Year Vision Planning (Not yet Vetted)

- Deploy Dual-Polarization and Super Resolution
- Continue R&D on MPAR
- Continue R&D on Short-wave length Radars (Gap fillers)
- R&D on adaptive radar data integration leading to Warn-On-Forecast
- Explore use of non-NOAA radar data sources
- Utilize testbeds to facilitate the evaluation of new weather radar technologies and products
Joint Radar Plan PPBES FY10-15

Funding Profile ($0.76M bump)
- FY10    FY11    FY12    FY13    FY14    FY15
- $1.71M  $1.71M  $1.71M  $1.71M  $1.71M  $1.71M

Tasks
- R&D for Dual Polarization Scientific Applications
- R&D for Weather Radar Science Applications
- R&D for CASA-like Short Wavelength, Boundary Layer Radar Applications

NEXRAD Product Improvement (NPI)
- Funding @ ~$1.3M per year
MPAR PPBES FY10-15

Funding Profile

FY10  FY11  FY12  FY13  FY14  FY15
$4M   $10M  $10M  $10M  $10M  $12M

Tasks

- Dual-Polarization Sub Array design & fabrication
- Verification of value of MPAR
- Improved Decision support systems
- Adaptive scanning
- Improved Visualization methods
- Full MPAR prototype design, fabrication and testing
NSSL RADAR HISTORY

1960s
WSR-57 Research

1970
WSR-57

1971
Norman
10cm Doppler

1973
First Dual Doppler Analysis
Cimarron 10cm Doppler

1974
First Dual Doppler using P3 & Cimarron
Cimarron 10cm Doppler

1980
First PPP for NOAA P-3

1981-86
Initial Algorithm Development
Mesocyclone Wind Profiling

1984
First Dual-polarization Real Time Displays
First Calculations of Differential Phase & Cross Correlation Coefficient

1989
First WSR-88D Installed
First Dual-polarization Real Time Displays

1990
First WSR-88D Research Radar

1992
First Calculations of Differential Phase & Cross Correlation Coefficient

1995
Helped build First DOWs

2000
First PPP for NOAA P-3

NSSL Laboratory Review February 17-19, 2009
Cross Cuts

- Collocation
  - Collocated with NWS & OU
  - Deep Collaborations vs. Superficial
- Collaborations
- Field Facilities
  - Equipment on Kessler’s Farm – Disdrometers, profilers, Micro Rain radar
  - Mobile Radars
- Use of Hazardous Weather Testbed
- Visualization
  - 3-D & 4-D
- Decision Support tools
Radar is an important tool for observations and warnings of severe and hazardous weather.

Relevance
- NOAA’s Plans

Quality
- Awards & Publication record
- Number of technologies transferred
- Patents

Performance
- In FY07: Eight different technology projects undergoing transition activities
Today you will hear from:

- Sebastian Torres - Innovative Techniques
- Mike Jain - Open Systems and Development tools
- Lak - Multi-sensor data mining
- Dusan Zrnic - Dual Polarization and Mobile Platforms
- Alexander Rhyzkov - Meteorological applications of Dual Polarization
- Kurt Hondl - Future Weather Surveillance Radars
- Terry Schuur - Meteorological observations in support of Dual Polarization
- Demonstrations
- Chris Curtis - Phased Array Radar (PAR)
- Pam Heinselman - PAR Weather Applications
Questions?

THANK YOU