Weather Radar Research Summary

Douglas Forsyth
Weather Radar Research

SUMMARY

Weather Radar is the primary severe weather observational tool

Radar is an important tool for warnings of severe and hazardous weather

We Support the NOAA Mission

NEXRAD - Excellent example of Research transferred to Operations

Among the World Leaders in Weather Radar

Our NSSL/CIMMS Team

Weather Radar Research

Quality

Senior Scientist – Dusan Zrnic – Member National Academy of Engineering

Patents - 3

Awards:

- Gold Medal for Research leading to WSR-88D
- Silver Medal – WDSS
- Bronze Medal – ORPG
- Bronze Medal – Cimarron Dual Polarization
- Bronze Medal – Algorithm Development
- Award for Shuttle Disaster
- NOAA Tech Transfer Award for WDSS-II
- AMS Editor's Award
- WMO Vaisala Award – Dual Polarization
- NOAA Outstanding Paper Awards
- Approval by NEXRAD TAC
- International use of our research & algorithms (i.e. Canada,, France, Korea)

Quality

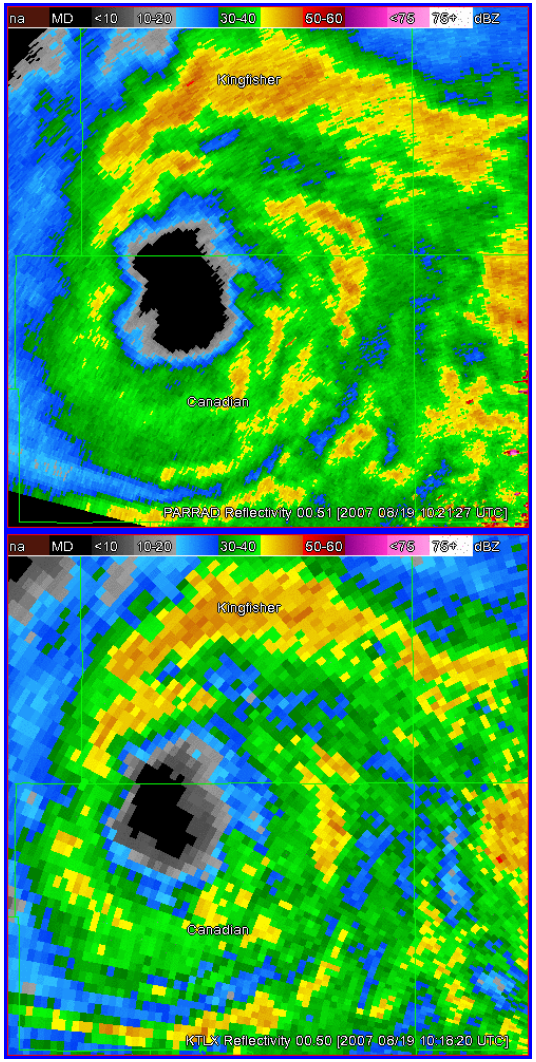
Publications:

9-PIs

18 – Publishing Staff

	Refereed	Reports	Conference
2004	9	2	31
2005	11	2	48
2006	12	1	11
2007	13	4	53
2008	12	2	37
Total (5 yrs)	57	11	180

Performance



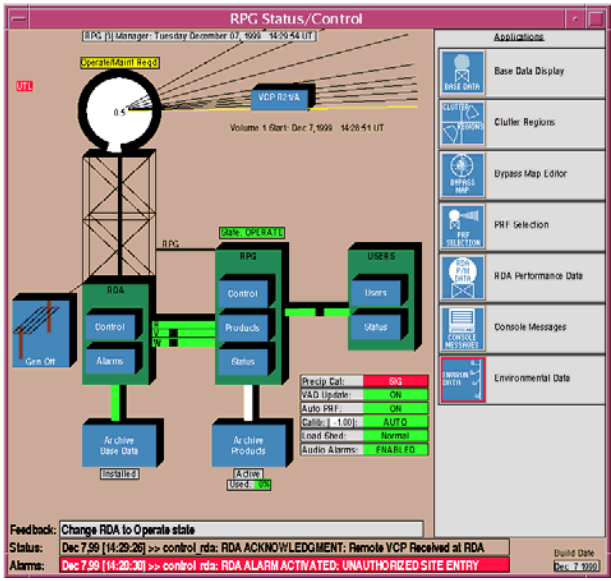
Technology Transfer

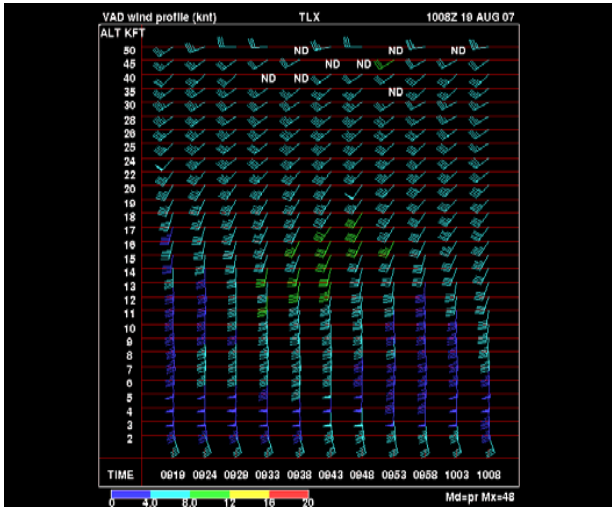
- Doppler Radar (WSR-88D)
  - ORPG
  - OPUP
  - ORDA
  - Super- Resolution
  - Level II data distribution
  - Severe Weather Detection Algorithms
    - Mesocyclone
    - Tornadic Vortex Signature
    - Tracking
    - Hail Identification
  - Range/Velocity Ambiguities corrections
    - Phase coding
    - Staggered Pulse Repetition Time (PRT)

Performance

Technology Transfer

- Doppler Radar (WSR-88D) (Cont.)
  - NEXRAD Product Improvement – Data Quality
  - Clutter Identification
  - Human Computer Interface (HCI) for WSR-88D
  - Spectrum Width Estimations in ORDA
  - Velocity Azimuth Display (VAD)
  - Clutter Identification



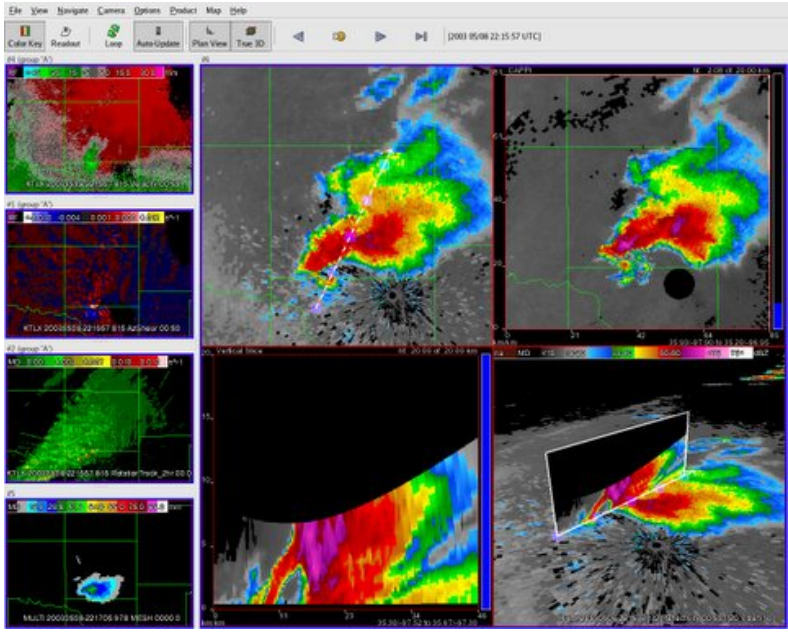


Performance

Technology Transfer

- Dual-Polarization
  - Dual Polarization Calibration Techniques
  - Hydrometeor Classification Algorithm (HCA)
  - Polarimetric Quantitative Precipitation Estimates (QPE)

- WDSS-II
  - System for Convective Analysis & Nowcasting (SCAN)
  - Four-Dimensional Storm-Cell Investigator (FSI)
  - CASA (WDSS-II)
  - WATADS – NWS capability to perform case studies and algorithm tuning
  - Lightning Threat Algorithm
  - KPIX-TV radar into NWS Operations

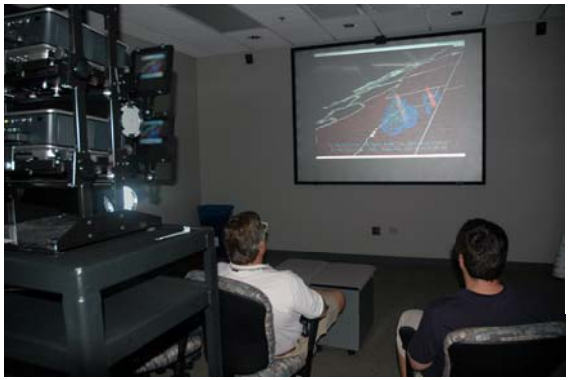


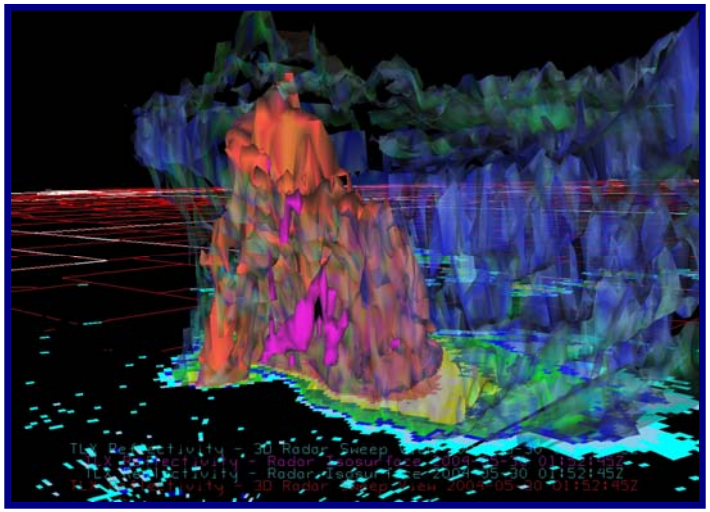
Summary

- ✓Plans
  - ✓ Continue to develop and evaluate Phased Array Radar
  - ✓ Continue research and support deployment of Dual Polarization
  - ✓ Continue research and development to improve the data quality
  - ✓ Continue to research and development of other wavelengths (X, C, K)
  - ✓ Continue to develop and evaluate uses of other radars (commercial, FAA, etc.)

Cross Cuts

- Continue our efforts in:
  - Collocation
  - Collaborations
  - Field Facilities
  - Use of Hazardous Weather Testbed
  - Visualization
  - Decision Support tools





Questions?