

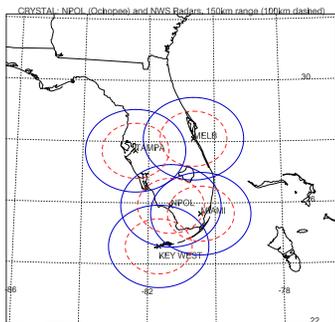
# ARCHIVAL AND APPLICATION OF WSR 88-D (NEXRAD) LEVEL II RADAR DATA FOR CRYSTAL-FACE

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## 1. Goals:

- Study convective and anvil (thickest portion) evolution for priority cases using the WSR 88-D (NEXRAD) radar network.
- Extend NPOL radar precipitation maps to all of South Florida using the NOAA/NWS WSR 88-D (NEXRAD) radar network.

*Applications: 1) Verify mesoscale model simulations. 2) Document anvil evolution.*



## 2. Approach:

- Upgrade of 88-D archival system for Key West, Tampa, Miami NEXRAD sites, prior to CRYSTAL-FACE.
- Archive, process and analyze (for priority days) NEXRAD radar data volumes.
- Use NPOL rainfall estimates to “tune” reflectivity-rainrate relations for the overlapping 88-D radar network (see Kucera et al. poster, this meeting).

## 3. South Florida WSR 88-D Level II Data

- Successful acquisition of complete (> 95%) S. Florida NEXRAD level II radar dataset, via CRYSTAL-FACE contribution to upgrade of NOAA/NCDC radar archival system  
*-Prior to CRYSTAL-FACE, only 65% of South Florida NEXRAD data saved due to unreliable exabyte tape archival. Insufficient for short-duration field campaign.*
- Partnered with NOAA Project CRAFT (Collaborative Radar Acquisition Field Test - CAPS/Univ. of Oklahoma, NSSL, NWS, NCDC) to achieve internet access to Key West, Tampa, and Miami level II data via NCDC.

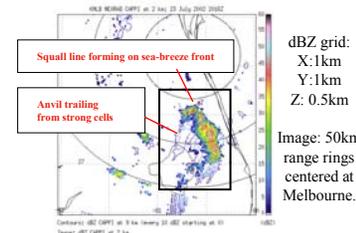


Source: Project CRAFT -<http://kkd.ou.edu/craft.htm> **CRYSTAL-FACE contribution**

- Demonstrated the utility of low cost, fast, and reliable DSL and cable modem connections (now used by many CRAFT sites) from NEXRADs to NCDC.
- CRYSTAL-FACE made the current NCDC archival of S. Florida NEXRAD data possible, which continues to benefit many user communities.

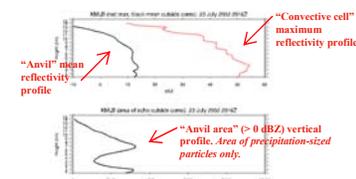
## 4. Evolution and vertical structure of 23 July 2002 case study from NEXRAD

- Image (right) of near-surface reflectivity (2km AGL) shows a squall line forming along sea breeze front at 2016 UTC.
- Superimposed reflectivity contours at 9km AGL show a trailing anvil of precipitation-sized particles (right).



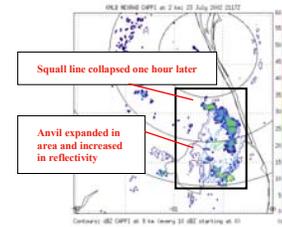
*Vertical reflectivity structure (within box):*

- Strong convective cells, developing anvil region, at 2016 UTC (right).
- Anvil area peaks at 7km AGL, nicely revealed by NEXRAD volumes.

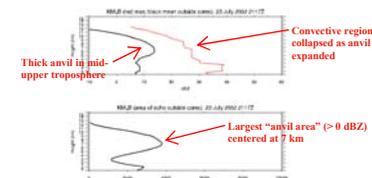


*One hour later...*

- Reflectivity image at 2117 UTC showed the rapidly collapsing squall line (right).
- Superimposed reflectivity contours at 9km AGL revealed an expanding anvil region of precipitation-sized particles (right), with little surface stratiform rain.



- Convective cells collapsed one hour later, while anvil has strengthened in upper troposphere (see profiles, right).
- Anvil of precipitation-sized particles has thickened and expanded greatly in area following decay of convective region.



**To access CRYSTAL-FACE NEXRAD data:** Raw level II data free of charge from NCDC at <http://has.ncdc.noaa.gov/plclimprod/plsql/HAS.DsSelect> Preliminary gridded netCDF volumes for selected radars and days are available from the author at [rickenba@umbc.edu](mailto:rickenba@umbc.edu)