P02

The WSR-88D
Tropical Cyclone Operations Plan (TCOP)
– A Living Document

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Historical Overview:

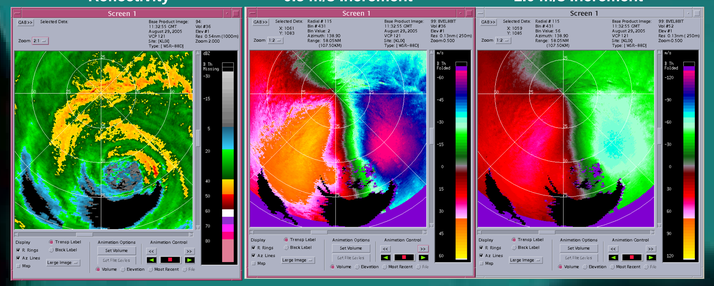
- **The WSR-88D Tropical Cyclone Operations Plan (TCOP) provides guidance on the optimal use of the WSR-88D radar and its products during tropical cyclone events.**
- **It was originally developed in 1994 as a collaborative effort between Colin McAdie of the National Hurricane Center (now the Tropical Prediction Center, TPC) and Dave Sharp of the Melbourne, Florida, Weather Forecast Office (WFO).**
- **Its successful use by other WFOs grew over the years, which led to its incorporation in the National Hurricane Operations Plan (NHOP) in recent years.**
- **Due to numerous changes in WSR-88D software and hardware, responsibility for maintaining the TCOP shifted to the Radar Operations Center.**

Note: Images on this poster are post-analyses using Common Operations and Development Environment (CODEview Graphics, CVG) software except Hurricane Emily images, which used NCDC Java NEXRAD Viewer and actual radar products..

Contents of the 2005 TCOP

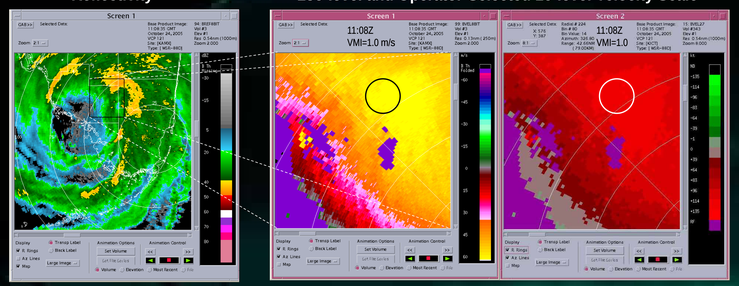
Velocity Increment Enables Products to Display Velocity > 122 kt (e.g., Hurricane Katrina, which had a maximum velocity in this 1132 UTC image of -142 kt at 139°/58 nm, roughly 5600 ft above radar level.)

Reflectivity | 0.5 m/s Increment | 1.0 m/s Increment



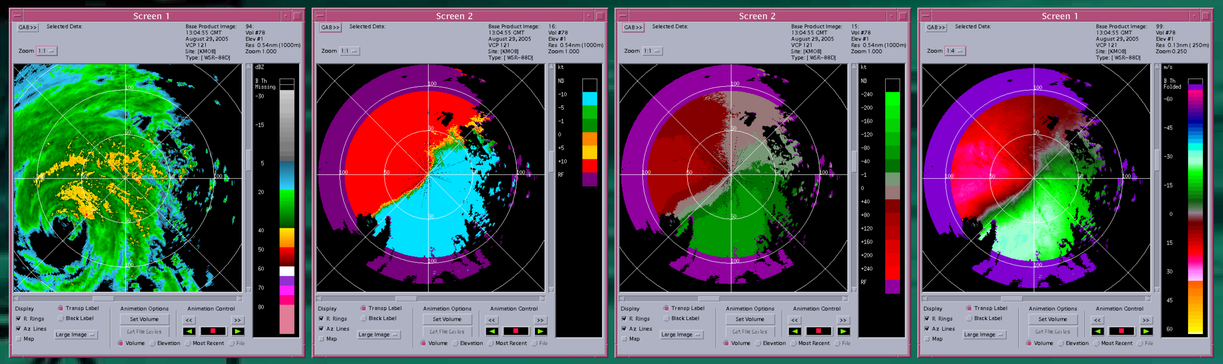
8-Level and 16-Level Velocity Products Have Operator-Selectable Scales (e.g., Hurricane Wilma with max. 138 kt outbound velocity at 1108 UTC)

Reflectivity | 256-level and Operator-Selected 16-level Velocity Scale



Velocity Product Data Levels Help Determine Maximum Inbound and Outbound Velocities and Significant Features Within the Storm (e.g., Hurricane Katrina)

Reflectivity | 8-Level Velocity | 16-Level Velocity | 256-Level Velocity



Main WSR-88D Problems During 2004-2005 Tropical Seasons and What Was Done to Rectify Them

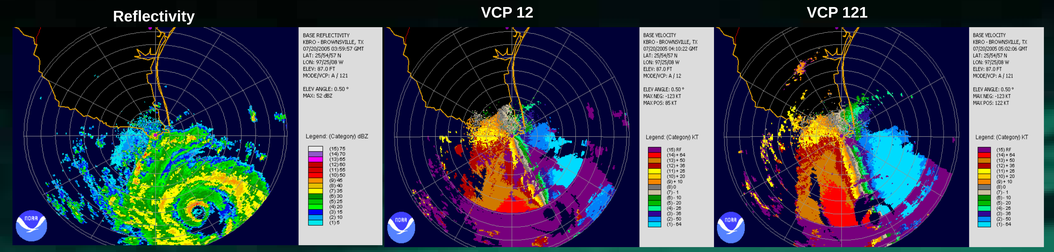
- **AWIPS did not display 256-level velocity properly in 2004. This was fixed in AWIPS Build OB6 (2005).**
- **WFOs were hesitant to use the new VCP 121 in 2004. Its usage increased dramatically during the 2005 season.**
- **Long periods of time without restarting the RPG and reinitializing its database may result in task failures (as occurred in Slidell). This has been rectified in Build 8 RPG software (being distributed in early 2006).**
- **Changing PRFs while in VCP 121 resulted in velocity increment reverting to 0.5 m/s (0.97 kt). This was fixed in Build 8 software.**
- **Communications backup is vital (for both wideband data and product transmission). The NWS CIO's Office is investigating microwave/satellite communications for vulnerable sites (such as Slidell/New Orleans).**

Major TCOP Changes in 2006

- **System Changes**
  - **Coastal WSR-88Ds switched to ORDA by start of hurricane season**
  - **Use of GMAP for clutter suppression**
- **WSR-88D Build 8 RPG-induced Changes**
  - **Main HCI window changes**
  - **New clutter suppression window**
  - **Mode Selection Function window changes**
  - **Precipitation Status window changes**
  - **Corrections to VCP 121 VMI selection and rpgdbm task**
- **AWIPS/WSR-88D Communications**
  - **WAN One Time Requests (OTRs) replace old/limited communications requests by AWIPS**
- **TCOP Procedure Changes**
  - **256-data-level products recommended instead of velocity 8-data-level products**

New VCP 121 (using Multiple PRF Dealiasing Algorithm, MPDA) Mitigates Range Folding (e.g., Hurricane Emily near Brownsville)

Reflectivity | VCP 12 | VCP 121



Dissemination of WSR-88D TCOP and Emergency Notification of Changes

The WSR-88D TCOP is posted on the Web site of the Federal Coordinator for Meteorology and has a link under the National Hurricane Operations Plan:
http://www.ofcm.noaa.gov/nhop/wsr-88d/nat_trop_cyc_wsr-88d_ops_plan.pdf

Short-term notification of changes or updates to the TCOP are done via e-mail from the WSR-88D Field Support Hotline. NWS Regional Operations Centers also help ensure that field sites are aware of the TCOP and any changes in it.

The views expressed herein are those of the authors and do not necessarily reflect the position of the National Weather Service.