

Information “Tid Bits” for Improved WSR-88D Operations

Terminal Doppler Weather Radar (TDWR)/ Supplemental Product Generator (SPG) Data

Two major TDWR/SPG project milestones have been reached since the last issue of *NEXRAD Now*.

(1) TDWR/SPG Modification Note 1, “Retrofit of SPG to TDWR LAN Connection,” was distributed and installed at sites with a TDWR/SPG connection(s). The purpose of the modification was to reduce occurrences of SPG/TDWR LAN connection disruptions due to the FAA Hub to NWS TinyBridge LAN connection 'locking up.' This problem occurred due to the characteristics of the one-way transmit cable (hub to tiny-bridge) and possibly power fluctuations forcing device re-initialization, both of which interrupt broadcasting User Datagram Protocol (UDP) to the SPG located in the WFO. The LAN switch installed between the FAA hub and the NWS TinyBridge will minimize communication problems, and connecting SPG devices into an UPS or 'critical power' source will reduce effects of power fluctuations.

(2) TDWR/SPG program management responsibility was transferred from OS&T to the ROC. While this change is transparent to most field sites and operations, it is a landmark in the progress of providing TDWR data to forecasters and the Central Server/RPCCDS/NOAAPORT.

There have been many instances of WFO and other users integrating the TDWR/SPG data to improve forecast and warning operations. The most recent success story related to TDWR data integration occurred during the late September tor-

nado outbreak in the New York City area. Note the following input from the NWS Eastern Region Radar Focal Point:

The Tornado Warnings issued by the Upton, NY WFO were completely based on the TDWRs. The WSR-88D did not indicate a tornadic threat (beam too high). The forecasters mainly used data from the TJFK TDWR. In addition, TDWRs were also likely very important for Tornado Warnings in Ohio.

The ROC recommends informally interacting with the local FAA TDWR maintenance staff to strengthen relationships and help FAA TDWR maintainers better understand how the WFO uses the TDWR/SPG products during life/property saving forecast and warning operations.



Information on the FMH-11, Part A, Update

The ROC is working with the NEXRAD tri-agencies and the Office of the Federal Coordinator for Meteorology to update the Federal Meteorological Handbook (FMH) Part A to the November 2010 Build 12.1 and Dual Polarization baseline. This update will provide a listing of new Dual Polarization products. A copy of the current Part A is available at: <http://www.ofcm.gov/homepage/text/pubs.htm>. The ROC is beginning work to update FMH-11 Parts C and D to the Dual Polarization baseline, but is not expected to be completed until at least late 2011. Unfortunately, the Part B update will be even later due to staff workloads.

How Long Can the WSR-88D Operate?

At times people see the “88” in the WSR-88D name and assume the system is frozen as of 1988

Continued on Page 12

Tid Bits

Continued from Page 11

technology. Oh, not true! The WSR-88D has undergone continuous modification/retrofit to avoid obsolescence, increase system reliability, control operations and maintenance costs, and meet new system requirements. In addition, original algorithms have been continuously upgraded or deleted, with new algorithms added to the system to ensure the WSR-88D is state of the art and the best radar in the world. We plan to continue this evolutionary process and expect the WSR-88D can be operationally and economically viable until at least 2020. The need for a decision around 2015 is anticipated to determine if the WSR-88D must remain in operation through 2030 or beyond. If so, the ROC expects to implement a Service Life Extension Program (SLEP) that will possibly include: Pedestal Refurbishment; Transmitter Refresh; and UPS Refresh. Please consider viewing a poster regarding this topic, presented by the ROC at the April 2010 NWS MIC/HIC meeting, located at (http://www.roc.noaa.gov/WSR88D/PublicDocs/MIC_HIC_2010_Poster.pdf).

Exclusion Zones...Part of the Enhanced Precipitation Preprocessing Algorithm (EPRE)

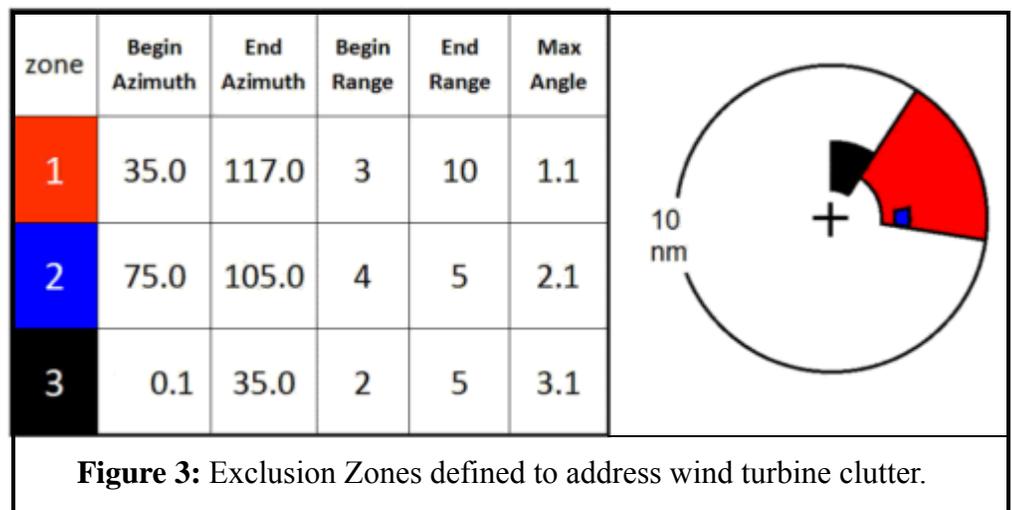
Some WSR-88D sites have areas where clutter filtering cannot completely remove non-meteorological returns. This residual undesired return is usually the result of:

- very high power from ground targets, such as mountain ranges; or
- moving ground-based targets, such as traffic on roads or returns from wind turbines (wind turbine clutter).

To address this problem, EPRE allows radar operators to define exclusion zones; however, some radar users misunderstand what exclusion zones do for precipitation estimation. The EPRE works on the fundamental premise that the lowest unblocked, uncontaminated sample bin will be used at any location for conversion of returned power (dBZ) to rainfall accumulation. Exclusion zones simply tell the EPRE not to use the area within the defined zone(s) for precipitation accumulation estimation, but instead use the next higher elevation angle. Exclusion zones are defined from azimuth to azimuth in the clockwise direction, range to range, and up to a maximum elevation angle. Figure 3 demonstrates one way of defining exclusion zones to address wind turbine clutter at a close range. Exclusion zones only prevent contamination of the rainfall products, and *do not affect* the base data. Up to 20 Exclusion Zones can be defined.

The example below (Figures 4 and 5) illustrates the application of an Exclusion Zone on the KCXX (State College, PA) WSR-88D to reduce anomalously large accumulations of Storm Total Precipitation due to wind turbine clutter (before and after site operators implemented the appropriate exclusion zone).

Continued on Page 13



Tid Bits

Continued from Page 12

Operators having questions about adding an exclusion zone to the WSR-88D can, (1) review Section 7.6.5 of the *RPG Adaptable Parameter Handbook*, or (2) call the WSR-88D Hotline for assistance.

WSR-88D Data Collection, Distribution, and Archive Update

Many exciting events have taken place and are planned for the collection, distribution, and

archiving of WSR-88D dual polarization data and products.

(1) The NWS has implemented a new architecture for the Level II network, as of mid 2010. Read the article “The New Architected WSR-88D Level II Data Collection, Distribution, and Archive Network,” which begins on Page 6 of this issue of *NEXRAD Now*.

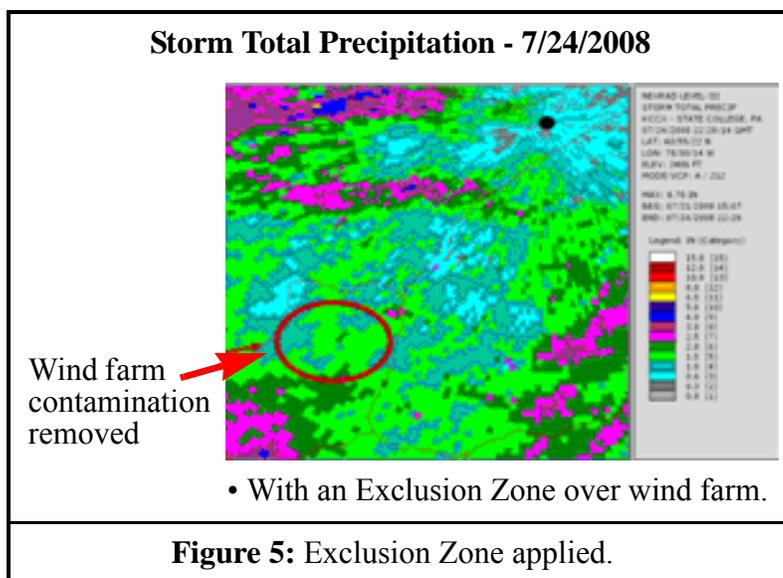
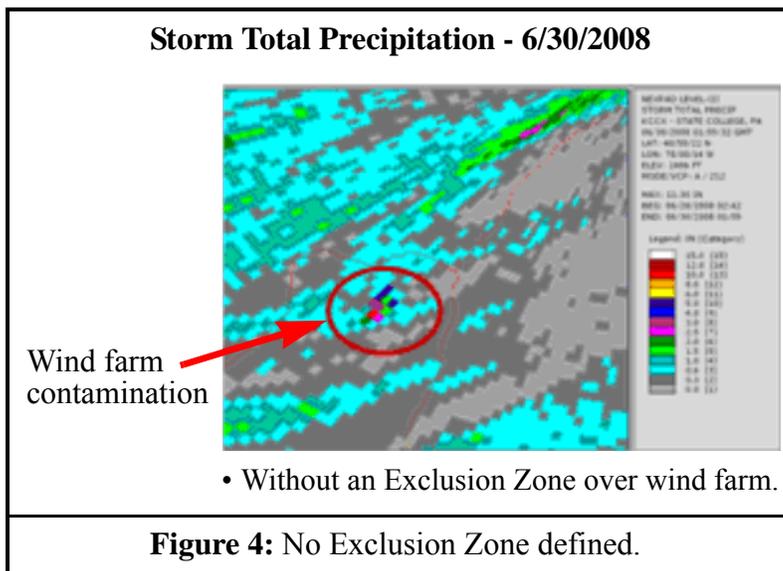
(2) The NWS will add the remaining eight CONUS DoD WSR-88D sites to the real-time network beginning in early 2011.

(3) The NWS will add the three dual polarization moments to the Level II data stream from all CONUS sites as the dual polarization modification is installed, beginning in spring 2011. These data will be critical for optimizing WSR-88D Dual Polarization algorithms and forecast interpretation of the Dual Polarization data for improving forecasts.

(4) The NWS will add 40 products based on the three dual polarization technology to the Level III data stream as the dual polarization modification is installed, beginning in spring 2011. The list of dual polarization products the NWS plans to make available via NOAAPORT and the Central Product Server is located at <http://www.roc.noaa.gov/WSR88D/DualPol/DPLLevelIII.aspx>.

Addition of a Doppler Weather Radar to Western Washington

The plan to add a Doppler weather radar along the western Washington coast is on track for an operational date of 30 September 2011. Since the last issue of *NEXRAD Now*, it has been confirmed that the key WSR-88D assets needed to build a WSR-88D



Continued on Page 14

Tid Bits

Continued from Page 13

(pedestal, transmitter, and RDA) have been transferred from the Keesler AFB, MS maintenance training facility to the NWS for this project. (Air Force technicians will now receive their WSR-88D maintenance training at the NWS Training Center.) This enables the installation date to be a year earlier than that of plans to buy a commercial S-Band Doppler and Dual Polarization radar to meet WSR-88D specifications/requirements. In addition to the earlier operation, the deployment of a baseline WSR-88D will enable the installation of future WSR-88D modifications and dual polarization technology to keep the radar at the state-of-the-science, and part of the WSR-88D network/logistics/training baseline.

WSR-88D Volume Coverage Pattern (VCP) Usage

Ever wonder how often the various WSR-88D VCPs are used? We have provided graphs of monthly usage in 2009 (Figure 1) and the annual average usage for 2004-2009 (Figure 2). The ROC recommends adopting a faster VCP than VCP 21 as the default Precipitation Mode VCP, especially during the “warm” season. The faster updates and more scans at the lower elevation angles improve radar estimates of precipitation rates and accumulation.

Conducting Semi-Annual URC Meetings?

Please remember that Chapter 4 of the *Memo-
randum of Agreement among the Department of*

Commerce, Department of Defense, and Department of Transportation for Inter-agency Operation of the Weather Surveillance Radar-1988, Doppler (<http://www.roc.noaa.gov/WSR88D/>) requires all WSR-88D sites with two or more NEXRAD agencies connected to have semi-annual Unit Radar Committee (URC) meetings. All but four WSR-88Ds should have an active URC, especially as we transition to the Dual Polarization

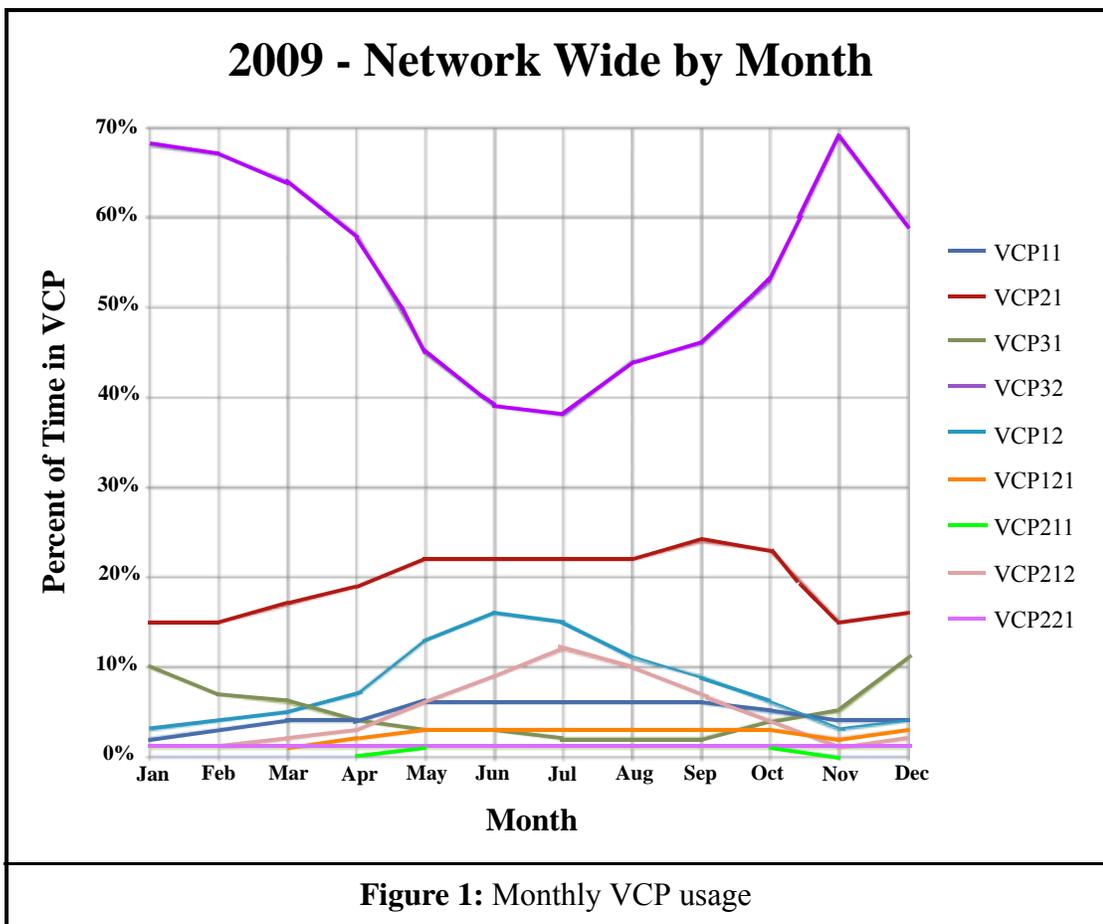


Figure 1: Monthly VCP usage

Continued on Page 15

Tid Bits

Continued from Page 14

technology. Sites should feel free to contact the WSR-88D Hotline with questions regarding starting/restarting their local WSR-88D URC. The Hotline will also be glad to participate in future URC telecons to answer questions or address system-wide topics on the agenda.

WSR-88D Related NWS Notices

With the many changes in products, the addition of Dual Polarization technology, addition of sites collecting Level II data, etc., the ROC has been teaming with NWS HQ to release several Technical Implementation

Notices, Public Information Statements, and Service Change Notices. The archive of these notices can be found at <http://www.weather.gov/os/notif.htm>. Also, many of these notices are listed on the “News & Information” section of the ROC web site: <http://www.roc.noaa.gov/WSR88D/>.

Tim Crum
ROC Director’s Office

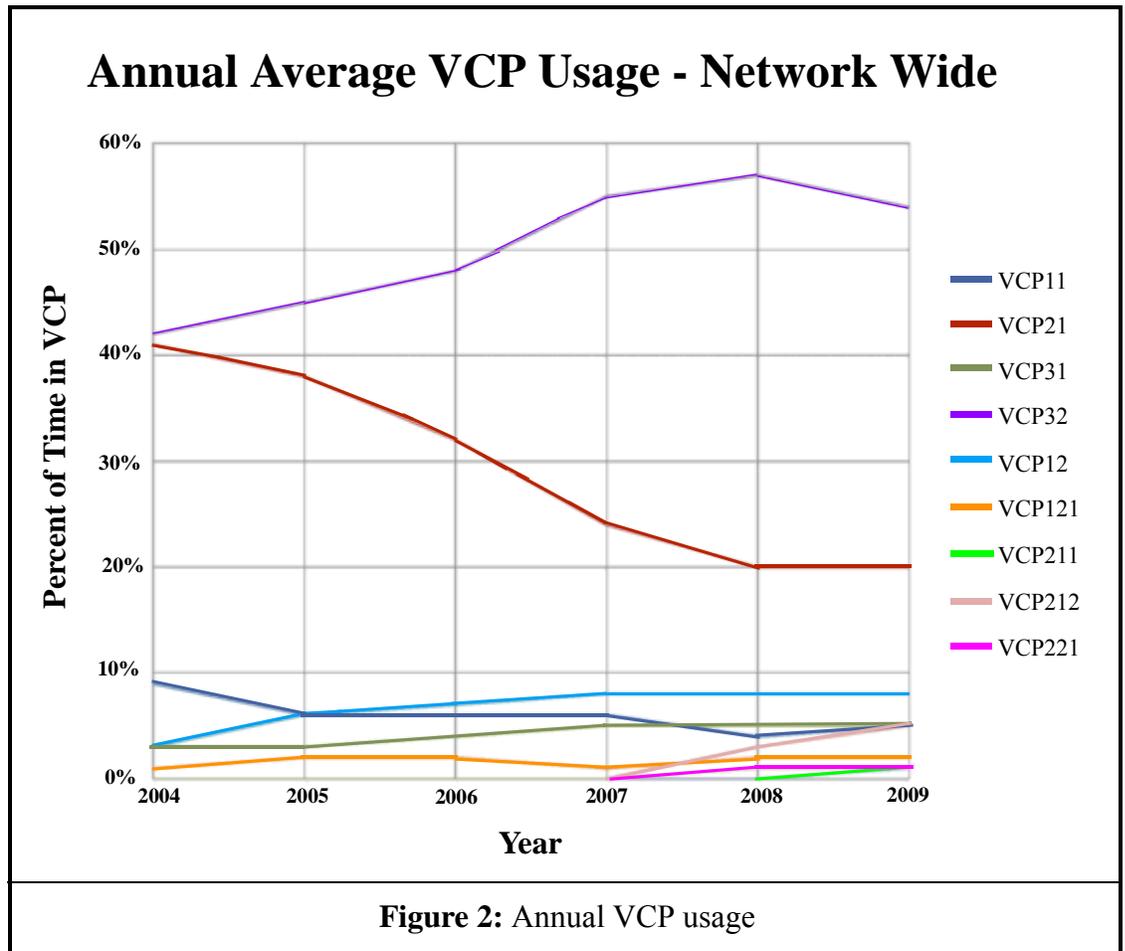


Figure 2: Annual VCP usage