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ZSE Weather Watch

A newsletter from your Seattle ARTCC Center Weather Service Unit

INSIDE THIS ISSUE:

"The NWS proposes to focus development on new forecast products and services that would further reduce weather-related risks and impacts to traffic flow."

CWSU Update *by John Werth, Meteorologist in Charge*

As we transition from a somewhat disappointing summer into fall and winter, it seems like an appropriate time to bring everyone up to date regarding the future of your NWS Center Weather Service Unit. Many of you have been aware of the somewhat uncertain future of CWSUs for quite some time now. Over the years there have been numerous NWS/FAA teams formed to develop plans for consolidation of CWSUs to reduce costs and improve services. In a collaborative effort between the NWS and FAA, the latest proposal would consolidate CWSU services from 21 locations to 3. This business model was designed in response to FAA requirements for more consistent and high-quality aviation weather products and services, focusing on weather impacts to the NAS at a lower cost to the FAA.

The proposal called for a 9-month demonstration and evaluation proof of concept - DemVal - conducted at two separate and secure CONUS locations. As part of the plan, multiple sets of performance metrics would be established to validate the new technology and services provided by the two centers.

However, after careful review by NOAA - NWS's parent agency - it was decided to not forward this proposal to the FAA. NOAA/NWS would instead develop an alternate plan that would maintain the current 21-Center model with a suite of new and enhanced products and services to meet FAA requirements.

Figure 1 - *ZSE CWSU operations area*

On March 12, 2010, NWS delivered the alternative proposal to the FAA which included:

- Keeping meteorologists at the 21 ARTCCs
- The development of a Collaborative Weather Impact Product (**CWIP**) that would provide a consistent, collaborative national forecast of weather impacting the NAS (convection, icing, turbulence, wind, ceiling and visibility).
- Adding meteorologists at the Aviation Weather Center (AWC) to facilitate production of the CWIP 24x7
- Establishing a CWSU Program Manager at NWS HQ as a single point of contact for all CWSU issues
- Establishing a cell of NWS meteorologist at the FAA's Command Center
- Adding additional forecasters at AWC to provide CWSU off-hour support
- Implementing Standard Operating Procedures for all NWS Aviation Weather Services from CWSUs, WFOs, and AWC.

As part of the plan, NWS would also conduct a test project at New York, Chicago, and Atlanta, focusing on reducing weather-related delays at these terminals through enhanced decision support products and services.

*"**CWIP** will be a collaborative hourly forecast (updated every 2 hours) for convection, precipitation type and intensity, ceiling, winds, surface visibility, icing and turbulence.*

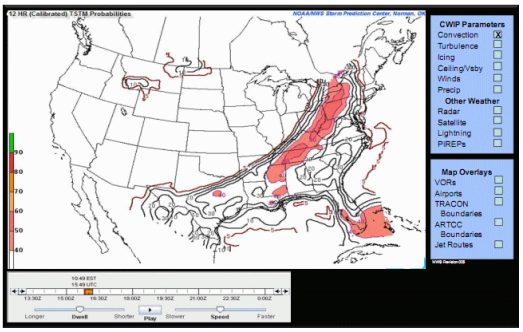


Figure 2 - *Example CWIP thunderstorm probability forecast*

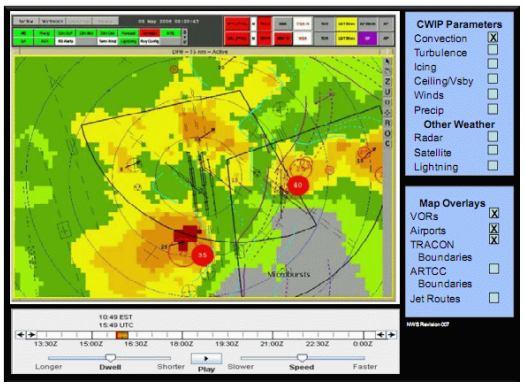


Figure 3 - *Example CWIP TRACON area convective forecast*

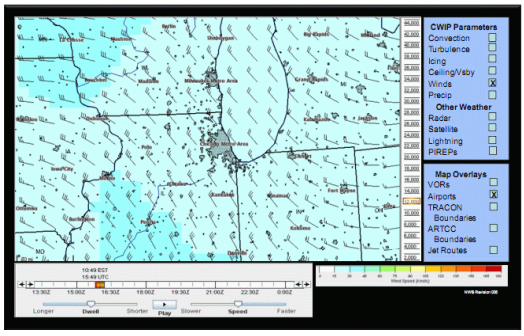


Figure 4 - *Example CWIP FL120 wind forecast*

The FAA responded to the NWS proposal this past July in a letter from Richard L. Day, Senior Vice President, Operations, Air Traffic Organization, to Dr. John L. Hayes, Director, National Weather Service. In his response, Rick Day stated the FAA was not prepared to accept the alternate plan because of an estimated 23% increase in the operating cost of CWSUs along with additional unspecified implementation costs. However, the FAA did commit to continue working toward a mutually acceptable solution, while taking steps to improve aviation weather services in the short term.

To that end, the current CWSU configuration will be continued through September 2011. The following two items will be implemented immediately:

- Standard Operating Procedures will be put in place for ARTCCs to receive weather information from the local NWS Weather Forecast Office when the CWSU closes for the night, and
- Technical requirements will be developed and implemented for new TRACON forecasts for the 10 busiest CONUS TRACONs, similar to the product currently being produced by the Atlanta CWSU.

The FAA also proposed a new FAA/NWS team be established to baseline current capabilities and to develop firm requirements for near-term services out to the NextGen Midterm Operating Capability (MOC) starting in 2015. The team will have until the end of November 2010 to complete these tasks that would be implemented in October 2011. The team will also work on refining performance requirements that could be implemented as early as October 2011. The performance requirements would then carry through to NextGen MOC in 2015.

Under this plan, the FAA expects NWS aviation services at CWSUs, WFOs, and AWC to continually be improved through 2015, at a decreasing cost to the FAA.

So here's the bottom line for ZSE CWSU. We will continue to operate at the Seattle Center through at least 2015. In the coming years though, there will be changes in both the products and the services provided by this office, as well as those provided by the entire suite of NWS offices in support of TFM weather requirements.

New NEXRAD for the Pac NW *by Linnae Neyman*

There are currently six National Weather Service (NWS) radars covering parts of the Seattle ARTCC area, including KATX-Seattle, KRTX-Portland, KMAX-Medford, KBHX-Eureka, KPDT-Pendleton and KOTX-Spokane. (Fig. 5) Because of mountainous terrain covering parts of the Pacific Northwest and the resulting radar beam blockage, there are large gaps in the radar coverage.

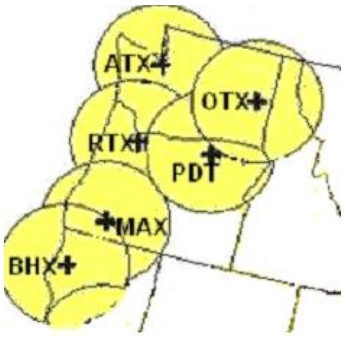


Figure 5 – *Current NEXRAD locations*

In 2011, NWS will install a new weather radar along the Washington coast. This will provide radar coverage to an area that currently has a large gap in coverage below 10,000 feet ASL due radar beam blockage by the Olympic Mountains. (See Figure 6)

Figure 6 - *Gap in coastal radar coverage*

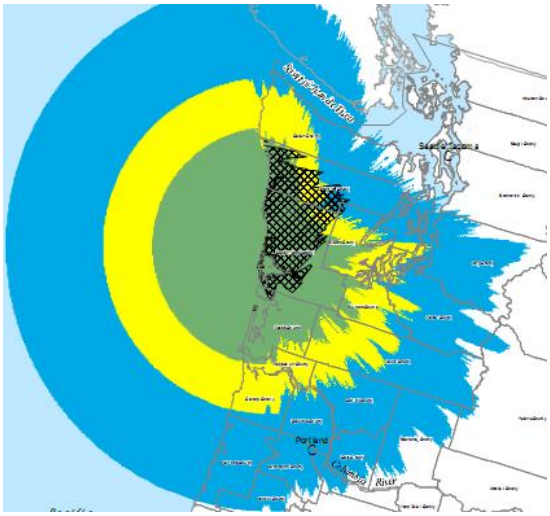
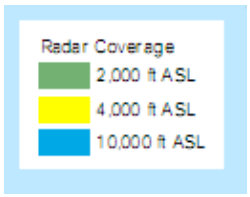


Figure 7 – *Expanded radar coverage*



The radar will be a high-powered, high-resolution, long-range, doppler radar with dual- polarization. It will be located northwest of Hoquiam, WA in Grays Harbor County. It's expected the radar will become operational by Sept. 30, 2011. The new radar will give forecasters full view of storms reaching the Washington coast from off the Pacific Ocean. It will be a refurbished, state-of- the-art, doppler radar - formerly owned by the Air Force. The radar will also be upgraded with the latest Dual-Pol technology as will all NEXRAD radars of next several years. (For information on dual- pol technology, please see the article by Steve Adams in this newsletter.)

The coastal radar will improve radar coverage in the A and B areas over SW Washington, the west slopes of the Olympic Mountains, the Willlapa Hills, the Strait of Juan de Fuca, and the mouth of the Columbia River. It will also improve precipitation estimates in these areas, while improving the detection of atmospheric structure and wind fields over coastal waters. It will significantly improve the detection of severe weather off the WA/OR coast. The upgrade to dual-pol technology will allow the radar to discriminate various precipitation types, such as rain, snow, freezing rain, hail, graupel, etc. The radar will also do a better job at detecting the melting and freezing levels of incoming storm systems and how they vary with time as the storm moves thru the area.

"The new radar will improve the detection of atmospheric structure and wind fields over coastal waters and improve the detection of severe convective storms."

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Dual-Polarization Radar coming to the NW

bv Steve Adams

The National Weather Service's Radar Operations Center (ROC) is in the process of upgrading all NEXRAD-88D weather radars with dual-polarization (or dual-pol) technology. Currently all NEXRAD-88D radars transmit and receive data on radio waves that oscillate (or are polarized) on a horizontal axis. Newer dual-pol technology allows radio wave signals to be transmitted and received on both a horizontal and a vertical axis. (Fig. 8)

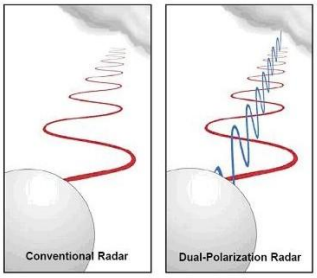

Figure 8 - *Dual-pol horizontal and vertical radar beam*

This will result in better identification and discrimination of water droplets, ice particles, snow crystals and even non-meteorological particles such as birds and insects. Algorithms using the new data sets will be able to:

a) Identify large hail

b) Detect thunderstorm updrafts and determine their strength,

c) Identify areas of rain-snow mixed precipitation transition zones during the winter months

d) Differentiate between precipitation echoes and non-precipitation returns.

There are also promising studies occurring in using dual-pol radar to better determine the more intense or severe areas of aircraft icing. Future issues of ***ZSE*** ***Weather Watch*** will provide more detailed information on new and enhanced radar products that will become available when dual-pol radars become operational.

The current installation schedule will bring the new technology to the Pacific Northwest in the summer and fall of 2011. Hopefully, it won't to too long after that before new radar products begin showing up in WARP.

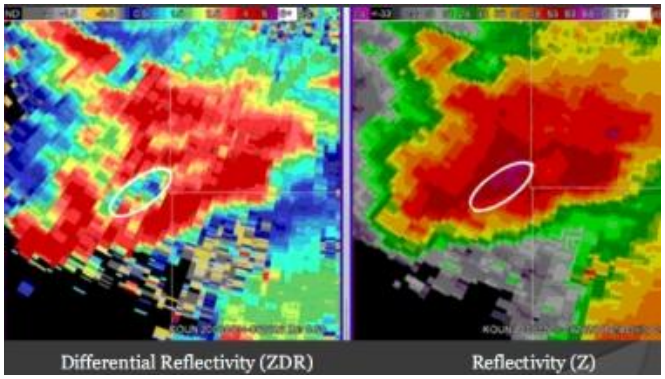

Figure 9 - *Differential reflectivity will allow forecasters to identify areas of hail in strong thunderstorms. Current NEXRAD image (right) shows very strong returns (red area in white circle). Dual-pol (left) discriminates between hail (area in white circle) and heavy rain (areas in red).*

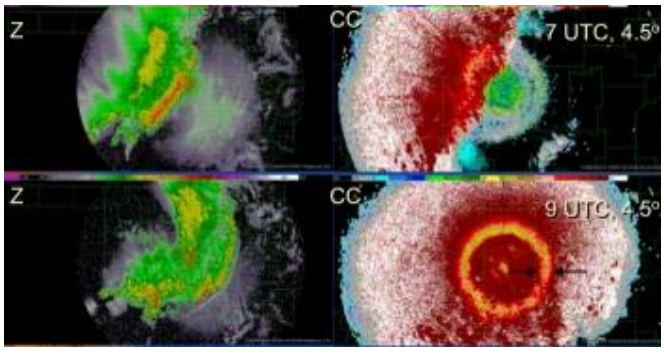

Figure 10 - *Left panels show standard NEXRAD reflectivity display. The bottom right panel shows the dual-pol display of the melting level (yellow circle).*