The U.S. West Coast 449-MHz Wind Profiler Network and New Algorithms to Improve the Detection and Removal of Spurious Signals

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The NOAA Physical Sciences Division (NOAA/PSD) has installed a picket fence of seven 449-MHz wind profilers along the U.S. West Coast. This network is supported by the California Department of Water Resources and the U.S. Department of Energy. The California portion of the network consists of four Vaisala, Inc. LAP-8000 systems. The Oregon and Washington network consists of three Scintec, AG legacy LAP-8000 systems. Engineers from NOAA/PSD assembled and installed the wind profilers, along with Radio Acoustic Sounding Systems (RASS), 10-m meteorological towers, and GPS receivers to retrieve total precipitable water, at each of the seven sites. Because the quality of the real-time data produced by the wind profilers can impact data assimilation for numerical weather prediction and human forecaster interpretation of high impact weather, NOAA/PSD has embarked on a long term research effort to detect, remove and/or reduce the impact of contaminating signals, and thereby improve the quality of real-time wind profiler data. For the locations where these profilers are installed the primary contaminating signals result from ground clutter, radio frequency interference, and migrating birds. Previous attempts to remove these contaminating signals occurred at the time series or spectrum computation levels of the signal processing chain. Some of these techniques are maintained in the current signal-processing program and are augmented by post signal-processing algorithms to enhance spurious signal mitigation. This presentation will describe the profiler network, as well as the algorithms used to remove contaminating signals in order to produce higher quality real-time wind profile data.