



Conservation Corner – Appeared in the *Ferry County View*

WATER FORECASTING

The Stickpin Fire destroyed the Sentinel Butte SNOTEL, located at the headwaters of Boulder and Deer Creeks in Northern Ferry County, on August 14, 2015.

SNOTEL, or Snowpack Telemetry, is a remote, automated, water forecasting system. A typical SNOTEL site consists of solar powered measuring devices and sensors, a shelter to house the radio telemetry equipment, and an antenna that transmits and receives data. Originally constructed in 2003, the Sentinel Butte Snotel was recently reconstructed by the USDA Natural Resources Conservation Service (NRCS). Data transmission resumed on November 5th.

In 2003, Ferry County Commissioners and the Kettle River Advisory Board (KRAB) made a request to the NRCS to install a SNOTEL system in the mountains above Curlew, WA. These groups recognized that successful water management begins with reliable measurements of the primary source of water in the West - snowpack. Original capital to construct the facility came from the KRAB and through Ferry County Title III funding.

The system evolved from NRCS's Congressional mandate in the mid-1930's "to measure snowpack in the mountains of the West and forecast the water supply." NRCS has been monitoring snow depth and snow moisture content on the Boulder/Deer Creek Summit's manual snow courses (strips cleared of trees and brush) since 1960. This manual monitoring has continued while the automated system has been providing additional water forecasting information for the Kettle River Watershed.

The Sentinel Butte site in Ferry County monitors minimum and maximum daily air temperature, soil temperature, moisture, and conductivity, cumulative precipitation, snow depth and snow moisture. These parameters are measured automatically every 10 minutes and transmitted hourly by meteor burst telemetry to master stations in Dugway, Utah and Boise, ID. Data from the Sentinel Butte is then sent to a central computer at the NRCS National Water and Climate Center in Portland, Oregon where it is compiled along with data from 1185 manually-measured snow courses and 858 automated Snotel station in 13 western states and analyzed before being posted in "real time" to the internet for public use. The metadata can be found at:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/or/snow/products/?cid=nrcs142p2_046198

The US Forest Service (USFS) Burned Area Emergency Response (BAER) Team is eager to have the information to feed into their hydrology models when assessing the effects of the Stickpin burn across the watershed. Monitoring post-fire weather conditions can provide the first alert to potential threats to downstream values-at-risk.

Through long term planning and a local agreement with Ferry County, the NRCS, and the USFS this "high tech" site was re-installed. Scott Pattee, WA NRCS Hydrologic Technician said, "After 10 years of providing a continuous stream of snow, precipitation and temperature data, even a major fire can't bring it down for good. The Sentinel Butte SNOTEL is back to work with an extended sense of purpose including public safety for forecasting potential flood flows from the Stickpin burn scar. Thanks to all involved in the preparation and completion of this installation."

NRCS employees from WA and Oregon who participated in the rebuilding of the Snotel included Bill Overman, Dan Fries, Scott Pattee, Patrice Beckwith, Doug Rochester, Bart Ausland, Dave Kreft, and Cheri Carrigan.

Monthly ground-truthing will begin in December and continue through April. Annual maintenance is required to recharge the antifreeze, check sensors and batteries, and clear brush. In Ferry County, this automated site joins a 2014 installation on Gold Mountain on the Colville Indian Reservation, a 2011 Gold Axe installation at the Kettle River-Buckhorn mine site (just across the Okanogan line), and a manual snow course on Vulcan Mountain outside of Curlew. More information about water forecasting and the Snow Survey Program is located at

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/>.

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