QuikScat Sees Santa Barbara 'Quick Dry'

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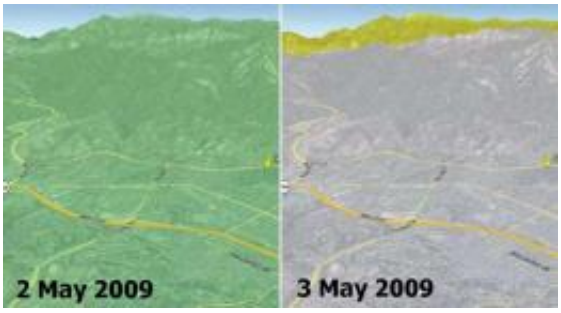

This image shows soil moisture change in the top soil layer (2-inches deep) on May 2 and 3, 2009, as measured by the NASA Quikscat satellite. Image credit: NASA/JPL

Hot weather just before the Santa Barbara, Calif., wildfire quickly dried up soil moisture from rain one day prior, contributing to the fire danger.

Wildfires are a recurring natural hazard faced by Californians. In Santa Barbara County, a wildfire, called the Jesusita fire, ignited on May 5, 2009 in the Cathedral Peak area northwest of Mission Canyon. As of midday May 8, the fire, which was 10-percent contained, had scorched 3,500 acres, damaged or destroyed 75 structures, and had forced the evacuation of tens of thousands of residents.

This image shows soil moisture change in the top soil layer (2-inches deep) on 2 and 3 May 2009, as measured by the NASA QuikSCAT satellite scatterometer (radar). Rainwater increased the amount of moisture in the soil by a moderate 4 percent (represented by the green

color) on May 2, which rapidly dried up on the next day (0 percent, as depicted by the grey color on May 3). Son Nghiem of JPL is leading a science team to develop wildfire applications using QuikScat data.

“Information critical to assessing the conditions leading to wildfires can be obtained from NASA’s SeaWinds scatterometer, a stable and accurate radar aboard the QuikScat satellite,” says Dr. Son Nghiem, a JPL scientist in remote sensing. This is accomplished by using QuikScat data to map moisture changes in the topsoil. As such, QuikScat can detect rainwater that actually reaches the land surface and accumulates on it, rather than raindrops in the air. While rain r adars may detect a significant rain rate, rainwater may evaporate in part before reaching the surface. For example, in the case of dry thunderstorm (known as virga), raindrops disappear on the way down, leaving the land dry, while the associated lightning ignites fires.

For the case of the current fire in Santa Barbara, QuikScat detected a moderate increase of 4 percent in soil moisture on May 2, while rain radar data seemed to indicate a significant and extensive rain. The next day, QuikScat revealed that whatever rainwater that had accumulated earlier quickly dried up over the whole area. The maximum temperature in Santa Barbara approached 90 degrees Fahrenheit and broke the record set in 1984. An important characteristic of QuikScat measurements is that they represent the average conditions over the whole area, rather than some disparate data collected at a few localized points. The rapid dry-up in Santa Barbara together with high temperatures and high winds led to the devastating Jesusita fire.

Soil moisture information is critical to enhance the capability for Red Flag Warning and to improve the National Fire Danger Rating System. QuikSCAT can provide such data.

NASA's Quick Scatterometer (QuikScat) spacecraft was launched from

Vandenberg Air Force Base, California on June 19, 1999. QuikScat carries the SeaWinds scatterometer, a specialized microwave radar that measures near-surface wind speed and direction under all weather and cloud conditions over the Earth's oceans.

Provided by JPL/NASA (news : web)