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RESEARCHERS TRACK SMOKE PLUME FROM BURNING TIRES

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Graphics are included in a separate file at
<http://www.ersc.wisc.edu/research/TireFire/>

MADISON – University of Wisconsin-Madison researchers are using satellite imagery to measure the extent of a massive smoke plume rising from a fire at a tire recycling facility in Watertown, Wisconsin.

According to news reports, the fire began around 10 AM on Tuesday, July 19. Just over four hours later, NASA's Aqua satellite passed over the region and captured an image of the smoke plume. By this time – 2:20 PM – the plume of smoke extended 150 km (93 miles) to the southeast, stretching across Milwaukee and over central Lake Michigan. A total of 1650 square kilometers (637 square miles) were covered by the plume, including 750 square kilometers (290 square miles) of Lake Michigan.

The image was collected by an instrument called MODIS, one of several sensors on the Aqua satellite. While the resolution, or level of detail, in MODIS imagery is very coarse (individual pixels have diameters ranging from 250 to 1000 meters (820 to 3280 feet), the sensor provides daily coverage of very large areas. This allows scientists to use MODIS to monitor atmospheric and lake-surface conditions across the entire Great Lakes region on a daily basis.

Researchers at the university's Environmental Remote Sensing Center processed the raw image data to enhance the visibility of the smoke plume. While the plume can easily be seen over land, it is more difficult to detect over the dark background of Lake Michigan's water. A statistical technique known as Principal Components Analysis (PCA) helped bring out the full extent of the smoke.

Examples of the satellite imagery can be viewed on the Web at www.ersc.wisc.edu.

The UW-Madison researchers are using the MODIS imagery as part of a larger project to develop satellite-based methods for analyzing water quality in Green Bay and Lake Michigan. The project is supported by the University of Wisconsin Sea Grant Program and the National Aeronautics and Space Administration (NASA) UW Affiliated Research Center (ARC).