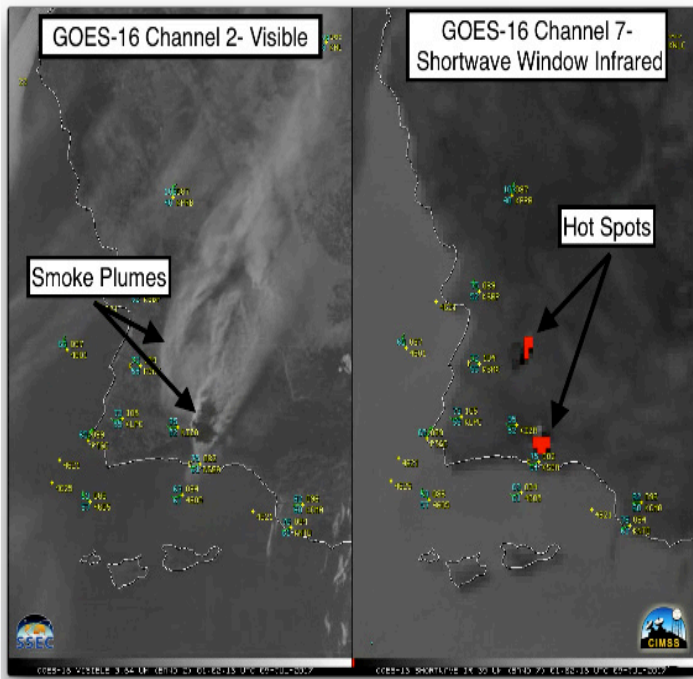




Monitoring Wildfires with Weather Satellite & Radar

Once wildfires are underway, it is important to continue monitoring Oklahoma Mesonet data – especially wind data for early cues of possible wind shifts. However, other datasets – namely weather satellite and radar – are better suited for confirming the presence of on-going fires as well as their changing coverage.



A significant upgrade in weather satellite technology arrived in late 2016 with the launch of the new GOES-16 weather satellite (officially commissioned as the new GOES-East in late 2017). The satellite boasts 3x more channels, 4x better resolution, and 5x faster scans than the satellite it replaced. Among the 16 available channels on the satellite are several that are useful for wildfire monitoring, including Channel 2 (visible channel) and Channel 7 (shortwave window infrared). The visible channel is effective in capturing the presence of smoke plumes (see above example), however, it is limited to daytime use only. The shortwave window infrared channel is the ideal GOES-16 channel for wildfire detection due to its sensitivity to increases in temperature. These increases appear as dark “hot spots” at the location of fires amongst cooler surrounding temperatures (see above example, which also includes colored enhancement). Channel 7 can be used day or night and tends to detect hot spots before smoke plumes are apparent in the visible channel during daytime wildfires.

Weather radar is another good tool for monitoring wildfires, which are observed as smoke plumes in Base Reflectivity. The example at the right shows a series of smoke plumes observed in reflectivity from the Dodge City, KS radar during the early portion of the 6-7 March 2017 wildfire outbreak. Smoke plumes align with the winds in the atmosphere and appear on radar as a streak of reflectivity with an anchored end (fire side of the plume). However, unlike satellite monitoring of wildfires, radar cannot observe all wildfires nor does it provide accurate location information of the fire itself. Radar often misses smoke plumes that are low in the sky or located far from the radar (smoke stays “under the radar”). Radar is an important detection tool but keep in mind these limitations.

