During the Iraq War in 2003, a fire at a sulfur plant created a toxic SO$_2$ gas cloud detected by NASA’s TOMS instrument. During the battle for Mosul in 2016, the same sulfur plant was set alight again, with SO$_2$ emissions tracked by OMI.
References:
Total Ozone Mapping Spectrometer (TOMS) observations of the sulfur fire in Iraq in 2003 are described in the following paper:

The current (2016) sulfur fire in Iraq is ongoing at this time and we hope to write a paper on the event within the next few months.

Data Sources:  Ozone Monitoring Instrument (OMI) observations of the 2016 Iraq sulfur fire use new operational OMI SO$_2$ products described in this paper:


These new SO$_2$ volcanic and pollution products, produced by the Goddard Ozone Monitoring Instrument (OMI) SO$_2$ team at code 614 (Can Li (614/ESSIC) and Nickolay A. Krotkov (PI- 614)), are currently ingested within three hours into NASA’s Land, Atmosphere Near real-time Capability for EOS (LANCE) platform, which enables multi-product and multi-satellite near real-time (NRT) imagery generation using the public NASA Worldview web application (https://worldview.earthdata.nasa.gov/) used to produce some of the images on slide #1.

Technical Description of Figures:
Graphic 1 (left): This shows the cover of Geophysical Research Letters from 2004 featuring the first Iraq sulfur fire observed by Earth Probe TOMS

Graphic 2 (right): This shows OMI and MODIS observations of the 2016 Iraq sulfur fire. The background NASA Worldview figure shows that OMI detected high concentrations of SO$_2$ in the sulfur fire plume (purple to red) over northern Iraq on October 24, overlaid on an Aqua/MODIS RGB image from the same day. Other images show OMI SO$_2$ retrievals on October 21 and October 24. According to a Washington Post news article on October 23, the toxic SO$_2$ plume originated from a fire set by Islamic State militants at the Mishraq sulfur mine, about 25 miles southeast of Mosul. The fire was also reported by BBC News on October 22 (http://www.bbc.com/news/world-middle-east-37738667). Plumes of SO$_2$ from the fire were first detected on October 21 and have been observed every day since then (as of October 25).

Scientific significance, societal relevance, and relationships to future missions: The SO$_2$ emissions from the fire created serious air quality issues in Iraq, with several deaths attributed to the fumes. This is an example of air pollution being used as a weapon – the deliberate setting of a sulfur fire to create a toxic gas cloud. Satellite observations of such events are crucial to assess the geographic extent of the air pollution, estimate ground-level concentrations of SO$_2$, and forecast transport into other regions. Such sulfur fires also produce a relatively pure SO$_2$ cloud, which is rarely observed in the atmosphere (other anthropogenic and volcanic SO$_2$ emissions are mixed with a variety of other gases and particles), which could be used to improve understanding of atmospheric sulfur chemistry.