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Gas Exploration in the Green River Basin, USA 1989-2004

Rapid development of gas and oil exploration wells raises concerns about safeguarding the region's wildlife, air and water resources.

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Irrigated agriculture is emptying India's groundwater reserves: sustainable management needed

Using satellite measurements and techniques, scientists have found that agriculture is responsible for most of India's water withdrawals.

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2008 was the ninth-hottest year in 130 years; the last 10 years have been the warmest 10-year period in the modern climate record (NOAA).



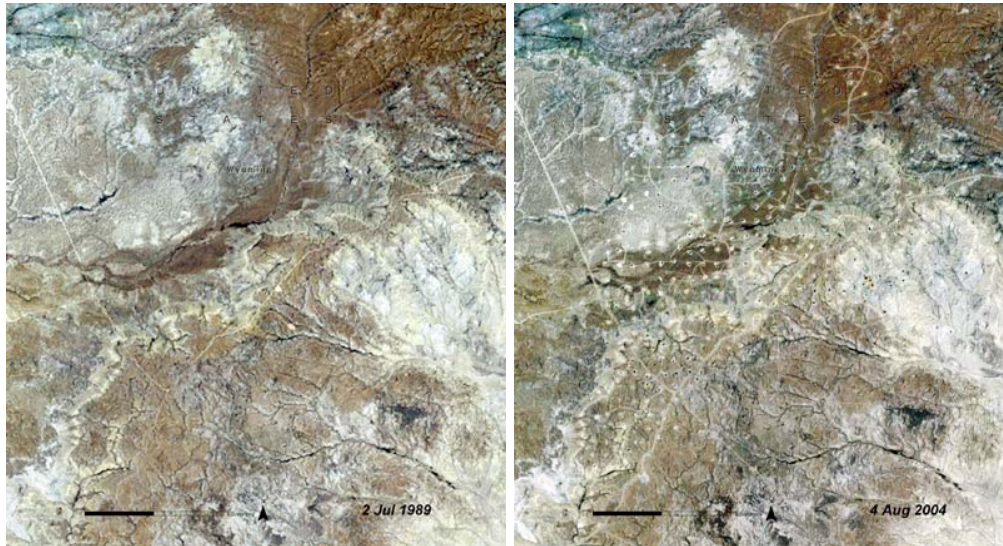
Forest Fires in Greece

On 24 August 2009, six major wildfires were burning in Greece, consuming more than 15,000 hectares of forest and brush.

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Environmental **Hotspot** Alert

Gas Exploration in the Green River Basin, USA 1989-2004



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The Upper Green River Basin (UGRB) is western Wyoming's sagebrush steppe, a landscape punctuated by ribbons of wildlife habitat, stunning vistas, and important cultural sites. The basin serves as the winter home of large herds of pronghorn antelope and mule deer, which migrate into the area from the highlands of Grand Teton and Yellowstone National Parks.

With its extraordinary reserves of oil and natural gas, the UGRB has become a focal point for the oil and gas industry. Over three thousand wells in the UGRB (black dots in the centre of the 2004 image) have been approved and development is occurring at a rapid rate—one that exceeds the Bureau of Land Management's "reasonably foreseeable development" plan by more than 300 per cent. The environmental impacts of this rapidly escalating oil and natural gas development are not clear, and conservationists are pressing for measures that will help safeguard the region's wildlife, air and water resources.

Source: <http://na.unep.net/atlas/webatlas.php?id=167>

[back to top](#)

Environmental Science Alert

Irrigated agriculture is emptying India's groundwater reserves: sustainable management needed



Northern India's aquifers are draining faster than rainfall can replenish them. Scientists using satellite measurements and techniques have found that agriculture is responsible for most of the withdrawals. During the Green Revolution in India, policies to boost agricultural production led to a near tripling of irrigated land between 1970 and 1999. A study in the states of Rajasthan, Punjab, and Haryana (including Delhi) show that between 2002 and 2008, more than 109 cubic kilometres of water was sucked out of the ground. This represents twice as much as the water contained in India's largest surface-water reservoir. About 95 per cent was for irrigation, which covers about 28 per cent of the land in the three states. Some 114 million people live in the region and they will suffer from food and water shortages if nothing is done soon to sustain the aquifer's water supplies. Another study of four agricultural areas in northern India, Pakistan, and Bangladesh reinforces this conclusion. Scientists used satellite techniques that measure variations in the Earth's gravitational field to monitor changes in groundwater variability in the region. They found that between 2002 and 2008, groundwater was being lost at a rate of more than 54

cubic kilometres a year. Some 600 million people or about one-tenth of the world's population relies on this disappearing underground water. The demand for both agricultural products and groundwater is expected to rise in coming years. There will be major water crises unless action is taken to recharge groundwater resources. Studies such as these point to the urgent need to manage water resources sustainably.

Source: Rodell, Mathew, Isabella Velicogna, and James S. Famiglietti. "Satellite-based estimates of groundwater depletion in India." *Nature* (advance online publication), August 2009.

[back to top](#)

Near Real-Time Environmental Event Alert

Forest Fires in Greece



Figure 1. On 22 August 2009, flames raced through the forests northeast of Athens, Greece, when the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite captured this image. Areas where the sensor detected fire on the ground are outlined in red. This image also shows the white trail of smoke from one of the fires being blown southerly towards the Mediterranean Sea.

Several forest fires occurred since 21 August 2009 in the prefectures of Attica and Boeotia, north-west of Athens. Many residents had to be evacuated from their homes.

As of 24 August, six major wildfires burned in Greece, consuming more than 15,000 hectares of forest and brush, reported the Associated Press. The fires destroyed homes and forced evacuations, but caused no serious injuries to date, said the Associated Press.

Hot, dry summers make Greece prone to fire. In 2007, massive fires on the Peloponnesus Peninsula killed 76 people and burned vast tracts of forest.

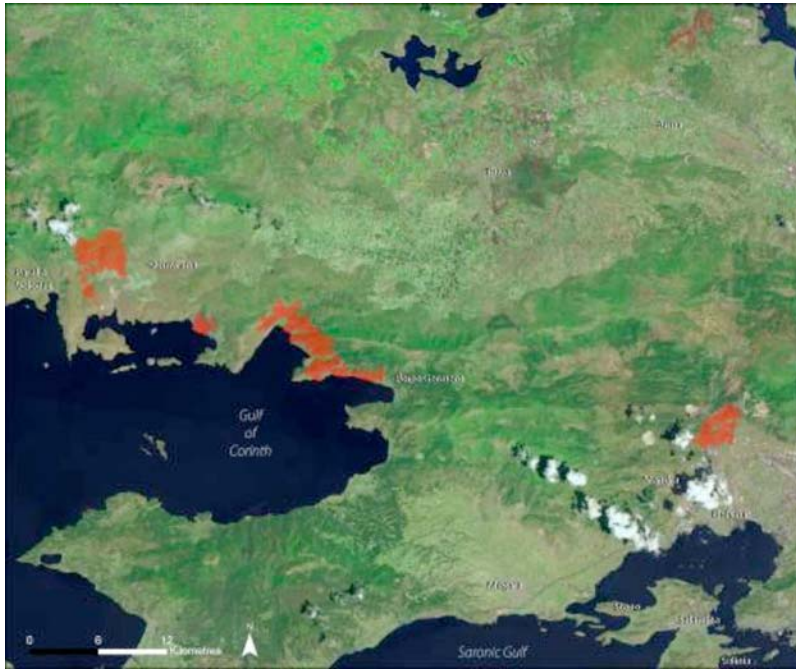


Figure 2. This image shows the location of burnt areas on 25 August 2009. The burnt areas (reddish coloured polygons) are superimposed on a Landsat 5 image of the general area taken on 8 July 2009 (before the fire).

According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Reliefweb estimates, by 25 August 2009, the fires had affected 773 ha of agricultural land and 3 463 ha of forests and shrublands.

Source: Gatopoulos, D. (2009, August 24). Fire crews scramble to tame Greek fires, save nuns. Associated Press (Accessed on 28 August 2009).

NASA 2009. NASA Earth Observatory, <http://earthobservatory.nasa.gov/IOTD/view.php?id=39913&src=eo-a-iotd> (Accessed on 28 August 2009).

Reliefweb 2009. United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Greece - Porto Germeno Disaster Extent - Burnt Areas - August 25, 2009, <http://www.reliefweb.int/rw/rwb.nsf/db900SID/HHOO-7VCMHE?OpenDocument&rc=4&emid=WF-2009-000162-GRC> (Accessed on 28 August 2009).

[back to top](#)

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