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**Thematic Focus: Resource Efficiency, Harmful Substances and Hazardous Waste, Disasters and Conflicts, Environmental Governance, and Ecosystem Management**

## **Satellite images record how wildfires have destroyed one million hectares of forests in western Russia**

### **Why is this issue important?**

Some types of forest ecosystems in Russia are adapted to wildfires and fire-tolerant trees such as pine (*Pinus*) can withstand high temperatures. Such forests regenerate quickly after fires have swept through. The summer of 2010 was the hottest in Russia in 130 years, however, and frequent temperatures as high as 40°C dried trees that are not fire-tolerant (such as birch), other vegetation, and peat bogs, making them a fire hazard. The heat wave began in June, and by August, fires started by lightning or careless human activity had burned more than 15 million ha of vegetation, including forests and crops (Gilbert 2010). Heat waves and forest fires can also destroy crops: Russia produces about eight per cent of the world's wheat (Hernandez and others 2010), so any threat to its harvest has global repercussions. In addition, smoke, ash and dangerous gases from wildfires affect air quality, with impacts on human health, while forest fires can consume homes and other infrastructure and cause human casualties.

### **Why are the findings and implications?**

Recent satellite images show that the summer fires in 2010 destroyed more than one million hectares of forests in western Russia alone and harmed approximately 40 000 ha of protected forest area (UNEP 2010). At one point, states of emergency were in effect in 14 regions in Russia. Forest fires in the western region around Moscow (Figures 1) produced smoke, dust, and dangerous gases that polluted the air; in some places, carbon monoxide was 10 times the permitted maximum (Figure 2). At least 53 people have died and 806 have needed medical attention. Houses have burned and harvests have been lost—including some 10 million hectares of grain (Gilbert 2010).

Figure 1: Extensive forest fires in the western region around Moscow and in the Ural region produce clearly visible smoke clouds larger than 1 000 km in extent (Source: NASA 2010).

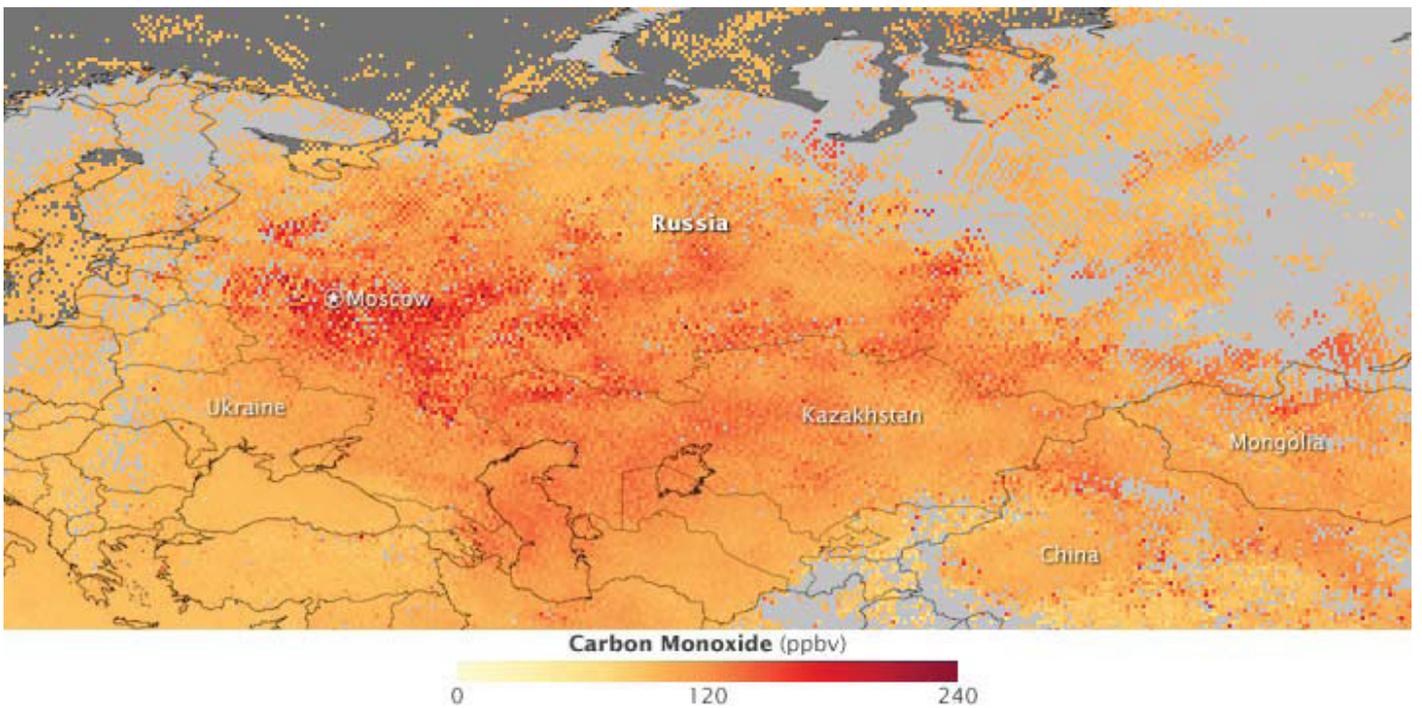
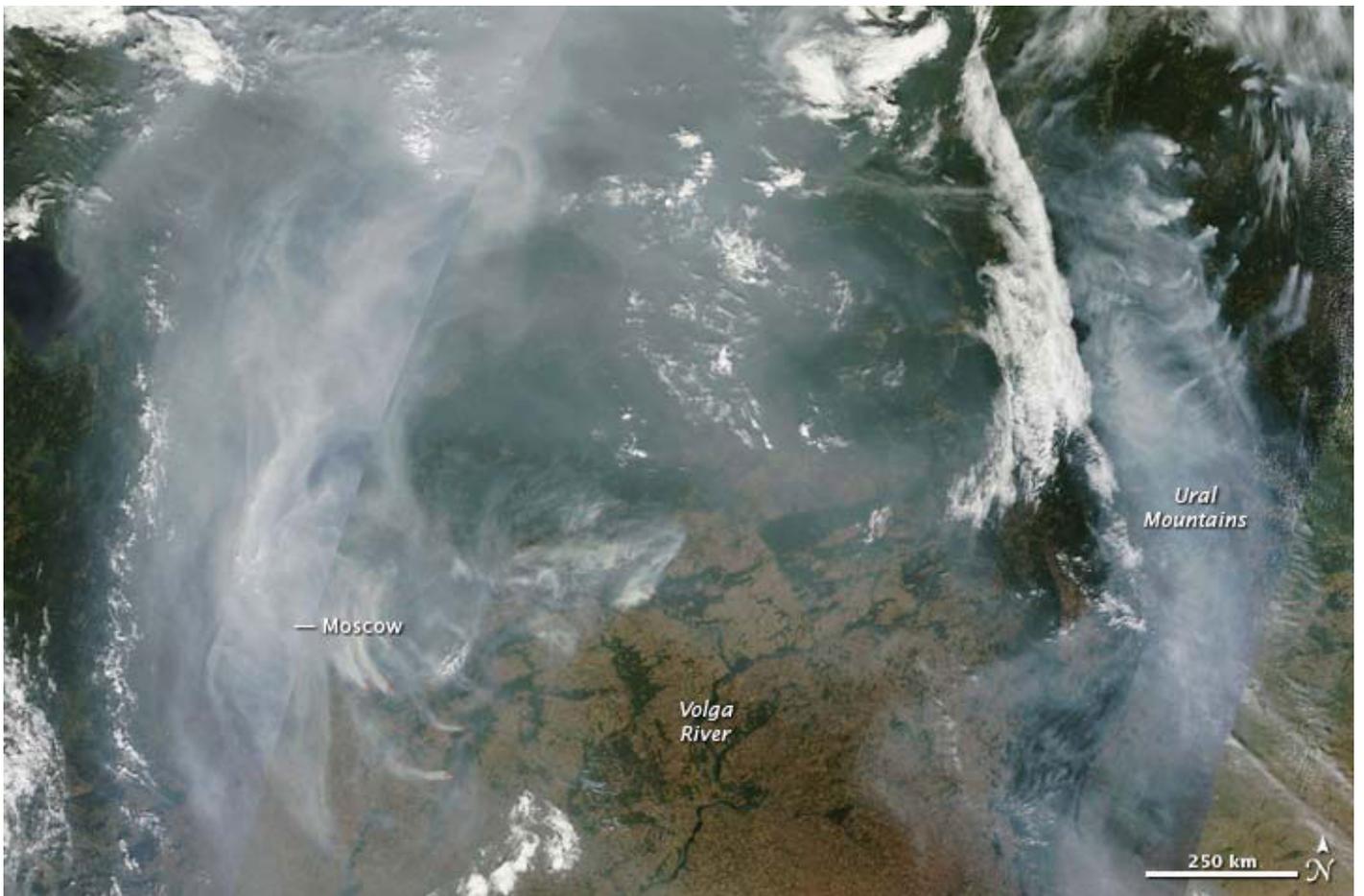


Figure 2: Carbon monoxide concentrations in the atmosphere between 2 and 8 km above Russia as recorded from 1 to 8 August 2010 by NASA (MOPITT). Ground concentrations of this dangerous gas are reported to be much higher, causing people to report headaches, dizziness, and other more serious conditions.



Figure 3: The forest fires near Moscow cover the Red Square in smoke and ash

The recent drought and associated fires destroyed 20 per cent of Russia's wheat crop, which represents a 1.6 per cent decline in the global wheat supply

The Russian meteorological agency has noted that the number of dangerous climate events, including heat waves, has doubled over the past 15 years (InfoRussia EU 2010). Climate change and increased climate variability could make such wildfires more common and extend their spread (UNEP 2010). Some areas could also continue to dry out, preventing forests from growing back and leading to the encroachment of grasslands, which are more vulnerable to wildfires. New legislation in 2007 making local regions responsible for forest management, and the lack of capacity of these agencies to protect forests and peat lands may have had a role in the fire severity (WWF 2010).

(Gilbert 2010). As a result, Russia froze the export of grain, including wheat, barley, rye and corn, from 15 August to 31 December 2010. Forecasts suggest a 38 per cent decline in the 2010 harvest compared to 2009 (Hernandez and others 2010), with likely implications for food security in some regions.

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