

Fiddling while Siberia burns: 'lungs of Europe' under threat from forest fires

Russia's pristine forests are the lungs of Europe. But vast swathes are being destroyed by global warming and loggers' greed - and ill-equipped firefighters are powerless to act, reports Steve Connor

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The vast forests of northern Russia are one of the last great wilderness areas of the world. They are the lungs of the northern hemisphere, soaking up the carbon dioxide emissions that float across Siberia on the prevailing winds from the industrial regions to the west. Yet they are also under threat from an unprecedented surge in the number, frequency and scale of forest fires.

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Twenty years ago forest fires destroyed about two million hectares of Siberian forests - the loss of an area the size of Wales. Last year 22 million hectares - about half the size of France - were lost to fire. Russian forestry scientists said they were bracing themselves for this year's fire season, which starts in late June.

Siberia's largest forest, the taiga, accounts for one fifth of the world's total forested land and contains half of the planet's evergreen forest. Yet in the space of a couple of decades this seemingly unlimited expanse of trees has suffered an unprecedented tenfold increase in the rate of deforestation caused by fire.

Lightning strikes in the dry summer months have meant that forest fires have always been a natural feature of the Siberian taiga. But Anatoly Sukhinin, head of the forest fire laboratory at the Sukachev Institute of Forest in the Siberian city of Krasnoyarsk, said that global warming, government underfunding and arson by loggers had caused a dramatic and unnatural surge in the number of fires.

"Late June and early July is when fires are most likely to occur and we are expecting some very fierce fires then," Dr Sukhinin said. "It is getting worse and it is a fact. The extent of fires and the extent of emissions is on the rise in the Russian federation," he said.

"There has been at least a tenfold increase in the size of the area. You ask me about why this is happening? There are two factors in play here. One factor is global warming, and there is absolutely no doubt that this is happening. Global warming results in more extreme droughts, greater droughts, longer droughts, and more frequent droughts," Dr Sukhinin added.

"The other factor is underfunding. We are critically underfunded. We cannot do a good job to preserve and protect our forests. There is very little money to fund such work. We have some equipment left from the old times, we have some organisational support, but they are critically underfunded by the government. We are practically penniless. There is not enough money," Dr Sukhinin said.

In Russia, forests are under federal protection and it is up to the government in Moscow to make all the important funding decisions, he said.

"One of the reasons why the federal government is not doing a good job putting out all these forest fires is that our timber does not cost that much. Our forests are pretty inexpensive, at least in comparison to foreign timber and foreign markets, and once there is a fire, the area affected by the fire costs nothing and is of minimal market value," he said.

But part of the reason for the explosive growth in the number of forest fires in Siberia is also due to deliberate arson by criminals who use fires as an excuse to exploit the system of logging licences. The federal government in Moscow issues

cheaper licences when the land has already been scarred by a fire, even though much of the timber is still perfectly useable - often only the foliage and undergrowth is destroyed, which makes tree-felling even easier.

"After a fire, the timber improves and is even better, it comes in better quality after a fire, and that is the time when people can come in, fell the trees, and sell the timber to China and get good money," Dr Sukhinin said.

"The Chinese pay good money, and they pay the same money for timber from affected areas as for timber from unaffected areas, and that is the reason for the arson. If you want to fell good forests that have not been affected by fires, you have to pay a lot for the licence. But affected-area licences are pretty cheap," he said. The Sukachev Institute of Forest in Krasnoyarsk - where the British Council last week launched an exhibition on global warming called Zero Carbon City - is Russia's pre-eminent centre for forestry research. Yet the institute has seen its resources dwindle since the fall of the Soviet Union in 1992.

Even though Russia has developed its own fire-fighting aircraft for the export market, the institute has none of its own planes and has had to resort to expensive leasing arrangements, often with foreign companies.

"If we have to use an aircraft we have to pay for the lease of the aircraft. We don't own our own aircraft fleet. The leasing is pricey, that's why we don't have enough aircraft at our disposal to be effective against forest fires," Dr Sukhinin said.

"Most of the time we have to lease these aircraft from abroad, not locally. Russia leases and sells these aircraft to foreign countries but doesn't have any of its own," he said.

One practical development since the fall of the Soviet Union has been the dramatic increase in active collaboration between the Sukachev Institute and Western scientists. The American space agency, Nasa, has for instance supplied vital satellite data to help the Russians to track forest fires in the remoter regions of Siberia.

In one satellite image taken in June 2003, for instance, some 157 fires across an area of 11 million hectares could be monitored simultaneously. The smoke plumes from this conflagration reached Kyoto in Japan, about 5,000 miles away.

But the effects of Siberia's gigantic fires can be felt much further afield. In the same year, smoke from Siberian forest fires affected the air quality in the west coast American city of Seattle across the Pacific Ocean. In the first week of June, Seattle's air monitors recorded levels of ground-level ozone that were 17 parts per billion by volume higher than they would otherwise have been, pushing levels over the health limits set by the US Environmental Protection Agency.

Dan Jaffe, an environmental scientist at the University of Washington, Bothell, said that in the past the possibility of long-range transport of pollutants was not considered to be particularly significant. "What we're finding is that these events can bring in significant levels of pollution, even to urban areas where the levels already are relatively high," Dr Jaffe said.

"Siberia has perhaps warmed more than anywhere else on the planet in the past 50 years. If there is increasing burning in Siberia, then we will see higher levels of ozone [in Seattle]," he said.

It may seem strange that a forest fire in one part of the world can cause effects in another, but weather patterns do not respect national boundaries and the size of the Siberian forests means that fires can run out of control for weeks on end.

It is difficult to comprehend the sheer scale of the Siberian forests, which extend from the Urals in the west to the Pacific coast of the Kamchatka peninsula in the Russian far east. Some of the forests are so remote that they have been barely explored, let alone exploited.

The trees range from evergreens such as larch, pine, spruce, fir and Siberian pine to deciduous species such as lime, oak and birch, which grow mainly in southern regions. Long winters and short summers mean that trees are slow growing and even a 200-year-old larch can have a slender trunk.

Eyvgeni Petrenko, a former director of the Sukachev Institute and veteran forester of 50 years standing, estimates that between 30 and 50 per cent of the Siberian forests are completely pristine and untouched by human activities. Most of these regions are in the north and north-eastern Russia, where larch trees are even able to grow on the permafrost, which extends for between 100 and 300 metres below the ground.

A distinctive feature of Siberia's forests is that most of them - some 70 per cent - grow on ground that is permanently frozen. In principle this should make them more resistant to fires because the ground remains soggy during the summer months, yet with warmer, drier summers even this has not made them immune to fire.

And when fires do begin in these permafrost regions, the ground is changed permanently. Trees are unable to grow back as

easily as in the warmer regions to the south. "Forest fires have always been a natural feature of Siberia and they have in the past been of little concern. But we know that people set fire to the forest intentionally. We see a lot of it on the border with China and Korea," Dr Petrenko said.

The link between people and forest fires was confirmed earlier this year in a landmark study conducted by Nasa scientists using an imaging instrument on board the space agency's Terra satellite. The moderate resolution imaging spectroradiometer instrument was able to compare the location of forest fires in central Siberia over a three-year period with the position of roads, railways, towns, cities and other industrial sites. The scientists found a clear correlation, which suggested human activities rather than lightning strikes were responsible for many of the worst forest fires.

Katalin Kovacs, a scientist at Nasa's Goddard Space Flight Centre in Greenbelt, Maryland, who led the study which was published in the journal *Earth Interactions*, said that there was some anecdotal evidence to suggest that many fires were caused when people built small fires to temporarily stay warm outdoors, keep insects away from cattle, cook, or burn rubbish. One speculative suggestion is that the wind may carry the sparks from these fires by accident to a nearby forest area.

The researchers, however, also found a strong correlation between the location of forest fires and areas of agricultural land where farmers deliberately set fire to the stubble. Forest fires were much more likely in these regions than in forested areas well away from farmland. Although Russia has signed up to the Kyoto agreement on climate change, there is still a feeling in the higher echelons of its national academy of sciences that global warming is part of a natural cycle of climate change rather than a man-made phenomenon. This mood emerged last week during a scientific debate in Krasnoyarsk between Russian and British scientists organised by the British Council as part of its Zero Carbon City exhibition. Some senior Russian scientists said that the Kyoto agreement was part of an attempt by Western countries to stifle Russia's economic development by penalising its use of energy.

However, other scientists in Russia clearly see Kyoto as an opportunity rather than a threat. They want to deal in carbon credits, the "currency" devised under the agreement where countries with large forests and relatively small industrial emissions - such as Russia - can sell their credits on the open market.

Anatoly Sukhinin of the Sukachev Institute said that carbon trading should be exploited by Russia as a means of supporting the protection of its forests. Dr Sukhinin said: "Our industry is not that large, really, so we are not polluting that much. We are lucky to have our forests and forest preservation should really be a priority.

"We should try to protect our forests, because they are the lungs of the planet: they absorb carbon dioxide, and it looks to me like these huge forests are currently being devoured by a powerful lung cancer."