

A Scientist Tracks the World's Fires

By G. PASCAL ZACHARY

Staff Reporter of THE WALL STREET JOURNAL
 FREIBURG, Germany—Hunched over his computer one recent Saturday night, Johann Goldammer peruses the Fireglobe Web site, a wildfire almanac created by his research group that displays daily updates from around the world.

Sitting in his darkened office, atop a converted air-traffic control center in this university town in southwest Germany, his face breaks into a smile. "No dramatic fires today," he says. "It seems calm all over the world."

That's a relief. Mr. Goldammer, 49 years old, is at the heart of a global movement to combat the surge in uncontrolled fires on the planet during the past decade. These fires—from recent blazes in Siberia and Brazil to last year's horrific fires in Borneo and Florida to the Oakland, Calif., fire in 1991, which took 23 lives—have turned the once sleepy field of fire ecology into a hot one.

Mr. Goldammer, though, doesn't advocate extinguishing every blaze. "It would be so easy just to say fire is always bad," he says. "Then you don't allow any fires. But this isn't the case. Fire is part of our ecological heritage. Many systems are more productive because of fire."

Used in the right way, Mr. Goldammer says, periodic wildfires often make for healthier forests and can lessen the chances of cataclysmic blazes. This nuanced view informs his advice on fire management to governments on four continents, to which he tries to tell why fires get out of control in the first place and how possibly to prevent them.

A professor of fire ecology at the Max Planck Institute for Chemistry, Mr. Goldammer looms large in his field. He studies fire from all angles: the ill it does to the landscape; the ecological benefits of proper burning; and the effect of fire on the atmosphere. He is editor of the *International Forest Fire News*, a leading journal, and a member of practically every fire-advisory group in the world.

"I haven't seen anyone else moving on so many practical and scientific fronts," says Keith Moser, a fire scientist at Tall Timbers Research Station in Tallahassee, Fla. Adds Stephen Pyne, an eminent historian of fire, "Goldammer's influence is huge."

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visited Tall Timbers, a nonprofit research center that early on promoted the idea that fires can be useful. He witnessed controlled burns there for the first time, and returned to Germany to write his undergraduate thesis on fire management.

A fixture at international fire conferences, Mr. Goldammer is happiest in the forest, painstakingly chronicling the history of fire in a specific area by studying the scars on tree trunks and analyzing even more ancient fires—from as long as 18,000 years ago—by digging out pieces of charcoal from tropical forest beds and carbon-dating them. As part of international teams, he has made such journeys into remote forests of Siberia, the Amazon, the jungles of the Philippines and dozens of other places.

His influence has shaped many fire-management plans, including those of the United Nations, the countries of Russia, the Philippines, Namibia and Indonesia, and the International Tropical Timber Or-



From his base in Freiburg, Germany, Johann Goldammer travels the globe, helping nations decide when to fight fires—and when to let them burn.

ganization. The central issue addressed in all of these plans: when is it safe to burn, or allow a fire to run, and when is burning too damaging?

In one project for the Indonesian government, he helps to run a fire-management group on the island of Borneo, the scene of last year's big burnings. Besides training fire wardens and improving firefighting techniques, the project teaches residents of the Samarinda area when it is reasonably safe to burn their land for planting crops and when the risks are too great of a fire escaping.

The program, which is partly funded by the German government, pays special attention to social aspects, such as how new migrants to the forest use fire. During the past 20 years, the Indonesian government

palm-oil or other agricultural plantations. Smoke from these conversions polluted the air in 1997 and 1998, forcing people in neighboring Singapore and Malaysia to wear masks while outside and sending rates of respiratory ailments soaring.

At the height of the burning, some activists claimed the resulting loss of trees and air pollution represented the worst environmental setback of the century. Mr. Goldammer dismisses such claims.

"People have short memories," he says. The Borneo fires of 1982 and 1984, he notes, were worse and the Siberian fires of 1987 destroyed more land and produced more smoke.

Mr. Pyne, the fire historian, agrees that Borneo's fires must be seen in context with great man-made burnings of the past. He sees parallels with long-running fires of a century ago that ravaged forests around the Great Lakes region of the U.S. The fires, set to clear land, blackened the sky and limited ship traffic.

Even in Borneo, which is still home to what are considered some of the world's last unspoiled forests, evidence of fire goes back nearly 20,000 years. The island's predicament resonates with Mr. Goldammer, whose own Germany saw many of its once-substantial forests clear-cut in the 17th century.

The country's famed Black Forest, near Freiburg, is a tiny fraction of what it was in the Middle Ages. German farmers, meanwhile, relied on the very methods of slash-and-burn land clearing that are so controversial in southeast Asia today. As late as the 1930s, German farmers burned brush to clear land, but the government banned all burning in 1975.

Last year, government officials from the historic wine region south of Freiburg allowed Mr. Goldammer to conduct the first controlled burning in decades. Grass in the area was threatening grape output.

The shifting attitudes toward the value of fire highlights how much more scientists must learn about the costs and benefits of burning. Mr. Goldammer points out satellites can produce pictures of "hot spots"

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The Wall Street
Journal

8 February 1999

US / Int. Edition

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around the world, but they can't indicate whether these are beneficial or destructive fires. "We are far from having reliable data on fire from all over the world," Mr. Goldammer says.

Then there is the need to catalog the Earth's biomass, or combustible fuel. By knowing more about how much burnable material is lying around, scientists may be able to predict more accurately where fires will break out and how big they will be. They could also judge which fires actually help the environment and which hurt. Long-term, Mr. Goldammer believes bad fires can be prevented and good ones promoted.

That's an elusive goal, and Mr. Goldammer worries that, if achieved, the Earth's forests will be in dire straits by then. His basic optimism is tempered by the knowledge that forests are being cleared at a rapid rate and that even well-intended governments are confused about the best course of action because policies depend so much on local circumstances.

Picking up a stack of international agreements on fire practices, which he has contributed to, he says sourly that they offer little valuable guidance on how to handle specific fires. He shakes his head and returns to his computer screen for one last glance at a fire report before he calls it a night.

Smoke Screen: German Scientist Sees Fire's Shades of Gray

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Mr. Goldammer Tries to Teach Difference Between Good And Bad Blazes in Forest

By G. PASCAL ZACHARY
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Hot Topic

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Teaching Safe Burning

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Scientist Sees Fire in Shades of Gray

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attention to social aspects, such as how new migrants to the forest use fire. During the past 20 years, the Indonesian government has moved many thousands of people from the more crowded Java and Sumatra islands to sparsely populated Borneo. The newcomers often fear the forest and have never used fires, so teaching them requires borrowing techniques from anthropology and psychology.

"We need people who understand why people are burning. What's happening in their brain?" Mr. Goldammer says. The training program emphasizes responsible use of fire. It explains that extra precautions need to be taken at drought time, when it is seductively easier to burn fields, but much easier for a fire to get out of control. To convey their message, Mr. Goldammer's team, composed of locals and visiting Germans, has created posters, slogans and a street theater troupe.

Worst Ever?

While Mr. Goldammer supports individual peasants clearing small plots of land to farm, he thinks the Indonesian government has too often allowed fires to be used to clear massive tracts of forest for use as palm-oil or other agricultural plantations. Smoke from these conversions polluted the air in 1997 and 1998, forcing people in neighboring Singapore and Malaysia to wear masks while outside and sending rates of respiratory ailments soaring.

At the height of the burning, some activists claimed the resulting loss of trees and air pollution represented the worst environmental setback of the century. Mr. Goldammer dismisses such claims.

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Toting Up Biomass

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