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International research effort

U. scientist part of study showing plunge in wildfires

The amount of biomass consumed in the fires globally dropped off precipitously after 1870

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Mitch Power reaches into the deep freeze at the Utah Museum of Natural History and pulls out a foil-wrapped slab as if he were getting ready to throw a huge salmon fillet on the grill. He unwraps the package to reveal a 26-inch-long, wedge-shaped Popsicle of mud that records 1,000 years of ecological change in Montana's Flathead Valley, including periodic pulses of charcoal washing off the land after wildfires.

Power, who recently joined the University of Utah's department of geography as an assistant professor, recovered the sample from the bed of the Flathead's Foy Lake, whose deep calm waters are ideal for the sedimentation that paleoecologists use to reconstruct environments.

Mud cores like these provided the data underlying a new study that indicates the amount of biomass consumed in wildfires globally dropped off precipitously after 1870 - despite the rise in global temperatures widely believed to be a consequence of industrialization. Foy Lake and three others in south-central Utah were among the 406 locations around the world that produced core samples used in the study that will be published Oct. 1 in *Nature Geoscience.* The research was previewed on the publication's Web site earlier this month.

"From studying this global network of charcoal records, we were surprised to see a decrease in global biomass burned during those years," says Power, the new curator of the museum's Garrett Herbarium. "We are attributing this recent decrease to habitat fragmentation, expansion of agriculture, intensification of livestock grazing, and effective fire management."

The study does not examine charcoal loading since 1970, but the team's data backs the notion that wildfire in the western United States has increased over the past three decades. This will be the subject of a forthcoming paper Power is writing with his mentor, University of Oregon geography professor Patrick Bartlein.

The international study was led by scientists associated with Bartlein's Environmental Change Research Group, where Power completed his doctoral work a few years ago. Power went on to co-lead the Global Paleofire Working Group as a post-doctoral researcher at the U.K.'s University of Edinburgh. His mission was to coordinate reams of lake-bed data gathered around the world to establish a global history of wildfire. Some 100 scientists are a part of the effort to exploit ancient charcoal, which persists in the environment for thousands of years.

The data show charcoal loading shot up after the so-called Little Ice Age, a period of glaciation that ended in 1750, which coincided with the coal-fired birth of industrialization, with its attendant need to clear land for food production.

"This was a period when several factors combined to generate conditions favorable to wildfires," says lead author Jennifer Marlon, a grad student in Bartlein's lab. "Population growth and European colonization caused massive changes in land cover, and human-induced increases in atmospheric carbon dioxide concentrations may have started to increase biomass levels and fuels."

But then fire peaked in 1870 and decreased markedly.

"Fire on a global scale has been on a roller-coaster ride over the past 250 years as humans learned to start fires and then learned to put them out," Bartlein says.

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