

News in focus

The results show that government and industry scientists experienced greater constraints from their employers than did university staff. Among government employees, about half were prohibited from speaking publicly about their research, compared with 38% employed in industry and 9% of university staff. Three-quarters of those surveyed also reported self-censoring their work.

One-third of government respondents and 30% of industry employees also reported that their employers or managers had modified their work to downplay or mislead the public on the environmental impacts of activities such as logging and mining.

Government employers most commonly modified science reported for the media or for internal communications, but conference presentations and journal articles were also altered to downplay environmental impacts. In a 2013 survey of more than 4,000 Canadian government scientists, a similar proportion (24%) of respondents reported that information for the media had been altered or excluded for non-scientific reasons (see go.nature.com/3o8eioi). In Australia, public commentary was most often curtailed on issues related to threatened species. “The public often remains ‘in the dark’ about the true state and trends of many species,” wrote one survey respondent.

Managers modifying communications shared in government departments is particularly concerning, says ecologist Don Driscoll at Deakin University outside Melbourne, who led the study. It suggests that for controversial issues, such as the environmental impacts of mining or land clearing, “the information is not getting right through to the decision makers”.

Although university scientists reported fewer restrictions on communicating their work, Cunningham says that they are not immune to pressures that can prevent them from speaking out. “Many prominent researchers in my school receive threats of violence as a result of their work,” he says. That’s “not going to be good for your mental health, and it might also shape your willingness to speak publicly about contentious issues”, he adds.

Just under half of the survey respondents reported being harassed or criticized for speaking out. The Ecological Society of Australia has now set up a permanent online portal where instances of science suppression can be anonymously reported.

Most scientists felt the main consequences of being blocked or refraining from speaking about their work was that groups with vested interests then dominated public debates and could mislead people, and that relevant data were not used to inform policies.

Driscoll says that one way to reduce employer interference and improve transparency is to establish an independent environment commission that provides policy advice and has guaranteed funding. The

commissioner in charge would need security of tenure, “so that they can’t be sacked every time there’s an election”, says Driscoll. This happened in 2013, when a newly elected conservative government disbanded a climate commission set up two years earlier to act as an advisory board to government on climate science. New Zealand has had an independent commissioner for the environment since 1986, to provide independent advice on environmental issues to the parliament.

Policies that stipulate how science should be communicated can also be helpful for scientists working in government departments, says Driscoll. In 2018, Canada adopted a policy for the public service that ensures scientific communication is free from interference.

“I don’t think there’s a simple solution,” says Cunningham, but “it’s important to pursue some of these sorts of institutional changes and policy changes that can create a little bit of protection for ideas”.

‘APOCALYPTIC’ FIRES ARE RAVAGING A RARE TROPICAL WETLAND

Researchers fear the fragile ecosystem of South America’s Pantanal region will never recover.

By Emiliano Rodríguez Mega

When Luciana Leite arrived in the Pantanal on 2 September, she thought she would be celebrating her wedding anniversary. Instead, the biologist and her husband spent their planned eight-day holiday aiding volunteers and firefighters struggling to extinguish the burning landscape.

A common destination for ecotourists, the

Pantanal is the world’s largest tropical wetland, home to Indigenous peoples and a high concentration of rare and endangered species, such as jaguars (*Panthera onca*) and giant armadillos (*Priodontes maximus*). Small fires occur every year in the region, which sprawls over parts of western Brazil and extends into Bolivia and Paraguay.

But 2020’s fires have been unprecedented in extent and duration, researchers say. So far, 22% of the vast floodplain – around



Firefighters and volunteers in the Pantanal have been scrambling to rescue jaguars from fires.

ANDRE PENNER/AP/SHUTTERSTOCK

3.2 million hectares – has succumbed to the flames, according to Renata Libonati, a remote-sensing specialist at the Federal University of Rio de Janeiro, Brazil, whose data are being used by firefighters to plan containment. That's more than twice the area that has burnt in the record-breaking fires in California this year.

Scientists worry that the extreme blazes will profoundly alter the already fragile ecosystem of the Pantanal, and that research programmes investigating the region's ecology and biodiversity will never recover.

"It's apocalyptic," says Leite, who studies humanity's relationship with nature at the Federal University of Bahia in Salvador, Brazil. "It is a tragedy of colossal proportions."

Scorched earth

Unlike in the nearby Amazon rainforest, vegetation in the Pantanal has evolved to coexist with fire – many plant species there require the heat from fires to germinate. Often caused by lightning strikes, natural fires tend to spring up at the end of the dry season, in September. They run out of fuel quickly, and the surrounding floodplains prevent them from spreading.

What's different this season is that the region is facing its worst drought in 47 years, says Luisa Diele-Vegas, a Brazilian ecologist at the University of Maryland in College Park. And 2019's fires were intense, contributing even further to the unusually dry conditions and exacerbating the fire risk this year.

The desiccated vegetation was perfect tinder for fires intentionally set by ranchers clearing land for their cattle. But some of those fires got out of control, adding to the wildfire damage, says Diele-Vegas.

In July, Brazilian President Jair Bolsonaro announced a 120-day moratorium on setting fires in the Amazon and the Pantanal. However, those regulations were not strictly enforced, says José Marengo, a climatologist at the National Center for Monitoring and Early Warning of Natural Disasters in São Paulo. According to news reports, the Bolsonaro government, which has a reputation for being unfriendly towards environmental regulations, reduced the number of environmental inspectors and blocked funding for fire prevention this year.

What worries scientists further is that this year's fire season might not be an isolated incident. Climate modelling suggests that the Pantanal could become hotter and drier, with a rise in temperature of up to 7°C by the end of the century¹. Unpublished data from Diele-Vegas project an even grimmer outlook: by 2050, if climate-change trends continue, annual mean temperatures in the Pantanal could increase by 10.5%, and the annual volume of rain could decrease by 3%.

According to Marengo, these changes could lead to a collapse of the Pantanal's current



Luciana Leite surveys the burnt landscape of the Pantanal during her trip on 2 September.

vegetation, making it even more susceptible to fires, and could push the region to transform into a different type of ecosystem.

One of the biggest losses in this year's fires is the region's wildlife, says Douglas Morton, a remote-sensing specialist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, who has studied fires and deforestation across Brazil for two decades. Many creatures thrive in the mosaic landscape of the Pantanal, which includes flooded areas, grasslands, lakes and

"We are trying to race against time, but the fire is coming and taking everything down."

forests. Scientists have so far documented hundreds of species in the region²: more than 580 birds, 271 fishes, 174 mammals, 131 reptiles and 57 amphibians. "My lasting memory from being in the Pantanal is the cacophony of life," Morton says. "To me, that's what's so heart-wrenching about seeing the extent of fires."

The flames have also breached five territories in the Pantanal where Indigenous communities live. More than 80% of the land in each of the 3 most affected – Baía dos Guató, Perigara and Tereza Cristina – has been consumed by fire.

Rescue mission

A number of locals have jumped in to rescue as many animals as possible from the flames and smoke. Eduarda Fernandes Amaral, who works as a guide in the Encontro das Águas State Park, is among them. As of 20 September, more than 83% of the park, which is home to

a large number of jaguars, capybaras (*Hydrochoerus hydrochaeris*) and alligators, had been destroyed.

In the past month, a team including Fernandes Amaral has rescued more than 20 animals, although some had to be euthanized. To help them cope, Fernandes Amaral and her colleagues have adopted a mantra. "When we see an animal dying, we have to look at it, be sad for two minutes and understand that there is another in need of help," she says.

As the blazes advance, animal research in the Pantanal might also suffer. Two years ago, Diele-Vegas started a project to study the distribution of frogs, including tree frogs, and toads across the Pantanal, and how it might shift owing to land-use change and climate variations. But she doesn't know whether the amphibian populations she's monitoring will even survive the blazes.

"We are seeing our fauna and flora burning. And there's a lot of this fauna and flora that we haven't had time to study yet," she says. "We are trying to race against time, but the fire is coming and taking everything down."

After her initial trip to the Pantanal, Leite couldn't leave it behind. She returned a few days ago to keep helping the locals. What she's seen has convinced her that the wetlands will be forever changed.

"If climate trends, land-management trends and the current anti-environment politics persist," says Leite, "the Pantanal as we know it will cease to exist."

1. Marengo, J. A., Oliveira, G. S. & Alves, L. M. in *Dynamics of the Pantanal Wetland in South America* (eds Bergier, I. & Assine, M) https://doi.org/10.1007/698_2015_357 (Springer, 2015).
2. Tomas, W. M. et al. *Trop. Conserv. Sci.* <https://doi.org/10.1177/1940082919872634> (2019).