

STEVE CHRISTO/FARFAX MEDIA/GETTY

Surfing and science have joined forces as the World Surf League, the sport's governing body, partners with a climate-research centre at Columbia University.

CLIMATE RESEARCH

University calls on private donors for climate funding

Columbia courts philanthropic benefactors to support research on impacts and adaptation.

BY JEFF TOLLEFSON

Like most researchers at Columbia University's Lamont–Doherty Earth Observatory (LDEO) in Palisades, New York, Park Williams is expected to win research grants to cover his salary. But times are tough for climate scientists, who face flat levels of government funding in an ever-expanding pool of competitors. Two years into a post as an assistant research professor, the 34-year-old bioclimatologist had yet to receive a single grant.

But on 22 January, the Center for Climate and Life, a new research institute at Columbia that is seeking funds from the business community, awarded Williams US\$180,000 for his work on historical drought and fire cycles. Michael Puma, an environmental modeller at Columbia and NASA's Goddard Institute for Space Studies in New York City, received \$190,000 to explore the impact of climate change on the global food system.

"I was beginning to worry about my future here and wondering if I'd be wise to begin

applying for more-traditional professorships," says Williams. "Now I'll have time to actually do research."

With climate-science funding under

perennial threat in Washington DC, Columbia is engaging corporate philanthropists to boost research into the effects of projected environmental changes and how human systems can adapt. Seeded by Columbia with an initial budget of \$3.1 million over five years, the Center for Climate and Life hopes to build a \$200-million endowment that disburses around \$10 million annually.

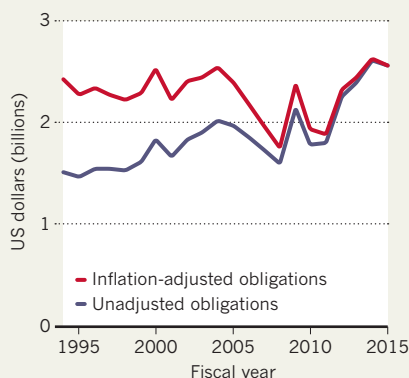
"It's a very new way of funding science," says Peter de Menocal, a palaeoclimatologist at the LDEO and founding director of the new centre.

The centre will supplement salaries and research costs for scientists at Columbia, as well as at NASA's Goddard Institute for Space Studies, which is located on the Columbia campus. De Menocal says that the centre will apply the same peer-review procedures used by the US National Science Foundation to ensure that its grants are directed towards the best research proposals.

With roughly 85% of scientists at the LDEO reliant on government grants for their salaries, de Menocal says, two decades of stagnant

GOING NOWHERE

When adjusted for inflation, US government spending on environmental-science research has not increased substantially in 20 years.



SOURCE: NATIONAL SCIENCE FOUNDATION

budgets for the environmental sciences have taken a toll (see 'Going nowhere'). And Republicans in the House of Representatives, many of whom deny the reality of global warming, have attempted repeatedly to cut funding for climate-related research. De Menocal says that the situation has many young Earth scientists rethinking their career choice because of what he calls "a silly ideological divide." The new institute should give them needed job security, he says, and allow the community to identify and pursue new research paths without waiting for Washington to come around.

Others have also recently turned to private philanthropy to fund climate research. "It is going to be very hard for the government to undertake a really big increase in federal research," says Margaret Leinen, director of the Scripps Institution of Oceanography in La Jolla, California. In August, Scripps opened the Center for Climate Change Impacts and Adaptation, with a donation of \$5 million from energy executive Richard Hertzberg and his wife Carol Dean Hertzberg. And the Grantham Foundation for the Protection of the Environment, founded by investment manager Jeremy Grantham and his wife Hannelore, has helped to establish similar research institutes at multiple universities, including the Grantham Research Institute on Climate Change at the London School of Economics.

One of the Columbia centre's initial partners is the World Surf League (WSL) in Santa Monica, California, which is the governing body of professional surfing. The organization says that it seeks to promote environmental awareness among more than 120 million surfing fans around the world. As part of that partnership, Columbia plans to develop an online certificate programme focused on ocean science and conservation. The courses will be open to anybody beginning in 2017, and may evolve into a formal master's degree programme.

"We've got this perfect combination of science and soul," says Scott Hargrove, chief marketing officer for the WSL, which plans to announce its funding commitment as early as this month. "Surfing has the power to move culture," he says, with Columbia driving the science and education, and surfers serving as public ambassadors.

De Menocal is also in talks with French aerospace giant Airbus, which would provide the fuselage for a research aircraft that could be readily equipped with instruments to study everything from the atmosphere to rainforests and polar ice sheets. De Menocal says that the centre is currently working on a viability study for the project.

"We want to change the way we do and fund science," says de Menocal, "and fast track the science we need to understand how climate impacts people." ■

PSYCHOPHARMACOLOGY

Drugmakers target fog of depression

Industry and researchers push for reliable ways to assess cognitive deficits associated with mood disorders.

BY HEIDI LEDFORD

In the past quarter of a century, a wave of drugs has transformed the treatment of depression. But the advances have struggled to come to grips with symptoms that often linger long after people start to feel better: cognitive problems such as memory loss and trouble concentrating.

On 3 February, the US Food and Drug Administration (FDA) will convene a meeting of its scientific advisers to discuss whether such cognitive impairments are components of the disorder that drugs might be able to target — or just a result of depressed mood. The discussion will help the agency to decide whether two companies that sell the antidepressant vortioxetine should be allowed to label it as a treatment for the cognitive effects. A 'yes' could spur drug developers to invest in ways to test cognitive function during their antidepressant trials.

Psychiatrists have long noted that some people with depression also struggle to concentrate and to make decisions. The question has been whether such difficulties are merely an offshoot of altered mood and would thus clear up without specific treatment, says Diego Pizzagalli, a neuroscientist at McLean Hospital, an affiliate of Harvard Medical School in Belmont, Massachusetts.

But some patients who report improved mood after treatment still struggle with cognitive deficits — so psychiatrists sometimes prescribe concentration-enhancing drugs that are approved to treat attention deficit hyperactivity disorder to people with depression.

The scenario is a familiar one for those who treat schizophrenia: antipsychotic drugs may drive away hallucinations, but the cognitive deficits persist. And the deficits make it difficult for people with schizophrenia to keep jobs or to live independently, says Michael Green, a neuropsychologist at the University of California, Los Angeles.

LONG LEAD TIME

More than a decade ago, companies waged a campaign to encourage drug regulators to recognize cognitive impairment in schizophrenia. But the FDA refused to do so until drugmakers came up with uniform criteria to measure the impairments. As a result, the

schizophrenia community built a consensus around a battery of tests for use in clinical trials. In the case of depression, tests would have to be especially sensitive because the cognitive impairments can be more subtle than those that accompany schizophrenia, says Richard Keefe of the Duke Institute for Brain Sciences in Durham, North Carolina.

Researchers and industry representatives discussed the problem of cognitive impairment in depression at a workshop held by the US Institute of Medicine (now the National Academy of Medicine) almost a year ago, but they did not set a course for establishing uniform assays. And even if tests acceptable to the FDA can be established, that is no guarantee that effective drugs will soon follow. Guidelines governing schizophrenia trials were established in 2005, but no cognitive-function drug has yet been approved in such cases. Furthest along is the company Forum Pharmaceuticals in Waltham, Massachusetts, which is conducting late-stage clinical trials of encenicline — a drug that targets the memory-related nicotinic protein acetylcholine receptor $\alpha 7$. Results are expected in the first half of this year.

But interest in cognitive drugs for people with depression is building as more and more antidepressants become available in cheap, generic forms and pharmaceutical companies seek to carve out niches for their newer, more expensive offerings, says psychiatrist Eduard Vieta at Spain's University of Barcelona. "Companies are changing strategies, and trying to find indications that are not the typical ones," he says. "When you can speak about an indication that nobody else has — like cognition in the context of depression — it's a huge advantage."

In making the case for vortioxetine, Takeda Pharmaceutical Company in Osaka, Japan, and H. Lundbeck in Valby, Denmark, cite clinical-trial data showing that the drug led to improvements in several cognitive tests, apart from its effect on mood.

If the FDA does decide to recognize cognitive dysfunction as a treatable aspect of depression, the effects could also reach beyond the pharmaceutical industry, says Green. "It's a matter of respecting an aspect of the illness that we've always thought wasn't getting enough attention," he says. "The more visibility there is on these deficits, the better." ■