

Green growth

US policymakers must set aside their divisions and give climate research a much-needed boost.

Columbia University in New York has invested US\$3.1 million in a new centre to bolster climate research while building ties with big business and corporate philanthropists. The idea is simple: the business community has both the resources to promote climate science and a vested interest in the results. The university, meanwhile, is looking for a stable funding source to support its research. Other institutions have taken similar paths, and as long as the science remains independent, everybody benefits. But even if the Center for Climate and Life succeeds, it does not solve the larger problem of stagnant US budgets for environmental research.

The proposal for the centre initially arose from Columbia's Lamont-Doherty Earth Observatory in Palisades, which has nearly 200 Earth scientists. Most are dependent on research grants for the majority of their salaries. As a News story on page 16 makes clear, it is particularly difficult for young researchers there to get government funding. But even the senior scientists are coming up empty-handed with increasing frequency, and that means more time spent on grant applications and less time spent on science. Money is not always the answer, but federal funding has not kept up with the times.

The numbers say it all. Adjusted for inflation, the US budget for environmental science peaked in fiscal year 2003 at \$4.73 billion and then began to decline. Things have improved over the past few years, but only slightly. The budget for environmental science stood at \$4.18 billion in 2015, the latest year for which data are available. That is roughly the same as more than two decades ago, but it is safe

to say that awareness of the environmental threats posed by resource consumption, rising populations and global warming has increased significantly in that time.

One factor was the financial crisis of 2008. It has taken time for the United States and other countries to recover; there has simply not been as much money to go round. But no comfort has come from the US Congress, where conservatives have sought — unsuccessfully so far — to further reduce spending on climate sciences.

“Partisan divides have begun to seep into the debates over funding for basic science.”

Long-standing partisan divides over climate and environmental policy have begun to seep into the debates over funding for basic science, which in the past has remained relatively bipartisan.

In 2007, the US Congress passed the America COMPETES Act, which enabled a doubling of science budgets at several agencies over ten years. America COMPETES was re-authorized in 2010, but lawmakers have yet to follow through with increased funding in the annual appropriations process. Last year, Republicans in the House of Representatives passed yet another re-authorization of the act, but this controversial version would have actually reduced research spending in various areas, including a 12% reduction in funding for geosciences. It drew a veto threat from US President Barack Obama, and rightly so.

The original drive for America COMPETES followed an influential 2005 report by the National Academies of Science, Engineering, and Medicine, titled *Rising Above the Gathering Storm*. It argued that US economic competitiveness depends on innovation in energy, science and technology, and this remains true today. Policymakers on both sides of the aisle say that they want the United States to lead. They say that they want decisions to be based on solid science. But leadership requires energy, and science requires investment — as well as freedom from political interference. ■

Better together

The European Union has its issues, but a Brexit could spell problems for science.

Greece narrowly avoided being kicked out of the European Union's single currency last year. Now Britain could exit the whole union voluntarily (a possibility dubbed 'Brexit'). The grand EU project has not looked so shaky since the financial crash of 2008, which brought many of the 28 EU member states to their knees. Now, in the midst of a Europe-wide migration crisis, the United Kingdom is trying to renegotiate its EU membership. If concessions won this week do not convince the UK public, then Britain could vote to leave the EU by the end of 2017.

Many researchers in the United Kingdom and elsewhere are aghast at this idea. As detailed on page 15, UK scientists pull in millions of euros of funding from EU research programmes and gain preferential access to major infrastructure projects. No one is really sure whether Britain leaving would jeopardize this, because no state has left the EU before.

British discussion of the relationship with Europe is coloured by decades of tabloid scorn and political opportunism. The first step to any sensible decision must be to separate the facts from the rhetorical fiction. So it is essential that debates over the role of the EU in science — such as the ongoing inquiry by the House of Lords science committee into the EU's influence — offer a critical analysis of what science stands to lose.

It is certainly true that EU funding has sustained many a scientific career as national-government support has withered throughout the continent. Across leading British universities, one in every five employees comes from a non-UK EU member state. UK scientists ply their trade

in universities across the EU in return. Indeed, for many scientists, the country that they work in is less important than the work that they do.

Opponents of a Brexit make a compelling case for what might be lost if UK researchers were locked out of EU systems and UK institutions had to jump through hoops to bring in talented staff. Among those who have come out to sing the praises of EU links are the academic umbrella group Universities UK, the elite-university lobbying organization the Russell Group, and the anti-Brexit group 'Scientists for EU'.

They argue that cooperation in research shows Europe at its best. British citizens were as proud as any across the continent, for example, when the European Space Agency wowed the world last year by landing a spacecraft on a comet. And the CERN particle-physics laboratory is a model of trans-boundary science — quite literally, because its accelerators near Geneva straddle the border between France and Switzerland.

There have been complaints that debate might be stifled by the great and the good in science coming out wearing their institutional badges and arguing against a Brexit. But scientists — to their credit — generally do not shy away from speaking up. A dedicated group of pro-Brexit researchers is making its own case.

The group's position has some merit, too. It would be wrong to pretend that the EU is without problems. Supporters of a Brexit cite rules on clinical trials as an example of EU regulations that have hindered the pursuit of knowledge. And the political gridlock on growing genetically modified crops in the EU has left agricultural scientists frustrated. Brussels bureaucracy has become a shorthand term for red tape, officialdom and delays.

On balance, it is the view of this journal that science, in Britain and elsewhere, would benefit from the United Kingdom remaining as a committed member of the European team. An exit decision would cause chaos and uncertainty, and could set back some projects significantly. ■

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