

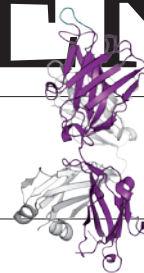
THIS WEEK

EDITORIALS

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Uncharted territory

Political maps that seek to advance disputed territorial claims have no place in scientific papers. Researchers should keep relationships cordial by depoliticizing their work.

Muhammad Ali observed that the wars of nations are fought to change maps — and he was a man who knew how to fight. Yet there are more subtle ways to change maps. Take the South China Sea: Chinese officials insist that much of its waters belong to China, and Chinese maps tend to include a dotted line that makes the same point. Yet there is no international agreement that China should have possession, and other countries have overlapping claims.

What has this to do with science and *Nature*? Nothing — except that territorial disputes, including that over the South China Sea, are leaking into the pages of scientific journals such as this one. In a disturbing trend, an increasing number of maps included in scientific articles by Chinese researchers feature a dotted line that envelops almost the entire South China Sea, to indicate Chinese possession (see page 293). Scientists and citizens of surrounding countries are understandably peeved by the maps, which in most cases are completely unrelated to the subjects of the papers in which they are published. The inclusion of the line is not a scientific statement — it is a political one, apparently ordered by the Chinese government. It's a territorial claim, and it's being made in the wrong place.

Where research and politics mix, science should be a tool of diplomacy, not territorial aggression. Even politically hostile environments can prove fertile ground for scientific collaborations. An increasing number of researchers from Taiwan are teaming up with colleagues in mainland China, even as Beijing and Taipei continue to fundamentally disagree over their relationship. According to data provided by Lou-Chuang Lee, the head of Taiwan's National Science Council, the number of research papers resulting from cross-strait collaborations rose from 521 in 2005 to 1,207 last year.

Such collaborations set the stage for the realization of common interests and, one might hope, resolution of political differences. At the least, they could help to restrain aggression.

Still, politics does often find a way to intrude. In August, for

example, Ann-Shyn Chiang, director of the Brain Research Center at the National Tsing Hua University in Hsinchu, Taiwan, was surprised by a request from Yi Rao, a neuroscientist at Peking University in Beijing, with whom he was writing a paper. Rao wanted to put down Chiang's affiliation as 'Taiwan, China', the appellation preferred by Beijing. Chiang told Rao either to use Taiwan or Taiwan ROC (Republic of China), or to drop his name from the author list.

Eventually the two found a compromise, agreeing that they would use Taiwan, Republic of China. The dispute over the South China Sea, with its resources and geopolitical significance, won't be so easily ironed out.

With regard to this and other international disputes, *Nature* takes the position that scientists should stick to the science. Authors should try to depoliticize their articles as much as possible by avoiding inflammatory remarks, contentious statements and controversial map designations. If such things can't be avoided, for example if a study of a country's resources requires taking account of whether a certain island belongs to it, the map should be marked as 'under dispute' or something to that effect. In papers in *Nature*, editors reserve the right to insert such a label if authors fail to do so. By avoiding controversy, researchers who keep politics from contaminating their science will keep the doors of collaboration open, and their studies will benefit. Researchers could also, as a by-product, help to defuse political tensions, show the way to mutual benefit and perform a diplomatic service.

Researchers on all sides have much in common, as many scientists in parts of the world made unstable by conflict can appreciate. It makes no sense to undermine this solidarity through irrelevant political and territorial posturing. ■

“Where research and politics mix, science should be a tool of diplomacy, not territorial aggression.”

Positive spin

Science lobbyists must boost the appeal of research to policy-makers.

Pity the science lobbyist. As we report on page 299 of this issue, the combination of the economic downturn, concerns over the budget deficit and anti-science rhetoric from the Tea Party have created a difficult environment for those paid to persuade US lawmakers to find funds for research. And money available to lobbyists to make the case is in short supply too, as sponsor organizations

watch their own budgets in the struggling economy.

The good news, at least, is that lobbyists are aware of the problems and have a pitch that takes some account of them. Their arguments now routinely stress the importance of research to US economic growth, health, welfare and competitiveness — and point out that research institutions are major employers in districts that include those represented by Tea Party members. A change in terminology, from 'science funding' to 'science investment', is particularly smart.

Yet there are many types of investment — roads, primary education and crime reduction, to name but a few — that must compete for an ever-decreasing pot of funds, and science advocates could do more to respond to the shifting mood in Washington.

First, lobbyists should argue that scientists spend US taxpayers' money efficiently. Campaigners can point to changes that the scientific

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PUBLIC HEALTH Freshly approved vaccine could aid Haiti cholera fight **p.295**

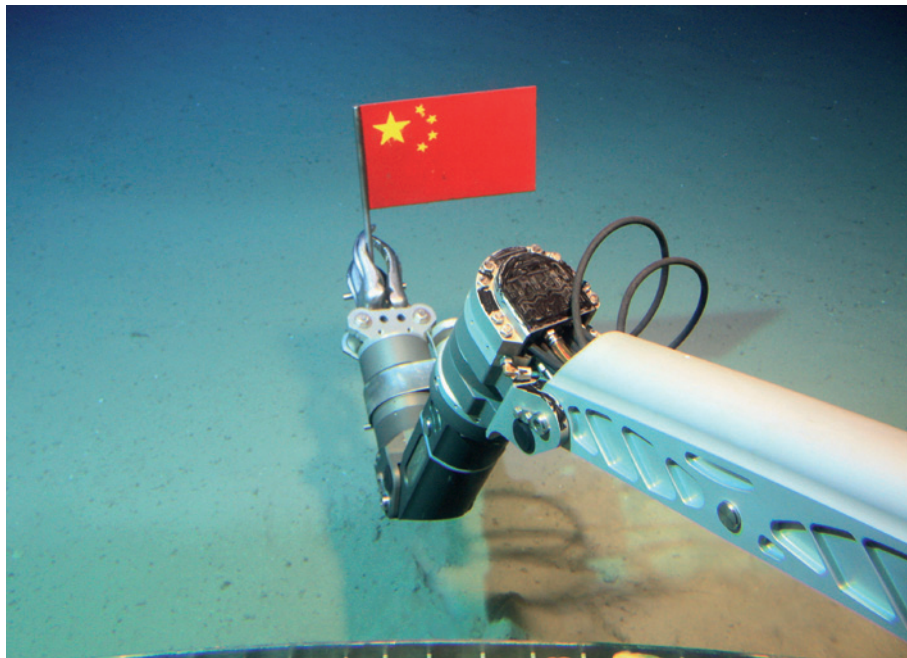
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SOCIAL SCIENCE Spies sift social media to forecast the news **p.301**



PHYSICS String theory comes down to earth **p.302**

CHINA/GETTY



Mine, all mine: the rush to claim minerals and oil is driving China's marine ambitions.

POLICY

Angry words over East Asian seas

Chinese territorial claims propel science into choppy waters.

BY DAVID CYRANOSKI

Clashes at sea. Disputed borders. It is not the usual stuff of science. But researchers and scientific journals are being pulled into long-simmering border disputes between China and its neighbours. Confrontations involving research vessels are raising tensions in the region, while the Chinese government is being accused of using its scientists' publications to promote the country's territorial claims.

China's desire to increase its exploitation of the sea is no secret. The country's 12th five-year plan, which covers 2011–15 and was approved in March, was the first to mention the

importance of a marine economy. In May, China's Ocean Development Report estimated that marine industries, including offshore oil and gas exploration, fisheries and ship building, will earn 5.3 trillion renminbi (US\$830 billion) by 2020. Last month, Zhang Jixian, head of the Chinese Academy of Surveying and Mapping, announced that the country will ramp up efforts to chart what he described as its "three million square kilometres of water territory", an area much larger than that considered by neighbouring states to be Chinese territory. The mapping project will be aided by China's first cartographic satellite, to be launched

in December, and the *Jiaolong* submersible, which is scheduled to take humans to ocean depths of 7,000 metres next year¹. If the dive succeeds, China will capture the record for the deepest-ever manned ocean exploration from its great marine rival, Japan.

China is also growing increasingly assertive over its boundaries (see map). China claims Taiwan, for example, whereas Taiwan claims that it is independent. Japan, China and Taiwan all claim the uninhabited Senkaku Islands in the East China Sea. The clashes are fiercest in the South China Sea, where China claims the Paracel Islands (home to turtles, seabirds and a few Chinese troops) and the Spratly Islands, an archipelago of more than 700 isles, along with a huge area of the South China Sea surrounding them. Vietnam, Malaysia, Taiwan, Brunei and the Philippines all argue that those areas fall within their exclusive economic zones, which are recognized by the United Nations. The disputes are decades old, but reports of oil deposits — estimated at anywhere from 1.6 billion to 21.3 billion recoverable barrels — and significant mineral resources are now raising the stakes.

Because exploration often goes hand in hand with research, scientists are finding themselves on the front line. In June, Vietnam accused a Chinese fishing vessel of ramming a seismic survey ship working for the state energy company, PetroVietnam. And on 26 September, Japan ordered a Chinese research vessel that seemed to be conducting a marine survey to leave the exclusive economic zone that Japan claims around the Senkaku Islands.

The battle is also spilling over to the pages of scientific journals. Critics say that Chinese researchers are trying to make their country's possession of the South China Sea a fait accompli by routinely using maps that show its extended marine boundaries. For example, a 2010 review of the impacts of climate change on water resources and agriculture in China, published in *Nature*², included a map with an inserted area that implied that most of the South China Sea was part of China.

Last month, in an online posting that was also sent to *Nature* and other journals, 57 Vietnamese scientists, engineers and other professionals living around the world complained about the use of such maps. The letter laments the Chinese government's use of "back door tactics", and argues that it is "using your magazine/journal as a means to legitimize such ▶

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► [a] one-sided and biased map". A map that appeared in a review of Chinese demography published in *Science*³ provoked similar criticism. *Science* responded with an Editor's Note⁴ stating that the journal "does not have a position with regard to jurisdictional claims" but that it is "reviewing our map acceptance procedures to ensure that in the future *Science* does not appear to endorse or take a position on territorial/jurisdictional disputes".

Meanwhile, Michael Oppenheimer, a geoscientist at Princeton University, New Jersey, who is co-editor of *Climatic Change*, has received a barrage of e-mails since June from scientists contesting a Chinese map that his journal published more than four years ago⁵. The map includes a thick 'cow-tongue' shaped dotted line that claims for China a wide swathe of the South China Sea, reaching down towards Malaysian Borneo. The scientists, from Vietnam, Finland, Canada and elsewhere, are demanding a correction to the map. But this kind of highly politicized debate over territory "is not a question that a journal like ours wants to deal with", says Oppenheimer.

Other Vietnamese scientists contacted by *Nature* were most angered by instances of what they consider to be gratuitous uses of the



cow-tongue map. "They include the line around the South China Sea even when this region, and the islands within it, have absolutely zero relevance to the topic," says Q. Tuan Pham, a chemical engineer at the University of New South Wales in Sydney, Australia.

Why Chinese scientists include the controversial map in their papers is not clear. Following the e-mails, Oppenheimer decided that the disputed map had no relevance to the conclusion of the paper in question, but he contacted the lead author, Xuemei Shao of the Institute of Geographic Sciences and Natural Resources Research in Beijing, to offer him the

chance to correct or amend the figure. Shao declined, explaining in an e-mail that the figure "is requested by the Chinese government".

Jingyun Fang, a climate-change specialist at Peking University in Beijing who was a co-author on the *Nature* review, says that he included the insert because "we should follow China's law to include these Chinese seas in the map". Neither Fang, Shao nor any of four authors of other articles that included similar maps responded to requests from *Nature* for details of these regulations.

Science, *Nature* and *Climatic Change* have ultimately decided not to remove the offending maps.

But Tuan Nguyen, a professor of medicine at the Garvan Institute of Medical Research in Sydney, who has independently complained to journal editors about China's maps of the South China Sea, says that maps in journals should be treated as scientific data and verified before publication. "The publication of such a map represents an abuse of science," he says. ■ [SEE EDITORIAL P.285](#)

1. *Nature* **476**, 10–11 (2011).
2. Piao, S. et al. *Nature* **467**, 43–51 (2010).
3. Peng, X. *Science* **333**, 581–587 (2011).
4. Bradford, M. *Science* **333**, 1824 (2011).
5. Liang, E. et al. *Climatic Change* **79**, 403–432 (2006).

SOURCE: UNCLDS/OA

POLICY

US row threatens Chinese links

Dispute intensifies over a ban on some types of scientific cooperation with China.

BY EUGENIE SAMUEL REICH

When US presidential science adviser John Holdren hosted a dinner and meetings between US and Chinese science officials in May, he must have known it would lead to a high-level stand-off. That came to pass on 11 October, when the Government Accountability Office (GAO), an arm of Congress, concluded in a report that those activities violated legislation banning scientific cooperation with China by NASA and by the White House Office of Science and Technology Policy (OSTP), which Holdren directs.

Frank Wolf (Republican, Virginia), the congressman who chairs the subcommittee that funds science agencies including the OSTP and NASA, inserted the ban into a spending bill that was passed last spring. Now, backed by the GAO report, he has asked the US Department of Justice to rein in Holdren's China-related activities; if the department refuses to do so,

the matter could end up in the courts.

Holdren — armed with a memo from the justice department saying that he has the right to conduct diplomacy on behalf of US President Barack Obama, even without congressional approval — is showing no signs of backing down. Yet science-policy experts say that the dispute has the potential to cast a cloud over joint academic and commercial research efforts between the two economic superpowers. "This has potential to cut off collaboration with a country on a rapidly rising science and technology trajectory," says Richard P. Suttmeier, a retired expert on Chinese science policy based in Keene Valley, New York.

Relations between the United States and

China have their roots in a historic 1972 visit to Beijing by US president Richard Nixon. That led to a 1979 agreement between the two governments for cooperation on scientific activities. Suttmeier estimates that US agencies now have more than 30 agreements on scientific cooperation with their equivalents in the Chinese government. The US National Science Foundation (NSF) opened an office in Beijing in 2006, and the US Department of Energy founded a US\$150-million Clean Energy Research Center with China in 2009. Chinese researchers are now more likely to collaborate and co-author papers with scientists from the United States than with those from any other country.

"I don't understand the motivation for trying to cut off something of benefit to both sides," says Martin Briggs, a hydrogeology graduate student at Syracuse University in New York, who spent two months at Fudan University in Shanghai on a fellowship funded by the NSF to learn about water quality.