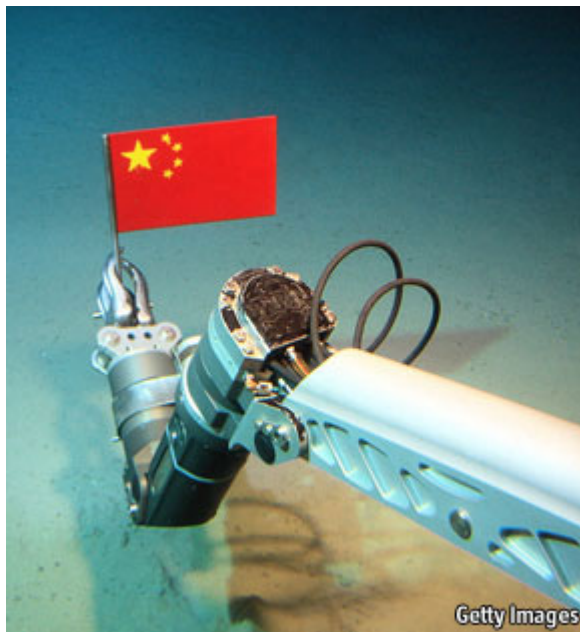


Who rules the waves?

China's ocean scientists will soon start exploring a controversial patch of sea

Oceanography in China

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IMPERIALISM and oceanography often go hand in hand. The British Admiralty's surveys of the world's coastlines and shallow seas during the 18th and 19th centuries brought a wealth of scientific knowledge. They also did no harm to the ability of British merchantmen to navigate the world—and of British warships to dominate it.

Viewed from that perspective, China's southern neighbours might be slightly nervous about [a meeting held in Shanghai on January 26th and 27th](#), which gathered the country's oceanographers (including several who work abroad) to discuss a project called South China Sea-Deep. As its name suggests, this project is intended to explore the South China Sea, a patch of water with an area of 3.5m

square kilometres and a maximum depth of 5.5km that China's government regards (despite competing claims from every other country with littoral waters there) in much the same way that ancient Romans regarded the Mediterranean: *mare nostrum*.

South by Southwest

The scientists in question disclaim any intent to push back frontiers other than those of human understanding. They also say the project's focus is on basic scientific matters rather than a search for things like oil and mineral resources. No doubt that is true—just as it is true that many who sailed under the Admiralty's aegis were motivated by a thirst for pure knowledge. But knowledge is power, and if Chinese scientists are the first to explore the depths of the South China Sea, then Chinese businessmen will be better placed than others to exploit any commercially valuable finding that they make, and the Chinese navy will be better placed to defend them.

South China Sea-Deep is led by [Wang Pinxian, of Tongji University in Shanghai](#), a doyen of the field. To assist him, he will be able to call on the services of *Jiaolong*, China's latest deep-submersible vehicle (pictured, planting a flag), which is designed to dive to a depth of 7km. Last July *Jiaolong* managed 3.8km. The craft's handlers aim to push that to 5km this summer and to the full amount next year.

The project is partly inspired by a study carried out aboard a vessel called *Dayang Yihao* in 2007, of the then little-known Southwest Indian Ridge. This is part of the system of mid-ocean ridges that form as the tectonic plates of the Earth's crust move apart—a process known as sea floor spreading. Among other things, the researchers on board *Dayang Yihao* located rich deposits of copper, lead and zinc, associated with hot springs called hydrothermal vents that are often found near mid-ocean ridges. And when the International Seabed Authority, which looks after such matters, promulgated regulations last May for the exploration of these sorts of deposits, China quickly made an application to do so in the Southwest Indian Ridge.

The South China Sea, too, is thought to be a product of sea floor spreading—though the spreading in question happened between 32m and 16m years ago. And Lin Jian of the Woods Hole Oceanographic Institution, in Massachusetts, one of the leaders of the expedition to the Southwest Indian Ridge, is also running a sub-project intended to study the tectonic evolution of the area. This should help settle the questions of how the South China Sea came into existence, how much of its floor is basaltic ocean seabed, of the sort spewed out of mid-ocean ridges, and how much is continental rock that simply happens to be below sea level.

The second part of the project, a study of sedimentation and the ancient climate, will follow up [Dr Wang's original examination of the area, in 1999](#), which was part of an international effort called the Ocean Drilling Programme. Despite all the disclaimers, this will be the bit of most interest to the oil and gas industry.

Three large drainage systems, the Mekong, the Red River, and the network that debouches into the Pearl River delta, have carried about 14,000 trillion tonnes of sediment into the South China Sea over the past 30m years or so. That forms traps for oil and gas. It also preserves a huge amount of information about past temperatures, rainfall and sea levels. [Jian Zhimin, also of Tongji University](#), and his colleagues hope to use this information to unravel the evolution of the modern climate—particularly of the Asian monsoon which, by providing enough rainfall for agriculture, keeps much of the continent’s population fed.

They will investigate the modern climate directly, too, for the South China Sea’s eastern edge is part of an area called the Western Pacific Warm Pool. This has an average temperature of 29°C, making it the hottest body of water in the ocean. It is thus an important source of climate-controlling heat and moisture, and is involved in regulating both the monsoon and El Niño, a weather-altering arm of warm water that reaches intermittently across the Pacific from South America.

Spreading information



The third part of the project will look at the South China Sea’s biology—particularly at depth. This will be led by researchers including Jiao Nianzhi, of Xiamen University in Fujian province, and Tian Jiwei, of the Ocean University of China, in Qingdao, Shandong province. They will study the sequestration of carbon by micro-organisms, examine life around the springs and vents of the ocean floor, and make long-term measurements of currents and the exchange of nutrients and plankton between different parts of the South China Sea, and between it and the Pacific.

All this costs money, of course. The budget for South China Sea-Deep is 150m yuan (\$22m), to be paid for over the next eight years by the National Natural Science Foundation, a government agency based in Beijing. Nor is this China's only oceanographic enterprise. A deep-sea technology centre in Qingdao will cost 400m yuan and a network of sea floor observatories similar to Canada's Neptune programme and America's Ocean Observatories Initiative will clock up another 1.4 billion yuan. Money well spent, no doubt, in the interests of pure research. Still, it cannot hurt, as Zhang Gongcheng, of the China National Offshore Oil Corporation, observed in his talk at the meeting, that the reserve of natural gas in the South China Sea is estimated at 200 trillion cubic metres. Pure research is all very well. But buttering a few parsnips at the same time can do no harm.