SOURCE: ANTARCTIC OCEAN ALLIANCE

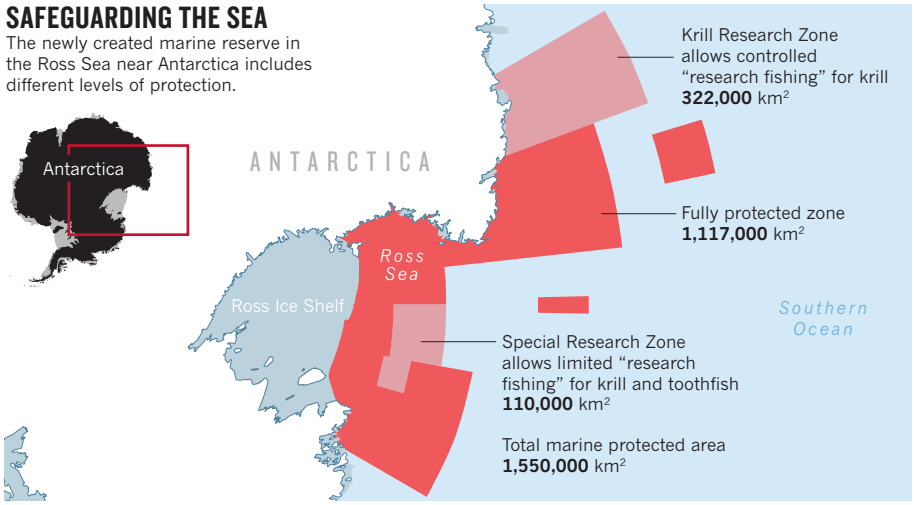
CCAMLR members had discussed the Ross Sea reserve since the United States and New Zealand proposed it in 2012. Observers say that Russia's change of heart might have been the result of behind-the-scene discussions on the issue in recent months between the US secretary of state, John Kerry, and his Russian counterpart, Sergey Lavrov.

The Ross Sea is relatively healthy, but fishing activity is increasing — and that has begun to affect stocks of the predatory Antarctic toothfish (*Dissostichus mawsoni*). Also in decline is the Antarctic krill (*Euphausia superba*), a shrimp-like crustacean and a key creature in the marine food web off Antarctica.

The deal includes some compromises. These might have been necessary to win the support of Russia, which operates a large fishing fleet in the region, says Jones.

Most of the reserve — 1.2 million km^2 — will be closed to all commercial marine activities. But a further 322,000-km^2 Krill Research Zone will allow controlled fishing, known as "research fishing", and another 110,000 km^2 will be a Special Research Zone open for limited fishing of both krill and toothfish ('see 'Safeguarding the sea'). So although the total area of the marine reserve is bigger than the next-largest — Papahānaumokuākea Marine National Monument near Hawaii — the region that is completely restricted is slightly smaller.

And for now, a 'sunset clause' specifies that the designated zone will expire in 35 years, meaning that it does not fully qualify as a marine protected area (MPA) under the strict rules set by the International Union for Conservation of Nature. "We do regret this," says Mike Walker, project director of the Antarctic Ocean Alliance, an environmental group in Washington DC.



"But we are confident that decision-makers will come to realize that the best way to conserve the ocean is to protect it forever."

SCIENTIFIC PRAISE

On the whole, scientists reacted enthusiastically to the decision. The Ross Sea contains one of the least-altered ecosystems on Earth, says Kirsten Grorud-Colvert, a marine biologist at Oregon State University in Corvallis. But that ecosystem is vulnerable to human disturbance and the effects of climate change. "Setting aside an area free from fishing stresses in this marine reserve provides a reference point and a place for research to evaluate how systems respond to climate change, and to learn how to foster resilience," she says.

Pauly adds, "It means we will protect one of the last parts of the world with a functioning natural ecosystem, with a complete array of marine mammals, seabirds and other marine life."

But others caution that ocean protection zones alone will not stop the decline in marine biodiversity, and that they do not provide a solution to overfishing because they may just move fishing to another spot. "If fishing is the problem, then they should reduce fishing pressure, not move it around," says Ray Hilborn, a fisheries specialist at the University of Washington in Seattle. "Indeed, MPA might also stand for 'Move Problems Elsewhere.'"

Next year, the CCAMLR will discuss further proposals to create protected zones of roughly similar size off the coast of East Antarctica and in the Weddell Sea. Chile and Argentina, meanwhile, are working on a proposal to protect the high seas surrounding the Antarctic Peninsula, the most rapidly warming part of the frozen continent. ■

BUSINESS

Young scientists gamble on biotech start-ups

Many are founding their own firms as venture capitalists show increased interest in science.

BY ERIKA CHECK HAYDEN

Vindication was three years coming for Ethan Perlstein. On 19 October, his California biotechnology company, Perlara, announced a deal with Novartis. The Swiss drug giant will test a compound that Perlara has identified as a possible treatment for a rare childhood disease, and will invest an undisclosed sum in the smaller firm.

Numerous biotech investors turned Perlstein away before he started Perlara in San Francisco in 2014, because he wasn't the tenured professor that most venture capitalists saw as founder material. "They pretty much told me to take a hike," he recalls.

But he persevered, and is now part of the vanguard of young biomedical scientists who have started companies instead of taking the conventional academic path and pursuing postdoctoral studies after their PhDs. Among the factors driving this change are an infusion of money into early-stage biotech investing, the emergence of biotech incubators and the scarcity of academic jobs in science.

"We're starting to see a renaissance of investors embracing the idea that scientists can build businesses," says Ryan Bethencourt, programme director of IndieBio, a biotech accelerator in San Francisco that began in 2014.

Previously, Bethencourt says, investors preferred to fund companies started by established professors who focused on the science, while investors installed a management team to take care of the business side. But that has changed as crucial technologies,

such as genetic sequencing, have become cheaper and lab work has become automated. The cost of starting biotech companies is falling, lowering the risk for investors to fund new science-based companies. IndieBio and Y Combinator — an information-technology incubator in Mountain View, California, that started accepting biotech companies in 2014 — provide funding and mentoring to entrepreneurs in exchange for shares in the companies.

FORK IN THE ROAD

Y Combinator, which provides US$120,000 in seed funding per company, invested in Perlara this year; IndieBio, which provides $250,000 per start-up, has funded 42 companies in a variety of fields. Last year, biotech firms in the United States and Europe raised $3.5 billion in early-stage financing — more than in any previous year, according to the consultancy Ernst & Young. Much of this was from investors who have already made money in technology.

"Most of the venture guys I know want to change the world for the better," says Dan Widmaier, co-founder and chief executive of Bolt Threads in Emeryville, California, which uses genetic engineering to manufacture textiles. Widmaier went to work for the company three days after completing his PhD in 2010. "As they see it, being able to serve up an ad faster probably isn't changing the world for the better as much as being able to solve climate change or cure disease."

"Most of the venture guys I know want to change the world for the better."

Conventional academic paths are also becoming less appealing. On average, young scientists earn their first US National Institutes of Health R01 grant — the bread-and-butter support for most biomedical scientists — at the age of 42. When Anitha Jayaprakash earned her genetics PhD from the Icahn School of Medicine at Mount Sinai in New York City in 2014, she saw scientists all around her stuck in postdocs. Many had no hope of finding their own tenure-track academic jobs — a phenomenon that Perlstein has dubbed the "postdocalypse". "It gave me a very depressing feeling about the whole academic space," says Jayaprakash. So she started Girihlet, a genetic-sequencing company in Berkeley, California, that has received funding from IndieBio and other investors.

Alexander Lorestani felt the same way when he left a joint graduate and medical-degree programme in 2015 to co-found Geltor in San Leandro, California, which makes a vegan alternative to animal gelatin. He and his co-founder are 29 and 30 years old, and felt ready to use science to serve humanity. "I couldn't imagine waiting another five to ten years to dive into doing what I think of as my life's work," Lorestani says.

It's not an easy road. Most young biotech firms fail. Widmaier says that he never expected Bolt Threads to raise $90 million and last for 6 years. He says it has been rewarding to thrive long enough to be doing groundbreaking science — and to have a rare degree of independence. "Anywhere else, you join someone else's vision for what a perfect workplace is," he says. "The most valuable thing about building a company is that you get to build the place where you go to work every day." ■

HELIOPHYSICS

Hiccups for US satellite

Cosmic rays may be inducing glitches in space-weather probe's computer.

BY ALEXANDRA WITZE

A space-weather satellite that is supposed to alert Earth to incoming solar storms has temporarily dropped offline six times in the year since it became operational. The US craft's onboard computer may be experiencing hiccups caused unexpectedly by Galactic cosmic rays.

The Deep Space Climate Observatory (DSCOVR) went out of action most recently on 30 October. In each case, it unexpectedly entered a 'safe hold', in which scientific data stopped flowing and engineers had to scramble to try to recover the spacecraft. In total, DSCOVR's space-weather forecasting instruments have been offline for more than 42 hours since 28 October 2015, when the US National Oceanic and Atmospheric Administration (NOAA) took the spacecraft over from NASA, which built and launched it.

NASA

Workers test solar arrays on the DSCOVR satellite, which is now used to monitor space weather.

Each outage lasts for only a few hours, and the total downtime amounts to more than 0.5% of its time in space — well within NOAA's requirement that the spacecraft operate at least 96% of the time. The 11 October outage did not significantly affect predictions of a minor geomagnetic storm that arrived a few days later, says Robert Rutledge, head of the forecast office at NOAA's Space Weather Prediction Center in Boulder, Colorado.

But the outages mean that DSCOVR could be offline when a major solar storm erupts, leaving Earth essentially blind to the incoming onslaught. "Are they problematic? Yes," says Douglas Biesecker, a solar physicist at the Boulder centre.

Other heliophysics spacecraft monitor solar eruptions, but DSCOVR delivers unique information from its location at ▶