that has been built to detect illicit nuclear testing: the system, it is hoped, will eventually underpin the Comprehensive Nuclear-Test-Ban Treaty (CTBT), a pact to halt work on nuclear weapons worldwide. Using data from this monitoring system, scientists in Canada and the United States were quickly able to establish that the rock that broke up over Russia was the largest to strike Earth in more than a century. They found that it exploded with the strength of a good-sized thermonuclear warhead, although, luckily, at an altitude high enough for the atmosphere to absorb most of the shock wave.

To understand the value of this monitoring network, imagine that the celestial visitor had arrived 30 years earlier — no time at all in the life of the Solar System. If there had been a sudden explosion over Chelyabinsk towards the end of the cold war, without an Internet or free press to circulate images, a very different picture could have emerged. The city is fewer than 100 kilometres from some of Russia's largest nuclear-weapon production and storage facilities: a surprise airburst would almost certainly have put the country's nuclear arsenal on hair-trigger alert. Shortly after the strike last week, right-wing lawmaker Vladimir Zhirinovsky asserted: "Those aren't meteors falling, it's the Americans testing new weapons." His comments were greeted with bemusement by the Russian press; in another time, they might have triggered nuclear war.

Just a few days before the spectacular events over Russia, the CTBT network picked up a less visible but politically more significant incident. On 12 February, North Korea conducted its third nuclear-weapon test deep underground. On this occasion, the CTBT network's seismic sensors detected the blast, and located it to within a few kilometres of North Korea's previous nuclear tests. Independent analysis of the network's data showed the yield of the weapon to be several kilotonnes, much smaller than the explosion of the Russian meteor.

Unlike with the Russian event, there were few other ways to verify the North Korean explosion. The North Korean Central News Agency put out a statement announcing the test, but is not particularly reliable. US, Japanese and South Korean sensors all picked up the shock from the blast, but because they belong to sovereign nations, there was no guarantee that the data would be shared in a timely fashion — or believed by adversaries.

"A ban on nuclear testing could be enforced, if a further eight nations are willing to ratify it."

The raison d'être of the CTBT network is to catch tests such as the one conducted by North Korea. Its ability to do so shows that an international ban on nuclear testing could be enforced, if a further eight nations, including China, the United States, India and Pakistan, were willing to ratify it. The CTBT has been open for ratification since 1996, but unfortunately, in recent years, little progress has been made towards its entry into force.

The meteor strike also shows that the constructed network has great value in its own right. It has done much non-nuclear-test work since it became active: tracking earthquakes, tsunamis and nuclear accidents.

Building and running this global sensor network isn't cheap. The CTBT organization in Vienna estimates that around US$100 million a year goes on its 321 monitoring stations and 16 laboratories worldwide, along with a data centre and other support for the treaty. Those funds are contributed by the treaty organization's 183 member states, which are guaranteed timely access to the data collected by the network.

Many hundreds of scientists have begun using the CTBT data in the past few years, and many hundreds more are likely to sign up. As the events of the past week show, even without a test-ban treaty, the network makes the world a safer and more interesting place to live. ■

Net gains

Estimating the scale of the problem may allow us to arrest dangerous levels of overfishing.

The sea is a big place. Most fish are small. So it stands to reason that it is difficult to work out with any degree of accuracy just how many fish live in the sea. One way is to measure how many fish we pull out of it. But is that the best way? Or even an accurate way? In two Comment pieces this week, starting on page 303, fisheries scientists debate the issue. It is a crucial one. Worldwide, more than US$200 billion of fish were caught or farmed in 2010. How long can that continue?

In one piece, Daniel Pauly argues that 'catch data' of the number of fish caught are a vital tool for assessing the health of fish stocks. In their counterpoint piece, Ray Hilborn and Trevor Branch warn that over-reliance on this measure misses important subtleties and can misleadingly distil the health of entire ecosystems down to a landed tonnage. This is far from an academic debate. If scientists cannot estimate fish numbers, and so the health of stocks, there is little hope that this resource can be exploited in a sustainable fashion.

Disagreements such as this can be problematic for policy-makers. They want a simple answer to the question of how much fish should be caught. But it is crucial that they happen, and happen openly. Fisheries science, and marine science generally, may never have been more important.

It is unquestionable that some fisheries have been horribly mismanaged, and some species driven to dangerously low levels. But equally, there are positive signs of change. There are examples of well-managed fisheries, and, more importantly, there now seems to be a political will to listen to scientists. In the past, quotas for fishing were frequently set much higher than recommended. Europe's rightly derided Common Fisheries Policy (CFP) is a leading example of this. Tuna populations also show the dangers of repeatedly ignoring scientific advice.

Last year, the International Commission for the Conservation of Atlantic Tunas surprised some by sticking to scientific advice on how many of the valuable fish should be caught, despite suggestions that numbers are increasing. And European politicians are pushing for a reform of the CFP that may finally put science in the driving seat in setting catch limits. Schemes to tell consumers which fish they can eat with a clear conscience have never been more popular, and are also attracting increasing, healthy scrutiny (including in these pages; see J. Jacquet *et al.* *Nature* **467,** 28–29; 2010, and related Correspondence).

Marine conservation more broadly is also gathering pace. Huge marine reserves are being created around the world, although these are not without teething problems and whether they will ultimately boost fisheries is hotly debated. Billionaires vie to explore the depths, bringing with them slick technology, show-business élan and even more public attention. Last week saw the launch of the Global Ocean Commission, with senior political figures aiming to produce recommendations on how to preserve the ecosystems of the high seas outside national jurisdictions, to feed into United Nations discussions set for 2014.

One message from the Comment pieces this week is just how little reliable information we have about fisheries. Pauly admits that catch data are massively under-reported in many countries, and Hilborn and Branch cite the value of more-detailed scientific assessments of stock while acknowledging that these exist for only 40% of the total catch in the global database of the Food and Agriculture Organization of the UN.

Fisheries scientists unwilling to face this reality can take heart. We don't have the basic information to judge the health of many human stocks either (see page 281). Those who have the more difficult job of sifting the oceans must be brave enough to outline the uncertainties — such as those over catch data — even as they fight to reduce them. ■

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