

A plan for the ocean

Governments have typically regulated their coastal waters as if fishing, shipping and the like were separate entities. A new, integrated approach could change all that — while greatly boosting marine science.

Although the US government's 28 April approval of a controversial wind farm off the coast of Massachusetts had little in common with the 22 April sinking of an oil rig off the Louisiana coast, or the environmentally catastrophic oil spill that followed, both events highlight the increasingly wide range of demands being made on coastal waters around the world. Government regulators are finding it ever more difficult to reconcile those demands, as wind turbines, off-shore aquaculture and a growing roster of other new activities jostle for space with the already long list of existing claimants, including fisheries, shipping lanes and recreational boating. These uses of the ocean are often incompatible not only with one another, but also with the need to protect what remains of fragile marine ecosystems.

The difficulty of finding that balance has led some governments to radically rethink their sector-by-sector, statute-by-statute regulatory strategies, replacing them with a more coordinated decision-making process known as coastal and marine spatial planning (CMSP). The idea is to bring together all the stakeholders, from energy companies and government agencies to environmentalists and fishermen, to sort through the interdependencies and their long-term implications, and then to map out the uses permissible in any particular region. In effect, CMSP is zoning for the oceans.

So far, leadership in CMSP has come mainly from Australia, from European countries such as Germany, Norway and the Netherlands, and from a handful of US states — notably Massachusetts, Florida and Oregon. The US federal government has lagged far behind, with different agencies regulating fisheries, energy, water quality and the like as if none of these activities had anything to do with the others.

That could soon change. Within the next couple of months, US President Barack Obama is expected to announce a national ocean policy that would implement CMSP throughout the country. The policy has been under development by an interagency task force since June 2009, and a draft (see go.nature.com/zyx8Go) has been publicly circulating since December. The final policy will undoubtedly be tweaked to address public comments. But in broad outline

it will call for US coastal waters to be divided into nine areas, each with a regional ocean council that will draw up a CMSP programme addressing local issues and priorities. A National Ocean Council would review each regional plan to ensure that it is compatible with the others and with national policy.

As welcome as Obama's announcement will be, it is just the first step. Getting any necessary legislation passed, setting up the national and regional councils, reaching agreement on the roles of the states, Native American tribes and other stakeholders could take years. But both Congress and the Obama administration should pursue this goal as rapidly as possible. Meanwhile, they should also be pursuing the research required to ensure that CMSP is based on the best scientific information.

One early priority, for example, will be to chart the biologically and ecologically important areas — not just on the sea floor, but throughout the water column, and not just once but over time, as populations move and habitats shift from season to season. Such maps are lacking in many US regions, but could prove invaluable for basic ocean science as well as for CMSP. Another goal will be to identify potential indicators for evaluating the effectiveness of the various plans. Are fishery closures helping to revive fish populations? Are marine protected areas working? And are the observed effects really due to the management plan, or to exogenous forces such as climate change?

None of this research will come cheap. But Obama has already made a good start with his 2011 budget request for the National Oceanic and Atmospheric Administration, which asks for US\$20 million to fund grants for regional CMSP work, and has a separate budget item for sea-floor mapping and charting. His request also includes \$4 million for CMSP work by the US Geological Survey.

Even if fully implemented, Obama's national ocean policy will not prevent every controversy or eliminate the danger of oil spills. But it would be a much-needed step in the right direction, and would move the United States to the forefront of efforts to make rational use of a finite and fragile resource. ■

Up in the air

Ways to obtain more accurate data can and should be put in place to police greenhouse-gas emissions.

It is hardly surprising that climate discussions tend to gloss over uncertainties in data on greenhouse-gas emissions. Governments are struggling towards an international agreement to reduce those emissions, and their focus is necessarily on coming up with specific, enforceable targets. But the fact is that scientists' ability to measure

emissions and verify that countries are following through on their commitments is far from adequate. And that is unlikely to change without the full engagement of governments and scientists.

There are a number of reasons to be sceptical about current emissions data (see page 18). Some are a matter of human frailty: it is often in the best interests of both companies and governments to underestimate emissions, and thus to overstate the effectiveness of a given technology or policy in reducing them. That temptation will only increase as countries ramp up climate commitments. Other reasons, however, hinge on the uncertainties inherent in even the best emissions statistics.