

organisms beyond national jurisdiction. It is possible that Negotiations may focus on creating a sui generis, or unique, regime that provides for access and benefit sharing processes, although which organisms will be subject to that regime is wide open at this stage (Druel and Gjerde, 2014).

Other issues arising from the discussions revolve around the protection of marine biodiversity. It has been noted that the high seas are regulated by sectoral regimes which are poorly coordinated. Some activities may not be regulated at all (Gjerde *et al.*, 2008; Rochette *et al.*, 2014). In light of this, there is a genuine concern that marine biodiversity is not being protected as well as it should be. Therefore, a range of proposals have centred around environmental protection mechanisms including ABMT and requiring environmental impact assessments. One of the key issues is the relationship between obligations created by the ILBI and existing institutions.

During these discussions, it has often been pointed out that the area beyond national jurisdiction does not include the continental shelves of coastal states that extend beyond 200 nm. In these cases, the coastal state has sovereign rights over the resources of the continental shelf, while the resources found in the water column are beyond national jurisdiction. As explained below, this legal separation of responsibility creates serious practical problems. It will be essential for the ILBI to address this problem.

Any consideration of protecting biodiversity in areas beyond national jurisdiction will need to address the fact that some activities will have effects across jurisdictional boundaries. This is particularly true for the continental shelf beyond 200 nautical miles. Activities conducted in the high seas could have a direct or indirect impact on the biodiversity of continental shelves. For example, bottom trawling for high seas species will have a significant adverse impact on vulnerable benthic ecosystems in that location (Norse *et al.*, 2012; Clark *et al.*, 2016). The disposal of waste from vessels or land-based sources might impact on continental shelf species (Ramirez-Llodra *et al.*, 2011). Carbon sequestration in the deep ocean that forms lakes of carbon dioxide above the seafloor could alter the acidity or oxygen level of the seawater, making it difficult for sedentary species to survive (Seibel and Walsh, 2001; Barry *et al.*, 2004).

It is also important to remember that activities conducted by the coastal state on the continental shelf can have an impact on biodiversity in the water column. This may affect biodiversity

relating to the EEZ, which imposes obligations on coastal states to ensure the sustainable utilization of the living resources of the EEZ. However, Part XII of UNCLOS imposes a number of environmental obligations on all states, including coastal states. In addition, other treaties and customary international law impose separate obligations.

First, coastal states must take steps to protect the environment under their jurisdiction, which includes the continental shelf beyond 200 nautical miles. Article 192 of UNCLOS imposes a general obligation on states to protect and preserve the marine environment. This has been interpreted as a positive obligation to take active measures to protect and preserve the marine environment, and a negative obligation not to degrade the marine environment (*South China Sea Arbitration*, para 941). Article 194 requires states to prevent, reduce and control pollution of the marine environment from any source. It also requires states to preserve and protect rare or fragile ecosystems as well as habitats. There can be no doubt that some continental shelf ecosystems will fall into this category.

The Convention on Biological Diversity (CBD) applies to areas under national jurisdiction and therefore applies to the extended continental shelf. Under the CBD, coastal states must develop national strategies for the conservation and sustainable use of biodiversity, identify and monitor components of biodiversity and where possible protect, manage, and restore biodiversity and ecosystems (CBD, arts 6, 7, and 8).

Second, coastal states have responsibilities in respect of the environment beyond their jurisdiction. Article 194(2) of UNCLOS establishes that coastal states have a responsibility to ensure that activities under their jurisdiction or control are conducted so as not to cause damage by pollution to the environment of other states, and to ensure that pollution arising from their activities does not spread beyond the areas they exercise sovereign rights. It is noteworthy that this obligation appears stronger in the way it is phrased

is similar. As detailed above, coastal states do bear responsibility for the protection of biodiversity on their continental shelf. Therefore, coastal states will, in some circumstances, be able to restrict the activities of other states, such as bottom trawling, if it is reasonably connected with the exploration and exploitation of sedentary species (Mossop, 2016).

The flag state also has a number of environmental obligations that qualify its high seas freedoms. These include the obligations in Part XII of UNCLOS, and it is clear that those articles apply to vessels operating on the high seas (*South China Sea*, para 940). The Arbitral Tribunal in the *South China Sea* case found a failure to prevent the large scale harvesting of corals and giant clams could amount to a breach of articles 192 and 194(5) (*South China Sea*, para 960). These obligations reinforce the view that coastal state regulations imposed to protect sedentary species as part of an ecosystem should be respected by flag states, unless they infringe or unjustifiably interfere with high seas freedoms.

The tension between concepts of biodiversity and sedentary species

resources of sedentary species in return for some advantages under a global access and benefit sharing regime.

One option is to stipulate that the coastal state will only have sovereign rights over species that are sampled directly from the continental shelf. If such samples are of sedentary species, the coastal state has the right to control access to such species, and to enter into access and benefit sharing arrangements in relation to the use of those species. However, if juveniles are collected in the water, or if environmental DNA is collected near, but not on, the continental shelf, this would fall outside the coastal state's jurisdiction. The advantage of this is that it avoids the question of when the "harvestable stage" of the organism is. It also simplifies the issue for both states and researchers, who will know what legal regime applies based on the location of the organism or DNA that is sampled. Where the coastal state has concerns about the protection of fragile ecosystems, it may be able to impose conditions on access. The key disadvantage is that this perpetuates a divided ecosystem approach, whereby some species in the same ecosystem are under the control and jurisdiction of the coastal state, while others are subject to the high seas regime. It is also unlikely that the coastal state could prohibit access to the non-sedentary species in the ecosystem even if it is concerned that the research activity might be harmful to the environment in some way. For example, could a coastal state impose a marine protected area to protect sedentary species in a vulnerable marine ecosystem and insist that researchers refrain from accessing the non-sedentary species on the basis that sedentary species will be affected? This would seem doubtful in the current legal framework under UNCLOS unless there was a clear and significant detriment to the coastal state interests in the sedentary species.

A second approach would be to create a "continental shelf benthic zone" within which the coastal state would have rights to exploit the genetic resources of the shelf, but also responsibilities to protect vulnerable marine ecosystems. This would extend the

include a process that allows a coastal state to initiate a discussion about using ABMTs to support coastal state objectives. The final shape of this process could vary depending on the final content of the ILBI and how it provides for the establishment of ABMTs. Of course, one of the key issues that needs to be resolved in the negotiations is the relationship between the ILBI and other regional and global organizations. If the ILBI ultimately leaves the establishment of ABMTs to such organizations, it could still set out some general principles relating to the relationship between ABMTs and coastal states. It would however, require coastal states to work with existing organizations to achieve their goals.

Environmental Impact Assessment

As discussed above, the obligation to conduct environmental impact assessments in certain cases is already a matter of international treaty and customary law. Both coastal states and flag states must ensure that assessments are conducted where there is a risk of significant transboundary harm or harm to the areas beyond national jurisdiction. For the coastal state, this will require careful consideration for almost all activities on the continental shelf beyond 200 nautical miles. The obligation to conduct assessments is closely connected to obligations to notify and consult with affected states. Arguably then, it is already part of customary international law that the coastal state be notified and consulted if activities in the high seas threaten the biodiversity of the continental shelf. At a minimum, the ILBI can articulate these obligations clearly.

An obligation to notify and consult does not provide the coastal state with a right to veto activities undertaken by other states in the high seas. A more complicated question is whether the ILBI could clarify matters that require the permission of the coastal state before they can take place. For example, it might be possible to argue that some activities (such as bottom fishing) are so likely to interfere with coastal state interests that permission is required before it is conducted on the continental shelf by other states (Mossop, 2016).

Another matter which the ILBI could assist with is the notification requirement on coastal states when they conclude that activities under their jurisdiction may have negative consequences on the high seas. Under existing international law, it is clear that there is an obligation to notify and consult with neighbouring states if there is a risk of significant transboundary harm. But, if the risk of harm is to the high seas, how is the coastal state's obligation to notify to be satisfied? The ILBI could create a reporting system which facilitates the notification of potential risks identified by environmental impact assessment.

Capacity Building

A considerable problem for coastal states is the lack of available information about the biodiversity on their continental shelf beyond 200 nautical miles. This problem is particularly acute for developing countries. It is expensive to study the deep sea, and most scientific expeditions are conducted by researchers from developed countries. It also seems that, in order for a strong case to be made at the international level for the protection of biodiversity on the continental shelf or in areas beyond national jurisdiction, this will have to be based on good science (

injection on deep-sea meiofauna. *Journal of Oceanography*, 60: 759–766.

Certain Activities Carried out by Nicaragua in the Border Area/ Construction of a Road in Costa Rica Along the San Juan River (Costa Rica v Nicaragua) (Judgment) ICJ, 16 December 2015.

Chistoserdova, L. 2010. Recent progress and new challenges in metagenomics for biotechnology. *Biotechnology Letters*, 32: 1351–1359.

Clark, M. R., Althaus, F., Schlacher, T., Williams, A., Bowden, D. A., and Rowden, A. A. 2016. The impacts of deep-sea fisheries on