

## Ecological connectivity between the high seas and coastal waters: Why coastal communities need to care about what happens on the high seas

*Editor's Note: For this article, we interviewed Ekaterina Popova, a global ocean modeller with the National Oceanography Centre in Southampton, United Kingdom, about her new article "Ecological connectivity between the areas beyond national jurisdiction and coastal waters: Safeguarding interests of coastal communities in developing countries" published in Marine Policy in June 2019. This research found that coastal regions of some least-developed countries (LDCs) are connected to areas beyond national jurisdiction (ABNJ) through larval dispersal and the potential dispersal of pollutants. These findings suggest that protecting 'source' areas in the ABNJ could help promote sustainable livelihoods for coastal regions that depend on larval supply from these regions (and could prevent pollutants from these source areas reaching coastal regions.)*

### The Skimmer: Can you briefly describe some of the connections between source areas in the ABNJ and coastal regions?

**Popova:** Our study showed that connectivity between the ABNJ and coastal waters of different countries varies considerably. How tight the connectivity is, depends on the prevailing direction, timescale and variability of ocean currents. Sometimes, the shape of the adjacent Exclusive Economic Zones (EEZs) also has an effect. The complex ways these various factors interact means that close geographical proximity, or 'adjacency', of coastal waters to ABNJ is not always a good indicator of strong connectivity and some countries are much more exposed to the influence of ABNJ than others. The world's most ABNJ-impacted LDC is the Federal Republic of Somalia. Its strong connectivity is shaped by three powerful currents: the South Equatorial current, the East African coastal current, and the seasonally reversing East Somali current. The most tightly ABNJ-connected stretch of the Somali coastline can be impacted by the upstream ABNJ waters on a time scale of just over a month. In contrast, the Republic of Senegal is one of the world's least connected LDCs. Its most tightly ABNJ-connected coastline stretch is impacted by upstream ABNJ on a time scale of more than seven months.

At the same time, not all areas in the ABNJ are equally important in their influence on the coastlines. Some areas of the ABNJ are connected to more countries and impact longer stretches of the coasts than others. In this respect, the Mascarene plateau in the central Indian Ocean, the northern Bay of Bengal, and the "donut hole" of the Pacific Islands are the most prominent areas. In general, the Indian Ocean with its energetic and seasonally reversible circulation is the most connected of the all ocean basins. Given that it is surrounded by numerous developing countries, where coastal populations are highly dependent on the ocean ecosystems for food and livelihoods, we need to think very carefully how to regulate activities in its ABNJ.

### The Skimmer: In your recent paper in Marine Policy, you focus on LDCs. Can you tell us anything about ecological connectivity between the ABNJ and coastal regions globally? Are there any broad characterizations that can be made about what types of areas are source regions and/or coastal regions that are highly connected to ABNJ?

**Popova:** The ocean is a very interconnected system, and ocean currents are complex and highly variable in time and space. It is possible, however, to draw some general patterns of the global connectivity. Naturally, it is strongest where there is a strong surface current directed towards a coastline. Westward flowing equatorial currents are probably the most pronounced example of this and provide a strong connection between ABNJ and the countries on the east coasts of continents. This is why our study highlighted East Africa as one of the most ABNJ-exposed areas, and this is also why west coasts of continents are generally less connected to the ABNJ in the tropics.

### The Skimmer: Is ecological connectivity between coastal regions and ABNJ being discussed at all in current UN negotiations on the conservation and sustainable use of marine biodiversity of the ABNJ?

**Popova:** Connectivity in general and the connectivity between ABNJ and coastal zones in particular are indeed beginning to draw a lot of attention at the UN Convention on the Law of the Sea (UNCLOS) negotiations. It was explicitly mentioned in the 'President's Aid to Negotiations' document for the March 2019 negotiations in relation to both Marine Protected Areas (MPAs) and Environmental Impact Assessment (EIA) elements of the negotiations. In addition, during the negotiations in March 2019, a number of side events dedicated to connectivity were run at the UN. One of these events ("So far, yet so close: why the High Seas matter to vulnerable coastal communities?") was based on the results of our study and a [study on future scenarios and projections for fisheries on the high seas under a changing climate](#). The key questions discussed at this event were:

1. What is ecological connectivity, and to what extent is marine biodiversity in ABNJ connected to territorial waters?
2. Why does conservation of the high seas need to take into account socioeconomic impacts on coastal developing states?
3. What are future scenarios and projections for fisheries in the high seas under a changing climate?

4. How will climate change impacts on biodiversity in the high seas affect potential revenue from fish in coastal developing states.

This event had a full house attendance, and we received very positive feedback, particularly from Pacific small island developing states. The event would not have been possible without co-hosts, the permanent missions of Malawi (chair of the LDCs Group), Eritrea, and Sweden.

Our study has exposed a number of important considerations. However, the key message we are delivering in this complex process is a simple one – the current debates on criteria to identify marine managed and marine protected areas in the ABNJ often focus only on the ecological and biological significance of the habitat/area in question. Given interconnectedness of the ocean environment, this is not enough. We have to include potential socioeconomic benefits for vulnerable coastal communities downstream of these areas.

*Photo: Fish Market in Zanzibar, Tanzania, Credit: E. Popova, NOC.*

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