When we think about the next frontier for humanity, we think about space. However, closer to home, the world’s seas are perhaps undergoing more important exploration. Artificial island construction is gaining momentum in struggles over sovereignty, rapid urbanization pushes cities to expand into the sea, and a great game for undersea resources is unfolding. The Blue Frontier still awaits us.

Our observations

- From the South China Sea to the Arctic, there is a battle to build artificial islands to claim sovereignty over the seas. China’s island-building in the South China Sea has long angered its neighbors, as China created more than 17 times more land in 20 months than all the other countries combined did in the past 40 years. Meanwhile, Russia is building several artificial islands in the arctic Barents Sea.
- Many countries have built artificial islands for functional infrastructure such as airports (e.g. Japan, China, Qatar) and windfarms (as the Netherlands is planning in the North Sea).
- The United Nations Convention on the Law of the Sea (UNCLOS) states that the high seas (defined by the dark blue areas on this map) are open to all states (article 87) and no state may subject any part of the high seas to its sovereignty (article 89).
- The Seasteading Institute has been trying to build “floating cities” for years in order to “escape rising sea levels, overpopulation and poor governance.” The organization currently cooperates with French Polynesia for its pilot project and is trying to raise funds through a cryptographic token.
- Land reclamation projects to expand cities into the sea have gained momentum. Around 25% of Singapore and 20% of Tokyo are artificial islands built out into the sea. Malaysia is also rapidly expanding into the sea. The Dutch province of Flevoland is the world’s largest land reclamation project.
- Both state-owned and private “mobile sovereignty” platforms roam the seas. Modern oilrigs no longer need to be moored to the ocean floor and use GPS-driven systems that direct hydraulic jets to hold the rig in position – and they can move around the world. Wang Yilin, chairman of the Chinese state-owned oil company CNOOC, has called their towable deep-water rigs part of China’s “mobile national sovereignty”.
- We have written before about the rising popularity of cruise ships among young people, and how these ships might in the future evolve further and turn into a type of self-driving city.
Global maritime history has always been characterized by struggles over securing trading posts (e.g. colonialism, China’s BRI) and harnessing natural resources (e.g. oil, food, metals). In line with this history, the current momentum behind artificial island construction, land reclamation, and underwater resource exploration is driven by several trends, and could, once again, have profound geopolitical implications.

Artificial islands and land reclamation projects have become symbols of modernity, but their origin actually dates back millennia. In prehistoric Scotland and Ireland, and in the city of Tenochtitlan, the Aztec predecessor of Mexico City, people built islands for ceremonial or political purposes. Modern-day artificial islands, however, serve many functions, such as relieving overcrowded cities, airports, windfarms, oil drilling and tourism. As a result, demand for dredgers, massive ships that lay the foundation for artificial islands, is rising rapidly. Most importantly, land reclamation (extending land into the sea) is no different from artificial islands: both serve to expand valuable landmass and, whether intentional or not, function as claims to sovereignty. Indeed, while China angers its neighbors by building artificial islands in disputed territories, Malaysia and Indonesia have stopped exporting sand to Singapore because the city-state’s land reclamation is threatening their livelihoods.

While we are increasingly raising the seabed to build land, we are also diving down to uncover the resources the seas have to offer. While material dug up in a typical copper or gold mine on land only yields a tiny fraction of useful metal, hydrothermal vents are much richer. Hence, deep-sea mining is gaining momentum. A Japanese expedition off Okinawa discovered enough zinc to keep Japan supplied for an entire year. Nautilus Minerals forecasts that an undersea industry of copper could be worth $30bn a year by 2030. Meanwhile, the food industry could be revolutionized by a shift from land to water as well. Aquaponics, systems which combine aquaculture (raising aquatic animals) with hydroponics (cultivating plants in water), need neither natural light nor soil and only one-third the water of organic farming.

These struggles over sovereignty and exploration for resources could have profound geopolitical implications. We are used to think of the “freedom of the seas”, a concept introduced by the Dutch legal scholar Hugo Grotius in his 1609 work Mare Liberum (open sea). However, the freedom of the high seas as defined by UNCLOS does not apply to areas of overlapping claims that cause legal friction. Instead, we therefore live in the world of Mare Clausum (closed sea) as defined by English jurist John Selden, who responded to Grotius within two decades in order to affirm control over offshore water. We will, indeed, increasingly see states claim sovereignty in hotspots like the Arctic, the Mediterranean, the Indian Ocean and the South China Sea. However, artificial islands are massively expensive. Hence, while land reclamation for global cities will continue, struggles over sovereignty could increasingly be determined by “mobile sovereignty” (e.g. oil rigs, tankers and other structures). In line with this trend, floating oil platforms and cruise ships could become much more than they are now. All in all, while the hype for space exploration continues (e.g. asteroid mining, space tourism), such innovation on the seas could have a much more profound impact in the coming years.

Implications

- Due to rapid urbanization and land scarcity for coastal cities, more cities will try to expand into the sea, boosting demand for land reclamation expertise. However, as we have noted before, sand scarcity is rising fast. In fact, construction of the famed Palm Islands off the coast of Dubai has repeatedly been stalled largely due to sand scarcity.

- As land reclamation is becoming more expensive (it has been estimated that the price of building a 5-square-kilometer island 3 meters above sea level is about $4.5bn), there could eventually be more momentum for mobile sovereignty. Relatedly, floating oil platforms and cruise ships could serve broader functions in the future (e.g. resource exploration, food, tourism).

- Land-scarce and food-import-dependent countries such as the U.A.E. and Singapore could become huge markets for aquaponics, as well as places with frigid climates that are relatively unsuited to other types of agriculture (as Parag Khanna notes in Connectography).