The Modern Political Map of Our Ocean Planet

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On land, the political map of the world has been relatively stable since the end of World War II: with some significant exceptions, most countries are, spatially, as they were in 1945 or shortly thereafter.[1] Land borders are mostly set, and the major state-to-state territorial disputes that persist today are—again, with some notable exceptions—disputes over relatively small areas, mostly tiny insular features with negligible inherent value.[2]

In contrast, the political map of the oceans has been fundamentally transformed over the same period. Today, what was a vast, undivided expanse of global commons as recently as the 1940s has become a patchwork of exclusive zones of coastal state sovereignty (in internal waters, archipelagic waters, and territorial seas) and sovereign rights and jurisdiction (in exclusive economic zones and continental shelves). These national zones, like zones of territorial sovereignty on land, have been or will be divided by political boundaries.

Half of the ocean space on the planet has been removed from the commons and is now under the exclusive control of coastal states for an important subset of uses.[3] Critical among these is the exploitation of the living and nonliving natural resources found in these areas, including fish, hydrocarbons, and other mineral resources. Many ocean areas are now entirely under the exclusive

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control of coastal states for the purpose of resource extraction, including most semi-enclosed seas such as the Caribbean, Mediterranean, Baltic, Black, Red, North, South China, East China, Barents, and Beaufort Seas, and the Arabian Gulf and Gulf of Mexico.

The seaward expansion of coastal state control has been a rapid but relatively peaceful process. Although there has been some important unilateral conduct, the process has been largely defined by multilateral consensus building and the establishment of customary and conventional international law governing claims to and uses of the oceans. The resulting legal regime strikes a balance between the coastal states' appetite for the economic wealth of the oceans and the navigating or flag states' need for unfettered mobility through the world's seas—including through coastal waters and straits. While it was not a foregone conclusion during their development, the spatial claims that have so dramatically changed the oceanic political map encompass the natural resources of those areas, but have had little impact on the fundamental freedom to navigate through them.

The resource-driven transformation of the oceanscape has created other changes underlying or related to the political map of the oceans. First, new mapping efforts have been undertaken to substantiate spatial claims to ocean area—including more precise mapping of coastlines and the exploration and surveying of previously unstudied areas of the deep ocean. Second, larger spatial claims have led to increasingly large areas being claimed by two or more states. Over the past 75 years, these growing overlaps have produced a new source of interstate tension, the peaceful resolution of which requires the delimitation of a maritime boundary or creation of a shared zone, which in turn adds a new geopolitical feature to the world map. Third, the ability of coastal states to claim vast maritime areas, even from small islands, has transformed inherently low-value land territory into some of the most intensely disputed real estate on the planet. These mixed disputes, involving both land territory and the ocean areas derived therefrom, are counted among the most troublesome flashpoints in the world today.[4]

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After three quarters of a century of seaward expansion, the modern political map of the oceans is resolving. Most of the claims contemplated under the

current international law of the sea have been made, and approximately half of the international maritime boundaries needed to divide areas of overlap have been agreed or adjudicated. Nonetheless, a handful of additional claims to continental shelf are expected, and the remaining half of the boundaries dividing disputed ocean areas will need to be settled before the political map of the oceans stabilizes to the same degree that it has on land.

Expanding Claims to Ocean Area

The centuries-old narrative of international ocean law has been informed by the tension between maintaining "open seas" (in which all states may exercise navigational and other rights) and expanding the area of "closed seas" (from which coastal states may exclude others and prevent them from exercising some or all of their high seas freedoms).[5] The norms in place from the 1700s through World War II favored "open seas" and limited the geographic scope of exclusive national ocean areas to a narrow band of territorial waters. During those two and a half centuries, the prerogative of maritime powers to move freely through the oceans was dominant, subordinating the coastal states' countervailing wish to control access to the living and non-living resources off their shores. The balance began to shift in favor of coastal states and "closed seas" in the mid-1940s and, 75 years later, resulted in the ocean map of the early twenty-first century.

In 1930, an international conference was convened in The Hague to formalize the breadth of the zone in which states could make lawful, internationally-recognized claims of sovereignty over areas of seabed, water column, and air space within, above, and below their territorial waters.[6] This narrow, sovereign zone—known as the territorial sea—was and remains the legal equivalent of land territory, but with a carve out for the innocent passage of foreign vessels navigating on the surface. The conference also explored whether there existed any other zones of coastal state control beyond the territorial sea in which some limited jurisdiction could be exercised over, for example, customs enforcement.[7]

The participating states failed to reach consensus on the maximum breadth of the territorial sea, nor could they agree on the existence or breadth of an additional seaward zone, although the range of proposals for the total breadth of both zones did not exceed 12 nautical miles from the coast.[8] Under those pre-war conditions the political map of the oceans sat mostly empty: beyond the narrow belt of territorial sea lay the undivided commons or the high seas, in which all states could freely navigate, fish, fly over, and lay submarine cables and pipelines.

Post-war Expansion Seaward

Weeks after the signing of the Japanese Instruments of Surrender, the United States initiated the seaward expansion of coastal state jurisdiction with two presidential proclamations, one addressing the seabed and subsoil (or continental shelf), and the other addressing fishing zones beyond the territorial sea.[9] Over the ensuing decades, zones of coastal state control over the resources of the continental shelf and the water column beyond the territorial sea became the two key building blocks of the modern ocean map.

President Truman's proclamation bringing the natural resources of the continental shelf contiguous to the land territory of the United States under its jurisdiction and control is commonly regarded as the starting point of the period of expanding claims to the continental shelf.[10] The rationale for the claim was clearly stated: the United States would need new sources of petroleum and other minerals—which would soon become accessible through technological advances—and their prudent utilization required recognized and exclusive coastal state jurisdiction.[11] The new claim was justified not on the basis of actual or effective occupation of the shelf, but on the basis of natural prolongation, i.e., the argument that the continental shelf is a natural geological extension of the land mass.[12]

In a short amount of time this unilateral claim and its underlying reasoning were incorporated into the fast-forming law of the sea regime. Other states soon joined the United States, and in 1958 the legal regime of the continental shelf was codified in the Convention on the Continental Shelf which provided that "the coastal State exercises over the continental shelf sovereign rights for the purpose of exploring and exploiting its natural resources" including non-living and sedentary living resources.[13] The Convention set the outer limit of the juridical continental shelf at the 200 meter isobath or depth line—an approximation of the average depth at which the physical continental shelf transitions to the continental slope—or, alternatively, "where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas."[14] Under either outer limit criterion, the 1958 Continental Shelf Convention formalized one of the building blocks of the modern ocean map: an area of exclusive coastal state control over the seabed and subsoil beyond the outer limits of the territorial sea.[15]

Fewer than 25 years after the United States asserted its unilateral claim, the International Court of Justice recognized the doctrine of the continental

shelf as a product of customary international law and declared that, as a natural prolongation of a coastal state's land territory, the continental shelf "exist[s] *ipso facto* and *ab initio*, by virtue of its sovereignty over the land....In short, there is here an inherent right."[16]

A parallel push into ever-expanding areas of the water column was also underway. Once again, the United States spurred this movement with the less well known Truman proclamation regarding coastal fisheries.[17] Ostensibly concerned about overfishing, this proclamation declared it proper for the United States to establish conservation zones in areas contiguous to its coasts in which "fishing activities shall be subject to the regulation and control of the United States" while also conceding the reciprocal right "of any State to establish conservation zones off its shores."[18] At the same time that the United States made a sweeping claim to exclude other nations from fishing in areas of the high seas, thereby frustrating one of the four high seas freedoms, it also preserved the residual high seas character of these zones, referring in particular to the freedom of navigation.

Other coastal states followed suit, each declaring fishery zone policies that carved out areas beyond the territorial sea for their exclusive management of the living resources in the water column.[19] This building block of the modern ocean map was not formalized for three more decades—with the advent of the exclusive economic zone—but the basic elements were in place by the late 1940s and early 1950s.

In a 1952 joint declaration, Chile, Peru, and Ecuador took the expansion movement one step further by enlarging the geographic scope and legal character of their claimed zones. Contemporaneous continental shelf claims expressly did not affect rights in the superjacent water column, and fisheries zone claims did not impact the high seas freedoms of navigation, overflight, or laying of cables and pipelines.[20] In contrast, the 1952 Santiago Declaration claimed *sovereignty* over a massive swath of the Pacific Ocean.[21] The declaration proclaimed that each of the three states "possess exclusive sovereignty and jurisdiction over the sea … to a *minimum* distance of 200 nautical miles from [their] coasts … which shall also encompass exclusive sovereignty and jurisdiction over the seabed and subsoil."[22] Essentially a territorial sea claim, the Santiago Declaration imposed severe limitations on surface and subsurface navigation and overflight by foreign vessels and aircraft.

Lead-up to the 1982 Convention

By the end of the 1960s, two major factors prompted the commencement of

multilateral negotiations that resulted in the 1982 United Nations Convention on the Law of the Sea and the international law of the sea regime that governs the uses of and spatial claims to the oceans today. The continuing tension between coastal state and navigating state interests constituted one major factor. Following the lead of Chile, Peru, and Ecuador, other coastal states, mostly developing or newly decolonized states made a spate of extra-wide territorial sea claims.[23] At the same time the Philippines and Indonesia were making sovereignty claims over the waters between their respective islands.[24] In these areas, which came to be known as archipelagic waters, navigation by foreign vessels would be limited to the restrictive regime of innocent passage. Both of these movements generated significant concerns about encroachment on the high seas freedoms of navigation and overflight. These concerns were felt most deeply by states with navies and air forces capable of projecting power beyond their coastal waters. In particular, the United States and the Soviet Union saw expanded territorial sea and archipelagic waters claims as a threat to their ability to move their militaries throughout the globe. This marked a notable example of aligned interests between these Cold War rivals.

The second major factor was a growing interest in the mineral resources of the deep seabed, an area beyond the outer limit of the continental shelf of any state. In the absence of agreed rules for their exploitation, it was clear that these resources would go to the best-funded and most technologically advanced states and corporations under a default rule of capture. As *res nullius*, a thing owned by nobody, ultimate ownership of these resources would be determined solely by possession. Developing states, unlikely to benefit from this default rule, found the predicted appropriation by developed states unsatisfactory. They rallied behind Maltese Ambassador Arvid Pardo's 1967 call for these deep seabed resources to be declared *res communis* or the "common heritage of mankind" and defined the battle lines of this second major factor.[25] Within three years of Pardo's speech, the General Assembly established a preparatory committee for a multilateral conference and, in 1973, convened the Third United Nations Conference on the Law of the Sea.

The Current State of the Map

Over the course of a decade, more than 150 states negotiated the 1982 United Nations Convention on the Law of the Sea. Among other matters, the parties finalized rules governing five zones that are now fixtures on the ocean map. First, they established the maximum breadth of the territorial sea at 12 nautical miles.[26]

Second, they created a 200 nautical mile-wide zone in which a coastal state could exercise sovereign rights over the natural resources of the water column, seabed, and subsoil with due regard to the freedom of other states to navigate through, fly over, and lay submarine cables and pipelines in that zone (appropriately called the "exclusive economic zone").[27] Third, they set the criteria and process for establishing the outer limit of the continental shelf, including in the event that it extended beyond 200 nautical miles from the coast.[28] Fourth, they created a regime of archipelagic waters to be applied by archipelagic states under strict geographic criteria.[29] Finally, the parties addressed Pardo's concerns by creating The Area—the deep seabed beyond the outer limits of the continental shelf—the exploration and exploitation of which would be for the benefit of all humankind and would be governed by the newly-created International Seabed Authority.[30] The Convention entered into force in 1994 and provides the framework for the peaceful governance of our oceans now and for the foreseeable future.

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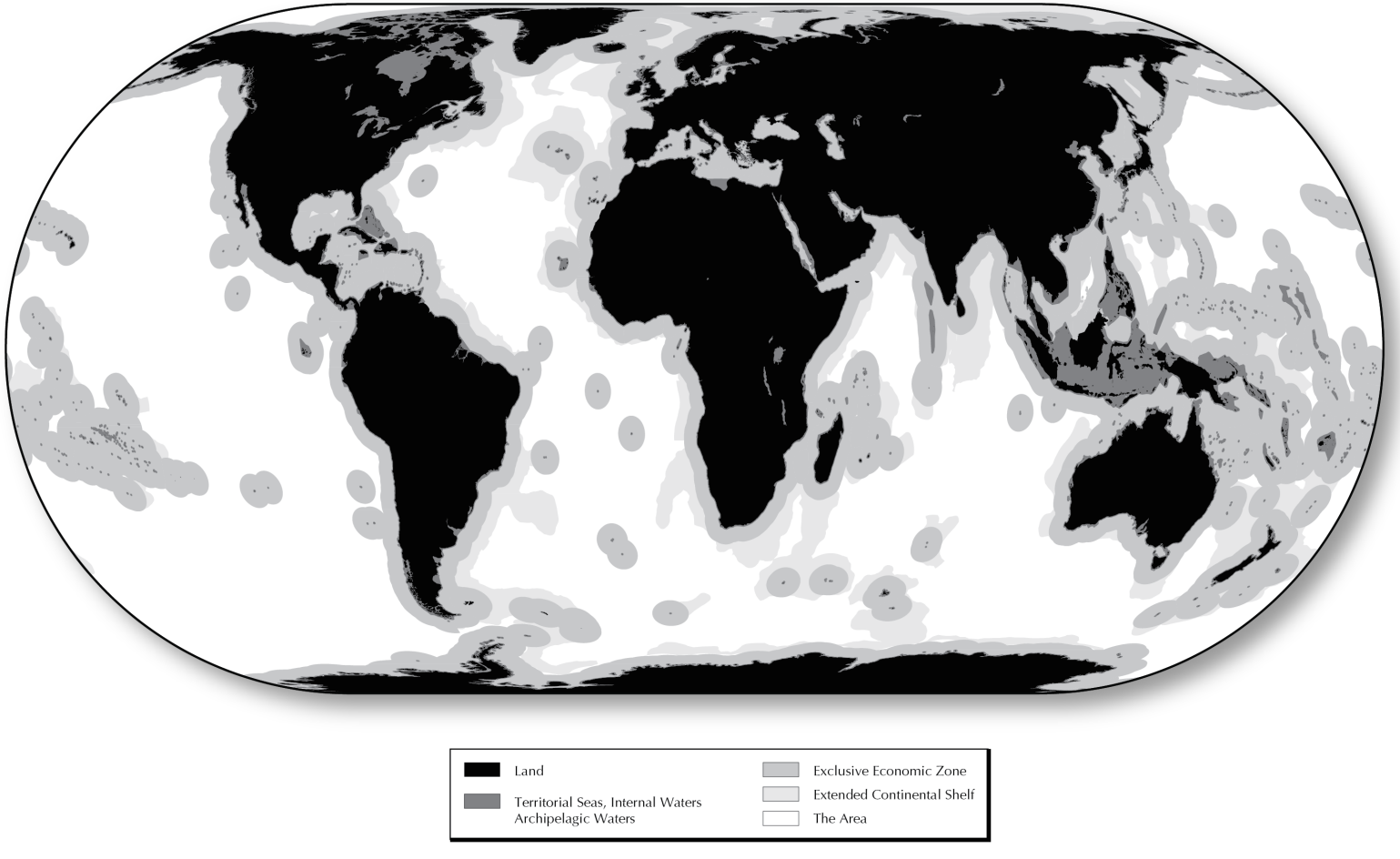
The changes since World War II to the legal regime governing the oceans have so fundamentally altered the oceanic political map that it would be unrecognizable to the 1930 Hague Codification Conference delegates. A three nautical mile territorial sea, applied globally, would have covered approximately three million square kilometers of ocean. The expanded breadth of the territorial sea from three to 12 nautical miles combined with the recognition of archipelagic waters brought an additional 18 million square kilometers of the planet under the exclusive sovereignty of individual states.[31] These areas, long regarded as high seas, are now subject to coastal state sovereignty, including the right to exclude other states from accessing natural resources and from subsurface navigation by submarines or overflight by aircraft (with some exceptions in archipelagic waters). While the spatial definition of the territorial sea and archipelagic waters appears to be stable, the tension between coastal state and navigating state interests is still in play. For example, the interest of foreign warships to navigate in innocent passage conflicts with the requirement imposed by some coastal states of prior notification and even prior authorization before a foreign warship may enter the territorial sea.[32]

OCEAN AREAS UNDER COASTAL STATE CONTROL



This map and its accompanying calculations have been provided by International Mapping using their Sovereign Limits international boundaries database, available at https://sovereignlimits.com/.

The creation of the *sui generis* exclusive economic zone, that is neither high seas nor territorial sea, brought the living and non-living resources in an additional 120 million square kilometers of ocean under the exclusive jurisdiction of states. Combined with the territorial sea and archipelagic waters, these areas constitute approximately 40 percent of the world's oceans—the resources of which are now under the exclusive control of individual coastal states.[33] Like the territorial sea, prior to World War II these were areas of high seas and the natural resources therein were subject to capture. In fact, such resources were captured in vast quantities by foreign fishing vessels in waters just beyond the territorial sea. (The exploitation of the non-living resources in these areas had not become technically or economically feasible by this time, and the Truman Proclamation and subsequent legal developments eliminated the future possibility of a foreign oil rig drilling just beyond the territorial sea.) As with the territorial sea, the geographic definition of the exclusive economic zone appears to be stable, but there remain significant disagreements about what a coastal state may control in its zone. For example, there is an ongoing debate about whether the coastal state may prohibit foreign military activities in its exclusive economic zone.[34]

Beyond the outer limit of the exclusive economic zone, an additional 30 million square kilometers of continental shelf have been claimed to date under the Convention, and additional areas are likely to be claimed in the years to come. Here, the geographic definition of the outer limit is not based solely on distance measurements from the coast. Instead, the outer limit may depend on a combination of distance from shore, the shape and depth of the physical continental shelf, slope, and rise, and the depth of sedimentary rock. The outer limit of the continental shelf is, therefore, not readily identifiable, and many coastal states are still in the process of making or revising their claims. Even once the outer limits stabilize, there will remain some debate about the making of payments and contributions with respect to the resources extracted in areas of shelf beyond 200 nautical miles. The rules and accounting governing those payments and contributions have not yet been tested.[35]

Beyond the outer limit of the continental shelf lies The Area: the ocean floor and subsoil—but not the water column or air space—beyond national jurisdiction. The size of the The Area is determined by the location of continental shelf outer limits, many of which are not final. After all claimant states have received recommendations from the Commission on the Limits of the Continental Shelf, The Area will approximate half of the total ocean area on the planet, somewhere on the order of 180 million square kilometers.[36] As Pardo proposed, the resources of The Area have been transformed from *res nullius* to

res communis subject to regulated exploration and exploitation.[37] To date, 27 contractors have been granted exploration areas covering over 1.25 million square kilometers for the purpose of exploring for polymetallic nodules, polymetallic sulphides, and cobalt-rich ferromanganese crusts.[38] Questions regarding the rules of liability for environmental harm caused by activities in The Area have been raised, and there may be instances of resources that straddle the limits between areas of national jurisdiction and The Area that could raise interesting questions about the division of those resources.[39]

The Impact on Ocean Mapping

The political map of the world's oceans has changed due to transformations in the legal regime which governs coastal states' ability to lawfully claim exclusive control over large areas of the ocean. In order to substantiate these claims, coastal states have required a better cartographic understanding of the coast and the continental shelf.

Coastline Mapping

The outer limits of the territorial sea and exclusive economic zone are determined by distance measurements from the coast, maritime boundaries are often based on distance from the respective coasts of the parties, and archipelagic waters and internal waters are delineated by lines connecting coastal features. The important part of the coast for these purposes is the low-water line; in simple terms, this is the water-land interface at low tide. Identifying the location of the low-water line requires measurements in the horizontal and vertical axes. Historically these measurements were made by ship-based survey, and the results were depicted on nautical charts. Once the only source of information about the low-water line, nautical charts hold a special place in the law of the sea where this legally important geographic feature is concerned.[40] However, nautical charts have shortcomings with respect to both their lack of global, high-resolution coverage and the rate at which the low-water line is updated to account for coastal change.

The primary purpose of nautical charts is the safety of maritime navigation, in particular to provide notice to mariners of navigational hazards. As such, charting and updating efforts have focused on high-traffic areas around ports and straits, while low-traffic or navigationally low-risk coastal areas have been given less attention. In the absence of an immediate navigational need, some nautical charts depict coastlines that have not been resurveyed or updated since

they were surveyed over a century ago. This has led to situations where claims to ocean space have been made on the basis of charted low-water lines which may no longer accurately represent the physical coastline, especially in areas prone to change from erosion, accretion, or changing sea levels.[41]

Coastal states are using modern technology to bring the representation of coasts into conformity with the physical realities of those coasts. Satellite-based remote sensing—a technology that was in its infancy in 1982—can detect broader patterns of coastal change, and airborne remote sensing using LIDAR is being used for detailed shoreline mapping.[42] Where the low-water line on nautical charts is insufficient, coastal states are now using data from these modern sources to identify the low-water line and depict their coasts for the purpose of making claims to ocean space. For example, the baselines used by Kiribati and Tuvalu in their maritime boundary negotiations and 2012 boundary agreement were based on high-resolution satellite imagery acquired between 2006 and 2011.[43] Changes in ocean law did not drive technological advances in remote sensing, but they did increase the importance of accurate coastline information, and new technologies have been harnessed to achieve that accuracy.

Seabed Mapping

Developments in the law of the continental shelf, in particular the definition of its outer limit, have required coastal states to increase their level of knowledge about the morphology and other characteristics of the seabed and subsoil. Here too they have done so with existing technology, such as sonar for water depth measurements and seismic reflection for sediment thickness. But unlike coastlines, which have been the object of cartographic surveys and depictions for millennia, the acquisition of the requisite information about the continental shelf has led to large-scale mapping efforts of under- and unexplored parts of the planet.

Between December 2001 and April 2019, 71 states made 83 submissions to the Commission on the Limits of the Continental Shelf (15 states made multiple submissions and eight submissions involved two or more states), and the Commission returned some 30 recommendations.[44] To date there are approximately 30 million square kilometers of continental shelf beyond 200 nautical miles claimed by coastal states (and not rejected by the Commission in its recommendations).

In order to succeed in their continental shelf outer limit claims, coastal states must acquire, process, and submit to the Commission evidence of the physical

characteristics of the claimed shelf. This information may include—depending on the basis of the claim—the location of the 2500 meter isobaths, the location of the foot of the slope of the continental shelf (both requiring bathymetric or water depth data), and the thickness of sedimentary rock beyond the foot of the slope (requiring seismic data). Since this information is not readily available at the level of accuracy and precision required, claims to extended shelf have led to a substantial amount of ship-based surveying of new areas of the ocean floor. These efforts have in turn produced slews of new geographic information, including maps used in submissions to the Commission.

For some states, the areas of shelf beyond 200 nautical miles have constituted a significant increase in the total area under their exclusive national jurisdiction. For example, Australia submitted a claim to areas of continental shelf beyond 200 nautical miles and received recommendations from the Commission covering 2.5 million square kilometers of seabed, subsoil, and the natural resources thereof.[45] To date, Australia controls the largest area of continental shelf beyond 200 nautical miles: an area one third the size of its land territory.[46] This is in addition to the eight million square kilometers of continental shelf already included within Australia's 200 nautical-mile-wide exclusive economic zone.[47]

In addition to the millions of square kilometers of extended shelf already claimed, some submissions have yet to be lodged with the Commission, including Canada's Arctic Ocean claim. Several other states have indicated that they intend to make claims in the future.[48]

Having been submitted through the agreed Commission process, claims to large areas of continental shelf beyond 200 nautical miles from shore are not controversial in and of themselves. Instead, controversy may arise for any of three related reasons. First, when two or more states submit claims to overlapping areas of continental shelf. If these overlaps remain after the Commission finishes its work, they would need to be divided like any other areas of maritime overlap: by a political boundary. Second, several of the submissions have included claims to continental shelf extending from areas of Antarctica.[49] All Antarctic territorial claims are suspended under the 1959 Antarctic Treaty, and those states that made Antarctic shelf claims have asked that they also be suspended, defusing the problem for now. Third, not every coastal state is a party to the Convention.

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There are questions about whether those states may access the Commission, and, if not, how they may make a lawful claim to areas of extended shelf without accessing the Commission. The United States is the last non-party with a potentially large shelf claim.[50]

Despite not having acceded to the Convention, the United States has been undertaking the scientific research and data collection required to assemble a full submission regarding the outer limits of its continental shelf in the Arctic, Atlantic, and Pacific oceans and in the Gulf of Mexico. The United States' claim is likely to cover more than one million square kilometers of extended shelf and has taken over a decade to assemble. Between 2002 and 2018, ship-based researchers have spent two and a half years of ship time to obtain nearly three million square kilometers of original, high-resolution bathymetric data for sea floor mapping and over 28,000 linear kilometers of original seismic data to determine sediment thickness in support of the United States' claim.[51]

This same level of effort has been exerted by other coastal states in their areas for the purpose of supporting their claims to the continental shelf. The Convention requirements for demonstrating the location of the continental shelf outer limit have led to a pronounced uptick in the rate of seabed data acquisition over the last two decades and an attendant increase in knowledge about the shape and other characteristics of the ocean floor. Unfortunately, there is no requirement that this data be made public beyond an executive summary of a state's submission and the maps that accompany that summary. For now, much of that data remains outside the public domain.[52]

The Impact on Maritime Spatial Conflict

Expanded claims to the resources of the continental shelf and water column have increased the potential for overlapping claims by two or more states and have resulted in international disputes and, in some instances, conflict between states vying for the same resources. Prior to 1945, overlapping claims were limited to the narrow territorial sea. Territorial sea overlaps occurred between adjacent neighboring states with a shared land boundary, and the overlaps were small. When there was no associated dispute over the location of the land boundary terminus at the coast or high-value resources immediately offshore, the peaceful division of these small territorial sea overlaps was relatively easy to achieve. In some instances, disagreement regarding the territorial sea was sufficiently inconsequential that its delimitation was considered an adjunct to the land boundary and incorporated into the associated land boundary agreement.[53]

As the geographic scope of coastal state jurisdiction has increased, the number and size of overlaps have grown along with the complexity of the interstate relationships involved. Instead of an overlap limited to the narrow territorial seas of two adjacent states, expanded claims have made maritime neighbors of opposite states with no prior boundary relationship.[54] Some crowded geographic circumstances have led to three and even four states claiming the same overlapping area.[55] In addition to increased number, size, and complexity of overlaps, one other trend has increased the potential for conflict related to maritime spatial claims: the ability (and necessity) to exploit mineral resources of the continental shelf at increasing depths often corresponding to areas farther from shore.

The geography of ocean political hot spots and, in some cases, subsequent dispute resolution related to overlaps, follows the known presence and ability to exploit offshore oil and gas. For example, the shallow submarine areas of the Gulf of Paria were the first to be divided by a maritime boundary beyond the territorial sea. The principal purpose of that 1942 agreement between Venezuela and the United Kingdom was to divide hydrocarbon resources between the parties.[56] The first Arabian Gulf delimitation was concluded in 1958 between Bahrain and Saudi Arabia, and much of the water body was divided by the end of the 1960s. The shallow, hydrocarbon-rich North Sea followed a similar pattern with the first maritime delimitation in the early 1960s and most of the boundaries concluded by the end of the decade. As new exploration techniques improved the ability to discover hydrocarbon resources and new exploitation methods expanded the depth at which they could be extracted, interest turned to new areas. Some of these areas, such as the Gulf of Mexico, now resemble the North Sea: completely delimited with hydrocarbon production in full swing. Other areas such as the Gulf of Guinea and the Mediterranean Sea are partially delimited but still saddled with ongoing disputes.

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Although the sequence of events in a maritime boundary relationship may vary significantly from one example to another, many follow a similar pattern: valuable resources are thought to exist, extended claims are made, an overlap is created, conflict precludes or increases the cost of the exploitation of the resource, pressure mounts to resolve the dispute in order to access the resource,

and the area is divided by agreement or by third-party dispute settlement so that exploitation of the valuable resource may proceed. The resource may motivate the overlapping claims, trigger conflict, be an obstacle to dispute resolution, and also provide an incentive to reach agreement. Where agreement has not yet been achieved, we find the current maritime hot spots, such as the eastern Mediterranean where the discovery of vast offshore gas fields has acted as both an obstacle and incentive for boundary making.[57]

In parts of the world where international relationships are already troubled, a negotiated or adjudicated boundary between neighboring states can prove difficult to achieve. But hot spots can cool, and peaceful maritime boundary settlements can be achieved even in high-volatility relationships. In 1977, after an oil strike in their overlapping maritime area, both Tunisia and Libya sent warships to the site of the discovery, shots were fired, and drilling efforts were halted.[58] And yet, once tensions abated, the two states agreed to take their dispute to the International Court of Justice. By 1982, the Court issued its decision in the delimitation of their continental shelf, a boundary that has remained undisturbed since. A 2000 incident between Guyana and Suriname involving a drilling platform and a gunboat soon morphed into an arbitration, which resulted in the peaceful establishment of a new maritime boundary between these South American neighbors.[59]

These are but two examples of the many formerly contested maritime areas that have now been divided by a new political boundary. In fact, over 200 maritime boundaries have been established since the end of World War II.[60] Most of these have been by agreement, including some between neighbors with notoriously fraught relationships. A small but important subset have been resolved by adjudication, including some that escalated before they were brought to international courts or tribunals for resolution. Approximately half of all maritime relationships are without a boundary, but it is to be expected that many of these will also be resolved and will further transform the political map of the oceans.

The Impact on Related Territorial Disputes

Some of the most intractable international disputes involve overlapping claims to maritime area generated from land territory that is itself in dispute. Territorial sovereignty disputes have always been difficult to settle, but they are made even more difficult when that territory also generates disputed maritime area.

In some of these mixed disputes, the contested territories are large, popu-

lated areas with inherent value deriving from natural resources or arable land. Consider, for example, the dispute between Argentina and the United Kingdom over the Islas Malvinas/Falkland Islands, or the dispute between Guyana and Venezuela over a large swath of territory west of the Essequibo River. Both disputes originated well over one hundred years ago and, because both involve coastal territory, the expansion of ocean areas under coastal state control has had the effect of increasing the spatial dimensions and the economic value of the areas involved. In both examples the disputed territories generated territorial sea, an exclusive economic zone, and are the basis for claims to continental shelf beyond 200 nautical miles. Recently, in the dispute between Guyana and Venezuela, conduct in the offshore has caused more tension than conduct on land.[61]

In the case of mixed disputes involving small, uninhabited island territory with little or no inherent value, the changing ocean legal regime has transformed territorial sovereignty disputes from non-issues into major international flashpoints. A glance at today's political map of the oceans explains the increased importance of these small features. Under the current legal regime, a small island with no near neighbors may generate as much as 430,000 square kilometers of territorial sea and exclusive economic zone. This type of claim has a pronounced cartographic impact on the political map of the oceans and also substantially increases the value of the insular feature. Where that feature is, itself, disputed, the value of the marine resources in the surrounding ocean areas is what moves the dispute from a diplomatic afterthought to the top of the list of foreign policy concerns. Consider the disputes between Japan and Korea over Takeshima/Dokdo, between China and Japan over Diaoyu/Senkaku, or among several claimant states over various insular features in the South China Sea. Under the current regime governing maritime spatial claims, these have become high-salience territorial disputes in each of the claimant states. Ironically, in many of these situations, the now-disputed island territory was so inconsequential in earlier periods, including during and immediately after World War II, that they were not included in lists of features or on maps defining the territorial claims of the respective countries. Nonetheless, today the maritime area generated by disputed coastal territory covers over 5 million square kilometers of territorial sea and exclusive economic zone and additional areas of continental shelf.[62]

Conclusion

Typically, archipelagic and internal waters, the territorial sea, exclusive economic zone, continental shelf, and the maritime boundaries dividing these zones do

not appear on political maps of the world. At most, we may see dashed lines of attribution indicating which dots of island territory should be grouped with one state or another. Nonetheless, these zones and the political boundaries dividing those of one state from those of another are all features relevant to the map of our oceans. While they may not be of daily importance to most individuals, these areas of national sovereignty, sovereign rights, and jurisdiction are important elements of the international geopolitical and legal framework. Many instances of international cooperation and international conflict can be better understood when these building blocks are included in the picture.

After a period of rapid change, the basic structure of the modern political map of the oceans is in place. Most of the map has been filled in. There will continue to be some minor alterations at the margins with the submission and resolution of remaining continental shelf claims and the delimitation of remaining maritime boundaries, but barring significant changes to the legal regime governing maritime spatial claims, there should be no significant changes to the ocean map in the next three quarters of a century. The most likely changes to occur during that period will not involve further seaward expansion of national areas, but rather the retraction, and in some cases disappearance, of national areas as rising seas reclaim the land territory upon which title to maritime areas depends.[63] WA

Notes

1. The reunification of Germany, the division of the Korean Peninsula, the division and reunification of Vietnam, the Balkanization of Yugoslavia, and the dissolution of the U.S.S.R. all changed the spatial dimensions of the countries involved. However, as consequential as these developments have been in terms of international relations, they did not do much to change the fundamentals of the world political map. While there has been some change since World War II, it has been quite minor in comparison, for example, with the territorial acquisition and dissolution of globe-spanning empires during the preceding ages of European exploration and imperialism.

2. Notable exceptions include Crimea, Kashmir, Cyprus, Malvinas/Falklands, and areas in dispute between Guyana and Venezuela and between Belize and Guatemala. The overlapping, but currently "frozen" claims to parts of Antarctica could also be included.

3. The map, along with the area figures and calculations in this article have been provided by International Mapping using their Sovereign Limits international boundaries database, available at https://sovereignlimits.com/. Calculations involving internal and archipelagic waters have been made using Flanders Marine Institute's Maritime Boundaries Geodatabase.

4. The Council on Foreign Relations' Global Conflict Tracker currently rates six international conflicts as likely to have a critical impact on U.S. interests. Two involve mixed disputes in the South China Sea and East China Sea. "Global Conflict Tracker," *Council on Foreign Relations*, https://www.cfr.org/interactive/global-conflict-tracker/?category=us.

5. See: Tullio Treves, "Historical Developments of the Law of the Sea," in *The Oxford Handbook of the Law of the Sea*, ed. Donald R. Rothwell et al. (Oxford: Oxford University Press, 2015), 1; David J. Bederman, "The Sea," in *The Oxford Handbook of the History of International Law*, ed. Bardo Fassbender et al.

(Oxford: Oxford University Press, 2012), 359.

6. See: League of Nations, "Acts of the Conference for the Codification of International Law," C.351.M.145.1930.V. August 19, 1930.

7. Bederman, "The Sea," 376–77; League of Nations, "Acts of the Conference," 123–24 (Annex 10: Report of the Second Committee: Territorial Sea). This second seaward zone, inchoate in 1930, survived the years and is now known as the contiguous zone. In this zone, extending as many as 24 nautical miles from the coast, states may exercise control related to their customs, fiscal, immigration, and sanitary laws. "United Nations Convention on the Law of the Sea," opened for signature December 10, 1982, United Nations Treaty Series 1833, 3, Article 33.

8. League of Nations, "Acts of the Conference," 134–37 (Annex 10: Report of the Second Committee: Territorial Sea, Appendix III, Extract from the Provisional Minutes of the Thirteenth Meeting, April 3, 1930). One nautical mile equals 1,852 meters and is longer than an international land mile equaling 1,609 meters. International agreement on the maximum breadth of the territorial sea would not finally be achieved for over 50 more years.

9. "Policy of the United States with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf, Proclamation 2667 of September 28, 1945," *Federal Register* 10, no. 193 (October 2, 1945): 12303, https://cdn.loc.gov/service/ll/fedreg/fr010/fr010193/fr010193.pdf [Continental Shelf Proclamation]; "Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas, Proclamation 2668 of September 28, 1945," *Federal Register* 10, no. 193 (1945): 12304, https://cdn.loc.gov/service/ll/fedreg/fr010/fr010193/fr010193.pdf [Coastal Fisheries Proclamation].

10. There were earlier claims to the living and non-living resources of the seabed, but Truman's proclamation is regarded as the starting point in the subsequent development of continental shelf law. See: *North Sea Continental Shelf, Judgment*, I.C.J. Reports 1969, 3, 33–34, para 47 ("Although the [Truman Proclamation] was not the first or only one to have appeared, it has in the opinion of the Court a special status. … The Truman Proclamation however, soon came to be regarded as the starting point of the positive law on the subject ….").

11. Continental Shelf Proclamation.

12. Ibid. Note that this claim, the subsequent development of a customary rule, and the codification of that rule in multi-lateral treaties resulted in the national appropriation of what could have been considered *res nullius*. Note also that the United States' claim did not rely on actual occupation of the shelf area, a recognized basis of title to land territory. One can imagine that a rule that relied on occupation would have resulted in a very different political map of the oceans.

13. Countries that followed the United States in declaring exclusive rights to their continental shelf included Mexico in 1945, Argentina in 1946, Saudi Arabia and the Philippines in 1949, Pakistan and Brazil in 1950, Israel in 1952, Australia in 1953, India and Iran in 1955, and Venezuela and Portugal in 1956. "Convention on the Continental Shelf," opened for signature April 29, 1958, *United Nations Treaty Series* 499, 311, Article 2(1).

14. See: "Report of the International Law Commission to the General Assembly," U.N. Doc. A/3159, in Yearbook of the International Law Commission, Vol II, 253, 296 (1956). "It seemed likely that a limit fixed at a point where the sea covering the continental shelf reaches a depth of 200 metres would at present be sufficient for all practical needs. This depth also coincides with that at which the continental shelf in the geological sense generally comes to an end and the continental slope begins, falling steeply to a great depth."

15. It will be noted that an outer limit based on the exploitability criterion would move seaward with the maximum depth at which the exploitation of natural resources was technically feasible and economically viable. For hydrocarbon resources, that depth has increased from five meters in the mid-1940s to some 3,000 meters today.

16. *North Sea Continental Shelf, Judgment*, I.C.J. Reports 1969, 3, 23, para 19.

17. Coastal Fisheries Proclamation.

18. Ibid.

19. States that extended jurisdiction over fisheries beyond the territorial sea included Panama in 1946 and Costa Rica and Iceland in 1948.

20. This state practice was codified in the Convention on the Continental Shelf, Article 3: "The rights

of the coastal State over the continental shelf do not affect the legal status of the superjacent waters as high seas, or that of the airspace above those waters."

21. "Declaration on the Maritime Zone [Santiago Declaration]," signed August 18, 1952, *United Nations Treaty Series* 1006, 325.

22. Santiago Declaration, 326 (emphasis added).

23. In addition to the three parties to the Santiago Declaration, states that have claimed a territorial sea wider than 12 nautical miles include: El Salvador, 1950, 200M; Panama, 1967, 200M; Nigeria, 1971, 30M; Somalia, 1972, 200M; Tanzania, 1973, 50M; Albania, 1976, 15M; Benin, 1976, 200M; Republic of the Congo, 1977, 200M; Liberia 1977, 200M; Togo, 1977, 30M. U.S. Department of Defense, Representative for Ocean Policy Affairs, *Maritime Claims Reference Manual, Combined* (2017), http://www.jag.navy.mil/organization/code_10_mcrm.htm.

24. *Note verbale* from Philippines to the United Nations (March 7, 1955), reprinted in "Report of the International Law Commission Covering the Work of its Seventh Session 2 May – 8 July 1955, Official Records of the General Assembly, Tenth Session, Supplement No. 9," UN Doc A/2934 (1955), 52–3; Declaration on the Territorial Waters of the Republic of Indonesia, 13 December 1957, official translation reprinted in Marjorie Whiteman, *Digest of International Law* IV (1965), 284.

25. United Nations General Assembly, First Committee, 1515th meeting, "Examination of the question of the reservation exclusively for peaceful purposes of the seabed and the ocean floor, and the subsoil thereof, underlying the high seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind," A/C.1/PV.1515, November 1, 1967.

26. "United Nations Convention on the Law of the Sea," Article 3.

27. "United Nations Convention on the Law of the Sea," Part V.

28. "United Nations Convention on the Law of the Sea," Article 76 and Annex II.

29. "United Nations Convention on the Law of the Sea," Part IV.

30. "United Nations Convention on the Law of the Sea," Part XI; "Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982," adopted July 28, 1994, United Nations Treaty Series 1836, 3.

31. This number does not include any maritime areas generated from Antarctica.

32. The United States position is that warships enjoy innocent passage through the territorial sea without prior notification or authorization. "Union of Soviet Socialist Republics – United States: Joint Statement with attached Uniform Interpretation of Rules of International Law Governing Innocent Passage," September 23, 1989, *International Legal Materials* 28, no. 6 (1989): 1444, 1446. This is in contrast with the practice of some 40 states that require notification or authorization before a foreign warship may enter their territorial sea. See Yoshifumi Tanaka, "Navigational Rights and Freedoms," in *The Oxford Handbook of the Law of the Sea*, ed. Donald R. Rothwell et al. (Oxford: Oxford University Press, 2015), 536, 546.

33. These numbers do not include any maritime areas generated from Antarctica.

34. See: James Kraska, "Military Operations," in *The Oxford Handbook of the Law of the Sea*, ed. Donald R. Rothwell et al. (Oxford: Oxford University Press, 2015), 866, 883–85; Moritaka Hayashi, "Military Activities in the Exclusive Economic Zones of Foreign Coastal States," in *The 1982 Law of the Sea Convention at 30*, ed. David Freestone (Boston: Brill, 2013), 121.

35. "United Nations Convention on the Law of the Sea," Article 82; International Law Association, Outer Continental Shelf Committee, "Report on Article 82 of the 1982 UN Convention on Law of the Sea (UNCLOS)," 2008 ILA Conference Report, Rio de Janeiro.

36. This number assumes that areas within 200 nautical miles of Antarctica will not be considered part of The Area.

37. "United Nations Convention on the Law of the Sea," Article 133 ("'resources' means all solid, liquid or gaseous mineral resources in situ in The Area at or beneath the sea-bed, including polymetallic nodules").

38. Contract areas cover 1.25 million square kilometers for polymetallic nodules, 70,000 square kilometers for polymetallic sulphides, and 15,000 square kilometers for cobalt-rich ferromanganese crusts. Areas derived from International Seabed Authority GIS files available at https://www.isa.org.jm/maps.

39. See: *Responsibilities and Obligations of States Sponsoring Persons and Entities with respect to Activities in The Area, Advisory Opinion*, ITLOS Reports, February 1, 2011, 10; Michael Lodge, "Can a 'Mining Code'

Make Deep Seabed Mining Sustainable?" *Maritime Executive*, March 15, 2019, https://www.maritime-executive.com/editorials/can-a-mining-code-make-deep-seabed-mining-sustainable.

40. "United Nations Convention on the Law of the Sea," Article 5 ("the normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State").

41. The issue of the charted low-water line becoming obsolete in the face of changing coasts has arisen in maritime delimitation cases, including the International Court of Justice case between Nicaragua and Honduras and the arbitration between Guyana and Suriname. *Territorial and Maritime Dispute between Nicaragua and Honduras in the Caribbean Sea (Nicaragua v. Honduras), Judgment*, October 8, 2007, I.C.J. Reports (2007), 659; *Award in the arbitration regarding the delimitation of the maritime boundary between Guyana and Suriname*, September 17, 2007, R.I.A.A. XXX (2012), 1.

42. Jennifer Wozencraft and David Millar, "Airborne Lidar and Integrated Technologies for Coastal Mapping and Nautical Charting," *Marine Technology Society Journal* 39, no. 3 (2005): 27.

43. See map attached to "Agreement between Kiribati and Tuvalu concerning their Maritime Boundary," August 29, 2012. Available at: https://www.un.org/Depts/los/LEGISLATIONANDTREATIES/PDFFILES/DEPOSIT/tuv_mzn98_2013_AgreementBetweenTuvaluandKiribati.pdf.

44. The United Nations Division for Ocean Affairs and the Law of the Sea maintains an updated list of all submissions to the Commission on the Limits of the Continental Shelf at https://www.un.org/depts/los/clcs_new/commission_submissions.htm.

45. "Continental Shelf Submission of Australia, Executive Summary," November 15, 2004, https://www.un.org/depts/los/clcs_new/submissions_files/aus04/Documents/aus_doc_es_web_delivery.pdf.

46. States with smaller land area stand to gain even more area, in relative terms. For example, Barbados has received recommendations covering 40,000 square kilometers of continental shelf beyond 200 nautical miles (subject to maritime delimitation with neighbors): an area over 90 times the size of its land territory.

47. This area does not include the 687,000 square kilometers of extended shelf claimed off the Australian Antarctic Territory.

48. Coastal states that are unable to meet the deadline for making a complete submission to the Commission on the Limits of the Continental Shelf may express their intention to do so at a future date with a submission of preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles. Forty-seven submissions of preliminary information have been made so far, some of which have now been turned into complete submissions to the Commission. The United Nations Division for Ocean Affairs and the Law of the Sea maintains an updated list of all submissions of preliminary information at https://www.un.org/depts/los/clcs_new/commission_preliminary.htm. Canada submitted its Arctic continental shelf claim on May 23, 2019, during the final proofing of this article. The Canadian claim covers approximately 1.2 million square kilometers of seabed and creates substantial overlaps with the claims of Russia and Denmark, and with the likely claim of the United States. "Partial Submission of Canada to the Commission on the Limits of the Continental Shelf regarding its continental shelf in the Arctic Ocean, Executive Summary," May 23, 2019, https://www.un.org/depts/los/clcs_new/submissions_files/can1_84_2019/CDA_ARC_ES_EN_secured.pdf.

49. Six of the seven states with territorial claims in Antarctica have also made claims to continental shelf extending from that territory, or have reserved their right to do so in the future.

50. For a comprehensive analysis of whether the United States may access the Commission on the Limits of the Continental Shelf without becoming a party to the United Nations Convention on the Law of the Sea, see: Kevin A. Baumert, "The Outer Limit of the Continental Shelf Under Customary International Law," *American Journal of International Law* 111, no. 44 (2017): 827.

51. United States Extended Continental Shelf Project, https://www.state.gov/e/oes/ocns/opa/ecs/missions/index.htm. The U.S. Department of State website, as of the last visit, did not include information from the July–August 2018 cruise in the Gulf of Alaska. That information was accessed in the 2018 cruise report of the *R/V Kilo Moana* from the University of New Hampshire Center for Coastal and Ocean Mapping, available at: https://ccom.unh.edu/sites/default/files/publications/KM1811-Cruise-Report.pdf.

52. According to the ambitious Seabed 2030 Project, an effort which "aims to bring together all available bathymetric data to produce the definitive map of the world ocean floor by 2030 and make it available

to all," less than 20 percent of the ocean floor has been mapped. Like coastline data, much of that bathymetric data is quite old. See, also: Adela Suliman, "The $3 billion map: scientists pool oceans of data to plot Earth's final frontier," *Reuters*, December 5, 2018, https://www.reuters.com/article/us-oceans-rights-science/the-3-billion-map-scientists-pool-oceans-of-data-to-plot-earths-final-frontier-idUSKBN1O504M.

53. See, e.g., the land boundary between Albania and Greece the description of which ends "In the sea segment in Phtelia Bay, the boundary follows a line perpendicular to the general direction of the coast up to the limits of the territorial waters..." U.S. Department of State, Office of the Geographer, "Albania – Greece Boundary," *International Boundary Study*, no. 113 (August 18, 1971), 7.

54. Consider, for example, the United Kingdom and Norway in the North Sea, Libya and Malta in the Mediterranean Sea, India and Myanmar in the Bay of Bengal, or Costa Rica and Ecuador in the Pacific Ocean.

55. Examples of three states with an interest in the same maritime area can be found in the maritime delimitation cases in which a third state intervened or attempted to intervene in order to protect its interests in the area in dispute between the main parties. See: *Land, Island and Maritime Frontier Dispute (El Salvador/Honduras: Nicaragua intervening)*, September 11, 1992, I.C.J. Reports (1992), 351; *Land and Maritime Boundary (Cameroon v. Nigeria: Equatorial Guinea intervening)*, October 10, 2002, I.C.J. Reports (2002), 303; *Territorial and Maritime Dispute (Nicaragua v. Colombia), Application for Permission to Intervene (Honduras)*, May 4, 2011, I.C.J. Reports (2011), 420; *Territorial and Maritime Dispute (Nicaragua v. Colombia), Application for Permission to Intervene (Costa Rica)*, May 4, 2011, I.C.J. Reports (2011), 348. Constricted geographic areas with many coastal states can lead to more than three claimants to the same ocean area, especially where some of the land territory is also subject to disputed sovereignty. The South China Sea is currently the most prominent example of this type of multi-state overlap.

56. Kaldone G. Nweihed, "Trinidad and Tobago – Venezuela (Gulf of Paria)," in *International Maritime Boundaries* 1, ed. Jonathan I. Charney et al. (Boston: Martinus Nijhoff Publishers, 1993), 639.

57. Cyprus has negotiated boundaries with Egypt, Lebanon, and Israel in order to divide and facilitate the exploitation of offshore natural gas. See: Tullio Scovazzi, "Cyprus – Egypt," in *International Maritime Boundaries* 5, ed. David A. Colson et al. (Boston: Martinus Nijhoff Publishers, 2005), 3917; Tullio Scovazzi and Irini Papanicolopulu, "Cyprus – Lebanon," in *International Maritime Boundaries* 6, ed. David A. Colson et al. (Boston: Martinus Nijhoff Publishers, 2011), 4445; Haim Srebro, Sarah G. Weiss Ma'udi, and Christos Zenonos, "Cyprus – Israel," in *International Maritime Boundaries* 7, ed. Coalter G. Lathrop (Boston: Brill Nijhoff, 2016), 5091. But, between Israel and Lebanon, who have not agreed to a maritime boundary, the tensions are mounting as both claim the same gas-rich offshore areas.

58. Geoff Simons and Isaline Bergamaschi, *Libya: The Struggle for Survival* (London: Palgrave Macmillan, 1993), 257.

59. See: *Award in the arbitration regarding the delimitation of the maritime boundary between Guyana and Suriname*, September 17, 2007, R.I.A.A. XXX (2012), 1.

60. See: *International Maritime Boundaries*, a multi-volume series providing standardized analyses of all maritime boundaries concluded by agreement or adjudication. *International Maritime Boundaries*, published in print and online by Brill Nijhoff in cooperation with the American Society of International Law, is an excellent reference for scholars interested in the maritime political boundaries referred to in this article.

61. See: Neil Marks, Vivian Sequera, and Luc Cohen, "Venezuela navy confronts Exxon oil ship in Guyana border dispute," *Reuters*, December 23, 2018, https://www.reuters.com/article/us-guyana-venezuela-oil/venezuela-navy-confronts-exxon-oil-ship-in-guyana-border-dispute-idUSKCN1OM0BK.

62. Here, too, maritime areas generated from disputed parts of Antarctica are not included in the area calculation.

63. The first countries to lose their entire land territory likely will be the small island states of the Pacific and Indian Oceans, including Tuvalu, Kiribati, the Marshall Islands, and the Maldive Islands. Rosemary Rayfuse, "International Law and Disappearing States: Maritime Zones and the Criteria for Statehood," *Environmental Policy and Law* 41, no. 6 (2011): 281. It is axiomatic in international law that title to maritime areas is derived from title to land territory. The International Law Association Committee on Baselines under the International Law of the Sea reached the conclusion that, without land territory, title derived therefrom would also cease. Coalter G. Lathrop, J. Ashley Roach and Donald R. Rothwell, eds.,

Coalter Lathrop

Baselines under the International Law of the Sea: Reports of the International Law Association Committee on Baselines under the International Law of the Sea (Boston: Brill, 2019).