



2016

Using International Property Law as a Lever to Evolve Toward Integrative Ocean Governance

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Recommended Citation

Rachael E. Salcido, Using International Property Law As A Lever to Evolve Toward Integrative Ocean Governance, 47 U. Pac. L. Rev 253, 254 (2016).

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Using International Property Law as a Lever to Evolve Toward Integrative Ocean Governance

Rachael E. Salcido*

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* Professor of Law and Director, Environmental Law Concentration, University of the Pacific McGeorge School of Law. Professor Salcido would like to thank all the participants from the 2015 Global Center Symposium, and special thanks to Dean Jay Mootz III, Associate Dean for Faculty Scholarship Raquel Aldana, Global Center Co-Director Jarrod Wong, and Ly Lee. I am indebted to Kitty Tetrault for research assistance, Kayla Cox and Sarah Kanbar for leadership and symposium organization, and the editors of *The University of the Pacific Law Review* for helpful comments.

I. INTRODUCTION

Recently, participants at the 2015 Pacific McGeorge School of Law global symposium debated the emergence of an international law of property.¹ Participants were inspired by Professor John G. Sprankling's seminal work in the field, *The International Law of Property*, which posited that the old view of property as generated by and existing purely in municipal law did not reflect the growing influence of international law.² Throughout the day, a new crew of International Property Law scholars delved into the depths of a number of themes related to the benefits and potential drawbacks of this evolution.³

Specific to the realm of ocean governance, the promise and perils of international property law are not merely theoretical, but are advancing in national regulatory bodies and international tribunals as well.⁴ There is a rich history of ocean space regulation under international law. The law has evolved to nationalize ocean space in order to facilitate use and conservation. But the former has been well advanced, while the latter has lagged far behind. In this article, I discuss the evolving governance of oceans with particular emphasis on the threats to sustainability, increased industrialization of the oceans, and the prospects for reforms that would address declining ecological health. I argue the international law of property, as configured in the oceans, could initiate a movement away from sectoral and divided ocean regulation toward more integrative approaches that manage unique spaces drawing on scientific information, public participation, and data sharing.

The international community is poised to adopt new governance for the High Seas—a continuing illustration of the tragedy of the commons. The High Seas, and beneath it “the Area,” are not controlled by any particular national government, but are ocean resources open to the international community.⁵ These areas not controlled by national governments are not lawless per se, but governance has been least effective in these areas beyond national jurisdiction (ABNJ).⁶ An international law of property could support proposed reforms that emphasize the shared nature of ocean resources and collaborative conservation

1. *Global Symposium Examined an Emerging International Law of Property*, University of the Pacific McGeorge School of Law (April 16, 2015), http://www.mcgeorge.edu/News/Global_Symposium_Examined_an_Emerging_International_Law_of_Property.htm [hereinafter *Global Symposium*] (on file with *The University of the Pacific Law Review*).

2. JOHN G. SPRANKLING, *THE INTERNATIONAL LAW OF PROPERTY* (2014).

3. *Global Symposium*, *supra* note 1.

4. Moira L. McConnell, *Observations on the Law Applicable on the Continental Shelf and in the Exclusive Economic Zone: A Comparative View*, in 25 *OCEAN YEARBOOK* 221 (Aldo Chircop et al. eds., 2011).

5. *Id.* at 221 (stating that the High Seas is “the water column areas outside the 200 nautical miles (NM) from the proximate coastal state baselines, beyond any potential EEZ”).

6. *Id.* at 221–247. McConnell notes the growing interest in developing a legal basis for waters and resources in the High Seas. *Id.* at 221.

measures tempered by consideration for the needs of current and future generations. With a new legal instrument addressing marine biodiversity in ABNJ under the International Law of the Sea, the international community could draw upon and contribute to the emerging international law of property.

II. BACKGROUND

The Third United Nations Convention on the Law of the Sea (UNCLOS III)⁷ provides a comprehensive blueprint for ocean regulation.⁸ UNCLOS III was drafted with the intent to create a legal order for the oceans by addressing all issues pertaining to the seas.⁹ For that reason, UNCLOS III has been called “a constitution for the oceans.”¹⁰ Nations that are not a party to UNCLOS III are bound by most of its provisions through its nature as customary international law.¹¹ Nonetheless, UNCLOS III is not perfect, and its gaps and shortcomings have come under increasing scrutiny as ocean systems have declined.

In creating UNCLOS III, nations recognized that the special interconnected nature of the oceans required a unified approach to their management.¹² Yet at the time, sectoral management that addressed each particular activity with a set of guidelines was the dominant mode of environmental regulation. Although the majority of ocean pollution is from land-based sources, people harm oceans by overfishing, through shipping activities, and from resource development.¹³ These issues are inter-related, but the legal regimes that manage each are divided up, often addressed by different organizations or agencies.¹⁴ UNCLOS III addresses

7. United Nations Convention of the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397, 21 ILM 1261 [hereinafter UNCLOS].

8. DONALD R. ROTHWELL & TIM STEPHENS, *THE INTERNATIONAL LAW OF THE SEA* 14 (2010).

9. *Id.*

10. Tommy T.B. Koh, U.N. President, A Constitution for the Oceans, Remarks at UNCLOS (Dec. 10, 1982), available at http://www.un.org/Depts/los/convention_agreements/texts/koh_english.pdf (on file with *The University of the Pacific Law Review*).

11. JOSEPH J. KALO ET AL., *COASTAL AND OCEAN LAW* 408–09 (3rd ed. 2007). “The few countries who are not party to the LOS Convention are bound to most of the provisions through customary international law or other treaties.” *Id.* On the other hand, those nations who are not a party to the UNCLOS III cannot directly impact its development and implementation, potential benefits, or use procedures such as those designed to delineate extended continental shelf claims. *Id.* at 409 (noting that treaty proponents claim national security is promoted by participating in the treaty).

12. The UNCLOS preamble states “conscious that the problems of ocean space are closely interrelated and need to be considered as a whole” UNCLOS, *supra* note 7.

13. *Infra* Part III.

14. For example, the International Maritime Organization addresses the shipping industry, while the FAO addresses fisheries, in addition to various Regional Fisheries Organizations. Within the United States, responsibility for various ocean activities is divided into NOAA Fisheries (species including some fish and marine mammals), Regional Fisheries Management Agencies (traditional fishing and aquaculture), the Coast Guard (security and safety), the Bureau of Ocean Energy Management (regulation and oversight of offshore oil and gas drilling operations). At the state level the variety of agencies is even more fragmented.

ocean governance at the outset by establishing agreed boundaries of national jurisdiction and lawmaking and enforcement responsibilities therein.¹⁵ Parties also agreed to specific dispute mechanism provisions, including the creation of two international bodies—the International Tribunal for the Law of the Sea and the International Seabed Authority.¹⁶ The ocean governance UNCLOS III employs relies on property and sovereign rights.¹⁷

A. *Brief Primer on Ocean Jurisdiction*

The Territorial Seas are recognized as the first twelve nautical miles from the shore, which is also called the baseline.¹⁸ Nations have the greatest rights in this area. Foreign flagged ships have the right of innocent passage through territorial seas subject to the law of the pertinent nation, UNCLOS III, and the international law on passage.¹⁹ Nations can also establish a Contiguous Zone of twenty-four nautical miles from the baseline, from which they are allowed enforcement rights to protect their territorial seas.²⁰

The Exclusive Economic Zone (EEZ) of a nation is recognized as the area 200 nautical miles from the shore.²¹ This area is not territorial in the same sense as national sovereignty can be fully exercised. Indeed, the exact nature of the EEZ is still being explored and illuminated, as UNCLOS III created it without a direct analogue. However, according to Article 56 of UNCLOS III, nations have sovereign rights to exploit the EEZ.²² As explained by the U.S. governmental agency responsible for oceans management, “[t]he U.S. does not exercise sovereignty in the contiguous zone or the EEZ. It does have exclusive sovereign rights and jurisdiction for exploration and exploitation of natural resources of the seabed, subsoil, water column, and air space in the EEZ.”²³ Many nations, including the U.S., U.K., Portugal, Germany, and Japan have begun extensive exploitation of their EEZs.

15. UNCLOS, *supra* note 7.

16. *Id.*

17. *Id.*

18. *Id.* at art. 3.

19. *Id.* at §3.

20. *Id.* at art. 33.

21. *Id.* at art. 56–57.

22. See BARBARA KWIATKOWSKA, THE 200 MILE EXCLUSIVE ECONOMIC ZONE IN THE NEW LAW OF THE SEA (1989); see also Maria Gavouneli, *Functional Jurisdiction in the Law of the Sea*, in 62 PUBLICATIONS ON OCEAN DEVELOPMENT (2007) (both examining the nature of the EEZ comprehensively).

23. *History of the Maritime Zones under International Law*, NOAA, http://www.nauticalcharts.noaa.gov/staff/law_of_sea.html (last visited Feb. 16, 2016) (on file with *The University of the Pacific Law Review*).

The Continental shelf overlaps with the EEZ in that its breadth is measured as 200 nautical miles from the baseline.²⁴ Nations have rights to use shelf resources while other nations have limited rights in these zones, such as the ability to lay submarine cables.²⁵ Again, this represents a balance between lawmaking by a sovereign nation and the respect for the needs of non-nationals.

Outside of these regions, the oceans are “High Seas,” also known as “areas beyond national jurisdiction” where all nations are afforded the Freedom of the Seas.²⁶ Freedom of the High Seas means that the area is open to all nations.²⁷ The High Seas are *res communis*—an open access system, for purposes such as fishing. This has led to significant impairment of resources as minimum coordination or management constrains overuse.²⁸

Underlying the High Seas is the “Area,” the seabed which the International Seabed Authority regulates in order to implement the international deep seabed mining regime pursuant to section XI of UNCLOS III.²⁹

B. Dispute Resolution and International Governance

In addition to the division into zones of jurisdiction, UNCLOS III created a set of mechanisms to resolve disputes.³⁰ UNCLOS III created the International Tribunal for the Law of the Sea (ITLOS) and contemplated dispute resolution by the International Court of Justice or an arbitral tribunal.³¹ This again speaks to the

24. UNCLOS, *supra* note 17, at art. 76 (noting that shelf extends 200 NM from the baselines).

25. *Id.* at art. 77 (rights of coastal states) and 79 (submarine cables and pipelines). It is worth noting that placement of submarine cables cause seabed disturbances and the environmental impacts particularly on sensitive marine habitats should be minimized.

26. *Id.* at Part VII.

27. *Id.* at art. 87.

28. The Working Group, *Outcome of the Ad Hoc Open-ended Informal Working Group to Study Issues Relating to the Conservation and Sustainable Use of Marine Biological Diversity Beyond National Jurisdiction* (Jan. 20–23, 2015), http://www.un.org/depts/los/biodiversityworkinggroup/documents/ahwg-9_report.pdf (on file with *The University of the Pacific Law Review*).

29. UNCLOS, *supra* note 7, at Part XI.

30. *Id.* at art. 287.

31. The history of the ITLOS is explained in Hugo Caminos, *The Establishment of Specialized Courts*, in *CURRENT MARINE ENVIRONMENTAL ISSUES AND THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA* 33–40 (Myron H. Nordquist & John Norton Moore eds., 2001); Gritakumar E. Chitty, *A Brief History of the Post Conference Development of the Tribunal as an International Judicial Body*, in *CURRENT MARINE ENVIRONMENTAL ISSUES AND THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA* 41–51 (Myron H. Nordquist & John Norton Moore eds., 2001); Mohamed Mouldi Marsit, *The International Tribunal for the Law of the Sea and the Difficulties Encountered During the Initial Phase of its Establishment*, in *CURRENT MARINE ENVIRONMENTAL ISSUES AND THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA* 53–55 (Myron H. Nordquist & John Norton Moore eds., 2001); Gudmundur Eiriksson, *Comments on the Origins and Purposes of ITLOS*, in *CURRENT MARINE ENVIRONMENTAL ISSUES AND THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA* 57–60 (Myron H. Nordquist & John Norton Moore eds., 2001); David H. Anderson, *Deliberations, Judgments, and Separate Opinions in the Practice of the International Tribunal for the Law of the Sea*, in *CURRENT MARINE ENVIRONMENTAL ISSUES AND THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA*

comprehensive nature of UNCLOS III. A chamber of the tribunal, the Seabed Disputes Chamber, deals specifically with boundary disputes between adjacent nations and other seabed disputes.³²

The International Seabed Authority (ISA) is an international body created to address mining under Part XI.³³ The mining regime was the primary reason the U.S. refused to join UNCLOS III, including disagreement over the creation of a “strong” or comparatively “weak” ISA, and the treatment of the resources of the Area as the “common heritage of mankind.”³⁴ Despite changes to address some of these concerns and the implementation agreement for deep seabed mining, the U.S. has still failed to accede to the treaty.³⁵

Even though the U.S. has not acceded to UNCLOS III, UNCLOS III is at the center of a robust body of international ocean governance. International cooperation through implementation of treaty provisions at the state level, functioning dispute resolution mechanisms contemplated by the treaty, and arbitral decisions that rely on UNCLOS III provisions as guidance illustrate a functional international ocean governance regime. Two recent decisions are noteworthy for their emphasis on broad responsibilities in ocean space. The Seabed Disputes Chamber of ITLOS issued its first Advisory Opinion (AO) regarding a matter ISA referred to it regarding liability for states sponsoring mining in the Area.³⁶ The AO asserted that all sponsoring states are held to a high standard of due diligence.³⁷ The Republic of Nauru initiated the inquiry because it was interested in sponsoring a third party with the technical and financial capacity to mine.³⁸ The Republic of Nauru noted that if countries like itself were held to the financial risks of these projects they would be functionally excluded.³⁹ The AO asserts that a state has a responsibility to ensure the sponsored

63–73 (Myron H. Nordquist & John Norton Moore eds., 2001) (explaining initial concept, negotiations, and post-conference development and challenges faced during its initial phase of establishment).

32. UNCLOS, *supra* note 7, at art. 287; *see also* PUBLICATIONS ON OCEAN DEVELOPMENT, MARITIME BOUNDARY DISPUTES, SETTLEMENT PROCESSES, AND THE LAW OF THE SEA (Seoung-Yong Hong & Jon M. Van Dyke eds., 2009) (collection of essays on how nations address disputes, pragmatically and legally).

33. UNCLOS, *supra* note 7, at Part XI.

34. Philip A. Burr, *The International Seabed Authority*, 29 SUFFOLK TRANSNAT’L L. REV. 271, 274 (2006).

35. UNCLOS, *supra* note 7.

36. Donald K. Anton et al., *Advisory Opinion on Responsibility and Liability for International Seabed Mining (ITLOS Case No. 17): International Environmental Law in the Seabed Disputes Chamber* (ANU College of Law, Working Paper No. 11-06 (March 23, 2011), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1793216 (on file with *The University of the Pacific Law Review*) (discussing historic nature of AO on four different levels); Anna Dolidze, *Advisory Opinion on Responsibility and Liability for International Seabed Mining (ITLOS Case No. 17) and the Future of NGO Participation in the International Legal Process*, 19 ILSA J. INT’L & COMP. L. 379, 380 (2013) (discussing role of NGOs in ITLOS advisory opinion).

37. Responsibilities and obligations of States with respect to activities in the Area, Case No. 17, Advisory Opinion of Feb. 1, 2011, ITLOS Rep. 2011, 34–35.

38. *Id.* at 6–8.

39. *Id.* at 8.

contractor's compliance to some degree.⁴⁰ The AO contributes to the development of international environmental law by confirming state liability for failing to ensure compliance by the sponsored contractor, although falling short of a strict liability scheme.⁴¹

Secondly, ITLOS issued an AO in April 2015 relating to illegal, unreported, and unregulated fishing (IUU).⁴² The tribunal emphasized that under the convention, nations must have due regard for the rights and duties of other nations.⁴³ Paragraph 216 noted the following:

While the SRFC Member States and other States Parties to the Convention have sovereign rights to explore, exploit, conserve and manage the living resources in their exclusive economic zones, in exercising their rights and performing their duties under the Convention in their respective exclusive economic zones, they must have due regard to the rights and duties of one another.⁴⁴

What are the responsibilities and liabilities of a nation for vessels flagged in that state, for IUU occurring in third party EEZ? The AO notes that flag state responsibility is that of due diligence:

The liability of the flag State does not arise from a failure of vessels flying its flag to comply with the laws and regulations of the SRFC Member States concerning IUU fishing activities in their exclusive economic zones, as the violation of such laws and regulations by vessels is not *per se* attributable to the flag State.⁴⁵

Flag State liability arises from its failure to comply with its "due diligence" obligations concerning IUU fishing activities conducted by vessels flying its flag in the exclusive economic zones of the SRFC Member States.⁴⁶

C. The Power of Property

Discussions of property evoke different norms and preconceptions. Because, as Professor Sprankling acknowledges, municipal laws have long defined property as a matter of sovereignty, property thus arises from different legal

40. *Id.* at 34–45.

41. Anton et al., *supra* note 36, at 5.

42. Request for an Advisory Opinion Submitted by the Sub-Regional Fisheries Commission (SRFC v. Ger.), Case No. 21, Advisory Opinion of Apr. 2, 2015.

43. *Id.* at ¶ 210.

44. *Id.* at ¶ 216.

45. *Id.* at 61.

46. *Id.*

histories and cultural backgrounds.⁴⁷ Panelists during the symposium noted that property doctrine and property theory can, at times, be so far apart as to render property an unworkable tool.

First, those wary of property rights fear the Blackstonian view of property vesting absolute authority in the person asserting the right. Although this view does not hold universal sway in practice, it is nonetheless influential. The desire to respect property rights often obstructs public efforts to change patterns of resource use. Property is conceptualized as a bundle of rights consisting of the right to exclude, right to use, right to transfer, and even the right to destroy.⁴⁸ The responsibilities side of property has not taken hold in the same ways as the rights side. For example, as nations expanded their territorial claims in the oceans, management regimes that exploit resources without concomitant resource conservation measures have been commonplace. As scholars have noted:

Many coastal nations have adopted domestic laws that assert expanded rights and jurisdiction in their offshore seas. Only rarely, however, do these domestic laws expressly recognize the duties, such as the duties to conserve and optimally utilize living resources, that current international law supposedly imposes on them.⁴⁹

For this reason, as I will return to later in this essay, scholars have emphasized the need to address the fiduciary responsibilities of nations that regulate authority over ocean space.⁵⁰ As one foundational property case in the U.S. emphasized, “[p]roperty rights serve human values. They are recognized to that end, and are limited by it.”⁵¹ This illustrates the reality that property rights are inherently shaped by a corresponding need to accommodate the rights of others. Ocean governance provides a useful example proving this point.

D. Ocean Governance Support for an International Property Law Thesis

The UNCLOS III territorial regime supports Professor Sprankling’s assertion that an International Law of Property has emerged.⁵² Nations have agreed to divide ocean space for the purpose of exploitation as well as conservation. This is the purpose of property as a tool—to allocate scarce resources and to facilitate the orderly use of resources by identifying clearly the actors who hold rights of

47. SPRANKLING, *supra* note 2.

48. JOHN G. SPRANKLING & RAYMOND R. COLETTA, PROPERTY: A CONTEMPORARY APPROACH 25–93 (2d ed. 2012).

49. KALO ET AL., *supra* note 11, at 408.

50. See *infra* Part V.A.

51. State v. Shack, 277 A.2d 369, 372 (Sup. Ct. N.J. 1971).

52. SPRANKLING, *supra* note 2.

use—and thus must be involved in transactions relating to physically existing assets of the marine environment. Moreover, creation of the ISA—an international body with supranational authority that vests title to minerals in contracting parties sponsored by individual nations—strongly supports the thesis of an existing international law of property.⁵³ In the case of seabed minerals, property rights are created without reference to a body of national law or national sovereignty over the space. The Area is international, it is shared, and its resources are the “common heritage of mankind.”⁵⁴ This strong reference point proves Professor Sprankling’s thesis regarding the development of an international property law. The recent AO of ITLOS again emphasizes the concept that even when exercising their rights, nations must exercise due regard for the rights of others.⁵⁵

It is important to note however, that the division into boundaries by reference to nautical miles does not take into account environmental assets, nor does division of the water column and seabed into separate management regimes support comprehensive environmental management.⁵⁶ These are a handful of the shortcomings of UNCLOS III. Compounding the problem is the slow progress of national implementation of responsibilities to conserve marine resources in UNCLOS III and other treaties. The next sections of this essay provides an examination of the current state of ocean health and ocean governance to support the argument that the international community should act in concert to mend existing agreements to strengthen environmental protection in the oceans.

III. STATE OF OCEAN HEALTH

The health of ocean systems is declining. This section describes some of the most pressing environmental issues in the ocean environment and the most direct international environmental laws that address these challenges. First, the section discusses overfishing, climate change, and pollution. Next, this section discusses emerging environmental impacts from industrialization and place-based activities—aquaculture, oil and gas exploration, mining, and ocean renewable energy—whose environmental regulation is just emerging. The most at-risk region due to lack of governance is the High Seas, where important fisheries and marine species spend time or migrate through areas that lack protection of national laws. Technology improvements have also allowed oil, gas, and minerals exploration and extraction in deep waters where scant research and

53. *The Mining Code, INT’L SEABED AUTH.*, <http://www.isa.org.jm/mining-code/Regulations> (last visited Feb. 16, 2016) (on file with *The University of the Pacific Law Review*).

54. *Supra* text accompanying notes 26–29.

55. *Supra* text accompanying notes 40–44.

56. Robin Warner, PROTECTING THE OCEANS BEYOND NATIONAL JURISDICTION: STRENGTHENING THE INTERNATIONAL LAW FRAMEWORK 64 (2009).

scientific data on the environment is available to use in assessing and crafting sustainable development frameworks. Even in the unforgiving Arctic environment, oil and gas companies are jostling to explore untapped fossil fuel resources.

A. *Overfishing*

For the past several decades, commercial fishing has led to severe declines.⁵⁷ With the advent of technology such as radar, there was literally nowhere for fish to hide from commercial fishery operations.⁵⁸ Industrial operations that process fish at sea to serve markets quickly also accelerated the decline.⁵⁹ Nearly eighty percent of commercial fisheries are overfished.⁶⁰ The continued extraction of fish at unsustainable levels has created a cascade effect that impacts fish, habitat, and other marine animals.⁶¹ When a popular fish disappears from the oceans, fishermen begin to harvest less popular varieties.⁶² As commercial fishermen “fish down the food chain,” even previously unimpaired fisheries have begun to exhibit declines from industrialized fishing operations.⁶³ Bycatch of non-target species is also common.⁶⁴ A related synergistic impact is the relationship of fewer fish within the environment and the negative consequences to the inter-related ecosystem.⁶⁵

UNCLOS III endorsed nationalizing EEZs and placing responsibilities for fishery conservation in the ambit of state control, which might be assumed to result in more effective conservation of fisheries. Instead, many nations restricted fishing by foreign fleets, but allowed nationals to overfish and continue the use of destructive fishing practices such as trawling. The parties revisited this issue in 1995 with the U.N. Fish Stocks Agreement.⁶⁶ This agreement seeks to conserve highly migratory fish and stocks that straddle the boundaries of one or more EEZs and the High Seas. Nations have also entered into regional fishing

57. Mercedes Lee & Carl Safina, *The Effects of Overfishing on Marine Biodiversity*, 13 J. MARINE EDUC. 5, 5–9, (1995).

58. *Id.*

59. *Id.*

60. *Id.*

61. *Id.*

62. *Id.*

63. *Id.*

64. *Id.* Bycatch means discarded fish or other marine resources, and includes marine deaths “due to a direct encounter with fishing gear.” *What is Bycatch?*, NOAA FISHERIES, http://www.nmfs.noaa.gov/by_catch/bycatch_what_is.htm (last visited Jan. 29, 2016) (on file with *The University of the Pacific Law Review*). Bycatch can have severe negative effects on the ocean ecosystem. *Id.*

65. *Id.*

66. U.N. Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks, U.N. Doc. A/Conf. 164/37 (Aug. 4, 1995).

agreements. Although parties need to implement these measures and focus on more effective enforcement, the law is in place to address fishing with an approach that recognizes collaborative efforts must be used to address the interests of multiple nations.

B. Climate Change

Climate change or climate disruption is a mounting challenge for ocean management.⁶⁷ The emission of greenhouse gases to the atmosphere has caused disruption to previously experienced predictable weather patterns. This has caused higher temperatures and melting ice in polar regions among other impacts.⁶⁸ As seas expand, we will see the impact on coastlines with sea level rise.⁶⁹ The addition of carbon dioxide, one of the greenhouse gases, reduces pH levels in oceans and causes an effect known as ocean acidification.⁷⁰ This change in pH bleaches corals and impacts the ability of calcium carbonate to form, which is needed by many base-level creatures that compose the bottom in the pyramid of food resources.⁷¹ For this reason, coral reef habitats, and thus the life depending on the reefs, are severely impacted.⁷²

Further, the U.S. government has emphasized that these changes could put the entire ocean food web at risk. Ocean acidification can impact the behavior of fish, perhaps increasing predation.⁷³ Marine mammals have been impacted as warmer waters change patterns of predation.⁷⁴ For example, waters off the shore of California have been warmer in the past year, and thus some fish have stayed

67. RANDALL ABATE & ROBIN KUNDIS CRAIG, CLIMATE CHANGE IMPACTS ON OCEAN AND COASTAL LAW: U.S. AND INTERNATIONAL PERSPECTIVES 2 (2015).

68. THOMAS F. STOCKER ET AL., CLIMATE CHANGE 2013, THE PHYSICAL SCIENCE BASIS: WORKING GROUP I CONTRIBUTION TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, V (2013); POTSDAM INST. FOR CLIMATE IMPACT RES. AND CLIMATE ANALYTICS, TURN DOWN THE HEAT: CLIMATE EXTREMES, REGIONAL IMPACTS AND THE CASE FOR RESILIENCE, XVII (2013) [hereinafter TURN DOWN THE HEAT].

69. See TURN DOWN THE HEAT, *supra* note 68, at 14–16 (discussing sea level rise).

70. *What is Ocean Acidification?*, NOAA, <http://oceanservice.noaa.gov/facts/acidification.html> (last visited Jan. 29, 2016) (on file with *The University of the Pacific Law Review*).

71. *Id.*

72. TURN DOWN THE HEAT, *supra* note 68, at 90 (noting vulnerable populations that depend on fisheries that will be impacted by destruction of coral reef habitats).

73. “Decreases in carbonate ions can make building and maintaining shells and other calcium carbonate structures difficult for calcifying organisms such as oysters, clams, sea urchins, shallow water corals, deep sea corals, and calcareous plankton. These changes in ocean chemistry can affect the behavior of non-calcifying organisms as well. Certain fish’s ability to detect predators is decreased in more acidic waters. When these organisms are at risk, the entire food web may also be at risk.” *Id.*

74. *Record Number of Stranded Sea Lion Pups Strains California Resources*, NPR (Mar. 20, 2015) <http://www.npr.org/2015/03/20/394242378/record-number-of-starved-sea-lion-pups-straining-calif-resources> (on file with *The University of the Pacific Law Review*).

further offshore.⁷⁵ NOAA scientists and others studying the record number of stranded sea lion pups have come to the consensus that mothers have had to travel further to get fish for their pups.⁷⁶ Pups have been found starving and emaciated, with some trying to hunt on their own.⁷⁷ These can be seen as cascade effects of climate change and overfishing throughout the interrelated marine ecosystem. Fewer fish that are located further offshore impacts reproduction of mammals that need land-based rearing grounds.⁷⁸

The legal regime to address climate change is scattered.⁷⁹ To date, nations have not fully employed international frameworks to curtail the emissions that cause climate change. Although the U.S. and many other nations joined the U.N. Framework on Climate Change, progress to implement effective greenhouse gas controls has been elusive.⁸⁰ Many see the Paris climate negotiations as the last possible opportunity for the international community to achieve a two-degree warming scenario, which the IPCC promoted as the outer-limit of warming to avoid catastrophic consequences.⁸¹

C. Pollution

1. Traditional Pollution

Traditional chemical pollution from vessel discharges and other industrial activities continues to impair ocean waters. The International Convention for the Prevention of Pollution from Ships (MARPOL) and the London Dumping Convention are international treaties that regulate these types of pollution.⁸² Although to date undeveloped, UNCLOS III also directs states to adopt laws and

75. *Id.*

76. *Id.*

77. *Id.*

78. *Id.* (mentioning that many of the sea lions off of California's coast are born on Southern California's Channel Islands).

79. RICHARD G. HIDRETH, ET AL., CLIMATE CHANGE LAW MITIGATION AND ADAPTATION, VI (2009) (noting that "climate change law is a new synthesis of several fields").

80. *Status of Ratification of the Convention*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, available at http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php (on file with *The University of the Pacific Law Review*).

81. *Paris Climate Change Conference—November 2015*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, available at http://unfccc.int/meetings/paris_nov_2015/meeting/8926.php (on file with *The University of the Pacific Law Review*).

82. Convention on the Prevention of Marine Pollution By Dumping Of Wastes And Other Materials, Dec. 29, 1972, 23 U.S.T. 2403, 1046 U.N.T.S. 120 [hereinafter London Dumping Convention]; Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, Feb. 17, 1978 [hereinafter MARPOL].

regulations preventing, reducing, and controlling pollution from dumping and from vessels.⁸³

MARPOL addresses pollution from vessel incidents at sea and restricts ships from emptying waste into the oceans.⁸⁴ However, this has not prevented a significant amount of waste and oily barge water from entering the oceans and has led commentators to note that MARPOL regulation is too lenient. The International Maritime Organization is the competent organization that addresses shipping issues, including employment, liability for safety, and seaworthiness of vessels.⁸⁵ The London Dumping Convention prohibits the placement of matter in the oceans⁸⁶ to prevent the ocean from becoming a convenient dumping ground.⁸⁷

2. *Special Growing Plastic Pollution Problem*

The foregoing laws are insufficient to stem the tide of waste entering our oceans. A growing accumulation of plastic garbage in the oceans is now engaging scientists and policymakers. An area twice the size of the state of Texas swirls with murky refuse.⁸⁸ This is known as the garbage patch or “vortex” Pacific gyre. Here, small pieces of plastic accumulate based on movement of sea conditions.⁸⁹ Incredibly troubling is how marine life mistakes the colorful garbage for food. An accumulation of garbage in creatures’ stomachs can starve marine life. Furthermore, the plastic garbage is leaching chemicals into the water and into sea creatures that consume it.

D. *Industrialization*

A picture of the pressures facing oceans wouldn’t be complete without highlighting the continued development of ocean resources. First, there is new interest in marine renewable energy sources—using devices to capture energy from offshore wind, wave and tidal energy, and ocean thermal energy conversion (OTEC).⁹⁰ Second, another development is open ocean aquaculture where sea-farmers would rear fish for consumption in large pens offshore.⁹¹ Third,

83. UNCLOS, *supra* note 7, at art. 210 (pollution from dumping) and art. 211 (pollution from vessels).

84. MARPOL, *supra* note 82.

85. *Introduction to IMO*, International Maritime Organization, <http://www.imo.org/en/About/Pages/Default.aspx> (last visited Feb. 16, 2016) (on file with *The University of the Pacific Law Review*).

86. London Dumping Convention, *supra* note 82.

87. *Id.*

88. *How Big is the “Great Pacific Garbage Patch?” Science v. Myth*, NOAA OFF. OF RESPONSE AND RESTORATION (Feb. 7, 2013), <http://response.restoration.noaa.gov/about/media/how-big-great-pacific-garbage-patch-science-vs-myth.html> (on file with *The University of the Pacific Law Review*).

89. *Id.*

90. *Infra* Part III.2.D.1.

91. *Infra* Part III.2.D.2.

continued interest in offshore oil drilling, with the additional pressure to extract Arctic oil and gas, is predicted to constitute some one-fifth of the existing reserves on earth.⁹² Finally, activity in offshore mining is increasing.⁹³ Deep seabed mining is actually emerging after long being hypothesized as on the horizon. According to one source, ISA has issued twenty-six contracts.⁹⁴ Unfortunately, laws have not kept pace with these developments.

1. Marine Renewable Energy

Perhaps at no other time has the pressure to develop new sources of renewable energy been greater. Marine renewable energy may have the least environmental impacts and will help us transition from carbon-based energy sources.⁹⁵ But since energy demand is onshore, whereas the production will take place far offshore, all of these forms of energy generation will require submarine cables to bring the generated energy to shore for human use. Thus, the destruction of some seabed will occur, as well as disturbances—from construction of submarine cable highways—that include noise and physical disturbance in the immediate vicinity.

Some of the other impacts from marine renewable energy are common. Each of the forms of renewable energy production offshore will involve physical disturbance and noise from construction. Ill-sited devices may cause impacts to migratory pathways no matter the form of energy generation as they result in the introduction of large objects used in the process of energy generation. The artificial reef impact suggests that some devices may aggregate fish that are associators. Marine life, such as barnacles, may attach itself to the devices and over time, that biomass could impact the integrity of the structure. The offshore oil and gas industry have used toxic chemicals like biocides to prevent degradation of the integrity of devices. If used with marine renewable devices, these toxic chemicals could enter the marine environment and cause harm.

Wind energy offshore has been developed in a number of nations and therefore, research on environmental impacts is more robust.⁹⁶ Beyond the construction impacts, these structures act as artificial reefs and create acoustic

92. *Infra* Part III.2.D.3.

93. *Infra* Part III.2.D.4.

94. *Managing Mining of the Seabed*, PHYS.ORG (July 9, 2015), <http://phys.org/news/2015-07-deep-seabed.html> (on file with *The University of the Pacific Law Review*).

95. Jeff Thayer & Patrick Lyons, *The Seas are Changing, It's Time to Use Ocean-Based Renewable Energy, the Public Trust, and a Green Thumb to Protect Our Seas From Climate Change*, 19 OCEAN AND COASTAL L.J. 241 (2014).

96. A. BRITO-MELO ET AL., 2008 ANNUAL REPORT: INTERNATIONAL ENERGY AGENCY IMPLEMENTING AGREEMENT ON OCEAN ENERGY SYSTEMS 62 (2009). Particularly in near-shore areas, wind energy has expanded for example in the U.K. and in Belgium. *Id.*

impacts, and windmills have been scrutinized for their effects on avian wildlife as blades impact migrating and marine birds.⁹⁷ Tidal energy devices are similar to windmill turbines, but placed in the water to capture movement during the very predictable tides.⁹⁸ The technology is well-developed and has been proven to have minimal impacts on the environment. Yet, the acoustic impacts are also noteworthy and of concern for sensitive marine life.

Wave energy conversion devices and OTEC are less developed technologies. Wave energy devices convert energy into electricity through various technologies,⁹⁹ such as fixed buoys attached to the seafloor, wave attenuators that are moved by the motion of waves, and overtopping devices that draw water down through the devices to move turbines.¹⁰⁰ Regardless of their conversion mechanism, all types of technologies will generate impacts during the construction phase. OTEC is premised on capturing energy created by the existence of different water temperatures at varying depths.¹⁰¹ Conversion of thermal gradient energy will require structures that are place-based and have similar impacts to other marine based renewable energy devices.

UNCLOS III Article 208 addresses pollution from seabed activities and requires nations to adopt laws and regulations to prevent, reduce, and control pollution in their jurisdictions.¹⁰² Article 208 cross-references articles 60 and 80, which make it clear that generation of energy by, for example, wave and wind energy devices attached to the seabed, are contemplated by this provision.¹⁰³ To some, the attempt to adapt the UNCLOS III provisions to the new technologies of marine renewables is ill-advised and a new regime to manage expedited marine renewables development should be introduced.¹⁰⁴

97. *Offshore Wind Farms Benefit Sealife, Says Study*, EWEA BLOG (Dec. 4, 2012), <http://www.ewea.org/blog/2012/12/offshore-wind-farms-benefit-sealife-says-study/> (on file with *The University of the Pacific Law Review*).

98. *Tidal Devices*, EUR. MARINE ENERGY CTR., <http://www.emec.org.uk/marine-energy/tidal-devices/> (last visited Jan. 29, 2016) (on file with *The University of the Pacific Law Review*).

99. *Wave Devices*, EUR. MARINE ENERGY CTR., <http://www.emec.org.uk/marine-energy/wave-devices/> (last visited Jan. 29, 2016) (on file with *The University of the Pacific Law Review*).

100. *Id.*

101. *Ocean Thermal Energy Conversion Basics*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, <http://energy.gov/eere/energybasics/articles/ocean-thermal-energy-conversion-basics> (last visited Jan. 29, 2016) (on file with *The University of the Pacific Law Review*).

102. The Third U.N. Conference on the Law of the Sea was convened in 1973 and met for several months a year through 1982, when the Conference adopted the United Nations Convention on the Law of the Sea, opened for signature Dec. 10, 1982. See UNCLOS *supra* note 17, at art. 208.

103. UNCLOS, *supra* note 17, at art. 208.

104. Francesca Galea, *A Legal Regime for the Exploration and Exploitation of Offshore Renewable Energy*, 25 OCEAN YEARBOOK 101–129 (2011).

2. Aquaculture

Demand for seafood has increased, while at the same time, many commercial fisheries are in declining yield. Aquaculture has been proposed as a means to address this shortfall in quantity. Aquaculture is the process of rearing fish in large ocean pens.¹⁰⁵ Waste can accumulate from the rearing of so many fish in one location. Thus, many jurisdictions have strictly regulated aquaculture near-shore, which has driven some companies to seek locations farther offshore in the EEZ. An additional concern is the spread of disease among fish in the confined aquaculture system. Whether this practice can be conducted sustainably is the subject of dispute. Another aspect is the feeding habits of the fish reared. If the fish themselves eat other fish, then the amount of protein needed to support the aquaculture activities may be more than the amount of protein yielded. Profit-making enterprises assert that low-grade and inexpensive sources of protein generate high-value sources of protein; however, the inputs must be scrutinized in order to support the practice as a means to feed a growing global population, not just profit and tonnage of fish outputs.

3. Offshore Oil and Gas

Oil and gas development near-shore began over a century ago.¹⁰⁶ Over the past few decades the industry developed technology to explore for and extract oil and gas in increasingly deep waters.¹⁰⁷ The Macondo well explosion in the Gulf of Mexico forever impacted the history of deep-water drilling and demonstrated that the industry had yet to develop adequate response capacity for the scope of the disaster that ensued.¹⁰⁸ As a result, some commentators assert that an international global regime should be adopted to compensate for the insufficiency of domestic laws to regulate the offshore industry.¹⁰⁹ To date, no such international law comprehensively regulates offshore oil and gas operations. UNCLOS III Article 208 addresses pollution from seabed activities and requires nations to adopt laws and regulations to prevent, reduce, and control pollution in their jurisdictions.¹¹⁰ The Arctic is the newest frontier for fossil fuels exploration,

105. *What is Aquaculture?*, NOAA FISHERIES, http://www.nmfs.noaa.gov/aquaculture/what_is_aquaculture.html (last visited Jan. 29, 2016) (on file with *The University of the Pacific Law Review*).

106. *Offshore Drilling: History and Overview*, OFFSHORE ENERGY TODAY (June 25, 2010), <http://www.offshoreenergytoday.com/offshore-drilling-history-and-overview/> (on file with *The University of the Pacific Law Review*).

107. ABATE & CRAIG, *supra* note 67, at 160–61.

108. NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, REPORT TO THE PRESIDENT, DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING (2011).

109. Naama Hasson, *Deepwater Offshore Oil Exploration Regulation: The Need for a Global Environmental Regulation Regime*, 4 WASH. & LEE J. ENERGY, CLIMATE & ENV'T. 277 (2013).

110. UNCLOS, *supra* note 7, at art. 208.

although no projects are anticipated in the U.S. territory for the foreseeable future.

4. Deep Seabed Mining

We have little experience with mining offshore to date, but significant momentum to expand mining is gathering.¹¹¹ One example of offshore mining is diamond mining from Namibia. Gravel is also mined in various offshore locations. Our lack of information about deep seabed environments compounds the issues. The type of deposits a company extracts drives the impacts from seabed mining. The ISA has adopted regulations in a “mining code” for polymetallic nodules, ferromanganese crusts, and polymetallic sulfides.¹¹²

Polymetallic nodules are potato-shaped rocks found at depths of 9,000 to 18,000 feet that contain copper, cobalt, manganese, and nickel.¹¹³ Polymetallic sulfide deposits, formed by deep-water vents contain silver, gold, copper, manganese, cobalt, zinc, and lead.¹¹⁴

In addition to the many contracts the ISA has issued, the company Nautilus Minerals Inc. has obtained a concession to mine offshore Papua New Guinea.¹¹⁵ This project will help to demonstrate the viability of these mining projects.

In conclusion, significant work is needed to improve the state of ocean health. The stressors on ocean health are transboundary.¹¹⁶ Thus, none of the stressors can be adequately addressed by one nation alone—a concerted effort of the international community will be required. There is some promise in the fact that issues involving conservation and the gaps in international regulation have reached international tribunals, organizations, and working groups and has generally entered into mainstream discussions focused on future solutions. One scholar noted “there will be more and more problems and disputes concerning the conservation and exploitation of the living resources of the sea and the protection of the environment.”¹¹⁷ We must seize these disputes as an opportunity to expand protection of environmental resources, moving more in the direction of

111. Alistair MacDonald & Edward Welsch, *Next Frontier: Mining the Ocean Floor*, WALL ST. J. (June 4, 2012), <http://www.wsj.com/articles/SB10001424052702303395604577434660065784388> (on file with *The University of the Pacific Law Review*).

112. *The Mining Code*, *supra* note 53.

113. INT’L SEABED AUTH., POLYMETALLIC NODULES 1–2, *available at* <https://www.isa.org.jm/files/documents/EN/Brochures/ENG7.pdf> (on file with *The University of the Pacific Law Review*).

114. *Id.*

115. *Id.*

116. Those stressors discussed include pollution, overfishing and climate change.

117. BUDISLAV VUKAS, MAIN FEATURES OF COURTS AND TRIBUNALS DEALING WITH LAW OF THE SEA CASES, IN CURRENT MARINE ENVIRONMENTAL ISSUES AND THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA 217 (2001).

integrative regulation and away from the responsive, sector-by-sector regulation that has thus far failed to protect the oceans from severe harms.

IV. BROADER ENVIRONMENTAL PROTECTIONS IN INTERNATIONAL LAW

As the prior section illustrates, ocean regulation has followed a sectorial management approach. Individual activities spurred adoption of laws specific to regulating the activity. Beyond these sectoral laws, there are an abundance of international environmental laws that influence environmental protection offshore. As one expert has explained, however, the regime of environmental protection suffers from a lack of implementation of these responsibilities in the domestic context and a failure to unify protection of the seabed with the water column itself and the living marine resources that depend on a healthy environment.¹¹⁸

First, UNCLOS III contains requirements for protecting the environment in Part XII.¹¹⁹ Article 192 establishes a fundamental duty of parties to protect and preserve the environment.¹²⁰ It can be perceived that this duty is elevated above the sovereign right of states to exploit their natural resources because Article 193 provides that the right must be exercised by states “in accordance with their duty to protect and preserve the marine environment.”¹²¹ Article 194(1) says that states shall take, individually or jointly as appropriate, all measures necessary to prevent, reduce and, control pollution of the marine environment from any source.¹²²

In their treatise on the International Law of the Sea, authors Donald Rothwell and Tim Stephens explain the interplay among various international sources to support an environmental ethic of transboundary obligations in the oceans.¹²³ As they note, UNCLOS III 194(2) provides that states are to ensure that activities under their jurisdiction or control do not cause damage to other states or their environment. States also must ensure that pollution does not spread beyond the areas where they exercise sovereign rights,¹²⁴ which is built upon the *Trail Smelter* case. In that case, a smelter in British Columbia created pollution that drifted into the neighboring U.S. and damaged natural resources and property in

118. See generally WARNER, *supra* note 56, at 39–79 (describing the author’s explanation regarding the lack of implementation of environmental protections).

119. UNCLOS, *supra* note 7, at Part XII.

120. *Id.* at art. 192.

121. *Id.* at art. 193.

122. *Id.* at art. 194(1).

123. ROTHWELL & STEPHENS, *supra* note 8, at 324–43.

124. UNCLOS, *supra* note 7, at 478. The Third U.N. Conference on the Law of the Sea was convened in 1973 and met for several months a year through 1982, when the Conference adopted the United Nations Convention on the Law of the Sea.

the state of Washington. The U.S. and Canada agreed to resolve the dispute and submitted itself to the tribunal for a binding resolution.¹²⁵ The tribunal held that a nation cannot knowingly permit use of its territory to cause serious injury by pollution in the territory of another state “when the case is of serious consequence and the injury is established by clear and convincing evidence.”¹²⁶ Further, the obligation is an incorporation of responsibility referred to in the 1972 Stockholm Declaration and 1992 Rio Declaration to prevent damage to the environment of areas beyond national jurisdiction.¹²⁷ Most, if not all, international environmental lawyers would contend that the 1972 Stockholm Declaration is customary international law.¹²⁸ Moreover, with the addition of the Rio Declaration, these declarations form the basis for an ethic of environmental protection and are the bedrock to international environmental law.

Biodiversity, of seas and otherwise, is promoted through the Convention on Biological Diversity (CBD).¹²⁹ This convention promotes the equitable sharing of benefits from genetic resources, specifically the growing interest in bioprospecting. Indeed, the CBD cites verbatim the 1972 Stockholm Declaration.¹³⁰ As nearly all nations have adopted the CBD—except three, including the U.S.—it is important to respect its binding nature on parties and likely ascendancy to customary international law.

Additional treaties could be drawn upon to protect marine wildlife. Using trade as its means of impact, the Convention on the International Trade in Endangered Species protects a number of threatened marine species.¹³¹ For example, all sea turtles are facing the threat of extinction and thus their harvest and trade is prohibited by the Convention on the International Trade in Endangered Species.¹³² The International Convention for the Regulation of Whaling has curtailed overharvesting of whales, although some whaling continues.¹³³ This Convention has been instrumental in rebuilding whale populations.

At best, these different laws represent a patchwork of protection, which has failed to keep pace with the advancing utilization of ocean living and non-living resources. In addition to proactive measures, the global community has yet to

125. Trail Smelter Case (U.S. v. Canada), 3 U.N.R.J.A.A. 1905, 1965 (Apr. 13, 1938).

126. *Id.*

127. ROTHWELL & STEPHENS, *supra* note 8, at 343 (discussing interplay of UNCLOS III art. 194, Trail Smelter Case and 1992 Rio Declarations).

128. DONALD K. ANTON ET AL., INTERNATIONAL ENVIRONMENTAL LAW: CASES, MATERIALS, PROBLEMS 60 (2007).

129. Convention on Biological Diversity, June 1992, 1760 U.N.T.S. 79

130. ANTON ET AL., *supra* note 128, at 60.

131. Convention on International Trade in Endangered Species of Wild Fauna and Flora, Apr. 30, 1983, 993 UNTS 243.

132. *Id.*

133. International Convention for the Regulation of Whaling, Dec. 2, 1946, 161 UNTS 72.

settle on the means to address damage caused to the global commons or swift means to address transboundary harms. As one scholar noted, “principles of liability and compensation in cases of transboundary damage are not well developed and the State practice and treaty formulations at the global level continue to show variation and disparity in content.”¹³⁴

V. GROWING SUPPORT FOR INTEGRATIVE SOLUTIONS

There is growing international interest to address the threats to ocean sustainability. The Rio Declaration and Brundtland Report, “Our Common Future,” recognized the promise of sustainable development that put environmental conservation at the forefront of consideration during development.¹³⁵ Spurred significantly by public interest groups and reaching into the commercial interests that wish to continue to profit from abundant ocean resources, change is afoot. Robin Warner, in her seminal book on sustainable development, tracks how human impacts on the marine environment must be curtailed by filling gaps in international law.¹³⁶

A. Ocean Public Trust

Under the concept of the public trust doctrine, the oceans are held in trust as assets by governments for current and future generations of citizens.¹³⁷ It is proposed as a limit on resource consumption, overuse, and overexploitation. Advocates draw on the public trust concept to limit total industrialization and form a foundation for limits on fishing, shipping, and energy development that has cumulatively overwhelmed ocean systems’ carrying capacity. Scholars acknowledge potential resistance to applying the doctrine. As Stephen Roady notes, “it is controversial because it has the potential to pit the public interest in access to certain lands and waters against property owners asserting a competing interest.”¹³⁸

134. Pemmaraju Sreenivasa Rao, *International Liability for Transboundary Harm*, 34 ENVTL. POL’Y L. 224 (2004).

135. U.N. Secretary-General, Report of the World Commission on Environment and Development: “Our Common Future,” U.N. Doc A/47/427 (Aug. 4, 1987).

136. WARNER, *supra* note 56.

137. Gail Osherenko, *New Discourses on Ocean Governance, Understanding Property Rights and the Public Trust*, 21 J. ENVTL. L. & LITIG. 317, 335 (2006) (arguing that government holds seabed, water column, and ocean resources in trust for the public). Her contention rests on the argument that nations do not hold sovereignty in the EEZ, and thus their exercise over ocean resources is that of imperium (authority, regulatory jurisdiction), not dominion (ownership). *Id.* at 334.

138. Stephen E. Roady, *The Public Trust Doctrine*, in OCEAN AND COASTAL LAW AND POLICY 39, 39 (ABA ed., 2007)

What is the history of the public trust doctrine? Its origins are in the Roman Institutes of Justinian, which likely borrowed the idea from the Greeks.¹³⁹ The concept was then incorporated into England's common law.¹⁴⁰ The U.S. inherited the concept from the English crown.¹⁴¹ Each U.S. state has a version applicable to submerged and tidelands and often water—even groundwater in California—which has one of the broadest conceptions of the public trust doctrine of any U.S. state. Critics challenge its application to the Federal government in the U.S., but a large number of scholars advocate its use in relation to conserving ocean resources under federal control.¹⁴²

Scholars such as Professor Peter Sand have argued cogently that the public trust doctrine should be extended internationally to common pool resources. Sand explains that because it has common law history, it has no exact parallel in civil law systems, yet he persuasively argues it could be used for the conservation of oceans.¹⁴³ He notes that the EEZ and additional international obligations make clear that a nation's use of the resources is "not proprietary, but fiduciary."¹⁴⁴

B. Marine Spatial Planning

As documented in this paper, both traditional and new uses of oceans have intensified environmental degradation. As one expert on ocean energy systems perceived, "[i]nstead of some usages replacing others, it is likely that traditional usages of ocean space [will] continue or even increase, while new and competing uses will equally require large areas."¹⁴⁵ It will then be necessary to find means to facilitate this development in a way that avoids conflicts among users while also preventing decline of marine ecosystems.

Marine Spatial Planning (MSP) is similar to ocean zoning, but with sensitivity to the environment.¹⁴⁶ MSP draws on zoning concepts where particular

139. *Id.* at 40.

140. *Id.*

141. *Id.*

142. Rachael E. Salcido, *The Law Applicable on the Outer Continental Shelf and in the Exclusive Economic Zone*, 58 AM. J. COMP. L. 407 (2010).

143. Peter H. Sand, *Sovereignty Bounded, Public Trusteeship for Common Pool Resources*, 4 GLOB. ENV. POL. 47-48 (2004); *see also* Peter H. Sand, *Public Trusteeship for the Ocean*, in LAW OF THE SEA, ENVIRONMENTAL LAW AND SETTLEMENT OF DISPUTES 521, 522 (Tafsir M. Ndiaye & Rudiger Wolfrum, eds. 2007).

144. Sand, *supra* note 143, at 48.

145. Frank Neumann, *Ocean Energy As Ocean Space Use Only Conflict or Also Synergies?*, in OCEAN ENERGY SYSTEMS IMPLEMENTATION AGREEMENT ANNUAL REPORT 41 (Dr. J. Huckerby and Dr. A. Brito e Melo eds. 2009).

146. *See* CHARLES EHLER & FANNY DOUVERE, INTERGOVERNMENTAL OCEANOGRAPHIC COMM'N, MARINE SPATIAL PLANNING: A STEP-BY-STEP APPROACH TOWARD ECOSYSTEM-BASED MANAGEMENT 24 (2009), available at <http://www.unesco-ioc-marinesp.be/uploads/documentenbank/d87c0c421da4593fd93bbee1898e1d51.pdf> (on file with *The University of the Pacific Law Review*) (stating that MSP is ecosystem-based).

locations are identified for specific uses and potentially impactful uses are limited, outlawed, or designated for specific places to reduce harm.¹⁴⁷ “[MSP] is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process.”¹⁴⁸

MSP is employed in different countries to different degrees—one of the best examples is Australia’s Great Barrier Reef.¹⁴⁹ The concept is also used to manage resources in Belgium and Germany.¹⁵⁰ It is used extensively in the U.S. by coastal states such as California, Oregon, and Rhode Island. One challenge of MSP in international waters is confronting the boundaries of multiple nations, many of which do not respect ecological boundaries.¹⁵¹ Indeed, experts have emphasized that the success of the Australian Great Barrier Reef is related to the fact that it is a large marine ecosystem that is within the national jurisdiction of a single nation.¹⁵² In the case of the High Seas, the lack of clear authority to designate uses or prohibited activities has also been seen as a challenge for which various international authorities must be employed to facilitate MSP.¹⁵³

An important aspect of this tool is the subcategory of Marine Protected Areas that are “no take” zones where restoration of marine living resources can occur.¹⁵⁴ Scholars have suggested closing the High Seas as a means of increasing the possible fishing success in nearby areas under national jurisdiction.¹⁵⁵ This would be of particular importance to migratory fish such as tuna, billfish, and sharks.¹⁵⁶

147. *See id.*

148. *Id.*

149. Robin Craig, *Ocean Governance for the 21st Century: Making Marine Zoning Climate Change Adaptable*, 36 HARV. ENVTL. L. REV. 305 (2012).

150. 2011 25 Ocean Y.B. 1

151. Frank Maes, *The International Legal Framework for Marine Spatial Planning*, 32 MARINE POLICY 797, 798 (2008).

152. *Id.*

153. Jeff Ardron, et al., *Marine Spatial Planning in the High Seas*, 32 MARINE POLICY 832–39 (2008).

154. EHLER & DOUVERE, *supra* note 146, at 23.

155. White et al., *Close the High Seas to Fishing?*, PLOS BIOLOGY 3 (2014).

The world’s oceans are governed as a system of over 150 sovereign exclusive economic zones (EEZs, [approximately forty-two percent] of the ocean) and one large high seas (HS) commons ([approximately fifty-eight percent] of ocean) with essentially open access. Many high-valued fish species such as tuna, billfish, and shark migrate around these large oceanic regions, which as a consequence of competition across EEZs and a global race-to-fish on the HS, have been over-exploited and now return far less than their economic potential. We address this global challenge by analyzing with a spatial bioeconomic model the effects of completely closing the HS to fishing. This policy both induces cooperation among countries in the exploitation of migratory stocks and provides a refuge sufficiently large to recover and maintain these stocks at levels close to those that would maximize fisheries returns. We find that completely closing the HS to fishing would simultaneously give rise to large gains in fisheries profit ([more than 100 percent]), fisheries yields ([more than thirty percent]), and fish stock conservation ([more than 150 percent]). We also find that changing EEZ size may benefit some fisheries;

C. Environmental Impact Assessment

The United States adopted the National Environmental Policy Act (NEPA) in 1970.¹⁵⁷ NEPA's foundational principle is that federal agencies must make an assessment of the environmental impacts of their proposed actions.¹⁵⁸ Although federal law does not require that agencies take the most environmentally benign course of action identified during the environmental impact assessment process, the process requires an analysis of the alternatives, including a no-action alternative, and cumulative impacts. Proposals often benefit by the incorporation of mitigation provisions and adjustments to reduce environmental impacts that may have evaded identification without the process.

This concept of environmental assessment has been exported to many nations and now exists at the international level as well.¹⁵⁹ The Transboundary Environmental Impact Assessment (TEIA) was adopted by the United Nations Economic Commission for Europe, known as the ESPOO Convention.¹⁶⁰ The ESPOO Convention requires that nations that take action that will cause transboundary environmental impacts assess those effects and provide transparency and an opportunity for comment from citizens of both nations impacted.¹⁶¹ In a transboundary context, it is often the host country that will receive the benefits of a project, while environmental impacts are often more concentrated on the other, non-project nation. Some have noted that the TEIA has been widely adopted due to its lack of a hard, outcome-based limitation on proposed actions.¹⁶² While impacts must be analyzed, and tradeoffs considered, no mitigation actions are imposed by virtue of the assessment itself.

The ESPOO Convention explicitly states it is not to be used to require transboundary assessments of marine activities.¹⁶³ Instead, we can look to the fact that the UNCLOS III itself articulated the environmental impact assessment

nonetheless, a complete closure of the HS still returns larger fishery and conservation outcomes than does a HS open to fishing.

Id.

156. *Id.*

157. National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-61 (Westlaw through Pub. L. No. 91-190).

158. *Id.*

159. STEPHEN C. MCCAFFREY & RACHAEL E. SALCIDO, *GLOBAL ISSUES IN ENVIRONMENTAL LAW* 1 (2009).

160. Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 1989 U.N.T.S. 310 [hereinafter Convention on Environmental Impact].

161. *Id.* Article 2, 6 requires that the public of the affected region receive same opportunity as public of the party of origin.

162. John H. Knox, *The Myth and Reality of Transboundary Environmental Impact Assessment* 96 AM. J. INT'L LAW 291 (2002).

163. Convention on Environmental Impact, *supra* note 160.

concept in Article 203.¹⁶⁴ Today, environmental impact assessment is proposed as another way of integrating scientific information into project proposals to reduce impacts on the marine environment. Although the process itself does not ensure prevention of environmental harm, it does facilitate better decision making by making explicit the tradeoffs of development and by requiring transparency, which facilitates broad involvement by the public and non-governmental organizations that can sometimes advocate strongly for mitigation of harms from the proposed development project. Environmental impact assessments can require that alternative sites are considered and can impose the responsibility to consider the cumulative impacts from a specific project.

D. The Proposed Implementation Agreement

Professor Sprankling noted that technological advances allowing for resource exploitation called for the international regulation of territories outside any one nation.¹⁶⁵ This advancement forms one part of the body of the international law of property. As the pressures on oceans were mounting, the United Nations convened an ad-hoc open-ended informal working group to consider measures to address marine biodiversity in areas beyond national jurisdiction.¹⁶⁶ The working group seeks to press momentum on an agreement to conserve the marine biological resources of ABNJ. Among the recommendations is the development of an international instrument under UNCLOS for the conservation and sustainable use of marine biological diversity in ABNJ.¹⁶⁷ As previously discussed, parties have created an implementation agreement to address overfishing—the 1995 Fish Stocks Agreement—and created regional fisheries organizations to attempt to prevent overfishing of highly migratory and straddling stocks of fish.¹⁶⁸ A similar agreement has not been reached to implement more broad conservation measures for marine impacts. However, it is possible to build on prior success, but garnering the political will to bring into existence an agreement limiting impacts on the environment takes time, effort, and leadership.

As the prior sections of this paper explored, there are many stressors on marine environments, and the toolbox that has developed to address them is more robust now.¹⁶⁹ The proposed agreement would be built around the well-

164. UNCLOS, *supra* note 7, at art. 203.

165. SPRANKLING, *supra* note 2, at 3.

166. G.A. Res. 59/24, ¶ 73 (Feb. 4, 2005).

167. The Working Group, *supra* note 28.

168. Agreement for the implementation of the provisions of the United Nations Convention on the Law of the Sea of December 10, 1982, relating to the conservation and management of straddling fish stocks and highly migratory fish, Aug. 4, 1995.

169. *See supra* Part II.

established practices of marine spatial planning, environmental impact assessment, and scientific information sharing.¹⁷⁰ As outlined in the draft report of the ad-hoc open ended informal working group studying potential conservation of areas beyond national jurisdiction, “several delegations . . . expressed the view that a global universal governance structure remained the best way to promote sustainable marine biodiversity beyond areas of national jurisdiction.”¹⁷¹ On the other hand, some delegations emphasized that existing legal instruments, as have been discussed in this essay, exist, and focus should be on ensuring those binding legal provisions are implemented.¹⁷² Further, the tools outlined—MSP, EIA, and technology and data sharing—could be employed under the existing legal provisions of UNCLOS III, ESPOO, and CBD. However, these international agreements do not solve all the gaps, such as marine genetic resources in the High Seas. A new agreement could bridge these gaps, although even through the use of existing legal provisions it is apparent that international cooperation is critical to addressing the transboundary impacts beleaguering the ocean environment.¹⁷³

The successful implementation of a Marine Protected Area (MPA) network through the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) illustrates a model that was built upon existing legal authorities.¹⁷⁴ OSPAR is a regional agreement. Efforts to create an MPA were initially led by non-governmental organizations then championed by the Netherlands and later Germany.¹⁷⁵

Those concerned about the health of the marine environment need to generate the political will to put limits on consumption and destruction. It requires that parties acknowledge the interrelated nature of ocean spaces and the health of coastal ecosystems. It is ineffective to manage human impacts primarily in the coastal zone and territorial seas. To some extent, the introduction of the EEZ was a step toward expanding regulation beyond national territories without completely closing the oceans to the peaceful uses of other coastal and non-coastal nations. But, the existing environmental regulations have been insufficient from both the perspective of gaps and inability to proactively address emerging issues.¹⁷⁶ Sectoral regulation also allows for inefficiencies in a context where enforcement at the minimum required level has been insufficient.

170. The Working Group, *supra* note 28, at para. f.

171. The Working Group, *supra* note 28, at para. 10.

172. *See supra* Part III.D

173. *See supra* Part V.

174. B.C. O’Leary, et al., *The First Network of Marine Protected Areas (MPAs) In the High Seas: The Process, The Challenges and Where Next*, 36 *MARINE POL’Y* 598-605 (2012).

175. *Id.* at 599–600 (emphasizing the need for a political ‘champion’ to keep up momentum and crediting the Netherlands, Germany as convener of the MPA group, among other OSPAR).

176. *See supra* Part II.

VI. CONCLUSION

The international law of property has the potential to improve coordination of ocean resource management. The declining status of biodiversity, fisheries, and ecological health demands restorative projects and curtailment of pollution and over-use. Legal scholars have identified the need for legal research to clarify rights in the EEZ and ABNJ, for orderly development of marine renewables, to reduce impacts of climate change, and to transition away from a fossil fuel dominated economy. Marine biodiversity decline has the most severe impact on island nations, whose economies depend on healthy oceans. As the working group on conserving marine biodiversity noted, “accumulating and compounding human impacts ha[ve] undermined the health of the oceans thereby gravely threatening the well-being and livelihood of their populations.”¹⁷⁷ As a practical matter, nations should engage in the negotiation of a new High Seas Agreement promoting the protection of biodiversity. We are perhaps on the cusp of such an agreement, but need legal hooks to reel in political support, and the international law of property could be one such hook. The grave concerns of overfishing and protecting biodiversity animate the discussion about bringing stakeholders together to share information and discuss the benefits of ocean resources. The ad hoc, open-ended, informal working group studying issues relating to the conservation and sustainable use of marine biological diversity in ABNJ strongly recommends the use of new tools to help overcome the challenge of fragmentary management deficient in the employ of scientific information.

While the international community would benefit from an implementation agreement that addresses High Seas management pursuant to UNCLOS III, we are also in need of a new ethos of shared responsibility. *The International Law of Property* may be influential in guiding that development as well. These are our shared resources and our shared responsibilities. Historically, the drafters of UNCLOS III recognized that the oceans must be managed with special attention to its integrated functioning—the mindset of a supranational public trust imposed on all nations could facilitate sustaining our common resources. The public trust doctrine has many of the same features espoused by soft law instruments—including the precautionary principle and intergenerational equity.¹⁷⁸ When engaging in ocean activities, all nations should take into account not only the aspirations of their own citizens, but also responsibilities to other nations and our future generations. The “common heritage of mankind” regime adopted for the seabed minerals was a strong articulation of our shared destinies.¹⁷⁹ Without

177. The Working Group, *supra* note 28, at para. 10.

178. *See supra* Part V.A.

179. *See supra* Part II.B.

integrated, science-based ocean management, it will not be possible to achieve sustainable development and all nations—whether coastal or not—will be poorer.