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The Tragedy of the Common Heritage of Mankind

Scott James Shackelford, *Stanford University*



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THE TRAGEDY OF THE COMMON HERITAGE OF MANKIND

Scott J. Shackelford¹

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LIST OF ABBREVIATIONS

- ❖ Antarctic Treaty System: ATS
- ❖ Committee on the Peaceful Uses of Outer Space: COPUOS
- ❖ Common Heritage of Mankind: CHM
- ❖ European Space Agency: ESA
- ❖ Geosynchronous Orbit: GSO
- ❖ International Space Station: ISS
- ❖ International Space Station Intergovernmental Agreement: IGA
- ❖ International Telecommunications Union: ITU
- ❖ Mutually Assured Destruction: MAD
- ❖ National Aeronautics and Space Administration: NASA
- ❖ Non-Governmental Organization: NGO
- ❖ Office of Outer Space Affairs: OOSA
- ❖ Outer Space Treaty: OST
- ❖ Return on Investment: ROI
- ❖ Special Sovereignty Areas: SSAs
- ❖ United Nations Convention on the Law of the Sea: UNCLOS
- ❖ Vision for Space Exploration: VSE

¹ Scott J. Shackelford is a J.D. Candidate (2009) at Stanford Law School and a Ph.D Candidate in International Relations at the University of Cambridge.

Introduction

The history of international law since the 1648 Treaty of Westphalia has in significant part been a chronicle of the rise of territorial sovereignty. By the nineteenth century all of the available land on Earth had been claimed by a sovereign state, save for at the poles and the deep seabed under the high seas. In these areas, Grotius's *mare liberum* triumphed: concerns over free passage outweighed the great powers' territorial ambitions.² Instead of a sovereign state, these areas including the deep international seabed, the Arctic, Antarctica, and space gradually became regulated to a greater or lesser extent by the Common Heritage of Mankind (CHM) principle in which theoretically all of humanity became the sovereign over the international commons.³

As resource competition intensifies, however, international law at the extremes of human civilization, comprising "special sovereignty areas" (SSAs)⁴ and in particular the communal property principle of the CHM, is under pressure with the need for greater private economic development. It will be argued that as resources become increasingly scarce and technology advances to meet surging demand, longstanding principles of communal property in the international commons will either be reinterpreted or rewritten outright. This process will be demonstrated through a temporal examination of sovereignty, as well as through case studies comprising new territorial claims on the deep Arctic seabed under the United Nations

Convention on the Law of the Sea (UNCLOS) treaty system and in the re-conception of space

² Bernard H. Oxman, *The Territorial Temptation: A Siren Song at Sea*, 100 No. 4 AJIL 830, 831 (Oct. 2006). A similar argument could be put forward regarding governance of the Northwest Passage, a point that will be returned to in Part II(b).

³ As will be noted, the only true CHM areas are the deep seabed, which includes much of the Arctic Ocean, (though this is to an extent arguable after the New York Amendments to UNCLOS) and the Moon. The legal status of Antarctica has been frozen by the ATS, and at this point is not a true CHM regime.

⁴ Special sovereignty areas are defined as commons zones lacking national jurisdiction in which the international community has assumed the authority to regulate development. A 'commons' is broadly defined as a territory with resources that are not privately owned. Although this premise was challenged to an extent in the 1950s era continental shelf claims, the passage of the 1982 UNCLOS codified many customary international law provisions and largely maintained the freedom of the high seas.

law to favor private property rights. Exploring the development and interconnected nature of these branches of international law is essential for understanding how the regulatory frameworks and theoretical justification for these areas are evolving.

This paper will develop a framework to deal with property rights over natural resources in the international commons by first building a foundation for discussion. Part I will analyze the dialectic between traditional notions of Westphalia sovereignty in international law and more modern notions of sovereignty such as popular sovereignty. The primary vantage point will be a temporal examination of the evolution of sovereignty over the international commons due to a combination factors, but first and foremost technological progress. This notion will then be applied in part II to property rights in international law with putative notions in the treaty systems of SSAs juxtaposed against actual territorial claims, including an analysis of the unfolding Arctic territorial grab as a means to examine how the international law of the sea has transitioned to allow greater private economic development. Specifically, it will be argued that these new frontiers are testing traditional interpretations of the CHM, and due primarily to technological innovation have found these legal regimes wanting. Part III will focus on how proprietary rights attach to divergent notions of sovereignty and the extent to which property rights do already exist in the commons and examine what this means for avoiding the tragedy of the commons scenario. This notion will be put to the test in part III(C) in which a case study of property rights in space law will be used to argue that since space is the most extreme of environments it necessitates the greatest technological leap to exploit commons resources. As this unfolds, the CHM regime will be further modified, as has already occurred in UNCLOS, to allow for private exploitation thereby demonstrating the extent to which technological progress impacts sovereignty over the commons. This brings the argument back full circle to the way in

which sovereignty is conceived. As such, the cycle will be reexamined through the somewhat controversial natural law origins of *res communis*, highlighting the tensions in international law with this construction.⁵ By way of conclusion, this paper will argue that a modified leasehold system reminiscent of the Homestead Act should be put in place to maintain the pillars of the CHM principle while allowing for property rights and sustainable economic development in the international commons.

I. A Temporal Analysis of Sovereignty in the International System

There exists nearly as many ways to approach a study of sovereignty as there are interpretations of this loaded term. Ethicists examine it through the lens of normative theory. Political scientists debate whether sovereignty itself is an outmoded concept due to the convergence of global governance and global civil society. Realist international relations theorists view the Westphalian system of sovereign nation states as integral to international politics and end unto itself.⁶ Public international lawyers catalogue treaties, custom, and limited case law to draw a picture of how the legal definition of sovereignty has evolved in the international system. Regardless of which vantage point one assumes, each discipline on its own fails to offer a complete representation of how sovereignty over the international commons has evolved over time. Given the unique, isolated, and vast nature of the international commons, only a temporal and interdisciplinary analysis of sovereignty that highlights the paramount role that technological progress has played in forming the legal regimes governing commons areas is sufficient to report both what has transpired to date, and how history is a guide to how the international commons will be governed in the future. By focusing on a temporal examination of

⁵ Natural law scholars do not universally support *res communis*; a controversy that will be explored in Chapter III.

⁶ This viewpoint is useful in describing US as the sole remaining hegemonic superpower after the end of the Cold War. In the arena of space law, this dramatic change signifies that the US is now enjoying a veritable feast, and is at the point of being able to dictate its own approach to property rights in space through NASA position papers and bilateral agreements, thereby circumventing the traditional COPUOS multilateral treaty-making process.

sovereignty a theme will emerge running through the four primary commons legal regimes, namely that every theory fails to serve as a guide in analyzing sovereignty over the international commons save for the notion that technological progress catalyzes changing political realities and thereby governance regimes.

Since Aristotelian antiquity, the term “sovereignty” has denoted a multitude of meanings dependent upon context, one’s perspective and objectives.⁷ First codified with the 1648 Treaty of Westphalia that ended the Thirty Years War, sovereignty became vested in the absolute monarch whose authority rested on divine mandate and history, but not the will of the people.⁸ The 128 clauses of Westphalia that gave birth to this concept include, among much else, the principle of the sovereign states’ monopoly on coercive force as well as the principles of nonintervention in internal affairs, consent as the basis of obligation to comply with international laws, and diplomatic immunity.⁹ Taken together, these nascent international law provisions gave birth to the modern notion of territoriality.

As the decades multiplied into centuries, sovereignty transitioned from an absolute right of monarchs to the supreme authority of states, eventually becoming established as “Westphalian sovereignty” that has to a large part since defined international relations.¹⁰ The sole exception to the system of Westphalian sovereignty has been the international commons, in which all of humanity is the sovereign under the CHM principle. This system is now unraveling as nation-states reinterpret treaty systems to garner greater property rights for private entities under their jurisdiction. In so doing, sovereignty over the commons has to some extent tracked sovereignty over continental territories, transitioning from communal to national. In summary, sovereign

⁷ W. Reisman, *Sovereignty and Human Rights in Contemporary International Law*, 84 No. 4 AJIL 866 (Oct. 1990).

⁸ S. Korff, *The Problem of Sovereignty*, 17 No. 3 THE AM. POL. SCIENCE REV. 404 (Aug., 1923).

⁹ *Id.*

¹⁰ J. Jackson, *Sovereignty-Modern: A New Approach to an Outdated Concept*, 97 No.4 AJIL 782, 785 (Oct., 2003).

states first laid claim to the international commons, including the deep seabed and Antarctica. A consensus was finally reached that these areas should, in fact, be governed under the CHM principle. Now today, CHM regimes are being challenged, demonstrating the fact that territorial sovereignty is still quite strong in the international system despite its myriad practical challenges. This cycle is at odds with the goal of CHM, namely preserving resources for the benefit of mankind and our posterity. The counterargument is that privatizing the commons is one strategy for avoiding a tragedy of the commons end game. To understand how this process is unfolding, a brief review of the concept of sovereignty and the extent to which the Westphalian system still reigns in international relations will be offered as a framework for discussion.

a. Westphalian to Sovereignty-Modern

Despite its widespread adoption, the Westphalian system has temporally proven not to be the ultimate manifestation of state-based sovereignty in domestic or international legal systems.¹¹ The American Revolution inaugurated the concept of popular will as the only legitimate basis for political authority, while the French Revolution further confirmed this principle.¹² Though at first only applied to a vanguard of progressive and developed states, in much of the Western world “the sovereignty of the sovereign became the sovereignty of the people: popular sovereignty.”¹³ However, the original interpretation of sovereignty remained enduring in international law, as seen in Article 15(8) of the Covenant of the League of Nations.¹⁴ This provision stated that the League Council should refrain from dealing with disputes that arose out of a matter solely within

¹¹ Emmerich de Vattel’s seminal work *Droit des Gens* setup the modern State-centric system in international law and supplanted the previous natural law models of Grotius, Suarez, and Vittoria. J. RAWLS, ET AL. LE DROIT DES GENS 202 (2004).

¹² Reisman, *supra* note 7, at 867.

¹³ *Id.*; Robert A. Ramey, *Conflict on the Final Frontier: The Law of War in Space*, 48 A.F. L. REV. 1 (2000).

¹⁴ League of Nations Covenant Art. 15, para. 8.

the domestic jurisdiction of a party state. It was not until after WWII that popular sovereignty became firmly rooted in the international legal system through the United Nations Charter.¹⁵

Article 1 of the UN Charter states that the United Nations is tasked with developing friendly relations between states “based on respect for the principles of equal rights and self-determination of peoples.”¹⁶ At first questioned as a holdover from Wilsonian diplomacy, the bedrock principle of self-determination has also been enumerated in the Universal Declaration of Human Rights. Article 21(3) states that “the will of the people shall be the basis of the authority of government.”¹⁷ With this and subsequent proclamations and treaties, “in customary international law, the sovereign had finally been dethroned.”¹⁸ Or had it?

The personified sovereign may have been demoted in international law, but not the absolute right that defines sovereignty. This fact highlights the failure of international law standing alone to explain the current status of sovereignty in international relations. Practical political considerations continue to emphasize the supremacy of state-to-state interactions and Westphalian sovereignty favored by realists.¹⁹ Self-determination is by no means universal and remains a paradox playing off the political aspirations of peoples and minorities against the territorial integrity of states.²⁰ This is despite the fact that international law has become increasingly people-centric in its focus, so much so that internal human rights abuses are no longer “essentially within the domestic jurisdiction of any state” and hence entirely insulated

¹⁵ UN Charter, Art. 1, para. 1. This was largely a response to new power structures in the international system, namely as a result of the Allied victory in WWII, favoring a consensus on popular will as the basis for legitimate governance in much of the Western world.

¹⁶ UN Charter, Art. 1, para. 1.

¹⁷ United Nations Declaration of Human Rights, 10 December 1948. *See also* JOHANNES MORSINK, *THE UNIVERSAL DECLARATION OF HUMAN RIGHTS: ORIGINS, DRAFTING AND INTENT* 1 (1999).

¹⁸ Reisman *supra* note 7, at 868.

¹⁹ J. Thomson, *State Sovereignty in International Relations: Bridging the Gap between Theory and Empirical Research*, 39 No. 2 *INTERNATIONAL STUDIES QUARTERLY* 213 (Jun., 1995). Realists conceive of sovereignty as the state’s ability to make authoritative decisions. If interdependence is growing, it is merely a reflection of state preferences.

²⁰ M. Weller, *The Self-Determination Trap*, 4(1) *ETHNOPOLITICS* 3–28 (2005).

from international law.²¹ The prior state of affairs is illustrated by the ICJ *Tinoco Case* in which *de facto* control of the claimant (the Costa Rican Minister of War) was the sole criterion for legitimacy of the government.²² Such a decision today would depart from the emerging constitutive, human rights-based conception of popular sovereignty.²³ Although it remains controversial how far such an interpretation has progressed, the salient point is that sovereignty can no longer unquestionably be used as an absolute shield against the suppression of popular sovereignty from external rebuke and remedy. As Vattel argued, a state is not and cannot be the patrimony of a despotic prince, because the sovereignty of the people is inalienable.²⁴ International law does not change on its own accord, though. It does so in response to normative and political factors as well as supranational pressures.

Since the time of Grotius international law has evolved, a process that has been catalyzed by the end of the Cold War and the rapid pace of globalization.²⁵ Indeed, it is this political influence on the development of law that has led to myriad reinterpretations of sovereignty, demonstrating that law in and of itself can never fully explain the changing nature of sovereignty. Thus, an analysis of the development of sovereignty in political science is essential to a temporal analysis of this bedrock principle, and what effect it has had on the international commons. As Justice Holmes has stated, “A word is not a crystal transparent and unchanged; it is the skin of a living thought and may vary greatly in color and content according to the

²¹ Reisman *supra* note 7, at 875.

²² *Tinoco Case* (Gr. Br. v. Costa Rica), *U.N. Reports of International Arbitral Awards*, Vol. I, 369, 375 (1923), reprinted in 18 AJIL 147 (1924) (sole arbitrator Taft holding that the new government of Costa Rica was bound by concessions and bank notes given by Tinoco, the former dictator of Costa Rica, to British companies, and dismissing as irrelevant that Tinoco's regime was unconstitutional under Costa Rican law and had not been recognized by several states).

²³ Reisman *supra* note 7, at 877.

²⁴ RAWLS, *supra* note 11, at 205.

²⁵ Globalization is to be understood to apply to the exogenous world circumstances of economic and other forces that have developed in recent decades owing, in major part, to the sharply reduced costs and time required for the transport of goods, services and for communication.

circumstances and the time which it is used.”²⁶ So, too, has the meaning of ‘sovereignty’ been re-conceptualized throughout history. In the early twenty-first century, scholars such as David Held contend that international law has moved away from law between states only and exclusively to one in which individuals and other non-state actors such as NGOs are recognized.²⁷ Idealist international relations theorists argue that the Westphalian system of separate entities acting in a state of anarchy is being morphed into a network of overlapping jurisdictions.²⁸

Each of the components of modern sovereignty, including internal authority, border control, policy autonomy, and non-intervention, is now being challenged in a multitude of ways.²⁹ Liberal political theorists argue that states’ borders are increasingly porous even as nations, notably the US, are trying to harden them.³⁰ The last several decades have further seen the rise of non-state actors in international negotiations. To illustrate, there has been a huge increase in International Non-Governmental Organizations (INGOs) during the 1990’s from 10,292 to 13,206 with memberships of now over 250,000.³¹ These organizations were party to 2,303 treaties in the 1990’s, an increase of one hundred percent from one decade prior.³² Indeed, the number of international treaties has nearly doubled every decade since 1946.³³ Global governance can now be thought of as involving a dispersed network of organizations each

²⁶ *Towne v. Eisner*, 245 US 372,376 (1918).

²⁷ D. HELD, PROSPECTS FOR DEMOCRACY 3 (1993).

²⁸ *Id.*

²⁹ The public regulatory authority of states, for example, has now been the subject of binding international arbitration through the growth of investment treaty arbitration. See GUS VAN HARTEN, INVESTMENT TREATY ARBITRATION AND PUBLIC LAW (2007).

³⁰ This conception, however, is far from the only theoretical work on sovereignty, which has been treated by academicians in strikingly different ways. Debates among realist, liberal interdependence, and critical theorists have infused sovereignty with new meaning, theoretical significance, and practical relevance. Liberal interdependence theorists such as Nye, Keohane, Morse, Rosecrance and Jackson, challenge the state-centric view and define sovereignty in terms of the state’s ability to control actors and activities within and across its borders. J. Nye, *Keeping Realism Relevant*, 111 FOREIGN POLICY 166-167 (1998). They argue that modern technology stymies states’ efforts to control the flow of goods, people, money, and information across territorial boundaries. *Id.* at 70.

³¹ D. HARVEY, THE CONDITION OF POSTMODERNITY: AN ENQUIRY INTO THE CONDITIONS OF CULTURAL CHANGE 105 (1989).

³² PETER H. ROHN, WORLD TREATY INDEX: VOLUME I, 2nd Ed. 702 (1984).

³³ Reisman, *supra* note 7, at 876.

expounding a set of intersubjective values to which other actors subscribe according to their specific cultures.³⁴ This procession though has not been absolute, as seen in the culturally divergent conceptions of property rights in the international system.

Certain world leaders have also joined with liberal theorists to bring attention to the inevitable decline of national sovereignty in international relations. Boutros Boutros-Ghali stated “The time of absolute and exclusive sovereignty...has passed; its theory was never matched by reality.”³⁵ Kofi Annan has noted, “Our post-war institutions were built for an inter-*national* world, but we now live in a *global* world.”³⁶ Further, political theorists such as Susan Strange contend that the waning authority of domestic policymakers over their states’ affairs has led to “territoriality [being] swept away by a pace of change more rapid than human society has ever experienced before.”³⁷ A more moderate viewpoint is expounded by Michael Mann, who asserts that nation-states continue to wield some economic, ideological, military and political powers in the world order, albeit at a reduced level.³⁸ In this, the dominant view, sovereignty is now universal, having migrated from Europe and become a mainstay of global politics and a central philosophy of the world’s sole remaining superpower.³⁹ Territory is simply a geographic space whose limits are defined by physical borders.⁴⁰ States have mutually recognized one another’s

³⁴ See generally FRED DALLMAYR, *ALTERNATIVE VISIONS: PATHS IN THE GLOBAL VILLAGE* (1998) (arguing that Frankfurt School philosopher Jurgen Habermas upholds the idealist tradition of Kant, Hegel, and Marx, arguing for a critical theory of modern society that fuses critical philosophy and emancipatory politics. Postmodernists, influenced by Nietzsche and Heidegger, alternatively view the humanist project of reason and progress as fundamentally flawed. Bunn-Livingstone’s intersubjectivity is one way in which to make constructive progress with diverse groups expressing everything from radical relativism to xenophobia. There is, according to this view, much more that unites than divides us, a sentiment in keeping with the transition from absolute to popular sovereignty).

³⁵ The Secretary-General, *An Agenda for Peace, Preventive Diplomacy, Peacemaking and Peace-Keeping*, Report of the Secretary-General, *delivered to the Security Council*, (Jun. 17, 1992).

³⁶ Jackson, *supra* note 10, at 784.

³⁷ S. Strange, *The Declining Authority of States*, in D. HELD & A. MCGREW, eds., *THE GLOBAL TRANSFORMATIONS READER: AN INTRODUCTION TO THE GLOBALIZATION DEBATE*, 2nd Ed. 128-134 (2003).

³⁸ *Id.*, at 129.

³⁹ Hugh Willis, *The Doctrine of Sovereignty Under the United States Constitution*, 15 No. 5 *VIRGINIA L. REV.* 437 (1929).

⁴⁰ Thomson, *supra* note 19, at 224.

exclusive sovereignty over that space, but increasingly with provisos. Highly institutionalized bargains between these interests are the stuff of cosmopolitan citizenship. However, it is a mistake to conclude that there exists now a universal legal and political consensus that the inevitable, if drawn out, decline of nation-state power represents the end state of world affairs.

Although criticized, Westphalian territorial sovereignty remains central to both international relations and law. The state's power is linked to the people and resources found within a set of geographical boundaries. As US Ambassador Richard Haass has said, "At the beginning of the twenty-first century, sovereignty remains an essential foundation for peace, democracy, and prosperity."⁴¹ From kings to citizens, to nations, the Communist Party, dictators, juntas, and theocracies, all have claimed to enjoy the benefit of sovereignty. The modern polity is known as the state, and the fundamental characteristic of authority within it is still sovereignty.⁴² The Temple of Westphalia⁴³ has been eroded by acid rain, flooded by rising waters, made porous by free information flows and the ever increasing rate of economic interdependence; but it remains standing.⁴⁴ Both the realist and liberal interdependence positions have weaknesses; there has never been a time that state control was absolute. Sovereignty is thus not about state *control* but about state *authority*.⁴⁵ The intersection of the two, as stated by Rosalyn Higgins, is the domain of law.⁴⁶

⁴¹ Jackson, *supra* note 10, at 789.

⁴² *Id.* at 780.

⁴³ Rosenau (1992) identifies six pillars that have traditionally upheld the autonomous state system: a cost/benefit ratio for the use of force, low physical externalities, low-levels of economic interdependence, low information flows, a predominance of authoritarian government limiting information flows, and a high degree of cultural, political, and economic heterogeneity. JAMES N ROSENAU, GOVERNANCE WITHOUT GOVERNMENT: ORDER AND CHANGE IN WORLD POLITICS 1-29, 58-101 (1992).

⁴⁴ That is not to say that sovereignty does not pose conceptual problems in dealing with the need to limit weapons of mass destruction, genocide, failed and rogue states. However, sovereignty remains a hallmark of the international community.

⁴⁵ Thomson, *supra* note 19, at 225.

⁴⁶ The purpose of international political theorizing is to understand, explain, and predict international outcomes resulting from interactions among sovereign entities. Classical theorists such as Bodin and Hobbes have shaped

Consequently, instead of calling for its decline and death in legal or political terms, it seems more useful to discuss the transformation of sovereignty into what John Jackson termed “sovereignty-modern.”⁴⁷ This re-invention posits that as the world trends towards interdependence, substitutes for portions of nation-state sovereignty will fall to international institutions that embrace a series of legitimizing good governance characteristics. This advent broadens the list of actors in the international community from states to include non-state actors such as nongovernmental bodies as well as individuals.⁴⁸ Such a theoretical system is reminiscent of John Herz’s notion of ‘neoterritoriality’ whereby sovereign states recognize their common interests through extensive cooperation, while also mutually respecting one another’s independence.⁴⁹ Such an interpretation has special resonance in the international commons. These areas require multilateral cooperation to avoid environmental depredation while ensuring the protection of property rights that is essential for economic development. At the same time, bastions of national sovereignty exist, such as in the exclusive economic zones that exist in the law of the sea regime. As such, it will be argued that it would be appropriate to apply a neoterritorial framework to international treaties dealing with the Arctic and outer space that emphasize multilateral cooperation while maintaining mutual independence where required. Given the diverse range of views, what conclusions can be drawn as to sovereignty’s role in the modern world in general and the governance of commons areas in particular?

One of the most difficult problems in modern political discourse remains that of sovereignty. As the political theorist Korff said in 1923, “A balance must be struck between a steadfast application of an, at times, outdated concept, and a blind denial of the principle solely

sovereignty to advocate an urgent need for international order, influencing centuries of international relations to follow. ROSALYN HIGGINS, *TERRORISM AND INTERNATIONAL LAW* 265 (1997).

⁴⁷ Jackson, *supra* note 10, at 790.

⁴⁸ *Id.*

⁴⁹ Dallmayr, *supra* note 34, at 64.

due to the avoidance of absolute power.”⁵⁰ Just as states crumble or disintegrate into smaller units (such as the Soviet Union or the former Yugoslavia) others coalesce into larger and more abstract levels of supranational authority (European Union), sovereignty grows both weaker and stronger. For example, despite the Bush Administration’s strong assertions of national sovereignty and the benefits of a unilateral foreign policy, it has endorsed the Law of the Sea Treaty as a means to assert its Arctic ambitions. Thus, states increasingly exercise sovereignty in multilateral, international institutions that are distanced from societal control, while in some instances seeing it limited in certain domestic matters.⁵¹ The movement towards global governance and the proliferation of international treaties and regimes was only beginning during the Cold War. Perhaps even more importantly, many of the technologies now being utilized to mine the international commons were still in their infancy. Yet, this was the time in which special sovereignty areas, notably the deep seabed, Antarctica and outer space, were first being regulated.

Beginning with the OST and later 1982 UNCLOS, treaties dealing with SSAs placed human rights and the role of non-state actors front and center, further challenging traditional notions of supreme territorial sovereignty. The CHM principle was the first codification of a property rights regime that transcended national sovereignty and instead dealt directly with humanity, its rights and development as a whole. The 1967 Outer Space Treaty (OST)⁵² was passed shortly after the Cuban Missile Crisis at a time of international strife and animosity between the first and second world. This accord curtailed national sovereignty in space (a place both superpowers were spending billions to reach—four percent of total US GDP at the height of

⁵⁰ Korff, *supra* note 8, at 410.

⁵¹ Thomson, *supra* note 19, at 226.

⁵² Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Signed at Washington, London, Moscow, January 27, 1967. Entered into force October 10, 1967.

Apollo) in the name of international peace.⁵³ This decision was the result of a brief alignment of political interests, as no one knew which country would ‘conquer’ space first. The OST ensured that whichever did, its discoveries belonged to all of humanity.⁵⁴ This, and not regulating private enterprise or ensuring the relentless expansion of territorial sovereignty, was the crux of the OST. Legal theory impacts political realities, and vice versa. The evolution of sovereignty cannot be understood from a myopic vantage point, but as this passage has shown requires a temporal analysis that includes political as well as legal developments without ignoring the role of technological progress. These factors, emphasizing the latter, have gradually redefined the law of natural resources in SSAs, as well as the understanding of sovereignty applied to the international commons.

b. The Tragedy of the Common Heritage of Mankind⁵⁵

General principles are the starting point of law and several such theories are relevant to regulating the international commons. Support for these theories, as was seen with sovereignty generally, has changed with the international political realities. Unique to the commons though, the main impetus has been the role of technology. Before this may be proven, though, the classical bases of claims to SSAs should be reviewed, including: *res communis*, *res nullis* and the common heritage of mankind. This latter principle originated through the notion of *res communis*, and is also referred to as *res communis humanitatus*.⁵⁶ It reflects the view that all human beings are members of the human race irrespectively of whether they live in the

⁵³ *Id.*

⁵⁴ J. LOGSDON, EXPLORING THE UNKNOWN, VOLUME II: EXTERNAL RELATIONSHIPS 16 (2002)

⁵⁵ ‘Tragedy’ in this sense should not be seen as tragic in the conventional sense, nor must it be taken as condemnation of the processes that are ascribed to it. Rather, the word ‘tragedy’ is used here in the spirit of the philosopher Alfred Whitehead as “the remorseless working of things.”

⁵⁶ T Brauningner, *Making Rules for Governing Global Commons: The Case of Deep-Sea Mining*, Vol. 44, No. 5 JOURNAL OF CONFLICT RESOLUTION 604 (2000).

developed or developing world,⁵⁷ and that things (*res*) may be used by everybody and cannot be appropriated. Use of a resource is allowed only as long as it does not impede someone else's use. In economic terms then, rival, or mutually exclusive competitive consumption is forbidden.⁵⁸

Res nullis accepts the same tenants as *res communis* but entails an opposite outcome. It holds that the global commons belongs to no one but may be appropriated by someone to the exclusion of others.⁵⁹ These areas are thus synonymous with "unclaimed territory," allowing states to possess the commons area, acquire title to it, and to exercise control over it for their exclusive sovereign purposes.⁶⁰ Examples of areas so classified include the opening of the American West through the Homestead Act.⁶¹ Consumable resources of the sea were initially thought to be unlimited; they were *res nullius*. When it became clear that this view was incorrect, the seabed became *res communis* under the common heritage of mankind.⁶² The CHM principle is a product of a political desire for more equitable resource distribution. This includes assisting nations with insufficient resource endowments to compete effectively. In international law, *res nullis* became outdated when it was determined that there was no longer any *res nullis*; all available land had been claimed.

The *res communis* principle originated with Roman property rights and holds that the commons does not belong to any country. All states, their nationals, and international legal

⁵⁷ L. VIKARI, FROM MANGANESE MODULES TO LUNAR REGOLITH; A COMPARATIVE LEGAL STUDY OF THE UTILIZATION OF NATURAL RESOURCES IN THE DEEP SEA BED AND OUTER SPACE 16 (2002).

⁵⁸ See generally K. BALSAR, THE CONCEPT OF THE COMMON HERITAGE OF MANKIND IN INTERNATIONAL LAW 1998; C. Joyner, *Legal Implications of the Concept of the Common Heritage of Mankind*, 35(1) INT'L. & COMP. L. Q. 190 (1986).

⁵⁹ *Id.* at 44.

⁶⁰ Brauningner, *supra* note 56.

⁶¹ The Homestead Act will be returned to in Part III in a discussion involving a modified property rights regime that could partially preserve the CHM while allowing for private economic development.

⁶² *Id.*

entities are free to explore, use, and exploit this area and its resources.⁶³ Exclusive property rights are thus denied allowing instead for general exploitation of resources. This has been identified in the law of the sea as the “freedom of the seas.”⁶⁴ The principle is applied contemporarily to resources that are available in such abundance or are so remote that no significant conflicts among current or future exploiters are expected. States have agreed to apply the international law principle of *res communis* to outer space through the OST. This accord stipulates non-appropriation, provides free access to celestial bodies and ordains that outer space is to be explored and exploited on the basis of equality and in accordance with international law.⁶⁵

The application of the CHM principle has been a source of controversy and scholarly debate since its inception. The inconsistencies are two-fold. There is a theoretical contradiction to address in light of the legal basis for the principle due to competing legal philosophies in the international system.⁶⁶ Moreover, the CHM’s inherent vagueness threatens its practical application. This has led to disagreements, especially among developed nations and developing nations. Two theories attempt to guide interpretation of the CHM and redress these disputes.

The first theory holds that the CHM is an extension of *res communis*, since it provides for communal and not exclusive propriety use.⁶⁷ The CHM seeks to benefit the long-run prosperity of humanity by conserving the world’s resources for future generations through an international regime. Developing countries are proponents of this viewpoint. The second CHM theory considers the first conception to be in conflict with established international law.⁶⁸ Proponents

⁶³ Michael Laver, *Public, Private and Common in Outer Space: Res Extra Commercium or Res Communis Humanitatis Beyond the High Frontier?*, 34 POLITICAL STUDIES 3, 359 (1986).

⁶⁴ C. CHRISTOL, EQUITY AND INTERNATIONAL SPACE LAW 290 (1991).

⁶⁵ Laver, *supra* note 63.

⁶⁶ CHRISTOL, *supra* note 64, at 291.

⁶⁷ VIHKARI, *supra* note 57, at 78.

⁶⁸ *Id.* at 45.

regard the first theory as a modern version of *res communis* applied to another phenomenon, namely the right to use a resource. Such a *res communis* cannot be owned but may be used on an equal basis.⁶⁹ Comparing the philosophies of *res communis*, *res nullis* and the CHM consequently opens the door to two lines of logic. One allows for the complete freedom of exploration, meaning that technologically advanced countries would benefit most from common resources. The other extreme views exploration on a communal basis. Although this would fulfill the spirit of the CHM principle, it would not generate the amount of commercial activity necessary for substantial economic development due to a complete absence of property rights.

Although no universally agreed upon definition of the CHM principle has been reached by legal scholars or policymakers, a working definition would likely comprise five elements. First, there can be no private or public appropriation; no one legally owns common heritage spaces.⁷⁰ Second, representatives from all nations must manage resources since a commons area is considered to belong to everyone. The role of governments then is relegated to being a representative of the people. As popular management is practically unfeasible, a special agency to coordinate shared management must administer commons spaces in the name of all mankind.⁷¹ Third, all nations must actively share with each other the benefits acquired from exploitation of the resources from the commons heritage region. Private entities seeking profits would have to perform a service that benefited all of mankind. Equitable distribution is intrinsic to the principle, but the application is ambiguous necessitating a balance between economic benefit-sharing and environmental protection. Fourth, there can be no weaponry or military installations established in commons areas. Armed conflict is unlawful since every nation has a

⁶⁹ *Id.* at 67.

⁷⁰ J. Frakes, *Notes and Comments: The Common Heritage of Mankind Principle and the Deep Seabed, Outer Space, and Antarctica*, 21 WIS. INT'L L.J. 409, 410 (2003).

⁷¹ *Id.* at 410.

stake in maintaining the peace. Finally, the commons should be preserved for the benefit of future generations, and to avoid a “Tragedy of the Commons” scenario.⁷²

The tragedy of the commons was first put forward by William Foster Lloyd, a fellow of the Royal Society in 1833, and was later popularized by Garrett Hardin in his essay by the same title.⁷³ The theory suggests that unrestricted access to a resource ultimately dooms the resource to over-exploitation. This occurs because the benefits of exploitation accrue to individuals, while the costs are distributed between all those exploiting the resource, a process engendering free riders who do not bear the proportional costs but only the benefits of exploitation. Hardin concluded that there is no foreseeable technical solution to increasing both human populations and their standard of living on a finite planet, stating, “Freedom is the recognition of necessity.” He suggests that “freedom,” as simply the freedom to do as one pleases, completes the tragedy of the commons. By recognizing resources as commons, and by agreeing that they require management, Hardin believes that “we can preserve and nurture other more precious freedoms.”⁷⁴ Thus, finding a solution to resource competition requires recognizing the ‘necessity’ of preservation and responsible management through international cooperation.

The commons places limitations on states’ ability to exercise national sovereignty. As commons belong to all of mankind, only mankind may decide when and in what manner to exploit common resources. Difficulties arise in administration given that nations vary greatly in their resource endowments and comparative advantages. As Avrid Pardo, Maltese Delegate to the UN and the “Father of the Sea,” stated:

The manner in which the common heritage principle will be used will depend on differing perceptions. There is a need to take into account the wants, needs,

⁷² *Id.*

⁷³ G. Hardin, *The Tragedy of the Commons*, 162 *SCIENCE* 1243-1248 (1968).

⁷⁴ *Id.*

interests and values favored by world constituencies. Undoubtedly different policies will be advanced...by developed and developing states.⁷⁵

Developed countries interpret the CHM principle narrowly as allowing the common use of designated areas, while upholding traditional concepts such as freedom of the high seas and of exploration. Developing nations interpret the CHM principle broadly, seeking to direct participation in the international management of resource extraction. This is not an argument for environmental protection, only representative exploitation. A viable compromise would provide an incentive for investment for the exploitation of resources in common regions along with some form of limited property rights as well as equitable economic benefit-sharing. This is the lesson of neoterritoriality specifically and this study of sovereignty generally.

Nations will assert claims over the commons as technology makes such claims economic. This is another example of the enduring status of the Westphalian system. Many Western nations, even established European powers, prefer national ownership over supranational management as will be seen in the unfolding Arctic land grab and reinterpretation of property rights in space law. That is not to say that advances in international law and the rise of global governance and global civil society as advocated by liberal interdependence theorists is insignificant. Rather, the necessity of multilateral cooperation inherent in the liberal message should be understood by realists as in their own long-term interest. In order to reach a universal application of the common heritage principle that respects both the interests of developing nations and the economic practicalities of resource use, realistic solutions must address the issues particular to each commons area. This is necessary to avoid the tragedy of the over or under exploitation of resources in international waters, at the ends of the Earth, or in outer space.⁷⁶

⁷⁵ VIKARI, *supra* note 57, at 58.

⁷⁶ Frakes, *supra* note 70, at 409.

II. The Law of the High Seas, Antarctica, and Outer Space

The law of the sea and the law of outer space⁷⁷ are branches of international law regulating activities in areas that do not, or only partially, fall under national sovereignty. The sources for these vast bodies are comprised of customs including state practice and *opinio juris*,⁷⁸ treaties, general principles and the writings of scholars.⁷⁹ Legal precedent set during the *North Sea Continental Shelf Case* requires “widespread and representative participation provided it include[s] that of [the] States whose interests were specially affected”⁸⁰ to create customary law.⁸¹ The framework for the governance of SSAs though is not custom; it is laid out in the 1967 OST, the 1982 UNCLOS, and to a lesser extent the 1959 Antarctica Treaty System (ATS).⁸² These regimes were created during the Cold War at a time before technological progress fully opened up these areas to economic activity. The great powers were thus content, as they had been when the law of the sea was first developing, to permit international management of these commons territories. As technology has progressed, though, so too has claims of sovereignty

⁷⁷ Outer space is defined as the area above airspace (atmosphere). Since the composition of the atmosphere does not change dramatically, defining exactly where airspace ends and outer space begins has proven problematic. Proposals have ranged from 80 to 100 kilometers (the US Air Force, and the recent X Prize, used 100 km). The question is significant since airspace partly falls under national sovereignty where it lies over national territory and territorial waters, while outer space never does. This represents a redefinition from the old doctrine of sovereignty that allowed ownership of land and the airspace above it, rights *ad coelum*. As technology progresses and space flights become as common as air travel is today, space law will likely react to allow some form of ownership.

⁷⁸ The Statute of the ICJ defines international custom “as evidence of a general practice accepted as law” and includes the following constitute elements: consistency of the practice in the form of substantial uniformity, generality of the practice among states, and the conviction on the part of states that the rule embodied in the practice is binding, or *opinion juris*. See also *Nicaragua*, where the ICJ stated that rigorous conformity to the rule is no longer necessary for a rule of custom to attach. General compliance is sufficient. Case Concerning Military and Paramilitary Activities in and Against Nicaragua (Nic v. USA.), Merits Judgment, ICJ Reports 1986 14 (Jun. 27).

⁷⁹ Statute of the ICJ, Art. 38, para. 1.

⁸⁰ *North Sea Continental Shelf* (Fed. Rep. of Gem / Den. v. Neth.), 1969 ICJ 41 (Feb. 20).

⁸¹ As the *North Sea Continental Shelf Case* demonstrated, treaties can have an important impact on the development of general custom. However, the treaty in question must be law-making. According to the ICJ, that means that the rule in question must be of potentially general application, it must be sufficiently specific, and it must not be capable of attracting reservations. This principle was altered by the *Nicaragua (Merits) Case* in which the key question became, do customary rules apply when both states are also subject to a treaty covering the same grounds. The Court decided that: “...there is no grounds for holding that when customary international law is comprised of rules identical to those of treaty law, the latter ‘supervenes’ the former.” (Harris, p.36)

⁸² VIHKARI, *supra* note 57, at 5.

over these unclaimed regions, albeit in the guise of popular sovereignty has held by neoterritoriality.

Outer space, the deep seabed,⁸³ the Arctic, and Antarctica are similar in that they are in remote and relatively unexplored areas.⁸⁴ Resources have only recently been identified and are regarded as common property under the common heritage or property of mankind.⁸⁵ Recent developments in these branches of international law also show similarities. The revised deep seabed regime that emerged after the 1994 New York Agreement is now commonly accepted and serves as a fruitful analogue for analyzing disputes surrounding property rights in outer space and the Arctic. In all of these regimes, calls are becoming louder from capital-exporting nations to permit greater private economic activity.

The special legal nature of outer space, the deep seabed, the Arctic, and Antarctica creates complex intersections of law, politics, economics, and technology. Resource exploitation has been especially controversial. Given the inhospitable terrain, or complete lack thereof, industries that wish to utilize these remote but resource-rich areas are fantastically capital-intensive. Only a small subset of developed countries is home to firms with the necessary resources. This engenders questions of equity as developing countries are prohibited from reaping the benefits of common property.⁸⁶

Equity is a general principle of international law, but one that has been used sparingly in litigation before the International Court of Justice (ICJ).⁸⁷ In the *Continental Shelf (Tunisia/Libya) Case*, the Court stated:

⁸³ The 1982 UNCLOS defines the international 'area' of the deep seabed as the region of "the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction" (Art. 1.1).

⁸⁴ UNCLOS Arts. 87, 89, 137

⁸⁵ VIKARI, *supra* note 57, at 10.

⁸⁶ *Id.* at 12; UNCLOS (1982) 21 ILM 1241, 1994 Agreement Relating to the Implementation of Part XI of UNCLOS.

⁸⁷ CHRISTOL, *supra* note 64.

“[Equity] was often contrasted with the rigid rules of positive law, the severity of which had to be mitigated in order to do justice. In general, this contrast has no parallel in the development of international law; the legal concept of equity is a general principle directly applicable as law.”⁸⁸

Equity is, however, a crucial component in both the law of the sea and of space law. It may figure in exponentially more as national and multinational actors increasingly interact to exploit common resources. Developing countries in particular decry what they view as inequitable resource exploitation. This was the reason for the 1982 UNCLOS deep seabed mining system. The fact that this system was changed in the 1994 New York Agreement gives precedent to similar changes in other treaty systems that incorporate the CHM principle, addressing developing nations’ concerns while providing an adequate framework for economic development. Without equity, numerous developing nations will not permit development of the commons.

The international community has sought, and in some cases successfully established, international regimes to regulate resource exploitation. The goal has been to offset disparities between countries with superior technological capacity claiming a ‘right of access’ to resources over developing countries.⁸⁹ These resources are located in the global commons, necessitating global solutions through transnational organizations. This is not a universally shared viewpoint. Differing theoretical camps are now active on the international stage to advance interpretations in forming international law.⁹⁰ It is first necessary to formulate a sufficient background for a well-informed discussion. The branch of international law with the longest, most well-developed history is the law of the sea. Briefly reviewing its history will inform an analysis of the evolving

⁸⁸ *Continental Shelf Case (Tunisia v. Libya)* 1982 ICJ Rep 18 (Feb. 24).

⁸⁹ VIHKARI, *supra* note 57, at 15.

⁹⁰ Interpretation of existing treaties and custom during disputes falls under the 1969 Vienna Convention on the Law of Treaties. Under this regime, Article 31 states that the dispute resolution body will start with the text, according to its ordinary meaning, then use the “object and purpose” or teleological method to make a determination of meaning. Only in rare cases are supplementary means of interpretation considered (ICJ Statute, Article 38).

law of property rights in outer space, the deep seabed under the Arctic, and Antarctica. In each case, it will be demonstrated that only a temporal understanding of sovereignty highlighting the role of technology can explain how the international commons has evolved, and what this means for pursuing future economic activity in SSAs.

a. Developing the Law of the Sea

Prior to the end of the fifteenth century, many nations made sovereign claims over the high seas. The Romans claimed the Mediterranean as a *mare nostrum* (our sea).⁹¹ In the tenth century England claimed the North Sea and the English Channel as its exclusive “Britannic Ocean.”⁹² These claims gave birth to serious philosophical work on the law of the sea, often cited as beginning with Hugo Grotius’s 1609 *Mare Liberum* (The Freedom of the Seas).⁹³ Grotius set forth his reasons why the high seas must be open for trade and exploration. All property, he wrote, is grounded upon occupation.⁹⁴ “Whatever cannot be seized or enclosed is not capable of being a subject of property...meaning that the vagrant waters of the ocean are necessarily free.”⁹⁵ In answer, and to uphold the English claim on exclusive use of the North Sea, John Selden wrote *Mare Clausum* (Closed Seas) in 1618.⁹⁶ Over time, Selden’s closed sea arguments faded and the world accepted Grotius’ open seas theorem.⁹⁷ Following a long conflict between starkly opposed national interests, the freedom of the seas emerged as the fundamental principle governing

⁹¹ J.E.S. Fawcett, *How Free Are the Seas?*, 49(1) ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS 14, 22 (1973).

⁹² N. JASENTULIYANA, *SPACE LAW: DEVELOPMENT AND SCOPE* 3 (1992).

⁹³ M. Vieira, *Mare Liberum vs. Mare Clausum: Grotius, Freitas, and Selden’s Debate on Dominion over the Seas*, 64(3) JOURNAL OF THE HISTORY OF IDEAS 361-377 (2003).

⁹⁴ Due to technological progress, it is now possible for entities to “occupy” formerly unreachable territory. This calls into question the fundamental basis of Grotius’s *mare liberum* argument and demonstrates the difficulties inherent in managing the international commons when these formerly inhospitable regions are suddenly brought within economic reach.

⁹⁵ Fawcett, *supra* note 91, at 18.

⁹⁶ *Id.* at 20.

⁹⁷ *Id.* at 16.

oceanic areas.⁹⁸ Through the nineteenth and early twentieth centuries, the high seas were *laissez faire* domains to be used by all nations: no state could subject the high seas to its sovereignty.

Content with this status quo faded following WWII with the discovery of valuable resources on the deep seabed, coinciding with the invention of the submarine, offshore drilling, and the expansion of the exclusive economic zone (EEZ).⁹⁹ These events together added a third dimension to the historically two-dimensional high seas and curtailed the freedom of the high seas even as its definition expanded. This technological progress also for the first time changed common perceptions of the high seas, from mysterious and seemingly infinite inhospitable regions to zones of potentially vast commercial activity. The process began in 1945 when President Truman issued a proclamation stating that the natural resources of the seabed and subsoil of the US continental shelf were exclusively US property.¹⁰⁰ The practice was followed by nations around the world,¹⁰¹ giving birth to the customary international law concept of the continental shelf since codified by four Geneva Conventions, beginning with UNCLOS I in 1958.¹⁰² It was this practice that demonstrated the weakness of Grotius' 'freedom of the seas' applied to accessible natural resources. Technology had advanced, and with it nations now could "occupy" portions of the seabed that had hitherto been unreachable. Differing layers of national

⁹⁸ *Lex Mercatoria* was then developing as well, so that the law of merchants and the law of the sea worked in tandem to establish customary international law concerning shipping and international trade.

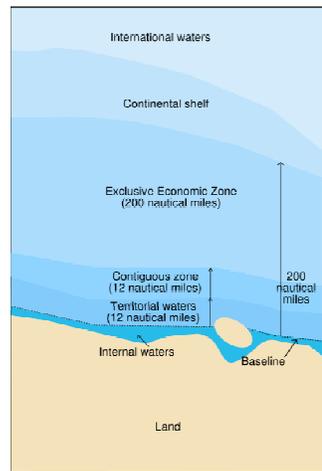
⁹⁹ EEZ zones are a principle under UNCLOS that are measured from a defined baseline, which is normally the low-water line along the coast. Penelope Warn, *Arctic Scramble: International Law and the Continental Shelf*, AM. SOC. OF INT'L L., Oct. 1, 2007.

¹⁰⁰ The continental shelf is defined as the "seabed and subsoil of the submarine areas that extend beyond a coastal state's territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance." Warn, *supra* note 99.

¹⁰¹ Between 1946 and 1950, Argentina, Chile, Peru and Ecuador all extended their sovereign rights to a 200 nautical mile (370 km) distance. Other nations extended their territorial seas to 12 nautical miles (22 km). By 1967 only 25 nations still used the old 3 nautical mile (6 km) limit, 66 nations had set a 12 nautical mile (22 km) territorial limit, and eight had set a 200 nautical mile (370 km) limit. *Id.* at 15.

¹⁰² In 1956, the United Nations held its first Conference on the Law of the Sea ("UNCLOS I"). UNCLOS I resulted in four treaties: Convention on the Territorial Sea and Contiguous Zone, Convention on the Continental Shelf, Convention on the High Seas, and Convention on Fishing and Conservation of Living Resources of the High Seas.

jurisdiction extending to territorial waters and the continental shelf were created, leaving the high sea, and under it the deep seabed, as for the time being the only commons area remaining.¹⁰³



*Layers of Oceanic Jurisdiction¹⁰⁴

Eventually though even the deep seabed garnered investors' attention. This vast region, comprising the majority of the Earth's surface, were not originally included in UNCLOS negotiations because neither the technology nor the expectation of mineral wealth in this area was well known. This changed with the discovery of an important deep seabed resource outside national jurisdiction: manganese nodules. These dark metal balls vary in size from .5 to 15 centimeters in diameter and are valuable because of an exceptionally high metallic content that includes precious metals such as iron, zinc, copper, silver and gold. It is estimated that 1.5 trillion tons of manganese, nickel, copper, and cobalt in the form of nodules lie on the seabed, mainly in the Pacific Ocean. In all, 26 elements found in them either are currently in high demand, or soon will be.¹⁰⁵ With the 1960's Green Revolution and the growing realization that certain resources were finite, the deep seabed and its mineral wealth garnered newfound attention. Once again, the international commons was threatened due to technological progress

¹⁰³ Fawcett, *supra* note 91, at 14.

¹⁰⁴ International Ownership Treaties Database: http://en.wikipedia.org/wiki/International_waters. Last Visited; 10/06/07.

¹⁰⁵ VIKARI, *supra* note 57, at 26.

and increased resource competition. However, in the 1970's a temporal analysis of sovereignty demonstrates that newly independent developing nations exercising self-determination to break the shackles of imperial colonialism were becoming a powerful force in international relations, and as their numbers grew so did the cries for equitable benefit-sharing.¹⁰⁶

This new wave included the New International Economic Order (NIEO) that was passed in UN General Assembly (UNGA) Resolution 3021 in 1974.¹⁰⁷ The NIEO was heralded as a tool to lessen global poverty and give developing countries greater bargaining power in the international system, such as in regulating the global commons.¹⁰⁸ This played out during UNCLOS and later the Moon Treaty negotiations as developing nations sought to keep industrialized countries from monopolizing the natural resources found in these two domains, and to make the deep seabed an arena of international control. Concrete examples include Malta's UNCLOS proposal and Argentina's Moon Treaty proposal to make the deep seabed and outer space respectively common heritage areas.¹⁰⁹ The NIEO demonstrates the power of what states can accomplish when they collectively act out of self-interest, as well as the effect that international relations has on the development of international law.

During the 22nd Session of the UNGA, Arvid Pardo proposed that the deep seabed should be declared a *res communis* CHM area. Pardo called for an international regime to govern the deep seabed, to mine manganese nodules, and to distribute the profits from their sale to the

¹⁰⁶ The most prominent during the UNCLOS negotiations was the "Group 77" (G77) comprised of a large proportion of the 90 states that became independent since 1945. VIHKARI, *supra* note 57, at 50. Most are coastal and have considerable voting strength. Together with the older developing countries, these newcomers were conscious of the need to redefine international law doctrines to correspond better with their interests. Private entities and the two superpowers also held strong opinions regarding UNCLOS, though the US and USSR differed with respect to the CHM principle. The Soviet bloc feared monopolization of deep seabed mining benefits by the technologically advanced Western states. The US insisted that mining was lawful and could be carried out at any time. Such a bifurcation of approaches reflects a common philosophical and cultural bent.

¹⁰⁷ G.A. Res. 3021 (1974). See H. Arndt, *The New National Economic Order: A Retrospect*, 28(4) INT'L. REV. OF EDUCATION 431 (1982).

¹⁰⁸ VIHKARI, *supra* note 57, at 36.

¹⁰⁹ *Id.* at 45.

poorest countries in the name of rapid economic development. UNGA Resolution 2749, the Declaration of Principles Governing the Seabed and Ocean Floor, was adopted by 108 states (including the US) and stated that the deep seabed should be preserved for peaceful purposes and is the “Common Heritage of Mankind.”¹¹⁰ Developing countries saw this as placing a moratorium on development, though most legal scholars did not support this argument.¹¹¹

This debate served as an impetus for UNCLOS III held from 1973 to 1982. Ultimately, 320 Articles were adopted with a roll call of 130 votes to four, with 17 abstentions and 160 nations overall participating.¹¹² These margins were not reflected with actual ratifications. UNCLOS III established unequivocally the concept of the EEZ in international law.¹¹³ States have the benefit of exploring, exploiting and managing all natural resources within their EEZ. By claiming the EEZ, the state can enforce its fishing rights within the zone and can even build artificial islands, such as offshore oil platforms. The EEZ does not prevent the passage of foreign vessels through its waters, and foreign states may lay submarine pipes and cables within the zone, but outside territorial waters. Notably, EEZs also mark another example of how the international commons is impacted when determined and technologically advanced states wish to open up new economic opportunities. Communal sovereignty can be seen as a temporary placeholder that exists until technology makes it worthwhile for states to assert national sovereignty in the oldest traditions of the Westphalian system. For example, the US did not sign

¹¹⁰ G.A. Res. A/RES/25/2749 (1970).

¹¹¹ VIKARI, *supra* note 57, at 16.

¹¹² *Id.*

¹¹³ In international maritime law, an EEZ is an area over which a state has special rights over the exploration and use of marine resources. Generally an EEZ extends to a distance of 200 nautical miles (370 km). The coastal state may set laws, regulate use and exploit resources within its territorial waters. Ships and vessels from any state have the right of innocent passage through the territorial waters of any coastal state (except in wartime), meaning they may pass peacefully and expeditiously without stopping at any port of the coastal state. Warn, *supra* note 99; UNCLOS Part. II, § 3, Art. 17. A coastal state may also claim a zone extending to 12 nautical miles beyond its territorial waters, which is called the contiguous zone. The coastal state may exercise certain special rights within its contiguous zone, such as control of illegal immigration and enforcing laws against smuggling. UNCLOS Part. II, § 3, Art. 33.

or ratify UNCLOS, eschewing multilateral cooperation, but it did claim three billion acres of coastal seabed in its EEZ open to drilling.¹¹⁴ UNCLOS III was setup to regulate the use, exploration and exploitation of all living and non-living resources of the international sea and the seabed extending in an “Area” beyond territorial waters.¹¹⁵

The International Seabed Authority (ISA) was created by UNCLOS to regulate the deep seabed CHM area on behalf of all mankind.¹¹⁶ The ISA was tasked with the distribution of economic benefits to parties, development of resources, and encouraging the transfer of technology. From the start many developed countries had concerns about the ISA, especially over establishing a precedent for technology transfer in international negotiations.¹¹⁷ Nevertheless, technology transfer requirements were imposed to ensure access for developing countries to the deep seabed. Funds from applications and other fixed fees were also distributed to developing countries. As a result of developed nations eschewing being forced to give up their technological edge or share the benefits of development, the US, Federal Republic of Germany, the UK and most other nations elected not to sign the accord.¹¹⁸ UNCLOS also underscored the political tension in the 1980’s, illustrated by the Reagan Administration rhetoric couched in market capitalism and individual freedoms above communal necessities.¹¹⁹

As the deep seabed mining provisions of UNCLOS proved ultimately unsatisfactory to the industrialized world, after Guyana became the 60th nation to ratify the agreement in 1993 (under Article 308 the accord would then enter into force 12 months later) preparations were laid

¹¹⁴ Amongst other things, the US objected to Article 103, the Supremacy of UNCLOS law; cf. Treaty of Rome, Maastricht, and the compulsory jurisdiction concept.

¹¹⁵ *Id.*, p.18

¹¹⁶ UNCLOS Art. 137.2.

¹¹⁷ Taking this logic to its extreme though, if developed nations had instigated technology transfer arrangements that would have made it possible for developing nations to reap the benefits of commons areas. Incentives would then have been aligned sufficiently to open up all of the deep seabed to economic development, potentially with multilateral environmental safeguards in place.

¹¹⁸ INIS, L. CALUDE, STATES AND THE GLOBAL SYSTEM: POLITICS, LAW AND ORGANIZATION 117 (1988).

¹¹⁹ J. AUNE, SELLING THE FREE MARKET 121 (2002).

for the 1994 New York Agreement. This amendment changed the nature of the ISA. Mandatory technology transfer was abolished. The 1994 Agreement changed the CHM into a market-based concept that fully comports with private economic activity.¹²⁰ A very similar outcome could easily transpire in the Arctic and in outer space.

The US has not yet ratified UNCLOS, though it has had the support of presidential administrations from Ronald Reagan to George W. Bush. Until 2003, Senators outside the Foreign Relations Committee had not even reviewed UNCLOS. This has been due to opposition by political conservatives led by Jim Inhofe, R-Oklahoma.¹²¹ They criticized limitations on national sovereignty in the as well as the creation of a tragedy of the commons regime through under-exploitation by designating oceanic resources as a CHM. Instead, US critics advocate privatizing the seabed, thereby creating incentives for preservation by giving owners an economic interest in protecting the long-term value of their property. However, with the rush to claim large tracts of the Arctic for natural gas and oil exploitation, the political realities have changed. The US now seems set to ratify UNCLOS sometime in 2008.

Establishing property rights has been commonly seen in the Western world as the solution to commons management. The US Congress has been receptive to such arguments, and has passed the Deep Seabed Mining Act stating that three conditions had to be met before US acquiescence to UNCLOS: non-discriminatory access to mineral resources, a legal definition to CHM, and environmental protection.¹²² As of May, 2001, and thanks to common acceptance of the 1994 New York Agreement, UNCLOS has now been signed by 158 states and ratified by

¹²⁰ VIKARI, *supra* note 57, at 78. Currently, the UK-based Kennecott Consortium (KCON) and three US-based consortia including Ocean Management Incorporated (OMI), Ocean Minerals Company (OMCO), and Ocean Mining Associates (OMA) are engaged in deep seabed mining. FILLMORE C. F. EARNEY, MARINE MINERAL RESOURCES 58 (1990).

¹²¹ Interview with Henry Hertzfeld, Professor of Space Law, George Washington University, in Washington, D.C. (Oct. 2, 2007).

¹²² *Id.*

135.¹²³ The legacy of the common heritage experience in UNCLOS has caused a general apprehension on the part of developed countries, leaving the governance status of other regions in the international commons including outer space and the poles questionable. Redrafting of the law of the sea to favor limited property rights and thus to promote economic development illustrates the powerful impact that technological progress funneled through international relations has on international law; it will be shown to echo to the ends of the world, and even to outer space.

b. Polar Bear: Russia's Arctic Claims and the Future of the Arctic

“The current interest in the Arctic...is a perfect storm seeded with political opportunism, national pride, military muscle flexing, high energy prices and the arcane exigencies of international law.”¹²⁴

The legal status of the Arctic in many ways mirrors the legal development of the UNCLOS treaty regime. Territorial claims on the Arctic were made starting from George Nares' first Arctic voyage in 1875. Despite these early attempts though, it quickly became evident that typical notions of territorial sovereignty were inappropriate in this inhospitable region.¹²⁵ Still, many states nevertheless carved out 'polar sectors' which ran from states bordering the Arctic to the North Pole.¹²⁶ Given the region's geopolitical importance and immense resources, little multilateral cooperation has been attempted, unlike in Antarctica, save for some limited success in the area of environmental protection.¹²⁷ Nevertheless, the North Pole and the majority of the

¹²³ VIKARI, *supra* note 57, at 78.

¹²⁴ James Graff, *Fight for the Top of the World*, TIME, Sep. 19, 2007.

¹²⁵ For a general review of historic Arctic sector claims, see Susan J. Rolston and Ted. I. McDorman, *Maritime Boundary Making in the Arctic Region* in DOUGLAS M. JOHNSTON AND PHILLIP M. SAUNDERS, OCEAN BOUNDARY MAKING: REGIONAL ISSUES AND DEVELOPMENTS 16-73 (1988); ORANR YOUNG, ARCTIC POLITICS 104-25 (1992).

¹²⁶ See generally A. R. CLUTE, THE OWNERSHIP OF THE NORTH POLE 19-26 (1927); GUSTAV SMEDAL, ACQUISITION OF SOVEREIGNTY OVER POLAR AREAS (1931); James Brown Scott, *Arctic Exploration and International Law*, 3 AJIL 923-41 (1909).

¹²⁷ L. Bloomfield, *The Arctic: Last Managed Frontier*, 60 FOREIGN AFFAIRS 87-105 (1981); D. Rothwell, *International Law and the Protection of the Arctic Environment*, 44(2) INT'L. COMP. L. Q. 280, 280 (1995) (noting that, among other incidents, the 1989 Exxon Valdez oil spills highlighted the vulnerability of the Arctic to pollution).

Arctic Ocean remains in the international commons under the UNCLOS regime. This could change though when the United Nations Commission on the Limits of the Continental Shelf (CLCS) next meets in 2009 to deal with a flurry of territorial claims on the Arctic seabed based on scientific investigations measuring the extent of the continental shelves of the petitioners. Depending on the outcome and veracity of these studies, it is possible or even probable that the Arctic could soon become the property of some mixture of the Arctic states. This would mark further erosion in the CHM principle by in effect nationalizing vast expanses of the commons, and also could lead to environmental calamities in the Arctic as industrial activities advance as the ice retreats. Thus, the Arctic also illustrates the cycle seen in other commons regimes of classic notions of Westphalian sovereignty giving way to international management that is until technological progress makes it economically advantageous to renationalize the territory. Only through this temporal analysis will it be possible to determine what will be not only the likely end state of the Arctic, but also the one most beneficial to the Arctic states and mankind generally.

Since Russia's most recent attempt to publicly "claim" the Arctic on August 2, 2007 by planting a Russian flag directly on the North Pole, the race to ownership of this vast land of untapped gas and oil reserves has only intensified with Canada, Denmark, Norway, and the US all vying to build credible political and legal cases to claim jurisdiction.¹²⁸ Iceland, Finland and Sweden have also been cited as having an interest, though Finland and Sweden's lack of a north-facing coastline make such a claim difficult. Iceland may also not pursue its claim for political reasons.¹²⁹ Due to an impending UNCLOS deadline for filing claims to define the outer limit of

¹²⁸ Conor Sweeney, *Planet Ark: Scientist Says Tests Back Russia Arctic Claim*, REUTERS, Aug. 23, 2007.

¹²⁹ Warn, *supra* note 99.

continental margins, other states are also seeking action.¹³⁰ Together, these claims demonstrate the power of states possessing the necessary technology and having economic opportunity to take advantage of all viable methods to claim sovereignty over the international commons.

Canada, Denmark, Norway, Russia and the United States all have territory within the Arctic Circle. Each controls an economic zone in the Arctic which extends 320 km (200 miles) north of their coastlines.¹³¹ Parties to UNCLOS can claim the seabed beyond those zones if the territory in question can be scientifically shown to connect to the continental shelf. A country has exclusive economic rights to the sea's resources within 200 nautical miles (230 miles, 370 km) of its coast.¹³² UNCLOS provides for extending that limit up to 350 nautical miles if a country can prove that its continental shelf stretches from the coastline beyond the current limit.¹³³ Although filing a claim under this provision is valid, the broad array of claims, which if all granted would nationalize more than half of the Arctic, shows how flexible international law can be in shrinking the commons when under pressure by aligned national interests.

Russia first lodged a claim with CLCS in 2002 in accordance with Article 76(8) of the United Nations Convention on the Law of the Sea (UNCLOS).¹³⁴ In its petition, Russia claimed title to an extra 460,000 square miles (the equivalent of California and Texas combined) of the

¹³⁰ The deadline is 10 years from the day that a state signs and ratifies UNCLOS, or May 13, 2009, whichever is later. This means Russia has a deadline of 2009; Canada - 2013, and Denmark - 2014. Warn, *supra* note 99.

¹³¹ Sweeney, *supra* note 128.

¹³² UNCLOS, art. 55. UNCLOS has not been signed by 157 countries and ratified by 155 (while the US is the only Arctic country that has not ratified the accord).

¹³³ Graff, *supra* note 124. The CLCS has 21 member-nations, and was organized to facilitate delineation beyond a 322-km (200-mile) economic zone that Russia, the United States, Canada, Norway, and Denmark have in the Arctic under the 1982 UNCLOS. Many of the provisions of this Convention apply to it as a statement of customary international law.

¹³⁴ Mark Benitah, *Russia's Claim in the Arctic and the Vexing Issue of Ridges in UNCLOS*, 11 AM. SOC. OF INT'L L. INSIGHT 27 (Nov., 2007); Sweeney, *supra* note 128. The commission was established under UNCLOS to "consider submissions by states to extend the outer limits of their continental shelf beyond 200 nautical miles; to make recommendations to states, and to provide scientific and technical advice to states that request it." Commission recommendations are final and binding. Warn, *supra* note 99.

Arctic as a continuation of its continental shelf.¹³⁵ Russia is extending its claim to the Arctic Ocean seabed based on its control of the Lomonosov Ridge and Mendeleev Rise, two sub-sea geo-structures that jut into the Arctic Ocean from the Russian shelf.¹³⁶ In support of its petition, Russia provided 21,120 depth points measured by echo-sounders and 17,426 depth points measured by seismic sensors, covering more than 90,000 linear kilometers.¹³⁷ The UN demanded more evidence.¹³⁸ In response, the Russian Maritime Geological Research Institute offered new measurements that the undersea Lomonosov mountain chain links Siberia to the Arctic.¹³⁹ These conclusions were drawn from aerial surveys of 373 miles at 35 separate points along the range. Next, physical samples will be taken.¹⁴⁰

Russia's claim is based on the theory under Art. 76(1) of "natural prolongation." Article 76(1) of UNCLOS provides that the "continental shelf of a coastal State comprises the seabed and the subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin."¹⁴¹

Assuming that this definition is satisfied, then, the continental margin is equivalent to the continental shelf.¹⁴² However, a natural promulgation means that the area has the *potential* to be

¹³⁵ The ridge, a largely uncharted geological formation named for an eighteenth century Russian polymath born near the northern coastal city of Arkhangel'sk, runs under the Pole from north of Canada's Ellesmere Island and Denmark's Greenland to the New Siberian Islands of Russia. Each of the three countries hopes the ridge's contours and rock content will throw up proof that it is an extension of the continental shelf rather than a strictly deep-ocean formation. Graff, *supra* note 124.

¹³⁶ Warn, *supra* note 99.

¹³⁷ *Id.*

¹³⁸ Russian News and Information Agency (NOVOSTI), *UN commission could decide on Russian Arctic bid in 3 years*, Aug. 31, 2007. Available at: <http://en.rian.ru/russia/20070831/75928564.html>; *Russia guided by international law in its polar shelf probe*, RIA NOVOSTI, Aug. 3, 2007.

¹³⁹ Sweeney, *supra* note 128.

¹⁴⁰ Russia is also demonstrating its resolve in other ways. Russian bombers launched cruise missiles during Arctic exercises in early September 2007. Russia is already a dominant force in the Arctic; it has the world's largest fleet of icebreakers. *Russia's Strategic Aviation Holds Tactical Exercises In Arctic*, RIA NOVOSTI, Aug. 9, 2007.

¹⁴¹ UNCLOS Art. 76(1); Benitah, *supra* note 134.

¹⁴² The continental margin is, for its part, defined in Article 76(3) as consisting of the seabed and subsoil of the shelf, the slope, and the rise. The ICJ held in the *Tunisia/Libya* and *Libya/Malta* Continental Shelf cases that natural prolongation may be defined by reference to either the geology or geomorphology of the seabed. Warn, *supra* note 99.

included in the continental shelf of the petitioning country. The process is not automatic; it is a necessary but not sufficient condition,¹⁴³ and by itself will not be determinative.¹⁴⁴

Russia's actions have unleashed a flurry of activity. Denmark announced in August that it would speed up its own scientific efforts to establish a similar legal basis to justify control of the Arctic through Greenland, a Danish dependency, to the North Pole.¹⁴⁵ Norway has also made an official submission to CLCS.¹⁴⁶ The US Coast Guard dispatched the cutter *Healy* on a mission north of Alaska.¹⁴⁷ The purpose of the mapping work aboard the *Healy* is to determine the extent of the continental shelf north of Alaska. US claims on the Arctic though are exacerbated by the fact that the Senate has yet to ratify UNCLOS. That is expected to change as the Senate Foreign Relations Committee voted 17-4 to recommend adoption of UNCLOS.¹⁴⁸ Canada as well has been quick in once again publicizing their Arctic claims that date back to 1925. On August 10, 2007 Canadian Prime Minister Stephen Harper announced plans for an Arctic military training facility and a refurbished deep-water port on the Northwest Passage.¹⁴⁹ However, it is not military conflict, but environmental damage (in essence the tragedy of the commons scenario) that Canadians fear most.

¹⁴³ Warn, *supra* note 99; Continental shelf (Tunisia/Libyan Arab Jamahiriya), Judgment of 24 February 1982 ([1982] ICJ Reports 18 at 47-58, paras 45-68; Continental shelf (Libyan Arab Jamahiriya/Malta), Judgment of 3 June 1985; [1985] ICJ Reports 13 at 31-37 paras 29-41).

¹⁴⁴ The first limit is found in Article 76(4), which provides two formulas for establishing the "Outer Limit Line." The second limit to the breadth of the continental shelf appears in Article 76(5) and is relating to the maximum distance seaward that this outer limit line can lie.

¹⁴⁵ Sweeney, *supra* note 128. Greenland has the nearest coastline to the North Pole, and Denmark argues that the Lomonosov Ridge is in fact an extension of Greenland. Expeditions are planned through 2008, which also happens to be the International Polar Year.

¹⁴⁶ This includes the North-Eastern Atlantic and the Arctic: the Loop Hole in the Barents Sea, the Western Nansen Basin in the Arctic Ocean, and the Banana Hole in the Norwegian Sea.

¹⁴⁷ Graff, *supra* note 124.

¹⁴⁸ UNCLOS Approved by Senate Committee on Foreign Relations, HOLLAND AND KNIGHT LAW, Nov. 1, 2007. Available at: <http://www.marinelink.com/Story/UNCLOSApprovedbySenateCommitteeonForeignRelations-209625.html>.

¹⁴⁹ Graff, *supra* note 124.

Already in August, 2007 the first Arctic industrial oil-and-gas operation outside of Alaska commenced operations. Norway's state-owned petroleum firm Statoil is expected to deliver an estimated annual \$1.4 billion worth of liquefied natural gas for the next 25 years.¹⁵⁰ With oil prices hovering close to \$100/barrel and with demand surging, nations and private companies alike are increasingly curious as to what resources lay below the newly accessible sea.¹⁵¹ A 2000 US Geological Survey estimated that the Arctic could contain 25 percent of the world's undiscovered oil reserves.¹⁵² In 2007, the USGS put total reserves in the East Greenland Rift Basins at 31.4 billion bbl. of "oil equivalent," mostly in the form of natural gas (analogous to four years of US oil consumption.)¹⁵³ Even at more conservative estimates, Russian geologists have previously estimated the Arctic seabed to contain at least 9 billion to 10 billion tons of fuel equivalent; about the same as Russia's total oil reserves.¹⁵⁴

Beyond natural resources, continued Arctic thawing means the opening of an ice-free Northwest Passage between Asia and Europe. This happened for the first time in recorded history in 2007, when at a rate 10 times the annual average the Arctic shed more than the area of Texas and New Mexico combined.¹⁵⁵ The ice cap, which floats atop much of the Arctic Ocean, is at least 25 percent smaller than it was 30 years ago.¹⁵⁶ Once the Northwest Passage becomes not

¹⁵⁰ *Id.*

¹⁵¹ However, this is not a new phenomenon, stretching back to before the 1969 Prudoe Bay Alaska oil strike. Donat Pharand, *Freedom of the Seas in the Arctic Ocean*, 19(2) UNIV. OF TORONTO L. J. 210 (1969).

¹⁵² Feliks M. Persits, *Maps Showing Geology, Oil, and Gas Fields and Geologic Provinces of the Arctic*, US GEOLOGICAL SURVEY OPEN FILE REPORT 97-470-J (2003).

¹⁵³ Graff, *supra* note 124.

¹⁵⁴ Sweeney, *supra* note 128.

¹⁵⁵ Graff, *supra* note 124.

¹⁵⁶ Brian Handwerk, *Arctic Melting Fast; May Swamp US Coasts by 2099*, NAT'L. GEOGRAPHIC NEWS, Nov. 9, 2004.

just a tourist destination but a viable commercial route cutting 5,000 miles from the distance between Asia and Europe through the Panama Canal, shipping traffic will greatly intensify.¹⁵⁷

Antarctica, with no native population, has been saved from international competition by a treaty signed in 1959, which (among other things) bans all mining there until 2041. Many have advocated such an approach for the Arctic. Thus far, the main advance has been the 1991 Arctic Environmental Protection Strategy (AEPS).¹⁵⁸ This accord contained a series of multilateral goals and obligations to enhance cooperation amongst Arctic states in order to more effectively protect the environment. No legal regime is currently in place to ensure implementation. Building on AEPS, specifically by providing enforceable legal rights, would allay fears of impending environmental damage posed by greater industrial activities in the Arctic.¹⁵⁹ In addition, the “Arctic Council” first proposed by the Canadians could be enacted to better guide sustainable economic development while minimizing environmental harm.¹⁶⁰ A clarifying ICJ continental shelf decision would additionally offer a comprehensive solution for all concerned parties.¹⁶¹ Funds could be provided by the fees charged by the ISA towards a dedicated Arctic fund.¹⁶² Currently, the Arctic is regulated by a mixture of customary international law,

¹⁵⁷ Arctic warming has become a “self-propelling” process that could leave the Arctic Ocean ice-free in summers by 2040. Specialty-built Arctic ships will be able to operate throughout the whole year. Graff, *supra* note 124.

¹⁵⁸ Arctic Environmental Protection Strategy 30 ILM 1455 (1991).

¹⁵⁹ Although a long history exists for unilateral state action, multilateral cooperation to deal with international environmental issues does have some precedent. For example, the 1911 Convention for the Preservation and Protection of Fur Seals, and the 1920 Treaty concerning the Archipelago of Spitsbergen (Svalbard). 214 ConTS 80 (1911); 2 LNTS 8.

¹⁶⁰ *Development and Possibilities for Cooperation in the Arctic*, 11 CURRENT RESEARCH ON PEACE AND VIOLENCE 137-145 (1988); O. S. Stokke, *The Northern Environment: Is Cooperation Coming?*, 512 ANN. AMERICAN ACAD. OF POL. & SOC. SCIENCES 58-68 (1998).

¹⁶¹ *Arctic Sovereignty: Drawing a line in the water*, CBC NEWS, Aug. 2, 2007.

¹⁶² Coastal states are required to contribute a percentage of the revenue derived from the exploitation of mineral resources beyond 200 miles to the ISA. However, no contributions are required during the first five years of exploitation and not from developing countries that are net importers of the mineral in question. Warn, *supra* note 99.

fragmented multilateral and bilateral accords, and global instruments such as UNCLOS.¹⁶³ This regime, regardless of the outcome CLCS reaches, will be unable to address the Arctic's growing list of issues.

For those areas that are beyond the continental shelves or EEZs, the common heritage of mankind (CHM) doctrine governs resource exploitation. This principle stands to deteriorate further as resource competition intensifies and rapid technological progress continues to open up immense new tracts of territory for development. As seen in the Arctic, outer space, and in the UNCLOS New York Amendments, private economic development is inconsistent with notions of communal property management. Finding compromises that allow for necessary exploitation of dwindling resources, while still providing for environmental protection especially for already strained areas such as the poles, is essential lest oil and gas drilling in the Arctic perpetuates the growing effects of climate change. The future of the Arctic should not rest solely on the technicalities of continental shelves delimitations.¹⁶⁴ It is in the best interests of all the Arctic states to agree on a regional compact based on neoterritoriality, perhaps reminiscent of the Antarctica Treaty System, to ensure both adequate property rights and environmental conservation.

c. **The Antarctica Treaty System as a Regional Compact**

Like the deep seabed and the Arctic, the continent of Antarctica is an enormous expanse of undeveloped land that contains substantial mineral deposits. Unlike the deep seabed and similar to the Arctic though, nations have made and continue to assert overlapping territorial

¹⁶³ See generally DONALD ROTHWELL, *THE POLAR REGIONS AND THE DEVELOPMENT OF INTERNATIONAL LAW* (1996).

¹⁶⁴ For example, the future of the Arctic will turn on: (1) the point at which the thickness of sedimentary rocks becomes less than 1 percent of the distance to the foot of the continental slope (sediment thickness formula); (2) or up to 60 nautical miles from the foot of the continental slope (distance formula), up to a limit of 350 nautical miles from the baseline or 100 nautical miles from the 2,500m isobath. The coastal state has the right to use whatever combination of constraint lines and formula lines is most advantageous in extending the outer edge of its continental shelf. Warn, *supra* note 99.

claims to Antarctica. The 1959 Antarctic Treaty attempts to clarify these conflicting demands. The ATS defines Antarctica as all land and ice shelves south of the southern 60th parallel.¹⁶⁵ The treaty was signed by 12 countries, including the Soviet Union and the United States. In effect, the ATS sets aside Antarctica as a scientific preserve, establishes freedom of scientific investigation, and bans military activity on the continent.¹⁶⁶ The main objective of the ATS is to ensure “in the interests of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord.”¹⁶⁷ The question of territorial claims has been deferred. Specifically, Article IV of the ATS suspended territorial claims in favor of a legal regime that protected the fragile environment and fostered scientific research in the region.¹⁶⁸

The abundance of natural resources at the poles concerns the sovereign rights of coastal states, freedoms of the high seas, and issues of resource management. The development and utilization of Antarctica, like the development of other SSA areas, is expensive, requiring significant technical innovations and posing unique challenges. A separate treaty, the Convention on the Regulation of Antarctic Mineral Resource Activities, was drafted to address this issue, but it has not been ratified by any nation.¹⁶⁹ Antarctica is now governed by 27 nations, known as “Consultative Parties,” who gather annually and vote by a consensus on various matters including commercial operations.¹⁷⁰ The only industry allowed is tourism; all mineral

¹⁶⁵ *Id.* at 82.

¹⁶⁶ These countries were Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the USSR, the UK and the US. It is important to note the restrictions on property rights and ban on military maneuvers that denote Antarctica as a quasi-CHM area. ATS was also the first arms control treaty of the Cold War.

¹⁶⁷ Preamble of the Antarctic Treaty, text available at the National Science Foundation website: <http://www.nsf.gov/od/opp/antarct/anttrty.jsp>. Last Visited: 10/06/07.

¹⁶⁸ Hertzfeld, *supra* note 121.

¹⁶⁹ VIKARI, *supra* note 57, at 9.

¹⁷⁰ *Id.* at 12.

exploitation is completely banned for the next fifty years.¹⁷¹ That ban can only be lifted thereafter by complete consent of all the Consultative Parties. Hence, only the Consultative Parties are entitled, under general international law principles, to determine a final legal regime.

The legal status of Antarctica remains doubtful. It is neither *terra communis* since a number of states formally uphold their claims over sections of the continent, nor *terra nullius*, since a number of other states vehemently deny such claims. Unlike UNCLOS, the ATS indirectly implements but does not explicitly state the common heritage principle. Applying the CHM to Antarctica would necessitate the renouncement of all territorial claims and a movement towards an internationalized regime. Unlike Antarctica, the legal regime of the Arctic is based on either global international law conventions, such as UNCLOS, or the individual legal systems of Arctic states.¹⁷²

The ATS though could be a useful analogue in developing a workable Arctic treaty system. After all, the ATS was created to deal with questions of sovereignty, scientific research, and the militarization of the continent.¹⁷³ These are also all of the primary concerns of the chief protagonists currently racing to claim the Arctic. Canada in particular, being primarily concerned with the environmental impact of an ice-free Northwest Passage, could seek support for an international treaty reminiscent of the ATS. The ATS could also serve as a model for an Arctic Council as long proposed by Canada. This would have the effect of giving the Arctic a quasi-CHM quality even if it is given over to sovereigns based on continental shelf delimitations. The main difference in this analogy is the presence of indigenous population in the Arctic and the

¹⁷¹ This period extends from the entry into force of the Madrid Protocol in 1998, so the “deadline” is 2048.

¹⁷² ROTHWELL, *supra* note 163, at 7.

¹⁷³ See generally Jonathan Charney, *The Antarctic System and Customary International Law* in FRANCESCO FRACIONI AND TULLIO SCOVAZZI, *INTERNATIONAL LAW FOR ANTARCTICA* 55-99 (1987).

multitude of conflicting land claims throughout the region.¹⁷⁴ This former hurdle could be surmounted though through the creation of a functional multilateral regime guaranteeing tribal sovereignty over indigenous tracts of Arctic tundra. The latter would require, if the ACLS fails to reach common ground, a clarifying ICJ continental shelf ruling.

As resource competition intensifies and global warming makes Antarctica more accessible, its legal system will doubtless be redrafted as has been demonstrated in UNCLOS. Necessity is, after all, both the mother of invention and law. As necessity, i.e. resource scarcity, meets opportunity, i.e. technological progress, large portions of the CHM areas could well be renationalized fulfilling the Westphalian cycle in the international commons. To illustrate, proponents of the CHM view Antarctica as the perfect environment to allow the principle to thrive while critics see an Antarctic CHM as a barrier to development.¹⁷⁵ Developed countries support the ATS, illustrated by reports such as “Study on the Question of Antarctica stating”¹⁷⁶ that the Consultative Parties are taking appropriate measures to ensure the peaceful use of Antarctica and conserve the fragile ecosystem. Developing countries share concerns over the inadequate protection of the Antarctic environment, its legal status, and questions of equitable resource allocation that also have arisen in UNCLOS and space law debates. In creating the basic legal rules for governing space activities, lawmakers drew from existing principles of international maritime law, the ATS, and even the Partial Test Ban Treaty.¹⁷⁷ Policymakers were cognizant of the regulatory problems that had already cropped up in other commons contexts. Temporally though, when the primary space law treaties were drafted temporally technology had not advanced sufficiently for states to ‘occupy territory’ and claim sovereignty. Thus far,

¹⁷⁴ Rothwell, *supra* note 163.

¹⁷⁵ Only the signatory countries of the Antarctica Treaty recognized any sovereign claims to Antarctica, so they argued that no legitimate force exists to prevent non-signatory nations from exploiting its resources.

¹⁷⁶ UN Chronicle; 02/01/1986.

¹⁷⁷ JASENTULIYANA, *supra* note 92, at 10.

defining precise property rights in outer space, like UNCLOS, the Arctic and Antarctica, remains an elusive goal.

d. **The Common Heritage of Mankind in Space Law**

The governing treaties of space law share many similarities with UNCLOS and the ATS. What makes space unique though is its status as the ultimate international commons, replete with infinite resources sufficient to satisfy infinite demand. All that has been preventing private entities and states to date in developing this untapped prize has been the technology, specifically an economic vehicle for reaching space. As rapid technological progress is fast changing this state of affairs, so too is it pushing many states to reexamine fundamental conceptions of sovereignty in space and its status as a protected international commons.

Space is now instrumental in communications, global trade, and the capabilities of the world's leading militaries. It has become vital to every nation relying on weather forecasting, remote sensing and satellite telecommunications. The \$83 billion worldwide space industry today already has a tremendous degree of economic and political importance and potential, employing over one million people and growing at an annual rate of 16 percent.¹⁷⁸ As new technologies are developed and access to space normalized, space will gradually become a final frontier that has to this point been primarily the purview of science fiction authors. For the first time, in 1997 the private sector spent more than the public sector on space. By 2010 this sum is expected to surpass \$200 billion annually.¹⁷⁹ NASA officials applauded this development. Former Administrator Michael Griffin stated, "Sooner rather than later, government space

¹⁷⁸ H. LAMBRIGHT & S. PACE, SPACE POLICY IN THE TWENTY-FIRST CENTURY: THE FUTURE OF SPACE COMMERCE 90 (2003).

¹⁷⁹ *Id.* at 89.

activity must become a lesser rather than a greater part of what humans do in space.”¹⁸⁰ In the last several years alone, the first Chinese taikonaut¹⁸¹ and a private citizen’s space flights have occurred. Despite initial rapid development though, multilateral efforts at regulating these new activities has faltered.

Since its inception after the launch of *Sputnik* in 1958, space law has created a whole new field of legal terminology that has challenged national governments and international institutions to redefine ideals for space operations. This is made evident by the five principal space law treaties signed between 1967 and 1981. These were the first international treaties to employ the terms “mankind” and “people” rather than “states,” “nations,” or “international community,”¹⁸² and affirmatively recognized the quasi-subject status of non-governmental organizations (NGO).¹⁸³ Space law considers the welfare of people as the beginning and end of all human activity and recognizes all humans as the holders of fundamental, non-transferable rights.¹⁸⁴ This puts it at odds with traditional notions of Westphalian sovereignty by limiting the positive rights of states, and thereby raising the profile of non-state actors in ways that are now being challenged as technology opens up the final frontier. In this legal row, Article II of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space (the “Outer Space Treaty” or OST) is most relevant.

The OST, dubbed the Magna Carta for space,¹⁸⁵ states that “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty,

¹⁸⁰ Michael Griffin, *Comments at the Workshop on Space Exploration and International Cooperation*, NASA Headquarters, Nov. 1, 2005.

¹⁸¹ ‘Taikonauts’ is the term for Chinese astronauts.

¹⁸² The US only refers to four treaties. It does not recognize the Moon Treaty.

¹⁸³ *Id.* at 5.

¹⁸⁴ There has been a rapid proliferation of non-state actors in space law, especially in private enterprise. This echoes other branches of international law, such as human rights, where the individual has become the primary subject, rather than the State.

¹⁸⁵ Interview with Steve Doyle, Executive Vice President, Clean Energy Systems in Sacramento, CA (Oct. 2, 2007).

by means of use or occupation, or by any other means.”¹⁸⁶ Interpreting Article II has engendered debates among academics and policymakers. Some see it as giving private interests freedom of action in space, so long as a government supervises but does not ‘nationalize’ new territory.¹⁸⁷ Others see this clause as a hindrance to economic development as great as the cost of accessing space (approximately \$10,000/pound) by voiding property rights and making entrepreneurs less apt to invest.¹⁸⁸ The center is comprised of those who feel that the legal framework will ensure sufficient protection to private entities, safeguarding commerce rather than hampering it and securing appropriate economic returns to those in need.¹⁸⁹ This trichotomy of views underscores theories surrounding what to do with celestial bodies such as the Moon and the asteroids that have vast amounts of untapped natural resources. Gold has now been discovered on asteroids, Helium-3 on the Moon, and magnesium, cobalt and uranium on Mars. The first wave of space tourists are preparing for launch in 2008 courtesy of Virgin Galactic.¹⁹⁰ New industries promising unlimited energy could be developed, necessitating a well-defined legal regime.

Space law is based on the principle that outer space, including celestial bodies, should remain freely accessible for exploration and use by all peoples. This is similar to the original law of the sea philosophy, before discoveries and technological progress required layered jurisdiction.¹⁹¹ As uses for and understanding of the world’s oceans has evolved, so also has humanity’s understanding of outer space. Now, as the proposed usages of outer space multiply, so too do the complexity of legal claims and challenges to existing legal norms. Differing

¹⁸⁶ OST Preamble.

¹⁸⁷ Doyle, *supra* note 185.

¹⁸⁸ LAMBRIGHT, *supra* note 178, at 56.

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ The UNCLOS agreements laid the groundwork for the OST. Nandasiri Jasentuliyana, President of the International Institute of Space Law (IISL), stated, “The freedom to construct artificial islands on the high seas is comparable to the freedom to erect permanent stations in orbit.” LAMBRIGHT, *supra* note 178, at 56.

interpretations of the general principles that guide space law abound, necessitating a brief revision of the development of space law to provide a framework for discussion.

The law of outer space initially underwent a less controversial development than the law of the sea, the Arctic, or Antarctica. After the 1958 launch of *Sputnik*, UNGA Resolutions created the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) which quickly became the primary vehicle for the advancement of international space law.¹⁹² COPUOS became a permanent member of the UN in 1959 and now has 65 member states. The Office of Outer Space (OOSA), housed under the Department for Political Affairs, implements the COPUOS through the Legal, Scientific, and Technical Subcommittees. It also assists developing countries in using space technology for developmental purposes, similar to the way in which the International Seabed Authority now operates in UNCLOS.¹⁹³

Beginning in the early 1960's there was extraordinary growth in space law based on the two superpowers' mutual need to answer basic questions of liability and jurisdiction in outer space. This compatibility of interests engendered cooperation and consensus-building, which is apparent when reviewing the five primary international treaties, six UNGA Resolutions, and numerous bilateral and multilateral agreements that deal with outer space that came into being from 1962 to 1979.¹⁹⁴ None of these directly deal with natural resources or the private sector, though several such as the OST and the Moon Treaty are significant and will be further analyzed. There is a possibility that the great powers learned from the UNCLOS ISA regime and instead of mandating a full CHM instead opted for a modified version that waited until technology had sufficiently developed for a final regulatory and benefit-sharing regime to be finalized.

¹⁹² These include UN General Assembly Resolutions 1348, 1472, 1721, 1802 and 1962.

¹⁹³ Interview with Sergiy Negoda, Chief Counsel for the UN Office of Outer Space Affairs, in Vienna, (July 5, 2006).

¹⁹⁴ BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 26 (1997).

Early space lawyers were divided on the occupation of celestial bodies. This dispute was addressed by UNGA Resolution 1721 and resolved by the OST that proclaimed outer space to be the “province of all mankind.”¹⁹⁵ It fell short though of proclaiming a CHM.¹⁹⁶ Nevertheless from 1962, the ground rules were set that drove space law development for 20 years. Progress slowed though after the 1979 Moon Treaty. COUPOS became basically inactive during most of the 1990’s, according to Sergie Negoda, Legal Officer at COUPOS.¹⁹⁷ Recently with the announcement of the NASA Vision for Space Exploration (VSE), space law has once again become a pressing topic, though this time predominantly not at the United Nations but instead through bilateral agreements.¹⁹⁸ This lack of multilateral cooperation is now threatening core principles of space law as technology leapfrogs the applicable governance regime.

In a world organized by and for sovereign states, it was natural that negotiation of a body of legal rules to govern space activities would take place in the principal intergovernmental organization, the United Nations. It is also natural then that, as priorities changed and technologies developed, states would take it upon themselves to negotiate bilateral accords and bypass the UN system altogether. This is precisely what is happening today. The movement has been towards bilateral agreements. Certain states, such as the United Kingdom, officially maintain that COPUOS is not the place to regulate commercial activity. “It is as telling what is what is not on the COPUOS agenda,” stated Richard J. Tremayne-Smith of the British National Space Center. “The position of the UK, and the West, is to shorten negotiations, not prolong them. The space treaties aren’t perfect, but they’re not supposed to be.”¹⁹⁹ If taken to its logical

¹⁹⁵ United Nations General Assembly Resolution 1721 (XVI) 1961

¹⁹⁶ See generally ANDREW HALEY, SPACE LAW AND GOVERNMENT (1963).

¹⁹⁷ Negoda, *supra* note 193.

¹⁹⁸ *Id.* The VSE calls for the retirement of the Space Shuttle by 2010 when the ISS is scheduled to be completed after 16 more flights. The new CEV spacecraft will be used for orbital flights and manned lunar missions.

¹⁹⁹ Phone interview with Tremayne-Smith, Chairman, World Space Week Association, (Oct. 8, 2007).

conclusion, this means that efforts to regulate space in the future would fragment to the bilateral and even national levels. Ultimately, this would complete the tragedy of the commons scenario without a specific new regime guaranteeing limited property rights to entrepreneurs as well as providing for environmental protection and some degree of benefit-sharing.²⁰⁰

It is important to highlight this new dramatic change in affairs as it has historically been the UN system as a whole that has stimulated international cooperation relating to space in keeping with its mandate to “maintain international peace and security” and to encourage the “progressive development of international law and its codification.”²⁰¹ United Nations space-lawmaking is an indefinite process requiring COPUOS to approve a text by consensus, after which it is included in a General Assembly Resolution for approval by states. Each state then decides whether to sign, ratify, or accede.²⁰² Despite its cumbersome mechanisms, COPUOS’s impressive track record is indicative of its successes. Without the UN, it is unlikely that a multilateral legal framework for space activities could have been established so expeditiously.²⁰³ The fragmentation of this system into bilateral relationships could foreshadow what would occur in the governance regimes of other SSAs, notably the Arctic, without concerted multilateral action. It is imperative that traditional conceptions of the CHM principle give way to the realities of technological progress and provide for limited property rights to stimulate development while also promoting multilateral solutions to environmental problems as well as to provide security and stability in the international commons.

²⁰⁰ It should be noted though that it is no longer only the US, Russia, the European Space Agency, and Japan that are now engaged in space operations. Brazil, India, and China also have fast developing programs. The prospect of rich developing countries participating in economic activity in this commons changes traditional arguments surrounding the necessity of economic benefit-sharing, and could provide fruitful ground for compromise.

²⁰¹ UN Charter, Preamble.

²⁰² This is similar to UNCLOS negotiations in that panels are made up of experts utilizing the consensus-building approach. Differences unique to the Moon Treaty are that this accord dealt with future, undefined technology.

²⁰³ Negoda, *surpa* note x.

A CHM in space is not the best way to achieve greater equality in the international system. As has been stated, the OST makes no mention of private activity in outer space. ‘Cosmic mining’ appears as a utopian dream rather than a practical possibility. The following four space treaties also neglect commercial exploitation and natural resources. This omission prompted Judge Manfred Lachs, former President of the ICJ to say “The Law of Outer Space has grown to become a body of substantial principles and rules which are generally accepted, but as science and technology penetrate space at an enormous speed, much more remains to be done.”²⁰⁴ In contrast to UNCLOS, as of March 2004, the OST has been ratified by 98 nations (including the US) giving it the strength of customary international law and thus making this accord binding on all states. One way to explain this discrepancy is the differences in technological capabilities available in deep seabed mining versus space exploration when these treaties were drafted. The technological envelope in space was only beginning to be pushed when the OST was being formulated. *Sputnik* was launched only a year before COPUOS began work on the treaty. Deep seabed mining had advanced far more by the time of UNCLOS 1982. Similarly, with the prospect of an ice-free Northwest Passage, commercial activity in the Arctic also seems like much less of a commercial impracticability. These facts support the thesis that as competition spurs technological progress to reach hitherto unattainable resources, law should similarly react to allow for greater private development but not without multilateral cooperation. Lessons should be learned from the broad vision for space was accepted over practicability of application. If left unchecked, abrasive politics can quickly hinder progress as seen when the Cold War intervened when it was time to decide a governing regime for the Moon.²⁰⁵

²⁰⁴ JASENTULIYANA, *supra* note 92, at 10.

²⁰⁵ M. Shaw, *The state of globalization: towards a theory of state transformation*, 4(3) REV. OF INT’L. POL. ECON. 88 (1997).

When COPUOS began work in 1970 to draft a treaty on the legal status of the Moon and its natural resources, opinion was divided. Controversies centered on the question of whether resources could be lawfully and freely exploited, or whether such activity was unlawful appropriation.²⁰⁶ Distinctions were offered between states, private enterprise and scientific investigations. Proposed solutions included applying the CHM to the Moon but not its natural resources, or to the Moon but nowhere else in outer space.²⁰⁷ Negotiations took on an ardent fervor as the US had landed on the Moon in the previous July, and the USSR had recently obtained its own lunar regolith samples.²⁰⁸

During the drafting process of the Moon Treaty²⁰⁹ confrontations erupted between the US, USSR and many developing countries. When the treaty was opened for signature in 1979, the climate had shifted and these initial confrontations emerged as organized opposition to the proposed international regime. This outcome is mirrored by the initial acceptance, and then ultimate infeasibility, of the UNCLOS system. Using wording identical to UNCLOS, the Moon Treaty expressly asserts that the natural resources of the Moon and other celestial bodies belong to the common heritage of mankind. Article 11(5) states that an international regime should be set up to develop the commons as soon as “exploitation is about to become feasible.”²¹⁰ This confirms the propensity in international law to declare a new frontier communal property until the technology is developed to exploit the newfound resources. Naturally, this begs the question as to the staying power of CHM areas in international law generally.

²⁰⁶ *Id.* at 89.

²⁰⁷ CHRISTOL, *supra* note 64, at 321.

²⁰⁸ ‘Regolith’ is the term for lunar soil.

²⁰⁹ The Moon Treaty is a 21 article document that applies to the Moon and other celestial bodies in the solar system, excluding Earth (Art. 1).

²¹⁰ Moon Treaty, Art. 11, para. 5.

The ambiguities and uncertainties inherent in the Moon Treaty, specifically regarding the CHM, made the US and every other participating nation save four put off ratification. This decision was made in the face of a US State Department report which indicated that the Moon Treaty was “the best possible structure for regulating activities which governments may now or in the future engage in on the Moon or elsewhere in space.”²¹¹ The Reagan Administration viewed the concept of the CHM as hostile to free enterprise and thereby contrary to the interests of “advanced” states with free-market economies. It would be a disincentive to development, a *de facto* moratorium, as had occurred after UNCLOS 1982.

The US viewed the Moon Treaty as antithetical to US interests. The US thus adopted a resource distribution philosophy in line with the ‘freedom of the high seas,’ a ‘freedom of outer space.’ While the US maintains that no state may claim or acquire exclusive sovereign rights to outer space, it does maintain that actors may exploit resources as long as there is reasonable regard for the rights and activities of others. This free market approach applies universally. As the only remaining superpower, the US approach to exploitation and property rights versus the CHM approach is the biggest impediment to a truly *de facto* rather than *de jure* CHM in outer space, or indeed anywhere. Given the fragmented nature of the regime governing space law today, the US, as well as the other space powers, are in a position to implement policy priorities without the restraint of multilateral commitments. Ultimately, this will prove detrimental to the commons as well as to development as entrepreneurs will not have the certainty necessary to invest with confidence.

The Soviet argument against establishing a CHM on the Moon is instructive as it mirrors the current thinking in international politics about regulating the commons. It was propounded by Y.M. Kolossov who believed that the CHM principle would threaten state sovereignty and that it

²¹¹ CHRISTOL, *supra* note 64, at 315.

would be erroneous to apply civil law concepts such as “common heritage” to relations between states. “The CHM tends to revise international law in its entirety, including its basic provisions of respect for national sovereignty, which is fundamental to the safeguarding of each state’s vitally important and legitimate interests.”²¹² The USSR opposed any form of international control of natural resources in space or any other SSA.²¹³ There has been no change in policy since 1991. Therefore, despite its communal nature and ban on private property rights, the Moon Treaty did not attract Soviet support since the accord was viewed less as a vindication of its legal policies and more as an attack on its sovereignty. Such a sentiment is in line with the Soviet position on sources of international law and the supremacy of the treaty. The irony in this (and with China’s approach) is the Marxist-Leninist-Mao Tse Tsung approach to private property actually concords with the CHM. Even though an exact definition of the CHM has never been enumerated, views range from the proclamation of a social and political ideal to a legal requirement that *must* benefit all humanity. The generally accepted interpretation remains something in between insofar as the CHM informs the subject matter identified with such heritage more so than serving as a basis for actual claims and counterclaims among nation states. In its most basic form, the CHM epitomizes the aspirations of friendly and cooperative international relations. It is this interpretation that should be favored going forward over a Soviet-style argument, now supported by the Bush Administration in the NASA VSE which supports private property rights in space through an exploitation-oriented agenda.²¹⁴

²¹² VIHKARI, *supra* note 57, at 62.

²¹³ G.P. Zhukov, V.S. Vereschetin, and G.I. Tunkin argue in favor of the peaceful use of outer space, and reject that customary international law and natural law should be applied to regulate outer space. M. J. Peterson, *The Use of Analogies in Developing Outer Space Law*, 51(2) INTERNATIONAL ORGANIZATION 245, 253 (1997) (noting

²¹⁴ L. Billings, *How shall we live in space? Culture, law and ethics in spacefaring society*, 22(4) SPACE POLICY 249-255 (Nov. 2006).

As a result of persistence resistance to any form of a CHM only the Moon and other celestial bodies of the solar system as well as the deep seabed beyond national jurisdiction are explicitly proclaimed as the CHM.²¹⁵ The Moon Treaty states that “[t]he Moon and its natural resources are the common heritage of mankind,” and Article 136 of UNCLOS reads that “[t]he Area [i.e. the seabed beyond national jurisdiction] and its resources are the common heritage of mankind.”²¹⁶ With the benefit of hindsight, it is clear that the Moon Treaty went too far in proclaiming a CHM as it has been ratified by only 11 countries, though it is in force. Worse yet, the debacle soured international support for further multilateral efforts. The international community has proven unable to produce any new multilateral legally binding instruments regulating space since the Moon Treaty. However, both UNCLOS and the Moon Treaty are United Nations accords and so bind the activities of states and other actors with international personality, but not directly private entities. Since airspace and the territorial sea are subject to state sovereignty while outer space and the high seas are not, controversy in both environments has centered on where sovereignty ends and an open regime begins.²¹⁷ The CHM applied to space law is conceived generally, while the Moon Treaty is also much less ambitious than UNCLOS in setting up a full-scale international organization. Many parallels exist between the law of the sea and outer space, as do differences meaning that a direct application of the lessons learned from UNCLOS and the 1994 Agreement should be learned from but not directly emulated.

Both developed and developing countries agree that management can occur in an international setting. Developed nations, however, are weary of the one nation, one vote method

²¹⁵ The UN General Assembly Resolution on Principles of the Use of Outer Space 1962 (XVIII), the OST 1967 (Art. 1), the UN General Assembly Declaration on Principles Governing the Seabed and Ocean Floor 2749 (XXV) 1970, the Moon Treaty, and UNCLOS.

²¹⁶ VIKARI, *supra* note 57, at 25.

²¹⁷ JASENTULIYANA, *supra* note 92, at 5.

employed by the United Nations and support more selective representation such as the Consultative Parties to the Antarctic Treaty, or bilateral agreements in space law. The increasingly fragmented nature of regulating the international commons will also play into future Arctic discussions, given that the Arctic states are exclusively developed. Developing nations support majoritarianism as a means to counterbalance the power of the developed nations. Many developed nations have also stated that *res communis* is still the guiding principle of the common heritage of mankind. Developing nations have advocated instead a *res communis humanitatus* or *res publicae* approach. The legislative history of the Moon Treaty does not shed significant light on interpreting the CHM. As no clear meaning has emerged, the CHM remains amorphous while the international regime for equitable benefit-sharing has not yet been created due to a lack of political will. As such, in the future the entire regime is in danger of being scrapped without a multilateral effort to preserve the core purpose of the CHM, namely the preservation and equitable distribution of resources.

The objectives expressed in Article 11.7 of the Moon Treaty do not necessarily prohibit the commercial utilization of the natural resources of outer space. Commercial enterprises may or may not be able to operate within such a framework. The situation is made more complicated by the widely differing political-economic philosophies of the spacefaring powers. Western economists have emphasized the need for advanced property rights to ensure the orderly and efficient development of resources. Economists from developing countries seek to avoid “economic colonization of space along neo-imperialist lines.”²¹⁸ It is necessary to look at the varying manners in which property rights have been defined in national and international laws in order to weigh the relative merits of these arguments applied to other special sovereignty areas. This discussion will permit a more specific model to emerge that would allay fears from all sides

²¹⁸ *Id.* at 135.

and permit an adequate level of property rights to ensure development while not privatizing the commons and in the process destroying the CHM outright.

III. Property Rights in International Law

Property rights are central to economic growth. It has been empirically demonstrated that the economies of nations which protect property rights grow more rapidly than those that do not.²¹⁹ The international commons is no exception to this principle. Without some form of guaranteed property rights, development in the commons will be curtailed even as technology meaningfully opens up the commons for the first time. Multilateral cooperation is essential to guarantee this protection for investors irregardless of their home nation, as well as to ensure that divergent property systems emanating from states practicing Westphalian sovereignty do not bifurcate the commons into a series of scattered economic zones under various national jurisdictions.

In its most basic form, a property right is an entitlement to exclude someone from doing something.²²⁰ There are nearly as many systems of property rights as there are cultures, each regime defined by a nation's unique history and political priorities. Property rights are among the oldest laws written down, dating back to the Roman system of communal property and even before to primitive hunter-gatherer societies.²²¹ Ownership over immovable property though is not a self-evident phenomenon defined by natural law, and it is not synonymous with local sovereignty.²²² Yet, nearly all nations regardless of their political philosophy view property rights as central to governance and economic growth.

²¹⁹ D. Lebang, *Property Rights, Democracy, and Economic Growth*, 49(1) POLITICAL RESEARCH QUARTERLY 5 (Mar. 1996).

²²⁰ S. Dinkin, *Property Rights and Space Commercialization*, THE SPACE REVIEW, May 10, 2004.

²²¹ *Id.*

²²² D. Cole, *The Meaning of Property Rights: Law versus Economics?*, 78(3) LAND ECON. 317-330 (2002).

Under the communist legal system prevailing in the Soviet Union and Allied States, it was legally impossible for a private person to own immovable property.²²³ In China, Deng Xiaoping's programs setup a scenario in which the resulting outcome will either establish a socialist market economy, or set China along the path to a radical transformation of property rights.²²⁴ The ambiguous state of property rights in China is similar to the current status of property rights in other common heritage zones, notably space. Certain rights do exist, but only as exceptions to the prevailing general philosophy of communal sovereignty. It is worth nothing though that despite the ambiguous state of property rights, especially over farmland in rural China, the PRC has managed an extended period of nearly double-digit growth. This has been done through the creation of special zones in which property rights are guaranteed, demonstrating both the importance of property rights and potentially an analogue for creating similar zones for the most resource-laden portions of the international commons.

Beyond the Chinese model though, it is worth juxtaposing differing systems of property rights to inform a discussion of property rights in the commons by injecting a degree of juricultural pluralism to the overall conception. Juriculture, defined as the axiological and behavioral formula which pertains to the law, provides a comparative tool that focuses on ontological and epistemological bases of law and concomitant legal theories.²²⁵ This concept is invaluable as it couches international law in a broader context, marrying legal culture and legal pluralism with notions of ideology and value structures. Using juriculture as a vehicle could lead to a consensus-building model for property rights in the commons. To reach this end, the varying theories of property rights in the international system must first be compared and contrasted.

²²³ S. Pejovich, *Lieberman's Reforms and Property Rights in the Soviet Union*, 12(1) J. OF L. & ECON. 155-162 (1969).

²²⁴ L. Putterman, *The Role of Ownership and Property Rights in China's Economic Transition*, 144 THE CHINA QUARTERLY 1047 (1995).

²²⁵ SANDRA BUNN-LIVINGSTONE, JURICULTURAL PLURLAISM VIS-À-VIS TREATY LAW 9 (2002).

a. Theories of Property Rights in the International System

In contrast to the Soviet and Chinese models, Western traditions regarding property rights may succinctly be found in *The Common Law*, by Oliver Wendell Holmes which describes property as having two fundamental aspects. The first is possession, which can be defined as control over a resource. The second is title, which is the expectation that others will recognize rights to control a resource.²²⁶ According to Adam Smith, the expectation of profit from improving one's stock of capital rests on this control through private property rights. The belief is that these rights encourage property holders to develop, generate wealth, improve standards of living, and efficiently allocate resources through a capitalist market system.²²⁷ Modern conceptions of property have evolved from this notion and have been enforced by positive law. Of course, privately increasing wealth naturally breeds inequality and as such requires, in the commons context, some form of equitable resource distribution as a result.

In contrast to market capitalism, through the labor theory of value popularized by Smith and David Ricardo socialists have critiqued the relations of property to other economic issues, notably profit. Socialism's fundamental concern is addressing income disparity by arguing that even if property rights encourage property-holders to develop, they will only do so for private benefit, which may not coincide with societal interest.²²⁸ Communism goes one step further, denying any benefits of private property and arguing that the creation of property involves the use of natural resources and private ownership of land. If these claims are illegitimate, then it follows that private property is illegitimate.²²⁹

²²⁶ G. Edward White, *The Rise and Fall of Justice Holmes*, 39(1) UNIV. CHI. L. REV. 51-77 (1971).

²²⁷ *Id.*

²²⁸ Alexander Krisztics, *Essential Principles of Socialism, Fascism, and Democracy*, 180 ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE 129-137 (1935).

²²⁹ *Id.*

In practice property rights are applied in combinations that incorporate these overarching ideologies. Many tribal cultures for instance balance individual ownership with the laws of collective groups: tribes, families, associations, and nations.²³⁰ Western countries conceive of property rights as belonging to individuals, even if the legal individual is not a real person (such as a corporation). This concept of “legal personality” is pure legal constructionism, and is wholly subjective. Exceptions include the commons, which belongs to a defined community.²³¹ The basic rationale for property rights is the necessity of entities changing ownership, the theory that property rights promote general welfare, and encourage economic development. Since the end of the Cold War, this fundamental principle has been commonly accepted by the international community.

National sovereignty over property and natural resources has been recognized as a key to economic development in the international system. UNGA Resolution 1803 declared that, “The right of peoples and nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the State concerned.”²³² UNGA Resolution 3171 clarified the “inalienable right of States to permanent sovereignty over all their natural resources reaffirmed this.”²³³ The Universal Declaration on Human Rights also affirms the right to property in general terms.²³⁴ As these resolutions and declarations demonstrate, defining property rights is the purview of national legislatures. International law only comes into play in regards to commons areas. Increasingly, as the consensus that private ownership of property rights inherent Western-style

²³⁰ *Id.*

²³¹ Putterman, *supra* note 224, at 1048.

²³² Permanent Sovereignty Over Natural Resources. Resolution Adopted by the United Nations General Assembly at Its 1194th Plenary Meeting, December 14, 1962, 7(3) AJIL 710-712 (1963).

²³³ Permanent Sovereignty over Natural Resources *The American Journal of International Law*, 68(2) AJIL 381-83 (1974).

²³⁴ UN Declaration on Human Rights, art. 2.

market capitalism has emerged, so too have calls for the necessity that investors enjoy such rights in developing the commons.

The international and domestic commons have been shrinking through privatization as law in most societies has reduced the number of scarce areas not having clear owners. This can be seen in the global commons with the renegotiation of UNCLOS to the more capitalist 1994 New York Agreement, and more controversially emerging in space. As humanity increasingly experiences resource shortfalls, it is natural to look towards commons zones for solutions—to Antarctica, the deep seabed and skyward. This could instigate international conflicts without effective multilateral cooperation as resource competition intensifies and technology continues to advance.

b. Property Rights and Resource Competition

The world is in dire need of the resources found in international commons. By 2050 the world's population may exceed nine billion while industrial output will quadruple. Developing countries with over three quarters of the global population will see the most dramatic population increases, yet they account for just 25 percent of energy consumption and contribute less than 16 percent of global Gross Domestic Product (GDP).²³⁵ Within several decades, energy consumption in developing countries such as China and India will double or even triple.²³⁶ In the developed world, energy demand will likewise soar to unprecedented heights putting new strains on existing energy infrastructures and requiring the creation of new nonrenewable and renewable

²³⁵ Jean-Pierre Lehmann, *Developing Economies and the Demographic and Democratic Imperatives of Globalization*, 77(1) INTERNATIONAL AFFAIRS 69-82 (2001).

²³⁶ W. Clinton, *Memorandum on the Effects of Imports of Crude Oil on National Security*, 36(13) WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS 634 (2000); C. Flavin, *Reinventing the Energy System*, STATE OF THE WORLD (1998); X. Ho, *An Insatiable Thirst for Oil*, XINHUA NEWS AGENCY, Dec. 3, 2004; L. Ling, *China needs a more powerful energy agency, experts say*, SALON.COM, Oct. 25, 2004.

sources of power. Unfortunately, inadequate resources currently exist to meet this surging demand.

There is between one to three trillion barrels of oil remaining on Earth, which at the usage current rate of 28 billion barrels per year will last between 35-100 more years.²³⁷ Other resources, such as silver, tin and copper, have remaining life spans of roughly 20 to 40 years.²³⁸ New discoveries and technologies will alter these predictions, but not the salient point that the Earth's resources are finite. Even if it takes centuries, at some point it will no longer be economically feasible to acquire needed resources from traditional sources. It is at that point in the future when the marginal cost is sufficiently high that private and public entities will look to new areas, to the poles, the deep seabed, and eventually the inexhaustible resources present in outer space. The legal regime that the international community puts in place now will govern the manner and rate at which these new markets develop.

More so than any other part of the international commons, space in particular is home to vast proven resource reserves. Celestial bodies contain a gargantuan supply of virtually all of the types of mineral resources used extensively on Earth today.²³⁹ The Moon's surface contains: oxygen (40 percent), silicon (20 percent), aluminum (14 percent), iron (4 percent), calcium, magnesium, and many others in trace amounts.²⁴⁰ Moon rocks are in upwards of 40 percent oxygen that could be used for life support and rocket propellant. Helium is an efficient alternative to terrestrial energy resources. On Earth, Helium-3 is virtually nonexistent since it easily escapes from the atmosphere. The lunar surface is believed to contain more than one

²³⁷ Flavin, *supra* note 236.

²³⁸ *Id.*

²³⁹ VIKARI, *supra* note 57, at 7.

²⁴⁰ United States Space Command, Vision for 2020, available at: <http://www.fas.org/spp/military/docops/usspac/visbook.pdf>. Last visited: 12/10/2007.

billion kilograms of Helium-3. A mere one percent of this would supply the entire estimated amount of energy to be consumed by humanity in the twenty-first century.²⁴¹

As demand shifts, celestial resources could provide a much needed diversity to energy production on Earth. It is as yet unclear exactly what type and in what amounts these resources are present. It is expected that asteroids will provide even richer resource deposits than the Moon.²⁴² In our solar system, asteroids are especially common between the orbit of Mars and Jupiter where it has been calculated that more than 100,000 Earth-approaching asteroids larger than 100m exist.²⁴³ Even hydrocarbons, similar to terrestrial petrochemicals on Earth, are abundant throughout the solar system. Halley's Comet contains hydrocarbons comparable in quantity to the Earth's entire reserves.²⁴⁴ These resources can eventually be used for industrial exploitation, economic research, pure scientific study, or even for military purposes off-planet so as to avoid environmental calamity.

These resources present entrepreneurs with an impressive vision of commercial opportunities in space. Humans would work in the micro-gravity environment to discover and manufacture metal alloys, computer chips, and pharmaceutical products that are indispensable to twenty-first century life. Skilled technicians would mine Helium-3 from the Moon to fuel fusion reactors. Solar power satellites would beam energy to the Earth, eliminating dependence on fossil fuels. People everywhere would possess instant access to anyone else through a wireless network of handheld communicators. Ordinary persons would regularly travel to outer space for business or pleasure. Mining companies would extract water ice from the Moon and remove

²⁴¹ This is made economically more feasible by the Moon's low gravity easing the transport of bulk materials, especially vis-à-vis a mass driver. A mass driver, or electromagnetic catapult, is a method of spacecraft propulsion that would use a linear motor to accelerate payloads up to high speeds and launch them from the Moon to the Earth.

²⁴² *Id.*

²⁴³ VIKARI *supra* note 57, at 10.

²⁴⁴ *Id.* at 12.

metals from asteroids. New forms of rocketry would support this economy as cheaply and safely as twentieth century jetliners.²⁴⁵ To bring this vision into reality, companies such as Space Exploration Systems (Space X) have already successfully launched rockets that would decrease the cost of sending payloads to orbit by 90 percent.²⁴⁶ Indeed, the private sector has been so successful in this regard that NASA has awarded the contract to resupply the International Space Station to Space X after the Shuttle is retired in 2010.

In addition to its economic potential, developing industry in space is also an important step towards arresting the effects of global warming. Carbon-dioxide levels are now at the highest levels in 160,000 years, and the average global temperature is at its greatest since the Middle Ages. Human activities could be ending the period of relative climactic stability that has endured for 10,000 years and permitted the rise of civilization.²⁴⁷ The International Energy Agency has determined that governments must accelerate technological innovations “that radically alter how we produce and use energy” to create an economically, socially and environmentally sustainable energy infrastructure. However, since 2000 the use of renewable energy sources worldwide has grown by an anemic 1.7 percent per year.²⁴⁸ Policies must be enacted to boost this stagnant growth to lessen the likelihood of a long-term change in climate. Lotta Viikari of the University of Lapland argues in her survey of natural resources in the international commons that:

If space resources are used equitably, we could guarantee all humanity decent living conditions. By moving industrial activities from the Earth’s fragile

²⁴⁵ LAMBRIGHT, *supra* note 178, at 90.

²⁴⁶ *SpaceX Successfully Completes NASA Systems Requirements Review for Dragon Spacecraft Demonstration to Berth at International Space Station*, BUSINESS WIRE, Dec. 18, 2007. Available at: http://www.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=20071218005318&newsLang=en. Last visited: 1/12/2008.

²⁴⁷ UN Intergovernmental Panel on Climate Change, Fourth Assessment Report, Climate Change 2007, available at: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf. Last visited: 12/12/2007.

²⁴⁸ *Id.*

biosphere to outer space, we could stop environmental degradation and greenhouse warming and begin recovery.²⁴⁹

The question then becomes, is the lack of property rights in the commons fundamentally impeding development?

Varying interpretations have been put forward as to the importance of property rights in space to investment. One argument is that developing countries have “kept all countries from reaching the Moon and let a valuable source of alternative energy lie unused” due to their majority support of the CHM in international relations.²⁵⁰ Developing countries contend that they have not fettered any state in its quest for property rights. It is in this way that the form and the compliance with international law conflict. Rather than an ill-defined legal regime, some scholars contend that it is the high cost of accessing space and insufficient Return on Investment (ROI) and nothing else that is the primary hurdle to developmental.²⁵¹ Any actions that developing countries have collectively taken to curtail property rights in outer space have not adversely impacted ROI.²⁵² However, developing countries have adversely impacted the development of space law generally, as seen in geosynchronous orbit (GSO) debates²⁵³ and the resulting Bogotá Declaration under which a group of equatorial developing countries asserted their sovereignty over equatorial geosynchronous space.²⁵⁴ This pact underscores the primary flaw of existing space law: the failure to establish an internationally acceptable view on

²⁴⁹ VIHKARI, *supra* note 57, at 123.

²⁵⁰ B. Hoffstadt, *Moving the Heavens” Lunar Mining and the ‘Common Heritage of Mankind’ in the Moon Treaty*, 42 UCLA L. REV. 575 (1994).

²⁵¹ ROI is defined generally as the ratio of profit over capital investment. Given this ratio, the way to increase ROI is by raising profits or by lowering capital investment. Hertzfeld, *supra* note 121.

²⁵² Indeed, developing countries have played an important role in advancing international law in several significant areas from the Vienna Convention for the Protection of the Ozone Layer in 1985, to the 1988 compromise on the Antarctica Treaty.

²⁵³ Geostationary orbit (GSO) is situated above the Equator at an altitude of approximately 35,787 km. This is the area most used by telecommunications satellites. The International Telecommunication Union (ITU) has called these orbital slots “limited natural resources.”

²⁵⁴ Bogotá Declaration; Intergovernmental Conference on Cultural Policies in Latin America and the Caribbean, Bogotá, Jan. 20, 1978.

proprietary rights in space, and the lack of any coordinated effort between or among developed and developing countries to change this fact.

The failure of folding in limited property rights into the CHM regime governing the Moon occurs because of two conflicting interpretations of property rights, namely a collection of principles versus a codification of regulations. Drafters of the treaties did not foresee civilian space travel as a regular commercial activity. The main hindrance is Article 11, which states that the “Moon and its natural resources are the common heritage of mankind.”²⁵⁵ The majority of space faring nations believe that any international lunar regime established will prove to be “a politically dysfunctional, economically, inefficient, global bureaucracy,”²⁵⁶ prohibiting the accords’ acceptance into customary international law, and highlighting why multilateral cooperation can be such a difficult proposition. Though, despite the frustrations inherent in building a system of internationally respected property rights for the commons certain property rights already exist in space law that may be used as a foundation to be used for allaying the fears of investors and developing countries alike. In this manner, property rights in space law may be used as a case study to examine how a similar system of rights and duties may be setup in other portions of the international commons.

c. **Case Study: Property Rights in International Space Law**

Despite the fact that the Moon Treaty establishes the Moon as a province of all mankind under the CHM, it also is as an area in which property rights exist. For example, states retain ownership of any installations that are erected as well as any equipment placed on the Moon or other celestial bodies.²⁵⁷ Free exploration and use of the Moon and other celestial bodies is also provided for, along with allowing profits and ownership rights to local resources no longer in

²⁵⁵ Moon Treaty, art. 11.

²⁵⁶ CHENG, *supra* note 191, at 194.

²⁵⁷ Moon Treaty arts. 8.1 & 9.1.

place.²⁵⁸ Questions remain though, such as how to maintain structures placed on these bodies. *In situ* resources would need to be used to reduce the cost of space development. It remains legally unclear whether such activity is allowed under established space law. Permission exists under the Moon Treaty only to use lunar substances “in quantities appropriate for the support of a scientific mission;” it is difficult to say whether large-scale industrial activity would also be covered.²⁵⁹ The only definitive statement is that space minerals can be used for scientific purposes as long as the use does not hurt the research interests of other states or alter the natural balance of the celestial body. Yet, even the term “scientific purposes” can be interpreted to cover a great range of activities that would come with commiserate property rights.

In addition to resources used in the field, multitude other ways exists to establish property rights in space. Anything taken from space and returned to the Earth becomes the property of the actor (person, company or government) given the absence of a positive conflict with a United Nations treaty provision.²⁶⁰ Likewise, anything launched into space is deemed to be owned by the launching party or state. This is comparable to the privileges and immunities afforded ships at sea, as seen in the *Lotus Case* when the ICJ held that “vessels on the high seas are subject to no authority except that of the state whose flag they fly.”²⁶¹ Sovereignty in some form also exists for satellites and aboard space stations. It is possible to claim ownership of permanent structures that might be constructed on celestial bodies, including the Moon, or in outer space. This echoes traditional capitalist conceptions of property rights more than of the

²⁵⁸ Professor of Space Law Henry Hertzfeld states, “Corporations exist to make profits, and property rights only matter to the extent that they are necessary to fulfill that objective. It is the costs of accessing space that is curtailing economic development, not legal barriers or sovereignty.” Hertzfeld, *supra* note 57, at 57. Given the enormous costs involved in operating in space, companies seeking to profit from such enterprises must obtain a significant governmental subsidy. Currently only the US has the economic and technological capability to do this, although others (notably China, with the continued help of the Russians) could achieve it within a decade.

²⁵⁹ *Id.*

²⁶⁰ H. HERTZFELD, *SPACE ECONOMICS* (1992)

²⁶¹ *Lotus Case*, PCIJ Ser. A., no. 10 (1927); JASENTULIYANA, *supra* note 92, at 10.

CHM. With all installations, vehicles, resources used for “scientific purposes,” and critically everything returned to the home country legally the property of the entity which operates it, sufficient property rights of (1) possession and (2) control exist to ensure adequate protection to spur economic development while providing all the protections of the CHM. Such a system could easily be amended into UNCLOS and the ATS, thereby warding off Westphalian claims of sovereignty in favor of maintaining the commons for the benefit of all mankind. Given that property rights have been proven to exist even in the CHM regulating the Moon, the question then beckons as to how these rights should be distributed.

Particular locations in outer space are becoming scarce resources, and thus zones for limited resource allocation among unlimited wants. This is the fundamental problem of economics, and so an economic analysis of property rights will prove enlightening. The argument for establishing property rights in space is an application of Adam Smith’s generalization: if transaction costs are low, the assignment and voluntary exchange of rights to scarce resources will result in an efficient allocation.²⁶² As applied to space, Smith’s simplification implies that an efficient use of scarce orbital slots will result once property rights are assigned. Free exchange should be permitted to sell the property rights at market value.²⁶³ The International Telecommunications Union (ITU) is a model in this regard.²⁶⁴ The ITU allocates the right to use the available spectrum for telecommunications satellites. Satellite frequencies cannot be separated from orbits or orbital planes creating an indirect property right. The market is thus used to ensure that property rights are efficiently distributed, defined, and

²⁶² A. SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS (1895).

²⁶³ *Id.*

²⁶⁴ G. CODDING, THE INTERNATIONAL TELECOMMUNICATION UNION: AN EXPERIMENT IN INTERNATIONAL COOPERATION (1952).

enforced. In an economic sense determining property rights is feasible, but politically it is less straightforward.

Despite common acceptance of all the property rights guaranteed under the Moon Treaty, debates continue to rage about exactly what economic activity is and what is not permissible. Some critics of the Moon Treaty argue that restrictions placed on sovereign nations are extended to citizens. Therefore, individuals and companies may not claim property rights in outer space.²⁶⁵ There is also disagreement as to what appropriation is prohibited. Some argue that the appropriation clause simply bars ownership of the land, not the resources found within.²⁶⁶ Others maintain that it is legally impossible to separate resources from land,²⁶⁷ and make a distinction between civil and common law countries in this regard.²⁶⁸ The lack of ownership of territory in space does not preclude private sector for-profit use of the territory. According to Steven Doyle, a member of the US delegation to the UN that drafted the 1967 OST and 1979 Moon Treaties:²⁶⁹

Individuals expressing interest in exploitation of extraterrestrial materials have concluded that, if there is no national sovereignty, there cannot be enforcement of private property rights. I do not concur...Private enterprise may use and function in outer space, under the supervision of the government of its country.²⁷⁰

Many private firms nevertheless point to provisions of space law as a major barrier to future commercial development, contending that the lack of sovereignty in space jeopardizes their ability to make profits from private investment. This viewpoint was upheld by the President's Commission on Space Exploration, stating, "The establishment of a property rights regime will remove impediments to business activities and inspire the commercial confidence

²⁶⁵ Hertzfeld, *supra* note 121; W. White, *Implications of a Proposal for Real Property Rights in Outer Space*, 40th Colloquium on the Law of Outer Space (1997).

²⁶⁶ *Id.*

²⁶⁷ *Id.*

²⁶⁸ In common law countries, the Crown traditionally held ultimate title to all lands. In civil law countries, derived from Roman law, distinguishes between property and sovereignty. Thus, under the OST, common law countries could not grant property rights to private entities while civil law nations could. White, *supra* note 265.

²⁶⁹ *Id.*

²⁷⁰ Doyle, *supra* note 185.

necessary for business development and the extraction of resources.”²⁷¹ In this passage, the Bush Administration the need to define exactly what celestial property rights are and how they apply to resources is still under debate, creating uncertainty for companies looking to invest in such ventures. It seems clear though that the OST does amount to a limited form of property rights, while OST Article VIII permits states to regulate activities under their jurisdiction. Using Article VIII instead of Article II to grant property rights would not violate the OST.²⁷² A modified version of the Homestead Act could be used to grant entities with ongoing operations limited property rights while those operations continue, while at the same time reciprocity provisions could be added to recognize similar arrangements with other nations.²⁷³ This exchange underscores the importance of creating well-defined legal regimes to govern the international commons as soon as possible, lest national governments take it upon themselves to fill this regulatory hole and in the process curtail long-term economic growth and security.

When a space-based economy begins to emerge, which could come as soon as 2017 if the current space policies unfold as planned, it will become necessary to devise a method of utilizing resources in space through the Moon Treaty, or another accord.²⁷⁴ It remains prudent to consider such options today.²⁷⁵ As is made evident by the convoluted history of UNCLOS, establishing an effective international regime over the international commons takes years with technology progressing apace. Even if an international treaty were created to deal with natural resources in space today, it seems unlikely that it would be in place by the time humanity returns to the Moon

²⁷¹ J. Scheraga, *Establishing Property Rights in Outer Space*, CATO JOURNAL, May, 2001.

²⁷² White, *supra* note 265; Gorove, *Interpreting Article II of the Outer Space Treaty*, 37 FORDHAM L. REV. 349, 351 (1969); Rothblat, *State Jurisdiction and control in Outer Space, Proceedings, Twenty Sixth Colloquium on the Law of Outer Space*, at 135, 136 (1984); Cepelka, *Application of General International Law in Outer Space*, 36 J. AIR. L. & COM. 30, 38-39 (1970).

²⁷³ *Id.*

²⁷⁴ The NASA VSE encourages the development of space-based industry. NASA began this process 20 years ago when Congress amended the Space Act, created the Office of Space Commercialization in response to the *Challenger* disaster.

²⁷⁵ Hertzfeld, *supra* note 121.

during the next decade. Short-term stopgap measures should therefore be considered, such as the International Space Station Intergovernmental Agreement that governs the International Space Station. This would include the option of creating EEZ's in space reminiscent of UNCLOS 1982,²⁷⁶ but would not completely solve contemporary or future abuses of space law.²⁷⁷ The only way to manage that is to find an ultimate compromise marrying limited property rights and the CHM principle. To such an end, the lessons learned from this case study regarding what property rights can exist in a CHM and how to economically distribute them will now be coalesced in a policy proposal detailing how to govern the international commons going forward.

d. Proposal: Property Rights and Conserving the International Commons

The case study of the Moon Treaty in space law demonstrates that property rights over vehicles, installations, *in situ* and returned resources, and even zones around habitats are accorded property rights. In order to distribute these rights, a modified version of the ITU could be established. But rather than giving away for free, these property rights could be auctioned off to the first investor(s) to arrive at a new resource area. This arrangement would be reminiscent of the Homestead Act, and would have the effect of not only equitably and efficiently according property rights to those entities most capable of using them efficiently, but also would raise large amounts of capital that could be used to develop new infrastructure allowing developing nations to partake in the resources. Or the capital could be given outright to poverty-stricken regions vis-à-vis classic equitable benefit-sharing as seen in UNCLOS III. Instead of ownership, a modified leasehold could also be adopted giving exclusive rights for a period of, for example, fifty years such as how intellectual property law now accords such rights. This would mean that the

²⁷⁶ The creation of EEZs around space infrastructure would create indirect property rights as long as the facilities in question remain in place.

²⁷⁷ Dennis Hope, a realtor from southern California, registered the Moon and Mars as his personal property. He now sells 100-acre tracts for about \$20 on the internet. The scheme is illegal according to the International Institute of Space Law (IISL) under OST Article II, but thousands of consumers continue to buy plots annually.

commons would not actually be privatized, but instead would be developed for the benefit of all mankind which is still ultimately vested with sovereignty.

Finding solutions such as the one described above is essential to avoid the tragedy of the commons scenario. Environmental concerns such as pollution and climate change are natural forces that affect the global commons without respect for political borders. Articulating solutions to these global forces is one of the main problems of political philosophy. An economic analysis of property rights in special sovereignty areas then is helpful given that fundamentally, as argued by Benjamin Tucker, the purpose of property is to solve scarcity.²⁷⁸ Classic solutions involve the enforcement of conservation measures or privatization.

The idea of dividing the commons into private parcels is often advocated by libertarians, who argue that this division should be done according to the Lockean principle of homesteading. This consists of allowing individuals to acquire property on a “first come first served” basis providing incentives for efficiency by internalizing social costs and benefits. The market would promote economic growth, achieve optimal levels of pollution, and reduce inefficiency.²⁷⁹ Advocates of a *res nullis* approach to commons areas favor privatization. The tragedy of the commons though may be no worse than the directly unproductive rent-seeking activities (DUP) that can result from private property establishment as groups lobby for the right to exploit the commons.²⁸⁰ As this argument applies to public policy formation in national legislatures, so it does too on the global stage as nations petition for the right to exploit commons resources on behalf of all humanity. This points to the necessity of having a simple auction, or awarding a leasehold to the first entity to arrive at a region in the international commons, so as to avoid DUP as well as conflict whenever possible.

²⁷⁸ Scherga, *supra* note 271.

²⁷⁹ *Id.*

²⁸⁰ J. Bhagwati, *Directly Unproductive Profit-Seeking (DUP) Activities*, 90 J. OF POL. ECON. (1992)

Without the type of multilateral cooperation described in the aforementioned proposal, the tragedy of the international commons could easily turn into a collective prisoner's dilemma in which each government acts in its own best interest without coordination. There are two options: cooperate with the group or defect.²⁸¹ It is this latter outcome of resources being prematurely exhausted through defection that developing countries fear most. Game theory²⁸² demonstrates that defection is beneficial even though everyone would be better off through cooperation. Far-sighted groups impose sanctions on members that over-exploit a resource to limit defection. An international regime would require punitive power to promote cooperation while preserving common resources.

Preservation is possible either through active (legislative action and enforcement measures) or passive means. Only a total ban on development would make passive preservation a possibility, such as has occurred in Antarctica.²⁸³ Given the diverse propositions for the use of natural resources in special sovereignty areas, there is a clear need to develop comprehensive plans for balancing the numerous actors' interests. This is especially relevant since SSAs are delicate environments with little known as to the potential impact of commercial operations.

In the end, the Moon Treaty met with tremendous international pressure that curtailed its acceptance as customary international law. Why? One answer lies in the negotiating process. Earlier space treaties were based on contemporary problems and drew on factual testimony from experts. Here drafters attempted to develop binding rules decades ahead of the necessary technology.²⁸⁴ If history is any guide, the international legal community must wait for natural

²⁸¹ Cooperation occurs when individuals agree to protect a common resource and avoid the tragedy. Defection happens when an individual decides to use more than his share of a public resource.

²⁸² Game theory is a branch of applied mathematics that studies strategic situations where players choose different actions in an attempt to maximize their returns.

²⁸³ *Id.*

²⁸⁴ VIKARI, *supra* note 57, at 118.

resource exploitation to become a contemporary problem on which experts can offer informed expertise before regulation can proceed. The difficulty with such an approach lays in the incredibly rapid rate that technology is now developing, and the comparatively stagnant pace at which multilateral accords are now negotiated. As such, it is imperative to proactively begin laying the groundwork for appropriate regulations as soon as new demonstrable technologies come on the horizon. This step now seems to have been reached in the Arctic. The Arctic AEPS should lay the ground for future polar environmental cooperation that will also ensure sufficient property rights for economic development. As has been demonstrated, international regimes governing SSAs are also guilty of a failure of imagination in not providing for the technological leaps that are today allowing companies to mine the Arctic deep seabed, and tourists to blast into space. This shortfall is causing a revision of these regimes, specifically the CHM provisions. All four SSA regimes are interconnected and commonly inform the debates surrounding one another in turn. Although the precise solutions for how to both conserve the commons and ensure basic property rights differ according to the unique situation of each arena, it is clear that some modified version of the CHM can in fact co-exist with economic development and even property rights. It is collectively in all nations' interest to cooperate, and not defect.

Conclusion

Commons areas face unique challenges, and occupy a special position in international law. This paper has attempted to demonstrate both commonalities and differences in how these areas, comprising the Antarctic, Arctic, deep seabed, and outer space, have been regulated and how increased resource competition is adding further pressure on these regimes. As this process unfolds, the commons is increasingly shrinking as the needs for private economic development displace communal property, enshrined in the Moon Treaty and UNCLOS in the CHM principle.

This has not led to flagrant breaches of international law, either in UNCLOS, the ATS, or the OST, but rather has led to reinterpretations of property rights in the international system, and a sharply increased number of pending territorial claims under CLCS. As occurred in the nineteenth century, once again the great powers, or private entities under their jurisdiction, are vying to claim new tracts of land as arenas that were previously thought economically inaccessible as a result of climate change and technological innovation are now reachable. The free rider problems associated with this situation will make future international agreements dealing with these issues, especially those dealing with the CHM principle, both increasingly difficult and all the more imperative.

Technological change has been shown to be the driving force in regulating the international commons. At this point in history, it does not take a great leap of imagination to foresee that all of the international commons will relatively soon be open to economic development. This outcome will permit both possession and occupancy of hitherto unreachable resources, brining into question the bedrock premise of Grotius's philosophy behind *mare liberum* as applied to the international commons writ large. As a result, policymakers will face a choice whether to defect and assert classic sovereignty in the long traditions of Westphalia as the Bush Administration is now doing in space, or cooperate to create a multilateral framework for governance in the vein of neoterritoriality. Such an outcome would provide internationally-respected property rights promoting economic development, adding needed resources, and staving off global warming while avoiding the tragedy of the commons scenario.

As sovereigns develop the commons, security and environmental concerns will proliferate without collective action. Regional multilateral agreements, such as the ATS, should be propounded in both the Arctic (through an expanded AEPS or an "Arctic Council") and in

space to limit environmental harm, ensure the protection of property rights, and promote multilateral cooperation over nationalism thereby enhancing sustainable economic development. The commons must be developed to garner necessary resources. It should be done, though, responsibly, and while respecting the principles of international and avoiding a temporal slide backwards in popular conceptions of sovereignty. Unilateral action by nations will not serve this purpose. Multilateral action is necessary to reap economic benefits in the short-term, and to ensure our common heritage is preserved for our posterity.