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## Regulating Near-Space Activities: Using the Precedent of the Exclusive Economic Zone as a Model?

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### ABSTRACT

The deployment of high-altitude vehicles in near space with the purpose of providing Internet, communication, and other services represents the new frontier of aerospace activities. Near-space operations are attracting growing interest due to their multi-purpose nature and their anticipated high profitability. Despite such positive perceptions, near-space plans are, however, hampered by the uncertain international legal status of near space. Using the precedent of the exclusive economic zone (EEZ), this article suggests a new categorization of the near space as the exclusive utilization space (EUS) and a set of rules to manage its utilization.

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## Introduction

The utilization of near space represents the new frontier of aerospace activities. Technological advancements are rapidly making it possible to operate in the area comprised between 18 and 100 km of altitude (from 59,005 to 328,083 feet), the so-called “near space,” to provide communication, navigation, sensing, Internet, and other services.<sup>1</sup> Until now, the near space has remained virtually unutilized and activities have been concentrated either at lower altitudes (the core of civil aviation operations takes place below 38,000 feet above sea level) or in outer space (beyond the altitude of 100 km). Several factors are, however, contributing to change this trend.

Near-space initiatives began emerging in the United States more than two decades ago with various attempts to develop vehicles capable of performing long-duration high-altitude operations.<sup>2</sup> These initiatives were, however, largely unsuccessful<sup>3</sup> and did not lead to marketable products.<sup>4</sup> Recently, near space has once again caught the attention of investors, resulting in the launch of new projects and the development of near-space vehicles, including airships, balloons, and various kind of high-altitude platforms. These projects have received significant media coverage, probably due to the notoriety of the issues involved and their ambitious goals.<sup>5</sup> For example, in 2013 the U.S. company Google X (now simply X) announced Project Loon, an initiative intended to create an aerial wireless network through the placement of balloons at altitudes between 18 to 25 km.<sup>6</sup> Similarly, in 2014, Facebook unveiled the Facebook Internet project with the

goal of deploying a high-altitude network of solar-powered unmanned aircraft to furnish Internet capability to underserved areas.<sup>7</sup>

The near-space sector has also been gaining ground in Asia, with Chinese companies quickly taking the lead. For instance, the company Kuang-Chi is developing helium-filled balloons and other kinds of lighter-than-air vehicles to provide aerial surveillance, communication, near-space tourism, and wireless WiFi transmission to remote areas.<sup>8</sup> China has also developed solar-powered unmanned aerial vehicles (UAV) that can provide natural disaster monitoring and response, sea area surveillance, and WiFi mobile communication services.

The renewed interest toward near space derives from three factors. First, its use promises to be highly profitable. A recent study estimates the high-altitude platforms market to grow at an annual rate of 8.7% and to reach a value of US\$4.77 billion by 2023.<sup>9</sup> Second, near space offers several opportunities for startup companies and newcomers.<sup>10</sup> Conversely, traditional areas of operation, such as the airspace and outer space, lack similar conditions; indeed, both environments are experiencing growing levels of congestion<sup>11</sup> and competition that substantially reduce market shares for new operators.<sup>12</sup> Third, high-altitude platforms are cheaper to launch and operate than satellites.<sup>13</sup>

Despite these positive premises, near space commercial operations still face two challenges. The first one is of a technical nature and concerns the difficulties inherent in undertaking long term activities in near space; in this regard, the relative strength of lightweight structures, energy storage capacity, thermal management, and the overall reliability of vehicles are the most problematic aspects.<sup>14</sup> The second challenge is related to the uncertain legal status of the near space; as no international legal regime specifically regulates it, the rules governing operations therein remain doubtful.<sup>15</sup>

A key difference between these two challenges is the fact that while efforts to address the technical obstacles to operate in near space are being undertaken,<sup>16</sup> no comprehensive initiative to clarify the applicable legal regime is currently underway. This article argues that this situation is untenable and that the time to deal with the fundamental legal questions associated with the use of near space has arrived. Indeed, the present state of uncertainty harms business plans and innovation because it creates doubts on the permissibility of an activity, the modalities of its implementation, and its possible revenues. The current legal environment is particularly harmful to near-space projects of an international nature,<sup>17</sup> namely, those involving the deployment of a system of vehicles, platforms, transmitters, and various links in the near space above foreign territories to offer wireless communication and other services.<sup>18</sup> This kind of venture is gaining ground among investors because it holds the potential to generate substantial revenues.<sup>19</sup> Nevertheless, it is precisely in that context that the ambiguous legal relationship between the state above whose territory the high-altitude vehicles are deployed and the operator of such vehicles, together with complex questions relating to sovereignty and security, may compromise such ventures, if not totally preclude them.

There are thus several legal factors that interfere with the realization of near-space operations. In order to overcome these obstacles, the authors of the present article have looked into the realm of international law in search of a model for the elaboration of a legal regime applicable to the near space. This research has led to the international law

of the sea, specifically to the precedent of the exclusive economic zone (EEZ). Interestingly, the use of the international law of the sea as a model to regulate other international areas is not novel; for example, the international law of outer space was largely modeled on the precedent of the high seas' regime.<sup>20</sup> Arguably, the provisions of the 1982 Law of the Sea Convention regulating the exclusive economic zone are particularly suitable to structure the near space's legal regime. On the one hand, the current level of uncertainty and dissatisfaction in regard to near space resembles, to a certain extent, that which existed at the time the EEZ regime was developed; on the other hand, the rules governing activities in the EEZ, if suitably modified, could be used to clarify the rights and duties of the entities engaged in near-space operations and to facilitate their overall management.

Based on this assumption, the present article suggests a new legal categorization of near space as the "exclusive utilization space" (EUS). Accordingly, the legal status of near space should be distinguished from that of national airspace and outer space. Essentially, under this proposal, the area comprised approximately between the altitude of 18 to 100 km (between 59,005 to 328,083 feet) above land territory and the territorial sea, now labeled the exclusive utilization space (EUS), would lie outside of national sovereignty and be regulated by a set of basic rules intended to maximize its profitable and sustainable use. The authors of the present article believe that the establishment of a separate and formalized legal regime would contribute to (a) clarify the legal status of the near space; (b) stimulate technological development and investments in the near-space sector; (c) eliminate unnecessary obstacles to the international utilization of near space; (d) put in place a level playing field for operators; (e) enable the largest number of countries and users to benefit from it; and (f) prevent the emergence of disputes.

The EUS proposal is not an attempt to undermine the sovereign rights and the security interests of the state above which an exclusive utilization space would be located, a state that can be designated as the "underlying state." On the contrary, while the EUS would not be part of its territory, such a state would retain several sovereign prerogatives over it, including the right to (1) decide whether and how to establish it; (2) use it on an a priori basis; (3) bilaterally negotiate the conditions to be complied with by foreign entities; and (4) regulate and enforce safety and security matters in relation to the activities carried out therein. Overall, the EUS idea attempts to balance the sovereign interests of the underlying state with the creation of economic opportunities in the near space.

As indicated, the EUS proposal draws inspiration from the concept of the exclusive economic zone (EEZ); indeed, despite essential differences between the EEZ and near space, there are several rules governing the former that, if adequately modified, could be used as a model to shape the legal regime of the latter.

After a few preliminary sections analyzing the current status of near space and describing the core elements of the exclusive economic zone, the main elements of the exclusive utilization space proposal are presented.

## **Near Space: An Analysis**

### ***Spatial Delimitation***

Near space constitutes an intermediate or buffer zone between airspace and outer space.<sup>21</sup> Indeed, due to its physical characteristics, it naturally separates these two areas

because neither traditional civil aviation activities nor space operations can be performed therein.<sup>22</sup> Commercial passenger aircrafts can safely fly up to an altitude of 12 km (38,000 feet),<sup>23</sup> beyond that point, the air becomes increasingly less dense until the moment where either the wings cannot generate sufficient lift or the engines cannot produce enough thrust.<sup>24</sup> Additionally, air navigation services (those services provided to air traffic during all phases of operations), cannot be effectively performed above the altitude of around 18 to 20 km above sea level (between 59,005 to 328,083 feet), the so-called flight level (FL) 600. Indeed, existing air navigation technologies were developed to perform at lower altitudes and they have not yet been adapted to function in near space.<sup>25</sup>

The altitude of 100 km (328,083 feet) represents the unofficial starting point of outer space because at around that altitude, the atmosphere becomes too thin to support aeronautical flight and a vehicle needs to travel faster than orbital velocity to derive sufficient aerodynamic lift to sustain itself.<sup>26</sup> This reality is reflected in the practice of a number of states that have recognized 100 km (328,083 feet) as the limit separating their national airspace from outer space. For instance, Australia,<sup>27</sup> Kazakhstan,<sup>28</sup> and Denmark<sup>29</sup> have enacted national space legislation applicable to activities occurring at an altitude of 100 km or higher.

Thus, even though international law does not set the precise spatial delimitation of near space, there is a general understanding of where its boundaries lie.

### ***The Legal Status of Near Space***

There is no consensus among scholars or states on the legal status of near space.<sup>30</sup> Such a controversy derives from the lack of international treaties regulating it. It is therefore safe to say that near space represents a gray area in international law, a zone of ambiguity at the edges of both airspace and outer space.

From a legal perspective, the fundamental question is whether near space should be assimilated to airspace, to outer space, or whether it should be deemed to have a separate legal status. In the absence of any international legal instruments specifically governing it, the most effective approach to answer this question is to analyze existing air and space law conventions. While these conventions do not specifically address near space, they may provide useful elements to determine what legal regime ought to apply.

The 1944 Convention on International Civil Aviation (commonly referred to as the Chicago Convention)<sup>31</sup> constitutes the pillar of the public international air law system. The Chicago Convention, which is widely ratified, establishes the fundamental rules regulating international transportation by air.<sup>32</sup>

Article 1 of the Chicago Convention is of paramount importance insofar as it recognizes a state's complete and exclusive sovereignty in the airspace above its territory.<sup>33</sup> Article 2 then clarifies that the territory of a state includes its land areas and territorial waters.<sup>34</sup> In the exercise of this sovereignty, the underlying state is entitled to apply its laws and exercise its jurisdictional powers within its national airspace.<sup>35</sup>

The provisions of Article 1 were inspired by security concerns<sup>36</sup> and were a means of protecting national soil from hazardous activities and foreign attacks.<sup>37</sup> Accordingly, the Chicago Convention prohibits aircraft from entering a foreign national airspace without

prior authorization by special agreement.<sup>38</sup> Though they enjoy several rights, states parties to the Chicago Convention are under the obligation to ensure the safety of aircraft transiting through their national airspace<sup>39</sup> and to manage air traffic pursuant to the International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs).<sup>40</sup>

Most importantly for our discussion, the Chicago Convention does not set a vertical limit to state sovereignty. Consequently, one is left to wonder what is the upward limit of a state's national territory and whether or not near space is included within it. In this regard, two views have been proposed. The first one claims that a state's sovereignty extends vertically with no limits until the point where outer space begins. This view is rooted in the old Latin maxim "*cuius est solum est usque at coelum*": "Whose is the soil, his it is up to the sky," or in more simple terms, "He who possesses the land possesses also that which is above it." Thus, under this construct, near space would be part of a state's national airspace and subject to its laws and control. Already in 1906, Professor Westlake advocated that "if there exists a limit as to the sovereignty of the State over the oceanic space, none exists for the sovereignty of the State over the air space."<sup>41</sup> More recently, Reinhardt stated that "if an area cannot be considered outer space then it must be considered sovereign airspace by default."<sup>42</sup> The second line of thought argues that national airspace should extend vertically as high as a state can enforce its sovereignty,<sup>43</sup> specifically, up to the point where air navigation services can be effectively provided or, at least, up to the highest point where airplanes can fly. For example, Professor Cooper claimed that "The Chicago Convention ... deals with no areas of space other than those parts of the atmosphere where the gaseous air is sufficiently dense to support balloons and airplanes."<sup>44</sup> Basically, the proponents of this view utilize the criterion of effectiveness in exercising jurisdictional powers to determine the extent of the national airspace. Therefore, under this approach, near space would not be a part of the national airspace as states cannot adequately perform air navigation services therein.

Evidently, the air law conventions do not clarify the legal status of near space. The situation does not get any clearer when international space law is considered. First, space treaties deal with activities occurring in space properly considered; therefore, their scope goes beyond the area usually referred to as near space.<sup>45</sup> Second, international space law does not set the physical lower limit of outer space, thus failing to shed light on where exactly airspace ends and outer space begins. Since the early days of space activities, states have failed to agree on a criterion to separate airspace and outer space, as well as on the practical need to do so.<sup>46</sup> In the preceding sections, we have referred to the general practice of viewing the 100-km mark as the lower border of outer space; such an approach, however, is not universally accepted. This uncertainty also affects the proposal in this article to consider the altitude of 100 km above sea level as the upward limit of near space; some experts may reject this approach and deem near space to end at lower or higher altitudes.

Regardless of this debate, it is evident that neither international air law nor space law clarifies the legal nature of near space. An alternative approach might be to shift the focus from the international to the national level and to consider national laws governing activities in near space. The existence of similar laws could indeed provide elements

to support the view that near space is part of national airspace. Regrettably, the analysis of national laws does not provide a uniform or satisfactory picture. Only one state, New Zealand, has passed legislation specifically regulating near-space activities. Other states have only legislated for operations occurring below the 20-km altitude mark and have left the question of the upward delimitation of their national airspace unanswered.

New Zealand enacted its Outer Space and High-Altitude Activities Act on December 21, 2017.<sup>47</sup> The purpose of the act is twofold: (1) to regulate space activities as well as high-altitude activities; and (2) to facilitate the development of a space industry.<sup>48</sup> The drafting of the act was prompted by the promising prospects of using portions of the largely uninhabited New Zealand territory to test and launch rockets and high-altitude vehicles.

Despite its stated goals, the act falls short of providing a clear regulation of high-altitude activities. It defines “high altitude” as either above flight level 600 (FL 600), around 18 km (59,005 feet), or above the uppermost limit of controlled airspace, usually at 2.9 km (9,500 feet).<sup>49</sup> Thus, the act does not set the upper limit of the areas designated as “high altitude” and since “outer space” is also not defined in the act, it creates uncertainty as to the point at which New Zealand’s airspace vertically ends and outer space begins. This ambiguity is not resolved with the definition of “high-altitude payload,” which is simply identified as “an object that is carried or placed, or is intended to be carried or placed, at high altitude.” The act states that a person “must not launch a high-altitude vehicle from New Zealand ... unless the person has a high-altitude license for the launch.”<sup>50</sup> A launch license is also required to launch objects into outer space.<sup>51</sup> However, in the absence of any determination as to where outer space begins or the “high-altitude” area ends, one is still left in the dark as to which of the two licenses should be obtained in any given case. Importantly, a high-altitude license is linked to the use of a “high-altitude vehicle,” which is defined as “an aircraft or any other vehicle that travels, is intended to travel, or is capable of travelling to high altitude.”<sup>52</sup> That definition, however, still does not clarify at what point an altitude would be so high as to constitute outer space and thus deprive a vehicle of the label “high-altitude vehicle.”

Apart from New Zealand, other states have generally not legislated near-space activities and have focused their regulatory attention on the implementation of air navigation services above their territory. As mentioned, these services are provided only up to the so called flight level 600 (FL 600). Therefore, as the largest majority of states have not enacted regulations applicable beyond FL 600, one can make the argument that the altitude around 18 km constitutes the upper limit of national airspace. Under this construct, anything located above that point, including near space, would consequently lie outside the state’s sovereignty. This argument is reinforced somewhat by the fact that domestic legislations do not typically set the upper limit of national airspace. However, there are also states that, while not having legislated beyond FL 600, have kept this option open. For example, in the United States, the Federal Aviation Administration (FAA) is in charge of ensuring the safety of daily flight operations by maintaining and operating the National Airspace System. According to existing FAA manuals and regulations, the FAA’s authority extends up to FL 600; nevertheless, this does not mean that FAA authority ends at FL 600. Federal Aviation Regulation §71.71, “Class E airspace,” describes what FAA authority exists above FL 600 by defining Class E airspace as: “The

airspace of the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska, extending upward from 14,500 feet MSL up to, but not including 18,000 feet MSL, and the airspace above FL600.” Furthermore, 49 U.S. Code § 40103 provides that “The Administrator of the Federal Aviation Administration shall develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace.”<sup>53</sup>

Thus, the FAA has the authority to regulate air traffic over the United States from just above the surface to a point where “the atmosphere becomes too thin to support aeronautical flight.”<sup>54</sup> In short, the United States considers its national airspace to extend beyond FL 600, even though U.S. legislation does not set a precise vertical limit to it.

The uncertainty surrounding the legal status of near space is reinforced by the peculiar nature of near-space vehicles that cannot be assimilated to either aircraft or spacecraft. The Chicago Convention defines an aircraft as “Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the Earth’s surface.”<sup>55</sup> Near-space vehicles are based on flight theories different from pure aerodynamics. Thus, even when they are capable of certain flying maneuvers, their maneuverability and performance cannot be assimilated to that of an aircraft.<sup>56</sup> A space object is specifically designed to be launched and operated in outer space. Near-space vehicles neither are intended to be launched in outer space nor have the capability to operate therein. Indeed, they are primarily intended to be stationary at a certain altitude that is well below the lowest limit of outer space.<sup>57</sup>

In summary, this section has demonstrated the controversial legal status of near space. On one hand, it can be argued that near space is part of a state’s national airspace. Indeed, an expansive reading of Article 1 of the Chicago Convention seems to support the view that national airspace extends up to the yet-unknown limit where outer space begins. In this respect, there is nothing in international law that prevents states from enacting legislation applicable to the near space above their territory. As described, one state has already done so, while other countries have left the possibility of regulating air navigation services above FL 600 open. On the other hand, one can also suggest that near space lies outside national airspace. This idea is rooted in two elements: first, the particular physical characteristics of near space that distinguish it from the lower portions of airspace; and second, the technical difficulties attendant with performing air navigation services above FL 600. Essentially, these two elements challenge a state’s ability to enforce its jurisdictional power above a certain altitude.

Based on the preceding analysis and the prevailing uncertainty, the proposal to confer a special legal status upon near space and to establish specific rules to govern activities therein seems justified. Such an approach appears to be further validated by the peculiar nature of near-space vehicles, as they are a hybrid between aircraft and space objects.

## **The Exclusive Economic Zone**

### ***Definition and Historical Background***

The exclusive utilization space (EUS) proposal has been inspired by the legal regime applicable to the exclusive economic zone (EEZ).<sup>58</sup> Even though there are evident

differences between near space and the EEZ, analysis reveals that there are also historical, economic, legal, and technological similarities. Most importantly for the purpose of this article, there are several EEZ rules that, if adequately modified, may facilitate the orderly management of near space activities and help achieve a balance between the interests of all the entities involved in its use.

Part V of the 1982 Law of the Sea Convention (LOSC) defines the EEZ as “an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction<sup>59</sup> of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of the Convention.”<sup>60</sup> A coastal state enjoys sovereign rights to manage and exploit the living and nonliving resources located within its EEZ. These rights are, however, not exclusive in the sense that other states also benefit from certain limited rights and freedoms.<sup>61</sup> Therefore, the term “exclusive” in the expression “exclusive economic zone” should not be interpreted literally.

The EEZ occupies a special place within the international law of the sea because it combines characteristics of the legal regimes applicable to territorial waters and the high seas without being assimilated to either. For this reason, scholars view the EEZ as a *sui generis* zone.<sup>62</sup>

The concept of the EEZ was formally codified in Part V of the 1982 Law of the Sea Convention, even though many of its elements had already emerged in state practice prior to that moment. The EEZ historically originated from the efforts of coastal states to extend their sovereignty and jurisdictional rights beyond the 12 nautical miles (nm) limit of their territorial waters.<sup>63</sup> Milestones in this process were the 1945 President Truman Proclamations, in particular the Proclamation on Coastal Fisheries in Certain Areas of the High Seas.<sup>64</sup> This proclamation declared the need for conservation zones in those areas of the high seas contiguous to the coast of the United States where fishing activities had been, or could be, developed and maintained on a large scale and affirmed that fishing activities within such zones would be subject to American regulation and control. Another proclamation, namely, the Proclamation in respect of the Continental Shelf, declared that the resources of the subsoil and the seabed of the continental shelf beneath the high seas but contiguous to the coast of the United States belonged to the United States and was subject to its jurisdiction and control.<sup>65</sup>

The U.S. example was soon followed by other countries that made similar claims over the resources located on the continental shelf adjacent to their coasts and declared their intention to establish zones of fisheries protection.<sup>66</sup> In subsequent decades, a significant number of states also expanded the breadth of their territorial sea or set up maritime areas in which they claimed exclusive jurisdiction on fishing and the exploitation of living resources up to 200 nm. It is against this backdrop of significant state practice that the Third United Nations Law of the Sea Conference was convened in 1973 and ended in 1982 with the adoption of Part V of the Law of the Sea Convention.

### **The Main Elements of the EEZ**

Articles 55 to 75 of Part V of the Law of the Sea Convention outline the legal regime of the EEZ. Coastal states must claim an EEZ that can extend up to 200 nautical miles

from the baseline from which the breadth of the territorial sea is measured.<sup>67</sup> More than 130 states have claimed an EEZ and many have passed legislation applicable to it.<sup>68</sup> Importantly, the EEZ is not part of the territory of the coastal state that has claimed it, even though such a state enjoys extensive rights to use and manage it.

Part V draws a distinction between two categories of subjects: coastal states and other states.<sup>69</sup> Coastal states enjoy two types of rights: (1) sovereign rights and (2) jurisdictional rights. Sovereign rights apply to both living and nonliving resources. As far as living resources are concerned, coastal states have the right to explore, exploit, conserve, and manage those located in the water column, seabed, and subsoil of their EEZ.<sup>70</sup> Essentially, this means that coastal states are conferred nearly exclusive sovereign rights to undertake and regulate<sup>71</sup> fishing in their EEZ.<sup>72</sup> However, coastal states are charged with the obligation of preserving fisheries and promoting their optimal utilization,<sup>73</sup> and to this end are given the power to set allowable catches, as well as the right to enforce their laws and regulations.<sup>74</sup>

In principle, if the coastal state does not have the capacity to harvest the entire allowable catch, it is obliged to negotiate agreements allowing other states to have access to the surplus; in doing so, it must give special consideration to landlocked, geographically disadvantaged, and developing states.<sup>75</sup> In practice, this provision has proven largely ineffectual as, except for a few marginal cases, no such agreements have been concluded.<sup>76</sup> Foreign states have limited capability to pressure a coastal state into sharing its harvesting rights, as the determination of the allowable catch and national harvesting capability and the allocation of any surplus fall outside the compulsory dispute settlement system set out in Part XV of the Law of the Sea Convention.<sup>77</sup>

In relation to nonliving resources, such as hydrocarbons and minerals, coastal states enjoy unrestricted rights of exploration and exploitation, without any specific obligation of conservation or judicious use.<sup>78</sup> These rights are exclusive in the sense that coastal states have no requirement to share access to those resources. Another nonliving resource mentioned in Article 56 is “energy from the water, currents and winds.” States may rely on this provision to grant licenses in their EEZ for renewable energy facilities such as offshore power generators and wind farms, always taking into account the rights of other states and the need for marine environmental protection.

Under Article 56 of the Law of the Sea Convention, coastal states are also conferred three kinds of jurisdictional rights concerning (a) the establishment and use of artificial islands, installations, and structures; (b) marine scientific research; and (c) the protection and preservation of the marine environment. The first right is particularly relevant for our analysis as it entails the coastal state’s exclusive jurisdiction to construct and operate artificial islands, installations, and structures for economic purposes.<sup>79</sup> Due notice must be given when constructing artificial islands or installations and the coastal state may, where necessary, establish safety zones around them.<sup>80</sup> Furthermore, in relation to such islands and installations, coastal states have exclusive jurisdiction to enact custom, fiscal, health, safety, and immigration laws and regulations.<sup>81</sup>

With respect to the rights and duties of other states, Article 58 of the Law of the Sea Convention incorporates into the EEZ regime elements of the high seas regime, namely, the freedom of navigation and freedom of overflight. This means that the navigational and overflight rights accorded to states other than the coastal state within an EEZ

somewhat resemble those enjoyed on the high seas.<sup>82</sup> However, these rights of navigation and overflight are less extensive than those exercisable on the high seas.<sup>83</sup> Indeed, within the EEZ, other states must pay due regard to the rights of the coastal state and must comply with the laws and regulations it has adopted pursuant to the Law of the Sea Convention.<sup>84</sup> Accordingly, a coastal state is entitled to take measures to ensure compliance by foreign vessels of such laws. However, the limits of such enforcement measures remain somewhat blurred, creating the risk of undue interference with other states' rights.

### ***Relevance of the EEZ for the Management and Utilization of Near Space***

Undoubtedly, there are differences between the EEZ and near space, most notably the fact that the former deals with the management and utilization of living and nonliving resources while the latter does not contain resources per se (unless we consider the air as a resource). It is also true that while in the period from the late 1940s to the early 1970s several states made sovereignty claims over the areas adjacent to their territorial waters, only one state has passed legislation specifically regulating near-space activities.

However, it is also undeniable that there are similarities between the two. First, near space and the sea adjacent to the territorial sea, as regulated prior to the entry into force of the 1958 Geneva Conventions, shared two characteristics: (a) They arguably lay beyond national boundaries, and (b) they were not adequately regulated at the international level. Second, the utilization of near space as well as of the EEZ faces technological and economic challenges. Long-term and sustainable operations in both environments require technological advancements and innovation; this element complicates business plans and generates unpredictability as to the profitability of an envisioned activity. Third, the use of near space and the use of the EEZ raise safety and security concerns, particularly when foreign entities are involved. A system to manage and supervise operations is thus needed to ensure that they do not interfere with pre-existing services and undermine national security interests. Fourth, due to their particular physical characteristics, both environments tend toward the internationalization of some of their activities and services. Indeed, several countries may not possess the necessary technology to fully exploit the potential of their EEZ or sufficient capabilities to meet domestic demand; this may lead a state to the decision to open up the zone to foreign entities. One should also keep in mind that the international law of the sea has historically influenced the formulation of other international legal regimes. For instance, the fundamental principles of outer space law were inspired by the rules applicable to the high seas.

Thus, taking into account that the international community has managed to agree on rules regulating the utilization of the EEZ, it seems rather intuitive to view them as a valuable precedent for the formulation of a framework for the management and utilization of near space. In that regard, the following elements of the EEZ regime are particularly relevant to achieving that goal: (a) the utilization of the EEZ area for exclusively economic purposes; (b) the promotion of the optimal use of resources; (c) the sovereign right of the coastal state to manage and use its EEZ on a priority basis combined with the limited rights of other countries to participate in activities therein; (d) the right of

the coastal state to pass and enforce laws in relation to activities occurring within its EEZ and the right to enforce them; and (e) the need to ensure safety, security, and order within an EEZ. As explained in the following section, these elements constitute the core of the exclusive utilization space (EUS) proposal.

## **The Exclusive Utilization Space**

### ***Background to the Exclusive Utilization Space Proposal***

As described in the previous sections, technological advancements are gradually making near-space activities a reality; several companies across the world are developing different classes of near-space vehicles capable of performing communication, internet, sensing, and other services. These companies are planning to deploy their vehicles in near space both above their national territories and above the territory of foreign countries.

Importantly, while the technology to perform near space activities is quickly progressing, the same cannot be said of the legal regime applicable to such activities, which remains highly uncertain. This uncertainty derives from the absence of international treaties clearly defining the legal status of the near space and the rules applicable therein. As a consequence, answers to several key questions related to its use remain in doubt. For example, what are the conditions to access and operate in near space? What kind of services may be provided? How long may a foreign platform station over a foreign territory? What kind of measures may an underlying state take to protect its national security interests?

The uncertainty surrounding these questions has resulted in an unpredictable legal framework that negatively affects near-space plans and discourages potential investors. Its detrimental impact is particularly evident in relation to near-space activities having an international nature; indeed, the placement of vehicles in near space above foreign territories raises significantly higher safety and security concerns if compared with the placement of the same vehicles above national territory. These concerns may eventually lead to barriers to enter and conduct operations in a foreign near space.

Overall, the present situation does not seem to offer a regulatory environment capable of adequately promoting innovation and, at the same time, enabling the preservation of national interests, wide accessibility of services, and the profitability of activities. Distinct options to ameliorate the situation ought therefore to be considered. One option would be to leave the matter entirely in states' hands without addressing the current ambiguous status of near space. This would mean that each state would be entitled to individually regulate the use of near space above its territory, including the activities undertaken by foreign entities, without setting up an internationally agreed regime. While it is reasonable to expect that certain aspects related to the use of near space could, and probably should, be regulated domestically, this approach runs the risk of creating a fragmented legal framework for near-space activities with the following negative consequences: (a) an unpredictable regulatory environment leading to diverging conditions of operation applicable to the same activity in different countries (e.g., safety and security requirements); (b) market access restrictions; and (c) obstacles in

distributing and accessing near-space services. In the long term, this is a situation that has the potential to discourage investors and innovation in the near-space sector and to be detrimental to both domestic and international actors. It should be remembered that certain countries do not possess the technology to undertake near-space activities; thus, if foreign entities are not allowed to operate in the near space above such territories, those countries might not be able to benefit from near-space services.

An alternative option would be to address the question of the legal regime of near space at the international level, rather than leaving it exclusively in states' hands. Ideally, this would result in the recognition of a new legal status for near space, that of the exclusive utilization space (EUS), and in the setting up of basic rules governing activities therein. Under this construct, near space would lie outside national airspace and would thus, at least in principle, be accessible to foreign entities. Nevertheless, the state above whose territory an EUS was established would enjoy a priority right of utilization and the authority to manage safety/security matters. This priority afforded the underlying state is inspired by the precedent of the EEZ. As explained earlier in this article, while the EEZ is not part of the national territory of a coastal state, it does enjoy sovereign rights of utilization and overall management within the zone. Third countries, for their part, have distinct rights in other countries' EEZ, including the right of overflight and access to the surplus of resources. Similarly, under the exclusive utilization space proposal, the ultimate decision on whether to establish an EUS would belong to the underlying state; if it decided to do so, and while the EUS would not be considered its sovereign territory, the underlying state would enjoy special rights to administer, supervise, and manage the area, as well as the right to use it on a priority basis. However, upon meeting certain conditions, nonnationals would be entitled to access and carry out activities in a foreign near space.

Interestingly, the suggestion to attribute a distinct legal status to near space is not unprecedented in international law. For instance, one scholar proposed that the area extending from 21 to 100 km be considered as the "protozone," with the ultimate goal of better regulating safety and security matters.<sup>85</sup> Another proposal suggested that the legal regime of the high seas should be applied to near space so as to enable freedom of navigation by all.<sup>86</sup> The difference between these proposals and the EUS is threefold: (1) The EUS proposal focuses on the economic aspects of the utilization of near space; (2) it uses the exclusive economic zone as a precedent; and (3) it attempts to find a balance between the interests of the underlying state and foreign entities as far as the use of specific areas of near space are concerned. It is the opinion of the present authors that endorsing the EUS idea would (a) enable the broadest utilization of near space; (b) clarify the rights and duties of the actors involved in its use; (c) favor its predictable and orderly management; (d) stimulate industry growth; and (e) favor accessibility to near-space services.

### ***Main Elements of the Exclusive Utilization Space Proposal***

This section delineates the main elements of the exclusive utilization space proposal. Its purpose is to introduce the rights and duties of the parties involved in the use of near

space, as well as the basic conditions for the provision of services. A more detailed analysis of these elements is provided in the next section.

The main principles of the EUS proposal are the following:

1. An exclusive utilization space could be claimed by a state above its land territory and territorial sea in the area between 18 to 100 km (59,005 to 328,083 feet) above sea level.
2. The exclusive utilization space would be based on purely economic motives.
3. The exclusive utilization space would not constitute part of the territory of the state above which it is established.
4. The establishment of an exclusive utilization space would not undermine the sovereignty of the underlying state in its national airspace.
5. The underlying state would retain a priority right to use and administer the exclusive utilization space established above its territory.
6. The underlying state would be entitled to regulate and enforce safety and security matters within the exclusive utilization space established above its land territory and territorial sea.
7. The conditions for deployment and operation of near space vehicles within an exclusive utilization space would be agreed upon between the underlying state and the operator prior to the commencement of operation.
8. The underlying state would have the right to deny the deployment of foreign high-altitude vehicles in its EUS based on any perceived threat to its national security and safety interests.
9. Third countries/foreign operators would be entitled to deploy their near space vehicles in a foreign EUS subject to prior notification and approval by the underlying state.
10. Third countries/foreign operators would enjoy the right of overflight through a foreign EUS upon prior notification.
11. The operators of foreign high-altitude vehicles would be obliged to apply for a license from the underlying state to provide services in its EUS.

### ***Elaborating Upon the Exclusive Utilization Space Proposal***

1. *An exclusive utilization space could be claimed by a state above its land territory and territorial sea in the area between 18 to 100 km (59,005 to 328,083 feet) above sea level.*

Ideally, an exclusive utilization space should be established at around the altitude between 18 to 100 km (59,005 to 328,083 feet) above a state's land territory and territorial sea. As described in the first section of this article, that area represents a sort of buffer zone between airspace and outer space. Commercial passenger aircrafts fly far below the 18 km mark (59,005 feet) and air navigation services cannot be adequately provided above that level. As for the 100 km (328,083 feet) limit, it separates near space from outer space because above that altitude, aerodynamic operations are no longer possible and space activities officially begin (even though satellites must be placed at a minimum altitude of 160 km or 524,934 feet). Indeed, certain countries have officially designated 100 km as the point at which outer-space activities begin. While the area comprised between the altitudes of 20 and 100 km has thus far remained largely underutilized, several operators have ambitious plans to deploy their high-altitude platforms in that area. It therefore seems reasonable to argue that this area should be dedicated to near-space uses through the establishment of exclusive utilization spaces.

The establishment of an exclusive utilization space would be the result of an independent decision made by the underlying state. Such a decision might be prompted by

a willingness to provide commercial opportunities in near space above the state's territory (and territorial sea) or because of existing agreements with third countries (and their operators) willing to operate therein. Regardless of the motives behind the state's decision, the basic idea is that no EUS could be declared without the explicit consent of the underlying state. This principle derives from two considerations: (1) the need to protect the national interests of the underlying state; and (2) the sovereign and equal rights of states under international law. First, even if we assume that national airspace only extends up to an altitude of 20 km, it is unquestionable that the operation of vehicles even at higher altitudes, especially when operated by foreign entities, poses potential risks to the fundamental sovereign interests and rights of the underlying state. Therefore, it seems essential to confer upon that state the exclusive right to authorize operations in near space above its territory through the setting up of an EUS. Second, two of the fundamental rights of states under international law are sovereignty<sup>87</sup> and equality.<sup>88</sup> Hence, no state can be forced to act in a manner detrimental to its sovereign interests or in a way that puts it in a disadvantaged position as compared to other countries. Based on this assumption, no state could be "obliged" to establish an EUS above its territory if it did not choose to do so independently. This reasoning would hold even if the state had been directly involved in the elaboration of the EUS rules at international level.

2. *The exclusive utilization space would be based on purely economic motives.*

The goal of the exclusive utilization space proposal is the promotion of the use of near space. Until now, no significant operations have been carried out in near space, largely due to its uncertain legal status, technological barriers, and lack of economic incentives. The EUS idea is intended to invert this trend by putting in place a regulatory framework that, through the definition of operational conditions and the creation of favorable business perspectives, may contribute to the broadest utilization of near space. Importantly, the focus of the proposal is to enable the economic use of near space, that is, a use aimed at providing commercial (paying) services to customers. Other kinds of activities, such as scientific or military, fall outside the scope of the proposal.

3. *The exclusive utilization space would not constitute part of the territory of the State above which it is established.*

Similar to the precedent of the exclusive economic zone, where the EEZ does not belong to the coastal State that has established it, the exclusive utilization space would not constitute part of the territory of the underlying state. Based on the technical considerations discussed in point 1 and described earlier, the present article suggests that national airspace should be defined as extending from ground level up to an altitude of 18 km. The portion of airspace ranging from 18 to 100 km (59,005 to 328,083 feet) would not be considered a part of a state's territory, though extensive rights of management and utilization would be conferred upon it. This proposal is meant to overcome the barrier that sovereignty would likely pose to the utilization of near space by foreign entities. Indeed, such entities might be hesitant to pursue their near space plans in light of the restrictions that sovereignty would inevitably place on access, operations, and the

provision of services. It is true that even under the exclusive utilization space proposal, the underlying state would have the right to impose and enforce conditions on foreign operators; however, in the absence of sovereignty related considerations, it seems more likely that an equilibrium between the preservation of national interests and the (foreign) utilization of the near space could be achieved.

4. *The establishment of an exclusive utilization space would not undermine the sovereignty of the underlying state in its national airspace.*

The exclusive utilization proposal is not intended to negatively affect the sovereignty and the rights that a state enjoys in its national airspace. Indeed, even after establishing an exclusive utilization space above its territory, the underlying state would maintain its authority to legislate over, administer, and control the activities taking place in its airspace up to an altitude of 18 km, as that airspace would remain a part of its national territory. Any near-space operation that interfered with this fundamental principle or that raised safety/security concerns could be suspended, modified, or terminated.

5. *The underlying state would retain a priority right to use and administer the exclusive utilization space established above its territory.*

Following the precedent of the exclusive economic zone, the underlying state would enjoy the sovereign right to use and manage the exclusive utilization space established above its land territory and territorial sea on a priority basis. This right might become exclusive if the underlying state does not allow foreign entities to operate within its EUS, a decision that might derive from the failure of those entities to demonstrate their ability and willingness to comply with safety and security requirements. However, if the underlying state decided to allow other states or foreign entities to operate in the near space above its land territory and territorial sea, it would retain the right to administer and supervise their activities and to enforce compliance with the contractual conditions agreed upon prior to the commencement of operations.

6. *The underlying state would be entitled to regulate and enforce safety and security matters within the exclusive utilization space established above its land territory and territorial sea*

Even though the exclusive utilization space proposal is focused on the economic aspects of the use of near space, the placement and operation of high-altitude vehicles, particularly when controlled by foreign entities, unquestionably raise security and safety concerns.

From a security perspective, the essentially stationary nature of these vehicles is a troublesome element because, in principle, they might be used to spy over sensitive facilities and areas, such as governmental buildings and military bases. High-altitude vehicles might also be used for communication purposes to coordinate and support operations detrimental to the sovereignty of the underlying state. There are also concerns related to the preservation of the privacy of individuals living in that state.

From the point of view of safety, the priority must be to ensure that near-space activities do not interfere with preexisting operations and services. First, the deployment and

recovery of high-altitude vehicles would have to be organized in a manner that posed no risk to air traffic or to the eventual launch of a space object. Second, as high-altitude vehicles are mostly meant to provide communication and Internet services, it will be crucial to ensure that those vehicles do not interfere with existing services.

Based on these considerations, the underlying state would have the right to set the safety and security requirements that an operator would have to comply with in order to be allowed to operate in near space above land territory or territorial sea and to enforce them upon domestic and foreign entities. Failure to comply with such requirements could result in the temporary suspension, revision, or termination of the activities.

7. *The conditions for deployment and operation of near space vehicles within an exclusive utilization space should be agreed upon between the underlying state and the operator prior to the commencement of operations.*

Any entity willing to provide services from an exclusive utilization space would have to abide by the underlying state's conditions for the deployment and operation of near-space vehicles prior to the beginning of activities. Indeed, the underlying state would be entitled to assess whether an intended project threatened its national security and safety and whether the proposed services were in its national interest and that of its citizens. In order to do so, the operator would submit a plan to the underlying state detailing the nature, duration, and purpose of its planned activities. Only after reviewing the operator's ability to comply with safety and security requirements, its past performances, and the financial and technical soundness of the project would the underlying state authorize the commencement of operations. Such an authorization might take the form of a license; however, it would be entirely up to each state to determine how to structure the authorization process. The key point is that high-altitude vehicles, especially when owned by foreign entities, could not be deployed in an exclusive utilization space without prior authorization and coordination with the underlying state.

8. The underlying state would have the right to deny the deployment of foreign high-altitude vehicles in its EUS based on any perceived threat to its national security and safety interests.

In relation to near-space services undertaken by foreign entities, the preservation of national security interests and the avoidance of harmful interferences or other safety hazards would be of paramount importance. Indeed, on the basis of safety and security considerations, a foreign entity could be denied permission to deploy high-altitude vehicles in an exclusive utilization space. The underlying state might take this decision if it considered that the entity did not offer sufficient guarantees of its ability and willingness to comply with its security and safety requirements. However, to help preserve the equilibrium between the parties, the underlying state would be obliged to communicate the reasons for its refusal and afford the foreign entity an opportunity to address its concerns.

9. *Third countries/foreign operators would be entitled to deploy their near space vehicles in a foreign exclusive utilization space subject to prior notification and approval by the underlying state.*

Any foreign entity willing to provide services from an exclusive utilization space located above another country's territory would have to notify its intention of doing so to the underlying state and submit an operational plan. Any action contrary to this principle, including the unannounced deployment of near-space vehicles, would constitute a breach of the underlying state's rights and a threat to its national security interests. In this event, the underlying state would have the right to take the necessary measures to respond to this unwelcome event. However, if the foreign entity/state acted according to the principles just described and duly submitted an operational plan, it would be entitled to deploy its vehicles and provide the proposed services, as long as no financial issues or safety and security concerns motivated a refusal. Such an advantageous position for foreign entities can be justified on several grounds. First, the exclusive utilization space proposal aims to promote the efficient use of near space, particularly in countries that do not have the capability to do so themselves. Consequently, the advantage conferred to foreign entities is meant to encourage them to enter the near space business and to offer services to any interested customer worldwide. Second, it is likely that in the period preceding the start of operations, the underlying state and the foreign entity will have discussed and determined the terms for the provision of near-space services to the former. On the basis of such discussions, it is likely that the foreign entity would have invested technological and financial resources to develop the necessary capabilities to perform those services. Thus, once those capabilities were mature and if the entity submitted an operational plan and no serious safety or security concerns arose, there seems to be no legitimate reason why that entity would be refused the right to deploy its vehicles in the foreign exclusive utilization space. Importantly, even in this scenario, the foreign entity would always have to comply with the operational conditions and licensing requirements set out by the underlying state. Nevertheless, the foreign nature of the entity could not in itself constitute a sufficient reason to deny that entity the opportunity to undertake activities in a foreign near space. Third, the establishment of an exclusive utilization space would clearly signal the underlying state's willingness to promote the use of near space above its territory and to attract all interested entities, including foreign ones.

The possibility of deploying high-altitude platforms assumes particular importance in relation to projects aimed at building communication networks across several countries. In this context, an entity from State A might be willing to place broadband transceivers in near space above State B to provide services to States C and D. The deployment of this kind of transceivers raises limited security and safety concerns from the perspective of State B, the underlying state. Therefore, there would appear to be limited grounds for that state to oppose these types of projects, especially if the entity notified its plan and demonstrated technical reliability.

10. *Third countries/foreign operators would enjoy the right of overflight through a foreign exclusive utilization space upon prior notification.*

Despite their mostly stationary nature, certain high-altitude vehicles have a certain degree of maneuverability. Thus, it would be possible for a foreign entity to transit its high-altitude vehicles through a foreign exclusive utilization space upon giving prior notification to the underlying state. This represents a significant departure from Article

87 of the Law of the Sea Convention, which does not set any requirement for a state to notify its intention prior to undertaking an overflight of a foreign EEZ. The reason for such a condition is twofold. First, the unannounced crossing of an EUS by a foreign high-altitude vehicle might be perceived by the underlying state as an unacceptable threat to its national security. Such a state might, eventually, decide to suspend/terminate the foreign activity and, in extreme circumstances, even to deny entry to the vehicle. Second, internationally recognized aviation rules require an aircraft intending to enter a foreign airspace to notify the competent authorities and to wait for approval before proceeding with the maneuver. Thus, even if the EUS does not constitute part of the territory of the underlying state, it seems reasonable to expect that the owner of a near space vehicle would notify its intention to access a foreign managed EUS to the appropriate authorities prior to proceeding with such a manoeuvre.

11. *The operators of foreign high-altitude vehicles would be obliged to apply for a license from the underlying State to provide services in its EUS.*

In the context of near-space activities, it is important to distinguish between two types of licenses: (a) the license to launch and operate a high-altitude vehicle, and (b) the license to provide near space services. The first type of license would be issued by the state in which the entity was registered and operated, which we label state A. The state responsible for issuing the second type of license would depend upon where the services were to be provided. If the services were to be offered within State A, then that state would be responsible for issuing the license. Alternatively, if the entity intended to provide services to a third country, for instance, State B, it would be the responsibility of that state to grant a service license. Obviously, State B would issue such a license if it believed that the proposed activity would not be detrimental to its national security interests. The license would then include a series of requirements to prevent the entity from causing harmful interference with preexisting services and would define the conditions governing operations. Furthermore, the licensing authority would be entitled to demand an annual fee from the licensee. This kind of licensing system is not uncommon. For example, in the context of the licensing of a mega-constellation of satellites, the Federal Communications Commission (FCC) recently granted OneWeb access to the U.S. communication market.<sup>89</sup> OneWeb is a United Kingdom-based company, so the launch of its satellites had to be authorized by the United Kingdom.<sup>90</sup> However, in order to provide broadband services in the United States using satellite technologies, it required a license from the competent U.S. authority, in this case the FCC.

## Conclusion

Near-space activities represent the new frontier of aerospace operations. Recent studies have indicated that the provision of communication, Internet, and other services from near space is potentially highly profitable. These promising prospects have attracted a number of nongovernmental entities to enter near-space business with the goal of offering services on a domestic and international basis.

Despite these positive developments, the uncertain legal status of near space still poses challenges to the effective commencement of large-scale near-space activities. This

uncertainty is particularly detrimental to international activities and might lead to burdensome restrictions or even the outright denial of such activities. This ambiguity may not only lead some entities to abandon their near space plans but also harm customers who may be deprived of services that are otherwise unavailable.

In order to overcome these obstacles and promote the broadest utilization of near space as well as the greatest accessibility of services, this article has suggested a new classification of near space above the territory of a state (land and territorial sea) as the exclusive utilization space. At its core, the EUS proposal is an attempt to achieve a balance between the rights of the state above which territory an EUS is established, the underlying state, and the interests of the entities willing to provide near space services. On the one hand, while the EUS would not constitute a part of the underlying state's territory, such a state would retain sovereign and priority rights of utilization and management. On the other hand, domestic and foreign entities, upon meeting the underlying state's safety and security requirements, would have the opportunity to deploy their vehicles and carry out their intended activities within an exclusive utilization space. The EUS proposal would not undermine the legal position of the underlying state. First, only that state could establish an EUS above its territory, and second, it would be entitled to set out conditions and requirements to be complied with by operators.

The authors of the present article are aware of the controversial and still embryonic nature of the EUS proposal. Undoubtedly, elements of the proposal need some refinement and a greater level of specificity in order to be applied in practice. However, the ultimate goals of this article are to draw attention to the current uncertainty surrounding the legal status of near space, to stimulate discussions about developing a regulatory framework to govern activities therein, and to hopefully provide some ideas to serve as a foundation for such discussions. In this respect, a possible forum for discussion could be ICAO, which has already shown an interest in addressing and possibly regulating aerospace matters, as demonstrated by the recent establishment of its Space Learning Group.

This article concludes with the hope that the upcoming near-space era will bring benefits not only to those states and entities directly engaged in its management and use, but also, and most importantly, to civilian users.

## Notes

1. For a general review of these technologies see Flavio Araripe d'Oliveira, Francisco Lourenço de Melo, and Tessaleno Campos Devezas, "High Altitudes Platforms: Present Situation and Technology Trend," *Journal of Aerospace Technology and Management* 8 (2016): 249; Alejandro Aragon Zavala, Luid Cuevas-Ruis, and José Delgado-Penin, *High Altitude Platform for Wireless Communication* (Chichester: Wiley, 2008); Stylianos Karapantazis and Fotinioti Pavlidou, "Broadband Communication via High-Altitude Platforms: A Survey, Communications Surveys and Tutorials," *IEEE Communications Surveys and Tutorials* 7, no.1 (2005): 2; Toshiaki Tsujii, Masatoshi Harigae, and Masashi Harada, "Navigation and Positioning System Using High Altitude Platforms Systems," *Journal of the Japan Society of Aeronautical and Space Sciences* 52 (2004): 175; Emanuela Faletti, "Integrated Services from High-Altitude Platforms: A Flexible Communication System," *IEEE Communications Magazine* 44 (2005): 85.
2. Araripe d'Oliveira, Lourenço de Melo, and Campos Devezas, *supra* note 1, at 251–56.

3. Examples of unsuccessful projects were SkyStation and Halo: the former aimed at placing solar-powered high-altitude platforms at altitudes around 21km to provide wireless communication services, and the latter planned to deploy airplanes at similar altitudes to offer broadband communications. For more information, see Aragon Zavala, Cuevas-Ruis, and Delgado-Penin, *supra* note 1, 20-25.
4. *Ibid.*, 23; and Dean Reinhardt, “The Vertical Limit of Sovereignty,” *Journal of Air Law and Commerce* 72 (2007): 65, 94–100.
5. Tom Simonite, “Billions of People Could Get Online for the First Time Thanks To Helium Balloons That Google Will Soon Send Over Many Places Cell Towers Don’t Reach,” [www.technologyreview.com/s/534986/project-loon/](http://www.technologyreview.com/s/534986/project-loon/); Will Oremus, “Not as Loony as It Sounds,” [www.slate.com/articles/technology/future\\_tense/2014/12/project\\_loon\\_how\\_google\\_s\\_internet\\_balloons\\_are\\_actually\\_working.html](http://www.slate.com/articles/technology/future_tense/2014/12/project_loon_how_google_s_internet_balloons_are_actually_working.html) (accessed March 22, 2018).
6. See [x.company/loon](http://x.company/loon). Significantly, in October 2017 the X company was able to provide immediate Long Term Evolution (LTE) coverage to Puerto Rico in the aftermath of Hurricane Maria, [www.engadget.com/2017/11/09/project-loon-delivers-internet-100-000-people-puerto-rico](http://www.engadget.com/2017/11/09/project-loon-delivers-internet-100-000-people-puerto-rico). Furthermore, in 2016, X concluded an agreement with Sri Lanka to provide full Internet coverage using LTE.
7. For a description of the Facebook Internet Project see [www.wired.com/2016/01/facebook-zuckerberg-internet-org](http://www.wired.com/2016/01/facebook-zuckerberg-internet-org).
8. For example, on November 21, 2014, Kuang-Chi signed a joint memorandum with Airways New Zealand to enable the launch of a near-space commercial platform called Traveler from New Zealand territory. The Traveler was successfully launched on June 6, 2015. For more details about the activities of Kuang-Chi see [www.kuang-chi.com/en](http://www.kuang-chi.com/en). For technical information about the use of wireless sensor systems in near space see, e.g., Wen-Qin Wang and Dingde Jiang, “Integrated Wireless Sensor Systems Via Near Space and Satellite Platforms: A Review,” *IEEE Sensors Journal* 14 (2014): 3903.
9. See Transparency Market Research, “High Altitude Platforms (Airships, Unmanned Aerial Vehicles (UAV) and Tethered Aerostat Systems), Market—Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2015–2023,” (2017), [www.transparencymarketresearch.com/high-altitude-platforms-technologies.html](http://www.transparencymarketresearch.com/high-altitude-platforms-technologies.html).
10. Ned Allen, “Our Strategic Space Shore: Opportunities in Near Space,” *Aerospace America* 31 (2007): 45.
11. Paul Stephen Dempsey and Kevin O’Connor, “Air Traffic Congestion and Infrastructure Development in the Pacific Asia Region,” in *Asia Pacific Air Transport: Challenges and Policy Reforms* (Singapore: Institute of Southeast Asia Studies, 1997), 23–25; Paul Dempsey, *Public International Air Law* (Montreal: Centre for Research in Air and Space Law, 2008), 164–171; Justine Barkowski, “Managing Air Traffic Congestion Through the Next Generation Air Transportation System: Satellite Based Technology, Trajectories, and Privatization?,” *Pepperdine Law Review* 37 (2010): 247.
12. National Space Policy of the United States of America, June 28, 2010, available at [www.nasa.gov/sites/default/files/national\\_space\\_policy\\_6-28-10.pdf](http://www.nasa.gov/sites/default/files/national_space_policy_6-28-10.pdf).
13. Araripe d’Oliveira et al., *supra* note 1, at 260.
14. For more information on these technical challenges see *ibid.*, at 258–260.
15. See first section.
16. Araripe d’Oliveira et al., *supra* note 1, at 261; David Grace and Mihael Mohorcic, *Broadband Communications via High-Altitude Platforms* (Chichester: Wiley 2010).
17. See Karapantazis and Pavlidou, *supra* note 2, at 5. One such near-space international project is the Angel Technologies Corporation’s plan to provide high-speed Internet access via stratospheric HALO aircraft deployed at 51,000 feet, [www.isoc.org/inet99/proceedings/4d/4d\\_3.htm](http://www.isoc.org/inet99/proceedings/4d/4d_3.htm). Companies like Airborne Wireless Network (AWN) are, for their part, proposing to operate a high-speed broadband airborne wireless network by linking commercial aircraft in flight. Essentially, AWN is planning to install its broadband transceivers on a critical mass of airborne aircraft and use these equipped aircraft as signal repeaters capable of providing wireless signals all over the world. For more information, see

- Woodrow Bellamy III, “This Company Plans to Turn Airplanes into Communication Satellites,” [www.satellitetoday.com/telecom/2017/02/08/company-plans-turn-airplanes-communications-satellites](http://www.satellitetoday.com/telecom/2017/02/08/company-plans-turn-airplanes-communications-satellites), and the Airborne Wireless Network website at [www.airbornewirelessnetwork.com/index.asp](http://www.airbornewirelessnetwork.com/index.asp).
18. See Eric Cook, “Broad Area Wireless Networking via High Altitude Platforms,” unpublished PhD dissertation, Naval Postgraduate School, 2013, available at [calhoun.nps.edu/bitstream/handle/10945/34648/13Jun\\_Cook\\_Eric.pdf?sequence=1](http://calhoun.nps.edu/bitstream/handle/10945/34648/13Jun_Cook_Eric.pdf?sequence=1); Zhe Yang and Mohammed Abbas, “High Altitudes Platforms for Wireless Mobile Communication Applications,” in *Mobile and Wireless Communication Physical Layer Development and Implementation*, edited by Salma Ait Fares and Fumiyuki Adachi (Vukovar: IntechOpen, 2015), 47–56.
  19. Indeed, several states, while not possessing near-space technology (and not intending to develop it) are still interested in benefiting from near-space services and in allowing their population to access it. See Araripe d’Oliveira et al., *supra* note 1, at 252–258; and Aragon Zavala et al., *supra* note 1, at 51.
  20. Paul G. Dembling and Daniel M. Arons, “The Evolution of the Outer Space Treaty,” *Journal of Air Law and Commerce* 33 (1967): 151.
  21. On this point, see Ruth Stilwell, “The First 100 KM, the Case for Integrated Space and Aviation Policy and Governance,” in *Space Safety is No Accident*, edited by Tommaso Sgobba and Isabelle Rongier (Berlin: Springer, 2015), 561–570; Joseph Pelton, “A New Integrated Global Regulatory Regime for Air and Space: The Needs for Safety Standards for the Protozone,” Paper presented at the 2nd Manfred Lachs International Conference on Global Space Governance, Montreal, May 2014, available in Ram Jakhu, Kuan-Wei Chen, and Yaw Nyampong, eds., Monograph Series III, *Global Space Governance* (Montreal: McGill University Centre for Research in Air and Space Law, 2015), 293; Matthew King, “Sovereignty’s Grey Area: The Delimitation of Air and Space in the Context of Aerospace Vehicles and the Use of Force,” *Journal of Air Law and Commerce* 81 (2016): 377.
  22. Francis Lyall and Paul Larsen, *Space Law: A Treatise* (Oxford: Routledge, 2009), 163; Jinyuan Su, “Near Space as a Sui Generis Zone: A Tri-Layer Approach of Delimitation,” *Space Policy* 29 (2013): 90; Joseph Pelton, “Urgent Security Concerns in the Protozone,” Paper presented at the 4th Manfred Lachs Conference, Montreal, May 2016 (on file with the author); and King, *supra* note 21, at 403.
  23. The Federal Aviation Administration (FAA) does not allow commercial aircraft to exceed the altitude of 40,000 feet (MSL) unless the structure is certified to not have any type of decompression. See *Federal Aviation Administration, Advisory Circular—AC No: 61-107B, Aircraft Operations at Altitudes Above 25,000 Feet Mean Sea Level or Mach Numbers Greater Than .75*, March 29, 2013.
  24. See King, *supra* note 21, at 407, 411; Rebecca Maksel, “Who Holds the Altitude Record for an Airplane?,” *Air and Space Magazine* (2009), [www.airspacemag.com/need-to-know/who-holds-the-altitude-record-for-an-airplane-141522931](http://www.airspacemag.com/need-to-know/who-holds-the-altitude-record-for-an-airplane-141522931).
  25. For the purpose of air traffic control, domestic airspace is divided in different areas: controlled, uncontrolled, special use, and other airspace. See *Airspace Classification* at [herschlogbook.sg?2012/08/airspace.html](http://herschlogbook.sg?2012/08/airspace.html), as well as [www.faa.gov/regulations\\_policies/handbooks\\_manuals/aviation/phak/media/17\\_phak\\_ch15.pdf](http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/17_phak_ch15.pdf). Generally, domestic regulations apply to a maximum altitude of flight level (FL) 600, approximately 60,000 feet (18,000 m). For more information, see Federal Aviation Authority (FAA), *Appendix A, National Airspace System Overview*, available at [www.faa.gov/air\\_traffic/nas/nynjphl\\_redesign/documentation/feis/media/Appendix\\_A-National\\_Airspace\\_System\\_Overview.pdf](http://www.faa.gov/air_traffic/nas/nynjphl_redesign/documentation/feis/media/Appendix_A-National_Airspace_System_Overview.pdf).
  26. In practice, Low Earth Orbit satellites (Low Earth Orbit consists of the orbits located between 150 to 2000 km or 6,561,679 feet of altitude) are normally placed at a minimum level of 160 km (524,934 feet) because below that altitude, satellites enter a state of orbital decay caused by atmospheric drag. Low Earth Orbit is an orbit around the earth with an altitude of 2000 km (524,934 feet).
  27. Australia, Space Activities Act of 1998, as revised in 2001 and 2010, Part II—Definitions, “Space Object”: “A payload (if any) that the launch vehicle is to carry into or back from an

- area beyond the distance of 100 km above mean sea level.” The text of the act is available at [www.industry.gov.au/regulation-and-standards/space-regulation](http://www.industry.gov.au/regulation-and-standards/space-regulation).
28. Law of the Republic of Kazakhstan on Space Activities, January 6, 2012, Chapter I—Article 1, Basic Definitions, “Outer Space”: “A space extending beyond the airspace at an altitude of more than one hundred kilometers above the sea level.” The law is available at [cis-legislation.com/document.fwx?rgn = 49320](http://cis-legislation.com/document.fwx?rgn = 49320).
  29. Denmark, Law on Activities in Outer Space, May 3, 2016, Chapter II—Definitions, “Outer Space”: “Outer space: The area located more than 100 kilometers above sea level.” The law is available at [ufm.dk/en/legislation/prevaling-laws-and-regulations/outer-space](http://ufm.dk/en/legislation/prevaling-laws-and-regulations/outer-space).
  30. On the contrary, as described in the preceding, states seem to have a common understanding of where the spatial limitations of near space lie.
  31. Article 43, Convention on International Civil Aviation, adopted 7 December 1944, entered into force 4 April 1947, 15 *U.N.T.S.* 295 [hereinafter Chicago Convention].
  32. For an overview of the 1944 Chicago Convention see Dempsey, *supra* note 10, at 41–65; Michael Milde, “The Chicago Convention—After Forty Years,” *Annals of Air and Space Law* 9, (1984): 119; Ruwantissa Abeyratne, *Convention on International Civil Aviation* (New York: Springer, 2014).
  33. This principle was first established in Article 1 of the 1919 International Convention on Air Navigation [hereinafter Paris Convention] that recognized that “every Power has complete and exclusive sovereignty over the airspace above its territory.” Convention on the Regulation of Aerial Navigation, adopted 13 October 1919, entered into force 11 July 1922, 297 *L.N.T.S.* 173. For an overview of the period between the 1919 Paris Convention and the 1944 Chicago Convention, see Malgorzata Polkowska, “The Development of Air Law—From the Paris Conference of 1910 to the Chicago Convention of 1944,” *Annals of Air and Space Law* 33 (2008): 59; and Pascal Dupont, “L’espace aérien entre souveraineté et liberté au seuil du 21ème siècle,” *Revue Française de Droit Aérien et Spatial* 220 (2004): 13.
  34. For an analysis of Article 1 of the Chicago Convention and the concept of sovereignty as it applies to national airspace, see King, *supra* note 19, at 407; Dempsey, *supra* note 10, at 44; Reinhardt, *supra* note 4, at 69–76; John Cobb Cooper, *Roman Law and the Maxi “Cuius est Solum” in International Air Law* (Montreal: McGill University Press, 1952), republished in *Explorations in Aerospace Law: Selected Essays by John Cobb Cooper*, edited by Ian Vlasic (Montreal: McGill University Press, 1968), 54–102; Francis Lyall, “The Maxim ‘Cuius est Solum’ in Scots Law,” *Juridical Review* 147 (1978): 69; and Herbert David Klein, “Cuius est Solum, Eius Est ... Quousque tandem?,” *Journal of Air Law and Commerce* 26 (1959): 237.
  35. See, for example, 49 U.S. Code § 40103, “Sovereignty and Use of the Air Space.” The United States Code is the official compilation and codification of the general and permanent federal statutes of the United States. Pursuant to 19 CFR, Chapter I—U.S. Customs and Border Protection, Department of Homeland Security, § 122.0—Air Commerce Regulations, 122.49b: “Electronic manifest requirement for crew members and non-crew members onboard commercial aircraft arriving in, continuing within, and overflying the United States,” the term ‘Territorial Airspace of the United States’ means “the airspace over the United States, its territories, and possessions, and the airspace over the territorial waters between the United States coast and 12 nautical miles from the coast.” Available at [www.gpo.gov/fdsys/pkg/CFR-2011-title19-vol1/pdf/CFR-2011-title19-vol1-sec122-49b.pdf](http://www.gpo.gov/fdsys/pkg/CFR-2011-title19-vol1/pdf/CFR-2011-title19-vol1-sec122-49b.pdf).
  36. John Cobb Cooper, “United States’ Participation in the Drafting of the Paris Convention,” *Journal of Air Law and Commerce* 18 (1951): 266; Daniel Goedhuis, “Civil Aviation After the War,” *American Journal of International Law* 36 (1942): 596; Daniel Goedhuis, “Sovereignty and Freedom in the Airspace,” *Transaction of Grotius Society* 41 (1955): 137.
  37. Abeyratne, *supra* note 31, at 14.
  38. See Articles 3 and 6 of the Chicago Convention. For further restricting measures on access and use of the airspace in the United States, see [www.faa.gov/uas/where\\_to\\_fly/airspace\\_restrictions](http://www.faa.gov/uas/where_to_fly/airspace_restrictions).
  39. See Dempsey, *supra* note 11, at 164–203; Roxanne Zolin and Ira Lewis, “Air Navigation Services and the United States: A Comparative Case Study,” *Case Studies in Business and*

- Management* 1 (2014): 96; ICAO Working Paper ATConf/6-WP/52, “Performance of Air Navigation Services,” available on the ICAO website.
40. The term “SARPs” is used by ICAO to refer to the technical specifications adopted by its council to achieve “the highest practicable degree of uniformity in regulations, standards, procedures and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation.” See Dempsey, *supra* note 11, at 61–65.
  41. John Cobb Cooper, “High Altitude Flight and National Sovereignty,” in *Explorations in Aerospace Law: Selected Essays by John Cobb Cooper*, edited by Ian Vlastic (Montreal: McGill University Press, 1968), 256–258 [quoting Westlake].
  42. Dean N. Reinhardt, “The Vertical Limit of State Sovereignty,” 72 *Journal of Air Law & Commerce* 72 (2007): 65.
  43. Henry Jacobini, “Effective Control as Related to the Extension of Sovereignty in Space,” *Journal of Public Law* 7 (1958): 97.
  44. John Cobb Cooper, “Legal Problems of Upper Space,” in *International Air Law—Proceedings of the American Society of International Law’s Annual Meeting* (Cambridge: ASIL, 1956), 84, at 85–93.
  45. International space law regulates objects launched into outer space, either in Earth orbit or beyond.
  46. On the issue of delimitation between airspace and outer space see Lyall and Larsen, *supra* note 20, at 153; David Craig, “National Sovereignty at High Altitudes,” *Journal of Air Law and Commerce* 24 (1957): 384; Cooper, *supra* note 40, 98; Thomas Cheney and Lauren Napier, “Policy Analysis: Air Versus Space, Where Do Suborbital Flights Fit into International Regulations?” *Journal of Science Policy and Government* 7 (2015): 1.
  47. The act is available at [www.legislation.govt.nz/act/public/2017/0029/45.0/DLM6966275.html](http://www.legislation.govt.nz/act/public/2017/0029/45.0/DLM6966275.html) (accessed March 22, 2018).
  48. For an analysis of the drafting of the Act, see Gareth Hughes, “Outer Space and High-Altitude Activities Bill—Third Reading,” available at [www.greens.org.nz/news/speech/gareth-hughes-outer-space-and-high-altitude-activities-bill-third-reading](http://www.greens.org.nz/news/speech/gareth-hughes-outer-space-and-high-altitude-activities-bill-third-reading).
  49. Outer Space and –ndement and utilization of non- Using EEZ Precedent</rrh > as an opening for next summer. If you’omon belashion. She laughed thouHigh-Altitude Act of 2017, Part 1, “Preliminary Provisions,” Chapter 4 “Interpretations.”
  50. Outer Space and High-Altitude Act of 2017, Part 2, Subpart 6, “High-altitude licenses,” 45. Requirements for high-altitude licenses.
  51. Outer Space and High-Altitude Act of 2017, Part 2, Subpart 1, “Launch Licenses.”
  52. Outer Space and High-Altitude Act of 2017, Part 1 “Preliminary Provisions,” Chapter 4 “Interpretations.”
  53. 49 U.S. Code § 40103—“Sovereignty and use of airspace.”
  54. 49 US Code § 40103.
  55. Annex 7, Chicago Convention, *supra* note 28.
  56. In this respect, near-space vehicles can be divided into free floaters and maneuvering vehicles. Free floaters’ flying speed and direction depend mostly on existing winds, even though they are also capable of limited steering that enables them to float at different altitudes and take advantage of different wind directions and speed. Instead, near-space maneuvering vehicles can use a variety of propulsion mechanisms to fly or keep stationary over a specific area of interest. For example, high-altitude buoyant lift systems rise only to an altitude where the ambient air density equals the weight-to-volume ratio of the buoyant system. For more information, see Su, *supra* note 20, at 91.
  57. A “High Altitude Platform Station” (HAPS) is defined in the International Telecommunication Union’s Radio Regulations (RR) No. S1.66 A as “A station located on an object at an altitude of 20–50 km and at a specified, nominal fixed point relative to the Earth,” available at [search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.43.48.en.101.pdf](http://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.43.48.en.101.pdf).
  58. The literature on the EEZ is extensive: for example, see Robin Churchill and Vaughan Lowe, *The Law of the Sea* (Manchester: Manchester University Press, 1999), 133–152; David

- Joseph Attard, *The Exclusive Economic Zone in International Law* (Oxford: Oxford University Press, 1987); Barbara Kwiatkowska, *The 200 Miles Exclusive Economic Zone in the New Law of the Sea* (Dordrecht: Brill, 1989); Gemma Andreone, "The Exclusive Economic Zone," in *The Oxford Handbook of the Law of the Sea*, edited by Donald Rothwell, Alex Oude Elferink, Karen Scott, and Tim Stephens (Oxford: Oxford University Press, 2015) 159–180; Budislav Vukas, *The Law of the Sea* (Leiden: Brill, 2004), 83–111; Donald Rothwell and Tim Stephens, *The International Law of the Sea* (Oxford: Hart Publishing, 2010), 82–97; Francis Rigaldies, "La zone économique exclusive dans la pratique des états," *Canadian Yearbook of International Law* 35 (1997): 3; Syma A. Ebbin, Alf H. Hoel, and Are Sydnes (editors), *A Sea Change: The Exclusive Economic Zone and Governance Institutions for Living Marine Resources* (Springer Netherlands, 2005).
59. Robin Churchill, "The Impact of State Practice on the Jurisdictional Framework Contained in the LOS Convention," in *Stability and Change in the Law of the Sea: The Role of the LOS Convention*, edited by Alex Oude Elferink (Leiden: Martinus Nijhoff Publishers, 2005), 91–126.
  60. Article 55, United Nations Convention on the Law of the Sea, adopted 10 December 1982, entered into force 16 November 1994, 1833 *U.N.T.S.* 1833 (hereinafter the LOSC).
  61. See Franciso Orrego Vicuña, "La Zone Économique Exclusive: Régime et Nature Juridique dans le Droit International," in *Collected Courses of the Hague Academy of International Law* (Leiden: Brill, 1986), 199; Moira L. McConnell, "Observations on the Law Applicable on the Continental Shelf and in the Exclusive Economic Zone: A Comparative View," *Ocean Yearbook* 25 (2011): 221.
  62. Rothwell and Stephens, *supra* note 54, at 84; Gemma Andreone and Giuseppe Cataldi, "Sui Generis Zones," in *The IMLI Manual of International Maritime Law: The Law of the Sea*, edited by David Attard, Malgosia Fitzmaurice, and Norman Martinez (Oxford: Oxford University Press, 2014), 217–238; Francisco Orrego Vicuña, *The Exclusive Economic Zone: Regime and Legal Nature Under International Law* (Cambridge: Cambridge University Press, 1989), 44; Kwiatkowska, *supra* note 54, at 5.
  63. See McConnell, *supra* footnote 57, at 225; Winston Conrad Extavour, *A Study of the Evolution and Progressive Development of the International Law of the Sea* (Leiden: Brill 1979), 171–182. The territorial sea is considered as territory of the coastal state pursuant to Article 1 of the 1958 Convention on the Territorial Sea and Contiguous Zone, adopted 29 April 1958, entered into force 10 September 1964, 516 *U.N.T.S.* 205, and Articles 2 and 3 of the LOSC. Pursuant to Article 1 of the 1958 Convention on the High Seas, adopted 29 April 1958, entered into force 30 September 1962, 450 *U.N.T.S.* 11, the water column beyond territorial waters was considered as high seas.
  64. Proclamation with respect to Coastal Fisheries in Certain Areas of the High Seas, 28 September 1945, Proclamation 2668 by U.S. President Harry S. Truman, available at [www.presidency.ucsb.edu/ws/?pid=58816](http://www.presidency.ucsb.edu/ws/?pid=58816). For a commentary on the proclamation see Douglas M. Johnston, *The International Law of Fisheries* (New Haven: Yale University Press, 1965), 333–338; Jean-Pierre Quéneudec, "La Remise en Cause du Droit de la Mer," in *Actualités du droit de la mer—Colloque de Montpellier 1972*, edited by Société française pour le droit international (Paris: A. Pedone DL, 1973), 34–35.
  65. Proclamation with respect to the Natural Resources of the Subsoil and the Sea-Bed of the Continental Shelf, 27 September 1945, Proclamation 2667 by U.S. President Henry S. Truman, available at [www.trumanlibrary.org/proclamations/index.php](http://www.trumanlibrary.org/proclamations/index.php).
  66. For an analysis of these claims see Robert W. Smith, *Exclusive Economic Zone Claims: An Analysis and Primary Documents* (Dordrecht: Martinus Nijhoff Publishers, 1986).
  67. Article 57 of the LOSC.
  68. In principle, states are free to claim an EEZ of a lesser breadth than 200 nautical miles and to assert less than the full array of rights granted by the EEZ regime.
  69. For an extensive analysis of the rights given to coastal states and other states in the EEZ, see Andreone, *supra* note 54, at 165–180; Robert Beckham and Tara Davenport, "The EEZ Regime: Reflections After Thirty Years," in *Securing the Ocean for the Next Generation*:

*Papers from the Law of the Sea Institute-Korea Institute of Ocean Science and Technology Conference*, edited by Harry N. Scheiber and Moon S. Kwon (Wollongong: Australian National Centre for Ocean Resources and Security, 2012), at [www.law.berkeley.edu/files/Beckman-Davenport-final.pdf](http://www.law.berkeley.edu/files/Beckman-Davenport-final.pdf).

70. Article 56 of the LOSC.
71. Articles 61 and 62 of the LOSC.
72. On the distribution of fishing rights, see Tore Henriksen and Alf H. Hoel, "Determining Allocation: From Paper to Practice in the Distribution of Fishing Rights Between Countries," *Ocean Development & International Law* 42 (2011): 66.
73. Articles 61 and 62 of the LOSC. Part V also contains provisions that are specific to certain categories of fisheries (see Articles 64–68 of the LOS).
74. Article 73 of the LOSC.
75. Articles 62, 69, and 70 of the LOSC.
76. Andreone, *supra* note 54, at 165–66; Ivan Shearer, "Ocean Management Challenges for the Law of the Sea in the First Decade of the 21st Century," in *Ocean Management in the 21st Century: Institutional Frameworks and Responses*, edited by Alex Oude Elferink and Donald Rothwell (Leiden: Brill, 2004), 1–17.
77. Rothwell and Stephens, *supra* note 54, at 88. On the dispute settlement mechanism of the Law of the Sea Convention see Alan E. Boyle, "Dispute Settlement and the Law of the Sea: Problems of Fragmentation and Jurisdiction," *International Comparative Law Quarterly* 46 (1997): 37.
78. On the management and utilization of nonliving resources, see David M. Ong, "Towards an International Law for Conservation of Offshore Hydrocarbon Resources within the Continental Shelf," in *The Law of the Sea: Progress and Prospects*, edited by David Freestone, Richard Barnes, and David M. Ong (Oxford: Oxford University Press, 2006), 93–110.
79. Article 60 of the LOSC.
80. Articles 60(3) and 60(4) of the LOSC.
81. Article 60(2) of the LOSC.
82. Part. VII "High Seas" of the LOSC. See, particularly, Article 87, "Freedom of the High Seas."
83. Rothwell and Stephens, *supra* note 54, at 93.
84. Article 58(3) of the LOSC.
85. Joseph N Pelton, "Urgent Security Concerns in the "Proto-Zone" (May 2016), Presentation at the 4th International Manfred Lachs Conference on Conflicts in Space and the Rule of Law, McGill University, Institute of Air and Space Law Montreal, online: IASL [www.mcgill.ca/iasl/files/iasl/mlc4\\_presentation\\_j\\_pelton.pptx](http://www.mcgill.ca/iasl/files/iasl/mlc4_presentation_j_pelton.pptx), slide 3.
86. Paul S. Dempsey and Maria Manoli, Sub-orbital Flights and the Delimitation of Air Space Vis-à-vis Outer Space: Functionalism, Spatialism and State Sovereignty, A Submission by the Space Safety Law & Regulation Committee of the International Association for the Advancement of Space Safety, 57th Session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, 9–20 April 2018, A/AC.105/C.2/2018/CRP.9.
87. "Sovereignty in the relations between States signifies independence" and "independence in regard to a portion of the globe is the right to exercise therein, to the exclusion of any other State, the functions of a State." See *Island of Palmas Case* (Netherlands, USA), Award of 4 April 1928, II R.I.A.A. 829. On the concept of sovereignty, see among an abundant literature: Sergio M. Carbone and Lorenzo Schiano di Pepe, "States, Fundamental Rights and Duties," in *Max Planck Encyclopedia of Public International Law*, edited by Rüdiger Wolfrum (Oxford: Oxford University Press, 2012) 566; Janice Thompson, "State Sovereignty in International Relations: Bridging the Gap between Theory and Empirical Research," *International Studies Quarterly* 39 (1995): 213; Antonio Cassese, *International Law* (Oxford, New York: Oxford University Press, 2005), 71–97.

88. According to the right to equality (or equal treatment), all states occupy the same position within the international community, have the same legal capacity, and bear equal rights and duties regardless of their size or power. The right has been enshrined, inter alia, in the UN General Assembly, *Declaration on Principles of International Law concerning Friendly Relations and Cooperation among States in accordance with the Charter of the United Nations*, 24 October 1970, A/RES/2625(XXV), [www.refworld.org/docid/3dda1f104.html](http://www.refworld.org/docid/3dda1f104.html) (see Paragraph 15); the Organization of African Unity (OAU), *Charter of the Organization of African Unity*, 25 May 1963, available at [www.refworld.org/docid/3ae6b36024.html](http://www.refworld.org/docid/3ae6b36024.html); and the Organization of African Unity (OAU), *Constitutive Act of the African Union*, 1 July 2000, [www.refworld.org/docid/4937e0142.html](http://www.refworld.org/docid/4937e0142.html) (see Paragraph 12). On the concept of equality, see, among many others, James Crawford, “The Criteria for Statehood in International Law,” *British Yearbook of International Law* 48 (1977): 93.
89. Federal Communications Commission, Action by the Commission on June 22, 2017 by Order and Declaratory Ruling (FCC 17-77): “FCC Grants OneWeb Access to the US Market for Its Proposed New Broadband Satellite Constellation,” [www.fcc.gov/document/fcc-grants-oneweb-us-access-broadband-satellite-constellation](http://www.fcc.gov/document/fcc-grants-oneweb-us-access-broadband-satellite-constellation).
90. According to Article VI of the 1967 Outer Space Treaty, a nongovernmental entity willing to undertake space activities must be authorized and continuously supervised by an appropriate state. Treaty on principles governing the activities of states in the exploration and uses of outer space, including the Moon and other celestial bodies (Outer Space Treaty), adopted 27 January 1967, entered into force 19 October 1967, 610 *U.N.T.S.* 8843. On Article VI see, for example, Frans Gerhard von der Dunk, “The Origins of Authorization: Article VI of the Outer Space Treaty and International Space Law,” in *National Space Legislation in Europe*, edited by Frans Gerhard von der Dunk (Leiden: Brill, 2011), 3–28.