

Managing the Global Commons

The geopolitical theorist Sir Halford Mackinder once observed that democracies find it difficult to think strategically in peacetime. It should not be surprising then that one of the United States' core peacetime strategic objectives for more than half a century—the development of a robust international system based on free trade, international law, and international institutions—was born in wartime. The 1944 Bretton Woods agreement laid the foundation for this system to reconcile and reconstruct the Axis powers and avoid another world war. This strategy was further developed in 1950 with “NSC 68,” which claimed that the development of a healthy international community should be pursued by the United States even without the existence of a Soviet threat.¹

The international system is inextricably interwoven with the continued openness and stability of the world's common spaces.² Open commons allow large container ships to connect manufacturers to customers all over the world, like-minded individuals to share information as well as ideas, and global militaries to coordinate movements over vast distances. These capabilities did not happen by accident; they are the result of decades of effort by governments and private corporations to build a “system of systems” that allow for global commerce. These systems exist within and between the global commons: the sea, air, space, and cyberspace.

Today, over 90 percent of global trade—worth over \$14 trillion in 2008—travels by sea.³ Every year, 2.2 billion passengers and 35 percent of the world's manufactured exports, by value, travel through the air.⁴ Governments, militaries, and corporations around the world rely on space for communications, imagery, and accurate positioning services. Any computer in the world with access to the

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The Washington Quarterly • 33:3 pp. 165–182
DOI: 10.1080/0163660X.2010.492347

Internet can access and transmit information to any place in the world within seconds, allowing unprecedented connectivity for global financial transactions, social networks, commercial enterprises, and militaries.

Since the end of World War II, and especially since the end of the Cold War, the openness and stability of the global commons have been protected and sustained by U.S. military dominance and political leadership. The U.S. Navy and Coast Guard have dissuaded naval aggression and fought piracy around the world, ensuring unprecedented freedom of the seas. The United States led the creation of international agreements on air transportation, enabling the creation of a global air industry. Washington also forged an international consensus on the openness of space, ensuring that all countries with the means to do so can utilize orbital space for scientific, commercial, and military purposes. Lastly, research funded by the U.S. government led to the creation of a

Four key elements are reshaping U.S. hard power to help manage the global commons.

decentralized network of connections now called the Internet, which connects physically dispersed markets, capital, and people.

For the past 65 years, U.S. power has been derived in part from providing global public goods that also service vital U.S. interests, including stability in key regions, a vibrant and interconnected global economy, and open access to the global commons. Leading American theorist Joseph Nye has argued

that considering the relationship of U.S. power to global public goods helps to unveil “an important strategic principle that could help America reconcile its national interests with a broader global perspective and assert effective leadership.”⁵ Geography made the United States a natural sea power, while successful exploitation of air, space, and U.S. technological prowess made the United States a power in the other commons as well. Yet, globalization—by lowering trade barriers, spreading advanced technologies, and enabling the rise of new economic powers—has given birth to new military powers capable of changing the military dynamics within the global commons, heralding a new era in which unilateral U.S. military power alone will be insufficient to preserve their openness and stability.

To address these changes, the United States must adapt its military and diplomatic approaches to the global commons. While U.S. hard power is already being adjusted to account for these threats, Washington has yet to articulate a diplomatic strategy to sustain access to the commons. Just as the Obama administration has emphasized “mutual interest” in pushing initiatives from nuclear nonproliferation to engaging the Muslim world, Washington should now emphasize the international system’s dependence on the global commons in

order to build support for international regimes and agreements that bolster their openness and stability.

Challenges to Unilateral Dominance

U.S. dominance of the global commons has driven some states and non-state actors to pursue military capabilities to undermine the U.S. military's ability to access and operate within the commons. Analysis of U.S. war-fighting practices since the 1991 Persian Gulf War have repeatedly demonstrated the tremendous advantage enjoyed by the U.S. military because of its unfettered use of the global commons. Potential adversaries are now pursuing these capabilities in the hope that, if successful, the U.S. military could be more easily deterred, dissuaded, or defeated. Two trends—the emergence of new military powers pursuing high-end asymmetric capabilities and the distribution of disruptive technologies to state and non-state actors—will enable potential adversaries to fundamentally challenge the U.S. military's ability to maintain dominance within the global commons, with profound implications for the international economic order.

First, enabled by free trade and post-Cold War stability, new economic powers are emerging, giving rise to a multipolar world with new centers of power.⁶ Several of these states are using their newfound wealth to modernize their militaries, which will inevitably increase the number of players within the global commons. According to data compiled by the Stockholm International Peace Research Institute (SIPRI), since 1998 the major emerging and revanchist states with significant defense budgets (e.g., Brazil, China, India, Russia, and Saudi Arabia) have collectively more than doubled their military spending in the past decade. These major emerging states are already beginning to orient their militaries toward the global commons, fielding significant maritime capabilities including advanced surface combatants, increasingly capable submarines, sophisticated anti-ship cruise missiles, and (in China's case) ballistic missiles designed to strike major ships at sea.⁷ Likewise, emerging states are acquiring advanced air capabilities, including fourth-generation fighters and advanced integrated air defense systems. States are also developing the ability to operate within and potentially challenge the ability of an adversary to access space, along with challenging their potential within cyberspace.⁸

The second trend caused by globalization—lowering the threshold for states and non-state actors to acquire disruptive military technologies—will also challenge the ability of the United States to maintain the openness and stability of the global commons. States like Iran, and non-state actors like Hezbollah, have been able to acquire advanced military capabilities that would otherwise be far out of reach for their indigenous defense bases. Armed with a small fleet of frigates and fast patrol craft, along with submarines, mines, and

advanced anti-ship cruise missiles, Iranian military doctrine and recent exercises suggest that it will employ asymmetric tactics to exploit the advanced systems that it has acquired. The constricted geographic character of the Persian Gulf will also enable Iran to target an adversary's naval assets or, potentially, threaten the disruption of oil trade to deter a military confrontation.⁹

The ability to acquire advanced military technologies also allowed Hezbollah to acquire and use an Iranian-supplied anti-ship cruise missile to strike an Israeli corvette during Israel's 2006 invasion of southern Lebanon. While terrorist groups like Hezbollah have yet to develop the ability to sustain threats against the maritime commons or press them beyond the littoral waters of the Middle East, their ability to acquire and successfully employ advanced anti-access capabilities is an example of a lowering threshold for acquiring disruptive technologies, and may be a harbinger of future developments. Access to technologies also poses new risks amidst U.S. military operations. For example, Iranian-backed militants in Iraq

Adjustments in U.S. hard power are vital but insufficient to address the challenges in the global commons.

have been able to intercept live video feeds from U.S. Predator drones using \$26 off-the-shelf software.¹⁰ In the future, terrorist organizations with sufficient technological know-how may use satellite jammers, available all over the world, to disrupt satellite communications that are vital to everything from global financial transactions to U.S. military command and control.

Yet, for small states and non-state actors, the cyber commons represents a unique opportunity to strike the United States or undermine its military operations. In cyberspace, innovation and agility allow small states and non-state actors to mitigate many of the traditional advantages enjoyed by larger states. The distributed, anonymous, and easily accessible nature of the cyber commons gives a natural advantage to organizations that are themselves distributed. For actors with relatively limited resources, the cyber commons offer an inexpensive weapon that can be used to directly attack an enemy with little risk to personal or organizational safety and without fear of certain reprisal. For example, the world's millions of internet cafes and undefended networks can be used by any organization with access to technological expertise to conduct distributed, quickly-shifting attacks against U.S. infrastructure networks. This is especially true for actors whose adversary is the United States, with a military fundamentally reliant upon the cyber commons for everything from command and control to logistics.

Combined, these two trends represent a profound challenge to the U.S. military and its continued ability to sustain the openness and stability of the

global commons on its own. U.S. military primacy has not, and will not, dissuade some rising powers from investing in capabilities designed to contest U.S. power on the sea and in the air, space, and cyberspace. Thus, the United States will both have to adjust its military capabilities to ensure that it can counter anti-access threats posed by a state as well as non-state actors in the global commons, and to lead an international effort to build international regimes that sustain global access to the commons.

Shifting U.S. Hard Power

With the 2010 Quadrennial Defense Review (QDR) and the fiscal year 2011 budget request, the Obama administration has signaled its intention to respond robustly to these challenges in the global commons. The 2010 QDR explicitly identifies “maintaining secure access to the global commons” as a goal for the evolving U.S. defense posture,¹¹ and notes the challenge of “future adversaries likely to possess and employ some degree of anti-access capability—the ability to blunt or deny U.S. power projection—across all domains.”¹² Examining four elements highlighted in the 2010 QDR and FY11 budget request—flexibility; air-sea battle; long-range strike and intelligence, surveillance, and reconnaissance (ISR); and partner capacity-building—reveals how the Obama administration intends to shape U.S. hard power so that it may respond to the challenges presented by managing the global commons. Although much work remains to be done, it has successfully laid the foundation upon which the U.S. military can help sustain the security of the global commons.

Complexity Requires Flexibility

The 2010 QDR, and other Pentagon assessments, are founded on the judgment that “the United States faces a complex and uncertain security landscape in which the pace of change continues to accelerate” with a greater number of threats, across a broader spectrum of warfare, in a more geographically diverse and challenging number of hotspots than it has in the past.¹³ This complexity drove the Pentagon’s shift away from its traditional “two-war” guidance to its new direction for the U.S. military to “plan and prepare to prevail in a broad range of operations that may occur in multiple theaters in overlapping time frames.”¹⁴ This will mean that platforms will have to be useful across the spectrum of conflict, from counterinsurgency to countering high-end asymmetric threats in the global commons.

The Pentagon is already moving in this direction. At sea, the Obama administration’s request for two Arleigh Burke-class guided missile destroyers and two littoral combat ships (LCS) signals the Pentagon’s recognition that the U.S. military will confront lower-end naval challenges in littoral waters, as well as high-end threats from missiles and advanced surface and subsurface ships.

The United States must now share the responsibility of managing the global commons.

Arleigh Burke-class destroyers will have a role in counterpiracy and missile defense operations, and the LCS is intended to enhance the U.S. Navy's ability to provide security in the constrained maritime environments that pirates often operate in.

In the air, the decision to favor the F-35 over the F-22 as the primary air power workhorse for the United States perfectly exemplifies the Pentagon's emphasis on

flexibility. As an exportable multi-role fighter, the F-35 can be used by all services and U.S. partners and allies to capably strike air, land, and sea targets. The bleeding-edge technologies used by the F-22 make it the world's most capable air-to-air platform. Yet, it also limits its utility to a unidimensional weapon by one U.S. service that can not be exported to friends and allies. Thus, the Pentagon has implicitly accepted the risk of a slightly less capable air-to-air platform in order to accomplish more goals with less money.

The Pentagon also plans to maintain flexibility by building in platform interoperability with allies and partners that procure U.S. military hardware. By ensuring that U.S. allies and partners use the same equipment, and their doctrine is based on the same capabilities, the United States can better ensure that necessary military capabilities are available throughout the world to respond to fast-emerging threats or crises that require a coalition response. Moreover, the Obama administration's efforts to reform the defense export laws and certain bilateral defense trade treaties (such as with Australia and the United Kingdom) will further improve the U.S. military's ability to work with allies and partners who have access to U.S. military hardware.

Air-Sea Battle

The 2010 QDR commits the U.S. military to confront challenges in the sea and air commons by calling for the U.S. Navy and Air Force to develop an "air-sea battle" concept. While details on what that concept will be remain undeveloped, the QDR describes the concept as addressing "how air and naval forces will integrate capabilities across all operational domains—air, sea, land, space, and cyberspace—to counter growing challenges to U.S. freedom of action."¹⁵

With little insight into the Pentagon's thinking about air-sea battle, one is left to examine military procurement developments. Platforms that would be most applicable to operate within—and eventually undermine—threats in the global commons are already in active production. The Virginia-class nuclear-powered attack submarine, with its ability to conduct covert insertions and extractions, its ability to quietly strike surface and subsurface targets, and its long-range

stand-off strike capability makes it a particularly capable challenge to anti-access threats. As is the F-22 with its ability to penetrate advanced integrated air defense networks and strike targets at long range.

Long-Range Strike and ISR

The 2010 QDR also calls for a close examination of several long-range strike options, including both penetrating platforms and stand-off weapons, as a response to anti-access threats in the global commons.¹⁶ The logic behind all this is clear—if an adversary prevents the United States from operating within a given area, the United States should be able to strike from beyond that anti-access envelope both because doing so might be necessary to protect the country, and because the threat of such a strike should deter state as well as non-state actors from thinking they can threaten the United States with impunity. Interestingly, the QDR hints at the continuing advantages the United States sees for itself in stealth technology in the air and sea commons.¹⁷ Although it seems a lot, much remains to be decided when it comes to long-range strike and ISR, the Pentagon may be looking to submarines as a staging platform to literally undercut an adversary's anti-access capabilities, to develop a conventional, global-strike capability, and to upgrade and modernize the bomber fleet.¹⁸

Today's unmanned aircraft—the Predator, Reaper, and Global Hawk—offer an impressive capability to loiter on station for several hours and strike with precision. Yet, weapons on the drawing board today, especially the Naval Unmanned Combat Air System (N-UCAS, aka the X-47), represent a potentially revolutionary advance in long-range strike and ISR by adding stealth and the ability to take-off and land from carriers. Such a capability, if and when available, would greatly enhance the U.S. military's flexibility and ability to respond to threats to the global commons more effectively and responsively.

Partner Capacity-Building

As missions and responsibilities for the U.S. military multiply, and as its dominance within the global commons becomes increasingly contested, the status quo—in which the United States is the sole guarantor of the openness of the global commons while other states free ride—is unsustainable. While the United States should continue to develop military capabilities to ensure that it can counter anti-access threats, it must recognize that it cannot—and should not—protect the commons alone. The 2010 QDR primarily focuses on partner capacity-building as a tool of U.S. military assistance to local security forces in conjunction with two ongoing wars and counterterrorism operations. Partner capacity-building, however, should be understood in a much broader context. Working with and through like-minded partners will be key to the ability of the

The Strait of Malacca could be an important model for future efforts to engage pivotal actors.

United States to share the responsibility of managing the global commons. Yet, what this will look like remains unclear.

U.S. assistance to the littoral states surrounding the Strait of Malacca, with enhanced local control of a strategic choke point without increasing U.S. or foreign military commitments, could be an important model for future efforts to engage pivotal actors to secure the global commons. As one

of the world's most important shipping lanes, the rise of piracy in 2004 threatened to undermine a significant segment of global trade. Yet, piracy attacks have fallen drastically since then—from 38 in 2004 to only 2 in 2008—due to increased coordination of sea and air patrols and intelligence-sharing among Indonesia, Malaysia, and Singapore.¹⁹ In the background of this newfound cooperation were Australia, Japan, and the United States, quietly facilitating increased coordination and providing technical assistance and training. Thus, the United States and its allies were able to help like-minded partners to maintain the openness of a commons without violating the regional state's sense of autonomy or taking on additional burdens for the U.S. military.

Cooperation between like-minded partners need not be limited to the maritime commons. Engaging responsible emerging space powers, such as India and South Korea, could contribute to increased cooperation on everything from space exploration to orbital debris mitigation. Similarly, engaging like-minded states with robust technical capabilities, from Europe to India to South Korea, could enhance international cooperation to maintain a clean and open cyber commons.

Building New Regimes

Though vital, adjustments in U.S. hard power will, in themselves, be insufficient to address the systemic challenges to the global commons posed by rising military and political powers. Building a robust system of international regimes that buttress the openness of the global commons against potential disruption from new military powers will be an essential element of any future U.S. strategy.

The air commons offers an important model for how international norms and widely-accepted agreements can combine to sustain the openness of a commons. Along with a long international tradition of supporting the freedom of the skies, the over 4,000 bilateral air transport agreements registered with the International Civil Aviation Organization ensure that civil air transport through the air commons

is organized, safe, and efficient. The state of international regimes within the other global commons varies widely, however. Key principles, outlined here, can guide U.S. diplomatic efforts toward the commons.

Maritime Regimes

From international agreements to norms of responsible seamanship, the maritime commons also has a rich tradition promoting the freedom of the seas. Yet, existing agreements are being challenged by the emergence of new maritime powers who are using their newfound naval capabilities to enforce long-standing claims over disputed waters. Though not alone, China's claims over the South China Sea and the Spratley Islands are the most egregious.

As defined in the UN Convention on the Law of the Sea (UNCLOS), a state maintains sovereign control of coastal waters out to 12 miles beyond its beach, and the sole right to extract resources as much as 200 miles from its shores. The area between 12 and 200 miles is known as the Exclusive Economic Zone (EEZ). As stated in UNCLOS, the EEZ remains an international waterway through which warships may make innocent passage. Yet, China claims that states must first obtain permission from Beijing before transiting its EEZ, in direct contradiction to the spirit of traditional laws of the sea and the letter of UNCLOS's language.

The implications of China's interpretation would have drastic consequences for the openness of these strategically vital waterways, and would set a highly problematic precedent for the openness of the maritime commons around the world. If states are able to determine who is able to sail in what have traditionally been international waters, and exclude maritime traffic at will, navies would be forced to request permission before sailing through what would normally be international waters—in effect extending sovereign claims 200 miles beyond the coastline. The openness of the maritime commons demands freedom of navigation within the EEZs, and restrictive interpretations of UNCLOS would fundamentally undermine that openness. While four other countries (Brunei, Malaysia, Philippines, and Vietnam) dispute Beijing's claims, none would be nearly large enough to resist sustained Chinese pressure. The United States must be involved if Chinese claims are to be resisted. Further, U.S. leadership is necessary to ensure that maritime disputes are resolved and adjudicated in a way that are conducive to U.S. interests.

Yet, Washington's long-standing failure to ratify the UNCLOS prevents the United States from having a seat at the table as continental shelves are identified, sovereign control of coastal waters is assigned, and the UNCLOS provisions are interpreted. Ratifying the UNCLOS is not a radical idea—former presidents Bill Clinton and George W. Bush, Chairman of the Joint Chiefs of Staff Admiral Mike Mullen, Chief of Naval Operations Admiral Gary Roughead, former Secretary of State James Baker, and Secretary of State Hillary Rodham Clinton have all expressed support for ratification.²⁰ The key

for the Obama administration is to utilize such a broad set of supporters to make the case for ratification, and let the Congress tangibly support efforts to sustain the openness the of the maritime commons.

Space Regimes

Unlike the air and maritime commons, space is in serious need of stronger international regimes. The 1967 Outer Space Treaty does not address most issues that the international community is grappling with today, while other agreements are non-binding and have largely been ineffective. For international regimes to contribute to the openness of the space commons, they must focus on behavior, not capability, and should first tackle the common enemy of all space-faring nations: orbital debris.

The vulnerability of the space commons, and the international system's dependence on it, makes a stronger set of international agreements essential to their future security. Satellites themselves are highly susceptible to kinetic- and

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directed-energy attacks, as well as jamming and hacking from the surface of the Earth. Further complicating the openness of space is the growing problem of orbital debris—there are more than 19,000 objects in orbit larger than 10 cm and more than 1.5 million objects less than 10 cm. Small pieces of debris can be lethal because of the tremendous speeds of orbit. It is estimated that a pea-sized ball moving in

orbit would cause as much damage to a satellite or manned spacecraft as a 400-pound safe travelling at 60 miles per hour.²¹

The primary enemy to the continued openness of the space commons is not anti-satellite (ASAT) weapons or even kinetic weapons. The real enemy to all space capabilities is the debris kinetic weapons create—about 50 percent of all trackable objects in orbit were created by explosions or collisions inside the orbit.²² A broad kinetic anti-satellite campaign in orbit would be analogous to fighting a conventional war on land in an environment where all the stray bullets, mortars, and bombs do not simply fall to Earth, but continue to fly around the world for decades, rendering much of the surface of the Earth uninhabitable. Similarly, orbits littered with debris from a kinetic anti-satellite campaign would be useless for the satellites upon which the global economy, and the U.S. military, depend.

In 2008, China and Russia proposed an international treaty banning the development of “space weapons.” The proposal was largely seen in the West as disingenuous because it would not prevent the development of land-based ASAT

weapons as China has tested in January 2007 and January 2010. Furthermore, its definition of what constitutes a “space weapon” is imprecise, at best. Despite its disingenuity, the proposed treaty’s stated goal—keeping outer space from turning into an area for military confrontation, in assuring security in outer space, and safe functioning of space objects—is laudable. To accomplish these objectives and sustain the openness of the space commons, the United States and the international community should develop realistic and implementable regimes that focus on behavior, not capabilities, and ensure that agreements strike an appropriate balance between ensuring stability in the commons while preserving U.S. freedom of action.

An international regime should focus on behavior and capabilities because, as reflected in the Chinese/Russian draft treaty’s definition of what constitutes a space weapon, anything in orbit can be used as a weapon, or given enough of another function to plausibly be in orbit for a non-offensive purpose. Focusing on behavior will both allow the international community to avoid vexing definitional issues and enable the United States to develop deterrent military capabilities.

Cyber Commons

Where the space commons is in need of stronger international agreements, the cyber commons is positively anarchic. Foundational concepts about the nature of warfare and military competition in the cyber commons—such as deterrence, response, and escalation—remain ambiguous and not well understood. Today, security in the cyber commons is similar to that of the West in the United States in the nineteenth century—any security you enjoyed is what you brought with you. Existing international agreements, namely the Council of Europe’s Convention on Cybercrime, are limited in scope and even more limited on enforcement. Effective international agreements at this point should not be too ambitious. It is better to understand the dynamics of the cyber commons before international regimes can hope to be effective.

Still, basic agreements to improve cooperation between major actors in the cyber commons, and to generally support an open and stable cyber commons, would greatly improve its health. A “clean,” healthy cyber commons—with realistic identification information built-in—would make it easier to identify the source of attacks and reduce the spread of botnets and other threats by malicious actors. A cleaner commons would also reduce risks to U.S. military systems and operations that require cyberspace to conduct network-centric warfare and to project U.S. power globally. Moreover, a cleaner commons would also be in the interests of the broader international community, as global commerce and communications would be a great deal safer and more reliable.

Such “cleanliness” would require a loss of privacy and anonymity that could generate a great deal of backlash, especially within the United States. While legitimate, these concerns overlook the fact that the cyber commons was completely man-made, and the rules can be changed at any time. Still, U.S. leadership—as the internet grew from a DOD project—ensured that it would become a truly global commons. By encouraging its open architecture, and by encouraging market-based governance that included people, groups, and governments around the world, the United States produced a remarkably flexible and effective global network of networks. Yet, an open and market-based approach has created a commons that today is highly anarchic and full of bad actors like hackers, state-sponsored and freelance alike.

Where to Go from Here

Ensuring the future openness and stability of the global commons will require a concerted, long-term effort encompassing all elements of national power. Specifically, the United States must reexamine its approach to forward-basing in order to account for emerging challenges in the commons, secure the “final frontiers” of space and cyberspace, and engage pivotal actors who can contribute to efforts for sustaining the stability of the global commons.

Reexamine Forward-basing

U.S. power projection capability has long been dependent on a worldwide network of forward bases. As these bases come under threat of ballistic missile strikes and adversarial capabilities within the global commons, and their utility becomes increasingly constrained by political sensitivities of the host countries, the United States should continue to pursue a robust and flexible force posture and logistics chain while investing in base-hardening and missile defenses. U.S. strategists should not forget that, even under threat from ballistic and cruise missiles, U.S. forward bases play a vital role in preserving stability throughout the world, assuring U.S. allies and partners of its continuing commitments, and deterring the use of force by potential adversaries. Threats should not force the United States to leave but to adapt.

Yet, better bases is not the complete answer. In order to obviate the threat posed by accurate missiles or host nations with uncertain levels of support for possible U.S. military operations, U.S. power must become more expeditionary and less dependent on easily-targeted fixed bases. For example, a promising basing concept proposed by retired U.S. Marine Colonel Pat Garrett imagines the use of Guam and the Caroline, Marshall, Northern Mariana, and Solomon islands as an important basing zone outside the range of China’s current anti-access capabilities.²³ Proposing a “regional presence in being,” Garrett proposes a dispersed collection of ships that avoids fixed forward bases in Japan and Korea,

instead operating in a constantly-moving (and hence difficult to target) fashion during a time of conflict with China.

Secure the Final Frontiers

While the QDR had specific recommendations to preserve U.S. military capabilities in the sea and air domains, its handling of space and cyberspace was strikingly unspecific. The QDR recognizes the role space and cyberspace play in enabling U.S. military operations, but limits declaratory actions for calls to assure access to space and cyberspace, to improve the ability to attribute attacks and hold aggressors responsible, and to work with like-minded nations to develop norms of behavior.²⁴ Though understandable, given that the Pentagon's reviews of space and cyberspace capabilities and posture are ongoing, this lack of specificity leaves open the question of how the U.S. military will ensure its ability to utilize space and cyberspace.

In space, DOD commits to engage the private sector, state, and non-state actors, promote spaceflight safety, improve space situational awareness, reduce vulnerabilities, and field capabilities for rapid augmentation and reconstitution of space capabilities.²⁵ The Obama administration's approach, however, will become clearer once it updates the national space policy and completes the national security space strategy (formerly known as the space posture review), which are expected early this summer.

Space regimes should focus on the common enemy: orbital debris.

The president's FY11 budget suggests an approach to space that is less ambitious than years past. President Barack Obama's decision to cut \$81 billion for NASA's constellation manned spaceflight program will have significant strategic implications. By cutting this capability, the United States will lose its ability to access very high orbits, some that have important military applications. The ability to access the moon, as well as so-called "Lagrange points" (points in space where the gravitational pull of the earth is cancelled out by that of the moon, allowing a satellite to sit between the two without expending fuel), puts the United States at the good will of other states to abide by existing international agreements. At a time when new space powers are emerging, the Obama administration's decision to cut heavy-lift capabilities will have profound strategic implications, especially considering that the loss of demand for heavy-lift rocket motors from NASA may double the cost of building future rockets necessary to reach high orbit with large payloads, a potential death sentence in tomorrow's likely budget-constrained environment.²⁶

Specifically, the United States should lead a global effort for the international community to adopt two mutually-supporting agreements. First, a kinetic

no-first-use in space agreement would help prevent the creation of orbital debris. Given exceptions to allow kinetic strikes in cases to protect human populations from out-of-control satellites, such an agreement would protect U.S. and international interests in preserving the openness of the space commons without restricting U.S. military interests in dissuading threats in space. Second, an international agreement against harmful interference of space objects during peacetime would prohibit jamming, blinding, and hacking satellites, and would further promote the openness of the global commons without restricting U.S. military interests. With these agreements in place, the United States would be able to research kinetic and non-kinetic military capabilities for use in extremes while developing defenses against a condensed range of threats. The international community would also benefit since the use of kinetic weapons would be restrained, as would the creation of orbital debris.

Fully-realized strategies and capabilities for the cyber commons appear beyond the U.S. reach today.

As with space, the QDR features an entire section calling on the U.S. military to operate effectively in cyberspace.²⁷ Yet, the initiatives it proposes to accomplish this objective—develop a comprehensive approach to DOD operations in cyberspace, develop greater cyberspace expertise and awareness, centralize command of cyberspace operations, and enhance partnerships with other agencies and governments—signals a profound focus on how to think about and organize for cyberspace, suggesting that

fully-realized strategies and capabilities to ensure the openness of the cyber commons is still beyond the United States' reach. Deputy Undersecretary of Defense Kathleen Hicks described the QDR's focus on cyber as:

... first, helping to propel forward the establishment of Cyber Command, and ensuring we have a locus within the Department that really takes seriously as its first mission the growth of cyber expertise within DOD. . . . And second, ensuring that we begin down the path with a vision and a strategy for cyber . . . to set out the range of DOD missions and responsibilities in a whole-of-government context.²⁸

At this point, concrete proposals to operate effectively in cyberspace seem far off.

Still, an international regime to clean up the cyber environment is well within U.S. capabilities. While there are existing programs to build the capacity of national Computer Emergency Readiness Teams, the United States should move beyond working with governments to engage and support global multi-stakeholder organizations, such as the Internet Engineering Task Force or Internet Cooperation for Assigned Names and Numbers. Moreover, the United States should encourage nongovernmental organizations, such as network operator

groups, to play active roles in ensuring that technological systems as well as operations of the cyber commons are more resistant to abuse by malicious actors and more resilient in the face of attacks.

Engage Pivotal Actors

The United States has a unique opportunity to shape the world's approach to the commons. If a larger number of existing and emerging powers can be persuaded to promote the openness and stability of the commons, the international political and economic order will be strengthened. If states and non-state actors, however, are able to disrupt the commons, international order will be fundamentally undermined.

The QDR's focus on building the capacities of partner states is focused on current wars, but it will also be vital to enabling like-minded states to contribute to efforts protecting the commons. The global commons should also be a major element of U.S. security engagement with allies, partners, and potential adversaries alike. By engaging allies and partners, the United States will be able to share the burden of commons sustainment and enlist the support of nations that possess comparative advantages in certain security sectors. For example, as two states with burgeoning military capabilities that generally share U.S. interests in the openness and stability of the global commons, India and South Korea represent two pivotal actors that the United States should engage in this area. Both are improving their air and sea capabilities, have nascent space programs, and boast private sectors with world-leading expertise in cyberspace.

Even further, by discussing the global commons with potential adversaries, the United States would be able to explain its intentions and approaches while attempting to improve mutual understanding, reduce the chances of miscalculation, and encourage positive forms of behavior. For its part, China represents the largest question mark vis-à-vis the global commons. China's dependence on the commons to import resources and export goods should make it a significant contributor to the commons' health. And some aspects of China's behavior, such as conducting counterpiracy operations off the coast of Somalia, demonstrate an interest in stability. But China's insistence on an exclusionary definition of its rights over the EEZs, its development of anti-satellite missiles, and its acquisition of advanced anti-access capabilities in the seas and air suggest a more exclusionary intention.

Pivotal actors will also be essential in creating effective international regimes, especially in the space and cyber commons. Broad disagreements between the United States and potential adversaries mean that international support for effective international regimes on the global commons will be won or lost with the pivotal states whose approaches are not yet solidified. U.S. allies and partners with significant interests in the global commons will be, if properly engaged and

consulted, pivotal centers of support in any U.S. effort to build effective international regimes.

U.S. Leadership in the Global Commons

The United States' power and the stability of the existing international economic system depend upon the openness and stability of the global commons. Goods flow, ideas promulgate, militaries operate, and people travel through them with little thought to how and why they are kept open. Since World War II, the responsibility of maintaining their openness has fallen to the United States.

The emergence of a multipolar world and the proliferation of disruptive military technologies to state and non-state actors, many of whose intentions toward the global commons are circumspect, will contest the U.S. military's dominance in these commons. The implications for the continued viability of the international

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economic system as well as for the future of the U.S. military's ability to project power are significant. As these challenges emerge, the U.S. military must adapt its capabilities while recognizing that partners and allies will play an increasingly pivotal role as bulwarks against the forces of exclusivity and chaos.

The Obama administration's development of an air-sea battle concept to confront anti-access challenges, its commitment to pursue long-range strike and ISR

capabilities, and the concomitant investment in advanced air and sea platforms demonstrate a commitment to maintain the U.S. military's dominant position in the air and at sea. Yet, more remains to be done. The Pentagon's approach to space and cyberspace is underdeveloped, which is particularly disconcerting considering the U.S. military's reliance upon these commons for almost every element of its operations. Further, the Pentagon's current approach to building partner capacities is profoundly focused on Afghanistan and Iraq. Broadening this focus to the global commons and identifying pivotal actors who can partner with the United States will contribute to the stability of the commons while reducing the burden on the U.S. military to defend and sustain them.

The U.S. commitment to the commons will be demonstrated by its rhetoric, its strategy, and its investments. While globalization and the rise of new and revanchist powers will inevitably change the military balance of power within the global commons, not all powers are created equal. Intentions toward the commons, and the willingness to confront destabilizing threats, will be key to the

commons' openness. With the 2010 QDR and FY11 budget requests, the Obama administration has demonstrated that the United States has the will to confront these challenges at sea and in the air. Going forward, it will be incumbent on the Pentagon to develop the appropriate concepts and capabilities to maintain the openness of the space and cyber commons, while engaging like-minded states and non-state actors to share the burden of their defense and construct international regimes. These actions will not only help secure the commons in the coming decades, but will also send clear deterrence and dissuasion messages to U.S. adversaries and actors whose intentions are unclear.

In the end, protecting the global commons will depend on cooperation between great and emerging powers, and U.S. willingness to lead them. No other country has the ability to project military power into the commons, and none can challenge the U.S. legacy of building global institutions to advance shared goals. This act of leadership will protect vital U.S. interests and those of the international community for years, and even decades, to come.

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