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US forces' capability to operate forward underpins the nation's ability to maintain a defense far from its shores; however, those capabilities may not always be available, causing US forces to operate in Places Without Bases. To solve this problem, the first step is forecasting and examining the future. While forecasts exist, they may have blind spots which may handicap leaders going forward, so a broader range of futures must be explored. The employment of the scenario matrix tool mitigates these blind spots and facilitates the analysis of the necessity and utility of concepts for addressing Places Without Bases. Forecasts completed with this tool demonstrate the Places Without Bases concepts are necessary.

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MASTER OF MILITARY STUDIES

Considering the Future:
Removing Blind Spots in Forecasting

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

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Executive Summary

Title: Considering the Future: Removing Blind Spots in Forecasting

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Thesis: The employment of the scenario matrix tool mitigates the blind spots that result from deficiencies in the methodologies of the reviewed forecasts and facilitates the analysis of the necessity and utility of concepts for addressing *Places Without Bases.* The implications of the forecast completed using the scenario matrix tool demonstrate that the *Places Without Bases* concepts are necessary and will have utility in 2030 and beyond.

Discussion: Since becoming a global power after World War II, the United States has postured its military capabilities in a fashion that allows for layered, forward defense and guarantees the world order it helped to establish. The expeditionary capability and forward basing of United States forces underpin the nation's ability to maintain this forward defense, but those capabilities may not always be available. *Places Without Bases* describes this situation and requires the exploration of a family of concepts for how the United States military could operate in a location where they do not have access to pre-existing infrastructure designed or easily converted to support military operations. The challenge of *Places Without Bases* is not seen as an immediate one, as it is believed the circumstances that might bring it about will not take shape until the year 2030 or beyond. The initial step in solving the problem posed is examining what the world might be like at that time, which requires forecasting the future. While forecasts exist, they appear to foresee a narrow range of futures and this myopic view may handicap our leaders as they prepare for the future, so a broader range of futures must be envisioned and explored. The scenario matrix tool with broad and disparate drivers allows the exploration of the broadest possible range of futures.

Conclusion: The bottom line is that any future that can be imagined is likely to find a role for the concepts that address the problem of the absence, loss, or degradation of the United States's capability to forward base or deploy forces. Therefore, the United States Marine Corps and the Department of Defense would be wise to start pursuing the capabilities and concepts associated with *Places Without Bases* so that they will be ready when they are needed to facilitate the continuation of the United States's policy of ensuring combat is played as an away game.

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THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

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Introduction

As of October 2015, more than 150,000 United States military members were forward based or forward deployed defending their nation.[1] The United States has not fought a battle on its own soil since World War II. This is no accident and is directly related to the large forward military presence that the United States maintains. Since becoming a global power after World War II, the United States has postured its military capabilities in a fashion that allows for layered, forward defense and guarantees the world order it helped to establish. The expeditionary capability and forward basing of United States forces underpin the nation's ability to ensure combat is always played as an away game. Those capabilities, however, may not always be available. Despite limitations imposed by the absence, loss, or degradation of those capabilities, the United States will continue strive to maintain its influence globally and to execute its defense and maintenance of global order far away from its own shores.

This problem presented by the absence, loss, or degradation of forward basing or deploying military capability, which will be referred to as *Places Without Bases*, requires the exploration of a family of concepts for how the United States military could operate despite the lack or loss of that capability, whether in a particular region or globally. In other words, such concepts provide the United States military the ability respond to a situation which requires its forces to operate in a location where they do not have access to pre-existing infrastructure designed or easily converted to support military operations. This lack of access could result from the loss of a preexisting capability or from a total lack of those facilities in the operating environment.

There are four main reasons that may cause this situation to occur. First, the United States could withdraw from forward bases on foreign soil because it can no longer financially afford to sustain them. Second, it could be asked to remove its forces from those bases for

political reasons. Third, adversary capabilities could threaten forward based American forces to an extent determined unacceptable by commanders, civilian leaders, or the American people, resulting in their relocation to safer positions. These safer positions could either be still forward, but outside of the threat radius, or back to United States territory. Finally, the United States could find itself having to conduct military operations in an undeveloped, austere geographic location in which it had not previous planned to operate, resulting in a lack of infrastructure on which it could rely. The challenge of *Places Without Bases* is not seen as an immediate one, as it is believed the circumstances that might bring it about will not take shape until the year 2030 or beyond. The initial step in solving the problem posed is examining what the world might be like at that time, which requires forecasting the future.

To provide an examination of the future and its potential implications for *Places Without Bases*, the scenario matrix methodology is most appropriate. The matrix mitigates the blind spots that can result from focusing on a predicted future operating environment, allowing instead for the falsification of assumptions and the future reversal of current trends. In generating several alternative futures, rather than describing one consensus view, the scenario matrix methodology in turn facilitates the analysis of the necessity and utility of concepts for addressing *Places Without Bases.*

Producing and exploiting such a set of alternative futures requires several steps in both analysis and synthesis. They include a review of existing forecasts and an analysis of their strengths and weaknesses; presentation and explanation of the scenario matrix methodology as different from the methods used in the existing forecasts; employment of the matrix tool to generate potential futures in which *Places Without Bases* may be operative; and, finally, discussion of those futures with an eye to their implications for new concepts for *Places Without*

Bases. This process of reciprocal analysis and synthesis will demonstrate that a new suite of future concepts for *Places Without Bases* is necessary and will have utility in 2030 and beyond.

Review of Selected Forecasts

Numerous official and quasi-official forecasts – that is, produced in and around the U.S. federal government and national security community – attempt to determine what the world will look like in the future, so why is another one needed? The answer is that many forecasts, including the four examined for this paper (*2016 Update to 2015-2025 Future Operating Environment: Implications for Marines [FOE]*, *2015 Marine Corps Security Environment Forecast: Futures 2030-2045 [MCSEF]*, *Joint Operating Environment 2035: The Joint Force in a Contested and Disordered World [JOE]*, and *Global Trends 2030: Alternative Worlds [GT]*), take too narrow a perspective about what the future might hold. They are useful tools, but they either directly follow the logical progression of relevant trends which are deemed likely to continue, or they slightly modify those trends by manipulating relatively minor factors in order to imagine what the world will look like in the future. These methodologies result in very similar predictions of what the future may hold, which risks leaving decision makers unprepared for materially different eventualities.

A nearly unlimited number of forecasts could be examined to develop an understanding of what the future has in store; however, that list was narrowed to four for the purposes of this paper. The FOE and the MCSEF are the Marine Corps's forecasts for the timeframe targeted in the paper. The JOE provides a joint perspective which will ensure that this paper avoids a completely service-biased perspective. Finally, GT takes a wider perspective into account than do the Department of Defense forecasts.

Together, these forecasts served as the foundational literature for exploring an alternative forecasting methodology in support of the solving the problem of *Places Without Bases*. While all of these forecasts were written to inform thinking about the future with an emphasis on national security, they all addressed slightly different goals based on their target audiences. They also used different methodologies to generate their visions of the future. Contrasting the purposes and methods of those forecasts illuminates the various strengths and weaknesses of each. It also reveals the fact that they all have gaps in their coverage of what the future might hold.

The FOE has the most limited goal of the four. It "describes how global and technology trends continue to evolve... [and] focuses on the implications for Marines."[2] The result of this analysis is that it "describes the future operating environment through the eyes of our adversaries."[3] To achieve this, it uses straight-line extrapolation of combinations of current trends to create one future world. This world is then communicated through three vignettes covering three combatant commands, Central Command, Pacific Command, and European Command, written from the adversaries' perspectives and focused on Marine missions. The vignettes are not supposed to represent baseline threats, but are supposed "to highlight the overall challenges that USMC forces may face."[4] The key strengths of the FOE are that it is short and compelling. The length makes it accessible and digestible. The interesting technique of writing the vignettes from the adversaries' perspectives results in its compelling nature. However, one key weakness of the FOE is that it envisions only one future. The second key weakness is that instead of telling that one future from a global perspective, it narrows the focus to three specific combatant commands. Thus, the utility of the document is limited.

The MCSEF, by contrast, is a much longer and more thorough document that provides readers with multiple futures to contemplate. The MCSEF was written for planners and decision makers and has five stated goals:

- Identify and analyze the principal patterns and trends shaping the future security environment;
- Describe and assess plausible future security environments;
- Generate ideas that inform the development and implementation of institutional concepts, capabilities, and requirements;
- Offer recommendations for service consideration to guard against strategic surprise, shape the future force, and stimulate thought; and,
- Inform senior leadership's vision of the future.[5]

To accomplish these goals, the Futures Assessment Division (FAD) at the Marine Corps Warfighting Laboratory drew on the "Framework Foresight" method developed at the University of Houston. It began "by conducting a comprehensive, multidisciplinary survey of current patterns and trends as reflected in a wide range of literature ... to uncover common patterns and trends identified by a variety of national and multinational institutions, agencies, and organizations. … This extensive research and analysis generate[d] an informed assessment of the most relevant global patterns and trends that will influence the security environment beyond 2030."[6] They then developed "several plausible futures, beginning with the "baseline" future… [which is] based on the extrapolation of long-range trends, cycles, and patterns."[7] Next, they developed "alternative futures… [which] are plausible futures that may occur due to reasonable alteration in long-term trends, cycles, and patterns."[8] Finally, the authors created and described a preferred future. The key strengths of the MCSEF are its thoroughness and the provision of multiple global futures. Providing multiple, broad-based visions of what may come twenty years hence expands the possibilities leaders and planners must consider when preparing for what is to come. The main weakness of the authors' approach is that the futures they envisioned are not as

varied as they could be, and therefore may result in blind spots for those who are employing them to understand what is potentially to come. In other words, to create their alternative worlds, they only manipulated two relatively minor variables for each and both variables in each case were related, so the amount of variance created is more limited than if they had manipulated larger or more diverse variables. Those limitations, combined with the fact that the other two futures are the standard extrapolation of current trends and a preferred future makes the overall forecast less useful than it could have been. It does not go far enough to challenge assumptions and make people consider the implications of more drastic changes to the trendlines.

While the first two forecasts were written by and for Marines, the JOE widens the audience to the Joint Force. "The purpose of JOE 2035 is to describe the future security environment circa 2035 and project implications of change for the Joint Force so it can anticipate and prepare for potential conflicts."[9] To achieve this goal, the JOE poses and seeks to answer the following three questions which describe the joint operating environment and how to prepare for it:

- What trends and conditions will shape the future security environment?
- How will trends and conditions intersect to change the future character of war?
- What missions will the Joint Force need to conduct in the future?[10]

Rather than drawing holistic worlds or vignettes in the way the MCSEF or FOE do, the JOE uses trends to develop six contexts for future conflict and then draws implications for the future Joint Force based on those contexts.

The JOE has two key strengths and two key weaknesses. First, it stresses the importance of the interaction of the drivers (variables which produce change) to generate the contexts in which the Joint Force will find itself operating. Second, the generic nature of those contexts prevents them from being pigeon-holed into one scenario and allows creativity in their

application. This second strength is also one of the documents main weaknesses – the contexts presented are not anchored to any specific reality which makes them difficult to grasp. The other main weakness of the JOE is that the logic the authors use to establish their contexts, i.e., the linking of the trends to the conditions, the thematic areas, and finally the overall challenges, which are then combined to create the contexts, is not always very clearly delineated. This pattern makes it difficult for the reader to follow the logic and grasp the contexts presented.

While still focused on national security, GT is intended for the widest audience of the four forecasts. GT "is intended to stimulate thinking about this rapid, vast array of geopolitical, economic, and technological changes transforming our world today and their potential trajectories over the next 15-20 years. … [It] do[es] not seek to predict the future—an impossible feat—but instead provide a framework for thinking about potential outcomes, their implications, and opportunities to influence the course of events."[11] To accomplish that objective, GT combines megatrends, which are deemed to have miniscule likelihood of alteration, with game-changers, "the raw elements that could sow the seeds of global disruption or incredible advances,"[12] to generate four potential future worlds. The worlds they create consist of a best case, a worst case, and two in between. The four worlds exist on a somewhat linear axis and were created by adjusting multiple variables in various ways. The main strengths of GT are that it is broad-based, thorough, well-structured, and readable. Its flaws are similar to those of the MCSEF in that the futures it envisions are not as varied as they might have been if the variables were manipulated in a different way. In other words, the linear nature of the forecasting method limits the range of possibilities.

These four forecasts provide useful insight into how the future may unfold. However, they may leave blind spots because the methodologies used to generate them cause limitations.

No forecast can avoid all blind spots and the future will have surprises in store no matter what methodology is used to examine it, but the methodology proposed by this paper provides leaders and decision makers with a much broader scope of possibilities to examine. Rather than use straight-line prediction based on trends or manipulating specific variables within generally the same framework, like the forecasts reviewed, the methodology suggested here uses two expansive and unrelated variables to envision the widest possible array of outcomes. The difference in the results generated by this methodology as compared to the methodologies employed in the reviewed forecasts will be examined more closely after the explanation of the proposed methodology.

Explanation of Proposed Methodology

The recommended methodology uses two broad and unrelated drivers on x and y axes to generate four quadrants within which the possible futures could fall by manipulating those drivers. Since the drivers are broad and unrelated, their manipulation results in a comprehensive array of possible futures, rather than the reasonably narrow variety of potential futures that results from manipulating minor variables which may be related to each other. These large drivers are the composite of a series of sub-drivers, which are smaller, related variables that combine to constitute the larger driver.

These scenarios are then generated using a form of a scenario matrix tool.[13] This tool places the two key drivers on a graph with one on the x axis and one on the y axis. The opposite ends of each axis represent the degree to which the key driver is present or operative in the future. This results in four quadrants on the graph representing four conditions: driver x

operative, driver y operative; driver x operative, driver y not operative; driver x not operative, driver y operative; and driver x not operative, driver y not operative (see Figure 1).

Although the methodology has been in use in a variety of settings for many years, a formal set of guidelines for creating a scenario matrix has been developed by The Leipzig Graduate School of Management Center for Scenario Planning. While a form of a scenario matrix tool was developed and used for this paper, the Leipzig methodology was not strictly followed. Instead of choosing specific clusters of uncertainties as the variables as the methodology suggests,[14] two of the broadest and least related possible drivers of change in the future were chosen. This allowed the concept to be tested against as comprehensive as possible a set of possible future scenarios.

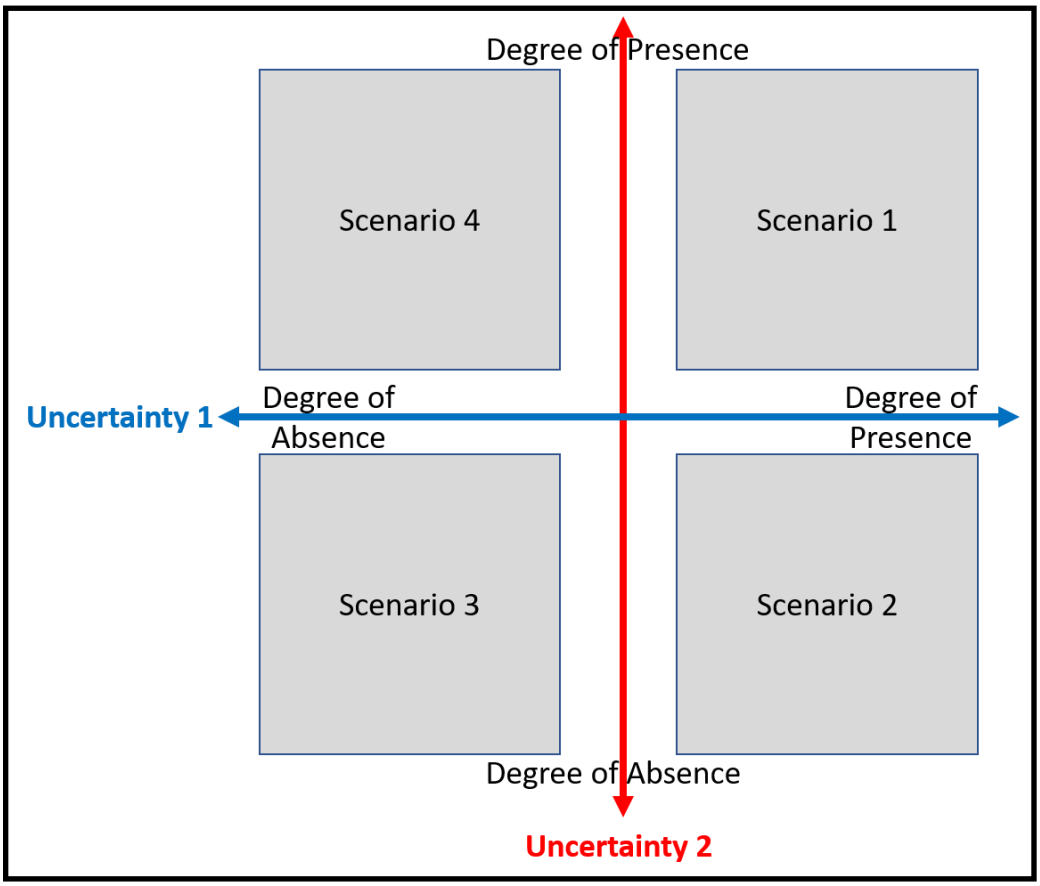

Figure 1. Generic Scenario Matrix Tool

These two drivers arose from consideration of a much larger set of variables that are likely to affect the unfolding of the future. These include international law, the international system, transnational threats, rogue states, population size and demographics, technological advancements, and the impact of climate change. among others. From this list of variables driving the future, two groups emerged, which gave rise to two overall distinct drivers. The two drivers chosen were global order and global resource plenty. The general nature of each driver and their distinctness from each other were key factors in their selection because those elements allow the widest possible range of futures to be envisioned. Figure 2 below lists the sub-drivers associated with each of the main drivers.

Order	Resources
• International Law	• Population Level
• Diplomacy	• Education (Science, Technology, Engineering, and Math)
• International Institutions	• Infrastructure
• Trade	• Climate Change
• Rogue States	• Technological Progress
• Transnational Criminal/Terrorist Organizations	• Alternative Energy Sources
• National Identity Trends	• Space Exploration
• Trends in Sovereignty/Ungoverned Spaces	
• Individualization of Information	

Figure 2. Drivers and sub-drivers.

Figure 3 below shows the four quadrants in which futures can be generated by combining the two drivers on the matrix: Future 1 – "Mary Poppins" (global order combined with global resource plenty); Future 2 – "Lord of the Flies" (global order combined with global resource scarcity); Future 3 – "Hunger Games" (global fragmentation combined with global resource scarcity); and Future 4 – "Brewster's Millions" (global fragmentation combined with global resource plenty). The same figure also plots the futures described in the forecasts reviewed and demonstrates how they lack variety in comparison to the ones that can be developed using the

proposed scenario matrix methodology. The lack of variety is clearly demonstrated by the fact that eight out of ten of the futures envisioned in the four reviewed forecasts fall into the "Hunger Games" quadrant, while none of them fall into the "Lord of the Flies" and "Brewster's Millions" quadrants.[15] What if the world moves into those two quadrants? Will military leaders relying on the existing, official forecasts be completely unprepared? If they fail to examine these other possibilities, there is a chance they will be. The discussion of the methodology in the previous section and the forecasts produced in the following section will demonstrate the variety that this methodology produces.

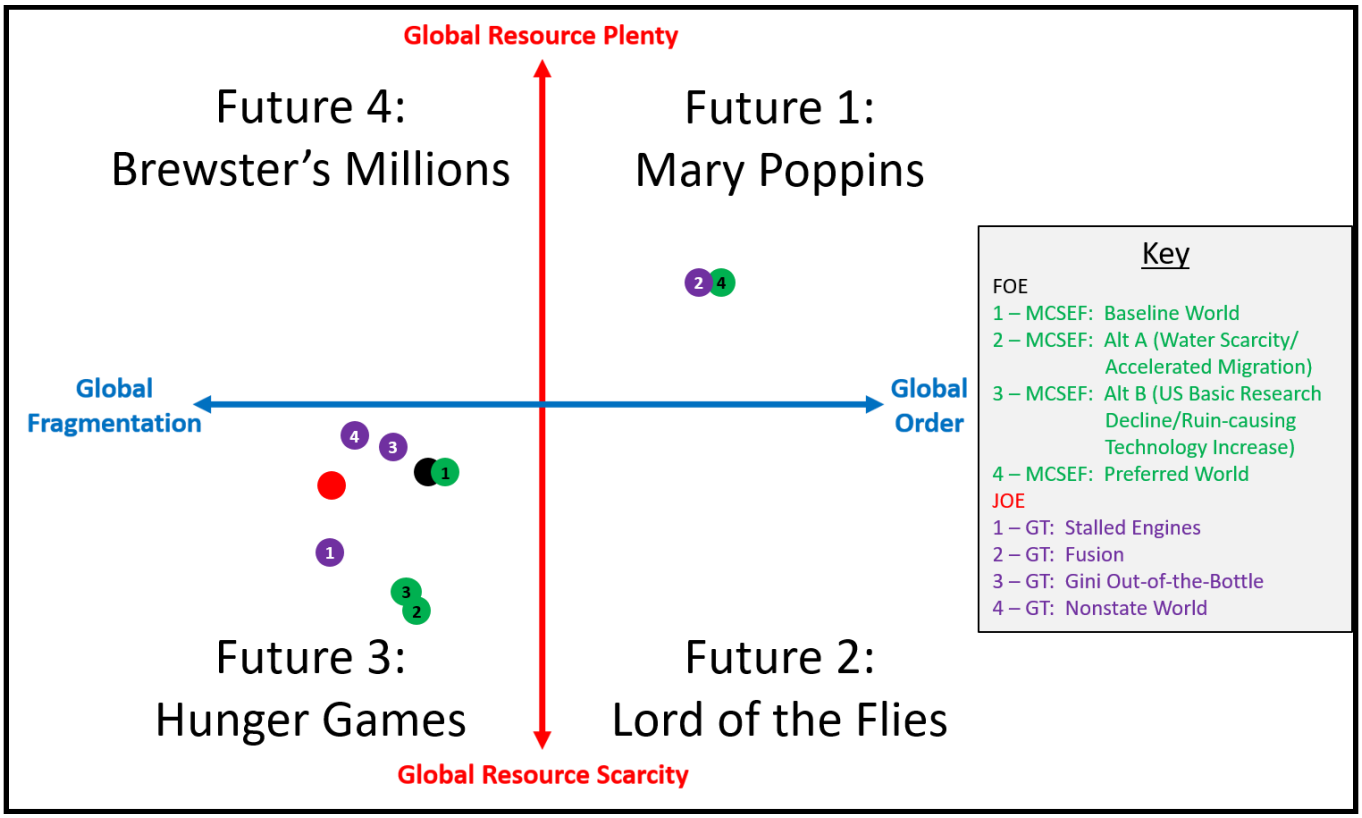

Figure 3. Scenario Matrix (Global Order and Global Resources). In addition to the axes being labeled, the reviewed forecasts are plotted on the matrix. NOTE: "The "Gini" in [the] scenario title refers to the Gini Coefficient, which is a recognized statistical measurement of inequality of income."[16]

Since the chosen drivers are expansive concepts that could be interpreted in myriad ways, they require specification to ensure a common understanding. Numerous combinations of

conditions could meet the definition of world order. These combinations could result in worldwide fascism with a global dictator, global democracy in which all nations are democratic and assent to a democratic supranational organization that governs interstate relationships, and many other alternative "worlds" in between. While the two extreme manifestations are not likely to occur, many of the disparate results in between are feasible and, while they will have varying degrees of order, they could still be called orderly.

Order is defined on by Merriam-Webster as "a regular or harmonious arrangement."[17] The key to this definition for the purposes of developing scenarios is the term "regular," which implies conformity to rules.[18] In the scenarios developed, global order will refer to the degree to which the actors in the world – states, nongovernmental organizations (NGOs), intergovernmental organizations (IGOs), international corporations, transnational criminal or terrorist organizations, and individual people – behave in conformity to rules. Scenarios with high degrees of global order will minimize the disruptive influence of the transnational criminal and terrorist organizations while maximizing the cooperation of the other entities listed. Cooperation does not necessarily rule out competition. Rather, it denotes that the competition will be conducted within a generally agreed upon set of rules and the goal will be the betterment of one's own entity, not the destruction or detriment of the other entity.

Scenarios tending toward global fragmentation will do the opposite – maximize the disruptive influence of criminals and terrorists while also maximizing the level to which the other entities attempt to obstruct each other. As with competition in the global order scenarios, the concept of obstruction in the global fragmentation scenarios does not rule out cooperation amongst some of the entities. Cooperation may occur, but it is likely to be in violation of the

agreed upon rules and for purposes that are intended to aggrandize the involved parties to the detriment of others.

Global resource plenty is more easily defined than global order, but still requires explanation to ensure mutual understanding. Global resource plenty means that the world is producing enough of the commodities necessary for existence – water, food, energy, raw materials for manufacturing and construction – to support the requirements of the global population. While this is generally accomplished by increasing production of those commodities to support a growing population, this condition could also be reached by using what is already produced more efficiently.

Potential Futures

There are three elements of information required to establish a shared point of departure from which to envision potential futures: a zero point from which to depart, the key assumptions used in developing the futures, and the implications of the various of sub-drivers for global order and global resource levels. Articulating those various conditions allow for the "instantiation" of each future world. This process in turn takes the analyst from the briefest conceptual sketch of that alternative world, as captured by the quadrant's title, to a more realistic vision of a possible future. This realistic vision provides decision-makers with a richer contextual understanding of what the future may be like, but, first the current situation must be established.

The MCSEF's thorough description of the current state in its Patterns and Trends chapter serves as the basis for this sketch of the zero point. The post-World War II international system is still in place and functioning, but the power of the state is in decline. The power once held by the state has dissipated due to the growth of the power of non-state actors like large multinational

corporations, transnational criminal and political organizations, non-governmental organizations, and inter-governmental organizations. Additionally, "the Internet, social media, streaming television, and wireless and satellite communications are challenging traditional notions of cultural and geographic boundaries,"[19] but these changes are still playing out in a world that recognizes states as the chief political units on the world stage. At the same time, relatively low barriers to trade as well as low transportation and communication costs encourage global trade. "[T]he current data reflect wider geographical participation in international trade, increased trade among developing economies, and greater reliance on international supply chains."[20] Current levels of globalization and current trends in technology that facilitate global connectedness provide enormous access to information and ideas to individuals and small groups. Technology continues to develop and spread at a rapid and constantly increasing pace, fueled by a combination of government and private funding. Even in the underdeveloped world, there is a strong association between economic development and technological innovation. The world population is concentrated in a small number of countries, most of which are part of the developing world. While population continues to grow, the rate of that growth is declining and the world's population is generally aging. Additionally, urbanization, particularly in the littorals, continues to increase. This "[d]ense urban geography changes the nature of spatial and temporal relationships …[and c]ritical infrastructures (e.g., physical, economic, governmental, and social) are in such close proximity and, in most areas, so intertwined that even minor disruptions can cause significant repercussions."[21]

Water infrastructure is largely antiquated, most people who live in extreme poverty suffer from an acute lack of fresh-water, and there has been a recent increase in water-related political, military, and terrorist actions. While chronic hunger has declined due to improved farming,

"estimates indicate 842 million people suffer from chronic hunger."[22] Hydraulic fracturing, advances in renewable energy sources, and better energy storage techniques have improved energy availability, but like the global distribution of water and food, global energy distribution is very uneven. Additionally, "[a] continually growing field of climate study has produced a credible international consensus that the planet is warming and that over time this trend will have more harmful than beneficial effects on the environment."[23] This increased temperature is associated with increased storm intensity and levels of precipitation.

Six key assumptions were instrumental in generating the futures in the forecast.

1. Population growth is an unavoidable trend (although the rate is variable.)
2. There will always be winners and losers on the global stage – global equality is unachievable.
3. True global harmony will only be achieved if humans are threatened by aliens; the existence of such an out group is the only way for all people to see all other people as members of the in group.
4. The world economy will continue to grow in the long run, but growth may or may not result in global resource plenty.
5. Climate change will continue, but humanity can potentially mitigate and adapt to its effects.[24]
6. China will continue its rise and rival U.S. power in Asia and potentially globally. [25]

The final element of information required to establish the point of departure for developing futures based on relative existence of world order and relative availability of global resources is an understanding of the performance of each sub-driver within the two axes or meta-drivers. This thought experiment generates the initial data to describe what is actually happening in the world of US national security as the value of each meta-driver shifts from positive to negative or the reverse. The sub-drivers thus begin to add some detail to the picture.

Conversely, increasing and decreasing values of the corresponding sub-drivers can be called "indicators" of positive or negative movement along the axes themselves. The sub-drivers of world order will be addressed first, followed by the sub-drivers of global resources.

The first indicator of global order is the effectiveness of the system of international relations or governance. Two likely conditions for this sub-driver move the larger driver in the direction of global order. The first is the strengthening of the current international institutions conceived and implemented in the post-WWII, Cold War era by the West (mainly the United States) – the United Nations and its many subsidiaries, the World Bank, the International Monetary Fund, current currency market mechanisms which largely use the US Dollar as the standard, the World Economic Forum, etc. While it is not possible to prove causation, based on the significant reduction in war death since their inception,[26] it is fair to state that these institutions have been successful over the last seventy years in ensuring relative peace among their members or, at least, in avoiding conflict on the scale seen twice in the first half of the twentieth century, and in facilitating economic progress throughout the world.[27] There is no reason to believe, if left largely unchallenged (the premise of this line of thought), they could not continue to accomplish those results.

However, with the rise of China, the more likely course of events will see two sets of international institutions – the previously mentioned one developed by the west and a new one established by developing nations (largely China). This process is already occurring with China's establishment of institutions like the Asia Infrastructure Investment Bank (AIIB) and the Shanghai Cooperation Organization (SCO). The factor which will decide whether this course indicates global order or global fragmentation will be how these two systems of international institutions interact. If they are able to cooperate, their existence will still indicate global order.

It is not unreasonable for multiple institutions to accomplish similar functions for different regions of the world, or even overlapping regions of the world, in an orderly fashion. Even now, there are countries that are members of the World Bank and the AIIB. If, however, these institutions fail to cooperate and instead vie for dominance in a zero-sum fashion, the result will be an indication of global fragmentation rather than order.

The level of diplomatic communication around the world is a simple indicator of global orderliness – if diplomatic communication increases, the orderliness of the world likely will too; if it decreases, there is apt to be more strife. Even during the height of the Cold War, there were diplomatic channels open between the United States and the Soviet Union.[28] As with most of these indicators, this is not absolute because there could be a spike in diplomatic communication just prior to a conflict, but as a rule high levels of diplomatic communication likely facilitate transparency and global order.

Trade is another sub-driver of world order. The fewer barriers to trade that exist, the more trade there will be and this is another indicator of harmony in the world. If states become protectionist, passing tariffs and creating other barriers to trade, this will indicate a world moving towards fragmentation. While free and open trade is a solid indicator of global order, it is important that the trade not be exploitative, as that will have the opposite effect. Trade, to indicate orderliness, must be conducted in a mutually beneficial manner according to agreed upon rules.

While a limited number of rogue states, defined as nations that do not abide by international rules and norms, does not indicate an overall disordered world, their proliferation or an uptick in their influence around the world would demonstrate movement in that direction. A decrease in the number of such states or in their influence would be evidence that the world is

moving towards increased global order. Conversely, as the world moves toward increased order, one can envision a decrease in the number of rogue states.

A similar situation is found with regard to transnational criminal and terrorist organizations. While their presence in the world in any measure is detrimental to world order, it does not mean the world is fragmented. A reduction in the number of those organizations or their influence would mark a tendency towards increased world order while an increase would signal fragmentation. Another way to look at this sub-driver is that if the world order is working for most people, there is a decreased need for these types of organizations. If people are doing well under the current system, they will generally see less need to oppose that system (transnational terrorist organizations) or go outside that system to succeed (transnational criminal organizations).

Although the social media genie cannot be put back in the bottle, the impact of this phenomenon will serve as another sub-driver of global order or fragmentation. Social media allow people to network with each other without regard to their geographical location or citizenship. If people stop identifying largely with the states of which they are citizens and choose to identify with another group or idea at the expense of their identity as a citizen, it could lead to the extreme weakening of states and potentially the disintegration of the state system. This disintegration could take two forms: the disintegration of the international state system or disintegration within a nation state.

Unless a new global system were developed to harmonize the interaction of these new identity groups (which would be challenging without geographic proximity), the discarding of national identities by individuals and the disintegration of the international state system would certainly indicate movement in the direction of global fragmentation. If this disintegration

occurred within a nation state, that would indicate a more localized issue that may or may not have global implications. Either way, this is not to say that worldwide social networking will lead to global fragmentation. As long as the majority of people maintain their identity as citizens of states as one of their main identities, the Westphalian system's contribution to global order will remain.

Another potential indicator of order is the existence of democracy around the world. While it is true that established democracies tend to be relatively stable, it is important to note that the actually establishment of democracy where it did not previously exist can cause significant instability.[29] So, it is fair to say that the establishing of democracy is a potential indicator of fragmentation, but once they are established and functioning, democratic governments are signs of world order.

There is no such thing as an "ungoverned space," but the amount of space which is not governed by states and the nature of how those places are governed will influence whether or not there is order in the world. A reduction in the amount of space not governed by states would indicate a tendency towards global order, while an increase in these spaces would tend to indicate the opposite. That said, it is important to understand that the process by which the amount of "ungoverned space" is reduced has an effect on whether or not that change will tend toward order or fragmentation. If the vacuum of the "ungoverned space" is filled by local government or a national government that has legitimacy in that regions, it will likely lead to increased order. However, if that "ungoverned space" has governance forced upon it by an outside power, particularly one of the Great Powers, that act of force may have the opposite effect. An increase in spaces not governed by states, moreover, does not necessarily indicate movement towards global fragmentation because it depends on what occurs in those spaces. If

those spaces are peaceful and do not disrupt the overall order of things, the way in which they are governed is immaterial to global order (assuming they represent a relatively small proportion of the inhabited world).

The individualization of information is the tendency of people to seek out only that information which reinforces what they already believe.[30] This tendency is reinforced by search engines like Google or Bing.[31] The growth of these phenomena would indicate a more fragmented world for several reasons. First, if people are only receiving information that reinforces what they believe, it means they are not being exposed to other points of view and will result in pulling back from the world. Next, people who only listen to what they already believe, who subscribe to alternative facts when it suits them, and who believe fake news that suits them and call any news that does not suit them fake are easily manipulated. While this ability to manipulate people may reduce fragmentation within a nation state as their common beliefs are reinforced – especially if the state controls the media – it is likely to lead to greater differences between nation states which increases the potential for global fragmentation. Additionally, even within a nation state, individualization of information can increase tensions and fragmentation, as is the case currently in the United States.

Transitioning to indicators of global resources, the population remaining at a sustainable level vis-à-vis the other resources would indicate a world of plenty. There are two ways to bring about this condition: reduce the rate of population growth or increase production of the other resources at a pace that meets or exceeds the additional requirements created by the increased population. Hypothetically speaking, global population growth may be slowed in two different ways – reduction in worldwide reproduction rates or occurrence of a catastrophic event (weapons of mass destruction exchange, famine, pandemic, other natural disasters, or a combination of the

above) that temporarily reduces the population – but neither is likely to occur or to have a significant impact on the overall projected population growth.

The more likely way to achieve a sustainable level of resources for the growing population is by increasing the amount of resources available. If, however, the population grows at the projected rate and there is not an attendant rise in resource production, a world of scarcity would be indicated. While the level of production of resources and the population level are the two factors that directly determine global resource plenty versus scarcity, there are a number of factors that indirectly affect the equation by influencing one or both of the direct factors.

One such sub-driver of resource plenty is improved education, both in terms of levels of education and the breadth of its availability. More educated people tend to have lower birth rates,[32] which slows the curve of population growth, reducing the overall resource requirements. More importantly, education provides the basis for technological advancement which may, in turn, help societies to increase their resource production or find ways to be more efficient with the resources available. As a subset of education, an increased focus on science, technology, engineering, and mathematics (STEM) would certainly be a sub-driver tending towards a more resource plentiful future. These are the disciplines that will allow people to solve the production and efficiency challenges related to resource availability. Decline in quality or availability of education indicates significant potential for resource scarcity because of its effects on both birth rates and the development of solutions to the resource problems population growth would engender.

Another sub-driver of whether or not the world will see resource plenty is the condition and vector (improving or declining) of its infrastructure. Crumbling infrastructure retards production and would indicate movement towards resource scarcity. Good transportation

infrastructure – air and sea ports, roads, bridges, and railways – facilitates the efficient distribution of resources and use of energy, a key commodity that is in ever-increasing demand and currently limited supply. As with the transportation infrastructure, the quality of the power grid has an enormous impact on overall energy requirements and efficiency of production, so improved power grids, including the power generation facilities, will bode well for a resource rich future. The last infrastructure-related indicator of a resource plentiful future is an advanced or advancing communications network. Its direct influence on resource requirements will be its energy efficiency, but more than that, the ability to transmit information and ideas around the world in a free and open way will be another key factor in generating the technological advances that will allow resource production to continue to outpace demand.

Trends in climate change will also indicate whether the future will have plentiful resources or not. A reduction in the speed and effects of climate change would indicate that the world will be a resource plentiful environment. The impacts of climate change are rising temperatures, rising oceans, increased desertification, and more destructive storms.[33] While it is possible that rising temperatures could mean improved farming in northern climates, if the above-mentioned conditions continue unabated, they will, on the whole, negatively impact the global supply of water, food, and energy as well as increase the incidence of disease and natural disaster. All of this will result in fewer available resources. However, if the effects of climate change can be mitigated, their negative impacts can be reduced and they will be less likely to inhibit the increased production of required resources.

Technological progress, including the development of efficient, renewable energy sources, the more efficient storage of energy, the continued development of safe genetically modified organism (GMO) food sources, and more efficient water production or

decontamination processes, will also indicate a future of resource abundance. Not only do they permit more generation and storage of power but also, again, they also promote efficiency in industrial and agricultural production. If, however, those technologies are not pursued due to a lack of technological progress or fear of the advancement of certain technologies (GMOs),[34] the indication would be that scarcity will occur.

Finally, and perhaps less intuitively than the rest, increased space exploration will indicate a future wealth of resources. Space exploration will potentially contribute to future resource wealth in two ways. First, it will drive further technological innovation which has already been shown to increase resource availability. Second, there may be raw materials in space that are available for extraction, thus increasing the total raw materials available for use in providing for mankind's needs. A lack of space exploration would prevent those contributions and, while it will not decrease the production of resources, it could reduce the rate of increase in the production and obtainment of resources.

Four Alternative Worlds: What Does the Future Hold?

With the establishment of a point of departure based on current circumstances (the *status quo ante*), key assumptions, and various indicators of global order and global resource levels, it is now appropriate to envision and describe what the future may hold. How do we envision the interaction of these sub-drivers in each of the alternative futures? Each future falls into one of the four quadrants in the scenario matrix tool depicted in Figure 2. A rough synthesis of the indicators or values of the various sub-drivers in each quadrant is therefore the next step, starting with "Mary Poppins" and rotating clockwise through "Lord of the Flies," "Hunger Games," and "Brewster's Millions."

In “Mary Poppins,” the world is a relatively rich and harmonious place. The United States and China compete for influence and market share, relying primarily on the international institutions that they respectively fashioned. Despite the fact that there are two systems of institutions at work, they have developed agreements with each other that allow them to both function in a reasonably orderly way. They even have overlapping memberships. While the militaries of the United States and China are the large guarantors of the peace, diplomatic communication is frequent amongst most nations and is the preferred method of solving disputes. When state-to-state diplomacy fails, force is occasionally employed, but the international institutions rapidly take measures to enforce international law and return peace to the system. Militaries are more often employed cooperatively to combat transnational threats in the world and to keep the very few remaining rogue states in check.

The reduction of transnational threats can be attributed to the lack of inspirational causes as the people of the world are provided largely what they need and desire through robust trade and resource production. The more developed states take steps to assist developing states to extend governance throughout their territories and, more importantly, to increase and improve the provision of education. This, in concert with inexpensive and relatively open access to information of all sorts, pays dividends in terms of reduced birth rates and enormous technological advancements. These advancements improve the production of required resources, increase the efficiency with which those resources were used, and help to mitigate the impacts of climate change. Largely due to a global focus on STEM, renewable energy is being created on such a large scale and so efficiently that fossil fuel use is declining dramatically and will no longer be necessary within one more generation. This process benefits from significant advances in energy storage and other infrastructure improvement made possible by cooperative efforts of

the best and brightest scientists from around the globe. In addition, relatively friendly competition and some terrestrial cooperation amongst states lead to the same in space and resulted in the discovery of useable resources that can be efficiently mined in space and transported to earth for use. Finally, while individuals and small groups connect with each other around the world, the vast majority of people identify as citizens of their states and maintain their allegiance to those states.

In "Lord of the Flies," the world is orderly, but struggling to satisfy humanity's needs. International institutions are respected and effective, but tensions simmer just below the surface as states worry that they are not or will not be able to ensure the provision of their people's basic needs. The world population has continued to grow as expected, but countries do not make the necessary investments in education, infrastructure, and climate change mitigation or adaptation, so the earth's resources have not kept up with demand. Science, technology, engineering, and mathematics education suffer from a lack of focus by the various governments and from the deleterious effects of malnutrition and want in students. It is difficult to concentrate on electrical engineering class when one is contemplating how to quiet a rumbling stomach and whether or not one's little sister will get enough to eat tonight. The scarcity in resources is not an evenly distributed problem, affecting developing nations to a much greater degree than developed ones, although they do not get away unscathed. The chasm between the haves and have nots in developed societies has grown wider as the affluent are more capable of paying the necessary prices for the basics of life. Technological progress has slowed considerably, resulting in unremarkable advances in alternative energy sources. Infrastructure around the world continues to crumble, serving, not only as an indicator of coming scarcity, but also as a symptom of the

present scarcity. The majority of capital is used for immediate provision of basic needs and cannot be used for long-term projects like improving infrastructure.

Despite the dire resource situation, nations are trying to work through international institutions to solve the problem. The United States and China, affected by the scarcity, but also most able to absorb the effects, provide the security that underlies the order around the globe and enforces international law. Rogue states and transnational threats are still a factor, though, because they use the scarcity as a source of grievance to rail against the system. That said, they are seen by many as a drain on global society and coalitions of nations led by one of the two super powers usually can come together to reduce their influence, if not completely defeat them. Because most nations do not have the depth of resources to sustain conflict, disputes are generally handled through diplomatic channels. While there is relatively less to trade and trade is generally conducted within blocs based on the two hegemonic powers, there is enough trade between countries and between blocs that the world is better served by peace than by the disruption caused by war. People have become frustrated with their governments, but have not given up on their identity as citizens and still rely on information obtained from multiple sources with multiple perspectives to evaluate the situation in the world. People are, however, open to associating with other people around the world, especially those they view as being members of the same class or having the same access to resources. The orderly situation in the world is tenuous because of the scarce resources, and the world will likely move rapidly towards fragmentation if the resource situation is not improved soon.

In “Hunger Games,” the United States and China are openly hostile and, while not currently fighting each other directly, engage in proxy conflicts. They both demand and compete for the loyalty of smaller nations to increase their influence and power. While the United

Nations still exists and the United States and its allies still participate in its institutions, the Chinese and their allies merely pay it lip service while participating in institutions of China's making. This has resulted in a severe degradation of international law and diplomacy, especially between the competing blocs of nations. Trade occurs within the blocs, but has broken down between them. Terrorist organizations and transnational criminal organizations take advantage of the seams in global government and proliferate in "ungoverned spaces" that have resulted from a general lack of global order. While national identity remains high, there is also significant identification with the larger bloc and information tends to be gathered from sources that reinforce the point of view of the information gatherer.

In the context of this global disorder, nations forego infrastructure and education spending as well as climate change mitigation efforts in favor of military spending. They also largely focus their efforts at technological advancement on new weapons systems. These choices result in an increased population growth rate and lack of progress toward discovery or improvement of alternative energy sources. Despite the advantages space may provide in terms of both technological advancement and military applications, the long-term nature of space investment combined with short term security requirements cause most nations to reduce budgets for space activity. The sum of all of these decisions is an overall reduction in resources around the globe. This resource scarcity only serves to exacerbate the global fragmentation.

In "Brewster's Millions," the conditions of the two main drivers are reversed from "Lord of the Flies": the world has grown, albeit modestly, in resource abundance, but is very fragmented. Global fragmentation has resulted from a combination of individual behaviors and the reactions of national governments. Continued technological advancements and global interconnectedness have allowed people to identify with others based on myriad factors having

nothing to do with geography or nationality. This, in turn, has resulted in a reduction of those people's identification with the states of which they are citizens and a corresponding reduction in the importance they placed on the role of those states' governments. Many governments saw this phenomenon and increased their nationalist and populist rhetoric in an attempt to restore their importance in the lives of their citizens. While this has worked for citizens that were prone to those sentiments, it has not been widely effective. The result is that the citizens who had lost interest in their governments started to refrain from participation in their political institutions, preferring to communicate with those with whom they believed they had more in common. The byproduct of this trend is that most of those involved in politics now are extremely nationalistic.

The consequences of these trends are the withdrawal by many nations from international institutions and the erecting of trade barriers as loyalty to one's own nation is the main force driving politics. This is not to say that there is not trade, but it is far less free and open than it once was and tends to be segmented into blocs, broken down mostly, although not exclusively, along civilizational lines like the ones Samuel P. Huntington suggested – Western, Confucian, Japanese, Islamic, Hindu, Slavic-Orthodox, Latin American, and African.[35] Diplomacy still occurs, but it tends to be bilateral and most nations negotiate with each other in zero-sum terms. Bad actors, including rogue states and transnational criminal and terrorist organizations, take advantage of the fragmented world situation and continue to push their agendas by using violence, with limited repercussions. Making matters worse, when these bad actors conduct operations, various nations blame each other for failure to prevent them or for collusion, which only exacerbates world tensions. There is also an increase in "ungoverned spaces" due to a combination of the lack of international cooperation and the increased power of bad actors. It

might be hard to imagine how resources could be plentiful in such a contentious world, but the answer, ironically, is tied to some of the same causes of that fragmentation.

In short, the interconnectedness of people and non-state actors combined with individual nations tending to their own problems allowed the world to overcome resource challenges in spite of global fragmentation. While world population continued to grow, it did so more slowly than predicted, which reduced pressure on overall resource requirements. Many nations developed programs to improve and increase education in an effort to gain a competitive advantage on other nations. This not only contributed to the decreased population growth rate (birth rates decrease as education increases), but made technological progress accelerate even faster. This progress resulted in new solutions to infrastructure challenges, increased resource efficiency, and continued growth in individuals' access to information. Nations that took advantage of the infrastructure solutions made gains in resource efficiency and can now survive with far less reliance on other nations.

While the benefits of this technological progress, like most things, have not been evenly distributed around the world, they have increased the abundance of resources in the aggregate. Demand for space tourism resulted in technological advancements as private industry worked to meet those demands. Those advances in technology have been harnessed by nations, nonstate actors, and individuals to increase the production and efficient distribution of resources. Finally, individual, person-to-person communication across the globe has continued to increase and these networks have facilitated the spread of ideas and technologies that were harnessed to mitigate climate change, spread STEM education, and increase efficient production of water, food, and energy. Such material progress contributes to the ability of a fragmented world to find a way to prosper. Like "Lord of the Flies," however, this "future world" is likely to be a transitory

situation, moving either towards "Mary Poppins" if the world's powers can overcome their differences, or towards "Hunger Games" if they cannot.

As can be gathered by reading their descriptions, the futures envisioned in "Lord of the Flies" and "Brewster's Millions" are highly unlikely, and as mentioned will be transitory if they do occur. This does not mean that they are not worth considering as it is far better to be aware of a slim possibility than to be taken totally by surprise. Each poses significant threats, however less likely they may be than the risks inherent in the other scenarios. By guarding against them, one may possibly ensure that these worlds do not transpire. The improbable nature of these futures also demonstrates that the reviewed forecasts have covered the most likely futures, but the fact that they did not mention the possibilities of these other futures means that it was useful to examine them, even if it is, in the end, necessary to discard them.

Implications for Places Without Bases

The problem of *Places Without Bases* could present itself in all four situations, which validates the need to explore and develop a family of concepts to overcome it. That said, each of the above envisioned futures has unique implications for those concepts. The importance of understanding the indicators of which future is unfolding is knowing which concepts will need to be employed and to what extent to overcome the problem of *Places Without Bases* in that particular future.

Of all of the futures described, "Mary Poppins" is least likely to require the actual employment of concepts that solve the problem of *Places Without Bases*. The main role of those concepts will be to serve as a deterrent that facilitates the maintenance of the order and plenty that exists. Even in the world described in "Mary Poppins," two of the original reasons for the

problem of *Places Without Bases* are possibly in effect: adversary capability to threaten U.S. forward bases at a level that is considered unacceptable, and the requirement to operate in an austere environment where we have not previously operated and established military infrastructure. In the first case, the decision to withdraw forces from harm's way would require the use of the *Places Without Bases* concepts to maintain the advantage those bases were originally designed to obtain. For the second case, there are multiple reasons, from a foreign humanitarian assistance (FHA) operation to a conflict for which the United States had not planned, which might require the employment of *Places Without Bases* concepts.

In "Mary Poppins," *Places Without Bases* concepts would play a potential role, but in "Lord of the Flies," they would be more likely to play a more active role. While armed conflict would still remain an unlikely possibility, the simmering tensions from the scarcity of resources would require the military to play a more active role in keeping order among less developed nations than simply as a conventional deterrent to Great Power aggression.

In this future, three of the four reasons for the requirement of *Places Without Bases* could be operative: the United States could be unable to afford the maintenance of the forward bases, the adversary capabilities could require withdrawal, or there could be a need to operate in a new and austere environment. The second reason comes into play with respect to the United States' larger adversaries, China and Russia, as the harmonious world order still mitigates the possibility of conflict, but does not completely remove it. The United States would maintain a similar forward-based posture to the one it has now, in Europe (old and new) on the one hand and Korea and Japan on the other, and for the same reasons. While *Places Without Bases* concepts would most likely still play a deterrent role in this scenario, if military conflict with China or Russia were to occur, their fires capabilities would force a withdrawal from most, if not all, of those

forward bases. This would necessitate the actual employment of the *Places Without Bases* concepts. As resources would be at a premium even in the developed world, there would be significant need for application of resource-efficient operating concepts.

As an example of the need to operate in new and austere environment, resource issues in the developing world, particularly in Africa, may spark conflict that necessitates intervention by United States forces to maintain world order in a place where it is unwilling to expend the resources required to build bases. In fact, developing concepts that solve the problem of *Places Without Bases* could be a key contributor to the decision not to build bases in those locations, and thus be a cost-saving measure [36]

The requirement for capabilities and concepts to operate in *Places Without Bases* is at its highest in "Hunger Games." All of the resource limitations from "Lord of the Flies" still apply and the additional burden of global fragmentation is added to the situation. In a disorderly and resource-deprived world, all four of the reasons for the *Places Without Bases* concepts will be likely. Political sensitivities, threat capabilities, or a combination of the two would likely result in the United States withdrawing forces from forward bases. Reduced resources would decrease further the United States's ability to forward deploy because it is expensive and budgets would likely be tight. The overall tension in a fragmented world implies a higher likelihood of conflict, which would also increase the chances of the U.S. operating in a new and austere location. The chances of actual conflict with Great Powers, like China and Russia, would still be quite low, but greater than in any of the other scenarios. This implies that the actual application of concepts and capabilities for *Places Without Bases* would be more likely as well.

"Brewster's Millions" presents the opposite situation of "Lord of the Flies," but still justifies the need for solving the problem of *Places Without Bases*. Again, three of the reasons

for developing relevant concepts are indicated: U.S. forces are asked to withdraw for political reasons, adversary capabilities make the bases untenable, and the likelihood arises of operating in a new austere location. The United States's current forward bases tend to be located in the vicinity of its potential major rivals, China and Russia, a fact that could contribute to the first two reasons listed in this scenario. It is possible that, especially in a fragmented world, the nations who host U.S. bases would receive and succumb to pressure put on them by China or Russia to evict U.S. troops. With resource plenty, moreover, the chances increase that major powers might acquire and enhance capabilities that unacceptably threaten forward U.S. bases. Finally, as has been seen with all of the scenarios, the potential to have to react militarily to a situation in a new place always exists and the *Places Without Bases* concepts could increase the United States's ability to succeed in those situations.

Conclusion

Since the circumstances that will engender the problem of *Places Without Bases*, i.e. the absence, loss, or degradation of U.S. forward basing or deploying military capability, are deemed most likely to occur after 2030, the first step to examining that problem is gaining an understanding of what the world might look like at that time. The forecasts reviewed for this paper describe that world in fairly similar ways, which begs the question of whether they contain blind spots. This possibility necessitates a different way to forecast the future that examines a broader set of possibilities.

After using the scenario matrix tool and the two broad drivers of global order and global resources, it becomes clear that the reviewed forecasts describe the world in ways that are most plausible, and that the futures they do not describe would be transitory at best and, more likely,

wholly implausible. The methodology used in this paper covered those gaps, which achieves two important outcomes. First, it provides a description of those highly unlikely but highly dangerous futures, just in case they somehow do come to fruition. By guarding against an undesired future, statesmen can sometimes avert it altogether. Second, there are always unforeseen developments; current trends and assumptions do not guarantee future results. Articulating the seemingly unlikely futures allows for a planning team not only to state their assumptions, but also to reach consensus on indicators or metrics of their accuracy or falsification. Defining these indicators and metrics to track them allows commanders to change course before being surprised by a future forecasters had disregarded.

The exhaustive examination of the widest possible set of potential futures demonstrates that those concepts will be necessary and useful no matter which future unfolds. Whether it be the most likely situation of "Hunger Games," where the United States can expect all four of the reasons for *Places Without Bases* to be operative, or "Mary Poppins," where only two of the reasons might be in play and the capabilities will serve more as a passive deterrent than as active measures. Even in the two unlikely or transient futures, "Lord of the Flies" and "Brewster's Millions," three of the reasons for *Places Without Bases* are likely to apply, with the difference being that "Lord of the Flies" would see an inability of the United States to afford the forward presence and "Brewster's Millions" would see U.S. forces being asked to depart for political reasons.

The bottom line is that any future that can be imagined is likely to find a role for new concepts and capabilities to address the problem of "Places Without Bases." Therefore, the United States Marine Corps and the Department of Defense would be wise to start pursuing such solutions. The year 2030 may seem distant, but pipelines and lead times for new capabilities are

long. By anticipating alternative futures and seeing the broad applicability of "Places without Bases," planners will ensure that those capabilities are ready when needed to facilitate the continuation of the United States's policy of ensuring combat is played as an away game.

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