

# 2015

PROGRESS REPORT

**THE FUTURE OF NATIONAL SECURITY**  
strategy • policy • budget



**CSBA**

Center for Strategic and Budgetary Assessments



# THE FUTURE OF NATIONAL SECURITY

The Center for Strategic and Budgetary Assessments (CSBA) is an independent, non-partisan, non-profit public policy research institute established to promote innovative thinking and debate about national security strategy, defense planning, and military investment options for the 21st century.

The Center for Strategic and Budgetary Assessments began its analytic work in 1983 as the Defense Budget Project. Its mission was to fulfill an urgent need for research and information on defense policy and budget issues. Within a decade it was recognized as a leading authority on the analysis of defense policies and budgets. Former Army Lieutenant Colonel Dr. Andrew F. Krepinevich became president in 1993, and in May 1995 he incorporated the research group as the Center for Strategic and Budgetary Assessments. For nearly two decades, CSBA has provided consistent, high-quality, and innovative research on defense strategy, budgets, and the security environment. With notable alumni including Michael Vickers, Robert Work, and Todd Harrison, CSBA experts have worked to analyze U.S. defense strategy, force structure and planning, and defense budgets in the

effort to reconcile these inter-related subjects and inform on them, contributing extensively to the Revolution on Military Affairs debate, the development of an AirSea battle concept, and discussions on the strategic choices necessary for the transformation and modernization of the U.S. military in the face of sequestration. CSBA remains instrumental in guiding the nation's most critical defense policy debates as a small, powerful group comprising experts with extensive experience in the field of national security—many of them military veterans and former senior level policy makers from the Department of Defense, State Department, and the National Security Council—supported by a dedicated staff of accomplished executives and scholars.

CSBA's mission today is to promote innovative thinking and debate about national security strategy, defense planning, and military investments, and to enable policymakers to make informed decisions regarding strategy, security policy, and resource allocation.

### Research Themes

**Strategy & Policy** research informs the formation of U.S. strategy by developing innovative options to reconcile ends and means and identifying strategic priorities. It highlights sources of enduring advantage for the United States in sustaining its position and meeting 21st century challenges.

**Budget & Resources** research provides an independent source of analysis to understand budgetary trends; the near-and long-term implications of prospective trade-offs; the second-order consequences of changes to the defense program; and how budgetary policy fits within the overall context of U.S. defense policy and strategy. It informs the budget-making process and explores policies to optimize essential resources.

**Future Warfare & Concepts** research considers possible developments in the realm of national security and their implications on regional and global security. CSBA specializes in thinking about the future of warfare, which is essential to formulating concepts and strategies that will be effective across the widest range of contingencies and executable within projected resource limitations. CSBA utilizes scenario planning and wargaming to identify future trends and candidate operational concepts, understand emerging warfare regimes, and challenge preconceived notions of the future.

### OUR STRENGTHS

- CSBA analyses derive value from an integrated strategic and budgetary approach.
- CSBA's mature scenario-planning and wargaming methodology help experts think in new ways about operational planning problems and solutions.
- CSBA experts and strategists bring the benefit of diverse backgrounds and experiences to our research.
- CSBA's freedom to challenge prevailing views and planning assumptions allows us to look at the greater realm of possibility beyond doctrine.
- CSBA's extensive contacts among political and military leaders, on Capitol Hill, within the press, and in academia and industry enables us to hold the right conversations with important stakeholders.
- CSBA's solid reputation as an independent, non-partisan voice of authority with a proven track record as a driving force in decades of defense debate validates the quality and impact of our work.

**Forces & Capabilities** research explores the utility of various military capabilities in a variety of plausible future contingencies to inform U.S., ally, and partner force planning, doctrine, and procurement decisions. CSBA's force planning research determines needed changes in force structure, operational concepts, and system performance characteristics by taking into account the future security environment, identifying critical gaps and seams in the current defense program, and providing options for improving the U.S. military's organization, training, equipment, and doctrine for meeting future security challenges.

**Nuclear Strategy & Forces** research examines the culture of the current nuclear age and the implications of increased proliferation. CSBA has conducted in-depth research on topics such as the dynamics of the second nuclear age, the costs of America's nuclear arsenal, the consequences of nuclear proliferation, and the importance of a credible nuclear deterrent.

## Research Methods

### ANALYTIC STUDIES

Analytic studies look 20–30 years forward and are informed by history. They frame security developments in a broader context of strategic competition and identify critical areas of competition, particularly with regards to technological development, as well as the competitive advantages and disadvantages of the United States and potential adversaries. They take into account bureaucratic considerations and their influence on policy.

### CONCEPT DEVELOPMENT

CSBA’s operational concepts link strategies and capabilities to achieve strategic objectives. They consider future technological and political developments and explore the utility of elements of the program of record, including potential additions, enhancements, or necessary alterations. Promising operational concepts may be validated by wargaming.

### SCENARIO DEVELOPMENT

CSBA employs an “alternate futures” scenario development methodology. The future cannot be predicted, but scenario development understands the value of thinking through various potential challenges. Our scenario development has been successfully employed by a variety of U.S. and allied government sponsors.



### WARGAMING

CSBA’s wargaming methodology is designed to illicit the insights of a well-informed community of subject-matter experts on important, evolving issues instead of generate predetermined outcomes. CSBA wargames are intended to question prevailing assumptions underlying current and potential U.S. military concepts of operations, discover essential U.S. and adversary capabilities, identify capability and capacity shortfalls, and highlight potential areas of strategic advantage or disadvantage.

### WORKSHOPS AND SEMINARS

CSBA workshops and seminars expose participants to new issues and concepts. They explore different approaches to thinking about strategic challenges designed to elicit non-obvious ideas and insights and provide a forum for discussion. They are also a way to critically review ideas and concepts in development.

### BUDGETARY ANALYSIS

CSBA provides trusted insight on current defense spending and resource allocation, acquisition issues and reform, extraordinary funding for ongoing military operations, Department of Defense efficiency initiatives, historical spending trends, and future defense spending levels.

### SPECIAL PROJECTS

CSBA is a flexible organization with a broad base of expertise, well-suited to conduct or participate in a variety of additional work that may not fall into any specific category. Special projects in the past have included QDR “Red Team” efforts such as the 2005 “Downing Report” on SOF, congressional studies, and consulting for allied governments.

*“ We do have a big strategy-resource mismatch,  
and it only seems to be growing.”*

*– Todd Harrison, CSBA alumnus, Chicago Tribune*



## MESSAGE FROM THE CHAIRMAN OF THE BOARD



THE BOARD AND I WOULD LIKE to thank Dr. Andrew Krepinevich for his decades of public service as President and Chief Executive Officer for the Center for Strategic and Budgetary Assessments. Many would consider a 21-year career in the U.S. Army enough service for anyone, and they'd be right. But Andrew is not just anyone, and his career has been far from simple. A graduate of the United States Military Academy, he earned a Ph. D. from Harvard University while on active duty and served on the personal staff of three Defense Secretaries while developing policies and strategies in the Department of Defense's Office of Net Assessment. After retiring from the Army, Andrew spent more than 20 years building CSBA into one of this nation's most respected national security think tanks.

Andrew has been the architect of CSBA's reputation as a non-partisan think tank focused on long-term strategic challenges and analyzing realistic strategic responses. CSBA's analyses play a significant role in the development of the nation's defense strategies, policies, force structures, and budgets, and its success is due in no small measure to the talented team of senior fellows, researchers, and others recruited by Andrew whose thoughtful work helps our leaders make critical decisions.

We are pleased to announce that Dr. Thomas Mahnken will succeed Andrew as President and CEO in March 2016. Tom's career has been devoted to the study and practice

of national security strategy. He is a respected scholar, having taught at the U.S. Naval War College and Johns Hopkins School of Advanced International Studies for nearly 20 years. He is the author of a number of major works, to include most recently: *Strategy in Asia: The Past, Present, and Future of Regional Security*, and *Competitive Strategies for the 21st Century: Theory, History, and Practice*. He has also served for over 20 years as an officer in the U.S. Navy Reserve, with deployments to both Iraq and Kosovo, and he served as Deputy Assistant Secretary of Defense for Policy Planning from 2006–2009, where he helped craft the 2006 Quadrennial Defense Review and 2008 National Defense Strategy. He also served on the staff of the 2010 Quadrennial Defense Review Independent Panel and 2014 National Defense Panel.

The Board is pleased that Tom has accepted the challenge of following Andrew as CSBA's leader. We believe that he has the vision and experience to continue Andrew's extraordinary legacy.

Sincerely,

**NELSON M. FORD**  
Board Chair

## MESSAGE FROM THE PRESIDENT AND CEO



I AM BOTH HONORED and excited to join the Center for Strategic and Budgetary Assessments as its new President and Chief Executive Officer. CSBA has been at the forefront of thinking through our country's tough strategic challenges for more than 20 years. Throughout its history, CSBA has had an impact on national security policy far out-measuring its size. CSBA's outstanding reputation for bringing expert knowledge to bear during the government policy-making process is directly attributable to the expertise and insight of our staff, the counsel of our Board of Directors, and of course the support of our many sponsors.

In the years to come, CSBA will continue to be a leading voice in the public debate on national strategy, the changing character of war, and the defense budget. Our continuing success will require a number of things. First and foremost, we rely on our world-class staff, which has justifiably earned a reputation for delivering independent, non-partisan analysis. Andrew Krepinevich built an organization on the bedrock of a talented

and dedicated staff committed to helping this country's senior leaders build an armed force capable of meeting the security challenges of the future. CSBA's future success is in their trusted hands, and I thank them in advance for their continued commitment to serving this nation's interests.

A second ingredient of our continued success will be the in-depth, timely analysis upon which our reputation has been built. CSBA's core mission is to enable the efforts of senior policy makers to reach informed decisions with regard to our nation's defense strategies, military capabilities, force structure, and budgets. Our success will be measured by how our studies influence their consideration of possible alternatives, likely costs, and resulting consequences. In the coming months you can expect us to tackle new issues with the same independent, non-partisan approach that has marked CSBA's work throughout its history.

A third element of our continuing success will be our peerless wargaming capabilities. Our games will continue to gather together the best subject matter experts to hash out the tough national security issues that senior policy makers confront today and will confront in the future. Our games help us question prevailing assumptions, identify capability and capacity shortfalls, highlight U.S. military advantages and disadvantages, and develop operational concepts that will ensure success in our future military competitions. In the next year we will expand our gaming capability into some exciting new areas. You can expect to hear more on that soon.

Last, but certainly not least, we will remain the center of excellence for defense budget and resource assessments, helping senior government officials understand budget trends, the second- and third-order implications of strategic budgetary choices, and how these factors affect the overall context of U.S. defense policy and strategy. Expect to see some new budgetary initiatives from our team in 2016.

Sincerely,

**THOMAS G. MAHNKEN**  
President and Chief Executive Officer



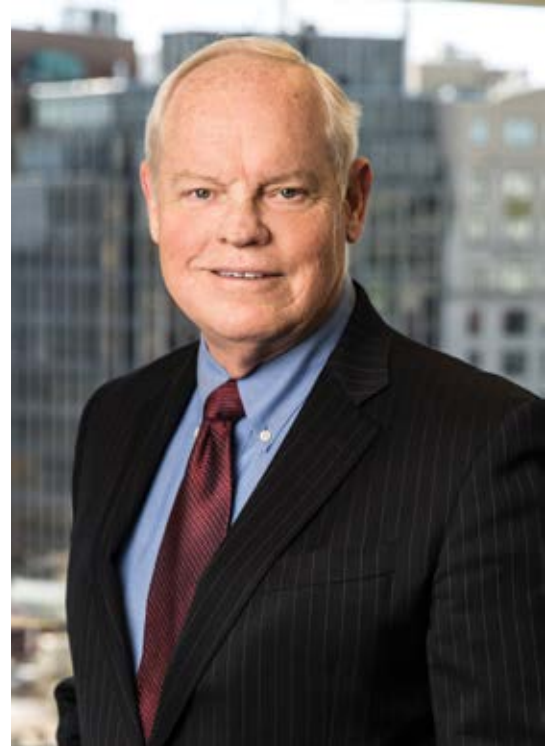
FUTURE AMERICAN MILITARY power depends on wise investments informed by a well-crafted strategy. Making those investments has become increasingly challenging. Revisionist powers in Eastern Europe, the Middle East, and the Far East are confronting the United States and challenging the rules-based international system, and the threat posed by non-state actors like the Islamic State show no signs of abating. At the same time, the means available to address these threats are diminishing—a consequence, among other things, of the Budget Control Act of 2011, growing personnel costs, and reduced military investments on the part of many key U.S. allies and partners. With Federal deficit spending once again on the rise, our fiscal trials are likely to grow, not diminish, over time.

For more than 20 years, the Center for Strategic and Budgetary Assessments has dedicated itself to examining emerging military challenges and charting a path for the U.S. Armed Forces and our allies. These past few years have been some of our most productive, with CSBA shaping the defense debate in a number of critical areas. Competitive strategies are again in vogue after a long hiatus following the Cold War. CSBA experts are sought after in policy discussions concerning the third offset strategy. Our work on operational concepts such as AirSea Battle and Archipelagic Defense orient military and defense programs on the challenges we face, a CSBA contribution of which I am particularly proud. Our long-running

portfolio of rebalancing exercises have enabled a wide range of national security policy makers, senior U.S. defense officials and military leaders, and partner-country delegations to explore options for enhancing our military's effectiveness.

We would not be able to accomplish all that we have without our talented research team, our dedicated administrative and support staff, and the generous support of our sponsors. Policymakers will continue to need reliable analyses rooted in historical context to help guide them in weighing policy alternatives as they work to enhance America's security. And, when it comes to providing senior leaders within the Department of Defense, Congress, and other organizations with critical analyses of tomorrow's military competitions, potential opportunities and challenges derived from emerging technologies, or shifts in defense budget policies and priorities, I am confident that CSBA will remain the gold standard. In this context, Dr. Thomas Mahnken could not be joining the CSBA team at a better time. His experience, accomplishments, and formidable analytic skills are assets that will ensure CSBA is positioned to meet the challenges and exploit the opportunities of a new era.

For more than two decades, I have had the privilege to work with an accomplished staff committed to supporting our country's senior



policymakers in their efforts to keep our nation safe and strong. My colleagues over the years are the source of many fond memories, and they have been a constant wellspring of intellectual growth and renewal for me. Some have gone on to serve in senior government positions in the administrations of both parties, something of which I am especially proud. I owe them a debt of gratitude that can never be repaid. They are the principal reason for CSBA's success and the fact that its reputation and influence has never been greater. It has been my honor to serve with them. With their support and Tom's leadership, I am confident that CSBA's best days are yet to come.

Sincerely,

**ANDREW F. KREPINEVICH, JR.**  
President Emeritus, CSBA



*“ Military service branches are generally unable to either launch new programs or to make adjustments to ongoing programs, restricting military planners’ abilities to ramp up certain programs or scale others back.”*

– Bryan Clark, CSBA Senior Fellow, *Fortune*

## SENATE ARMED SERVICES COMMITTEE HEARINGS ON THE FUTURE OF WARFARE SERIES

In fall 2015, CSBA welcomed the Senate Armed Services Committee (SASC) invitation to participate in a series of hearings aimed at considering the future of warfare. Senator John McCain, chairman of the SASC, designed these inquiries to discuss the country's current geopolitical challenges, examine the ability of our defense enterprise to meet these challenges, and identify what reforms are necessary to ensure we have the most agile, innovative, and effective military and defense organization possible.

CSBA President Dr. Andrew Krepinevich delivered testimony on October 30 describing the current threats facing the United States and arguing that the need for a well-crafted defense strategy has never been greater. On November 2, Senior Fellow Bryan Clark testified that DoD must reform its current weapons acquisition system and take advantage of emerging technologies from DoD research labs as well as defense and commercial industry to rapidly field new capabilities in key missions such as undersea, strike, air, and electronic warfare that will impose costs on America's rivals and improve U.S. force capability. Senior Fellow Robert Martinage in his November 5 testimony focused on three broad areas for change: the possible creation of new Services for space, cyber, and special operations; the need for increased Service specialization; and the concept of "competitive jointness," or healthy

intra- and inter-Service rivalry to foster innovation. CSBA's contribution to this series of hearings concluded on November 10, when Vice President Jim Thomas argued that new legislation is needed to ensure the DoD is effectively organized to address current and future security challenges. CSBA involvement in these four hearings has helped the SASC focus on key emerging threats to U.S. national security and thoughtful options to address them.



CSBA Senior Analyst Jacob Cohn on Capitol Hill

## KEY INITIATIVES

*“Folks from the Hill, the Department, and industry don’t get together enough for events like this one, but when we do, it’s amazing what can come from the dialogue and collaboration. I hope that today we can help each other better answer at least two basic questions: Why Directed Energy? And why now?”*

– Congressman Doug Lamborn, Directed Energy Summit keynote speech

### DEFENSE REFORM CONSENSUS

On April 29, 2015 all of CSBA’s senior scholars joined dozens of experts from a bipartisan group of think tanks in calling for reforms to the Department of Defense. In an open letter to Secretary of Defense Ashton Carter and Congressional leaders, the experts call for base closures, changes to the DoD civilian workforce, and military compensation reform. In the original letter from 2013, also cosigned by several CSBA senior staff, a bipartisan group of experts warned similarly of growing imbalances within the defense budget. This strong bipartisan



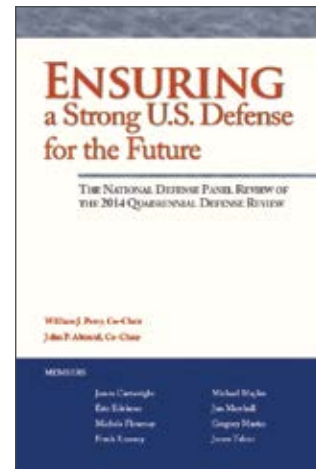
2015 Defense Reform Consensus

consensus is even stronger today, and the urgency for change is even greater. As the letter argues, without these reforms, U.S. combat power will continue to suffer, morale will further deteriorate, and competitors will continue growing more capable of contesting U.S. interests globally.

### NATIONAL DEFENSE PANEL

CSBA Distinguished Fellow Ambassador Eric Edelman played a key role in the drafting of the National Defense Panel’s (NDP) Review of the 2014 Quadrennial Defense Review. The panel concluded that the 2011 Budget Control Act (BCA) constituted a “serious strategic misstep.” They recommended that the funding baseline proposed in Secretary of Defense Robert Gates’ FY 2012 defense budget serve as the floor for defense budgets going forward.

The NDP Review drew heavily from CSBA research on emerging strategic threats and developing operational concepts. From examining these analyses, the panel determined to emphasize the growing threat of anti-access/area-denial capabilities and designated the “maintenance of assured access” a key U.S. security interest. It echoed CSBA’s Outside-In and AirSea Battle operational



National Defense Panel Review of the 2014 QDR

concepts and discussed the specific capabilities necessary to address future A2/AD challenges, including more robust space systems, long-range strike platforms, and undersea capabilities, as well as electromagnetic railgun and directed-energy technologies. Since the NDP Review, CSBA has continued researching these capabilities and connecting them to U.S. strategy.

The NDP report also recommended the Department of Defense pursue aggressive military compensation reform. This issue was analyzed extensively in a CSBA report and separate budget analysis by CSBA alumus Todd Harrison, with whom the panel consulted on this issue.



### DIRECTED ENERGY SUMMIT

On Tuesday, July 28, 2015, CSBA co-hosted a Directed Energy Summit with Booz Allen Hamilton. Over 300 people, including active duty military personnel, congressional staff, media, defense industry guests, and government personnel, attended the event. The purpose of the summit was to convene thought leaders and decision makers to explore new issues and solutions related to fielding directed energy (DE) and related capabilities and to address emerging threats and identify new advantages for warfighters. Keynote speakers included Major General Jerry D. Harris, Jr., Vice Commander, U.S. Air Force Air Combat Command, and the Honorable Ray Mabus, Secretary of the Navy. Congressional Perspectives were delivered by Congressmen Doug Lamborn and Jim Langevin, Co-Chairs of the Congressional Directed Energy Caucus. The Honorable Frank Kendall, Undersecretary of Defense for AT&L, also presented an address to the Summit.

Above: Mark Gunzinger and Andrew Krepinevich in a discussion with a speaker at the Directed Energy Summit. Below: Jim Thomas, Ambassador Eric Edelman, and Ambassador Thomas Schieffer discuss, among other things, the importance of offset strategies to the U.S.-Japan alliance.



### OFFSET STRATEGY

In November 2014, Defense Secretary Hagel announced a Defense Innovation Initiative to sustain U.S. military advantage by accelerating technological innovation. Hagel tasked CSBA alumnus Robert Work to oversee the execution of the initiative. Coinciding with this announcement, CSBA released a strategy to leverage enduring U.S. technological advantages to address anti-access/area-denial threats and restore the U.S. global projection capability. Acknowledging the new austere budgetary reality under

which the U.S. defense posture must be planned, CSBA's offset strategy identifies "core competencies" in unmanned systems, long-range and low-observable airpower, undersea warfare, and complex systems engineering, as well as areas where resources could be divested or rebalanced. The CSBA offset strategy was built on decades of research and wargaming, including the concepts and insights developed as part of the Strategy for the Long Haul, AirSea Battle, and the Strategy in the Age of Austerity initiatives.

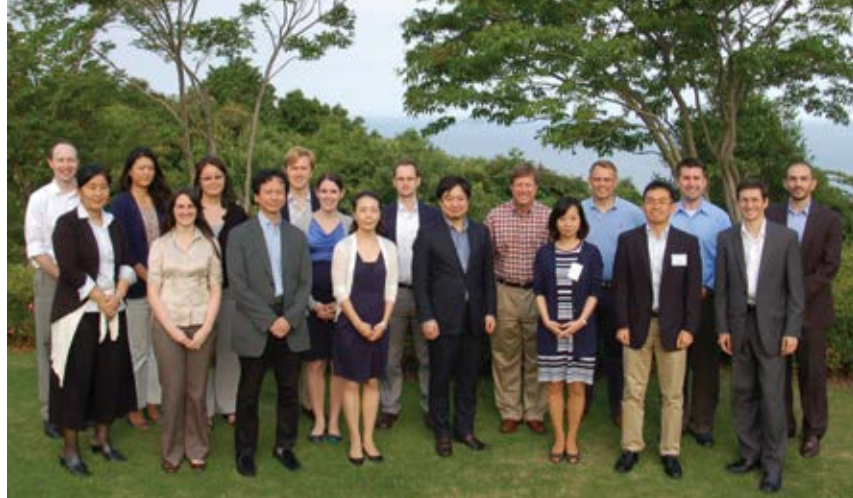
## KEY INITIATIVES

In the midst of this ongoing conversation, CSBA continues to shape the national defense policy discussion through congressional testimonies and briefings, workshops with senior congressional and Pentagon leaders, and media outreach.

### DEFENSE BUDGET AND STRATEGIC CHOICES EXERCISES

CSBA's Strategic Choices Tool has served as the connective tissue linking its strategic and budgetary research programs. Using CSBA's rebalancing tool and methodology, participants are able to choose from several hundred pre-costed options to add or cut from the projected defense program over the next 10 years, including major units of force structure, end strength, bases, readiness, civilian personnel, weapon systems, and modernization programs.

In 2015, CSBA continued to refine its proprietary Strategic Choices Tool and conducted several exercises. Exercises are conducted with the participation of congressional staff, industry experts, graduate college students (including military colleges), military services, and think tank scholars. These exercises inform thinking on the difficulty of defense resource allocation in light of declining budgets. The tool facilitates discussion and leads to understanding between participants, despite differences in policy, strategy, or Service outlook. In this way, participants can envision ways in which the strategy-resource gap can be minimized.



From 2014–2016, with generous sponsorship by the Sasakawa Peace Foundation, CSBA hosted discussions and Strategic Choices exercises with up-and-coming Japanese and American defense and Asia-Pacific experts, as well as a senior-level round table on the future of the U.S.-Japan defense alliance.

Top: Subject matter experts gather in Odawara, Japan to rebalance the U.S. defense budget from an alliance perspective.

Bottom/left: CSBA fellows, senior experts, and U.S. and Japanese officials meet and discuss the implications of the exercise and strategies for preserving the security of the alliance.

In early 2016, CSBA piloted its first exercise using both the updated tool and a version of the tool adapted with units and figures from an ally government's defense program—that of the Japan Self Defense Force. In the future, the tool could be adapted for other ally government defense programs and facilitate critical discussions about how best to balance alliance defense responsibilities and mutually exploit competitive advantages.



In addition to CSBA's Strategic Choices research and annual budget analysis, CSBA's budget analysts have published an annual *Weapons System Factbook* since 2014, a reference book resource utilizing data from DoD's Selected Acquisition Reports summarizing the program plans and funding for more than 80 major DoD acquisition programs.

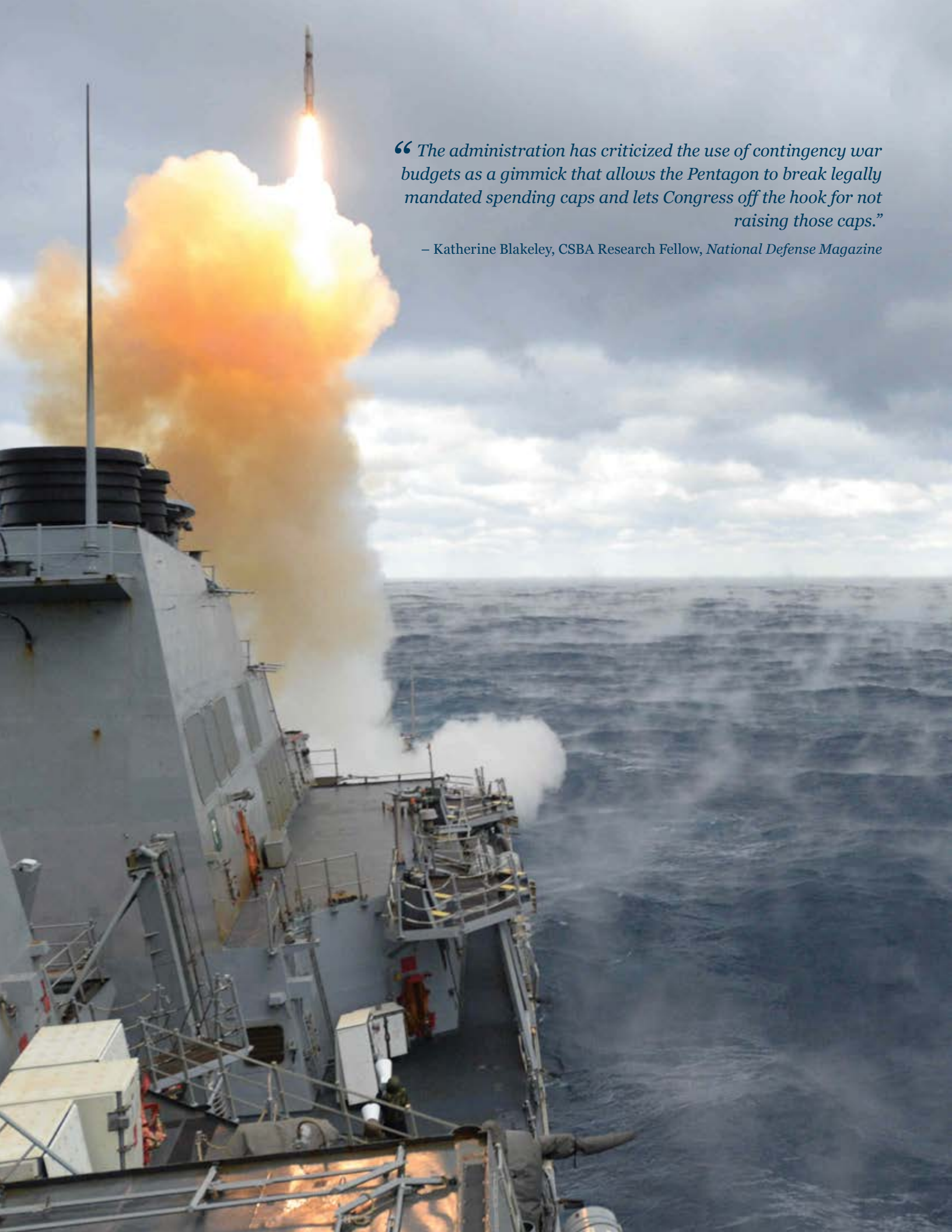


In 2015, CSBA and Poland's National Centre for Strategic Studies (NCSS) conducted a wargame-style Polish-American Crisis Planning Seminar on October 12–14 in Warsaw.

Top: CSBA's Jan van Tol and Ryan Boone explain the crisis scenario.

Middle: Mark Gunzinger and Ryan Boone present a briefing to the seminar teams.

Bottom: Mark Gunzinger accepts thanks and commendation from the NCSS.



*“The administration has criticized the use of contingency war budgets as a gimmick that allows the Pentagon to break legally mandated spending caps and lets Congress off the hook for not raising those caps.”*

*– Katherine Blakeley, CSBA Research Fellow, National Defense Magazine*

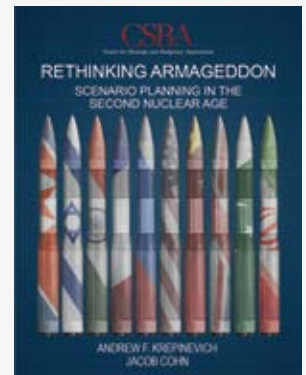


**March 2016**

## Rethinking Armageddon: Scenario Planning in the Second Nuclear Age

Andrew Krepinevich and Jacob Cohn

This scenario-based assessment of the competitive dynamics of the Second Nuclear Age explores, among other things, the implications for extended deterrence, crisis stability, missile defense, prompt conventional global strike, growing multipolar or “n-player” competitions, and planning assumptions as they have been influenced by advances in the cognitive sciences, to include prospect theory. It includes an analysis of the implications for U.S. interests, with an emphasis on preserving the 71-year non-use of nuclear weapons, or the “nuclear taboo.”



**February 2016**

## FY 2016 Weapon Systems Factbook

Jacob Cohn and Jesse Sloman

The most recent available SARs, submitted in December 2014, project funding and quantities for major acquisition programs extending more than 30 years into the future. The SARs project that these programs will need \$337 billion over the FYDP spanning FY 2016 to FY 2020 and an additional \$453 billion in FY 2021 and beyond. This report summarizes the program plans and funding for each of the major acquisition programs included in the SAR and four additional programs. The Air Force’s Long Range Strike-Bomber (LRS-B); Long Range Standoff Missile (LRSO); and the Ground Based Strategic Deterrent (GBSD), the future replacement for the Minuteman III, and the Navy’s Ohio-Class Replacement are not yet reported in the SAR, but enough is known about each program to construct a reasonable cost estimate.



## PUBLICATIONS

February 2016

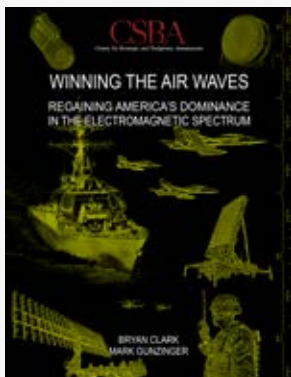


### 7 Areas to Watch in the FY17 Defense Budget

Katherine Blakeley

President Obama's final budget, released February 9th, was his last chance to put his administration's stamp on the nation's defense spending. Key areas to watch included: the political fight over overall defense spending; finding the \$22 billion in cuts between the FY 2017 spending called for in last year's budget plan and this year's budget submission; the potential for defense reforms in acquisition, organization, and compensation; balancing investments in force structure and modernization; investment bets on the future; the early wedges of the bow wave in acquisition spending; and Overseas Contingency Operations adjustments in response to ISIS and Russian aggression in Europe.

December 2015



### Winning The Airwaves: Regaining America's Dominance In The Electromagnetic Spectrum

Bryan Clark and Mark Gunzinger

The electromagnetic spectrum is one of the most critical operational domains in modern warfare. Unfortunately, America's once significant military advantage in the EMS domain is eroding. DoD now has the opportunity to develop new operational concepts and technologies that will create enduring advantages in EMS warfare. This report analyzes military use of the EMS over the last century, identifies how EMS warfare is likely to change over the next several decades, proposes operational concepts and technologies that will enable U.S. forces to dominate the next phase of EMS warfare, assesses of the barriers DoD faces in implementing a new approach to EMS warfare, then offers recommendations to overcome these.

*“ I'd like to thank CSBA for all the great work that they do... You produce so many great pieces, and we just thank you for that work.”*

– Congressman Randy Forbes, *Winning the Airwaves* release, 2015

November 2015

## Deploying Beyond Their Means: America's Navy and Marine Corps At a Tipping Point

Bryan Clark and Jesse Sloman

Today the Navy and Marine Corps are facing a fundamental choice: maintain current levels of forward presence and risk breaking the force or reduce presence and restore readiness through adequate training, maintenance, and time at home. This choice is driven by the supply of ready naval forces being too small to meet the demand from Combatant Commanders, as adjudicated by the Secretary of Defense. To close the gap, the Department of Defense will need to grow the fleet and force, base more ships overseas, or pay to maintain a higher operating tempo.

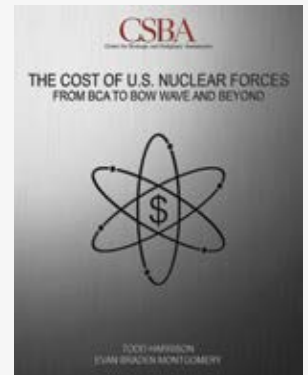


August 2015

## The Cost of U.S. Nuclear Forces: From BCA to Bow Wave and Beyond

Todd Harrison and Evan Montgomery

For more than half a century, the United States has relied on its nuclear arsenal to deter attacks against its territory, extend deterrence to its allies, and limit the amount of damage that an adversary could inflict if deterrence were to fail. However, nuclear weapons have also been one of the most controversial elements of U.S. military power. Several studies have suggested that cutting back U.S. nuclear force structure or scaling back modernization efforts would save money. This report provides an in-depth accounting of what U.S. nuclear forces cost and explicitly addresses how much could potentially be saved by cutting those forces.



July 2015

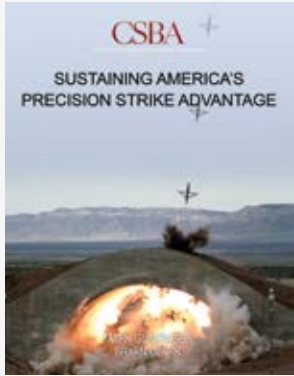
## What It Takes to Win: Succeeding in 21<sup>st</sup> Century Battle Network Competitions

John Stillion and Bryan Clark

Success or failure in war is often measured in terms of territory gained and losses imposed on the enemy. However, our research shows that it is often more cost effective to impose delay, disruptions, and inefficiency on adversary battle networks than to adopt traditional attrition warfare metrics. The findings of this quantitative examination of 100 years of air and undersea competitions provides a framework for understanding the battle network competitions of today and identifies operating concepts and technologies that can enable U.S. anti-submarine, air defense, and strike forces to be successful in future conflicts.



## PUBLICATIONS



June 2015

### Sustaining America's Precision Strike Advantage

Mark Gunzinger and Bryan Clark

While the U.S. military has enjoyed an enormous advantage in precision strike over the past 25 years, potential enemies have invested in active and passive defenses that could force the U.S. military to fly more strike sorties and expend larger numbers of precision-guided munitions in future wars. A “salvo competition” between two adversaries that are both equipped with PGMs and capabilities to defend against precision strikes may indicate that attempting to compensate for an enemy’s defenses by using much larger numbers of the kinds of PGMs DoD has procured over the last 14 years is infeasible. DoD might instead adopt operational concepts and field a new generation of offensive PGMs that will maintain its precision strike advantage in future salvo competitions.



June 2015

### Are U.S. Nuclear Forces Unaffordable?

Todd Harrison and Evan Montgomery

Since the Budget Control Act was enacted in 2011, the cost of nuclear forces has received considerable attention because nearly every component of the triad is due for modernization. To execute these programs as currently planned, DoD will need to increase funding for U.S. nuclear forces well above recent levels. This has led some to conclude that nuclear forces are “unaffordable.” This report estimates the cost of U.S. nuclear forces over the next 25 years, and while a “bow wave” in nuclear modernization costs is expected in the next decade, the search for savings in nuclear forces continues to be a hunt for small potatoes.



April 2015

### Trends in Air-to-Air Combat: Implications for Future Air Superiority

John Stillion

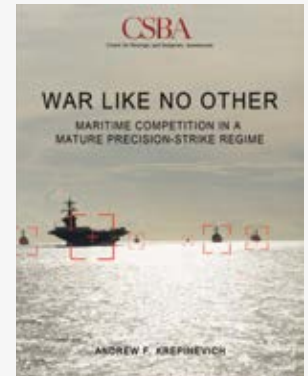
This study provides a historical analysis on a database of air-to-air victories in conflicts from 1965 to the present. It assesses how advances in sensor, weapons, and communication technologies have changed air combat and the implications these trends have for future combat aircraft designs and operational concepts. These advances may have steadily reduced the utility of some attributes traditionally associated with fighter aircraft (e.g., extreme speed and maneuverability) and increased the value of attributes not usually associated with fighter aircraft (e.g., sensor and weapon payload as well as range). As a result, the United States may save tens of billions of dollars in nonrecurring development costs by combining Air Force and Navy future fighter development programs with each Service’s long range ISR/strike programs.

April 2015

## War Like No Other: Maritime Competition in a Mature Precision-Strike Regime

Andrew Krepinevich

This short report complements CSBA's *Maritime Competition in a Mature Precision-Strike Regime*, presenting a summary of findings regarding the likely character of future maritime warfare and options for preserving U.S. freedom of maneuver in the maritime domain.



April 2015

## Maritime Competition in a Mature Precision-Strike Regime

Andrew Krepinevich

For over two decades, the U.S. military has enjoyed a near-monopoly in precision-guided weaponry and their associated battle networks. However, the proliferation of these capabilities to other militaries and non-state entities is gathering momentum. Through examining historic case studies, this report assesses the trajectory of maritime warfare. The advent of long-range sensors and strike capabilities may ultimately shrink oceans to “Mediterranean size,” imposing severe restrictions on the freedom of maneuver of surface naval forces similar to those faced by navies operating in the Mediterranean in World War II. In light of these challenges, the report proposes four operational concepts centered on winning the “scouting campaign,” depleting adversary long-range strike systems, and engaging in peripheral campaigns.



January 2015

## The Emerging Era in Undersea Warfare

Bryan Clark

U.S. defense strategy depends in large part on America's advantage in undersea warfare. Quiet submarines are one of the most viable means of gathering intelligence and projecting power in the face of mounting A2/AD threats. America's superiority in undersea warfare is the product of decades of research and development, a sophisticated defense industrial base, operational experience, and high-fidelity training. However, U.S. competitors are likely pursuing new detection techniques and expanding their own undersea forces. To sustain its undersea advantage, the U.S. Navy must accelerate innovation, reconsider the role of manned submarines, and exploit emerging technologies to field a new “family of undersea systems.”



# TESTIMONIES



On May 20, 2015, the Sasakawa Peace Foundation hosted CSBA's Dr. Andrew Krepinevich to speak on "The Future of U.S. Defense Strategy and the Japan-U.S. Alliance."

**November 10, 2015**

## Defense Reform

Jim Thomas, Senate Armed Services Committee

Our current system is optimized to deal with discrete military problems that can be addressed with short, intense conventional operations confined to the area of a single Regional Combatant Command and less suited to deal with protracted operations, unconventional warfare, and multiple threats spanning the boundaries of the Unified Command Plan's map. Thomas recommended retooling the Regional Combatant Commands, placing the Chairman in the chain of command and giving him directing authority over the Combatant Commands, and creating a true General Staff composed of strategists and planners across the Services.

**November 5, 2015**

## Revisiting the Roles and Missions of the Armed Forces

Robert Martinage, Senate Armed Services Committee

Martinage argued that the roles and missions of the Armed Forces need to be realigned to better address U.S. national security challenges and preserve U.S. military superiority in the decades ahead. He focused on three broad areas for change: the creation of new Services for space, cyber, and special operations; the need for increased Service specialization; and the concept of "competitive jointness," or encouraging healthy intra- and inter-Service rivalry to foster innovation.

**November 3, 2015**

## The Future of Warfare

Bryan Clark, Senate Armed Services Committee

Clark argued that the U.S. Department of Defense must take advantage of emerging technologies from DoD research labs as well as defense and commercial industry to rapidly field new capabilities in key missions such as undersea, strike, air, and electronic warfare that will impose costs on America's rivals and improve the capability of U.S. forces.

**October 30, 2015**

## Alternative Approaches to Defense Strategy

Andrew Krepinevich, Senate Armed Services Committee

Dr. Krepinevich described how the need for a well-crafted defense strategy has never been greater. Three revisionist powers in different regions are confronting the United States and actively challenging the rules-based international system. The means available to address these challenges are diminishing, and the United States will need to develop ways of deterring our enemies and defeating them if deterrence fails. This effort should be informed by (and inform) the strategy we adopt.

**October 27, 2015**

## Undersea Warfare Game Changers

Bryan Clark, House Armed Services Seapower and Power Projection Forces Subcommittee

Clark argues that American undersea dominance will increasingly be contested by competitors who are pursuing new detection technologies while growing and quieting their own submarine fleets. To affordably sustain its undersea advantage well into this century, the U.S. Navy must accelerate innovation in undersea warfare by evolving the role of manned submarines and exploiting emerging technologies to field a new "family of undersea systems."

**September 9, 2015**

## The Future of Air Force Long-Range Strike

Mark Gunzinger, House Armed Services Committee

Gunzinger argued that the Air Force has an opportunity to create a family of systems that will maintain America's long-range strike advantage well into the future. They need a penetrating bomber that is large enough and has sufficient range to deliver high volumes of munitions deep into denied areas. Failing to field a long-range strike platform or procuring too few would extend America's long-range strike capability gap, allowing future enemies to threaten our ability to project power.

**August 4, 2015**

## Examining the Iran Deal and the Military Balance in the Middle East

Eric Edelman, Senate Armed Services Committee

Ambassador Edelman asserted that the Joint Comprehensive Plan of Action (JCPOA) to resolve the Iranian nuclear issue is deeply flawed because it concedes an enrichment capacity that is too large, sunset clauses that are too short, a verification regime that is too leaky, and enforcement mechanisms that are too suspect. The prospect of Iranian nuclear latency could put the Middle East on the path to a catastrophic arms race.

**April 16, 2015**

## The Role of Surface Forces in Presence, Deterrence, and Warfighting

Bryan Clark, House Armed Services Seapower and Projection Forces Subcommittee

Clark argued that today's security environment is not as benign or stable as when the Navy planned a "network-centric" approach to surface warfare 15 years ago. The Navy's ability to achieve sea control is challenged by improving and proliferating sophisticated anti-access/area-denial capabilities. The Navy should restore the ability of surface combatants to gain and maintain access for the joint force through sea control and sustain the ability of the surface fleet to provide a stabilizing presence and conduct security cooperation operations with allies and partners.

## TESTIMONIES

April 1, 2015

### Managing China's Missile Threat: Future Options to Preserve Forward Defense

Evan Montgomery, U.S.-China Economic and Security Review Commission

Dr. Montgomery discussed the implications of China's offensive missile force. The eroding U.S. conventional military advantage in the Western Pacific threatens U.S. forward defense posture. While fielding offensive missile forces might partially ameliorate this problem, the INF Treaty prohibits U.S. testing and deployment of ballistic and cruise missiles with extended ranges. However, Russia has not complied with the Treaty's restrictions, and China is not a party to the Treaty. Withdrawing from or revising the Treaty could bolster U.S. defense posture in the Western Pacific.

March 3, 2015

### Growing Nuclear Capabilities in the Middle East and Their Implications for U.S. Security

Andrew Krepinevich, Senate Armed Forces Strategic Forces Subcommittee

This testimony delivered an overview of Israeli and Iranian nuclear capabilities and doctrines. It assessed prospective characteristics of a nuclear competition between these two countries, as well as those of a prospective "n-player" competition, should Iran's acquisition of nuclear weapons lead other states in the region to follow suit, highlighting the strategic choices we confront.

February 11, 2015

### Alternative Budgets and Strategic Choices

Jim Thomas, House Armed Services Committee

Regardless of the budget Congress ultimately sets for DoD, choosing where to invest or divest should be informed by the external security challenges we face and the choices we make about strategy. Future operating environments may serve as a useful lens for evaluating programs; the forces and capabilities most viable to project power in contested environments may represent areas for preserving or expanding, while those designed for relatively benign operating environments may be targets for divestiture.

February 11, 2015

### Joint Think Tank Strategic Choices Exercise

Todd Harrison, House Armed Services Committee

In 2014 CSBA convened a group of scholars from four think tanks and asked them to develop alternative approaches to rebalance DoD's budget and capabilities in light of projected security challenges and fiscal constraints. Based on these assessments of future threats, the teams were asked to prioritize the capabilities and capacity required in the military for the next ten years and beyond. This hearing reviewed the takeaways of the exercise.

January 27, 2015

### Iran Nuclear Negotiations After the Second Extension: Where Are They Going?

Eric Edelman, House Foreign Affairs Committee

Ambassador Edelman testified on the implications of the Obama Administration's approach to the Iran nuclear negotiations. He expressed concern over the pattern of concessions and the resulting prospect of negotiations moving far beyond the parameters of an acceptable final agreement. He called on the American policymakers to use all available instruments of coercive diplomacy to restore credibility to the oft-repeated statement that every option remains on the table to prevent a nuclear Iran.



**WAR ON  
THE ROCKS**

January 27, 2016

Small States Have Options Too:  
Competitive Strategies Against Aggressors

Thomas Mahnken, *War on the Rocks*

**THE  
NATIONAL  
INTEREST**

December 4, 2015

Winning the Airwaves: Sustaining America's  
Advantage in the Electromagnetic Spectrum

Bryan Clark and Mark Gunzinger, *The National Interest*

**The New York Times**

August 27, 2015

America's Dangerous Bargain With Turkey

Eric Edelman, *The New York Times*

**THE WALL STREET JOURNAL.**

August 25, 2015

Changing Tides in South China Sea

Evan Braden Montgomery, Elbridge Colby, *The Wall Street Journal*

**FOREIGN  
AFFAIRS**

February 18, 2015

How to Deter China: The Case for  
Archipelagic Defense

Andrew Krepinevich, *Foreign Affairs*



*“ Aviation readiness will continue to suffer despite the best efforts of the Marine Corps unless adequate funding levels are maintained and operational commitments are limited to what is sustainable.”*

*– Jesse Sloman, CSBA Research Assistant, War On The Rocks*



CSBA's outreach efforts provide new information and recommendations on defense technology, policy, and budgets based in its research and expertise to members of congress, industry, and the press. They offer a public forum for discussion on new ideas and research.



On Capitol Hill, June 24, 2015, Senior Fellows Mark Gunzinger and Bryan Clark presented the findings in their report titled *Sustaining America's Precision Strike Advantage* concerning U.S. precision guided weapons acquisition and operational concepts. Senator John McCain, Chairman of the Senate Armed Services Committee, and Congressman Randy Forbes, Chairman of the House Armed Services Seapower and Projection Forces Subcommittee offered their remarks at the event. Pictured front row left-to-right: Senior Fellow Mark Gunzinger, Senior Fellow Bryan Clark, CSBA President Andrew Krepinevich, Congressman Randy Forbes. Speaking: Senator John McCain.

## OUTREACH



CSBA alumnus Todd Harrison presented a statement on CSBA's Joint Think Tank Strategic Choices Exercise in front of the House Armed Services Committee on February 11, 2015. He described each think tank team and summarized their decisions and findings for rebalancing the defense budget and prioritizing areas of investment. Each team constructed a strategy which they sought to fulfill under varying budget scenarios.



*“ It’s hard to find consensus on most anything in Washington D.C., but four national security-focused think tanks managed to forge something of a rough outline for the future of defense spending.”*

*– Navy Times*

Over 300 audience members and panel participants attended the first annual Directed Energy Summit in McLean, VA on July 28, 2015, co-hosted by CSBA and Booz Allen Hamilton. To the right, Congressman Doug Lamborn presented a congressional Key Note speech on the importance of bringing together defense policy experts, technologists, industry, and counterparts in congress to answer questions to make progress towards fielding capabilities. Below CSBA Vice President Jim Thomas moderated the Warfighter Perspectives Panel comprising Lt Gen Bradley Heithold, Lt Gen William Etter, BG(P) Neil Thurgood, and RDML Bryant Fuller.



## OUTREACH



CSBA Senior Fellows Bob Martinage, Bryan Clark, and Mark Gunzinger are interviewed by Vago Muradian on Defense News. Martinage answered Muradian on how the U.S. plans to offset the technological gains of other countries in May, 2015. In July, Clark and Gunzinger discuss their report, *Sustaining America's Precision Strike Advantage*.

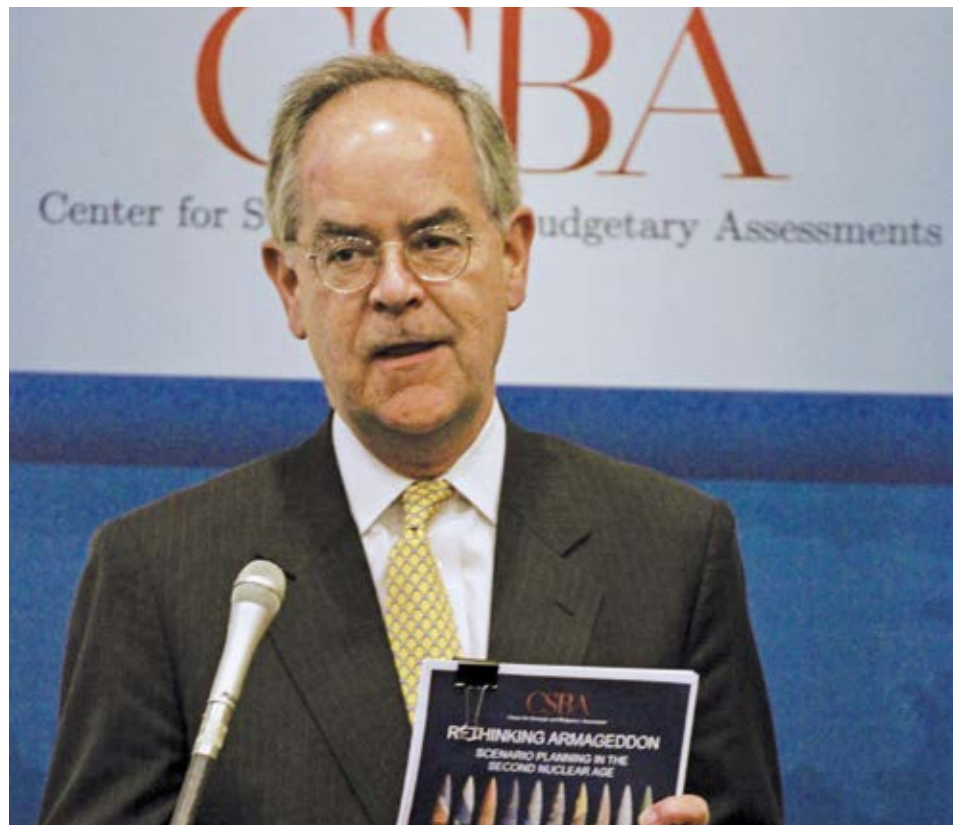


CSBA senior experts participated in the SASC series of hearings in fall 2015 looking at the future of warfare, sponsored by Senator John McCain. Senior Fellow Bryan Clark offers insight on pursuing advanced capabilities on November 3, and Senior Fellow Bob Martinage discussed the need to review the function and organization of the Services on November 5.

“ I don't know of another group other than CSBA that has done more to help our committee and America do the right thing.”

– Congressman Jim Cooper  
*Rethinking Armageddon* release, 2016

Congressman Jim Cooper speaks on the Hill at the March 1, 2016 release of the CSBA report, *Rethinking Armageddon: Scenario Planning in the Second Nuclear Age*, authored by CSBA President Andrew Krepinevich and Senior Analyst Jacob Cohn. Congressman Mac Thornberry also attended and offered comments on the usefulness of the scenario-based assessment.



*“ I want to thank CSBA, especially Mark and Bryan, for all the work they put into this report and so many others that have further advanced our understanding of the critical issues that we face today. The contributions you’ve made are truly invaluable. One of the very underappreciated facets of being a member of Congress is that unfortunately you never really have the time to do the deep dive on many of the topics that we work on, particularly ones that are so technical in nature. That’s why we really do lean so heavily on organizations like CSBA for the intellectual heavy lifting that really undergirds the work that we do here, and I’ve been a beneficiary of that work over the years.”*

– Congressman Jim Langevin  
*Winning the Airwaves* release, 2015



CSBA Senior Fellows Bryan Clark and Mark Gunzinger take questions from the audience at the release of their CSBA report titled *Winning the Airwaves: Regaining America’s Dominance in the Electromagnetic Spectrum*. The event was held in the U.S. Capitol Building on December 2, 2015, and several members of congress presented insights on the policy and industry side of pursuing electromagnetic capabilities, including Representatives Randy Forbes, Jackie Walorski, Rick Larsen, and Jim Langevin.

## CSBA STAFF



### Thomas Mahnken

#### PRESIDENT AND CEO

Dr. Thomas G. Mahnken is President and Chief Executive Officer of the Center for Strategic and Budgetary Assessments.

He is a Senior Research Professor at the Philip Merrill Center for Strategic Studies at The Johns Hopkins University's Paul H. Nitze School of Advanced International Studies (SAIS) and has served for over 20 years as an officer in the U.S. Navy Reserve, to include tours in Iraq and Kosovo.

His government career includes service as Deputy Assistant Secretary of Defense for Policy Planning from 2006–2009, where he helped craft the 2006 Quadrennial Defense Review and 2008 National Defense Strategy. He served on the staff of the 2014 National Defense Panel, 2010 Quadrennial Defense Review Independent Panel, and the Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction. He served in the Defense Department's Office of Net Assessment and as a member of the Gulf War Air Power Survey. In 2009 he was awarded the Secretary of Defense Medal for Outstanding Public Service.

Dr. Mahnken is the author of *Strategy in Asia: The Past, Present and Future of Regional Security* (Stanford University Press, 2014), *Competitive Strategies for the 21<sup>st</sup> Century: Theory, History, and Practice* (Stanford University Press, 2012), *Technology and the American Way of War Since 1945* (Columbia University Press, 2008), and *Uncovering Ways of War: U.S. Intelligence and Foreign Military Innovation, 1918–1941* (Cornell University Press, 2002), among other works.

#### EDUCATION

Dr. Mahnken earned his MA and Ph.D in international affairs from SAIS and was a National Security Fellow at the John M. Olin Institute for Strategic Studies at Harvard University. He was a *summa cum laude* graduate of the University of Southern California with bachelor's degrees in history and international relations (with highest honors) and a certificate in defense and strategic studies.

#### AREAS OF EXPERTISE

Strategy

Intelligence

Defense Planning

Future Warfare

International Strategic Studies





# CSBA

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## Jim Thomas

### VICE PRESIDENT AND DIRECTOR OF STUDIES

Jim Thomas is Vice President and Director of Studies at the Center for Strategic and Budgetary Assessments. He oversees CSBA's research programs and directs the Strategic and Budget Studies staff.

Prior to joining CSBA, Mr. Thomas was Vice President of Applied Minds, Inc., a private research and development company specializing in rapid, interdisciplinary technology prototyping. Before that, he served for 13 years in a variety of policy, planning, and resource analysis posts in the Department of Defense, culminating in his dual appointment as Deputy Assistant Secretary of Defense for Resources and Plans and Acting Deputy Assistant Secretary of Defense for Strategy. In these capacities, he was responsible for the development of defense strategy, conventional force planning, resource assessment, and the oversight of war plans. He spearheaded the 2005–2006 Quadrennial Defense Review (QDR) and was the principal author of the QDR report to Congress.

Mr. Thomas received the Department of Defense Medal for Exceptional Civilian Service in 1997 for his work at NATO, and the Department of Defense Medal for Distinguished Public Service, the department's highest civilian award, in 2006 for his strategy work.

Mr. Thomas is a member of the Council on Foreign Relations and the International Institute for Strategic Studies. A former Naval reserve officer, Mr. Thomas attained the rank of lieutenant commander.

### EDUCATION

Mr. Thomas holds a B.A. with high honors from the College of William and Mary, an M.A. from the University of Virginia, and an M.A. from Johns Hopkins University's School of Advanced International Studies.

### AREAS OF EXPERTISE

Strategy

Future Warfare

Concept Development

Defense Planning

Political-Military Relations

## CSBA STAFF



### Ilana Esterrich

#### CHIEF ADMINISTRATIVE OFFICER

Ilana Esterrich is the Chief Administrative Officer at the Center for Strategic and Budgetary Assessments. As part of CSBA's management team, she oversees CSBA's finance, administration, operations, external relations, publications, IT, and HR functions. She also serves as Secretary/Treasurer on CSBA's Board of Directors.

Prior to joining CSBA, Ms. Esterrich worked in a variety of executive positions in finance, management, and operations for Thomson Reuters, General Mills, Inc., T.E. Systems, Inc., The Pillsbury Company, and as a senior management consultant for Computer Sciences Corporation and Coopers & Lybrand, LLC.

#### EDUCATION

Ms. Esterrich earned a B.S. in Economics with concentrations in Multinational Management and Political Science from the Wharton School at the University of Pennsylvania and an M.B.A. with concentrations in Corporate Strategy and Strategic Marketing from the Booth School of Business at the University of Chicago.

#### AREAS OF EXPERTISE

Finance  
Operations  
Organizational Strategy  
Strategic Planning  
Non-Profit Management  
Grants and Contracting



## Katherine Blakeley

### RESEARCH FELLOW

Prior to joining CSBA, Ms. Blakeley worked as a defense policy analyst at the Congressional Research Service and the Center for American Progress. She is completing her Ph.D. in Political Science from the University of California, Santa Cruz, where she also received her M.A. Her academic research examines Congressional defense policymaking.

### EDUCATION

Ms. Blakeley graduated from Vassar College with honors.

### AREAS OF EXPERTISE

Defense Budgets  
Defense Resourcing



## Ryan Boone

### RESEARCH ASSISTANT

Ryan Boone is a research assistant at the Center for Strategic and Budgetary Assessments, supporting senior staff in CSBA's Strategic Studies and Budget Studies programs. In addition to research, he assists in the design and execution of CSBA's wargames and workshops and serves as one of CSBA's in-house graphic artists. His primary areas of interest concern the development and implementation of competitive strategies and operational concepts, future conflict, and political-military dynamics in the Middle East and East Asia.

Prior to joining CSBA, Mr. Boone interned in the office of the Chairman of the House Armed Services Committee's Subcommittee on Seapower and Projection Forces. Prior to graduation, he interned in U.S. Embassies in Hanoi and Cairo.

### EDUCATION

Mr. Boone was a Robertson Scholar at Duke University and graduated with a B.A. in International Relations and Middle Eastern and East Asian history. He also studied at the American University in Cairo in 2012.

### AREAS OF EXPERTISE

Strategy Development  
U.S. and Foreign  
Military Forces  
Middle East and Asia-  
Pacific Security Trends  
Operational Concept  
Development  
Wargaming

## CSBA STAFF



### Sean Cate

#### ANALYST

Sean Cate is an analyst at the Center for Strategic and Budgetary Assessments, specializing in transformational concepts and capabilities for future warfare.

#### EDUCATION

Mr. Cate holds a B.A. in political science from the University of South Florida and an M.A. with honors in Strategic Studies and International Economics from the Johns Hopkins University's School of Advanced International Studies.

#### AREAS OF EXPERTISE

Future Warfare Capabilities  
U.S. & Foreign Military  
Forces



### Bryan Clark

#### SENIOR FELLOW

Prior to joining CSBA in 2013, Bryan Clark was Special Assistant to the Chief of Naval Operations and Director of his Commander's Action Group, where he led development of Navy strategy and implemented new initiatives in electromagnetic spectrum operations, undersea warfare, expeditionary operations, and personnel and readiness management.

Mr. Clark served in the Navy headquarters staff from 2004–2011, leading studies in the Assessment Division and participating in the 2006–2010 Quadrennial Defense Reviews. His areas of emphasis were modeling and simulation, strategic planning, and institutional reform and governance. Prior to retiring from the Navy in 2007, Mr. Clark was an enlisted and officer submariner, serving in afloat and ashore submarine operational and training assignments including tours as Chief Engineer and Operations Officer at the Navy's nuclear power training unit.

He is the recipient of the Department of the Navy Superior Service Medal and the Legion of Merit.

#### EDUCATION

Mr. Clark holds an M.S. in National Security Studies from the National War College and a B.S. in Chemistry and Philosophy from the University of Idaho.

#### AREAS OF EXPERTISE

Strategy Development  
Undersea Warfare  
Electromagnetic Warfare  
Force Planning  
Long-Term Military  
Competition  
Military Readiness



## Jacob Cohn

SENIOR ANALYST

Jacob Cohn is a senior analyst at the Center for Strategic and Budgetary Assessments, conducting research and analysis for both the Strategic Studies and the Budget Studies programs. His primary areas of interest concern trends in the overall defense budget and specific acquisition programs, long-range strategic planning, and the utilization of wargames to develop future operational concepts.

Prior to joining CSBA in 2014, Mr. Cohn served as a Peace Corps Volunteer in West Africa, worked in the Special Operations/Low Intensity Conflict office at the Pentagon, and was a grants and budget manager for CARE USA.

### AREAS OF EXPERTISE

- Strategy Development
- Defense Budgets
- Quantitative Military Operations Analysis
- Operational Concept Development
- Wargaming

### EDUCATION

Mr. Cohn holds a B.A. in Economics and Math with Highest Honors from Emory University and an M.A. in Strategic Studies and International Economics from Johns Hopkins University's School of Advanced International Studies (SAIS).



## Christopher Dougherty

RESEARCH FELLOW

Christopher Dougherty researches, writes, and conducts wargames in support of the Strategic Studies program at the Center for Strategic and Budgetary Assessments. He has contributed extensively to CSBA monographs, including: *Sustaining America's Strategic Advantage in Long-Range Strike*; *AirSea Battle: A Point of Departure Operational Concept*; *The U.S. Navy: Charting a Course for Tomorrow's Fleet*; *Why AirSea Battle?* and *Special Operations Forces: Future Challenges and Opportunities*. He has supported numerous CSBA wargames with a particular focus on developing operational concepts and capabilities for countering anti-access/area-denial threats.

Prior to his graduate studies and joining CSBA, Mr. Dougherty served as an airborne infantryman with the 2nd Battalion, 75th Ranger Regiment from 1997 to 2000.

### EDUCATION

Mr. Dougherty graduated summa cum laude with a B.A. in Security Studies from the Henry M. Jackson School of International Studies at the University of Washington and received an M.A. in Strategic Studies with distinction from John Hopkins University's School of Advanced International Studies.

### AREAS OF EXPERTISE

- Special Operations
- Irregular Warfare
- Future Military Capabilities
- Operational Concept Development & Wargaming



### Eric Edelman

#### COUNSELOR

Ambassador Eric S. Edelman retired as a career minister from the U.S. Foreign Service on May 1, 2009. He has served in senior positions at the Departments of State and Defense as well as the White House, where he led organizations providing analysis, strategy, policy development, security services, trade advocacy, public outreach, citizen services, and congressional relations. As undersecretary of defense for policy (August 2005–January 2009), he was the DoD’s senior policy official, overseeing strategy development with global responsibility for bilateral defense relations, war plans, special operations forces, homeland defense, missile defense, nuclear weapons and arms control policies, counterproliferation, counternarcotics, counterterrorism, arms sales, and defense trade controls.

He served as U.S. ambassador to Finland in the Clinton administration and Turkey in the Bush administration and was Vice President Cheney’s principal deputy assistant for national security affairs. He was chief of staff to Deputy Secretary of State Strobe Talbott, special assistant to Undersecretary of State for Political Affairs Robert Kimmitt, and special assistant to Secretary of State George Shultz.

Ambassador Edelman has been awarded the Department of Defense Medal for Distinguished Public Service, the Chairman of the Joint Chiefs of Staff Joint Distinguished Civilian Service Award, the Presidential Distinguished Service Award, and several Department of State Superior Honor Awards. In 2010, he was named a knight of the French National Order of the Legion of Honor.

Ambassador Edelman serves on the National Defense Panel, on the bipartisan board of directors of the United States Institute of Peace, and on the board of the Foreign Policy Initiative.

#### EDUCATION

Ambassador Edelman received a B.A. in History and Government from Cornell University and a Ph.D. in U.S. Diplomatic History from Yale University. He is a Roger Hertog Distinguished Practitioner-in-Residence at the Philip Merrill Center for Strategic Studies at Johns Hopkins University and a Senior Associate of the International Security Program at the Belfer Center for Science and International Affairs at Harvard University.

#### AREAS OF EXPERTISE

- Diplomatic Practice
- Grand Strategy
- Nuclear Proliferation and Extended Deterrence
- Unipolarity and Anti-Americanism
- Counter-Insurgency and Inter-Agency Operations
- Civil-Military Relations



## Jamie Graybeal

### DIRECTOR OF EXTERNAL RELATIONS

Prior to joining CSBA in 2015, Jamie Graybeal served as the Associate Director for Public Affairs on the Presidential Military Compensation and Retirement Modernization Commission, where he generated broad awareness and understanding of the Commission's efforts, which reviewed all compensation and retirement programs used by the Uniformed Services to compensate their service members and made recommendations for their modernization to the President and Congress.

#### EDUCATION

Mr. Graybeal holds a Master's degree in National Security and Strategic Studies from the Naval War College and a Bachelor's in Business Administration.

#### AREAS OF EXPERTISE

Strategic Communications  
Risk Communications  
Crisis Communications  
National and International  
Media Relations



## Kamilla Gunzinger

### PRODUCTION MANAGER

Ms. Kamilla Gunzinger is the Production Manager at the Center for Strategic and Budgetary Assessments. She oversees the Center's publication and production processes, provides logistical and administrative assistance for events and wargames, and contributes to research, editing, and graphic design.

Ms. Gunzinger has extensive international experience, including an internship with Scholastic, Asia in Beijing, China (2008–2010) and studies at Keio University in Tokyo, Japan (2005–2006). She speaks Japanese and Mandarin Chinese, and her areas of interest include East Asian security affairs and international business.

#### EDUCATION

Ms. Gunzinger received a B.A. from The College of William and Mary in 2007 and an M.A. in International Studies from Concordia University, Irvine in 2010.

#### AREAS OF EXPERTISE

Publications  
Copy Editing  
Event Planning  
East Asian Regional Studies  
Japanese and  
Mandarin Chinese



## CSBA STAFF



### Mark Gunzinger

SENIOR FELLOW

Mark Gunzinger is a Senior Fellow at the Center for Strategic and Budgetary Assessments.

Mark Gunzinger previously served as the Deputy Assistant Secretary of Defense for Forces Transformation and Resources. He is the principal author or coauthor of multiple Defense Planning Guidance directives, key strategic planning documents that shape DoD force planning. A retired Air Force Colonel and Command Pilot, he joined the Office of the Secretary of Defense in 2004. He was appointed to the Senior Executive Service and served as Principal Director of the Department's central staff for the 2005–2006 QDR. Following the 2006 QDR, he was appointed Director for Defense Transformation, Force Planning, and Resources on the National Security Council staff.

Mr. Gunzinger is the recipient of the Department of Defense Distinguished Civilian Service Medal, the Secretary of Defense Medal for Outstanding Public Service, the Defense Superior Service Medal, and the Legion of Merit Medal.

#### EDUCATION

Mr. Gunzinger holds an M.S. in National Security Strategy from the National War College, a Master of Airpower Art and Science degree from the School of Advanced Air and Space Studies, an M.P.A. from Central Michigan University, and a B.S. in Chemistry from the United States Air Force Academy (Class of 1977).

#### AREAS OF EXPERTISE

Strategy Development  
Force Planning  
Long-Term Military Competition  
Defense Transformation  
Air Warfare  
Quadrennial Defense Review



### Andrew Krepinevich

DISTINGUISHED SENIOR FELLOW

Dr. Andrew F. Krepinevich, Jr. is a Distinguished Senior Fellow at the Center for Strategic and Budgetary Assessments (CSBA). He assumed this position in March 2016 after having served as CSBA's President since 1995. His service at CSBA was preceded by a 21-year career in the U.S. Army.

Dr. Krepinevich has served in the Department of Defense's Office of Net Assessment, and on the personal staff of three secretaries of defense. He has also served as a member of the National Defense Panel, the Defense Science Board Task Force on Joint Experimentation, and Secretary of Defense Robert Gates' Policy Board. He currently serves as member of the Chief of Naval Operations Executive Panel and on the Advisory Council of Business Executives for National Security.

Dr. Krepinevich has lectured before a wide range of professional and academic audiences, and has served as a consultant for many senior government officials, including several secretaries of defense, as well as the CIA's National Intelligence Council and all four military services. He has testified frequently before Congress. Dr. Krepinevich has taught on the faculties of West Point, George Mason University, Johns Hopkins University's School of Advanced International Studies, and Georgetown University.

#### EDUCATION

A graduate of West Point, Dr. Krepinevich holds an M.P.A. and Ph.D. from Harvard University. He has taught on the faculties of West Point, George Mason University, Johns Hopkins University's School of Advanced International Studies, and Georgetown University.

#### AREAS OF EXPERTISE

Strategic Assessments & Planning  
Military Revolutions  
Military Transformation  
Counterinsurgency



## Robert Martinage

SENIOR FELLOW

Mr. Martinage recently returned to CSBA after five years of public service in the Department of Defense (DoD). While performing the duties of the Under Secretary of Navy, he led development of the Department of the Navy’s FY 2014/2015 budgets and represented the Department during the Strategic Choices and Management Review, as well as within the Defense Management Action Group (DMAG). From 2010–2013, Mr. Martinage served as the Deputy Under Secretary of the Navy, providing senior-level advice on foreign and defense policy, naval capability and readiness, security policy, intelligence oversight, and special programs. Appointed Principal Deputy Assistant Secretary of Defense for Special Operations, Low-Intensity Conflict and Interdependent Capabilities in the Office of the Secretary of Defense (OSD) in 2009, Mr. Martinage focused on special operations, irregular warfare, counter-terrorism, and security force assistance policy. He also led a two-year, DoD-wide effort to develop an investment path for a future long-range strike “family of systems.”

### AREAS OF EXPERTISE

- Grand Strategy
- Alliances
- Nuclear Proliferation
- Scenario Development

### EDUCATION

Mr. Martinage holds an M.A. from The Fletcher School of Law and Diplomacy, Tufts University, with concentrations in International Security Studies, Southwest Asia, International Negotiation and Conflict Resolution, and Civilization and Foreign Affairs. Mr. Martinage earned his B.A. cum laude from Dartmouth College in Government with concentrations in International Relations and Political Theory and Public Law.



## Evan B. Montgomery

SENIOR FELLOW

Dr. Evan B. Montgomery’s work covers a wide range of defense policy topics, including scenario development; the proliferation of nuclear weapons and advanced conventional capabilities; operational concepts and force structure options for the United States as well as American allies and security partners; and East Asia, South Asia, and Persian Gulf security issues. His academic research focuses on grand strategy, the interaction between rising and declining powers, how democratic leaders mobilize support for their foreign policies, and the relationship between democratization and international conflict.

### AREAS OF EXPERTISE

- Strategy
- Force Planning
- Long-Term Military Competition
- Future Warfare, Special Operations
- Air-Space
- Naval Warfare

Dr. Montgomery is the author of several monographs in CSBA’s Strategy for the Long Haul series, including *Nuclear Terrorism: Assessing the Threat, Developing a Response*; *Reshaping America’s Alliances for the Long Haul*; and *Defense Planning for the Long Haul: Scenarios, Operational Concepts, and the Future Security Environment*. He has also written a number of policy briefs and book chapters, and his work has been published in *Foreign Affairs*, *International Security*, *Security Studies*, and *the Journal of Strategic Studies*. In addition, he is the lead author or coauthor of numerous reports for the Pentagon’s Office of Net Assessment on defense strategy, geopolitics, and trends in future warfare.

### EDUCATION

Dr. Montgomery graduated summa cum laude from Villanova University with a B.A. in Political Science and Sociology and received his M.A. and Ph.D. in Foreign Affairs from the University of Virginia.

## CSBA STAFF



### Julie H. Pulley

#### OFFICE MANAGER

Julie Pulley manages CSBA's administrative functions. Prior to CSBA, Ms. Pulley worked at Discovery Communications, Inc., where she managed a variety of special projects.

#### EDUCATION

Ms. Pulley earned a B.S. at Howard University.

#### AREAS OF EXPERTISE

Operations

Logistics

Non-Profit Management



### Jesse Sloman

#### RESEARCH ASSISTANT

Jesse Sloman is a research assistant at the Center for Strategic and Budgetary Assessments, where he conducts research and analysis for both the Strategic Studies and the Budget Studies programs.

Prior to joining CSBA, Mr. Sloman worked for the Council on Foreign Relations and served on active duty in the U.S. Marine Corps.

#### EDUCATION

Mr. Sloman is a 2009 graduate of Tufts University with a B.A. in political science.

#### AREAS OF EXPERTISE

Defense Budgets

Military Compensation

U.S. & Foreign

Military Forces



## John Stillion

SENIOR FELLOW

John Stillion is a Senior Fellow at the Center for Strategic and Budgetary Assessments. Prior to joining CSBA Dr. Stillion was a Senior Analyst at the Northrop Grumman Analysis Center where he analyzed the cost-effectiveness of existing and possible future Northrop Grumman products as well as the emerging demand for advanced capabilities and production techniques. Before that he led a multi-disciplinary team of analysts and engineers at Northrop Grumman exploring advanced applications of stealthy unmanned aircraft in future conflicts. Dr. Stillion previously worked at the RAND Corporation where he led multi-disciplinary study teams and analyzed a wide range of issues related to airpower and future warfare, including air operations in urban environments and against elusive targets, airbase vulnerability, combat aircrew skill acquisition and retention, tanker and airlift operations, aerial ISR, and fire support to Special Operations Forces. During his time at RAND he received a number of awards for the quality of his research.

Dr. Stillion is a former U.S. Air Force officer, instructor navigator, and tactical aviator. He is a Distinguished Graduate of Air Force ROTC, USAF Navigator Training, and RF-4C Tactical Aircrew Training.

### EDUCATION

Dr. Stillion holds a Ph.D. and M.Phil. in Public Policy Analysis from the Pardee RAND Graduate School, an M.A. in Political Science from Stanford University, and a B.A. in Political Science from North Carolina State University.

### AREAS OF EXPERTISE

- Strategy
- Future Warfare
- Unmanned Aerial Vehicles
- Air and Missile Operations
- Quantitative Military Operations Analysis



## Jan van Tol

SENIOR FELLOW

Jan M. van Tol is a Senior Fellow at the Center for Strategic and Budgetary Assessments.

Prior to his retirement from the Navy in 2007, Captain van Tol served as special advisor in the Office of the Vice President. He was a military assistant to Andrew W. Marshall, the Secretary of Defense's Principal Advisor for Net Assessment, from 1993–1996 and again from 2001–2003. At sea, he commanded three warships, two of which, the USS O'Brien (DD-975) and the USS Essex (LHD-2), were part of the U.S. Navy's Forward Deployed Naval Forces based in Japan.

Captain van Tol's analytic work has focused mainly on long-range strategic planning, naval warfare, military innovation, and wargaming.

### EDUCATION

Captain van Tol holds degrees in Philosophy and Logic from the University of Massachusetts, in Operations Research from the Naval Postgraduate School, and he graduated with distinction from the Naval War College.

### AREAS OF EXPERTISE

- Long-Range Strategic Planning
- Naval Warfare
- Military Innovation
- Wargaming

## CSBA STAFF



### Timothy Walton

#### SENIOR ANALYST

Timothy A. Walton focuses his research and analysis on trends in future warfare and Asia-Pacific security dynamics. Prior to joining CSBA, Mr. Walton was a Principal of Alios Consulting Group and an Associate of Delex Consulting, Studies, and Analysis, both defense and business strategy firms.

#### EDUCATION

Mr. Walton holds a Bachelor of Science in International Politics (Security Studies) and a Master of Arts in Security Studies from Georgetown University. He also studied abroad at Nanjing University.

#### AREAS OF EXPERTISE

Force Planning  
Integrated Air and  
Missile Defense  
Logistics  
Asia-Pacific  
Latin America

*“ I have said before that I have benefited more from the work of CSBA over the twenty-something years that I’ve been here than any other organization.”*

– Congressman Mac Thornberry, *Rethinking Armageddon* release, 2016

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