



Book Reviews

Climate Concerns Expanding in 2014: The CNA/MAB Report and Six Others. National Security and the Accelerating Risks of Climate Change.

CNA Military Advisory Board. Foreword by Michael Chertoff and Leon Panetta.

Alexandria VA: CNA Corporation, May 2014, 37p.

(download at www.cna.org/reports/accelerating-risks).

Review by Michael Marien

Director, Global Foresight Books;

Fellow, World Academy of Art and Science

1. Introduction

The early months of 2014 have seen several new reports on climate change, all more worrisome than earlier reports. The best-known is the **Fifth Assessment Report (AR5)** of the Intergovernmental Panel on Climate Change (www.ipcc.ch), which provides a voluminous survey of the three IPCC Working Groups: **WGI: The Physical Science Basis**, **WGII: Impacts, Adaptation, and Vulnerability**; and **WGIII: Mitigation of Climate Change**. A Summary is available for each of these three reports, and a **Synthesis Report** will soon be available.

In May 2014, the third **National Climate Assessment** was issued by the U.S. Global Change Research Program (www.globalchange.gov), described as “Thirteen Agencies, One Vision: Empower the Nation with Global Change Science.” The report involved more than 300 experts, with analysis and excellent maps projecting regional variations as concerns future climate, sea level rise, human health, infrastructure, extreme weather, water supply, oceans, ecosystems, and biodiversity.

At about the same time, the American Association for the Advancement of Science, the largest organization of scientists in the world with 140,000 members, issued a simply-written 28-page statement on **What We Know: The Reality, Risks and Response to Climate Change** (<http://whatwewknow.aaas.org>). It stressed the reality that climate change is happening and “very likely” to be worse over the next 10-20 years and beyond, and that 97% of scientists agree with this view (a rebuttal to the deniers who still say that the science is not settled).

The statement also covers potential scenarios (including permafrost melt in the Arctic as “a key uncertainty”), wildfires and the growing chance of a “mega-fire,” and climate change and national security. We face the risks of abrupt and potentially irreversible changes, and “the sooner we act, the lower the risks and costs.”

An emphasis on economic risk is the focus of **Risky Business: The Economic Risks of Climate Change in the United States** (www.riskybusiness.org), issued shortly after writing

this long review of the CNA Military Advisory Board report. An EPILOGUE to this review provides a brief look at the “Risky Business Project” co-chaired by former NYC Mayor Michael R. Bloomberg, former US Secretary of the Treasury Henry M. Paulson Jr., and retired hedge fund manager Thomas F. Steyer, and notes important parallels to the CNA/MAB report.

These two reports addressed to American audiences raise alarms about climate change from national security and economic security perspectives. But doing something about it in a major way is left to yet another major report addressed to a global audience: **Pathways to Deep Decarbonization** from SDSN and IDDRI (Interim 2014 Report, July 2014, 195p; www.deepdecarbonization.org). This report is also briefly covered in the EPILOGUE. And still to follow is **The New Climate Economy Report** of the Global Commission on the Economy and Climate, to be published in September 2014, focusing on urban development, energy systems, and agricultural land use.

2. Background to CNA and its Military Advisors

CNA Corporation (www.cna.org) was originated in 1942 as the non-profit Center for Naval Analyses, and became CNA Corporation in the 1990s. It employs nearly 400 staff and now includes the Institute for Public Research, which does studies on education, energy, water and climate, air traffic management, and security. The Military Advisory Board, which is part of the Institute, includes 15 retired Generals and Admirals from the US Army, Navy, Air Force, and Marine Corps, and one retired British Rear Admiral.

An initial 63-page report of the Military Advisory Board, **National Security and the Threat of Climate Change**, was issued in 2007, finding that “climate change poses a serious threat to America’s national security”; it can act as a threat multiplier for instability in volatile regions, it will add to tensions even in stable regions, and it is linked to energy dependence and national security. Five recommendations were made.

After nearly a decade of scientific discoveries in environmental science and a burgeoning scholarly literature on the complex interdependence among nations, the MAB felt “compelled” to provide an update, where “we validate the findings of our first report and find that in many cases the risks we identified are advancing noticeably faster than we anticipated. We also find the world becoming more complex in terms of the problems that plague its various regions... We see more clearly now that while projected climate change should serve as catalyst for change and cooperation, it can also be a catalyst for conflict. We are dismayed that discussions of climate change have become so polarizing and have receded from the arena of informed public discourse and debate.”(p. iii)

The Foreword by Michael Chertoff (former Secretary of Homeland Security) and Leon Panetta (former Secretary of Defense) states that “projected climate change is a complex multi-decade challenge. Without action to build resilience, it will increase security risks over much of the planet. It will not only increase threats to developing nations in resource-challenged parts of the world, but it will also test the security of nations with robust capability... Even though we may not have 100% certainty as to the cause or even the exact magnitude of the impacts, the risks associated with projected climate change warrant taking action today... When it comes to thinking through long-term global challenges, none are more qualified than

our most senior military leaders... (who are) experts in geopolitical analysis and long-range strategic planning.” (p. 1)

“Coordinated, wide-scale, and well-executed actions are required—now.”

3. CNA/MAB Major Findings

“We gather again because of our growing concern over the lack of comprehensive action by both the United States and the international community to address the full spectrum of projected climate change issues.”

1. **Insufficient Action.** Climate mitigation and adaptation efforts are emerging in various places around the world, but the extent of these efforts is insufficient to avoid potential water/food/energy insecurity, political instability, extreme weather events, and other manifestations of climate change. Coordinated, wide-scale, and well-executed actions are required—now.
2. **Cooperation or Conflict?** The potential security ramifications should be serving as catalysts for cooperation and change; instead, “climate change impacts are already accelerating instability in vulnerable areas of the world and are serving as catalysts for conflict.” As identified in the 2007 report, the projected effects of climate change are “threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions.”
3. **Population Challenges.** “Rapid population growth, especially in coastal and urban areas, and complex changes in the global security environment, have made understanding the strategic security risks of projected climate changes more challenging.” Since research began for the 2007 report, the world has added more than half a billion people, geopolitical power has become more dispersed, and non-state actors are having increasing impacts.
4. **Arctic Ice Melt.** Accelerated melting of “old ice” in the Arctic is making the region more accessible to a wide variety of human activities. “The US and the international community are not prepared for the pace of change in the Arctic.”
5. **Water/Food/Energy Nexus.** As the world’s population and living standards continue to grow, projected climate impacts on the nexus of water, food, and energy become more profound. By 2030, worldwide demand will call for 35% more food and 50% more energy, which will stress resources across a growing segment of the world.
6. **U.S. Homeland Security.** Heat waves, intense rainfall, floods, droughts, rising sea levels, more acidic oceans, and melting glaciers and Arctic sea ice will not only affect local communities, but challenge key elements of National Power to protect national assets and influence others.
7. **Military Impacts.** Climate change could be detrimental to military readiness and strain base resilience, as more forces are called on to respond in the wake of extreme weather events at home and abroad; climate change will also make training more difficult, and put at greater risk critical military logistics, transport systems, and infrastructure.
8. **National Infrastructure.** Extreme heat is already damaging roads, rail lines, and airport runways. Much of the nation’s energy infrastructure (oil and gas refineries, stor-

age tanks, power plants, electricity transmission lines) is located in coastal floodplains increasingly threatened by more intense storms and rising sea levels. Increased temperatures and drought across much of the nation will strain energy systems with more demand for cooling, and possibly dislocate and reduce food production.

9. **Economic Impacts.** Most US economic sectors in every region, including international trade, will be affected by projected climate change.
10. **Social Support Systems.** As coastal regions become increasingly populated and developed, more frequent or severe storms will threaten vulnerable populations in these areas and increase requirements for emergency first responders. Simultaneous or widespread extreme weather events and/or wildfires, accompanied by mass evacuations and degraded critical infrastructure, could require increased use of military and private sector support.

4. CNA/MAB Recommendations

Risks posed by predicted climate change “represent even graver potential than they did seven years ago and require action today to reduce risk tomorrow.”

1. **U.S. Leadership.** To lower national security risks, the US should take a global leadership role in preparing for climate change. “At the same time, the US should lead global efforts to develop sustainable and more efficient energy solutions to help slow climate change.”
2. **Planning.** US Combatant Commanders should factor in the impacts of projected climate change across the full spectrum of planning and operations, and focus on building capacity and sustained resilience with partner nations.
3. **The Arctic.** The US should accelerate and consolidate efforts to prepare for increased access and military operations in the Arctic, which is already becoming viable for commercial shipping and increased resource exploitation. To provide itself with better standing in resolving future disputes in the Arctic, the US should become a signatory to the UN Convention on the Law of the Sea.
4. **Water/Food/Energy.** Adaptation planning should consider this nexus to ensure comprehensive decision-making for these vital resources.
5. **National Risk Assessment.** Projected impacts of climate change should be integrated fully into the National Infrastructure Protection Plan and the Strategic National Risk Assessment. “As military leaders, we know that we cannot wait for certainty. The failure to include a range of probabilities because it is not precise is unacceptable.” [Note: This responds to the deniers who insist on perfect or near-perfect certainty.]
6. **New Metrics.** The Department of Defense should develop plans to adapt to impacts of climate change, including developing metrics for measuring climate impacts and resilience. Climate impacts should be considered in all vulnerability assessments.
7. **Recognizing Risks.** The risks associated with climate change are accelerating, and the effects of climate change are becoming more than just threat multipliers: without action to build resilience in the most vulnerable parts of the world, the projected impacts of climate change will likely serve as catalysts for conflict. “On the positive side, recog-

dition of the risk can lead to increased collaboration; thus we see climate change also serving as a catalyst for cooperation and change.” In the past seven years, the world has moved toward a greater understanding of the threats, and “most countries now identify climate change as a national security threat.”

8. **Better Data, but Wild Cards Remain.** Improved models and better data collection systems are contributing to increased confidence levels of projected changes. Growing risks measured with greater accuracy since 2007 include longer and stronger fire seasons, an acceleration of sea-level rise (the 100-year storm surge associated with Superstorm Sandy can now be expected every 10-20 years), the continued collapse of sea ice in the Arctic Ocean, the movement of plant and animal diseases toward higher elevations and latitudes (posing a greater risk to crops from pests and invasive species), precipitation becoming more irregular and intense, increased drought frequency and stress to freshwater systems.

Although scientists are coalescing around standard climate change predictions, some wild cards remain, the most significant being the melting West Antarctic Ice Sheet, which “has the potential to raise sea levels by several meters within a few decades.” A second wild card is the ability of the ocean to adapt to increased acidification, which affects the entire aquatic food chain, and “could cause food shortages around the globe, with considerable security implications.” [Note: Expanding the list of potential wild cards, and roughly assessing their likelihood, are unfortunate omissions to the list of recommendations. Especially important is methane released by permafrost melt in the Arctic, described in the AAAS report as “a key uncertainty.”]

5. Comment on the CNA/MAB Report

The key word in this important report is “*acceleration*,” which has not been used by other official and quasi-official reports on climate change written by perhaps overly cautious scientists. Another distinctive and useful phrase in this report is “*threat multiplier*,” which is more likely to be seen by military planners than by scientists.

The theme of **Climate Change and National Security**, edited by Daniel Moran (GlobalForesightBooks.org Book of the Month, March 2013), is forcefully demonstrated by thoroughly assessing potential negative impacts of climate change in 19 regions and nations beyond North America. The US National Research Council has issued a recent report, **Abrupt Impacts of Climate Change: Anticipating Surprises** (GFB Book of the Month, Jan 2014), which considers the likelihood of 14 “wild card” changes in the ocean, the atmosphere, higher latitudes, and ecosystems. **Bankrupting Nature: Denying Our Planetary Boundaries** by Anders Wijkman and Johan Rockstrom, a recent report to the Club of Rome (GFB Book of the Month, Jan 2013), not only introduces the concept of nine “planetary boundaries” (such as ocean acidification and biogeochemical loading), but warns of a possible tipping point in the Arctic as permafrost continues to melt, and the melt becomes “self-accelerating.” Thus, there are still more plausible threat multipliers and wild cards—if one bothers to look for them.

A further addition to these concerns is the probable advent of El Nino in Fall 2014, as reported by Nate Cohn in *The New York Times* (20 May 2014, A3). “Above average sea-surface

temperatures have developed off the west coast of South America, and seem poised to grow into a full-fledged El Nino event, in which unusually warm water spreads across the equatorial East Pacific. Models indicate a 75% chance of El Nino this fall, which could bring devastating droughts to Australia or heavy rains to the southern US.” The Pacific Decadal Oscillation, which favors more frequent and intense El Ninos during its “warm” or “positive” phases, has been “cool” or “negative” since the historic El Nino of 1998. The oscillation between El Nino and its cold-water cousin, La Nina, is part of the reason for slower atmospheric warming in recent years. “But this year’s El Nino might represent a turning point.” Kevin Trenberth of the National Center for Atmospheric Research believes that it is reasonable to expect that 2015 will be the warmest year on record if this fall’s El Nino event is strong and long enough. It could at least double the rate of surface temperature increases, and “unleash a new wave of warming that could shape the (climate) debate for a decade, or longer.”

The CNA’s Military Advisory Board calls for climate action now, and AAAS warns that the sooner we act the lower the costs. In **America’s Climate Choices** (GFB Book of the Month, Oct 2011), the National Research Council called for global-scale efforts, due to “a pressing need for substantial action to limit the magnitude of climate change and to prepare to adapt to its impacts.”

The Obama Administration has recently issued new rules to reduce CO₂ emissions from US power plants by 30% by 2030, compared with the 2005 base. But, as reported by Eduardo Porter in “A Paltry Start in Curbing Global Warming” (*The New York Times*, 4 June 2014, B1), the proposed rules—even if realized despite expected political pushback—“fall far short” of what is needed. “Rather than a bold stride into the vanguard of the battle against climate change, the new proposals from the E.P.A. offer just enough progress to shuffle along with a world that unflinchingly falls short of delivering what is needed.” Perhaps a strong El Nino in 2015 will sharply boost the necessary global response. Viewing climate change as a major threat to national security everywhere can certainly help.

6. Epilogue: Two New Reports

Shortly after preparing this review of the CNA/MAB report, yet another report on climate change was issued that has important parallels. The CNA/MAB report by 15 retired generals and admirals was introduced by a former Republican Secretary of Homeland Security (Chertoff) and a former Democratic Secretary of Defense to emphasize the focus on national security aspects of climate change.

Risky Business: The Economic Risks of Climate Change in the United States (June 2014, 36p, www.riskybusiness.com) is co-chaired by Michael R. Bloomberg (recent New York City Mayor), Henry M. Paulson Jr. (former Republican US Treasury Secretary), and Thomas F. Steyer (a retired billionaire hedge fund manager and head of NextGen Climate Action). The seven politically-balanced Risk Committee members are Henry Cisneros (former Democratic US Secretary of Housing and Urban Development), Gregory Page (Executive Chairman and former CEO of Cargill, Inc.), Robert E. Rubin (Co-Chair of the Council on Foreign Relations and former Democratic Treasury Secretary), George P. Shultz (Distinguished Fellow at the conservative Hoover Institution, former Republican Secretary of State, Treasury, and Labor), Donna E. Shalala (President, University of Miami; former Democratic US Secretary of Health and Human Services), Olympia Snowe (former Republican US Senator from Maine), and

Dr. Alfred Sommer (Dean Emeritus and Distinguished Professor, Johns Hopkins University School of Public Health).

“Our findings show that, if we continue on our current path, many regions of the U.S. face the prospect of serious economic effects from climate change... (and) our climate risks will multiply and accumulate as the decades tick by.” (pp. 3-4) These risks to specific business sectors and regions of the economy include:

1. Large-scale losses of coastal property and infrastructure. “If we continue on our current path, by 2050 between \$66 and \$106 billion worth of existing coastal property will likely be below sea level nationwide, with \$238 to \$507 billion worth of property below sea level by 2100. There is a 1 in 20 chance that more than \$701 billion worth of existing coastal property will be below mean sea levels by 2100, with more than \$730 billion of additional property at risk during high tide.”
2. Extreme heat across the US—especially in the Southwest, Southeast, and Upper Midwest—threatening labor productivity, human health, and energy systems. Demand for air conditioning will surge, straining regional generation and transmission capacity. Changes in temperature will likely necessitate construction of roughly 200 new power plants costing ratepayers up to \$12 billion per year.
3. Shifting agricultural patterns and crop yields, with likely gains for Northern farmers offset by losses in the Midwest and South. Some states risk up to a 50-70% loss in average crop yields, agricultural adaptation being absent. (The Report assesses risks for six US regions, as well as for Alaska and Hawaii.)

In sum, “we call on the American business community to rise to the challenge and lead the way in helping reduce climate risks.” To plan for climate change, we must plan for volatility and disruption. If we act now, “the U.S. can still avoid most of the worst impacts and significantly reduce the odds of costly climate outcomes—but only if we start changing our business and public policy practices today.” However, the Risky Business Project “does not dictate the solutions to climate change...rather, we document the risks and leave it to decision-makers in the business and policy communities to determine their own tolerance for, and specific reactions to, those risks.” (p. 7)

Although the Project offers no proposals for action, co-chair Henry Paulson, chair of the newly-formed Paulson Institute at the University of Chicago, followed up the report with an essay on “The Coming Climate Crash” in *The New York Times* (Sunday, 22 June 2014, SR1), warning of “a crisis that we can’t afford to ignore” and the “profound economic risks of doing nothing,” and calling for a tax on CO₂ emissions.

A few weeks after **Risky Business**, yet another report was issued by the Sustainable Development Solutions Network (SDSN) of the United Nations and the Institute for Sustainable Development and International Relations (IDDRI) of Sciences Po in Paris. **Pathways to Deep Decarbonization: Interim 2014 Report** (July 2014, 195p. www.deep-decarbonization.org) is a collaborative initiative of 15 Country Research Teams showing how individual countries can transition to a low-carbon economy and how the world can meet the internationally agreed target of limiting the increase in global mean surface temperature to less than 2 degrees Celsius before 2050. The 15 countries in this Deep Decarbonization

Pathways Project (DDPP) represent 70% of global GHG emissions. The Interim report includes 12 country chapters from Australia, Canada, China, France, Indonesia, Japan, Mexico, Russia, South Africa, South Korea, the UK and the USA. Chapters on Brazil, India, and Germany will be in the complete report to be published in September 2014.

The 2014 DDPP report addresses such topics as taking the 2°C limit seriously (“a solemn responsibility of the global community”), catastrophic climate change as likely under business-as-usual, CO₂ energy budgets for the 2011-2050 and 2011-2100 periods, emissions reduction trajectories to 2050, pathways to deep decarbonization (the High Renewable Scenario of 75% renewables, the High Nuclear Scenario of 60% nuclear energy, the High CCS Scenario), low-carbon technologies (advanced nuclear power, carbon capture and sequestration, advanced biofuels, energy storage and grid management, new industrial processes, negative emissions technologies), developing country-level DDPPs, sectoral shares of total emissions, etc.

The 2015 DDPP report will take a broader perspective by considering integrated approaches, national and international financial requirements, and policy frameworks for implementation. “Above all, we hope that the findings will be helpful to the Parties of the UN Framework Convention on Climate Change (UNFCCC) as they craft a strong agreement on climate change mitigation at the Conference of the Parties (COP-21) in Paris in December 2015.”

As a final comment, everyone involved with forecasting, planning, policy analysis, new ideas and paradigms, investments, and general concern for the future should stay abreast of the accelerating threats of climate change and the wide-ranging responses that are necessary and likely in the years ahead. The seven 2014 reports covered here, written in a variety of styles for a variety of audiences, should help to point the way forward.

No single report is sufficient. The IPCC **Fifth Assessment Report** provides all of the scientific detail, but will be daunting to most readers. The US **National Climate Assessment** focuses on a single nation that plays a critical part in addressing the climate question. The 28-page **What We Know** report from AAAS is a simple, authoritative, and easily-read introduction to the problem by America’s leading scientific organization. The Military Advisory Board report extensively reviewed here describes climate change as a “threat multiplier” affecting national security. The **Risky Business** report addresses various economic aspects in eight US regions. The interim **Pathways to Deep Decarbonization** report describes how 15 countries representing 70% of global GHG emissions can each help to keep global temperature rise to less than 2°C by 2050. And **The New Climate Economy Report** published in September 2014 will focus on urban development, agricultural land use, and energy systems. Many more reports will surely follow, especially if the many impacts of climate change worsen in the years ahead.

Author Contact Information

Email: mmarien@twcny.rr.com