



Jack D. Gordon Institute for Public Policy

# Global Security Review

Volume 1 | 2017

**FIU**

Steven J. Green  
School of International  
& Public Affairs

ISSN 2473-747X

## Letter from the Director

---

The Jack D. Gordon Institute for Public Policy (JGI), which is part of the Steven J. Green School of International and Public Affairs (SIPA) at Florida International University (FIU), is launching *Global Security Review* in an effort to bridge the divide between academia and the policy world. The first issue addresses a wide range of threats that impact national security.

Some countries in the Americas have been plagued by high levels of drug trafficking and organized crime. States such as Guatemala, Honduras, Mexico, Colombia, and Brazil have experienced high levels of drug-related violence as transnational organized crime groups fight for control of drug routes and territory.

In addition to drug trafficking, countries in the Western Hemisphere confront challenges with regard to energy security and climate change. Some scholars contend that security begins with the environment.

Many governments are searching for alternatives sources of energy and new methods of extracting energy, such as hydraulic fracturing, or fracking. Practices such as fracking have been controversial in nature as some scholars argue that these techniques can lead to earthquakes and can contaminate water wells. Finally, other politicians and policymakers have sought to elevate the threat of terrorism and violent extremism on the security agenda. Fears exist that the Western Hemisphere is vulnerable to terrorist attacks, particularly from ISIS fighters who are returning home to their countries of origin in the Caribbean.

The first article by Dr. Robert Jervis of Columbia University addresses the threat of terrorism. Despite common perceptions and various recent terror attacks, Dr. Jervis contends that the U.S. is safer than people believe. Dr. Jervis's article is fol-

lowed by a piece by Dr. Jonathan D. Rosen (FIU) and Dr. Bruce Bagley (University of Miami) on Plan Colombia, a multi-billion dollar counternarcotics initiative financed by the U.S. government. The authors analyze the results of the initiative and provide insight as to whether Plan Colombia can be used as a model for other countries. The next article in the journal is by Dr. Marten Brienens of Oklahoma State University and examines energy security in the U.S. Dr. Brienens explores the energy profile of the U.S. as well as the major threats to energy security. This article is followed by Dr. Anthony Clayton's (University of the West Indies) article on terrorism in the Caribbean. He highlights the recent trends in terrorism, focusing on ISIS/Daesh, which he refers to as the "social media generation terrorists." Next, University of Miami scholar Dr. Daniel Suman's work begins with an analysis of ecosecurity and highlights the key trends and challenges in climate change in Florida. Finally, the journal concludes with an article on cybersecurity by Mark M. Deen of FIU that focuses on nation-state hacking.

In conclusion, we hope that you enjoy our first issue of *Global Security Review*. This journal will be published once per year and will attempt to publish articles from leading scholars and practitioners that address many of the pressing national security threats. In addition, JGI will continue hosting conferences and workshops and publishing policy papers, reports, books, and articles on pressing public policy and national security issues.

Sincerely,

**Brian Fonseca**, Director

The Jack D. Gordon Institute for Public Policy  
Florida International University

# Table of Contents

4	<b>We're Safer than You Think</b> Robert Jervis
8	<b>Is Plan Colombia a Model?</b> <i>An Analysis of Counternarcotics Strategies in Colombia</i> Jonathan D. Rosen and Bruce M. Bagley
15	<b>Energy Security in the United States:</b> <i>A Glance at the Major Issues</i> Marten Brienan
21	<b>Assessing the Threat from Terrorism in the Caribbean</b> Anthony Clayton
28	<b>Climate Change and Security: The Case of Florida</b> Daniel Suman
37	<b>Nation-State Hacking:</b> <b>Uniting Policy and Code to Limit the Threat</b> Mark M. Deen

# We're Safer than You Think

Robert Jervis, Columbia University

---

## Abstract

This article examines terrorism, arguing that the goal of terrorists is to invoke fear into individuals. The consequences of terrorist attacks in San Bernardino and Paris, among other places, is that the perceptions that terrorism is a threat to national security are high. This work contends that such fears are unwarranted as it is more likely that one dies in a traffic accident than a terrorist attack. Delving into the International Relations literature, this article highlights the current debates about terrorism and threats to security.

---

In the wake of the terrorist attacks in Paris and San Bernardino, fear is on the rise. A December 2015 poll showed 40 percent of the American people saying that national security and terrorism were their top concern, with job creation and economic growth coming in a distant second at 23 percent.<sup>1</sup> But even before these dramatic and disturbing events, political elites in the U.S., probably more than mass opinion, were worried. In 2009, two-thirds of the members of the Council on Foreign Relations reported believing that the world the U.S. faced was more dangerous than it had been during the Cold War.<sup>2</sup> Three years later the Chairman of the Joint Chiefs of Staff, General Martin Dempsey, claimed, "We are living in the most dangerous time in my lifetime,"<sup>3</sup> and the director of National Intelligence James Clapper, similarly said, "Looking back over my more than a half century in intelligence I have not experienced a time when we've been beset by more crises and threats around the globe."<sup>4</sup> Taking these concerns to heart, on December 22, 2015 the Dallas symphony cancelled its European tour "due to the recent and tragic events in Europe and the United States, and based on extensive conversations with national and international security professionals."<sup>5</sup>

The point of this brief article is that these fears are unwarranted.<sup>6</sup> The most dangerous thing I and most of us do every day is to cross the street; deaths from traffic accidents dwarf those from terrorism. The comparison to the Cold War is also telling; although there is no objective estimate of how likely nuclear war was then, let alone of how likely nuclear war with Russia or China is in the foreseeable future, the consequenc-

es of the latter would of course be dreadful, but nothing like the civilization-ending impact of the former.

So why are people saying such foolish things? In part—but I believe only in small part—people are consciously exaggerating for bureaucratic, political, or personal reasons. It would hardly behoove the head of the intelligence establishment to say something like: "Although there are no grave dangers to American national security, there are a lot of smaller problems we need to be aware of and multiple interests that while less than vital, still require attention." Not only budgets but people's sense of mission are entangled with believing that what they do is vital. During political campaigns (which consume more and more of the electoral cycle) advantage often goes to a candidate or a party that can claim that the opponents dangerously neglect American security. The media also has both an interest in playing up danger and an outlook that focuses on them. Bad news is generally good for circulation, and reporters and editors believe that it is their responsibility to keep a sharp eye out for threats to the country.

But this does not explain why so many members of the general public are fearful. In part, of course, they are picking up on the cues provided by the elites. This is not all there is to it, however. Although most of the dangers to our lives come in the form of everyday activities like driving, people both overestimate the degree of control they have over their lives and are more fearful of risks they feel that they cannot control. We incorrectly think that we are about-average drivers and that if we are careful we can take care of ourselves. By contrast, it is next to impossible for any of us to influence the chance of dying in a terrorist attack. Furthermore, each terrorist attack gets deeply embedded in our memories because they are vivid and widely covered in the media, and the irony is that the extensive coverage is due to the fact that they are so rare. Even traffic accidents that kill significant numbers of people, such as bad bus accidents, occur frequently enough so that we have come to expect them. The very fact that terrorism is so infrequent makes an instance unexpected and therefore more impactful.

## Unprecedented Security

The greatest threat to national security comes from war among the major powers, and so our starting point is that those who are so worried have lost sight of the fact that the world used to be dangerous be-

cause these states used to fight each other with some regularity. By contrast, currently the leading powers—the U.S., the states that form the EU, and Japan—form a security community.<sup>7</sup> According to Karl Deutsch, a security community is a group of countries who not only are at peace, but among whom war is unthinkable.<sup>8</sup> This is a very restricted category. Even countries who remain at peace with each other for prolonged periods often think about and plan for war with one another. It is exceedingly rare for major states to fail to do so, and when they have put the thought of war between them out of their minds, the reason often is the pressing threat from a common enemy. Indeed, it was the perception of a common threat from the USSR that was partly responsible for the rise of the security community, but that country's demise has not led to the community's demise.

The importance of this break with the past hardly can be exaggerated: it is not an exaggeration to say that the history of world politics has been dominated by war and the shadow of war among the most powerful states. My definition of leading powers excludes Russia and the PRC, and a skeptic might argue that it was designed with that purpose in mind. Nevertheless, even if a war involving these two countries remains possible, one reason why these possibilities receive as much attention as they do is the lack of greater dangers. Furthermore, when we look at the possible causes of a war between NATO and Russia or the U.S. (and/or Japan) and China we see that, despite some overheated rhetoric growing out of conflicts over Ukraine and the East and South China seas, the issues are not direct and vital to the U.S. That is, only those with overheated imaginations can envision Russia as a military threat to Europe, and the danger to the U.S. arising from China's rise is indirect only, stemming as it does from the maintenance of America's Cold War alliances in East Asia.

China does indeed challenge the U.S. dominance in East Asia, but even leaving aside the pacifying effects of nuclear weapons and high levels of economic interdependence, the U.S. has room to accommodate the rising power and the level of threat is much lower than that which characterized much of IR in the past. The same is true for the proliferation of nuclear weapons, another issue high on the American agenda. Even those who reject the argument that proliferation will be stabilizing have difficulty estimating the magnitude of the danger, and therefore the level of effort and resources that should be arrayed against it.

Although rank-ordering these and other threats is difficult, more difficult still is putting them on some absolute scale. The result, I believe, is that the American leadership if not the mass public has lost its sense of proportion in the international dangers being posed, and concomitantly has failed to see how much safer we are now.

In other words, the leading powers now have an unprecedented degree of security, or at least security against threats from other countries (I am leaving aside the dangers of climate change and other menaces from nature even if we can trace them to human activities), and the result is to give greater salience to minor threats like terrorism.

Francis Fukuyama famously declared the "end of history." Understood—or rather misunderstood—as the claim that history and conflict had come to an end, this is clearly incorrect. But this is not what Fukuyama argued. His claim is that we have seen the end of clashing ideologies that purport to be universally valid and that, as such, seek to spread themselves throughout the world.<sup>9</sup> There is much to this. While the ideology of liberalism, democracy, and capitalism, far from converting everyone, has spurred a backlash, there is no other general contender such as fascism or communism. Islamic fundamentalism (the term is imprecise if not misleading, but there is no other one in widespread use) rejects and seeks to exclude Western liberalism, but in no realistic sense aspires to spread its truth to the entire world. The PRC has also followed its own path, and the combination of some degree of economic liberalization coupled with authoritarian rule and enriching the leaders has produced dramatic results. But China has not touted this as a model for others to follow, its success may depend on factors particularly Chinese, and others have not flocked to approach.

As Arnold Wolfers explains, when states have met their needs for security and autonomy, they often turn toward what he called "milieu goals"<sup>10</sup> which arise from non-material motives. For the West today, this means democracy, human rights, and limits on if not the elimination of corruption. These embody the way of life in the West, or, to be more precise, the way the West likes to see itself. The argument for spreading these values and ways of behaving is partly that they will enhance international cooperation and so be in the interests of the West, but at least as important is that they will benefit the societies that adopt them. Whether or not this is the case is fortunately

beyond my scope here; all that is relevant is the claim that milieu goals are increasingly important in world politics.

One large open question is the extent to which the West, and especially the U.S., will seek to impose its values on others by force, a question which is related to whether its leaders believe that countries with different social systems are a threat to it. The obvious example is the war against Saddam Hussein's regime in Iraq in 2003, which I believe can be traced in large part to the fact that President George W. Bush held what Kenneth Waltz called a "second image" theory of the causes of international conflict<sup>11</sup> in believing that the fundamental source of a state's foreign policy was the nature of its domestic regime, and therefore that a regime like Iraq's that ruled its own people by force would inevitably behave in a parallel fashion internationally. The sad results of the war have dampened the enthusiasm for such enterprises and weakened the hold of the theory behind it, but whether this is a permanent or only a temporary development is yet to be determined. Even if this war and the overthrow of Qaddafi did not make us less safe, they were not the product of real security threats that have historically played such a large role in international politics.

## Terrorism

Whether or not America's previous adventures have led to the current bout of terrorism, my previous analysis does not address the validity of current fears. My claim that they are vastly exaggerated is quite simple. The extent of a threat depends on the probability that it will materialize multiplied by the damage incurred if it does. The last factor is crucial. As horrible as they were, the recent attacks in Paris and San Bernardino and the downing of the Russian airliner over Sinai killed relatively few people. Of course this is no solace to the relatives of those who died, and every individual death is a tragedy that affects a wider circle of people, but in the cold-blooded calculus of national security these numbers are tiny and pale not only in comparison to previous wars, but also when compared to everyday threats as noted at the start of this essay.

A rebuttal is that the past does not always predict the future, and the fact that terrorist attacks have so far killed only small numbers does not mean that this pattern will continue to hold true. Of course this is right, but it is crucial to realize that terrorists can kill massive numbers only if they use infectious biolog-

ical agents or nuclear weapons (a "dirty bomb" that would use conventional explosives to spread radioactive material is a borderline case). To estimate the probability that terrorists could obtain such weapons is subject to dispute and beyond my expertise.<sup>12</sup> But we should note that even if terrorists could steal or make such weapons, they would also have to bring them to an American or a European city, a feat that makes the Paris attack seem like child's play in comparison. The danger cannot be dismissed, of course, and one irony is that fear as reflected in government policy may be a self-denying prophecy. Because government officials are themselves deeply worried, or feel that they have to appease the public by acting on fears they do not believe, they may take extraordinary precautions that greatly reduce the danger. In a further twist, to produce the sustained spending and public mobilization needed to continue these policies, officials may fan public fears (think of the "if you see something, say something" campaign).

It is of course hard for the public—and even for experts—to estimate the likelihood of large-scale terrorist attacks. What evidence would be relevant to this task? If we hear that a plot has been foiled should we raise our estimate because it shows how active terrorists are or lower because it shows the success of vigilance and defensive measures?

On balance, I find it hard to see how terrorism is one of the major scourges of contemporary life. But many people take it as such, and indeed that is the whole point of terrorists. If they had sources of effective power, they would use it to overthrow the governments they despise, alter the societies they find loathsome, and establish their values as supreme. They cannot do this, and instead the goal of terrorism is to terrorize—to induce fear and expectation that much greater harm will follow. I do not think it will, but the frightened and frightening expectations themselves are not without their consequences.



# Is Plan Colombia a Model? An Analysis of Counternarcotics Strategies in Colombia<sup>1</sup>

Jonathan D. Rosen, FIU

Bruce M. Bagley, University of Miami

---

## Abstract

This article examines Plan Colombia, which began as a counternarcotics program in 2000. The U.S. has allocated more than \$8 billion to the country via Plan Colombia from 2000 to 2012. The article examines some of the successes of Plan Colombia. Some experts and policymakers have touted Plan Colombia as a model for other countries facing problems with drug trafficking, organized crime, and insurgency. This work focuses on the lessons learned from Plan Colombia and provides a critical perspective of the concept of models

---

Drug trafficking and organized crime continue to be important issues on the U.S. security agenda. Colombia has been at the epicenter of the U.S.-led war on drugs for decades. Colombian President Juan Manuel Santos (2010-2018) traveled to Washington, D.C. on February 4, 2016 to visit President Barack Obama and celebrate 15 years of Plan Colombia, which began as a counternarcotics plan.<sup>2</sup> Juan Carlos Pinzón, Colombia's ambassador to the United States, has also been promoting strengthening cooperation between the U.S. and Colombia. Plan Colombia has been touted as a model for other countries suffering as a result of drug trafficking and organized crime as well as insurgency movements. This article is an effort to analyze the concept of Plan Colombia as a model for other countries, particularly after the U.S. has provided Colombia with \$10 billion in assistance over the past 15 years.<sup>3</sup>

## Historical Background

By the end of the 1990s, Colombia faced major economic challenges as well as high levels of insecurity in the country. Colombia is a complex country because in addition to drug traffickers the country has had more than 50 years of internal armed conflict as various guerrilla organizations exist in Colombia.

The largest guerrilla organization is the Revolutionary Armed Forces of Colombia (Fuerzas Armadas Revolucionarias de Colombia—FARC). The FARC participate in various illicit activities such as drug trafficking, organized crime, extortion, and kidnapping. President Andrés Pastrana (1998-2002) sought support from the U.S. to prevent the situation in Colombia from worsening. Pastrana desired to end the internal armed conflict and focus first on peace and developmental issues and then drug trafficking and organized crime. The Clinton administration changed the initial plan, focusing more on drug trafficking and organized crime as it did not want to draw the U.S. into Colombia's internal armed conflict. While President Pastrana envisioned a plan financed by the international community, European governments did not agree with the reversal of the formula by the Clinton administration. As a result, Plan Colombia was financed solely by the U.S. In 2000, the U.S. Congress passed Plan Colombia and the Clinton administration signed it into law.<sup>4</sup> Plan Colombia focused on "hard" components such as strengthening the military and combating coca cultivation as opposed to alternative development. The original goal of Plan Colombia was to reduce drug cultivation, processing, and trafficking by 50 percent in the first six years of the initiative.<sup>5</sup> According to Adam Isacson, from 2000 to 2016, 71 percent of the financial resources went towards the police and military assistance, while only 29 percent went towards institutional and economic assistance.<sup>6</sup>

## Shifts in the Goals of Plan Colombia

The goals of Plan Colombia evolved over time. The events of September 11, 2001 altered U.S. foreign policy as the Bush administration launched a global war on terror. President Álvaro Uribe (2002-2010) recognized that he had to change the perceptions of the Colombian conflict in order to fit within the broader foreign policy goals of the U.S. President Uribe argued that Colombia did not have an internal armed conflict but rather terrorists. He contended that the FARC in Colombia are narco-terrorists or narco-guerrillas. President Bush bought into the re-orientation of Plan Colombia and provided the Uribe administration with the financial support necessary. The Bush administration supported Colombia in its fight against the narco-terrorists for several reasons. First, Colombia has historically been a key ally of the U.S. Second, the Bush administration received criticism that it was at war against the Muslim world. Supporting the Colombian government enabled President Bush



to demonstrate that it helped governments combat terrorism around the globe, regardless of religion or geographic region. Third, Colombia is located in an important position and an unstable Colombia could impact U.S. security as well as regional security.<sup>7</sup>

The FARC concerned the Uribe administration as this guerrilla group dominated large parts of rural Colombia. Uribe sought to combat this guerrilla organization and prevent them from expanding. In the early 2000s, there were discussions among experts about Colombia being on the brink of becoming a failed state.<sup>8</sup> Support from the U.S. enabled the Colombian government to modernize and professionalize the Colombian Army. As a result, the Uribe administration dealt crushing blows to the FARC, which was in part due to the military training and support that the U.S. government provided the Colombian military. By 2000, the FARC had approximately 20,000 members.<sup>9</sup> The number of FARC members decreased to 8,000 in 2010 from 16,000 in 2002.<sup>10</sup>

Plan Colombia had “partial victories,”<sup>11</sup> as security levels improved over time and the state’s control of the country’s territory increased. In 2005, Colombia had 801 recorded kidnappings. The number of kidnappings decreased from 523 in 2007 to 213 in 2009.<sup>12</sup> In 2014, Colombia recorded 288 kidnappings. In addition to decreases in the number of kidnappings, Colombia also witnessed a decline in homicides. In 2005, for example, Colombia had a national homicide rate of 42.2 per 100,000 inhabitants. By 2014, the homicide rate decreased to 28.0 per 100,000.<sup>13</sup> In sum, Colombia saw increases in security according to various metrics.<sup>14</sup>

Plan Colombia, however, was less successful in terms of reducing drug trafficking and organized crime. Aerial eradication has been a major element of Plan Colombia. The spraying of herbicides has had environmental and health consequences. In addition to the negative ramifications of aerial spraying programs, such efforts have not been effective as coca cultivation has simply shifted between departments of Colombia and to other countries in the Andes. In December 2007, Colombia cultivated 98,899 hectares of coca. The number of hectares declined to 63,762 and 47,790 in December 2011 and December 2012, respectively.<sup>15</sup> Peru became the leading coca cultivating country in the world in 2013.<sup>16</sup> In 2015, Colombia regained its status as the leading coca cultivator in the world.<sup>17</sup>

In addition to being the number one coca cultivating country, cocaine production has continued in Colombia. In 2008, Colombia’s potential manufacturing capability of cocaine was 450 tons. While the manufacturing of cocaine declined slightly over the years, cocaine production has remained high: 410 tons in 2009; 350 tons in 2010; 345 tons in 2011; and 309 tons in 2012.<sup>18</sup> The results of the partial successes of Plan Colombia are that drug routes have shifted to other countries like Mexico.<sup>19</sup> However, routes are returning to Colombia. Thus, despite these partial victories,<sup>20</sup> the overall situation has not changed as drugs remain purer, cheaper, and more readily available than when the U.S. launched the war on drugs in 1971.<sup>21</sup>

## **Plan Mexico and the Concept of a Model**

As a result of the successes, Plan Colombia has been promoted as a model for other countries suffering from organized crime, drug trafficking, and guerilla groups. Mexican President Felipe Calderón (2006-2012) sought support from the U.S. to combat drug trafficking organizations. The Bush administration supported the Mexican government with a Plan Mexico. The name of the Plan eventually changed to the Mérida Initiative in order to disassociate it from Plan Colombia.<sup>22</sup> While there are differences between the Mérida Initiative and Plan Colombia, the overall strategies have similarities. Both initiatives have focused on “hard” components and combating drug trafficking and organized crime, particularly by using the military. Calderón militarized the drug war in Mexico in part because he did not have high levels of confidence in the police as a result of the high levels of corruption.<sup>23</sup> The result has been extreme levels of violence. During the Calderón presidency, 70,000 people died as a result of drug-related violence and another 26,000 disappeared.<sup>24</sup> The goals of the Mérida Initiative have been altered under the Obama administration as efforts have been made to focus more on the rule of law and strengthening institutions. Despite this shift, Mérida Initiative funding levels have been lower than Plan Colombia: \$143 million in FY 2011 to \$194.2 million in FY 2014.<sup>25</sup>

There have also been talks about a Plan Colombia for Central America,<sup>26</sup> particularly since this region has become extremely violent in large part due to drug trafficking and organized crime. In 2012, Honduras recorded 85.5 homicides per 100,000 people, making it the most violent non-warring country in the world.<sup>27</sup> In 2015, El Salvador surpassed Honduras as the most violent non-warring country.<sup>28</sup> Retired

Admiral James Stavridis, who led the U.S. Southern Command in Miami from 2006–2009,<sup>29</sup> advocated for a Plan Colombia for Central America. He argues, “We need a ‘Plan Central America,’ much as we had a ‘Plan Colombia,’ and now is the time to explore what that should look like.”<sup>30</sup> Yet some experts have questioned a Plan Colombia for Central America. Michael Lohmuller contends, “Ultimately, while it is right to appeal for increased US attention to a region plagued by violence and crime, Central America is not Colombia. Policymakers must therefore be cautious about using Plan Colombia as a road map for action in the region, and should avoid indiscriminately taking its lessons as gospel.”<sup>31</sup>

Plan Colombia has not only been advocated as a model for countries in Latin America but other countries around the world. It has been argued that Afghanistan could learn from the lessons of Plan Colombia.<sup>32</sup> General Peter Pace, for instance, maintains that “the model that is present here in Colombia where the Armed Forces of the country have rid certain areas of terrorists and then, very importantly, the government has followed with projects that have brought electricity and water and jobs.”<sup>33</sup> Despite the occupation of the country by U.S. troops for more than a decade, Afghanistan remains the leading producer of opium poppy, which is the key ingredient for heroin. In 2012, Afghanistan produced 95 percent of the opium world-wide.<sup>34</sup>

Such discussions are despite the fact that many critics have argued that Plan Colombia has not been successful on the drug front. Plan Colombia has focused on supply-side strategies as opposed to addressing various underlying issues. Plan Colombia was originally designed as a counternarcotics program, and the results have been underwhelming. The problem with supply-side strategies is that they fail to address the demand for drugs. The logic is that criminal organizations and guerilla groups will continue to traffic drugs—and other illicit commodities—as long as a market exists.

Another issue with Plan Colombia has been the failure to address other important problems. Plan Colombia focused the bulk of the resources on strengthening the military and combating the guerrilla organizations as well as drug trafficking. However, this Plan did not provide sufficient funding to combat corruption and impunity. Colombia—as well as Mexico and Central American countries—has very high levels of corruption and impunity. The military components of

Plan Colombia do not help strengthen weak institutions within Colombia. More resources could be allocated to helping the Colombian government—and other governments—reform its institutions. Major institutional reforms are needed in Colombia—and other countries—in order to consolidate democracy.

Strengthening institutions will help combat the number of human rights abuses that have occurred in countries like Colombia and Mexico.<sup>35</sup> In 2008, there were over 800,000 individuals who had been victimized in Colombia, demonstrating that human rights abuses continue to be a serious issue.<sup>36</sup> Certain groups have been vulnerable, particularly various indigenous communities and Afro-Colombians. Colombia has seen more than 5.7 million people who have been internally displaced since June 2014.<sup>37</sup> Colombian soldiers have also been involved in what is known as the false positives scandal where they killed civilians and dressed them in FARC uniforms in order to receive rewards. José Miguel Vivanco claims that “[f]alse positive killings amount to one of the worst episodes of mass atrocity in the Western Hemisphere in recent years, and there is mounting evidence that many senior army officers bear responsibility.”<sup>38</sup> While Plan Colombia is not responsible for all human rights abuses in Colombia as the country has an internal armed conflict, the argument is that the militarization of the strategy has contributed to human rights abuses.<sup>39</sup> Sweeping assaults on Afro-Colombian and indigenous communities and the disregard for human rights during the Uribe administration suggests that the price of professionalization of the Colombian military was quite high.

A model like Plan Colombia is also problematic because it does not provide sufficient resources for addressing development issues. Unemployment, inequality, and lack of opportunities are contributing factors to drug trafficking and organized crime. The problem of the *ninis*—youth who *ni estudian ni trabajan* (neither work nor study)—has become a major issue in many Latin American countries, not just Colombia.<sup>40</sup> A model that seeks to focus on combating the supply of drugs fails to address the socioeconomic challenges. Coca cultivation remains a major issue in Colombia because campesinos do not have other viable options as other products do not grow in the jungle or the Andes Mountains.<sup>41</sup> In addition, peasant farmers can earn more for growing coca than other products, which helps explain why they resort to cultivating coca.

## Conclusion

Drug trafficking, organized crime, and guerrilla movements as well as other forms of insurgency will continue to be key priorities on the U.S. national security agenda. Debates have existed among academics and policy analysts as to how successful Plan Colombia has been. While some analysts have argued that Plan Colombia has been very successful as security has increased in Colombia,<sup>42</sup> others have questioned the accomplishments of this Plan. Adam Isacson asserts that “[w]ords like ‘success’ and ‘model’ are unhelpful to understanding Colombia’s experience. It has come with too many scandals, abuses, disappointments and high costs to be considered a template for other troubled states receiving U.S. assistance, like Mexico or Afghanistan.”<sup>43</sup> Some individuals, like Isacson, have argued that the security gains of Plan Colombia could be reversed and question whether Colombia is safer today.<sup>44</sup> There are still other internal armed actors in Colombia and human rights abuses continue to be a major concern, particularly among certain sectors of the population such as Afro-Colombians, labor organizations, and various indigenous groups.

Models like Plan Colombia that focus on “hard” components fail to address the various underlying challenges such as corruption, impunity, and weak institutions. In addition, some experts have argued that Plan Colombia has not been successful in terms of drugs as coca cultivation and drug production have continued. In sum, Plan Colombia shows that there are key lessons for policy-makers with regard to what has worked and what has not worked in efforts to combat drug trafficking as well as guerilla organizations.<sup>45</sup> It is important to note that each country is different, and a general model does not take into consideration the nuances of each country.







# Energy Security in the United States:

## A Glance at the Major Issues

Marten Brienen, Oklahoma State University

---

### Abstract

The article analyzes U.S. energy security and begins with an examination of the U.S. energy profile. The article then explores some of the major threats to U.S. energy security. Today, the U.S. is in a comfortable position in terms of its energy supply. However, great debates exist with regard to the size of hydrocarbon reserves. Disputes also continue regarding how long the U.S. will be able to use technology to extract gas and oil. While the U.S. has witnessed a boom in natural gas, hydraulic fracturing, or fracking, has caused many Americans to worry about the consequences of such practices.

---

---

The economic well-being of the United States is directly tied to its access to affordable energy. Indeed, every major economic crisis the country has traversed has been accompanied by high oil prices.<sup>1</sup> The connection between U.S. prosperity and access to affordable energy is so obvious, that this has in the past been used by those who supply the U.S. with energy (in the form of the “petroleum weapon”) as a weapon in an attempt to force political action: this was the case during the 1973 oil shock, when OPEC members decided to punish the U.S. for its support of Israel in the Yom Kippur war by restricting oil supplies and raising the price of crude oil, resulting in a deliberate crippling of the U.S. economy.<sup>2</sup>

It was, of course, the 1973 oil shock that first caused political leaders in the U.S. to really consider the notion of energy security, notably with Richard Nixon’s 1973 “Project Independence,” which was intended to reduce U.S. reliance on imported energy, particularly crude oil from OPEC countries.<sup>3</sup> Equally important was the 1979 oil shock, caused by the Iranian revolution, which put President Jimmy Carter in the uncomfortable position of having to effectively beg the nation to reduce its energy consumption and contributing directly to President Carter’s electoral loss to Ronald Reagan.<sup>4</sup>

The idea of energy security effectively revolves around

the ability of the country to guarantee reliable access to affordable energy to cool, heat, and illuminate our homes, to fuel our cars, trucks, trains, and airplanes, and to keep the industrial motor humming along. Anything that has the potential to disrupt these processes thus poses a threat to our economic wellbeing and quality of life.

Given that the United States remains a net importer of energy, this means that our energy security depends at least in part on the reliability of foreign sources of crude oil and natural gas and that our focus must be on the potential for disruption of those foreign supplies. To some extent—as demonstrated in the 1973 crisis—this puts the U.S. at the mercy of producers of the energy resources upon which we depend, a fact also exploited by Hugo Chávez of Venezuela, who repeatedly threatened to cut off the U.S. from its very sizeable oil reserves.<sup>5</sup> Naturally, then, we must look at domestic production capacity: our dependence on foreign sources of oil and natural gas is, after all, a direct function of our inability to meet energy needs domestically.

There is, of course, more to the story of our energy security. There are consequences to our dependence on fossil fuels, given that they are non-renewable resources and that they are responsible for changes in the planetary climate, which in turn may in the intermediate to long-term produce serious threats to U.S. national security.<sup>6</sup> In addition, there are some other concerns which are not generally considered by the general public, but which may ultimately create more vulnerability than our dependence on foreign energy resources. In the following pages, I will discuss U.S. energy security in the context of a volatile world.

### Energy Profile

Oil holds a very privileged position in the American public imagination. It is one of precious few commodities the price of which is discussed with regularity in the popular media. Just about every American can name the price of a gallon of gasoline, and more than a few will be able to tell you the current going rate for a barrel of crude oil. The same can decidedly not be said of a kilogram of uranium or indeed a ton of coal—other than perhaps in some corners of Appalachia. This is, of course, due to the fact that out of the many forms of energy we consume, gasoline happens to be the one product that Americans pay for directly at the pump. When oil prices are low, consumers not only feel it in their pocketbooks, but they

can see it while they fill up their cars. Given the direct link between the price of a barrel of crude oil and that of a gallon of gasoline, this produces an acute awareness of oil prices and one that is not matched when it comes to the other forms of energy we consume. Monthly electric bills are more difficult to interpret and are not generally read in great detail to see how much we are paying per kWh this month. Oil alone holds our fascination.

Oil is indeed important: transportation alone accounts for 28 percent of total energy consumption in the U.S., making it the second most energy-intensive sector in the country after the generation of electricity (39 percent), followed by industry (22 percent), and residential and commercial energy consumption (11 percent). Coal remains the most important fuel for our power plants (37 percent), while natural gas (26 percent), nuclear power (22 percent), and renewables (13 percent) make up the remainder: the sector consumes virtually no oil. This makes petroleum the most important source of energy in the U.S. at 36 percent of the total, followed by natural gas (29 percent), coal (16 percent), renewables (10 percent), and nuclear (9 percent).<sup>7</sup>

It is important to remark on the ongoing changes that are transforming the energy landscape. The most important of these has been the development of unconventional reserves of oil and gas in the form, primarily, of shale.<sup>8</sup> Innovations in horizontal drilling and hydraulic fracturing or fracking have allowed for a reawakening of the U.S. energy sector, especially with regard to the production of natural gas. As a result of this boom, the U.S. is now the world's leading producer of natural gas with an annual output of about 27.2 Tcf (2015).<sup>9</sup> This has had several effects: it has led to a reduction in the price of natural gas, which has benefited consumers. Moreover, it has caused utilities to shift away from coal and towards natural gas for the generation of electricity, which has reduced the importance of coal in energy production and has the added benefit of reducing the output of carbon dioxide by power plants.<sup>10</sup>

Indeed, the shale revolution has resulted in a much reduced dependence on foreign imports to meet domestic energy demands. Since 2004, total energy imports into the U.S. have dropped from 8,310 Twh to 3,586 Twh by 2013.<sup>11</sup> The most important energy import, crude oil, has dropped significantly as well, in part due to increased domestic production of tight oil: total petroleum imports dropped from 5.01 Bbl in

2005 to 3.43 Bbl in 2015,<sup>12</sup> constituting a reduction of some 32 percent in imports. Domestic production of oil—primarily due to increased tight oil production—increased from 1.89 Bbl in 2005 to 3.44 Bbl in 2015.<sup>13</sup>

As imports of petroleum have fallen, a shift has also taken place in the origin of imported petroleum. While OPEC still contributes a large share of imported petroleum, its share has been steadily falling in favor of exporters within the Western Hemisphere, especially Canada. Between 2010 and 2015, imports from OPEC countries fell from 1.79 Bbl to 1.05 Bbl, while imports from Canada rose from 0.93 Bbl to 1.37 Bbl. As of 2015, Canadian imports account for about 28 percent of the total, followed by Saudi Arabia (13 percent), Mexico (10 percent), and Venezuela (9 percent).<sup>14</sup>

These shifts have meant that even though the U.S. remains heavily dependent on imported petroleum—given that the U.S. produces only about 60 percent of its total demand—that dependence has been decreasing. At the same time, more of the demand is being met by producers in the region. The latter point is especially important when we consider U.S. vulnerability to oil shock in the framework of the extreme volatility that marks portions of the Middle East and North Africa.<sup>15</sup>

## Threats to U.S. Energy Security

The United States is currently in a relatively comfortable position with regard to its energy supply: its dependence on imports of petroleum is significantly reduced from just a decade ago, it is currently the leading producer of natural gas, and oil is currently relatively inexpensive. When it comes to energy security, the main things to address are 1) our continued ability to produce at current levels, or even to increase domestic production, 2) the ability of certain state and non-state actors to disrupt energy supplies, 3) the possibility of regional volatility causing a spike in oil prices, and 4) the long-term effects of our reliance on fossil fuels to sustain our economic growth and overall prosperity.

It is very much in the nature of hydrocarbon reserves to be the subject of great debate when it comes to the actual size of those reserves and our ability to exploit them in an economically viable way. One of the tricky things about hydrocarbon reserves is that they are hidden deep underground, where we cannot exactly take a good close look at them. Fields holding



great promise sometimes do not live up to that promise, while others prove more productive than expected. It is for this reason that we distinguish between proven, probable, and possible reserves with a range of caveats about what may or may not be technically recoverable.<sup>16</sup>

This is a continuous source of great uncertainty and allows for individuals, oft depending on their political agenda, to make statements with regard to the continued ability of the United States to supply itself with natural gas and oil. Indeed, the proven reserves in the United States are good for about 11 years of production at current levels, which does not seem like very much at all.<sup>17</sup>

The big question, then, is how long the United States will be able to extract oil and gas from the ground. The science behind estimating the productive capacity of known deposits is notoriously inexact, and this can be seen in the vast difference in size between our proven, probable, and possible reserves. There are those who would like to keep focused merely on the proven reserves, and in so doing can predict that we have no more than 11 years' worth of natural gas left.<sup>18</sup> That seems rather pessimistic: doomsday prophets have been predicting the "End of Oil" for a number of years now, not taking into account the very real effects of technological advances in petroleum engineering. Even the term "technically recoverable reserves" is a flexible one that mostly reflects the price point at which exploitation of certain reserves becomes economically viable.

Given the very real uncertainty that exists when it comes to exactly how much natural gas and tight oil the United States is likely to be able to extract from known and as yet unknown resources, any remark on the future of the domestic exploitation of hydrocarbons would be almost entirely speculative. The Energy Information Administration claims that we have resources for another 85 years of exploitation at current levels based on what it estimates current technically recoverable resources are.<sup>19</sup> Those estimates have been called into doubt in the past, but the predicted decline in production by those doubters has not occurred.<sup>20</sup> What can be said to be true is that the efficiency with which oil is extracted today from unconventional reserves is vastly superior even to that of ten years ago. Thus, the extent of existing resources—discovered and otherwise—is in effect unknowable without active exploitation. By the same token, what cannot be denied is that the position the U.S.

finds itself in today with regard to the total of proven, probable, and possible reserves is vastly better than it was around the turn of the century. Will the U.S. become energy independent? Maybe.

It is important to contextualize this emphasis on the theme of energy independence as an overarching goal in and of itself, given that its importance for a society's economic prosperity is clearly overstated: Venezuela is energy independent. So are Angola, Equatorial Guinea, Ecuador, Libya, and Iraq. Singapore, Japan, Germany, and Hong-Kong, on the other hand, import virtually every last joule of energy they consume.<sup>21</sup> Autarky is not all it is cracked up to be—ask any North Korean.

The issue at hand is not whether a country is capable itself of producing the energy it needs to fuel its economic activity, but whether it can rely on a steady supply of that energy at a reasonable price, regardless of the origin of that energy. Here, of course, lies the rub. Dependence on foreign sources of energy does create a certain vulnerability in that it creates a reliance on the willingness of vendors to play by the rules, and history teaches us that oil producing countries—especially when they are members of OPEC—are willing to harm their economic self-interest for geopolitical reasons. Russia has also demonstrated such a willingness.<sup>22</sup> The concerns that exist within the United States with regard to our inability to produce domestically the energy we consume are rooted in a history of manipulation by certain energy producers upon which we have historically relied.

In addition to the deliberate manipulation by oil producing countries we witnessed in the 1970s, there is the added concern of non-state actors who might seek to disrupt supplies for religious and political reasons, as well as the disruption of supplies that occurs when oil producing regions become embroiled in political conflict, as has been the case in Libya and the Levant. On the other hand, it should be noted that organizations such as ISIS have shown themselves to be perfectly happy to sell oil to the world markets: this is, after all, how one funds the bloodshed they have wrought upon Syria, Iraq, and Libya. It seems unlikely that ISIS cares very much who consumes the oil it controls, so long as it helps them to prolong their miserable existence.<sup>23</sup>

At this point in time, however, the majority of our imports come from within the hemisphere and primarily from Canada, which seems particularly unlikely to

become the next Syria. Rather, it is one of the most politically stable countries in the world, and one that seems unlikely to seek to inflict economic harm on the United States. The only country in the region that has specifically sought to block exports of its energy resources to the United States has been Bolivia, and at great cost to its own economy.<sup>24</sup>

While there may not be great need to worry about the end of the shale gas revolution quite yet, there are serious concerns with regard to the production of natural gas from shale, which may complicate the narrative. One of the least appreciated threats to natural gas production from unconventional sources has been the effect of fracking on inhabited areas. Fears of intrusion into ground water have sparked protests against fracking in numerous communities. Meanwhile, fracking is producing significant seismic activity in areas such as northern Oklahoma, which was hit by an earthquake in September 2016 that measured 5.8 on the Richter scale and caused some minor damage to the town of Pawnee. The United States Geological Survey has warned of the potential for even bigger earthquakes as a result of waste water injection into disposal wells.<sup>25</sup> This constitutes a true problem for the industry, which has largely been unwilling to acknowledge the connection between seismic activity and exploitation of oil and natural gas. Until the shale gas boom, Oklahoma rarely experienced earthquake activity, whereas in recent years the number of earthquakes has risen from two per year to over 4,000 per year, including some that have caused property damage and minor injuries.<sup>26</sup> It seems likely that an even bigger earthquake than the most recent one would cause significant damage to a region that has no history of earthquake mitigation. There is, for now, no good answer to the resultant conundrum. Indeed, it is interesting to note that this seismic activity is posing a real threat to the largest reserves of petroleum in the U.S.—in Cushing, Oklahoma—, which may be damaged by earthquakes produced by the exploitation of natural gas.<sup>27</sup>

The most overlooked threat to our energy security, however, lies in the distribution of electricity: the electrical grid itself. The vast majority of disruptions that take place in the United States, and at times at a very large scale, are caused by malfunctions in that system, which is vastly overcomplicated and underfunded.<sup>28</sup> This has produced massive blackouts, including a recent one spanning the entire Northeast and into Canada (2003).

In reality, winter storms and other weather phenomena cause more damage every year than any other circumstance. Hurricanes cause people and industries to remain without power for weeks at a time.<sup>29</sup> The potential for terrorism there is far greater than in other parts of the energy supply chain: it is childishly simple to cause great damage with the most primitive of tools, and there is some evidence at least that we should actually be concerned about sabotage in the grid.<sup>30</sup>

## Conclusion

The world is not as it was in 1973. While OPEC still has a real capacity to influence the world market by either depressing or raising the price of oil, innovation in petroleum engineering has drastically altered the landscape. In terms of reliable access to oil, the United States sits in the favorable position of being able to rely on its northern neighbor: Canada is certainly a much more reliable partner than Russia, which has in the past disrupted European supplies of natural gas for geopolitical reasons. In addition, despite the rather continuous predictions of the imminent end of the shale oil and gas boom that has transformed the energy sector in the United States, proven reserves now still look healthier than they did a decade ago. There is simply no argument to be made that the United States is not at this time significantly less vulnerable to deliberate disruption of its energy supplies than it has been for most of the period between 1970 and 2005.

Nevertheless, there is reason to be concerned with regard to our continued reliance on fossil fuels as the main source of energy. While the switch from coal to gas has helped reduce greenhouse gas output in the United States, global climate change and rising sea-levels do pose a very serious threat to a number of low-lying coastal regions, while changes in weather patterns across the continent pose a real threat to agriculture.

There is also real concern about the effect of fracking on some regions of the country, and is especially true in Oklahoma, which has become one of the most seismically active places in the country. There is no clear answer to the concerns Oklahomans have: if waste water injection into disposal wells continues, then it is entirely possible that damaging earthquakes will follow.





# Assessing the Threat from Terrorism in the Caribbean

Anthony Clayton, University of the West Indies

---

## Abstract

Gangs can serve as a “force multiplier” for terrorism; they are a source of recruits, weapons, and local knowledge. Terrorist organizations such as Daesh/ISIS are now skilled at recruiting disaffected youth, many with prior criminal records. Any country with significant numbers of gang members with the potential to be radicalized may therefore be a potential recruiting ground for fundamentalists. Several countries in the Caribbean appear particularly vulnerable, including Trinidad and Tobago, which has already suffered one attempted coup by jihadists, and Jamaica, which has nearly 300 violent gangs and many disadvantaged young men. There is a clear pattern of jihadist attacks on tourists, and the Caribbean is one of the world’s leading tourism destinations, so tourists may be the primary targets rather than Caribbean nationals.

## The Caribbean

Eight of the ten most violent countries in the world are in Central America and the Caribbean.<sup>1</sup> These exceptionally high homicide rates are the result of interlocking factors, including powerful criminal networks, weak and compromised governments, corruption, and the profits to be made from trafficking narcotics, weapons and people, extortion, and other criminal enterprises. The violence deters investment and spurs migration, which perpetuates the underlying social and economic problems, resulting in a large number of poorly-educated, disaffected, and marginalized youth who see violence as the way to wealth and power.

## Recent Trends in Terrorism

Recent terrorist attacks in Paris on November 13, 2015 and in Brussels on March 22, 2016 highlighted that the largest source of foreign recruits to international jihadist networks are disaffected young men with prior criminal convictions. From 2001 to 2009, (i.e. before the rise of Daesh) about 25 percent of the known jihadists in Europe had criminal records; mainly for narcotics, car theft, and weapons trafficking. In Belgium, by August 2015, this had risen to about 50 per-

cent of the known jihadists.<sup>2</sup> This suggests that Daesh is particularly skillful at recruiting criminals and gang members, who typically radicalize within a small network of friends.<sup>3</sup> These recruits are often motivated by excitement, power, and a sense of belonging; very few are pious. It is therefore likely that a country with high levels of violence and a large number of disaffected, unemployed youth will now be seen by terrorist organizations as a potential recruiting ground.

Daesh claimed responsibility for the Paris attacks of November 2015 and called them the “First of the Storm.” It is clear that Daesh no longer confines its operations to Syria, Iraq, and adjacent states, but now aspires to a much wider conflict. Daesh operates with delegated authority; the Caliphate provides guidance, training, and funding, but the time, place, and manner of the attack is determined by local affiliates. This appears to have been the model followed in recent attacks in Paris, Beirut, and the October 2015 bombing of a Metrojet Flight from Sharm el-Sheikh that killed 224 people.

The nature of the threat has evolved significantly since 2001, and the terrorist attacks in Paris reflect a rapid recent reordering of terrorist structures, alliances, priorities, and capabilities. The threat is now exceptionally fluid and complex, and very difficult to pattern or predict, because the enemy is no longer a single entity. Daesh is simultaneously an organization, a self-proclaimed state, the core of a network of affiliated organizations and sympathetic individuals, a religious and political belief system, and a malignant ideology that is being disseminated around the world on a multiplicity of media and social channels.

The current surge in terrorism is the result of a number of deep and almost intractable problems, including the conflict between the Sunni and Shia faiths, the U.S. invasion of Iraq, and the disbanding of the Iraqi army (many former Baathist soldiers are now with Daesh), Saudi Arabia’s support for Wahhabi (fundamentalist) Sunni imams, the complex, multi-sided war in Syria, and a large number of local conflicts and grievances, many of which now find common cause and expression through Daesh. None of these problems are likely to be resolved in the foreseeable future, and many of them are metastasizing, moving into new territories (especially ungovernable provinces and weak states), and evolving into new forms (such as cyberspace). This means that the associated terrorism is likely to persist for decades to come. Daesh is currently the most prominent and advanced

incarnation of these problems. Even if Daesh could be destroyed, the problems would persist and give rise to some new organization. A permanent solution would require resolutions to many issues, including questions of borders, ethnicity, identity, governance, faith, economic development, access to land, water and other resources, climate change, and other environmental impacts. None of these are easy, and there is no comprehensive solution in sight.

The key target audience for Daesh ideology consists of troubled and disaffected youth. Many of those who have been recruited in Western countries to kill for Daesh were not particularly religious; some were only recent converts to Islam. For example, Abdelhamid Abaaoud, the “mastermind” of the Paris attacks on November 13<sup>th</sup>, was a student at a Catholic school, and did not attend a mosque. He became involved in petty crime before travelling to Syria in 2014.<sup>4</sup> His actions appear to have been motivated by a desire for power, violence, and unaccountability, rather than religion. Similarly, Salah Abdeslam and his elder brother Ibrahim, a suicide bomber in the Paris attacks, used to run a cafe in Molenbeek that sold alcohol and was closed down for drug offenses. Their network of support was based on personal loyalty, disenchantment, and petty crime, rather than radical ideology. Khalid and Ibrahim el-Bakraoui, the suicide bombers who carried out the attacks in Brussels on March 22, 2016, had multiple prior convictions. Khalid was sentenced in 2011 to five years for criminal conspiracy, armed robbery, possession of stolen cars, and weapons; Ibrahim was sentenced in 2010 to nine years in prison for attempted murder (both were paroled).<sup>5</sup>

This is a common pattern; many recent recruits have a history of personal or psychological problems, petty crime and gang membership, and a sense of alienation. Daesh offers these people a very powerful message of glamor, violence and a sense of belonging to a great cause. Any country with a large number of troubled and/or disaffected youth is therefore a fertile potential recruiting ground.

## Daesh: The Social Media Generation Terrorists

Daesh originated as an affiliate of Al-Qaeda but has now largely supplanted them. Daesh claims to be the sole legitimate jihadi organization active today (this is a part of their image and recruiting strategy); Al-Qaeda is still a significant threat, but no longer has the image, momentum, recruits, operatives, financing, or

equipment to compete with Daesh.<sup>6</sup>

The Paris and Brussels attacks represent a major escalation of Daesh’s global campaign. Their publications were exultant, and they have promised more such attacks around the world. Many potential recruits will be motivated by these exceptionally high-impact, high-visibility attacks.

The main recruiting channels for Daesh are existing networks of disaffected youth accessed via prisons, charismatic preachers, leaders, and other opinion-formers. Daesh is also highly skilled at psychological manipulation on social media. Their media presence and ability to control the narrative are technically competent and skillful. Individual Daesh “mentors” will spend hundreds of hours patiently grooming valuable potential recruits over the Internet. They reach out to troubled and/or disaffected youth, with a message of glamor, violence, and comradeship. They offer a simple, uncompromising, radical, and compelling vision to those who find life difficult and confusing, to those who do not feel that they have the life that they want, to those that feel that they are not given the “respect” they deserve, and to those who feel that they want to be more than a loser or low-level gang member. Their method is essentially the same as that used by every totalitarian movement; to set life’s petty miseries in a grand historical context, to blame another group for these problems, and to extol the use of violence against that group. In this way, disaffected youth can feel that they are part of a great movement to reclaim their rightful place in the world.

The extraordinary and rapid success of Daesh reflects its ability to appeal to the disaffected with a compelling narrative and to sell this with exceptional skill. European jihadists come from a range of socio-economic backgrounds and areas, and from both immigrant and native backgrounds; but the largest group consists of young men with criminal records from urban areas, some of whom also have prior mental health issues.<sup>7</sup>

In 2006, the average age of European jihadists (at the time of their arrest) was 27.3, with the youngest aged 16 years old.<sup>8</sup> The average age may now be slightly lower, as a result of an increase in the number of very young recruits, some just 15, so a typical jihadi foreign fighter is now a male between 18 and 29 years old.<sup>9</sup> The average speed of radicalization appears to have accelerated, with the process generally taking weeks rather than months, and there is increasing

evidence that jihadist recruitment tends to spread through previously-established networks (communities, families, mosques, and gangs), where groups of acquaintances already identify with each other.<sup>10</sup> Given that recent immigrants may be easier to track, the main threat in most European countries is now from young, home-grown terrorists, typically radicalized through contact with others or, in some cases, via social media, who are usually “off the radar” until they commit their first serious action.

## The Threat to Caribbean Nations

In 2015, U.S. Southern Command said that about 100 Caribbean nationals had travelled to Syria to train with Daesh.<sup>11</sup> In addition, a total of 337,802 nationals from terrorist-linked countries (Afghanistan, Algeria, Cuba, Iran, Iraq, Jordan, Lebanon, Libya, Nigeria, Pakistan, Palestine, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, and Yemen) transited Caribbean nations over the period 2007-2014, indicating the ease with which jihadists could enter the Caribbean. The Republic of Trinidad and Tobago is probably the most exposed to risk, partly because some eight to nine percent of the population are Muslims; most of them are moderates, but they also have the fundamentalist group Jamaat al-Muslimeen, led by Yasin Abu Bakr, which attempted a coup on July 27, 1990, seized the parliament building, the main TV and radio stations, and killed 24 people.<sup>12</sup>

Jamaica is less obviously exposed to terrorist recruitment than Trinidad and Tobago, but has even higher levels of violent crime, with a homicide rate that is currently sixth in the world. This is the result of a complex set of interlocking problems; Jamaica’s National Security Policy notes that the Tier 1 threats to the nation include “transnational organized crime, including trafficking in narcotics, weapons, ammunition, money and people, money laundering and cyber-crime...gangs and domestic organized crime...contract killing, intimidation and extortion, kidnapping, dealing in narcotics and illegal weapons and money laundering...a political system that is still compromised by links to organized crime...corruption in key institutions of state, including the security forces, police, prison and justice systems, and gang-dominated communities.”<sup>13</sup>

As this suggests, Jamaica has deeper social, political, and economic problems than the marginalized communities in Paris and Brussels. Jamaica is also home to Abdullah el-Faisal (born Trevor William Forrest in

1963). He was raised as a Christian, but converted to Islam at the age of 16, studied in Saudi Arabia, and moved to the UK to preach during the 1980s. He appears to have been effective in radicalizing others; his congregation included “shoe bomber” Richard Reid, 9/11 plot member Zacarias Moussaoui, and Muhammad Sidique Khan and Germaine Lindsay, suicide bombers in the July 7<sup>th</sup> London attack in 2005. He was convicted in the UK in 2002 on five charges of soliciting murder, served four years and was deported to Jamaica in 2007.

## Potential Target: Tourists in The Caribbean

A single point of contact in any Caribbean island could be the nucleus of a devastating terrorist incident. Recent terrorist incidents have involved small numbers, typically from one to ten individuals, who can inflict serious harm in a single or coordinated set of attacks. There is a low level of awareness in the Caribbean of the potential threat from terrorism, but a number of recent attacks have focused specifically on tourist and leisure areas. For example:

- In 1997, members of al-Gama’a al-Islamiya killed 58 tourists at Luxor. Egypt’s tourism earnings fell that year by \$1.17 billion, about 25 percent of Egypt’s revenue from the industry.
- In 2002, members of Jemaah Islamiyah bombed a nightclub in Bali, killing 201 tourists. The event was planned to maximize civilian casualties.<sup>14</sup> The nightclub was known to cater largely to tourists, and was targeted as a result; members of Jemaah Islamiyah stated in court that their goal was to cripple the tourism industry. Bali’s visitor arrivals fell that year by 22 percent; some 300,000 jobs were lost.
- On September 21, 2013, al-Shabaab militants based in Somalia attacked the Westgate shopping center in Nairobi, Kenya, and killed 68 people. The shopping center catered mainly to the middle-class, UN workers, and tourists.
- On January 7, 2015, members of Al-Qaeda in Yemen attacked the offices of the satirical weekly newspaper *Charlie Hebdo* and a kosher market in Paris. They killed a total of 17 people and injured 22. Over the following nine days France’s revenues from tourism fell by 25 percent and then fell by another 26 percent over the subsequent 10 days. Occupancy rates in

Paris hotels fell by about three percent, but reservations for restaurants and bars experienced a cancellation rate of 68 percent, which suggests that people were not cancelling visits to Paris, but were far more reluctant to go out into public spaces.<sup>15</sup>

- On November 13, 2015, a series of coordinated terrorist attacks in Paris killed 130 people and 368 people were injured, some 80-100 seriously. The venues attacked were all social hubs, including a music venue and a restaurant. The occupancy rate at Paris hotels fell 21 percent on the Saturday following the attacks and 23 percent the next day, far more than the three percent fall after the Charlie Hebdo attack, which suggests that the cumulative impact of two terrorist incidents had a far bigger impact on tourist arrivals.<sup>16</sup>
- On June 26, 2015, Islamists attacked the tourist resort at Port El Kantaoui in Tunisia. They killed 38 people, 30 of whom were UK nationals.
- The bomb that destroyed Metrojet Flight 9268 over the Sinai on October 31, 2015 and killed all 224 people on board was probably placed on the aircraft at Sharm el-Sheikh. As a result, a number of countries advised against travel to that area. Egypt's tourism receipts fell by almost 50 percent, and many of the hotels in Sharm el-Sheikh closed.

Jamaica's tourism industry has already suffered as a result of terrorism. After 9/11, global tourism volumes fell by 10 percent. Visitor arrivals to some countries fell by 30 percent, Caribbean arrivals fell by 15 percent, and Jamaica's arrivals declined by 20 percent. Many Caribbean destinations had to discount heavily to try to maintain room occupancy, and found it difficult to revert to their former prices for years afterwards.<sup>17</sup> In spite of this, a survey of the tourism industry in Jamaica carried out in 2011 found that senior operatives in the industry did not think that Jamaica was at serious risk of terrorism because "we're not quarrelling with anyone."<sup>18</sup> If, however, the intended targets are U.S. or European citizens, Jamaica might be chosen as the scene of the attack, rather than the primary target (as with the Bali nightclub bombing).

Jamaica's tourism industry now attracts over 3 million arrivals. The industry generates some 13 percent of Jamaica's GDP; and 30-40 percent of all employment

in the country is directly or indirectly related to tourism. Any terrorist incident that damages confidence in Jamaica's tourism industry would therefore have immediate and widespread consequences to the nation—even if Jamaica was only the chosen location for the attack.<sup>19</sup> The deliberate sinking of a cruise ship, for example, could result in over twice as many fatalities as the 9/11 incident, in which some 3,000 people died, as a large modern cruise ship can carry over 6,000 passengers and over 2,000 crew members. Any such incident would probably have a long-term impact on the world cruise industry, which would affect the Caribbean more than any other region, as the Caribbean currently accounts for over half of the world market share of cruise ship destinations.<sup>20</sup>

The tourism industry does demonstrate remarkable resilience, and eventually recovers. After a major terrorist incident, however, tourism volumes typically fall by 25-75 percent and do not recover for some years, while the countries affected also have to invest in additional security, spend heavily on advertising, and offer steep discounts in order to rebuild their customer base. During that time, a number of the relatively fragile tourism-dependent Caribbean economies could collapse.

## Conclusion

Several Caribbean nations have a number of attributes that make them potentially fertile ground for terrorist networks, including:

- A large number of disaffected, disadvantaged youth with very poor prospects.
- Serious corruption among public officials, political patronage, and a democratic system compromised by links with organized crime, which fosters cynicism and despair of the prospects of legitimate change.
- A large number of criminal gangs.
- Availability of illegal weapons.
- Existing fundamentalists, with contacts with jihadists.
- Extensive in-bound travel from nations with active terrorist networks.
- A small but growing number of Caribbean nationals who have travelled to Syria.
- A large number of soft targets, such as tour



ism resorts and cruise ships, catering predominantly to North American and European nations, where it would be relatively easy to mount a “spectacular” attack resulting in a large number of fatalities.

The nations of the Caribbean are predominantly Christian, but this is unlikely to provide protection, as many recruits in other countries were only recent converts to Islam. All the information presented here is in the public domain, and therefore accessible to terrorist organizations. It is therefore likely that terrorist organizations will come to the same conclusions, if they have not already done so.

## Recommendations

There are a few key steps that would help to increase the resilience and preparedness of the Caribbean nations. The first line of defense, as always, is to be better informed. Thus, it is important to establish the protocols and mechanisms for faster and deeper intelligence-sharing and cooperation both within the Caribbean and with key partners overseas. This in turn will require the better management of bilateral and multilateral partnerships towards joint security goals, and the removal of internal silos (Jamaica has already integrated the counter-terrorism and organized crime branches of the Jamaican Constabulary Force). More effective immigration and border security can start simply by training staff. More serious investment would be required in order to improve the security of transport and shipping infrastructure, especially as most of the Caribbean nations have highly permeable marine borders. However, new technologies (e.g. as fixed-wing drones) are increasingly affordable, and would give a significant increase in regional air and maritime domain awareness. Regional resource-pooling would rapidly enhance rapid response and search and rescue capability, and address some of the most significant resource and capability gaps in regional defense and security systems.

The most important step, however, is to resolve the deep social and economic problems in the Caribbean that create pools of disaffected youth that can then be recruited by either criminal or terrorist networks. A combination of better-targeted policing and social interventions will be required; the normalization and reintegration of the high-crime, gang-dominated communities and informal settlements will require a transition to intelligence-led proximity and community policing supported by both social and private in-

vestment. This must be accompanied by steps to end the political culture of corruption and patronage, so that people can trust their governments, and by reforms to the dysfunctional legal systems so that the people can have faith in law, order, and justice. This combination of measures represents the best way to ‘inoculate’ a population against the spread of virulent and malignant ideologies.

# Notes

1 The nations with the highest homicide rates are as follows: Honduras: 90.4 per 100,000; Venezuela: 53.7; Belize: 44.7; El Salvador: 41.2; Guatemala: 39.9; Jamaica: 39.3; Swaziland: 33.8; Saint Kitts and Nevis: 33.6; Republic of South Africa: 31.0; Colombia: 30.8. Swaziland and the Republic of South Africa are the only two countries not in the region.; United Nations Office on Drugs and Crime (UNODC), *Global Study on Homicide 2013* (New York, N.Y.: UNODC, 2014), [https://www.unodc.org/documents/gsh/pdfs/2014\\_GLOBAL\\_HOMICIDE\\_BOOK\\_web.pdf](https://www.unodc.org/documents/gsh/pdfs/2014_GLOBAL_HOMICIDE_BOOK_web.pdf).

2 Jason Burke, "It is no surprise siblings with past crimes carried out attacks on Brussels," *The Guardian*, March 23, 2016.

3 "What is the driving force behind jihadist terrorism?" *Inside Story International*, December 18 2015.

4 "Abdelhamid Abaaoud: Paris attacks 'mastermind' never attended mosque, family says," *The Independent*, November 18, 2015.

5 "The men in the top floor flat who sowed terror in Brussels," *The Guardian*, March 24 2016; "Ibrahim and Khalid el-Bakraoui: From Bank Robbers to Brussels Bombers," *The New York Times*, March 24, 2016.

6 The organization now known as Daesh/ISIS originated as Jama'at al-Tawhid wal-Jihad in 1999, an affiliate of al-Qaeda in Iraq. It proclaimed the formation of the Islamic State of Iraq (ISI) in 2006. In 2011 ISI sent a mission into Syria; the Jabhat an-Nurah li-Ahli ash-Shām (al-Nusra Front). In 2013, ISI merged with the al-Nusra Front to form the Islamic State of Iraq and the Levant (ISIL). The merger was rejected by the leader of Al-Qaeda, Al-Zawahiri, who severed links with ISIL in 2014.

7 "Profiling Europe's jihadists," *The Economist*, April 8, 2016

8 Edwin Bakker, *Jihadi terrorists in Europe: their characteristics and the circumstances in which they joined the jihad: an exploratory study* (The Hague, Netherlands: Netherlands Institute Of International Relations Clingendael, 2006).

9 "ISIS and the Foreign-Fighter Phenomenon," *The Atlantic*, March 8, 2015.

10 The Soufan Group, *Foreign Fighters: An Updated Assessment of the Flow of Foreign Fighters into Syria And Iraq* (New York, New York, The Soufan Group, 2015).

11 "US Military Concerned ISIS Fighters Returning to Caribbean Could Reach Border," *Defense One*, last modified March 12 2015, <http://www.defenseone.com/threats/2015/03/us-military-concerned-isis-fighters-returning-caribbean-could-reach-Border/107421/>; SOUTHCOM, "Southcom commander discusses recruit movement to Syria," SOUTHCOM video, 36:23, March 13, 2015, <http://www.southcom.mil/newsroom/Pages/Southcom-commander-discusses-recruit-movement-to-Syria.aspx>.

12 "The Islamic Leader Who Tried to Overthrow Trinidad Has Mellowed... a Little," Vice News, last modified May 30, 2014, <https://news.vice.com/article/the-islamic-leader-who-tried-to-overthrow-trinidad-has-mellowed-a-little>; Raoul A. Pantin, *Days of Wrath: The 1990 Coup in Trinidad and Tobago* (Lincoln, Nebraska: iUniverse, 2007).

13 Government of Jamaica, *A New Approach: National Security Policy For Jamaica 2013*, 2013, [http://www.japarliament.gov.jm/attachments/1286\\_2014%20Ministry%20Paper%2063.pdf](http://www.japarliament.gov.jm/attachments/1286_2014%20Ministry%20Paper%2063.pdf).

14 A suicide bomber inside the nightclub detonated a small bomb in his backpack. Many of the patrons, some injured, fled into the street. 20 seconds later, a powerful bomb in a van parked outside was detonated by a second suicide bomber. This ensured maximum carnage, as the patrons were then exposed to the blast.

15 "France Tourism 2015: After ISIS Attacks Paris, Will The City Of Light Be Able To Recover?" *International Business Times*, November 16, 2015.

16 "France's Economy Slows After Paris Attacks as Tourists, Shoppers Stay Home," *Wall Street Journal*, November 24, 2015.

17 Maximiliano E. Korstanje and Anthony Clayton, "Tourism and Terrorism: Conflicts and Commonalities," *Worldwide Hospitality and Tourism Themes* 4, no. 1 (2012).

---



# Climate Change and Security: The Case of Florida

Daniel Suman, University of Miami

---

## Abstract

The low-lying subtropical Florida Peninsula, surrounded on three sides by the sea, is highly vulnerable to the manifestations of climate change. Rising sea levels are already responsible for significant coastal erosion that threatens infrastructure, real estate, and Florida's subtropical habitats. The State lies in the path of hurricanes whose winds and storm surges pose great threats to life and property. Rising temperatures are likely to impact the most vulnerable sectors of the population, adversely impact agriculture, and threaten the health of Florida's coral reef ecosystems. Some local governments are beginning to address the threats. However, the State of Florida irresponsibly continues to take a "business-as-usual" path.

## Ecosecurity

When hearing the phrase "national security" we often think about protection of the nation from terrorism, foreign enemies, drugs, and criminal activities. A broader consideration of "security" also includes the welfare of a society and its people that depend on and benefit from environmental goods and services. One responsibility of government should be to protect its citizens from threats, such as those mentioned above, but also including disease, poverty, ignorance, air and water pollution, and damage to ecosystems that provide numerous goods and services.

This short article examines some of the threats from global climate change that challenge the southeastern United States, particularly the State of Florida. The manifestations of climate change all bear some degree of uncertainty, yet the international community of scientists and policymakers has reached consensus about the reality of climate change and its anthropogenic drivers. This article examines some of the unique vulnerabilities that Florida faces due to climate change and urges the State's leaders to take clear responsibility for implementing adaptive actions that will mitigate the risks to Florida's population, infrastructure, and environment.

# Environmental Changes and Climate Change in Florida

The emission of greenhouse gases (carbon dioxide, carbon monoxide, methane, among others) to the global atmosphere via the burning of fossil fuels and biomass, as well as deforestation, has resulted in the elevation of global atmospheric temperatures. Since the Industrial Revolution, the concentration of atmospheric carbon dioxide has increased 35 percent from 280 ppm in 1750 to more than 400 ppm today. If these trends continue, CO<sub>2</sub> concentrations may well reach 600 to 700 ppm by the end of the twenty-first century. Greenhouse gases trap infrared radiation emitted from the earth's surface causing an increase in atmospheric temperatures. Land and ocean surface temperatures have already increased about 0.85°C—the range lies between 0.65 to 1.06°C—from 1880 to 2012.<sup>1</sup> Predictions of the range of temperature increases, of course, contain a degree of uncertainty. Panels of scientific experts organized by the Intergovernmental Panel on Climate Change (IPCC) have created various models that project global mean surface temperature increases during the twenty-first century that range between 0.3° and 4.8°C depending on future global emissions of greenhouse gases and mitigation measures that societies implement.<sup>2</sup> Heat waves will become more intense with longer duration in much of the United States.<sup>3</sup> Scientists reported that 2015 global temperatures were the highest on record and the second highest in the continental U.S. (after 2012).<sup>4</sup> Atmospheric temperature increases cause a number of other environmental and, ultimately socioeconomic, impacts.

As global temperatures rise, glacial and polar ice caps melt. The volumen of surface seawater also expands with increasing temperature (thermal expansion). Taken together, these factors produce an elevation of sea level. The IPCC estimates that by the end of the twenty-first century sea levels will rise between 25 and 195 cm with the most reasonable estimate being 60 cm.<sup>5</sup> The Sea Level Rise Work Group of the Southeast Florida Regional Climate Change Compact Steering Committee has estimated sea level rise for the region using data from reports of the IPCC, the U.S. Army Corps of Engineers, and the National Oceanic and Atmospheric Administration (NOAA).<sup>6</sup> Using 1992 as a baseline, sea levels may increase from 15 to 25 cm by 2030, 36 to 66 cm by 2060, and 79 to 155 cm by 2100.

When rising sea levels are projected horizontally, many low-lying coastal areas will be flooded. Predicted areas that will be inundated are site-specific and depend on coastal topography, land subsidence or emergence, drainage patterns, and society's ability to defend the coastline. The World Resources Institute estimates that by 2060 sea levels on the Floridian coastline could increase between 23 and 61 cm over levels in 2012.<sup>7</sup> Moreover, it appears that the rate of sea level rise is increasing.<sup>8</sup>

Atmospheric warming will also lead to changes in rainfall patterns and tropical storm intensity and frequency. Although climate predictions have inherent uncertainties, models forecast that some regions will experience increased rainfall while others will become drier. The dry southwestern U.S. will have even drier conditions throughout this century. While the variation in net rainfall in the southeastern U.S. may not be significant, extreme rainfall events will become more frequent, intense, and irregular—as will be the case in most of the U.S.<sup>9</sup> Predictive models also suggest that tropical storms will increase in intensity and precipitation during this century.<sup>10</sup>

The global ocean is an important sink for some of the increasing levels of atmospheric carbon dioxide. Dissolved carbon dioxide alters the ocean's carbonate-bicarbonate equilibrium leading to more acidic conditions of surface seawater (ocean acidification).<sup>11</sup> Even relatively small decreases in the pH of seawater (more acidic conditions) can make it more difficult for calcareous marine fauna to form their carbonate exoskeletons. Four IPCC scenarios predict decreases in surface seawater acidity between 0.06 and 0.31 (an increase in acidity between 15 and 109 percent) by the end of the twenty-first century.<sup>12</sup> Of particular concern are mollusks and coral reefs; the latter are already experiencing a number of threats from increasing seawater temperatures caused by global warming and El Niño-ENSO events, viral diseases, nutrient enrichment of coastal waters leading to algae blooms, damage from unsustainable fishing practices and physical damage from vessels and divers.

## The Case of Florida

### *Demography*

According to the 2010 U.S. Census, Florida's population was 18,801,310 persons, the fourth largest state. Population estimates of July 1, 2015 were 20,271,272—a percentage change of 7.8 in that five-

year period.<sup>13</sup> Population growth rates in Florida are among the highest in the country. In fact, Florida ranks sixth in growth rates among U.S. states.<sup>14</sup>

Florida's shoreline and coastal amenities are great attractions for visitors and residents alike. The U.S. Census Bureau defines counties bordering saltwater as "coastal". Using this definition, just under 14 million persons resided in Florida's coastal counties in 2008—about 78 percent of Florida residents (compared to about 29 percent of the U.S. population).<sup>15</sup> Almost 16 percent of the U.S. coastal population resides in Florida, second only to California.<sup>16</sup> The population in Florida's coastal counties increased by 12.9 percent from 2000 to 2008, yet percentage increases for all U.S. coastal counties only reached 6.5 percent, while that of the entire country was 8.0 percent.<sup>17</sup>

Florida's population is large, fast growing, coastal, and also relatively old. The State has the highest percentage of residents over 65 years of age of any state in the country—about 18.3 percent.<sup>18</sup> The percentage of seniors in Florida's population should reach 21 percent by 2020 and will continue to subsequently increase.

### *Economy*

Tourism is the primary economic industry in Florida, and the State received about 90 million visitors in 2012.<sup>19</sup> Miami-Dade County is one of the State's primary tourist destinations accounting for about 30 percent of the \$71.8 billion that visitors to Florida spend each year. Florida's beaches and nearshore and coastal environments are the principal attraction for tourists.

Agriculture also plays an important role in Florida's economy. The agricultural sector is the largest in the southeastern U.S. with citrus playing a principal role. Citrus is a \$9.3 billion industry in Florida.<sup>20</sup> The State produces more than two-thirds of the country's citrus production and almost half of the global supply of orange juice. Tomatoes follow citrus in economic contribution with sugar cane and nursery and ornamental plants also making significant contributions to Florida's economy.

### *Environment*

Florida's natural environment is closely linked to the sea. The state is a peninsula bordered on three sides by the ocean. Florida has the greatest length of coastline of any state in the continental U.S.,<sup>21</sup> as well as 1,200 miles of sandy beaches and 1,800 miles

of coastline.<sup>22</sup> The State's elevation is relatively low—the highest point reaching only 96 meters—and its water table is high.<sup>23</sup> Florida's Coastal Management Program defines the entire State as the coastal zone. However, for planning purposes, only the 35 coastal counties (of 67 in the State) are treated as "coastal."<sup>24</sup> Few points in the State are more than 100 km from either the Gulf of Mexico or the Atlantic Ocean. The State's unique position in the subtropics, as well as its exposure to the sea make it highly vulnerable to strikes from hurricanes. Of the Category three to five hurricanes that made landfall on the Atlantic Coast of the U.S. between 1851 and 2008, some 39 percent struck Florida.<sup>25</sup>

Florida's subtropical environment hosts the northernmost reach of shallow coral reef ecosystems and mangrove forests with their associated flora and fauna and is the only state in the continental U.S. with extensive areas of these ecosystems.

## Vulnerabilities of Sectors to these Climate Changes

### *Coastal Infrastructure*

Recent reports from the World Resources Institute (WRI) have projected initial vulnerabilities of Florida to sea level rise.<sup>26</sup> Florida is the state that is most vulnerable to sea level rise with large populations residing at low elevations, and thus, highly exposed to tropical storms and storm surges. These WRI reports focus on the State's four southeastern counties (Monroe, Miami-Dade, Broward, and Palm Beach) that are the most urbanized, have the highest population concentration in Florida (almost 6 million persons in the four county area), and only lie several meters above sea level. Miami-Dade County has more people living less than 1.3 meters above sea level than any state except Louisiana (and of course, Florida itself). About 25 percent of the county's land is less than one meter above sea level. Estimates of the value of Miami-Dade's beachfront properties range to about \$15 billion. Evaluation of cities most vulnerable to losses from flooding rank Miami, Florida in sixth place of global cities and first place of U.S. cities. The same evaluation ranks Tampa-St. Petersburg, Florida as 16<sup>th</sup> in the world and fourth among U.S. cities.<sup>27</sup>

A recent study published in *Nature Climate Change* estimated the number of people that will be affected by sea level rises of 90 and 180 cm in 2100—also taking population growth into account.<sup>28</sup> The lower sea level

rise value will place 1,221,837 persons at risk in Florida out of 4,310,983 in the U.S., while the higher value will affect 6,057,419 Floridians out of 13,115,250 in the entire country. Similarly, the WRI estimates that about 40 percent of properties in the U.S. that are vulnerable to sea level rise are in Florida. These estimates place Florida as the state most at risk from sea level rise. The *Nature Climate Change* report mentions the extreme risk faced by four Florida counties—Monroe, Miami-Dade, Broward, and Pinellas (Tampa-St. Petersburg).

Several cities in South Florida are already experiencing flooding during high tide events, as well as extreme rainfall events. Several streets on the west side of the City of Miami Beach flood about six times per year during high tides ("king tides"). Using U.S. Army Corps of Engineers estimates for sea level rise, the Union of Concerned Scientists predicts that Miami Beach streets will flood about 380 times per year by 2045.<sup>29</sup> To confront this threat, Miami Beach is conducting an overhaul of its stormwater system, installing 70 one-way pumps, and elevating some of the streets that are most vulnerable to flooding. The City is spending \$500 million on these initial adaptation measures. Ft. Lauderdale and Hollywood in Broward County are experiencing similar flooding during king tides.<sup>30</sup> However, protection of coastal areas from flooding and storm surges will be extremely difficult in many parts of Florida because of the State's geology. Porous limestone substrate in much of Florida suggests that protection of lowlying areas from storm surges and sea level rise by seawalls will not be feasible.

Florida is clearly a target for hurricanes that may approach from the Gulf of Mexico or the Atlantic Ocean bringing high winds, storm surges, high energy wave action, coastal flooding, coastal erosion, loss of coastal wetlands, and saltwater intrusion. On average from 1900 to 2007 a hurricane struck Florida once every two years, and a strong hurricane every four years. Eight of the ten most expensive hurricanes in the U.S. have affected Florida. Studies suggest that the State can expect a ten percent chance of property and infrastructure losses that exceed \$5.8 billion annually and a five percent chance of loss of \$19.6 billion.<sup>31</sup> Many experts predict that global warming will increase the size and intensity of hurricanes. Increased storm intensity compounded with Florida's rapid coastal development and population increases suggest that potential losses to property from tropical storms will

be extremely high.

Sea level rise, historical shoreline armoring (groins, seawalls, and bulkheads), jetties, destruction of dunes, and the buildout of much of Florida's coastline have resulted in severe beach erosion. Loss of sandy beaches means loss of defense against storms, habitat loss, and decreased tourism revenues. In response to the loss of Florida's natural beaches, the U.S. Army Corps of Engineers, the State of Florida, and in some cases local governments have funded beach renourishment projects. Essentially all of the beaches in South Florida have been renourished during the past 30 years at a cost of approximately a million dollars per mile of renourished beach. While these projects produce benefits, they also have adverse environmental impacts and are costly and often temporary. One wonders how long we will be willing to fund expensive sand replacement to protect low-lying barrier islands on which large-scale building should never have been allowed in the first place.

These multiple threats to coastal lands, property, and infrastructure in Florida (roads, bridges, wastewater treatment plants, stormwater drainage systems, nuclear power plants, etc.) present grave risks to the millions of Florida's coastal residents, as well as to Florida's coastal tourism industry. A study published by the University of Florida estimated the economic impacts of climate change in Florida using two cases: rapid stabilization of greenhouse gas emission and a business-as-usual model.<sup>32</sup> The study predicts that by 2050 the average annual losses from hurricane damages will range between \$24 and \$49 billion. By 2100 real estate at risk from sea level rise will have a value between \$10 and \$66 billion. Tourism losses will reach \$40 billion by 2050 and \$167 billion by 2100 or between 1.2 percent and 2.4 percent of the Gross State Product.

### *Agriculture*

Climate change in Florida may mean rainfall variability, increased droughts, greater incidence of extreme rainfall events instead of more consistent smaller rainfall events, and higher temperatures.<sup>33</sup> These factors may increase stress for commercial crops and also create greater susceptibility to diseases.

Citrus fruits are the largest contributor to Florida's agriculture. The State produces about 69 percent of the U.S. citrus crop.<sup>34</sup> Some researchers suggest that yields of citrus in South Florida may decrease with

global warming due to higher winter temperatures.<sup>35</sup> The major challenge that Florida's citrus industry faces today is Citrus Greening, an insect-spread bacterial infection that is now present throughout the State. This citrus disease impacts fruit color, size, and flavor and eventually kills the tree. The warmer temperatures may also favor reproduction and the spread of insects that spread the Citrus Greening bacteria.

Intensification of hurricanes could mean greater losses to Florida agriculture—not only from physical damage to plants and infrastructure but also because of salinization and salt water intrusion. Hurricanes also may facilitate insect movement that is responsible for Citrus Greening.

### *Fisheries and Marine Ecosystems*

Coral reef ecosystems are one of the most biologically diverse on the planet. Barrier reefs provide numerous ecosystem services, including attenuation of wave energy and shoreline protection. They offer habitat for numerous species of fish and other marine organisms that are important for commercial and recreational fisheries—including different species of grouper, snapper, and lobster. The U.S. Commission on Ocean Policy noted that about 50 percent of the country's federally managed commercial fish species depend on coral reefs for part of their life cycle.<sup>36</sup> The economic contribution from diving on Florida's coral reefs is also significant. The contribution of 8 million visitor-days annually from divers and snorkelers in Florida is close to \$1 billion per year.<sup>37</sup>

Coral reefs in Florida are already stressed from diseases, pollution, bleaching, direct damage from divers and boat groundings, and urban and port development. The Florida Department of Environmental Protection reported that between 1996 and 2005, coral cover in the Florida Keys declined by 44 percent.<sup>38</sup> In 2006, NOAA's National Marine Fisheries Service listed two emblematic coral species (Elkhorn and Staghorn corals) as "threatened" under the Endangered Species Act. In 2014, this federal agency listed 20 more coral species as "threatened"—five of which are found in the Caribbean. The two drivers directly related to climate change—ocean warming and ocean acidification—could mean the death blow to Florida's coral reef ecosystems.

The connectivity between coral reefs ecosystems, seagrass beds, mangroves, and other coastal wetlands in Florida is well understood. Coastal wetlands serve as

nursery grounds and homes for many species of Florida's coastal fish during some stage of their life. They trap sediments, are crucial to shoreline protection, and help build the shoreline. Coastal wetlands host many endangered species and are home to diverse avifauna, including many migratory bird species.

Florida has experienced great losses of coastal wetlands during the past century due to coastal development and urban expansion. Sea level rise poses an additional threat. Mangroves might gradually retreat inland with rising sea levels.<sup>39</sup> However, because of coastal infrastructure development in Florida (roads, bulkheads and seawalls, buildings, and reclaimed land), coastal wetlands may not have the necessary space to migrate inland with sea level rise.

Some studies suggest that ocean warming favors the growth and reproduction of introduced (exotic) species over native marine species and could lead to dominance of invasive species in some marine ecosystems.<sup>40</sup>

### *Public Health*

Climate change also may impact human health in several ways. Rising temperatures and extreme heat waves have the potential to increase the mortality of the most sensitive group in the population—the elderly.<sup>41</sup> The percentage of Florida residents over 65 years is higher than that of any state in the U.S.—suggesting a high risk for many Floridians.

Higher average temperatures and rainfall may also increase the incidence of certain vector-borne diseases, such as dengue and the Zika epidemic, the later which is linked to microcephaly and temporary paralysis. Perhaps the range of these diseases will also extend further northward in the U.S. with global warming. Higher temperatures may also speed up the life cycle of mosquitos and decrease the incubation period of the virus living in *Aedes aegypti* mosquitos, the vector for both of these diseases.<sup>42</sup> The first cases of Zika in the continental U.S. contracted from local mosquitos have been confirmed in Miami in July 2016,<sup>43</sup> and although the spread of this disease cannot be linked directly to global warming, in the future we may well discover some relationship.

Increased coastal flooding resulting from sea level rise and storm surges also creates a number of potential public health issues for Florida. Direct damage to infrastructure may cause injuries, make access to hospitals and health care facilities more difficult, and

contaminate water supplies. Increased standing water will also increase breeding habitats for mosquitos.

### *Water Resources*

Changes in precipitation patterns and an increase in short term rainfall events may lead to greater dependence on groundwater resources for irrigation. This could increase competition for this resource with public water supplies and also lead to overutilization of groundwater resources.

Southeastern Florida counties depend on groundwater from the Biscayne Aquifer for the vast majority of their drinking water. Wells providing the municipal water supply that once were close to Biscayne Bay have already been abandoned because of saltwater intrusion and have been moved further westward.

## **Response From The State Of Florida**

Despite the State of Florida's vulnerability to climate change impacts in many areas, at the State level, planning for response and adaptation to climate change has left much to be desired. In a 2012 evaluation of states' preparation planning for climate change, the Natural Resources Defense Council (NRDC) ranked Florida in Category three out of four categories; the 29 states in Categories three and four are "largely unprepared and lagging behind."<sup>44</sup> The NRDC Report stressed the importance that the Governor has in planning for climate change: "[w]ithout a top-down directive from the executive level, there is unlikely to be sufficient action by all necessary government agencies within a state on climate change issues."<sup>45</sup>

Recent responses to climate change impacts from the Governor of the State of Florida have not been energetic to say the least. The current Governor Rick Scott, a Republican who was first elected in November 2010, remains skeptical about climate change and claims not to be a scientist. He has established an unwritten policy that State of Florida agencies not use the phrases "climate change" and "global warming" in their documents. Reports of this policy come from Florida's Department of Environmental Protection, the Department of Transportation, the Department of Health, and the South Florida Water Management District.<sup>46</sup> Such a policy stance from the executive of the State most vulnerable to climate change impacts is unconscionable.

While the State of Florida continues to ignore climate change risk, Florida's counties and municipalities



have taken the lead in climate change preparation. The County Commissions of the four southeastern counties (Broward, Miami-Dade, Monroe, and Palm Beach) approved the Southeastern Florida Regional Climate Change Compact (SEFRCCC) in January 2010 to create a united front to face regional climate change. Since then the SEFRCCC Steering Group has adopted consistent methodologies and assessed the vulnerabilities from sea level rise in the four county region based on one, two, and three foot rises. In October 2012, the SEFRCCC produced a Regional Action Plan with 110 Action Items related to reduction of greenhouse gas emissions, water supply systems, sustainable communities, transportation infrastructure, and emergency management that decisionmakers at the county and city levels can adopt to mitigate and adapt to climate change.<sup>47</sup> Although it will take many years to adopt and implement the recommendations, these are important planning steps for local governments.

## **Conclusion**

The high vulnerability of Florida to climate change across so many economic, social, and environmental sectors demands unified responses from various levels of government—national, state, and local. The on-the-ground adaptive responses will be implemented at the county and city levels. The federal government may offer broad policy guidelines, scientific information, and funding for programs. The State must provide guidance for land use planning at the local level, funding for programs, guidance for local decisionmakers, and coordination of State programs. Today, the inability of Florida's leaders to internalize scientific information and their lack of comprehensive response to the high vulnerability of the State to environmental, economic, and social harm is truly irresponsible and will be remembered by future generations of Floridians who will ask why their leaders delayed so long before accepting reality and taking action to proactively address the climate change challenge.

# Notes

1 IPCC, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Core Writing Team, R.K. Pachauri and L.A. Meyer, eds.) (IPCC: Geneva, Switzerland, 2014).

2 IPCC, *Climate Change 2014: Synthesis Report*, p. 10.

3 Romero-Lankao, P., J.B. Smith, D.J. Davidson, N.S. Diffenbaugh, P.L. Kinney, P. Kirshen, P. Kovacs, and L. Villers Ruiz, North America. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White, eds.), (Cambridge, United Kingdom and New York, N.Y.: Cambridge University Press), pp. 1439-1498.

4 Justin Gillis, "2015 was hottest year in historical record, scientists say," *The New York Times*, Jan. 20, 2016.

5 IPCC, *Climate Change 2014: Synthesis Report*, p. 11.

6 Southeast Florida Regional Climate Change Compact Sea Level Rise Work Group, *Unified Sea Level Rise Projection for Southeast Florida*, 2015. A document prepared for the Southeast Florida Regional Climate Change Compact Steering Committee.

7 Christina DeConcini and Forbes Tompkins, *Sea-Level Rise and Its Impact on Florida* (Washington, D.C.: World Resources Institute, 2012).

8 DeConcini and Tompkins, *Sea-Level Rise and Its Impact on Florida*, p. 1.

9 Romero-Lankao et al., North America, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, pp. 1455-1456.

10 Wong, P.P., I.J. Losada, J.P. Gattuso, J. Hinkel, A. Khattabi, K.L. McInnes, Y. Saito, and A. Sallenger, Coastal systems and low-lying areas. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi., Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White, eds.) (Cambridge, United Kingdom and New York, N.Y.: Cambridge University Press, 2014), pp. 361-409.

11 Wong et al., Coastal systems and low-lying areas, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, p. 368.

12 IPCC. *Climate Change 2014, Synthesis Report*, pp. 66-67.

13 "Quick Facts: Florida," *US Census Bureau*, <http://www.census.gov/quickfacts/table/PST045215/12>, accessed August 2016.

14 "U.S. Population Growth Rate State Rank," *USA.com*, <http://www.usa.com/florida-state.htm>, accessed August 2016.

15 U.S. Census Bureau. Coastline population trends in the United States: 1960 to 2008: Population Estimates and Projections, May 2010, pp. 1, 4, and 9.

16 U.S. Census Bureau. Coastline population trends in the United States: 1960 to 2008: Population Estimates and Projections, p. 6.

17 U.S. Census Bureau. Coastline population trends in the United States: 1960 to 2008: Population Estimates and Projections, p. 9.

18 "Sixty-five Pulus in the United States," *U.S. Census Bureau* <http://www.census.gov/population/socdemo/statbriefs/agebrief.html>, accessed August 2016; "2014 Florida State Profile," *Florida Department of Elder Affairs*, <http://elderaffairs.state.fl.us/does/publications.php>, accessed August 2016.

19 Will Seccombe, "Florida Tourism By the Numbers," *Sunshine Matters: The Official Corporate Blog for VisitFlorida*, March 13, 2013, <http://www.visitfloridablog.org/?p=6284>, accessed August 2016.

20 National Research Council. 2010. *Strategic Planning for the Florida Citrus Industry: Addressing Citrus Greening Disease (Huanglong-bing)* (Washington, D.C.: The National Academies Press, 2010).

21 NOAA Office of Coastal Management, *General Coastline and Shoreline Mileage of the United States*, <https://coast.noaa.gov/data/docs/states/shorelines.pdf>.

22 "Florida Quick Facts," *State of Florida.com*, <http://www.stateofflorida.com/facts.aspx>, accessed August 2016.

23 "Florida Quick Facts," *State of Florida.com*.

---





# Nation-State Hacking: Uniting Policy and Code to Limit the Threat

Mark M. Deen, Florida International University

---

## Abstract

This article examines nation-state hacking and analyzes some possible defenses against these attacks by combining policy and code level defense. The article examines some recent incidents of nation-state hacking and evaluates the actions taken by the attacker and the effected parties. This work focuses on a variety of nation-state hacking incidents and provides a critical perspective on how policy and code level controls could be combined to defend against these attacks. Nation-state hacking continues to be an important issue on the United States security agenda. Advanced nation-state hacking threats can adversely affect the day to day operations of a nation effectively crippling it with nearly complete anonymity. In 2013, the U.S. issued E.O. 13636, *Improving Critical Infrastructure Cybersecurity*. On December 1, 2016, President Obama unveiled the National Cybersecurity Plan to increase awareness of the threat that lack of appropriate cybersecurity controls presents.

---

Nation-state hacking is an important issue on the United States security agenda. Nation-state hacking is defined as an attack or series of attacks conducted by one nation-state against another nation-state to defend national sovereignty and project national power.<sup>1</sup> Nation-state hacking may provide access to information that may take years or decades to access with traditional methods such as the use of spies or surveillance techniques and in the twenty-first century has replaced the spy as the most effective and efficient method to access secure information with little risk and significant reward.

The organizations creating nation-state malware are typically well-funded, well-trained, and dedicated to achieving their hacking objectives. While these team members remain safe in a remote location their malicious code may travel deep within highly secured networks and systems thousands of miles away. Nation-state hacking represents a new arms race as

countries rush to bolster defenses<sup>2</sup> and create newer, more effective attacks. Nation-states may hide attacks amongst a myriad of independent hacking organizations and may even mimic attacks used by independent hacking organizations. All of the preceding factors make it extremely difficult to forensically differentiate between an attack from a nation-state and an attack from an independent hacking organization.<sup>3</sup> To further complicate this, some nation-states may use independent hacking organizations to assist in attacks against other nations. The most predominant use of nation-state hacking is to resolve conflict and policy disputes in the cyber arena rather than the political arena. This article aims to examine the methods nations may use to defend against these threats.

## Historical Context

In 2007, a piece of malicious computer code called Stuxnet was used to disrupt the Iranian nuclear program.<sup>4</sup> Stuxnet succeeded in slowing Iranian progress in their nuclear program by severely damaging the centrifuges by causing them to spin out of control while monitoring systems reported normal centrifuge operation.<sup>5</sup> Stuxnet was the first tangible evidence that nation-state level hacking was being used actively to alter international policies and politics.

In 2009, China allegedly attacked several US companies including Google<sup>6</sup> and RSA.<sup>7</sup> The Chinese attack escalated in 2014 when China allegedly hacked the United States Office of Personnel Management (OPM) network and obtained the OPM database, which contains information about more than 4 million current and former federal government employees.<sup>8</sup>

In 2014, North Korea purportedly attacked the computer systems of Sony Pictures Entertainment.<sup>9</sup> The North Korean attack significantly disrupted the network operations of Sony Pictures and affected customers around the globe. The North Korean attack was rumored to be a result of a Sony Pictures planned release of a movie concerning the North Korean President.

Later that year, Russia allegedly launched an attack that compromised the United States State Department and the White House. The attack permitted the attackers to access non-classified information including information concerning the President in the form of emails and the President's daily schedule.<sup>10</sup>

The outcome of these attacks was that for a period of time foreign nation-state sponsored organizations

had access to sensitive information within the United States government or U.S.-based companies. The policy response from the United States government was swift and decisive. In 2013, the administration issued E.O. 13636, *Improving Critical Infrastructure Cybersecurity* which defined the need for Information Security concerns to be addressed on a national level.<sup>11</sup> In February 2014, the United States government released a *Framework for Improving Critical Infrastructure Cybersecurity* which provided guidance focused on protecting critical infrastructure organizations from attacks.<sup>12</sup> The most recent iteration in U.S. policy concerning cybersecurity is the December 1, 2016 *Report on Securing and Growing the Digital Economy* issued by the Commission on Enhancing National Cybersecurity. The report calls for a greater investment in cybersecurity mechanisms<sup>13</sup> and provides some actionable steps for organizations seeking to protect themselves from cyber-attacks.

## Policy And Why It Matters

All of the nation-state attacks involved the introduction of malicious code into trusted computer systems. In most cases the malicious code was introduced either by human interaction or previously unknown flaws in the configuration of effected systems. The absence of defined policy results in diversity within human processes and procedures. In turn, this leads to diversity in the configuration of computing systems which creates weaknesses that may be exploited to gain access to computing systems—often with increased levels of system permissions. The application of well-defined and sound policies minimizes the threat posed by inconsistent computing system configurations by employing general rules that should be applied to all computing systems. An excellent example of policy is the *National Institute of Standards and Technology (NIST) Cybersecurity Framework*. The *NIST Cybersecurity Framework* was developed in direct response to E.O. 13636, *Improving Critical Infrastructure Cybersecurity* and provides a framework to measure and enhance cybersecurity mechanisms in order to protect government and private sector organizations. The NIST framework provides a series of granular controls that address network configuration, connectivity, and Information Technology practices. However, the NIST framework provides very little guidance regarding code level security. NIST does however provide excellent guidance regarding human processes such as Information Technology change management practices. In the case of StuxNet simple human policy rules

regarding system patching, system security monitoring, and the use of USB thumb drives could have been useful in limiting the threat StuxNet presented.

Another example of policy and its effect in guiding Information Security practices is the European Union's May 17<sup>th</sup> release of the *Network and Information Security (NIS) Directive*. The NIS Directive provides a uniform approach to securing information systems between European Union (EU) member states. The NIS Directive recognizes that cybercrime may cross national boundaries and facilitates cross border coordination between EU member states during the investigation of cybercrime. NIS requires that specific security controls are enabled where personal information concerning European Union citizens is being stored. The implementation of the NIS directive fundamentally affects the way that EU and non-EU organizations interact. The NIS requirement to add additional security layers around EU citizen's information requires many organizations to alter the way they address Information security practices for data stored both inside and outside the EU. The EU directives stresses the need for sound information security practices such as encryption, secure destruction, and accountability for data. However, it provides little information about programming code used to store and manipulate data.

Overall, neither the EU NIS Directives nor the *Report on Securing and Growing the Digital Economy* issued by the Commission on Enhancing National Cybersecurity address the concerns pertaining to code or strong coding standards for security. Nation-state hacking relies on poor code controls as well as a lack of policies that govern human behavior. Many of the policies are concentrated on the activities of humans and are not focused on activities performed in an automated manner by computer systems executing the commands stored in programming code.

## Code And Why It Matters

At the most elemental level of computing systems, sequences of commands are contained in scripts referred to as code. The individual instructions contained within the code are then executed by the computer system. Because computers simply execute the instructions contained within code they cannot differentiate between malicious and benign instructions. Anti-virus and anti-malware tools are a means of restricting the execution of malicious code on computing systems. Anti-virus and anti-malware tools are based on known "signatures" of malicious

code and are therefore incapable of alerting system users concerning the possible threat presented by code for which signatures do not exist. Anti-virus and anti-malware software cannot defend computing systems completely due to the signature based nature of their operation.

The majority of nation-state hacking incidents required the execution of malicious code on effected systems in order to facilitate an effective attack. In the case of StuxNet the malicious code entered the Iranian nuclear facility on a USB thumb drive.<sup>14</sup> The code stored on the USB drive spread rapidly through the facility and around the world by exploiting a previously unknown flaw in the Microsoft Windows operating system.

Code level controls such as code whitelisting may limit the capabilities of malicious code.<sup>15</sup> Whitelisting is a process that permits computers to only execute code that is approved. Enacting policies requiring that only whitelist approved code may operate on computing systems decreases the probability that malicious code may be able to run on these computer systems.<sup>16</sup> Whitelisting is a supplementary control to existing anti-virus and anti-malware solutions and should be used in addition to these software countermeasures.

Furthermore, code is also contained in hardware components. The code in hardware components inform the computer how to communicate with the hardware component and is referred to as “firmware”. Firmware code is stored in chips on the hardware component and is always present regardless of whether or not a computer system has been restarted or reset. Firmware code executes within the hardware device and may not be visible to malicious code scanning tools such as anti-virus and anti-malware software installed on the computer system. Currently, very few solutions exist to validate the code stored in firmware, but methods such as code signing, code validation, and independent code testing serve to validate the authenticity of firmware code. On September 6, 2016, the United States Computer Emergency Readiness Team (CERT) issued advisory TA16-250 which discusses the threat presented by firmware executing within “grey market” devices.<sup>17</sup> Grey market devices are devices such as network switches and routers that are resold on the secondary market by parties other than the original equipment manufacturer (OEM). Gray market devices may have been tampered with or have malicious firmware installed that may also be

used to compromise sensitive information.

## **Conclusion: Combining Code And Policy**

Current national cybersecurity policies focus on restricting electronic access to networked computer systems but do not address the need to protect computer systems at the code level despite the fact that this method is used by most nation-state attacks. Policies should also consider possible efficiencies by adding requirements for code level controls to limit the threat presented by nation-state level hacking. The combination of policy level guidance and code level controls would serve to decrease the opportunity for malicious code to enter into computer systems and adversely impact the operation of those systems. National cybersecurity policy should also clearly address the ability for code to communicate from within the network to outside parties. By blocking the ability for code to communicate outside of secured computer networks the ability to remotely control or send information from compromised computer systems is disabled.

Nation-state hacking will increase in the future as it is fundamentally a part of warfare. Protecting as many key infrastructure computer systems as possible is an effective method to limiting the threats presented by nation-state attacks. The human element may be controlled by effective policies and practices but ultimately the code and instructions executed by computing systems will define whether or not an attack is effective.

National policy should be expanded to address code level controls and provide some guidance on how to implement these controls to create a complete approach to securing national cybersecurity. Furthermore, national policy should provide simple guidance regarding technologies such as whitelisting as a method to limit the capability for malicious code to execute on computer systems and as a supplementary control for anti-virus and anti-malware software. Finally, the threat presented by malicious firmware stored on chips inside of computer systems and grey market devices should also be escalated as a risk in the national cybersecurity policy. There is a unique challenge to validate and verify the authenticity of firmware since it may not be removed without disabling the hardware device. This provides a perfect platform for nation-state attacks to hide and operate with little risk of detection.

# Notes

- 1 Pierluigi Paganini, "FireEye World War C report—Nation-state driven cyber attacks," *FireEye*, October 3, 2013, <http://securityaffairs.co/wordpress/18294/security/fireeye-nation-state-driven-cyber-attacks.html>, accessed December 11, 2016
  - 2 Ken Dilanian, "Obama issues order to bolster cyber-defenses," *Los Angeles Times*, February 12, 2013.
  - 3 Kim Zetter, "We're at Cyberwar: A Global Guide to Nation-State Digital Attacks," *Wired*, September 1, 2015.
  - 4 Chloe Albanesius, "Stuxnet Worm Crafted by U.S., Israel to Thwart Iran's Nuclear Program," *PC Magazine*, June 1, 2012.
  - 5 Michael B. Kelley, "The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought," *Business Insider*, November 20, 2013.
  - 6 Ellen Nakashima, "Chinese hackers who breached Google gained access to sensitive data, U.S. officials say," *The Washington Post*, May 20, 2013.
  - 7 Gregg Keizer, "Researcher follows RSA hacking trail to China," *ComputerWorld*, August 4, 2011.
  - 8 Ellen Nakashima, "Chinese breach data of 4 million federal workers," *The Washington Post*, June 4, 2015.
  - 9 David E. Sanger and Nicole Perloth, "U.S. Said to Find North Korea Ordered Cyberattack on Sony," *The New York Times*, December 14, 2014.
  - 10 Polly Mosendz, "Report: Russians Hacked White House," *Newsweek*, April 7, 2015.
  - 11 Federal Register, Vol. 78, No. 33, Executive Order 13636 of February 12, 2013 <https://www.gpo.gov/fdsys/pkg/FR-2013-02-19/pdf/2013-03915.pdf>, accessed December 11, 2016.
  - 12 National Institute of Standards and Technology, *Framework for Improving Critical Infrastructure Cybersecurity* (Washington, D.C.: National Institute of Standards and Technology 2014) <https://www.nist.gov/sites/default/files/documents/cyberframework/cyber-security-framework-021214.pdf>, accessed December 11, 2016.
  - 13 Rob Freeman, "Commission on Enhancing Cybersecurity Report Calls for Greater Investment," *Cyber Law Monitor*, December 6, 2016.
  - 14 Daniel Terdiman, "Stuxnet delivered to Iranian nuclear plant on thumb drive," *CNET*, April 12, 2012, <https://www.cnet.com/news/stuxnet-delivered-to-iranian-nuclear-plant-on-thumb-drive/>, accessed December 11, 2016
  - 15 Homeland Security, Application Whitelisting (AWL): Strategic Planning Guide [https://www.uscert.gov/sites/default/files/cdm\\_files/FNR\\_NIS\\_OTH\\_AWL\\_Strategic\\_Planning\\_Guide.pdf](https://www.uscert.gov/sites/default/files/cdm_files/FNR_NIS_OTH_AWL_Strategic_Planning_Guide.pdf), accessed December 11, 2016.
  - 16 Roger A. Grimes, "To detect 100 percent of malware, try whitelisting 'lite,'" December 31, 2013, <http://www.infoworld.com/article/2609643/security/to-detect-100-percent-of-malware--try-whitelisting--lite-.html>, accessed December 11, 2016
  - 17 United States Computer Emergency Readiness Team, September 6, 2016, <https://www.us-cert.gov/ncas/alerts/TA16-250A>, accessed December 11, 2016.
-



# 1

Issue

## **Global Security Review:** Security Threats in the Western Hemisphere

**Jonathan D. Rosen**, Issue Editor

**Emely Pietri**, Issue Designer

### **Editorial Advisors**

#### **John F. Clark**

Department of Politics and International Relations,  
Steven J. Green School of International and Public Affairs,  
Florida International University

#### **Eduardo A. Gamarra**

Department of Politics and International Relations,  
Steven J. Green School of International and Public Affairs,  
Florida International University

#### **Brian P. Fonseca**

Jack D. Gordon Institute for Public Policy,  
Steven J. Green School of International and Public Affairs,  
Florida International University

#### **Hanna Kassab**

Department of Political Science,  
Northern Michigan University

#### **Frank O. Mora**

Kimberly Green Latin American and Caribbean Center,  
Department of Politics and International Relations,  
Steven J. Green School of International and Public Affairs,  
Florida International University



Steven J. Green  
School of International  
& Public Affairs