Attempts to identify linkages between climate-related events and conflict have led to ambiguous and contested results. Some analyses have found notable correlation between human conflict and climate-related events; however, they were criticized for being too broad in scope and scale. This debate has inspired additional, more specific research to examine individual case studies of possible climate change-induced conflict, using fewer variables—water scarcity in this case—and more confined geographical areas.

This essay is based on a project examining the nexus between water stress and violence at specified stages of conflict in Syria, Iraq, Somalia, and Nigeria—areas where hostilities are ongoing and military organizations with Islamic extremist ideologies are major combatants. More specifically, this piece focuses on Syria and Iraq between August 2012 and July 2015, the time period when hostilities in Syria grew most intense and when the role of water in the conflict became discernable, and asks: How did the supply, manipulation, and/or weaponization of water accelerate or perpetuate conflict? Is water scarcity one plausible driver of conflict in Syria and Iraq? The conclusions are telling, and reveal patterns that U.S. policymakers can use in formulating a response to groups like the Islamic State.

Water Scarcity and Conflict

The greater Fertile Crescent, comprised primarily of the countries of Syria and Iraq, experienced the worst drought in instrumental record from 2007–2010, a phenomenon increasingly attributable to long-term climate trends. The inability
of Syria and Iraq to meet demand for water—due to growing populations and/or decreasing supply and flawed water policies—has only exacerbated problems caused by drought conditions.\(^4\)

Water scarcity played a meaningful but complicated role in creating the conditions that led to political unrest and ultimately violent insurrection in Syria in spring 2011 and the spillover into Iraq. The sociopolitical impacts played out differently in the two countries. In Iraq, the roots of radicalization run deeper as they are arguably part of a cycle of conflict that began with the U.S. invasion in 2003, well before the current drought. In Syria, climate change’s impacts in the physical environment caused detrimental second- and third-order effects on ecological and human systems (See Figure 1): these effects included drought conditions and food insecurity. Forced migration and short-term and historical policy failures were fourth-order effects that deepened pre-existing ethnic and sociopolitical fractures. Migration was especially disruptive in Syria, where farmers and herders were forced to move to cities in search of more productive work, only to be relegated to peripheral shanty towns.\(^5\)

There are clear signs that these factors contributed to the rise of militant extremism.\(^6\) For example, in Syria, these environmental effects created a context of deprivation that allowed the Islamic State (IS) to recruit 60–70 percent of its fighters locally. This is in part because IS maintained municipal service organizations such as the Islamic Network for Public Services that provided electricity and transportation in Aleppo.\(^7\)

Similarly, in Iraq, the Al-Nusrah Front and IS both initially recruited heavily from populations of disaffected Sunni Iraqis. The drought of the late 2000s intensified existing grievances and increased the stress on Iraqi society through the

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**Figure 1: Systemic Effects of Climate Change in Syria**

<table>
<thead>
<tr>
<th>Level</th>
<th>Effect on Human Systems</th>
<th>Example: Severe Stress on Agriculture, Food Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Level</td>
<td>Changes in Physical Environment</td>
<td>Example: Higher Temperatures</td>
</tr>
<tr>
<td>2nd Level</td>
<td>Effect on Ecological Systems</td>
<td>Example: Droughts, Desertification</td>
</tr>
<tr>
<td>3rd Level</td>
<td>Effect on Human Systems</td>
<td>Example: Mass Migrations, Conflict</td>
</tr>
</tbody>
</table>
effects of migration and loss of agricultural productivity. In areas where the
drought weakened civil institutions and the protections they provide, new
fronts opened that not only provided a safe haven to IS combatants but also
served as an incubator where these groups could increase their numbers and
gain momentum. The north and northeastern provinces—the primary agricultural
region that typically produces two-thirds of Syria’s crop yields—were among the
most affected by the drought, and are the same regions that IS has maintained con-
sistent control of since the beginning of the conflict.8

This risk will only grow worse with the projected effects of climate change in the
next decade. The Intergovernmental Panel on Climate Change (IPCC) estimates
that climate change is likely to put ever-greater pressure on water resources in the
Mediterranean and North African regions over the next decades, notably increasing
droughts.9 A recent study concluded that a recurrence of a three-year drought in
Syria as severe as that of 2007–2010 is two to three times more likely to reoccur as a
consequence of human-induced climate change than natural variability alone.10 Such an event will only
increase third-order conditions of deprivation, which in
turn increases the fourth-order likelihood that extremist
groups will take advantage of the situation for recruit-
ment or other purposes. Indeed, paucity of water presents
threats that go well beyond what we already understand
and has created fertile ground for recruitment.

Using Water as a Weapon

A lack of water contributes to political instability and violent conflict in the first
place. The conflict can break out over the lack of water itself, or a malignant actor
can manipulate the water supply in such a way as to turn it into a weapon for use
in an unrelated conflict, effectively “weaponizing” the water. There are many histori-
cal examples of water’s use as a weapon in conflicts that have started for reasons not
related to water scarcity itself.11 For instance, the Dutch opened their dikes in order to
stop advancing French forces in the Third Franco-Dutch War, and during the Korean
conflict, U.S. strategy involved attacking dams in North Korea.12

In order to truly understand the weaponization of water, it is useful to understand
the term with some precision. At its most basic level, a weapon is essentially “a means
of gaining advantage or defending oneself in a conflict or contest.”13 A weapon
wielded by a group or individual can take many forms. It is an item, action, offensive
capability, or mechanism used or intended to kill, injure, or coerce. On the battle-
field, weapons may be anything used to gain a strategic, material, or mental advantage
over an adversary. (Interestingly, the term “weapon” is not formally defined under
international law or treaties regulating the use of force.)

Paucity of water has created fertile ground for IS recruitment.
The Syria and Iraq region has seen some of the earliest recorded, if not the most frequent, history of water’s use as a weapon. The territory of Syria and Iraq constitute part of the ancient Kingdom of Mesopotamia. The earliest recorded conflict over water in this region was over 4500 years ago, when a dispute over access to irrigation water led King Urlama of the city-state of Lagash to cut off the water supply of the neighboring city of Umma.14

A far more recent despot, Saddam Hussein, used water as a strategic weapon against a Shia population known as the Marsh Arabs, who reside in the swampy area near the confluence of the Tigris and Euphrates Rivers. The Marsh Arabs rebelled against the regime in the wake of the 1991 U.S. invasion, and Hussein responded by systematically diverting the water feeding the marshes—driving more than 100,000 people from their homes, destroying a unique way of life, and causing an environmental disaster of “epic proportions” according to the U.S. intelligence community.15 Restoration efforts by the government were 75 percent successful by 2008. Unfortunately, this trend had been substantially reversed as of July 2015 due to greatly reduced water flow of the two rivers, related to the confluence of drought and purposeful environmental manipulation by IS. Similarly, IS control of the upper reaches of the Euphrates River enables them to further reduce the water flow to the Marsh Arabs, whom IS also considers enemies due to their minority status as adherents to Shia Islam.16

Establishing this sort of chokehold on water resources is just one way to weaponize water. To understand others, we conducted a systematic analysis of how combatants used water in the ongoing conflicts in Iraq and Syria from August 2012–July 2015 using information gleaned from a variety of primary and secondary sources in English and Arabic, including IS publications, news feeds, and tweets. Altogether, we found 44 incidents of water manipulation, which we then classified into five categories based on the perpetrator’s intended use of the water weapon for political or military advantage: strategic weaponization, tactical weaponization, psychological terrorism, extortion or incentivization, and unintentional weaponization. Figure 2 shows how frequently water was used for each purpose by any actor in this time period. (Incidents in which multiple categories were applicable were double-counted.)

**Strategic Weaponization**

We identified two types of strategic weaponization. The first is the use of water to virtually or actually control large or important land areas or facilities to fulfill the vision of sovereignty, and the second is as an asset to fund activities, such as administration and weapons acquisition, of a “state.” Strategic weaponization also includes targeting or destroying large population centers, or industrial facilities and/or other infrastructure.

The Islamic State provides ample examples of the strategic weaponization of water. For instance, on August 7, 2014, IS seized control of Mosul Dam, a 3.2-
kilometer-long dam on the Tigris River upstream of Mosul city in northern Iraq. It is unclear what IS might have done next as seizing the dam provided the primary motivation for U.S. airstrikes the next day. Just 10 days later, from August 17–18, Iraqi and Kurdish forces fought a pitched battle that reclaimed the dam with the support of about 35 U.S. airstrikes.\(^{17}\)

In another example, during October 2014, IS diverted the Khalis tributary of the Tigris River to flood parts of the town of Mansouriya in Diyala province in Iraq. According to a local official, this action flooded over 3000 donum (781 acres) of agricultural land and inundated homes with up to two meters of water, causing hundreds of families to flee. IS also cut off water from the Khalis tributary for 10 days, suspending the drinking water supply to villages by the towns of Mansouriya, Salam, and Sarajiq.\(^{18}\)

In another form of weaponization, IS has used water as an asset for funding, collecting taxes on it. In Raqqa for example, the de facto capital of the Islamic State, the Credit Bank has been turned into the tax authority that collects payments from business for electricity, water, and security.\(^{19}\)

### Tactical Weaponization

Tactical weaponization is primarily the use of water as a weapon on the battlefield in direct or immediate support of military operations or against targets of strictly military value. In other words, we characterized the weaponization of water on a small, local scale as tactical. In September 2014, for example, IS diverted waters from rivers in the Shirwain Basin area in Diyala province, Iraq, to inhibit an advance by Iraqi security forces. The decision collateralaly flooded nine nearby villages.\(^{20}\)

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<table>
<thead>
<tr>
<th>Weaponization Type</th>
<th>Totals</th>
<th>Syria</th>
<th>Iraq</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Weaponization</strong></td>
<td>23</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td><strong>Tactical Weaponization</strong></td>
<td>11</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Psychological Terrorism</strong></td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td><strong>Incentivization</strong></td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Unintentional Weaponization</strong></td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td><strong>N/A</strong></td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
Instrument of Psychological Terrorism
This type of weaponization involves creating fear among non-combatants of denial of access or contamination of the water supply. Actors can use this weaponization, or “hydro-terrorism,” on either a strategic or tactical level. In July 2015 in Syria, Wadi Barada Shura Council militants threatened to cut off water from the Ayn Al Fija spring, which supplies drinking water to Damascus. They demanded the cessation of military operations after the Syrian Army’s Fourth Mechanized Division and Hezbollah’s incursion into Zabadani, a city on the border with Lebanon, after days of indiscriminate “barrel bombings.”

Instrument of Extortion or Incentivization
This form of weaponization involves the use of the water weapon to establish credibility as a governing authority or to reward support from the “occupied” populace. In June 2014, IS captured Mosul and Tikrit and cut off water to surrounding villages. Water was suspended from Mosul’s water purification plant to Christian minority villages on the outskirts of Mosul, including Qaraqosh and Bartalla. This action compelled residents to buy water at the rate of $6.25 USD per cubic meter instead, which is unaffordable to most residents. Water service was restored to Mosul by mid-June, and offered at discounted prices to the Sunni residents who returned to the city after IS’s initial seizure.

Unintentional Weaponization
Unintentional weaponization describes an outcome when use of the water weapon causes collateral damage to civilians or the ecological environment. We found that water is often a relatively indiscriminate weapon. Unintentional population displacement is a frequent form of collateral damage. For example, as of December 2014, various combatants had damaged 35 percent of the water treatment facilities in Syria. The contamination of drinking water supplies is a pervasive issue.

The Islamic State and Water Weaponization
Regimes intentionally used the water weapon less frequently than sub-state actors. All major combatants, with the notable exception of the U.S. coalition assembled for air strikes, have intentionally used the water weapon according to one of our categories (see Figure 3). However, although we did not document any cases in this time period, it is likely that U.S. bombing has caused some collateral damage to water supply sources or related infrastructure such as dams, levees,
irrigation systems, or treatment plants at some point. Nevertheless, the data shows that regimes intentionally used the water weapon less frequently than sub-state actors. Notably, there were only 5 incidences of water weapon usage by state-level actors. This may provide evidence that many states are adhering to international agreements prohibiting the use of the environment as a weapon.

The Islamic State is responsible for the most deployments of the water weapon. IS-attributed incidents nearly equal the total of all other incidents combined. IS’s frequent weaponization of water is understandable when one takes their declaratory strategic objectives into account: territorial expansion is the group’s primary goal, and the water weapon is an effective means for expanding control of territory. Indeed, the frequency of weaponization incidents reached their peak by December 2014, the period when IS reached its greatest control of territory to date, and declined thereafter.

**The Islamic State’s Strategy**

The frequency and locations of use raise the question of whether the parties to the conflicts in Syria and Iraq are exercising a coherent water weaponization strategy. The Islamic State is the only actor that displays evidence of a truly strategic approach. Notably, one factor that has separated IS from other extremists groups, such as the Al-Nusrah Front, is the superior ability to articulate a vision and implement a military strategy in support of that vision. The vision is the establishment of a caliphate that will presumably assume many of the attributes of statehood, including static control of territory and providing municipal services to its populace. Our investigations and the literature, including statements of IS, suggest that the use of water as a weapon is indeed an integral part of IS’s strategy.

![Figure 3: Use of the Water Weapon by Major Combatant Groups](image)

<table>
<thead>
<tr>
<th>Combatants</th>
<th>No. of Attributed Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islamic State (IS)</td>
<td>21</td>
</tr>
<tr>
<td>Free Syrian Army (FSA)</td>
<td>2</td>
</tr>
<tr>
<td>Syrian regime</td>
<td>3</td>
</tr>
<tr>
<td>Iraqi Kurds</td>
<td>1</td>
</tr>
<tr>
<td>Jabhat Al Nusra</td>
<td>3</td>
</tr>
<tr>
<td>Islamist Sharia Council</td>
<td>2</td>
</tr>
<tr>
<td>Iraqi Security Forces (ISF)</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td>NA</td>
<td>6</td>
</tr>
</tbody>
</table>
As a strategic weapon, the significance of water and related infrastructure in Syria and Iraq is evident. It was widely reported that the decisive factor in the U.S. decision to launch the air campaign against IS in August 2014 was the organization’s seizure of the Mosul Dam. In a letter to Congress justifying the airstrikes, the White House explained that “failure of the Mosul dam could threaten the lives of large numbers of civilians, threaten U.S. personnel and facilities—including the U.S. Embassy in Baghdad—and prevent the Iraqi government from providing crucial services to the Iraqi populace.”26 In this way, it was IS’s use of water as an instrument of both strategic and psychological terrorism that escalated the conflict by provoking a new actor and a new type of warfare (the aerial campaign) into the fray. Among the parties to the conflict, IS has used terrorism as a tactic to great effect and has been given credit by one academic for mastering the technique of “hydro-terrorism.”27

As a tactical weapon, the use of water in Syria and Iraq has caused few, if any, military battlefield casualties. However, the water weapon has certainly taken its toll on vulnerable noncombatants. We can measure this both by the suffering caused by mass migration and by outbreaks of waterborne disease, which come from water contamination and the lack of basic water sanitation and hygiene (WASH) facilities in refugee camps. So the water weapon has proven relatively useless as a tactical military weapon but effective as a tool of political control. However, the humanitarian consequences of diminished water supply due to weaponization are likely to last longer into the future, whatever the immediate outcome of the war.

Furthermore, water weaponization is a critical enabler of a successful IS military campaign. Our research suggests IS does not have the capability to conduct efficient warfare without ready access to the water weapon. Along with other factors, including high morale and some level of support from the Sunni population, water enables IS to create an economy of force to exercise strategic or virtual control over disproportionate amounts of territory with a relatively small attacking force.

In several instances we identified, IS seizure and resulting ability to destroy dams created the threat of floods that could wipe out enemy forces distributed over a wide area as well as civilian population centers. Combatants opposing IS are forced to take this reality into account in deciding whether to occupy physically vulnerable territory. Military leaders are also compelled to recognize IS’s strategic advantage as they plan, position forces, and execute counteroffensives.

Beyond using water as a weapon, the Islamic State—a group that wishes to establish a wide-reaching caliphate governed by Islamic law—will have to provide water as a basic service if it wishes to gain and retain legitimacy. In Baghdad, for example, a heat wave in late July and early August 2015 provoked mass demonstrations over lack of access to electricity and water. In response to
the pressure, Iraqi Prime Minister Abadi implemented comprehensive structural reforms and declared a long weekend. The heat wave has pressured the Kurdish Regional Government in Iraq’s north to implement similar measures. The Islamic State likely faces similar challenges in service provision. In one video posted by the “Scenes from Mosul” YouTube channel, for example, locals describe a city beset by electricity cuts and exorbitant water prices.

As Francesco Femia and Caitlin Werrell, Syria experts at a U.S. think tank called the Center for Climate and Security, explain, “the social contract between governments and their publics is being stressed by these extreme events … Governments that are responsive to publics in the face of these stresses are likely to strengthen the social contract, while those who are unresponsive are likely to weaken it.” It is important to watch for emerging reports of IS’s successes and failures in service provision. This metric will indicate their capacity to retain territory and legitimize their presence.

**Significance**

The threat of IS’s use of the water weapon was the key accelerant that precipitated U.S. involvement in the aerial campaign against IS. Our analysis of the use of the water weapon yielded three basic observations, particularly regarding its utility to IS. First, use of the water weapon has been a critical enabler and perpetuator of IS’s strategic campaign of territorial acquisition. Second, IS’s ability to effectively wield the water weapon is a major factor in achieving the political objective of winning the hearts and minds of the Iraqi and Syrian people.

The Islamic State has used water resources as both a carrot and stick in a quest to build popular support. IS’s modus operandi upon capturing a municipality is to assume total control over the core needs of a civilian population, spending significant financial resources on providing social services. These actions encompass monopolization of all industries and municipal services facilities, including electricity, water, and gas supplies, local factories, and even bakeries. IS’s goal is to take advantage of discontent to ensure what it perceives as a more efficient and egalitarian provision of services. These actions show that IS has been able to quickly adapt to the challenges of governing in some areas, methods first pioneered by Hezbollah, the Lebanon-based Shiite militia.

The costs of utilities, including water, have increased dramatically under IS rule. Taxation of these goods coupled with higher food prices and unemployment have pushed people to desperation. IS is using water as part of this economic stranglehold to persuade people to join their ranks. This tactic is reportedly working well in areas that IS has controlled for a significant period. In Palmyra, Syria, as many as 1200 fighters joined IS between May and September of 2015. However, intentionally raising the prices of water in an effort to drive people to
become fighters is a double-edged sword. A population that loses confidence in IS’s ability to provide basic services like electricity and water is less likely to grant them the legitimacy of a state they seek.

IS had better luck in June 2014, when it captured the Iraqi cities of Mosul and Tikrit and cut off water to surrounding villages. Water service was restored to Mosul by mid-June, and offered at discounted prices to Sunni residents. When IS restored the water supply, the Sunni population who had fled viewed them as liberators.34

Our third observation is that while the use of water as a weapon indeed has significant historical roots in Mesopotamia, IS’s systematic and sustained deployment of the water weapon is unprecedented in the history of modern conflict. The Pacific Institute, a U.S.-based think tank, maintains a “Water Conflict Chronology” database containing descriptions of worldwide incidents ranging from 3000 BC to 2010 AD. It contains 343 entries but it documents no more than a handful of water weaponization incidents associated with any previous war. Likewise, weaponization specifically classified as terrorism has been isolated and sporadic.35 These conclusions are confirmed by data collected by a research project on water and conflict based at Oregon State University.36

The three main conclusions must be seen in the context of an ever-dwindling water supply due to stressors including climate change-driven droughts, the destruction of water infrastructure, and the interruption of water conservation policy implementation. There is growing evidence that the drought of 2007–2010 is likely to reoccur. The UN Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR) has found that higher temperatures and longer dry seasons (periods with daily precipitation < 1 millimeter) are likely in the Middle East and North Africa to the year 2100.37 These changes over time would compound the effects of already water scarce conditions. If the war continues into the coming year, water scarcity will in many instances magnify the extent of damage caused by the continued use of the water weapon.

This situation underscores the need for regional coordination as soon as any peace or truce is reached. Turkey is the upper riparian state on the Euphrates River, and it has currently severed relations with Syria. Regional coordination, including regulation of new dam construction and water withdrawals, will be necessary to prevent the worst outcomes for human security in any post-conflict situation. It is likely that sub-state actors will continue to exert influence in more locations than was the case before the current conflict. Nation states will
likely have to take the equities of these actors in account in order to reach a sustainable solution to regional water scarcity.

**Strategies for U.S. Policy and Regional Engagement**

Use of the water weapon by terrorist groups in Syria and Iraq should inform a future U.S. engagement strategy in this region and elsewhere to mitigate instability by denying non-state actors the ability to wage this type of war. Accordingly, any modification of U.S. strategy to defeat IS should employ all U.S. foreign policy tools in defense, development, and diplomacy. Action should be taken with the realization that the various forms of water weaponization are so different in scope and intent that they require tailored prevention strategies and responses.

**Defense Policy**

In the area of defense policy, the U.S.-led coalition should abide by the Hippocratic Oath in conducting its military campaign: First, do no harm. Allied military action to dislodge IS from captured territory should be conducted in a way that minimizes or prevents damage to water supply and infrastructure. It will also be important to understand IS’s use of water as a tool of incentivization if and when territory is retaken by the allied forces. This requires developing counter strategies that provide immediate resources and support for reconstruction of vital infrastructure benefitting populations otherwise susceptible to extremist recruitment. Successful denial of IS’s ability to use the water weapon may be the decisive factor in determining whether they can be defeated on the battlefield itself and whether segments of the population that support IS can be persuaded to shift allegiances.

As of late October 2015, the United States has shifted its strategy to allow some “boots on the ground,” deepening engagement in the fight against IS by introducing small numbers of Special Forces. The Pentagon has given them orders to create a task force in Northern Iraq designed to coordinate the campaign against IS, including operations across the border into Syria. These U.S. forces should provide tactical assistance to cripple IS’s ability to wield the water weapon through active denial of access to critical water infrastructure. For example, highly maneuverable rapid reaction teams with air support could be deployed to protect water bodies, associated infrastructure, and distribution systems. The U.S. military, including ground forces, should also prioritize different forms of water weaponization require tailored prevention strategies and responses.
gathering all source intelligence that can be used to prevent weaponization of water by IS or other regional non-state actors. In addition to information about planned enemy offensives, this intelligence should include geospatial and hydrological information pinpointing vulnerable water supplies.

Development Policy

In development policy, the U.S. government should play a leading role in the provision of post-conflict stabilization and reconstruction assistance. It might be a considerable amount of time until conditions on the ground in some areas permit the reconstruction of water infrastructure. Until those conditions grow more permissive, the U.S. government should work with civil international organizations and non-governmental development and donor agencies to restore damaged or destroyed water infrastructure. There is precedent for such cooperation—the U.S. military and private relief agencies cooperated closely to replace water and sanitation infrastructure after the cessation of NATO-led air-strikes during the Kosovo conflict in 1999.39

Providing capacity-building assistance to regional governments is also a cornerstone of the redevelopment process. Technical and financial support for environmental monitoring and more efficient approaches to water management for agriculture, such as the installation of more efficient drip irrigation systems, should be one of the highest priorities. The best available hydrological data and long-term drought and climate modeling should inform development projects in the water sector. These tools are maintained by a variety of scientific and governmental organizations. U.S. government agencies including USAID have the capacity to direct this assistance. Members of the U.S. defense community including the U.S. Army Corps of Engineers provide R&D and technical assistance in support of Combatant Commands (COCOMs).40

A successful U.S. strategy for regional engagement should also contain a commitment to science diplomacy, specifically hydro-diplomacy. Hydro-diplomacy can play an integral role in a conflict avoidance strategy by diminishing the chances of future political instability fueled by water scarcity. Encouraging regional coordination of shared water resources between Syria and Turkey from the Euphrates River Basin is a good start. Preexisting Turkish plans for the continued construction of dams as part of the Southeast Anatolia Project, also known as GAP, jeopardize long-term security of downstream Syria by reducing the available water supply.41 M. Nouar Shamout of Chatham House and other Arab water experts have proposed the creation of a new river commission made up of experts inside and outside the riparian states. This formation of a commission should be encouraged as it could provide a forum for coordinating water policies and providing early warning about critical water situations until a stable peace is reached.42 The provision of U.S. technical assistance to
such a commission would be a significant positive step toward peace-building in the region.

**Leveraging International Law**

It is likely that sub-state actors will continue to exert influence in large areas of Syria and Iraq. Nation-states will likely have to take the equities of these actors in account in order to reach a sustainable solution to regional water scarcity. For example, Kurdish minority groups are U.S. allies in the fight against IS. The Kurds will likely emerge from the conflict with greater autonomy in the northeastern areas of Syria and Iraq. The United States should therefore use its considerable influence to coax the Kurds into discussions about the equitable allocation of water supply to downstream territories.

At the same time, it is likely that the best possible U.S. diplomatic response to the growing capacity of hostile non-state actors to use the water weapon is to legitimize state power. It can achieve this by supporting international agreements and facilitating cooperation among the governments of Turkey, Iraq, and possibly Syria depending on the outcome of the war. The United States can use diplomatic leverage in the United Nations and other bodies to support the application and enforcement of an existing body of international law that prohibits the use of water as a weapon.

At least two conventions classify water weaponization as a war crime. First, use of water as a weapon violates Additional Protocol II of the Geneva Conventions relating to the Protection of Victims of Non-International Armed Conflicts, Article 49. According to the protocol “Starvation of civilians as a method of combat is prohibited. It is therefore prohibited to attack, destroy, remove or render useless, for that purpose, objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works.” The State Parties to the Geneva Conventions have an obligation to bring to trial or extradite persons who have allegedly committed the violations referred to in the Additional Protocol.

Second, using water as a weapon also violates the Convention on the Prohibition of Military or any Hostile use of Environmental Modification Techniques of December, 10, 1976 (ENMOD). In its Article I, the Convention prohibits the Contracting Parties from engaging in “military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party.” Violations are reported to the UN Security Council and parties to the Convention agree to provide support or assistance in accordance with the Charter of the United Nations.
As water supplies diminish, the need for nations to craft international legal responses will only grow more acute. The U.S. Intelligence Community has judged that the use of water as a weapon will become more common during the next ten years, not only on the subnational level, but between states as powerful upstream nations impede or cut off downstream flow. Forecasts also predict that water will be used within states to “pressure populations and suppress separatist elements.”

If the U.S. government is not willing to use the foreign policy tools at its disposal to resolve regional water challenges, non-state actors including extremist groups operating in Syria and Iraq may fill the gap. According to a 2012 U.S. Intelligence Community Assessment, active engagement by the United States to resolve water challenges will improve U.S. influence and may “forestall other actors achieving the same influence at U.S. expense.”

**Fight Water with … ?**

The drought that devastated Syria from 2007–2010 was a significant driver of the Syrian civil war. While it is important to avoid oversimplification, the resultant food insecurity and mass migrations were among the key factors that marginalized populations and created widespread discontent, creating the conditions for the outbreaks of violence that ensued. When the war in Syria and Iraq reached greater intensity, purposeful manipulation or weaponization of water increased the scale and intensity of conflict. In Syria and Iraq, nearly all combatants understood the potency of water as a weapon, but its use has been essential to the heretofore successful war strategy of the Islamic State. Therefore, successful denial of IS’s ability to use the water weapon may represent a decisive factor in whether or not they can be defeated.

The magnitude of the use of water as a weapon in Syria and Iraq is probably unprecedented in modern warfare. Emerging evidence demonstrates that climate change will contribute to water scarcity even further in the Middle East and North Africa as well as other areas where other conditions for conflict already exist. Increased scarcity will only increase the potency of the water weapon. The successful employment of a water weaponization strategy by IS not only carries implications for U.S. engagement in Syria and Iraq, it suggests that the use of water in warfare is likely to become an even greater factor unless countervailing strategies are designed and implemented by states committed to defeat extremists.
Notes

2. This research builds on conclusions of two Chatham House style dialogues at the Elliott School in 2012–2013 as part of a climate and water security initiative featuring over 60 leaders from government, think tanks, NGOs, and business. The workshop was animated by the findings of the 2012 National Intelligence Assessment on Global Water Security.
10. Kelley, “Climate Change in the Fertile Crescent and Implications of the Recent Syrian Drought.”


27. Ibrahim Al Marashi, “The Dawning of Hydro-terrorism.”


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