

## **Weakening of the Nation-State by Climate Change: Water Weaponization by ISIL**

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**ABSTRACT:** Climate change is quickly becoming one of the biggest threats faced by the international community and has the capacity to greatly impact global security. The relationship between climate change and conflict is still unraveling; however, worsening climatic events have contributed to political instability around the world. As climate change implications become more apparent, water is less abundant due to worsening droughts and less precipitation, allowing it to become a target for groups seeking to control territory or populations. This paper examines the impact of climate change in shifting the power dynamic between states and violent non-state actors within their borders. More specifically, focusing on the use of water weaponization by the Islamic State of Iraq and the Levant (ISIL). The water weaponization of ISIL in Iraq and Syria shows the ability of water resources to be manipulated in a water scarce and politically unstable environment to strengthen the role of violent non-state actors. This research creates a chronology of water weaponization to track acts of water weaponization by ISIL from 2012, as they gained power in Iraq and Syria, until 2019 following the ‘defeat’ of their caliphate. Succeeding the chronology, acts of water weaponization are tracked using the Institute for the Study of War’s ISIS Sanctuary maps and Situation Reports to find the connection between acts of water weaponization and the strength of their caliphate through territory held. Through identifying fourteen water weaponization acts by ISIL from 2012-2019, a connection is found between the acquisition of a water resource, or an attack weaponizing water, and the territorial shifts of the caliphate over time. In doing so, this research hopes to contribute to a better understanding of the relationship between climate change and conflict connected to future security and counterterrorism measures to combat climate related threats.

### **Introduction**

As the effects of climate change become more visible, there is intensifying discussion of the nexus between climate change and conflict. In 2014, the International Panel on Climate Change (IPCC) dedicated a report, the first of its kind, addressing the human security dimensions of climate change.<sup>1</sup> Increased droughts in arid and semi-arid regions are one of the most frequent ways in which climate change might increase conflict, one of the most affected regions being the Middle East.<sup>2</sup> The Middle East has experienced ten out of twelve of its’ driest winters since 1902 within the last 20 years, with climate change being one of the key factors for this increase in drying.<sup>3</sup> In relation to this prediction, this research seeks to explore the connection between climate change and conflict in the Middle East.

The drought between 2006 and 2010 in the Levant region was a major factor in the 2011 uprising in Syria.<sup>4</sup> It was estimated that 1.3 million Syrians experienced or were affected by agricultural failures due to the drought.<sup>5</sup> Wheat and barley prices dropped 47% and 67%

respectively and approximately 800,000 inhabitants lost their livelihoods.<sup>6</sup> This major agricultural failure led to a widespread migration of up to 1.5 million Syrians from rural to urban centers.<sup>7</sup> In September 2008, the first UN drought appeal claimed that migration from rural areas during 2007 and 2008 was 20 to 30% higher than during previous years.<sup>8</sup> A subsequent UN report estimated the drought migration at 65,000 families in that time period, although a UN Special Reporter once claimed 600,000 people had emigrated.<sup>9</sup> De Châtel (2014) notes that the Northeast region of Syria had been declining since 2000 due to the agricultural practice shifts and mismanagement of water and land resources; however, continued mishandling of climatic events and a weak socio-political atmosphere exacerbated existing instability.

Water management in Iraq has been poor throughout continued conflicts in the past decades. The first and second Gulf wars led to a major breakdown of an already crumbling water management system.<sup>10</sup> The 2006-2010 drought interacted with the poor socio-economic system following the geopolitical upheavals in Iraq following the Gulf wars and the 2003 US invasion and continued insurgency.<sup>11</sup> Namely, the drought intensified grievances and stress on the Iraqi society through the effects of migration and agricultural losses (King, 2015). Between 2008 and 2009, Iraqi crop yields plummeted 45% leading to a sharp increase in food prices and food insecurity.<sup>12</sup> This event led to over 10,000 farmers abandoning their fields along the Euphrates to emigrate to already struggling urban centers, which increased tensions with the Iraqi government who failed to provide adequate services.<sup>13</sup> These conditions allowed the Syrian conflict to spill across the border into North-Western Iraq.<sup>14</sup>

In areas where climate disasters weakened central government authority, new areas opened that not only provided a safe haven to violent non-state terror actors, but also served as an incubator where these groups could increase their numbers and gain momentum.<sup>15</sup> The Northern provinces of Syria, which produced two-thirds of Syria's crop yields, were some of the most impacted by the drought.<sup>16</sup> These same regions are the ones that ISIL has maintained steady control of since the beginning of the conflict.<sup>17</sup> Due to the political instability in Iraq and Syria, exacerbated by the drought and weak water management systems, dams overwhelmingly became a focal point of struggle, and a weapon in war.<sup>18</sup> ISIL captured strategic natural resources and weaponized them to accomplish political, economic, and military aims.<sup>19</sup> It is these actions that showcase ISIL's goal of establishing a caliphate that intends to assume many of the attributes of statehood, including control of territory and providing municipal services to its population. Through apprehending water resources or manipulating them to control the local population, ISIL shifts the power dynamic away from the established state by decreasing state sovereignty and maintaining control over key resources such as food, water, energy and employment.

This paper first explores the existing literature on the relationship between climate change and conflict, water weaponization and the weakening of nation-states. In order to explore the connections between these concepts, a water weaponization chronology of fourteen water weaponization acts by ISIL is produced, along with subsequent state actions against these acts, from November 2012 through June 2018 using information from a variety of news sources, the Pacific Institute's Water Chronology Site and the Global Terrorism Database. Following the chronology, the Institute for the Study of War's ISIS Sanctuary Maps and Campaign Tracker are utilized to map these water weaponization acts coinciding with the caliphate's territorial activity in Iraq and Syria until March 2019 with the announcement of the caliphate's defeat. The analysis of the chronology and territorial shifts shows a connection between the acquisition of water resources or manipulation of water with the gaining and loss of territory by ISIL over this time period.

## Literature Review

The weakening of the nation-state as the primary security actor has caused great concern among the international community. Recent technological, economic, and social developments have posed serious challenges to the capacity of a nation to fulfill their traditional functions of security, welfare, and identity, which has allowed for a greater playing field for violent non-state actors (VNSAs) including terror organizations.<sup>20,21</sup> A report by the US National Intelligence Council explains that challenges such as water shortages, poor water quality, and floods increase the risk of instability and state failure and elevate interstate tensions.<sup>22</sup>

Of increased interest is the degree to which climate change might exacerbate both water insecurity and political instability, causing opportunity for these violent non-state actors. Climate change is often classified as a ‘threat multiplier’, meaning that it triggers, accelerates and intensifies current instabilities.<sup>23</sup> Scholarly research has primarily explored the MENA region, Africa and Southeast Asia. Climate change has enflamed water stress in these areas due to increased droughts, less precipitation and natural disasters combined with weak governments and powerful non-state combatants.<sup>24</sup> When extreme poverty is exacerbated by climate threats and the presence of terrorist organizations, climate change can expand the role and recruiting of these organizations.<sup>25</sup> Climate change impacts elicit the occupation of vital water infrastructure, or the targeting of essential water sources, which make the local population rely on the occupying group for vital resources.<sup>26</sup> The developed world will be far better prepared to tackle the effects of climate change compared to developing nations; therefore, the gap between developed and underdeveloped countries can potentially provide an opening for extremist ideologies and create the conditions for terrorism.<sup>27</sup> In relation to anticipated climate change effects, increased poverty and reduced state capacity may contribute to the creation or preservation of functional space which may allow terrorist groups to flourish.<sup>28</sup> Of this discussion, the most frequently sought connection between climate change and terrorism within these regions is through water.

In order to conceptualize water as a strategic resource utilized by these terror actors, scholars studying water in security studies focus on water scarcity combined with other factors as a determinant of intra-state conflict.<sup>29,30</sup> Violent non-state actors such as terrorist organizations pose a significant threat to nation-states as they are engaging states in “asymmetric wars,” in which there are no rules to warfare enabling the expansion of tactics used.<sup>31</sup> For instance, under the 1977 Protocols to the Geneva Convention it is prohibited to “attack, destroy or render useless objects indispensable to the survival of the civilian population”, including water.<sup>32</sup> While states must abide by social norms of war including international law, non-state actors do not, which has increased the direct targeting of strategic resources, such as water, to achieve their goals.<sup>33</sup>

Some classify water weaponization in the concept of “hydro-terrorism.”<sup>34</sup> VNSAs destabilize governments through violent and coercive acts using resources like water as a target, a weapon, a leveraging tool, and a nation-building strategy as well as a motive for violent response.<sup>35</sup> King provides a detailed clarification on types of water weaponization used by these groups. In his assessment of water weaponization, King defines strategic, tactical, psychological terrorism, extortion or incentivization, and unintentional weaponization.<sup>36</sup> He outlines strategic weaponization as “the use of water to virtually or actually control large or important land areas or facilities to fulfill the vision of sovereignty, and... an asset to fund activities, such as administration and weapons acquisition, of a ‘state.’”<sup>37</sup> Tactical weaponization is primarily the “use of water as a weapon on the battlefield in direct or instant support of military operations or against targets of military value.”<sup>38</sup> Psychological terrorism encompasses “creating fear among non-combatants or

the denial of access or contamination of the water supply.”<sup>39</sup> Extortion or incentivization involves the “use of the water weapon to establish credibility as a governing authority or to reward support from the local population.”<sup>40</sup> Lastly, unintentional weaponization describes when the “use of water as a weapon causes collateral damage to civilians or the ecological environment.”<sup>41</sup> This classification is the most detailed of water weaponization and is useful to separate the multiple utilizations of this strategy.

Additional definitions are utilized to encompass the use of water weaponization. Von Lossow (2016) describes weaponized water as “water resources directly used as an instrument of war in order to achieve strategic political and tactical military goals through targeting the population, addressing the opponent’s political leadership and confronting the opposing military.”<sup>42</sup> Von Lossow’s definition is an all-encompassing definition to describe the strategy rather than separate the different types of weaponization and primarily combines King’s tactical and strategic water weaponization classifications.<sup>43</sup> Daoudy (2020) rather splits it into categories including: domination and legitimacy, the control over resources and infrastructures; attack and capture of large infrastructures (a military target and goal); cutting off water, intentional flooding and defensive fortification (a military tool); and delivery or refusal of basic infrastructure-produced services (a tool of cooperation). This paper utilizes Daoudy’s (2020) definition as it is primarily interested in the ways in which water weaponization is used to shift the power dynamic between the nation-state and VNSAs and the four classifications seen in this definition are the most aligned with the types of weaponization used by ISIL to accomplish this.

Water weaponization is also covered in the context of environmental terrorism—distinct from ‘hydro-terrorism’. Gleick (2006) defines the term “environmental terrorism” as referring to the “unlawful use of force against environmental resources or systems with the intent to harm individuals or deprive populations of environmental benefit(s) in the name of a political or social objective.”<sup>44</sup> Although environmental terrorism encompasses any environmental resources, water is damaged by rendering water unusable, or destroying purification and supply infrastructure, harming local populations.<sup>45</sup> For this research, the classification of acts of water weaponization is not utilized; however, this discussion is useful to clarify the meaning of the term and how scholars have previously identified these acts.

The degree to which water is able to be weaponized relies on its value to the state, which makes regions of the world more prone to water scarcity exacerbated by climate change greater targets. Von Lossow (2016) noted that the effect of water as a weapon depends on the regional hydrological and political context. A resource is more strategically appealing and destructive based on its potential impact in a specific environment.<sup>46</sup> Sofuoğlu et al. (2019) show support for a general causal pattern between climate change and political instability within 16 countries, and conflict in 15 countries, in the Middle East and North Africa region (out of 18 analyzed over the time period of 1985-2016). In arid or semiarid regions like the Middle East and North Africa where water is already scarce, combatants use water to provide robust leverage over their opposition as a militarized target.<sup>47</sup> ISIL in Syria and Iraq has employed the most frequent use of water as a strategic resource in gaining control of territory.<sup>48</sup> ISIL has distinguished itself from other terror organizations through its vision of a caliphate that will assume many of the attributes of statehood, including territorial dominance and provision of municipal services to its population.<sup>49</sup> Water is a key component of this strategy through their ability to both maintain control and gain territory, but also as a source of taxation, agriculture, and as a service usually provided by a state.<sup>50</sup>

Alternative organizations employing these strategies that scholars have explored include Al Shabaab in Somalia, Boko Haram in Nigeria and the Taliban in Afghanistan. Although less

central to their strategy, these groups have all used water as a strategic weapon. Succeeding widespread regional droughts in 2011, Al Shabaab cut off liberated cities from their water sources, forcing residents from cut-off cities to walk to nearby towns to fetch water, many of which Al Shabaab controlled.<sup>51</sup> Al Shabaab's water weaponization was widely unsuccessful in its attempt to gain legitimacy or hurt the Somali government forces; however, it led to widespread suffering in the population and maintained their presence in the region during the ongoing civil war in Somalia.<sup>52</sup> Boko Haram was documented weaponizing the limited water resources in Nigeria, strategically contaminating water sources such as streams and wells pursued by their enemy, capitalizing on the unrest caused by the civil war from 2005-2010.<sup>53</sup> Continued water stress and intensification of both droughts and flooding in the region impeded the governance capacity of the weak Nigerian government, which led to Boko Haram's violent surge to create an Islamic caliphate in 2010.<sup>54</sup> In 2017, the Taliban blew up a dam constructed in the Kandahar province of Afghanistan, a key irrigation resource to agricultural lands and its destruction sparked panic among residents.<sup>55</sup> Afghanistan is prone to drought and flooding, which have become more severe as climate change impacts have progressed, causing less snow, earlier snow melting, and an extended, hotter growing season.<sup>56</sup> Additionally, the national government of Afghanistan was not functional for much of the past few decades meaning a lack of central governance over water infrastructure.<sup>57</sup> These are additional examples in which states with weak central governments have been unable to maintain authority to govern due to environmental crises, allowing VNSAs to manipulate water resources as weapons.

As the above examples of countries in the Middle East and African regions imply the vulnerability of states to both climate threats and terrorism hinges on their strength as a state. A decrease in state authority often correlates with an increase in non-state terror organization occurrence who can use strategic resources to their advantage.<sup>58</sup> The provision of goods is a key measure indicating the difference between a weak state and a strong state. The state's primary function is to provide security meaning to prevent invasions, territorial loss and to eliminate domestic threats or assaults on the national order and social norms.<sup>59</sup> Unlike strong states, failed states cannot maintain their borders and may lose authority over sections of territory.<sup>60</sup> Climate change has the capacity to contribute to reduced state capacity, state failure and economic troubles fostering an enabling environment for non-state actor terrorist groups.<sup>61</sup> In the case of interceding climatic disasters, the economic failure and pervasive neglect that is endemic to failed states leads to recurring food shortages and widespread hunger furthering political instability and providing increased access to VNSAs.<sup>62</sup> VNSAs capitalize on the destabilization of weak borders and reduced state capacity to provide key resources exacerbated by these climatic events.

The strength of a violent non-state actor is measured similarly to that of states. Oktav (2017) uses characterizations of actorness, powerfulness and effectiveness to demonstrate the measure. Actorness includes territoriality and geopolitical codes as well as community building, specifically highlighting territorial control for administrative practices and enforcing the idea of citizenship. Powerfulness comprises financial resources including territorial control and natural resources as well as taxes and confiscations, additionally, recruitment and propaganda. Finally, effectiveness encompasses regional engagements including regional territorial control and degree of security threat as well as international engagements, legitimacy, level of autonomy and counterterrorism actions by the international community. Oktav's study using the Islamic State as an example, highlights viewing territory not only as a shelter but also an opportunity to engage in administrative aspects of proto-statehood and *community-building* practices, as well as its funding through the extortion of the population within its territories through taxes, fees, and

confiscations.<sup>63</sup> These distinctions solidify the importance of territory to measure the influence of these actors as an indicator of state-like behavior. As discussed previously, water is identified as a key component of the ability to both maintain control and gain territory, but also as a source of taxation, agriculture, and resources provided by the state.<sup>64</sup>

The connection between the identified weakness and failure of states and the advancement of violent non-state actors is of vital importance to examine the role of water in these conflicts. Through the capitalization of state weakness, substate actors gain control over areas within the state, build up their own local security mechanisms, authorized markets, and can even establish attempted forms of international relations.<sup>65</sup> VNSAs have particular power in contexts where governments demonstrate a lack of capacity to provide the goods commonly associated with statehood such as security, infrastructure, and other basic welfare services, such as in the Middle East and North Africa region suffering from civil wars and continued unrest.<sup>66</sup> Organizations can leverage their armed capacity to capture and monopolize access to state-sponsored services; specifically, previously existing infrastructure, such as dams, to secure locally dominant status at the expense of the state while avoiding costly and time-consuming investment in independent welfare systems.<sup>67</sup> This strategy ensures the dependency of the local population and demonstrates that a militia is capable of running the state after the conflict.<sup>68</sup>

The existing literature is primarily concerned with the exploration of ISIL's water strategy rather than the tactic's use in the deterioration of state sovereignty in Iraq and Syria. Additionally, while they focus on the beneficial use of the strategy in expanding ISIL's caliphate, they neglect the effect of the loss of these resources and the eventual defeat in March 2019. My research aims to link the environmental issues caused by climate change with terrorism by showing how the acquisition or manipulation of water resources illustrates the shifting power dynamic between the state and VNSAs. In order to show the complete power shift, this paper will analyze not only the attainment or manipulation of these resources, but the effects of their retrieval by the state in the weakening of the caliphate to provide a full view of the influence of water weaponization to gain legitimacy and power.

### **Research Design**

The unstable conditions produced by the droughts in Iraq and Syria from 2006-2010 played a meaningful relationship in the Syrian uprising and the ensuing spill over into Iraq, a weakness capitalized upon by ISIL to set up their caliphate.<sup>69</sup> Brewing grievances against the failing governments and weakened civil institutions produced a safe haven for ISIL combatants and an incubator to recruit and gain momentum.<sup>70</sup> In Syria, following the loss of livelihood and environmental crisis, ISIL recruited 60 to 70% of its fighters locally; likewise, in Iraq, ISIL recruited heavily from disgruntled Sunni Iraqis and prisoners released from Abu Ghraib Prison.<sup>71</sup> The maintenance of municipal service organizations, such as the Islamic Network for Public Services, by ISIL provided electricity and transportation greatly supported by the dams captured through water weaponizations, and was key to this recruitment.<sup>72</sup> For this reason, acts of water weaponization are used, primarily the seizing of dams or use of water to control the local population, to track ISIL's rise to power and fall to defeat.

While other scholars have sought to identify acts of water weaponization to quantify the links between climate change and terrorism, the previous studies were finalized before the so-called 'defeat' of the ISIL caliphate in March of 2019, which is of great importance in understanding how water resources have contributed to their strength. Additionally, the previous studies have been concerned with the exploration of ISIL's water strategy rather than the strategy's

deterioration of state sovereignty. My research aims to link environmental issues caused by climate change with terrorism by showing how the acquisition and manipulation of water resources illustrates the shifting power dynamic between the state and VNSAs.

In order to do this, this paper explores the strategy of water weaponization by ISIL in the creation of their caliphate in order to show the power shift from the nation state to the terror group. To further explore this, this paper continues to analyze the decline of the caliphate with the loss of these key water resources and the eventual defeat of the caliphate to further show the power shift back to the nation state. The Islamic State of Iraq and the Levant is used in this case study as their use of water weaponization is the strongest identified utilization of this strategy and their acquisition of territory to build a caliphate is transferable to tracking territorial power shifted to the VNSA group from the state and vice versa.

A chronology of acts of water weaponization by ISIL throughout Iraq and Syria is produced from 2012, as they build their caliphate, eventually announcing in June 2014, through March 2019 with the announcement of their defeat. The Pacific Institute's Water Chronology Site, the Global Terrorism Database, news sources, local government and UN reports are employed to locate the acts of water weaponization. The Pacific Institute's Water Chronology Site is a database tracking and categorizing events related to water and conflict. Their database is coded by region, date, category of conflict and includes sources confirming the event. The database is sorted through acts coded as 'triggers', 'weapons', and 'casualty'; however, this was not utilized in my research. When the specific timeline of the event was unclear, this research utilized the Global Terrorism Database's incident reports to narrow the specific date.

This research corroborates these acts through newspapers and reports detailing the events. When possible, using both Western<sup>73</sup> and regional news sources to detail the events in order to verify accurate depictions of the events and obtain both international and local accounts. Although multiple sources are used seeking to prevent bias and error, news media reports in conflict areas provide both crucial on-the-ground information and areas for uncertainty and misinformation. The UN and other international organizations publish reports periodically on the humanitarian situation and events in conflict zones, which are sometimes used to verify news reports.

This chronology is then compared with the regional campaign tracker produced by the Institute for the Study of War in order to compare acts of water weaponization with territory controlled by the caliphate. The institute provides periodical publications of ISIS Sanctuary Maps detailing an assessment of the organization's control throughout Iraq and Syria. Their publications begin in June of 2014 and the most recent was August 2019. To track the territory controlled by the ISIL, this research turns to their Syria Situation reports and other campaign tracking reports of Iraq and Syria which detail areas controlled by pro-regime forces, ISIL, SDF forces, Iraqi Security forces and reconciled opposition terrain.

By connecting the acquisition and losses of these resources and acts of weaponization through the chronology with the tracking of territory controlled within the timeframe, this paper aims to show that the rise and decline of the ISIL caliphate in Iraq and Syria corresponds with the number of weaponization acts and areas attacked. In doing this, this paper hopes to provide a clearer view of how ISIL's water weaponization coincides with their strength as a group. This correspondence will aid in solidifying the link between climate change and terrorism.

## **Results and Discussion**

Preceding the proclamation of a caliphate by ISIL in June 2014, declaring the Islamic State, the insurgent group had already acquired territory and water resources. Figure 1. shows the territory

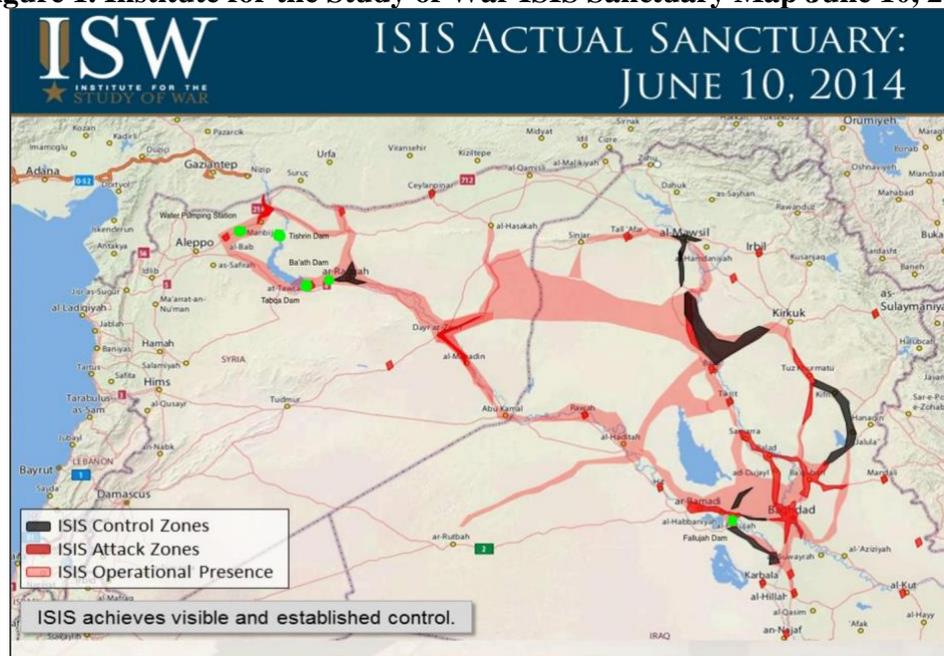
gained by ISIL up until just before the declaration of the caliphate. In a year-long offensive starting after the splintering of the group from Al Qaeda in 2013, ISIL sought territorial gains by fracturing Iraqi Security Forces starting from Mosul, Iraq.<sup>74</sup> From Mosul, the group moved to weaken Iraqi government control toward Baghdad, expanding operations South of Mosul to Taji, Kirkuk and eventually to Baghdad aiming to lay the ground for an Islamic State.<sup>75</sup> ISIL claimed Mosul from June 6-9, 2014 after dissolving the security forces and freeing over 3,000 prisoners from Abu Ghraib Prison.<sup>76</sup> The Ar-Raqqa region of Northern Syria also provided a safe haven and training ground for ISIL seeking control of the Kurdish regions of Northern Syria.<sup>77</sup>

**Key. Marking of Weaponization Acts.**

Key.

- - Act of water weaponization territorial acquisition
- - Loss of water resource previously held
- - Attempt of water weaponization (brief territorial acquisition)
- - Attempt of water weaponization (no territorial acquisition)

**Figure 1. Institute for the Study of War ISIS Sanctuary Map June 10, 2014**



In Figure 1. their acquisition of Fallujah, Ba’ath, Tabqa and Tishrin dams are highlighted. ISIL captured the Tishrin Dam along the Euphrates in Manbij, Syria on November 16, 2012, their first dam seizure while the group was still fragmented and vying for power.<sup>78</sup> Tishrin supplied several Syrian towns with energy, with the capacity to produce 630 megawatts of

hydroelectricity.<sup>79</sup> This attack led to a Syrian government air raid to regain territory and the dam; however, ISIL maintained control of the dam and surrounding areas.

Several months after capturing Tishrin Dam, ISIL seized the neighboring Tabqa Dam in February 2013 and a year later, the Ba'ath Dam, both located in Ar-Raqqa, Syria (Figure 1.). This acquisition gave much of the countryside to the militant group while government forces struggled to retain the cities of Raqqa and Tabqa. ISIL eventually conquered the city of Raqqa in later January 2014.<sup>80</sup> ISIL leaked that they had controlled the provision of water services after this acquisition by threatening the population with significant fines if the local population evaded the water taxes or tried to steal electricity.<sup>81</sup> Their acquisition of Tabqa Dam, the largest dam in Syria, supplying five million people (including Aleppo) with water including irrigation for agricultural purposes and several towns with electricity, with a max hydropower capacity of 824 megawatts, greatly strengthened their security threat.<sup>82</sup> The control over this Dam gave them power over this population. The Tabqa Dam is also strategic due to its location on Lake Assad and has been Syria's main source of electricity, in the past making Syria self-sufficient in power generation.<sup>83</sup> The Ba'ath dam provides less hydropower, a max capacity of 81 megawatts, but supplies 60% of Syria's water.<sup>84</sup>

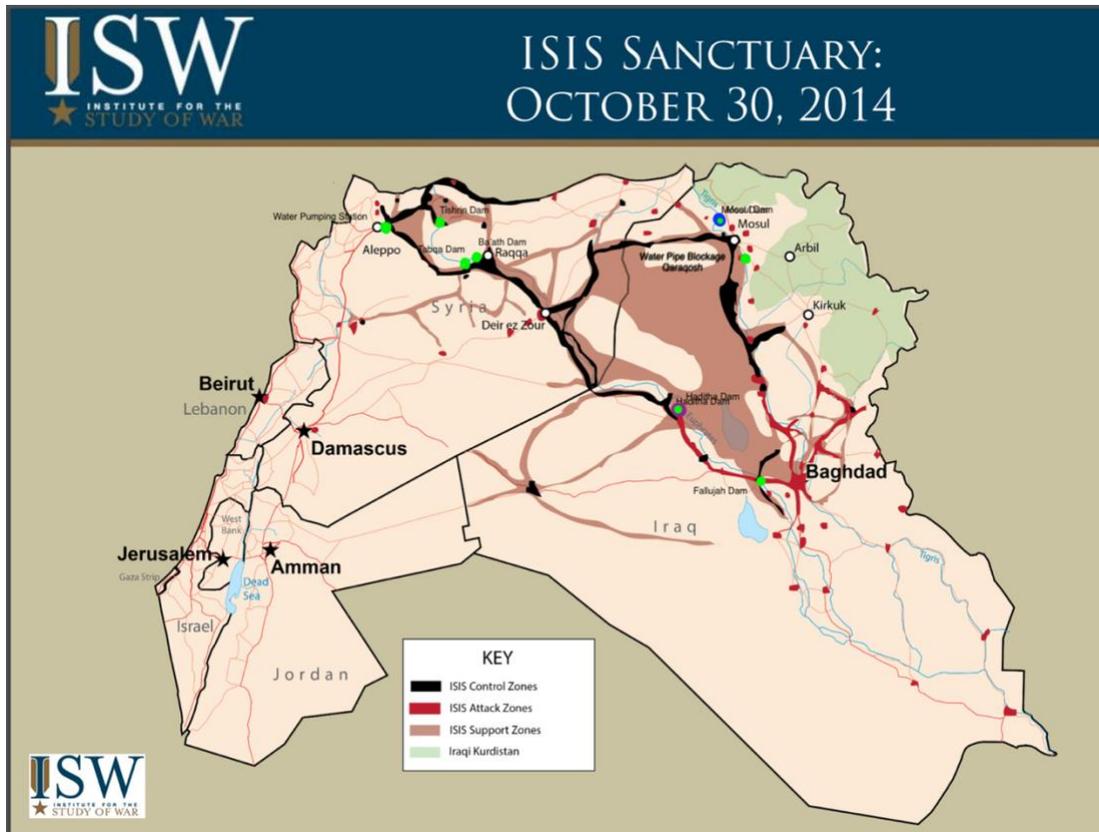
**Table 2. Chronology of Water Weaponization by the ISIL within Iraq and Syria**

<b>Date</b>	<b>Location</b>	<b>Description</b>
<b>November 26, 2012</b>	<b>Manbij, Syria</b>	ISIL rebels <sup>85</sup> capture Tishrin Dam
<b>February 11, 2012</b>	<b>Raqqa, Syria</b>	ISIL rebels capture Tabqa Dam
<b>February, 2013</b>	<b>Raqqa, Syria</b>	ISIL rebels capture Ba'ath Dam
<b>January, 2014</b>	<b>Aleppo, Syria</b>	ISIL seizes Aleppo Water Pumping Station
<b>April 11, 2014</b>	<b>Nuaimiya, Iraq</b>	ISIL rebels capture Fallujah Dam
<b>June, 2014</b>	<b>Qaraqosh, Iraq</b>	ISIL blocks water pipes in Qaraqosh
<b>June 25, 2014</b>	<b>Haditha, Iraq</b>	ISIL troops advance toward Haditha Dam
<b>August 7, 2014</b>	<b>Mosul, Iraq</b>	ISIL captures Mosul Dam
<b>August 18, 2014</b>	<b>Mosul, Iraq</b>	Kurdish troops regain control of Mosul Dam
<b>December, 2014</b>	<b>Salahaddin, Syria</b>	ISIL contaminates drinking water in Salahaddin Governorate
<b>January, 2015</b>	<b>Mosul, Iraq</b>	ISIL attacks Mosul Dam
<b>April, 2015</b>	<b>Samarra, Iraq</b>	ISIL attacks Samarra Dam
<b>June, 2015</b>	<b>Ramadi, Iraq</b>	ISIL shuts off water flows below the Ramadi Dam

<b>December 23, 2015</b>	<b>Manbij, Syria</b>	Syrian Democratic Forces regain control of Tishrin Dam
<b>June 13, 2016</b>	<b>Fallujah, Iraq</b>	Iraqi forces regain control of Fallujah Dam
<b>November 29, 2016</b>	<b>Mosul, Iraq</b>	ISIL destroys water pipeline in Mosul
<b>December, 2016</b>	<b>Ramadi, Iraq</b>	Iraqi officials announce they have full control of Ramadi
<b>February, 2017</b>	<b>Aleppo, Syria</b>	ISIL floods fields in Aleppo to stop the Syrian Army
<b>March, 2017</b>	<b>Aleppo, Syria</b>	Syrian Regime forces regain water pumping station in Aleppo
<b>March-May 2017</b>	<b>Raqqa, Syria</b>	US and Syrian forces fight ISIL controlling Tabqa Dam
<b>June, 2017</b>	<b>Raqqa, Syria</b>	Syrian Democratic Forces Seize Ba'ath Dam
<b>June, 2018</b>	<b>Raqqa, Syria</b>	Syrian Government announces reoperation of Tabqa and Tishrin Dams

In January 2014, ISIL rebels seized one of the main water-pumping stations in Aleppo, Syria leading to the local population being without water for two months (Figure 1.).<sup>86</sup> This site had previously been captured by opposition forces in February 2013.<sup>87</sup> Their final acquisition before the caliphate was the Fallujah Dam in Nuaimiya, Iraq on April 11, 2014 (Figure 1.) which helps to distribute water from the Euphrates River as well as provide water for a number of irrigation projects throughout the Anbar province.<sup>88</sup> ISIL captured Nuaimiya in February and closed the gates to the dam one week before (approximately week of April 4) which reduced water flow to the rest of Iraq's Southern provinces.<sup>89</sup> Insurgents reopened five gates on April 10 fearing that the dam would flood their stronghold in Fallujah (Reuters, April 11, 2014). Iraqi officials stated that previous flooding from the dam has already caused families to flee and had prevented security troops from retaliating against ISIL.<sup>90</sup> Decline of water levels from the dam closure also resulted in power outages (decrease from 170 megawatts to 90 megawatts) in Baghdad which relied on steam-powered generators.<sup>91</sup> By closing the floodgates, they diverted water over an irrigation channel, flooding land up to 100 km away, including the city of Abu Ghraib, under up to four meters of water.<sup>92</sup> More than 10,000 houses and 200 square kilometers of fertile farmland, including the annual harvest, were destroyed between Fallujah and Abu Ghraib.<sup>93</sup> Over 60,000 residents in the area were displaced after losing their livelihood to the flood.<sup>94</sup> In destroying homes, agricultural fields and livelihood, the local population is forced to succumb to the insurgent groups' authority or flee.

**Figure 2. Institute for the Study of War ISIS Sanctuary Map October 30, 2014**



Institute for the Study of War (2015, August 3).

In June 2014, following the declaration of the caliphate, ISIL obstructed water pipes to the predominantly Christian town of Qaraqosh, Iraq (Figure 2.).<sup>95</sup> They took over agricultural lands displacing close to 50,000 inhabitants pushing them to arrive in search of safety, food and water in Erbil.<sup>96</sup> This action followed ISIL's seizure of the city of Mosul on June 10, 2014 which is nearby. The seizure of Mosul attached ISIL's southern Dier ez-Zour and Anbar system, which was the primary goal throughout July.<sup>97</sup> ISIL also maintained vast control of territory in Northeast Syria in the Ar-Raqqa province and surrounding Aleppo continuing to hold Tishrin, Ba'ath and Tabqa dams as well as the Aleppo Pumping Station (Figure 2.).

Later in June, Iraqi security officials reported that ISIL troops were advancing on the Haditha Dam (Figure 2.).<sup>98</sup> More than 2,000 Iraqi troops were deployed to the area to protect the dam, prepared to open the floodgates if ISIL reached the dam which would cause flooding of the town and villages and potential harm to the locals.<sup>99</sup> Due to its attachment to Lake Qadisiyah, which could be a potential weapon of mass destruction, US rangers seized Haditha Dam during the 2003 invasion of Iraq to prevent Saddam Hussein's forces from destroying it and causing an enormous flood.<sup>100</sup> ISIL was unable to seize the dam due to Iraqi presence; however, this would have been a major gain if they had, as it supplied more than 30% of Iraq's energy, particularly to the city of Baghdad.<sup>101</sup>

ISIL captured the key facility of Mosul Dam (Figure 2.) on August 7, 2014 prompting swift airstrikes by the Iraqi government, Kurdish and US starting on August 11.<sup>102</sup> The head of the Kurdistan region's presidency office noted that ISIL had transitioned from a terrorist organization to a terrorist state.<sup>103</sup> The dam can produce 1010 megawatts of electricity, 75% of Iraq's energy production capability and holds back 12 billion cubic meters of water which are crucial for the

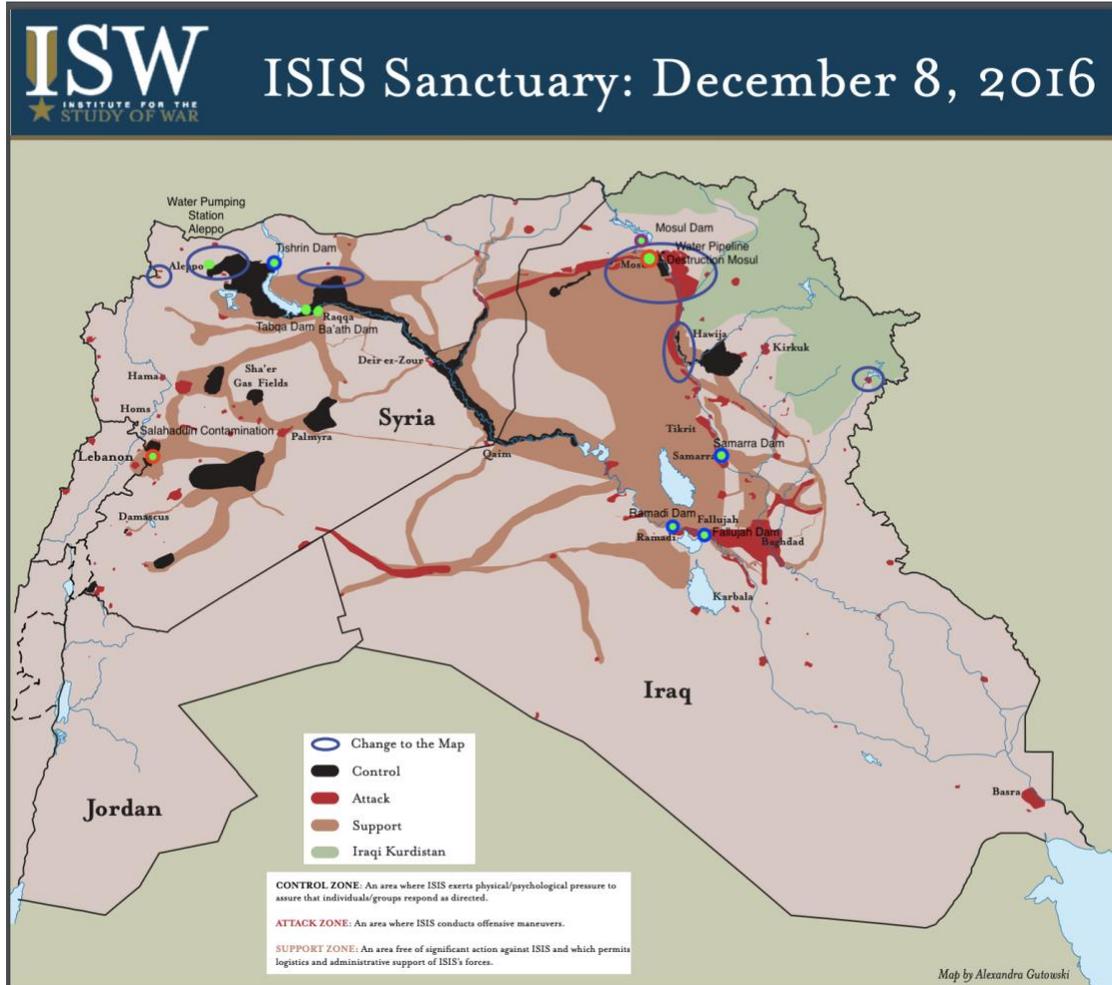
irrigation of local agriculture of the Nineveh province.<sup>104</sup> It is estimated that a catastrophic failure of Mosul dam could result in a flood wave of 20 meters toward the city of Mosul.<sup>105</sup> ISIL's featured their capture in their propaganda campaign and the group placed an Islamic State flag on top of the dam declaring their victory shown in Figure 3. The Iraqi government and Kurdish forces announced that they have fully regained control of Mosul Dam with the help of US airstrikes on August 18, 2014 (Figure 2.).<sup>106</sup> US airstrikes commenced on August 8 following ISIL's capture.<sup>107</sup> These were the first US operations in Iraq since 2011 when they pulled out of the war in Iraq and prompted further European involvement against the insurgent group.<sup>108</sup>

**Figure 3. ISIL Propaganda featuring Mosul Dam.**



Photos retrieved from UN Security Council CTED Trends Report March 2017

September and October 2014 marked ISIL's consolidation of control over the Anbar province of Iraq, specifically the midpoint of Hit between Ramadi and Haditha.<sup>109</sup> This corresponded with ISIL's quest for the Haditha Dam (Figure 2.). The 'Southwestern Baghdad Belts' had been an ISIL stronghold including Jurf al-Sakhar, Farisiyah, Fadhiliyah, Abu Ghraib, and Amiriyat al-Fallujah; however, Iraqi Security forces were struggling to maintain control of Amiriyat al-Fallujah which was crucial for their strength.<sup>110</sup> Their stronghold in Mosul fell before the June attack on Mosul dam, but it is noted that this could have been in order to preserve the surprise of their great attack.<sup>111</sup>

**Figure 4. Institute for the Study of War ISIS Sanctuary Map December 8, 2016**

Institute for the Study of War (2016, December 6).

In October 2014, ISIL captured the city of Hit between Ramadi and Haditha, as previously targeted, and sought to take Ramadi.<sup>112</sup> In December 2014, ISIL conducted simultaneous attacks on Iraqi Security Forces in Haditha and Ramadi in their widespread ground offensive to capture Ramadi.<sup>113</sup> In December 2014, the UN reported that ISIL had intentionally contaminated drinking water with crude oil in the Governorate of Salahaddin as well as in Aleppo, Deir ez-Zor and Raqqa (Figure 4.).<sup>114</sup> During this time, Kurdish SDF forces pushed ISIL's presence to the periphery of Raqqa; however, ISIL expanded greatly in the Hasaka province and surrounding Damascus in Syria near where the Salahaddin contamination took place.<sup>115</sup> ISIL also saw losses in Mosul in January 2015 and launched another attack on Mosul Dam (Figure 4.); however, the militant group was not able to capture the dam.<sup>116</sup> Peshmerga soldiers and Sunni tribal groups near Mosul prevented this attack leading ISIL to declare new governorates in nearby Jazeera and Zaab in a defensive mobilization around Mosul.<sup>117</sup>

Iraqi forces conducted a major offensive to take back areas around Tikrit and Baiji from November 2014 through March 2015.<sup>118</sup> ISIL took partial control of the Samarra dam (also known as Al-Thirthar dam) in Samarra, Iraq in late April 2015 (Figure 4.).<sup>119</sup> Iraqi forces announced an

increased offensive to take back the Anbar province, but this attack majorly decreased their progress.<sup>120</sup>

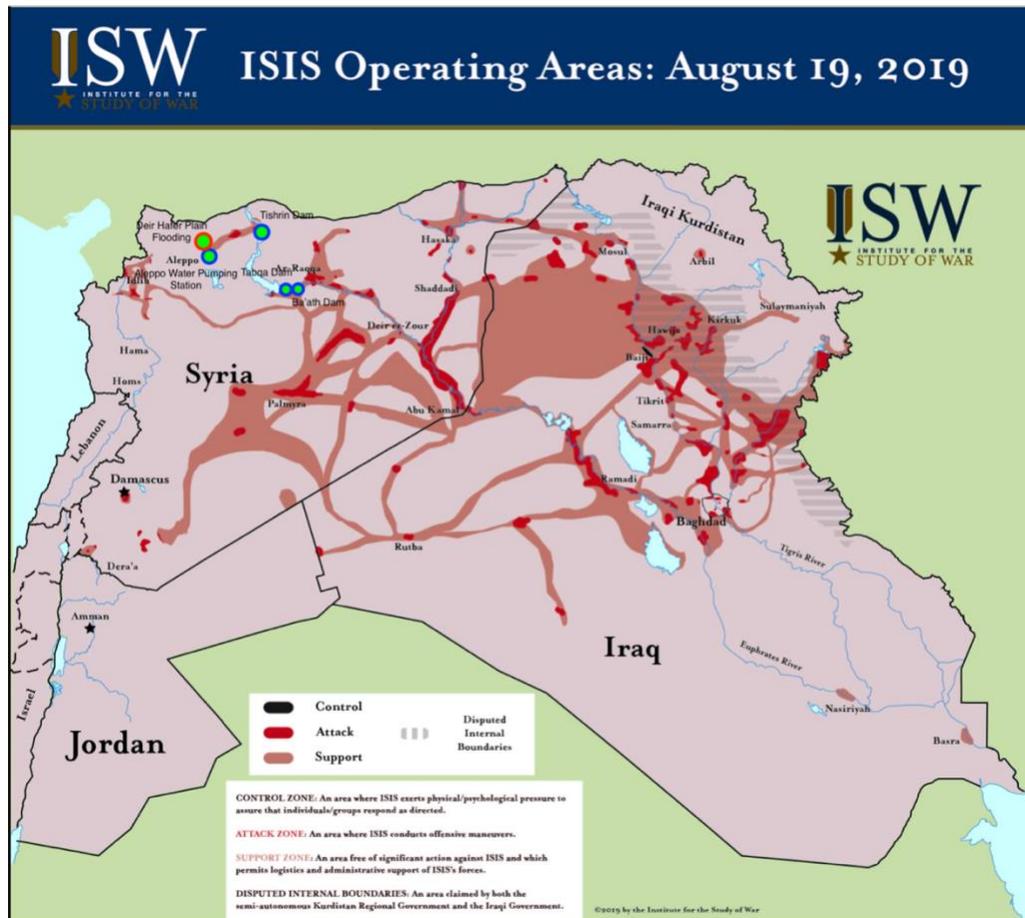
ISIL seized Ramadi dam (Figure 4.) in May of 2015 and weaponized this water by cutting off pro-government towns downstream on the Euphrates River.<sup>121</sup> This followed ISIL's conquest of Ramadi which finally fell on May 27, 2015 after many months of ground attacks against Iraqi forces (Martin, 2015). The militants manipulated the dam by only opening two or three of the dam's gates per day rather than the twenty-six possible.<sup>122</sup> This lowered the depth of the river allowing ISIL soldiers to cross and strike pro-government towns of Husaybah and Khalidiyah, most importantly located near the Habbaniya military base.<sup>123</sup> Additionally, there were threats to cut off drinking and irrigation water to the local population reportedly causing thousands to go without drinking water in the height of the summer heat.<sup>124</sup> 800 Iraqi federal forces were deployed to combat ISIL following a major Iraqi government operation tasked to take back the Anbar province, of which Ramadi is the capital.<sup>125</sup> There were reports of families fleeing the militants' control; however, the reports vary from dozens to 300 families.<sup>126</sup>

In September of 2015, Russia began its direct intervention in Syria enabling the Syrian regime to mount renewed offensives against the caliphate.<sup>127</sup> Islamic Revolutionary Guard Corps and proxy forces initiated a prolonged offensive on the city of Aleppo.<sup>128</sup> US backed SDF forces also made major gains along the Syria-Iraq border in Al-Hawl and Sinjar provinces.<sup>129</sup> The SDF were also advancing toward the Southern Hasaka province seeking to liberate areas of the Ar-Raqqa province.<sup>130</sup> On December 23, 2015 in this SDF offensive to liberate ISIL controlled towns along the Euphrates River, the forces regained control of the Tishrin Dam (Figure 4.).<sup>131</sup>

ISIL continued to lose terrain in Iraq and Syria throughout the early months of 2016. Iraqi Security Forces resealed the city of Hit in the Anbar Province on April 14 as part of continual operations to secure the Euphrates River Valley.<sup>132</sup> In May, ISIL lost territory in Iraq but claimed an attack on Wilayat Sahel, on the Northwestern coast of Syria, located in regime territory.<sup>133</sup> ISIL combatants initiated complex suicide attacks in deep regime territory in Tartus City and Jableh on May 23, 2016 and indicated they were escalating assaults against Alawite communities on the coast of Syria in order to aggravate existing sectarian tensions during the month of Ramadan.<sup>134</sup>

On June 13, 2016 Iraqi forces regained control of the nearby Fallujah dam (Figure 4.), which ISIL took in early 2014, following an Iraqi quest to liberate the city of Fallujah on May 23.<sup>135</sup> ISIL also capitulated the city of Manbij and the town of Al-Rai in Northern Aleppo Province in a chain of victories for the US-backed anti-ISIL coalition in July.<sup>136</sup> Simultaneously, the Iraqi Security Forces sustained conditions for future operations to retake Mosul.<sup>137</sup> These areas under ISIL control in Mosul, Raqqa and Al-Bab were weakened in October by increasingly strong anti-ISIL operations.<sup>138</sup> In retaliation to the encroaching Iraqi forces, on November 29, 2016 more than 650,000 Iraqis were without water in Mosul after ISIL struck one of the three major water pipelines (Figure 4.).<sup>139</sup> It was reported that the militant group cut electricity to the water stations feeding neighborhoods where Iraqi troops were advancing in the operations by Iraqi Security forces to liberate Mosul that began in October.<sup>140</sup>

### Figure 5. Institute for the Study of War ISIS Sanctuary Map August 19, 2019



Institute for the Study of War (2019, October 12).

In late December 2016, Iraqi officials announced that they had control over Ramadi Dam and the surrounding town (Figure 5.).<sup>141</sup> ISIL initiated offensives in January 2017 against the Syrian regime in Deir ez-Zour, the Eastern Homs province, and the Eastern Damascus province, capitalizing on the regime's focus on Aleppo and aiming to offset or redirect regime operations near Al-Bab.<sup>142</sup> ISIL flooded villages in Deir Hafer Plain in East Aleppo, Syria (Figure 5.) in response to a raid by the Syrian Arab Army.<sup>143</sup> The militant group pumped water from Assad Lake into Al-Jar Channel.<sup>144</sup> This advancement by the Syrian Army put them within the ISIL stronghold of Deir Hafer for the first time since the creation of the caliphate.<sup>145</sup> Regime forces began to chip away at ISIL's territorial gains in Homs province in mid-February and ISIL capitulated additional terrain in Mosul, Iraq to the US-led anti-ISIS coalition in early 2017.<sup>146</sup>

ISIL suffered territorial losses in Iraq and Syria between February 27 and March 9, 2017.<sup>147</sup> Pro-regime forces retook Palmyra, Syria with reinforcements from Iranian, Russian, and Lebanese Hezbollah forces on March 2.<sup>148</sup> Pro-regime forces acquired additional towns from ISIL in the Northeast Aleppo province between March 7 and March 9.<sup>149</sup> Syrian regime forces recaptured the key water pumping station in Aleppo, Syria (Figure 5.) after inhabitants had been without water for two months since ISIL had cut the pipeline.<sup>150</sup> ISIL seized the facility in January, 2014 (Figure 5.).<sup>151</sup>

In May 2017, US-backed forces continued to advance in major ISIL strongholds in Mosul, Iraq and Raqqa, Syria.<sup>152</sup> Iraqi Security forces encircled the city of Mosul and US-backed SDF

forces captured the city of Tabqa.<sup>153</sup> The Syrian Democratic Forces and US troops launched an offensive in March against ISIL holding Tabqa Dam, a key source of hydroelectricity for the caliphate.<sup>154</sup> On May 10, 2017 reports indicated that drone footage showed the dam completely under SDF control (Figure 5.).<sup>155</sup> Both Tabqa and Tishrin Dams were re-operational under the Syrian government in June 2018 (Figure 5.).<sup>156</sup> NATO leaders also formally negotiated a partnership in the Anti-ISIS Coalition in Iraq and Syria during the NATO Summit on May 25 in Brussels, announcing that NATO will increase its "airspace management" and aerial refueling mission for coalition aircraft and expand its deployment of special forces teams to train local ally forces.<sup>157</sup> As ISIL within Iraq had largely been defeated, regional actors continued to vie for control of post-ISIL Iraqi reconstruction.<sup>158</sup>

In June of 2017, US-backed SDF forces regained control of the last dam under ISIL control, the Ba'ath Dam (Figure 5.).<sup>159</sup> This came within the SDF's major offensive to take back Raqqa, which they achieved in October of that year.<sup>160</sup> In September, Syrian pro-regime forces continued to attack Deir ez-Zor province with the support of heavy bombardment by the US and Russia and also launched offensives to clear out the Iraq-Syrian border.<sup>161</sup> This offensive from Deir ez-Zor continued down the Euphrates river to continue liberating towns.<sup>162</sup> Additionally, the US Anti-ISIS coalition withdrew from its outpost on the Syrian-Iraqi border near Homs as part of a de-confliction agreement.<sup>163</sup> In July 2017, a de-escalation zone in Southern Syria was brokered by the US, Russia and Jordan.<sup>164</sup> On October 20, the SDF declared victory over ISIL in the city of Raqqa, Syria.<sup>165</sup>

In early 2018, Israel announced its support for the new opposition offensive against ISIL in Syria entitled "Battle of Conquerors" and reportedly contributed cross border shelling from the Golan Heights.<sup>166</sup> The coalitions continued offensives against ISIL in the Deir ez-Zor province of Syria.<sup>167</sup> In May of 2018, Syrian pro-regime forces announced the complete control of Damascus after the evacuation of the last remaining pocket in the capital city.<sup>168</sup> Additionally, the US-led coalition launched Operation Roundup in order to "destroy IS" in Eastern Syria.<sup>169</sup> In December of 2019, President Donald Trump announced the withdrawal of troops from Syria and in January, US troops were spotted removing military equipment from Northern Syria.<sup>170</sup> This movement came after US troops prepared to clear the final pocket of ISIL held territory in the Deir ez-Zor province of Syria.<sup>171</sup> ISIL lost its last territorial zone in Syria on March 23, 2019 after it was seized by SDF forces.<sup>172</sup>

Looking forward after the 'defeat' of the caliphate, it was estimated that ISIL still had over 30,000 fighters located within Iraq and Syria in August 2018 based on a report by a defense intelligence agency.<sup>173</sup> After the widely successful offensives, it was presumed that ISIL deliberately pulled back, relocating the majority of combatants and their families from Mosul, Raqqa, and other prominent cities into new and previously known support zones in Iraq and Syria.<sup>174</sup> ISIL forces are now scattered across Iraq and Syria and are still an existing security threat.<sup>175</sup> ISIL also preserved their global finance network which enabled their ability to transition back to an insurgency, additionally, retaining ample weaponry and other resources in alleged tunnel systems and other support mechanisms in order to equip its revived insurgent force in the future.<sup>176</sup> On May 31, 2019, ISIL declared the start of a new global campaign called the 'Battle of Attrition' instructing their followers to seize terrain temporarily as a way to erode their opponents.<sup>177</sup> ISIL has also made great strides in its ability to campaign both in Iraq and Syria and abroad which enables it new opportunities.<sup>178</sup> A successful reestablishment of a physical caliphate in Iraq and Syria could yield new surges of ISIL attacks in Europe and give the opportunity for legitimization of ISIL's inevitable long-term victory narrative.<sup>179</sup>

## **Conclusion**

This paper explored the capacity of climate change to shift the power dynamic between nation-states and violent non-state actors within their borders. The water weaponization of ISIL in Iraq and Syria shows the ability of manipulating water resources in a water scarce and politically unstable environment to strengthen the role of violent non-state actors. Fourteen acts of water weaponization were identified and chronologized along with any subsequent state actions to reconcile these water resources. These acts of water weaponization were mapped in order to correlate ISIL's use of water as a weapon with the acquisition and loss of territory within their caliphate in Iraq and Syria. Analysis of these acts showed a swell of weaponization acts before the establishment of the caliphate and during its territorial strength from 2012 through 2015 and the demise of both the frequency of weaponization acts and the territory held by the caliphate from then until 2019.

These findings show a link between the effects of climate change and the increased opportunity for violent non-state actors through the weakening of the nation-state. Furthermore, this case shows the vulnerability of states to VNSAs while under environmental and political stress. Although the caliphate was 'defeated', ISIL remains a continued security threat and the strategy of water weaponization could be used to reestablish territorial control over other water scarce regions. Similar tactics have been seen throughout Africa, Southeast Asia and other areas within the Middle East, and this strategy could become widespread as climate change impacts increase.

The offensives to take back resources acquired by ISIL through water weaponization were enabled by the involvement of outside international actors including the US, Russia, NATO, Israel and Iran who provided military-training, funding and weaponry to strengthen on the ground forces in Iraq and Syria. Following the demise of the caliphate, international support withdrew and coincided with a shift towards controlling the reconstruction of post-ISIL Iraq and Syria. The success of the reconstruction and strengthening of these states will become a key predictor in ISIL's potential resurgence in the region. Additionally, as climate change effects increase, this strategy could become widespread and used by other groups taking the lead of ISIL. The strengthening of both central governance and authority over water infrastructure is vital for future security and counterterrorism measures, especially in water scarce regions affected by climate change.

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