

Water, Conflict and Cooperation: *Geographical Perspectives*

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This article addresses the question of whether water as a geographic feature enhances the likelihood that a state would go to war. Over the past few decades, geopolitical literature on water's role in international conflict has increased, and the 1990s have seen a turn toward considering water in terms of cooperation, rather than conflict. Drawing on a vast literature on geography's role in international relations, and analysing key concepts of 'hydro-strategic territory' and 'environmental security', the article examines the validity of this claim. Through a critical examination of the hydropolitics of the Middle East, it is established that while water may be a source of international tensions, it is more often the subject of intense negotiation than an object or cause of armed conflict.

The 261 international rivers, covering almost one half of the total land surface of the globe, provide ample opportunity for political tensions. Given water's pre-eminence as a critical resource, and one whose management is especially poorly defined in the international arena, it is of little surprise that 'water' and 'war' are being assessed together with increasing frequency. Over the past few decades, geopolitical literature on water's role in international conflict has increased. This theme is also evident in literature on environmental security. The 1990s, however, have seen a turn toward considering water in terms of cooperation, rather than conflict.

Historically, water has links to both conflict and cooperation, though often the division between the two is unclear. The word *rival*, for example, originates from the Latin, *rivalis*, which refers to those living on the same stream. Conflict over water appears in Chapter 26 of the book of Genesis, where the herdsmen of Gerar strove with the herdsmen of Isaac over control of water wells. Other ancient links between water and conflict may be found in the writings of Herodotus, who describes how the Persians surrendered, after they had been cut off from their wells and water tunnels.¹ Despite water's links to conflict, Jerome Delli Priscoli argues

that the development of irrigation systems contributed to the development of communities and of civilisation itself. 'Indeed, water may actually be one of humanity's great learning grounds for building community'.²

What is the role of water in international affairs; a cause of war, a builder of communities, or something else altogether? Until recently, geopolitical literature said little about water in its discussions of international conflict. Geopolitical literature continued to focus on issues of territorial organisation and power, the nation-state, and territory and population. Where water appears in geographical literature it is as part of economic development, most notably in human geography, resource management, and natural hazards studies. It is only in the last two decades that geopolitical scholars have turned their attention to water as a cause of war. Their research reflects environmental determinist thinking, as well as more elaborate conceptualisations of the role of water in international conflict and cooperation.³

Is the access to and control of water resources considered 'vital' enough for war? That is to say, does territory exist over which sovereignty has been sought politically or militarily, or which would be insisted upon in the course of current territorial negotiations, solely because of its access to water sources, and in the absence of any other compelling strategic or legal rationale? Such a territory would be considered 'hydrostrategic', i.e. land territory which has strategic value solely for its access to water resources.

A closer look at the cases most commonly cited as conflicts reveals on-going dialogue, creative exchanges, and negotiations leading fairly regularly to new treaties. The question which emerges, which is arguably more interesting than where 'water wars' will break out, is, given all of the seemingly conflict-inducing characteristics of transboundary waterways, why has so little international violence taken place? The Middle East encompasses both the worst and the best of international water resources. The region, therefore, provides an excellent opportunity to explore water's role in violent conflict, and more importantly, in creative cooperative solutions to sharing international water resources.

Water and conflict, and water and cooperation

While the study of international relations in the early half of the 20th century emphasised geographic attributes in its explanations of state actions, with the end of World War II and the beginning of the nuclear age, geographic concerns received less attention in strategic thinking. The last few decades, however, have witnessed renewed interest in the study of geography as a key component in international relations – with an emphasis on international conflict.⁴ Recent literature discussing international conflict links resource scarcity, population growth, political instability, and conflict.⁵ A recurring theme in this literature is that of 'resource geopolitics' – that is, vital and scarce resources which cross political boundaries present sources of conflict. As scarcity increases, so too does the potential for conflict.⁶

In particular, there is a growing literature that describes water as both a historic and, by extrapolation, future cause of interstate warfare.⁷ Arthur Westing suggests

that 'competition for limited...freshwater...leads to severe political tensions and even to war'.⁸ Peter Gleick describes water resources as military and political goals, using the Jordan and the Nile as examples.⁹ Wilfried Remans uses case studies from the Middle East, South Asia, and South America as 'well-known examples' of water as a cause of armed conflict.¹⁰ Paul Samson and Bertrand Charrier write that 'a number of conflicts linked to freshwater are already apparent', and suggest that 'growing conflict looms ahead'.¹¹ Kent Butts suggests that 'history is replete with examples of violent conflict over water,' and names four Middle Eastern water sources particularly at risk.¹² Thomas Homer-Dixon, citing the Jordan and other water disputes, comes to the conclusion that 'the renewable resource most likely to stimulate interstate resource war is river water.'¹³

The May 1991 issue of *Geographical Magazine* ran a series of articles relating to 'water wars' and hydropolitics, including a piece on the Middle East, 'where conditions for water-related tension are perfect'.¹⁴ Authors writing in this vein cite the importance of aridity, internationally shared rivers, rapid population growth, and unfriendly political relations among the riparian states. Aridity and population growth appear often key contributors to potential 'water wars', in a modified form of environmental determinism, which conceptualises that environmental factors strongly influence human actions. In a similar fashion, other articles, such as 'Where Dams Cause Wars', link water development projects 'in the parched regions of the world' with the potential for violent conflict.¹⁵

A closer examination of case studies cited as historic interstate water conflict suggests some looseness in classification. Samson and Charrier (1997), for example, list eighteen cases of water disputes, only one of which is described as 'armed conflict'.¹⁶ That particular case, on the Cenepa River, is actually not about water at all, but rather about the location of a shared boundary that happens to coincide with the watershed. Armed conflict did not take place in any of Remans' (1995) 'well-known' cases (save the one between Israel and Syria, described below), nor in any of the other lists of water-related tensions presented.¹⁷

The examples most widely cited are wars between Israel and her neighbours. Westing lists the Jordan River as a cause of the 1967 war and, in the same volume, Malin Falkenmark, mostly citing John Cooley, describes water as a causal factor in both the 1967 war and the 1982 Israeli invasion of Lebanon.¹⁸ Norman Myers, citing Middle East water as his first example of 'ultimate security' writes that 'Israel started the 1967 war in part because the Arabs were planning to divert the waters of the Jordan River system'.¹⁹ In fact, in the years since Israel's invasion of Lebanon in 1982, a 'hydraulic imperative' theory, which describes the quest for water resources as *the* motivator for Israeli military conquests, both in Lebanon in 1979 and 1982 and earlier, on the Golan Heights and West Bank in 1967, was developed in the academic literature and the popular press.²⁰

The only problem with these theories is a complete lack of evidence. While shots were fired over water between Israel and Syria in 1951-1953 and 1964-1966, the final exchange, including both tanks and aircraft on July 14, 1966, stopped Syrian construction of the diversion project in dispute, effectively ending water-related tensions between the two states. The 1967 war broke out almost a year later.

The 1982 invasion provides even less evidence of any relation between hydrologic and military decision-making. In extensive papers investigating precisely such a linkage between hydro-strategic and geo-strategic considerations, both Stephan Libiszewski and Aaron Wolf conclude that water was neither a cause, nor a goal, of any Arab-Israeli warfare.²¹

It should be noted, however, that this analysis only describes the relationship between interstate armed conflict and water *as a scarce resource*. Both internal disputes as well as those where water was a means, method, or victim of warfare, are excluded. Also excluded are disputes where water is incidental to the dispute, such as those about fishing rights, access to ports, transportation, or river boundaries. Many of the authors, notably Gleick, Libiszewski, and Remans, are very careful about these distinctions.²² The bulk of the articles cited above, then, turn out to be about political tensions or stability rather than about warfare, or about water as a tool, target, or victim of armed conflict – all important issues, just not the same as ‘water wars.’

The views of water as a source of conflict contrast with the views of water as a source for peace and development prevalent in the 1950s. George Cressey, then President of the Association of American Geographers, described the role of geographers as providing knowledge about water resources in a region, in order to facilitate development. ‘The contribution of geography is to integrate and weigh all the [hydrographic] factors, physical and cultural, and to present a total budget of [water] assets and liabilities’.²⁴ This branch of research has not disappeared and is, in fact, regaining prominence. There appears to be renewed discussion in geographic literature of water as a vehicle for peace and an area of possibility for preventive diplomacy. This shift is a welcome change from geopolitical literature that emphasises violence and conflict and leaves no room for negotiated solutions.

In May 1994, the International Geographical Union (IGU) held a symposium in Basle, Switzerland, on *Political Boundaries and Coexistence*. Papers at this symposium covered a broad range of border-region topics. William Barnard (1994), for example, evaluates the changing nature of the Lower Orange River – the most stable territorial boundary in Southern Africa – and its impact on development in the region, particularly with regard to water resources.²⁶ According to Barnard, the region's inhabitants have largely disregarded the river's role as an international boundary, as they have jointly shared its resources. All the conference papers shared the common theme of coexistence and possible cooperation, rather than conflict, across international boundaries.

Empirical evidence supports this theme of cooperation. In modern history, only seven minor skirmishes have occurred over international waters, and invariably other inter-related issues also factor in. Of those seven skirmishes, none escalated to war. In each case, armies backed down and the conflict was dealt with by other means. In fact, there has only ever been one war fought over water, that between the Sumerian city-states of Lagash and Umma, in 2,500 BC.²⁷ Conversely, over 3,600 treaties have been signed over different aspects of international waters, almost 150 in this century which deal with water *qua* water, many showing tremendous elegance and creativity in dealing with this critical resource.²⁸

This is not to claim a historical absence of water-related violence. However, such incidents occurred at the sub-national level, generally between tribe, water-use sector, or state. Examples of such incidents range from interstate violence and death along the Cauvery River in India, to California farmers blowing up a pipeline meant for Los Angeles, to much of the violent history in the Americas between indigenous peoples and European settlers. Moreover, one need look no further than relations between India and Bangladesh and the issue of the Farakka barrage, to note that internal instability can both be caused by, and exacerbate, international water disputes.²⁹

So, while no 'water wars' have occurred, there is ample evidence to suggest that the lack of clean freshwater occasionally has led to intense political instability and that, on a small scale, acute violence can result. What we seem to be finding, in fact, is that geographic scale and intensity of conflict are *inversely* related.

Geopolitical literature and war

In response to questions concerning the links between natural resources and international conflict, there has been a call for political geography and international relations literature to think more broadly.³⁰ Writings in political geography tend to elaborate on proximity, diffusion, shared borders, and territorial values in their discussions of war. Cold War power struggles and related issues remain a dominant theme in the literature. Political geography, at least in the 1970s and 1980s, continued a focus on 'old' themes, 'such as territory and population; territorial organisation and power; ... core areas; boundaries; the unitary state; the federal state; and capital cities'.³¹ In part, this focus may be related to geography's close ties to war.

The establishment of geography as a university discipline towards the end of the 19th century is closely tied to exploration and the expansion of nation-states. As Neil Smith comments in a discussion on the historical and philosophical relationship between practitioners of geography and practitioners of war: 'The military uses of geographic knowledge are as old as war itself ... and integrally related to state-building and imperial pursuit'.³² In these early days of the discipline, geographers were more prescribers of policy rather than consulted scholars.

Geography's role in conflict: influence, facilitator, source

A number of theoretical frameworks have influenced conceptions of geography and war. While none of these frameworks contend that geography plays an exclusive or primary role in the cause of war, each assigns a prominent role to geography. Paul Diehl categorises these frameworks into three: geography as influence, facilitator, or source of conflict.³³

Geography as influence is epitomised by Starr's concepts of 'opportunity' and 'willingness,' which refer to the possibility for interaction between nations, and how desirable a policy-maker perceives a decision option. Both opportunity and willingness are influenced by geographic and environmental factors, and both are considered necessary in order for a decision to go to war to be made. Starr's concepts build on the 'environmental possibilism' of Sprout and Sprout, which

describes how a state's physical and social situation enhances or inhibits particular international actions.³⁴

The second conceptual category sees geography's role in conflict and cooperation as a facilitating condition, in which proximity and the number of shared borders a state possesses influence the likelihood of war. The third conceptualisation regards geography as a source of conflict and is concerned with the conditions that surround territorial disputes. It is here that discussions of hydrostrategic territory and resource geopolitics come into play, though only in recent studies.³⁵ Geography as a source of conflict concerns the frequency or likelihood of border disputes as indicated by the distribution of power, or change in the relative power of the states involved.³⁶ Focusing on the characteristics of the territory, others relate the indicators of conflict to the value of the resources within a territory, i.e. how 'vital' the territory is perceived to be.³⁷

*Borders, boundaries, and hydrostrategic territory*³⁸

Geographers have considered water's military - strategic role and its function, as both a physical and political boundary. Prescott defines boundaries as 'the line of physical contact between states' and points to these lines as both opportunities for conflict and for cooperation.³⁹ Water, as a unique natural resource, has caused its share of boundary conflicts. Stephen Jones is the first in the literature on boundaries to detail the conflict-inducing aspects of international rivers, notably the difficulty in allocating the water of a shared river.⁴⁰ Prescott describes disputes over water bodies which mark or cross a boundary, including territorial waters, as the most common source of functional boundary disputes.⁴¹

Johnson, Broek and others have pointed out problems unique to river boundaries, including the difficulty in accommodating geomorphic change and the fact that rivers often flow through heavily populated areas. Distinguishing between 'hydrostrategy', the influence of the location of water resources on strategic thinking, and military strategy, defined concisely by one military officer as 'from where are they shooting and from where will we shoot back', can be difficult.⁴² A river, for example, serves as a valuable barrier against tanks and troop movements, and, as clear landmarks, rivers often delineate boundaries. High ridges, ideal for military positioning, are also often local watershed boundaries.

It is precisely these contrasting elements of water sources – their role in delineating boundaries, their strategic value in the traditional sense, and their functional value in a domestic sense – which informs the definition of hydrostrategic territory. 'Hydrostrategic territory' is that territory which has strategic value *primarily* because of its access to water resources for irrigation, drinking and/or electric power. This territory is distinguished from strategic territory in a traditional military or political sense.

Geography and environmental security

Geography-security relationships are also discussed in terms of the concept of environmental security, which considers links between the environment, natural resources, and violent conflict. The environmental security concept gained

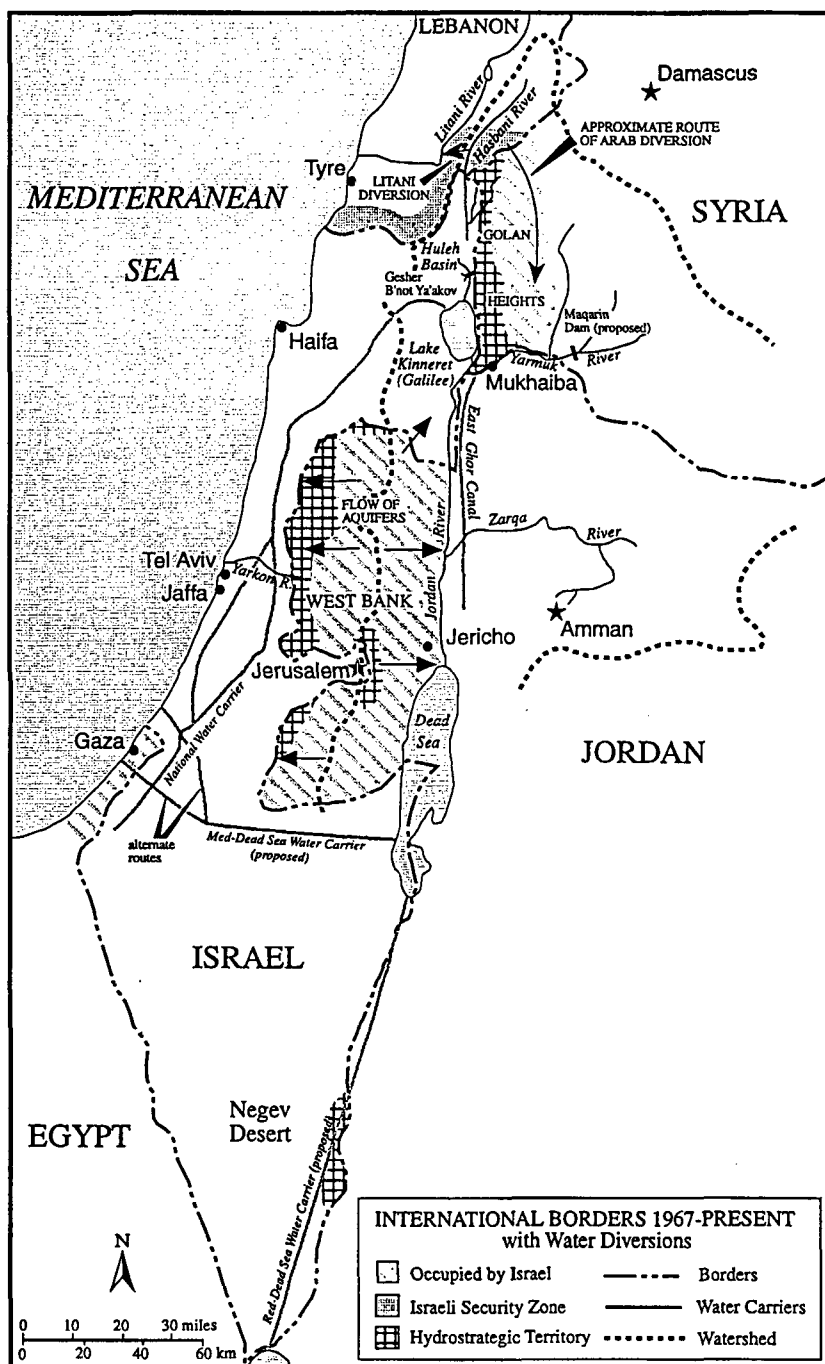
prevalence at the end of the Cold War, when several scholars began to consider the inclusion of environmental concerns in the concept of international security.⁴³ Researchers in the environmental community are debating such questions as: If environment is a security issue, for whom is that security – individuals, the nation state, the earth? What, if any, relationship is there between environmental change and violent conflict? What are the most effective fora for dealing with environmental security concerns?⁴⁴

Like in recent geopolitical literature, researchers are questioning environmental security's emphasis on conflict. Is environmental security an appropriate approach for addressing international environmental concerns? Advocates of environmental security hope to shift the political and economic resources that traditionally have supported security threats to support environmental concerns. Nevertheless, while many argue that resources and environmental issues may lead to increasingly dangerous international conflicts, others maintain that linking environmental concerns with national security merely serves to reproduce outdated mindsets and fails to address the new realities of current and future environmental challenges. Deudney argues that the security concept developed from a military perspective – in which 'threats are focused, ... discreet and amenable to technological and relatively straightforward social responses'. Environmental threats, on the other hand, are 'rarely so easily compartmented'.⁴⁶ Therefore, one should not enlarge the scope of security without first rethinking its fundamental underlying assumptions.

Water and the Arab-Israeli peace negotiations

The history of hydropolitics along the rivers of the Middle East exemplifies both the worst and best of relations over international water. The Jordan River Basin is a complex hydrological system shared by four states; Jordan, Lebanon, Syria, and Israel and the Palestinian Authority. All of these riparian countries and territories currently use between 95% and more than 100% of their annual renewable supply of freshwater. During recent dry years, water consumption often exceeded the renewable supply, with the difference coming from overdrafting of fragile groundwater sources. Withdrawal of water from the river basin exceeding that of its natural recharge rate decreases available renewable water resources. This decrease is exacerbated by accompanying pollution from industrial, domestic and agricultural waste.⁴⁷

Israel, Jordan and the Palestinians are particularly dependent upon the water of the Jordan River. Relative to its importance, the actual amount of water in the Jordan River is very small. Considering their current needs, Israel, Jordan, and the Palestinian Authority are at a crisis point. In Israel, pumping of groundwater exceeding the natural recharge rate of the aquifers has led to their contamination, such that there has been a net loss in annual renewable water yield. Certain areas of Jordan, such as in the Jordan valley, are subject to significant water rationing. It is estimated that by 2020, water shortages will be the norm for the region. Projected water requirements for that year range from 2000 million cubic meters (MCM) annually for Israel, approximately 130% of current renewable supplies, 1000 MCM,



or 120% of current supplies for Jordan, and 310 MCM, or 150% of current supplies, for the Palestinians of the West Bank and Gaza.⁴⁸

Unless changes are made in national water policies and movement occurs toward joint cooperative management of the region's water resources, pollution and overuse will continue to decrease net water yield while at the same time that growing populations and economic development will increase water need. Unilateral development of water resources, sufficient in the past, will not meet future water demand. Though all riparians recognise the need for cooperation over water resources, they have, until recently, been unable or unwilling to reach formal agreement.

Hampering resolution of the crisis are the intense geopolitical forces that crafted boundaries that lie in direct contradiction to the natural watershed boundaries of the region. Water-related conflict, for example, informed the borders of the British and French Mandates, later the modern entities of Israel, Jordan, Lebanon, Syria, and the Palestinian Authority. As each of these entities developed their water resources unilaterally, dispute became inevitable. Every state or territory in the Jordan watershed has at least some of its water sources in a different, occasionally hostile, state or territory (see Map 1). Exchanges of fire occurred over water between Israel and Syria in the mid-1950s and 1960s. The 1967 war served to exacerbate such problems.

The West Bank overlies three major aquifers, two of which Israel has been tapping from its side of the Green Line since 1955. In the years of Israeli occupation, a growing West Bank and Gaza population, coupled with burgeoning Jewish settlements, has strained the limited groundwater supply and increased already tense political relations. Palestinians object strenuously to Israeli control of local water resources and to settlement development, which they see as occurring at their territorial and hydrological expense. Israeli authorities view their hydrological control in the West Bank as defensive. With approximately 30% of Israeli water originating in the West Bank, Israelis see limiting groundwater exploitation in these territories as necessary to protect their wells from saltwater intrusion.

Because of the disparate depths of the aquifers of the coastal plain (about 60 metres) compared to the Judean hills (from 150-200 metres in the foothills to 700-800 in the hills), and the resulting cost differences for drilling and pumping of wells in those areas, portions along the westernmost band of the north lobe of the West Bank, in the region of Kalkilya and Tulkarm, are especially vulnerable to overpumping.

The right-wing Likud party gained control of the Israeli Parliament for the first time in 1977. As Israeli Prime Minister Menachem Begin was preparing for negotiations with Egyptian President Anwar Sadat, he asked then-Water Commissioner Menachem Cantor to provide a map of Israeli usage of water originating from the West Bank, along with guidelines as to where Israel might relinquish control, if protecting Israel's water resources were the only consideration. Cantor concluded that a 'red line' could be drawn, beyond which Israel should not relinquish control, north to south following roughly the 100-200m contour line along both 'lobes' of the West Bank. Israeli water planners still refer to

this 'red line' as a frame of reference and it has occasionally been included in academic boundary studies of the region. Others later extended this concept to areas of the northern headwaters and the Golan Heights.

(1) Bilateral and multilateral negotiations

The collapse of the Soviet Union and the 1990 Gulf War realigned political alliances in the Middle East and made possible the first public direct peace talks between Arabs and Israelis in Madrid on October 30, 1991. During the bilateral negotiations between Israel and each of its neighbours, it was agreed that a second track be established for multilateral negotiations on five subjects deemed 'regional,' including water resources. Mutually reinforcing, the bilateral and multilateral tracks have led, at the time of writing, to a peace treaty between Israel and Jordan, and to a declaration of principles for agreement between Israel and the Palestinian Authority. Both agreements have a water component in terms of allocation and projects. In neither has water had any influence on discussions over final boundaries.

(2) The Israel-Jordan treaty of peace

Israel and Jordan have had probably the warmest relations of any two states legally at war. Communication between the two since the creation has ameliorated conflict and facilitated conflict resolution on a variety of subjects, including water. The so called 'Picnic Table Talks' on allocations of the Yarmuk have taken place since the 1950s, and negotiations formulating principles for water-sharing projects and allocations have occurred in conjunction with, and parallel to, both the bilateral and multilateral peace negotiations.⁴⁹ These principles were formalised on October 26, 1994, when Israel and Jordan signed a treaty of peace, ending more than four decades of a legal, if not actual, state of war.⁵⁰

For the first time since the states came into being, a treaty legally defines mutually recognised water allocations. Acknowledging that 'water issues along their entire boundary must be dealt with in their totality', the treaty spells out allocations for both the Yarmuk and Jordan Rivers and Arava/Araba groundwater, and calls for joint efforts to prevent water pollution. Also, recognising 'that their water resources are not sufficient to meet their needs', the treaty calls for ways of alleviating the water shortage through cooperative projects, both regional and international.

The peace treaty also makes some minor boundary modifications. Delineated by Great Britain in 1922, the Israel-Jordan boundary followed the centre of the Yarmuk and Jordan Rivers, the Dead Sea, and Wadi Araba. In the late 1960s and 1970s, Israel occasionally made minor modifications in the boundary south of the Dead Sea to make specific sections more secure from infiltrators. Israel also made modifications in order to reach sites from which small wells might be better developed. Over the last sixteen years, no modifications were made except on the rare occasion that one of these local wells ran dry and had to be re-dug. All of these territorial modifications were reversed and all affected land was returned to Jordan as a consequence of the 1994 peace treaty, although Israel retains rights to the water

which comes from these wells. Moreover, a small enclave of Jordanian territory in the Arava is being leased back to Israel in 25-year increments.

In what will no doubt become a classic modification of the tenets of international law, Israelis and Jordanians invented legal terminology to suit particular local requirements in their 1994 peace treaty. In negotiations leading up to the treaty, Israelis, arguing that the entire region was running out of water, insisted on discussing only water 'allocations'; that is, the future needs of each riparian. Jordanians, in contrast, refused to discuss the future until past grievances had been addressed – they would not negotiate 'allocations' until the historic question of water 'rights' had been resolved.

There is little room to bargain between the past and the future, between 'rights' and 'allocations.' Negotiations reached an impasse until one of the mediators suggested the term 'rightful allocations' to describe simultaneously historic claims and future goals for cooperative projects. This new term is now immortalised in the water-related causes of the Israel-Jordan Treaty of Peace.

(3) The Israel-Palestinian Declaration of Principles and Interim Agreement

On 15 September 1993, the 'Declaration of Principles on Interim Self-Government Arrangements' was signed between Palestinians and Israelis. This declaration called for Palestinian autonomy in, and the removal of Israeli military forces from, Gaza and Jericho. Among other issues, this bilateral agreement called for the creation of a Palestinian Water Administration Authority. Moreover, the first item in Annex III, on cooperation in economic and development programmes, included a focus on cooperation in the field of water, including a Water Development Programme prepared by experts from both sides, which will also specify the mode of cooperation in the management of water resources in the West Bank, and Gaza Strip and will include proposals for studies and plans on water rights of each party, as well as on the equitable utilisation of joint water resources for implementation in and beyond the interim period.

Between 1993 and 1995, Israeli and Palestinian representatives negotiated to broaden the interim agreement to encompass greater West Bank territory. On September 28, 1995, the 'Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip', commonly referred to as 'Oslo II' was signed in Washington, D.C. The question of water rights was one of the most difficult to negotiate, with a final agreement postponed to be included in the negotiations for final status arrangements.⁵¹ Nevertheless, tremendous compromise was achieved between the two sides: Israel recognised the Palestinian claim to water rights, of an amount to be determined in final status negotiations, and a Joint Water Committee was established to cooperatively manage West Bank water and to develop new supplies. This Committee also supervised joint patrols to investigate illegal water withdrawals – their first 'action' was to discover and put a stop to illegal drilling in the area of Jenin in December 1995.⁵²

According to the agreement, Israeli forces withdrew from six Palestinian cities in order from north to south, and from 450 towns and villages throughout the West

Bank. The final status of Israeli settlements in the West Bank has yet to be determined. No territory whatsoever was identified as being necessary for Israeli annexation due to access to water resources. The second and third cities from which Israel withdrew – Tulkarm and Kalkilya – fall well within the ‘red line’ delineated in Israeli studies as being necessary to retain for water security. This lack of correlation between transferred territory and the location of water resources has become ever more apparent. Most recently, the November 1998 agreement reached at the Wye Plantation transferred an additional 13% of the West Bank from Israeli to joint territory (including 3% as a nature preserve), and 14.2% from joint territory to Palestinian control, in a way that superimposes land transfers from both the Oslo II and the Wye negotiations onto a map delineating the most hydrologically sensitive territories of the West Bank. Even a cursory examination shows that ‘hydrostrategic’ considerations are all but ignored in favour of joint management and other creative solutions.

(4) Negotiations between Israel, Syria and Lebanon

At the time of writing, water has not been raised as an issue in official negotiations between Israel and Syria.⁵⁴ Serious bilateral negotiations have only taken place since the autumn of 1995 and, given the influence Damascus has on Beirut, Israel/Lebanon talks are not likely until Israel and Syria make more progress. Israelis had hoped to begin talks on water resources with the Syrians at a meeting in Maryland in January 1996, but the Syrians reportedly refused to broaden the scope.⁵⁵

The basis for Israel/Syria negotiations is the premise of an exchange of the Golan Heights for peace. The discussions thus far have focused on interpretations of how much of the Golan, and with what security arrangements, for how much peace. The crux of the territorial dispute is the question of to which boundaries Israel would withdraw. The boundaries between Israel and Syria have included the international boundary between the British and French mandates (1923), the Armistice Line (1949), and the cease fire lines from 1967 and 1974.

The Syrian position has been an insistence on a return to the borders of June 5, 1967, while Israel refers to the boundaries of 1923. Although it has not been mentioned explicitly, the difference between these two positions is precisely over access to water resources. The only distinction between the two lines is the inclusion or exclusion of the three small areas which made up the demilitarised zone between 1949 and 1967 – Givat Banias, the hill overlooking Banias Springs, the Daughters of Jacob bridge area, and the town of El-Hamma/Hamat Gader – a total of about 60 km². Each of these three territories were included in British Palestine specifically because of their access to the Jordan and Yarmuk Rivers and, since each is a relatively low-lying area with no strategic importance,⁵⁶ their access to water is still considered paramount.

In fact, even before the Israel-Syria negotiations began, a flurry of articles had stressed the importance of water in the Golan Heights. Yehoshua Schwartz and Aaron Zohar advised Israeli retention of the Golan Heights west of the Jordan River watershed line in order to guarantee continued control of both water quantity and

quality.⁵⁷ In a 1994 study, Aryeh Shalev, himself a retired general in the Israeli army, cites five other retired generals on the importance of Israeli sovereignty over the Golan to the protection of water resources.⁵⁸ Even in his small sample, Shalev found a broad spectrum of opinions, from Maj. Gen. (res.) Hofi, who suggested that Israel needed to retain a physical presence on the Golan Heights, to Maj. Gen. (res.) Shafir, who advocated retention of at least the plateau above the Sea of Galilee, to former Chief of Staff Gur who concluded that the water problem could be resolved politically in a peace treaty, and that the territory was not vital. Shalev concluded that Syria would not risk a war with Israel over water, especially since a diversion would take years to construct and would constitute a clear *casus belli*. Shalev argued, that countries involved in water-sharing agreements would want to maintain them.

Conclusions

Accounts of conflict related to water indicate that only seven minor skirmishes have occurred in this century, and that no war has yet been fought over water. In contrast, 145 water-related treaties were signed in the same period. War over water seems neither strategically rational, hydrographically effective, nor economically viable. Shared interests along a waterway seem to consistently outweigh water's conflict-inducing characteristics. Furthermore, once cooperative water regimes are established through treaties, they turn out to be impressively resilient over time, even between otherwise hostile riparians, and even as conflict is waged over other issues.

The Jordan Basin provides a representative example in microcosm. In answer to the question, 'How much of the quest for negotiated boundaries has been influenced by the location of water resources?' the evidence seems to suggest not much. This is not to say that water has been unimportant in each set of negotiations – quite the opposite. The questions of water allocations and rights have been intricate and are being resolved with great difficulty. Nevertheless, with the concluded negotiations between Israel and Jordan, and the ongoing talks between Israel and the Palestinians, and despite the quantity of studies identifying hydrostrategic territory and advising its retention, no territory to date has been retained simply because of the location of water. Solutions in each case have focused on creative joint management of the resource, rather than insistence on sovereignty.

These principles may be played out in negotiations between Israel and Syria as well. While Syria insists on the Armistice Line as it stood on June 5, 1967, Israel is arguing for boundaries based on the 1923 international division between the British and French mandates – the difference being three small areas of vital hydrostrategic importance. Based on the patterns of negotiations between the other co-riparians in the region, once the right people are in the room, and they have a clear mandate to reach agreement, the territorial imperative will be circumvented in favour of principles of joint monitoring and management.

Stephan Libiszewski concludes in a thorough study of water and security in the Middle East, that the Arab-Israeli conflict 'is not primarily a struggle "over water"'.

The conflict is over national identity and existence, and territory, as well as over power and national security'.⁵⁹ In this context, water has played a role but only, it seems, in conjunction with one or more of these over-riding imperatives. The true lesson of the Arab-Israeli experience seems not to be of water as exacerbator of conflict but rather, as the people in the region move from war to peace and the desire for sovereignty gives way to principles of joint management, of water as an incentive for cooperation. As Lord Curzon said in 1907, 'Frontiers are indeed the razor's edge on which hang suspended the modern issues of war and peace'. It is perhaps this latter aspect that needs to be stressed.⁶⁰

- 1 Daniel Hillel, *Rivers of Eden: the struggle for water and the quest for peace in the Middle East*, New York, Oxford University Press, 1994.
- 2 Jerome Delli Priscoli, 'Water and civilization: reframing the debate on water and conflict', a paper delivered at the *Ninth World Water Congress*, Montreal, Canada, September 1-6 1997, p.3.
- 3 Geopolitical literature has considered water in terms of its strategic uses, but these discussions do not examine water's role as a source of conflict. Gleick delineates among water as a military and political goal, as an instrument or tool of conflict, as a target of conflict, and as a cause of conflict due to inequities in water distribution and use.
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- 32 Neil Smith, 'History and philosophy of geography: real wars, theory wars', *Progress in Human Geography*, vol. 16, no. 2, 1992, p. 260. Smith goes on to discuss the use of Geographic Information Systems in military operations.
- 33 Paul F. Diehl, 'Geography and war: a review and assessment of the empirical literature', *International Interactions*, vol. 17, no. 1, 1991, pp. 11-27.
- 34 in Diehl, 'Geography and war'.
- 35 According to Diehl, 'Geography and war', territorial disputes have received little attention from scholars. Diehl's explanations for this lack include a tendency for conflict research to concentrate on superpowers, while territorial disputes often involve non-superpower countries. This emphasis may explain in part why water does not appear much in the literature – since disputes of territory and water specifically were more likely to occur between non-superpower states.
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- 37 Kock, North and Zinnes (1960); Kratochvil (1986); Gochman and Leng (1983), all in Diehl, 'Geography and war'.
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- 43 Peter Gleick, 'The implications of global climatic changes for international security', *Climatic Change*, vol. 15, no. 12, October 1989; Homer-Dixon, 'On the threshold'; Jessica Tuchman Mathews, 'Redefining security', *Foreign Affairs*, vol. 68, no. 2, 1989, pp. 162-77; Norman Myers, 'Environment and security', *Foreign Policy*, vol. 74, Spring 1989; Westing, ed., *Global resources and international conflict*; Richard H. Ullman, 'Redefining security', *International Security*, vol. 8, no. 1, 1983.
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- 46 Deudney (1991), as paraphrased in Dalby, 'Ecopolitical discourse', p. 511.
- 47 Sharif S. Elmusa, *Water conflict: economics, politics, law and the Palestinian-Israeli water resources*, Washington D.C., Institute for Palestine Studies, 1997.
- 48 Elmusa, *Water conflict*.
- 49 For further detail on the bilateral and multilateral talks on water, see Peters (1996).
- 50 These boundaries may represent the first to be legally defined by Universal Transverse Mercator (UTM) co-ordinates measured using a Global Positioning System.
- 51 'Oslo II' estimates the future needs of West Bank Palestinians to be 70-80 MCM/yr. Until a final arrangement is negotiated, the two sides agree to co-operate to find a total 28.6 MCM/yr. for the interim period.

- 52 *Israel Line*, December 20, 1995.
- 53 Many thanks to Robert Tobys, a geography student at Oregon State University, for bringing his cartographic skills to bear on this intricate problem.
- 54 In unofficial 'Track II' discussions, water was the focus of meetings where Israelis and Lebanese were present as early as 1993, and where Israelis and Syrians participated in 1994. Participants at these meetings did not necessarily have any official standing.
- 55 *Israel Line*, January 24, 1996.
- 56 One might argue that the hot springs at Hamat Gader offer economic benefits, but these are relatively minor.
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- 58 Aryeh Shalev, *Israel and Syria: peace and security on the Golan Heights*, Jaffee Center for Strategic Studies, Study #24, Jerusalem, The Jerusalem Post, 1994.
- 59 Libiszewski, *Water disputes*, p. 93.
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- 61 John O'Loughlin and Henning Heske, 'From 'Geopolitik' to 'Geopolitique': converting a discipline for war to a discipline for peace', in *The political geography of conflict and peace*, London, Bellhaven Press, 1991, p. 52.