

**TRANSBOUNDARY GROUNDWATER MANAGEMENT:
OPPORTUNITIES UNDER INTERNATIONAL LAW FOR
GROUNDWATER MANAGEMENT
IN THE UNITED STATES-MEXICO BORDER REGION**

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I. INTRODUCTION

The management of shared watercourses has historically drawn nation states to the bargaining table to insure navigation rights or when critical water resources were threatened by the actions of another nation.¹ The damming of a river for irrigation or municipal water supply by an upstream party that visibly reduced the flow to the downstream nation caught the attention of the downstream party and resulted in a call to either restore the water (or water quality) or jointly regulate use of the watercourse. In general, the willingness of the upstream party to temper its actions depended on its perception of national self-interest; unless the downstream party offered sufficient trade or other economic benefits or posed a credible military threat, the upstream party had little need to collaborate.²

In the case of international boundary waters, that is, waters that define at least for part of their course the boundary between two countries, the parties have a more immediate and compelling incentive to come to an understanding because both would likely suffer the consequences of obstacles to free navigation or the deterioration of water quality or quantity by the unregulated activities of either or both parties.³ This self-interest is mutual to the extent that the resource itself is

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1. See LUDWIK A. TECLAFF, *THE RIVER BASIN IN HISTORY AND LAW* 26-42 (1967) [hereinafter TECLAFF, *THE RIVER BASIN*]. In his comprehensive study of river basins, Teclaff notes that the earliest fluvial civilizations depended on the regulation of water resources for agriculture and that the control over navigation was critical to the process of political centralization as well as the source of intermittent conflict. *Id.*

2. This position was advanced by U.S. Attorney General Judson Harmon in response to Mexico's complaint regarding the diversion of waters of the Rio Grande. In an 1895 opinion, Harmon declared that under international law the United States had exclusive interest in the waters of the Rio Grande before it entered into Mexico. *Id.* at 158.

3. This is the case, for example, with the northern boundary of the United States, which for much of its length shares river and lake resources with Canada. The Boundary

knowingly shared. For river systems, the connection is visible and the mutuality is obvious. This is not the case for shared groundwater since aquifers are invisible in their “natural” underground state and the effect of one party’s use is, at least initially, generally imperceptible to the other. Until relatively recently, groundwater was considered to be “a dark, hidden, mysterious realm” distinct from surface waters.⁴ For example, when groundwater comes to the surface it is linguistically transformed into a “stream” or “spring”; that is, it is no longer groundwater and in many countries and jurisdictions becomes subject to a separate and unrelated legal regime for surface water.⁵ The chasm between science and law has created confusion among water users and politicians alike, resulting in the relegation of groundwater to a subordinate position in the legal and regulatory regimes applied to other water resources.⁶

Aquifers have been characterized as underground rivers or lakes by the lay community and were thought to flow under the ground in unseen channels, much like rivers and streams flowed on the surface.⁷ What has been least understood until recent times is the hydrologic linkage between groundwater and surface water.⁸ Rather than existing as two distinct water sources, hydrologists have learned that surface waters may feed or be fed by aquifers as part of the

Waters Treaty of 1909 between the U.S. and Canada establishing the International Joint Committee was an early recognition by the United States of the benefits of collaboration in surface water resource management. This recognition was prompted when Canada, frustrated with U.S. refusal to reconsider a planned U.S. diversion of the St. Mary River into the Milk River at a point where both were in U.S. territory, authorized a diversion from the Milk to the St. Mary at a point where both rivers were wholly in Canadian territory. See JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES* 775 (3d ed. 2000). The Boundary Waters Treaty also provided for free navigation for vessels of both nations within the waters covered by that guarantee. See Treaty with Great Britain Relating to Boundary Waters Between the United States and Canada, Jan. 11, 1909, U.S.-U.K., art. I, 36 Stat. 2448.

4. John E. Thorson, *Visions of Sustainable Interstate Water Management Agreements*, 43 NAT. RESOURCES J. 347, 349 (2003).

5. See SAX ET AL., *supra* note 3, at 343.

6. See ROBERT GLENNON, *WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA’S FRESH WATERS* 29 (2002).

7. Gabriel Eckstein & Yoram Eckstein, *A Hydrogeological Approach to Transboundary Ground Water Resources and International Law*, 19 AM. U. INT’L L. REV. 201, 217 (2003). The authors offer a thorough yet accessible technical presentation of hydrological dynamics and propose six models of aquifer types that have transboundary implications. *Id.* at 207-22, 235-48.

8. See GLENNON, *supra* note 6, at 35-50. In Chapter 3, *How Does a River Go Dry?*, Glennon presents a highly readable explanation of the hydrologic cycle with an emphasis on surface water-groundwater interaction applied to the case of the Santa Cruz River in southern Arizona. Glennon’s account is of particular import since the Santa Cruz and the San Pedro River discussed in Chapter 4 are transboundary waters with linked aquifers.

natural hydrologic cycle.⁹ Recognition of the interrelationship between surface and underground waters is critical to the management of international groundwaters.¹⁰ When groundwater extraction results in a dropping of the water table, surface waters that were once recipients of underground recharge no longer benefit from this inflow of water.¹¹ Pumping of groundwater beyond natural recharge levels creates a cone of depression in the underground aquifer that may reverse the natural flow of water from underground to surface streams and result in the surface water being drawn in to replace the water lost through pumping.¹² As groundwater extraction increases, surface springs may dry up, streams and rivers may become noticeably smaller and slower, and in severe cases the surface waters may cease to flow on the surface, creating dry riverbeds and destroying riparian habitat.¹³

Sharing groundwater resources is one of the most complex and pressing issues along the United States–Mexico border.¹⁴ The United States and Mexico are estimated to share seventeen groundwater basins.¹⁵ These basins are broadly divergent in terms of their hydrologic characteristics, the diversity of aquifer types, and their geographic distribution.¹⁶ For example, some of the groundwater basins include major rivers, such as the El Paso–Ciudad Juárez aquifer known as the Hueco Bolson, that follow the Rio Grande for roughly ninety miles of its route and is shared by New Mexico and Texas in the United States and the state of Chihuahua in Mexico.¹⁷ Other groundwater basins consist of one or more isolated aquifers that do not empty into another outlet, such as the Mimbres aquifer which supplies the town of Columbus and irrigators in Luna County in southwest New Mexico and the communities of Palomas and Ascensión in the municipio of Ascensión northern Chihuahua.¹⁸

Some aquifers are hydrologically linked to smaller watercourses, such as

9. Eckstein & Eckstein, *supra* note 7, at 214-15.

10. Albert E. Utton, *International Groundwater Management: The Case of the U.S.-Mexican Frontier*, in INTERNATIONAL GROUNDWATER LAW 157, 178 (Ludwik A. Teclaff & Albert E. Utton eds., 1981) [hereinafter INTERNATIONAL GROUNDWATER LAW].

11. See SAX ET AL., *supra* note 3, at 350.

12. GLENNON, *supra* note 6, at 45.

13. See *id.* at 35.

14. Stephen P. Mumme, *Minute 242 and Beyond: Challenges and Opportunities for Managing Transboundary Groundwater on the Mexico-U.S. Border*, 40 NAT. RESOURCES J. 341 (2000).

15. Marilyn C. O'Leary, *The Bellagio Draft Treaty as a Tool for Solving Border Groundwater Issues*, 11 U.S.-MEX. L.J. 57 (2003).

16. See, e.g., Dante A. Caponera & Dominique Alh  riti  re, *Principles for International Groundwater Law*, in INTERNATIONAL GROUNDWATER LAW, *supra* note 10, at 25, 47.

17. See J.C. Day, *International Aquifer Management: The Hueco Bols  n on the R  o Grande River*, in INTERNATIONAL GROUNDWATER LAW, *supra* note 10, at 117.

18. See Elaine Moore Hebard, *A Focus on a Binational Watershed with a View Toward Fostering a Cross-Border Dialogue*, 40 NAT. RESOURCES J. 281, 289 (2000).

the Santa Cruz River that runs through Nogales, Arizona and Nogales, Sonora.¹⁹ The San Pedro River basin contains both confined and unconfined aquifers.²⁰ The San Pedro River has its headwaters near Cananea, Sonora and flows north past the Huachuca Mountains and the towns of Benson and Sierra Vista in southern Arizona before joining the Gila River. In the last two examples, the rivers and their linked aquifers flow south to north from Mexico, while other aquifers flow from north to south. In the case of the Mimbres aquifer which receives the bulk of its recharge from the Mimbres River and other sources in the northern part of its basin, studies indicate that the traditional north to south flow of the waters of the aquifer has been reversed due to heavy groundwater pumping.²¹ The pumping has created a massive cone of depression that draws water away from the Mexican communities and farms that depend on the aquifer for their survival to feed expanding agricultural production in the Columbus, New Mexico area.²²

The difficulty of developing a common management framework for the diverse groundwater basins shared by the United States and Mexico is further complicated by the disparate legal regimes found on each side of the border.²³ The Mexican system of water management is centralized – water is considered a national resource subject to central allocation.²⁴ In contrast, water law in the United States is largely determined by each state, and the allocation rules that apply from one state to another vary substantially.²⁵ The lack of a national legal framework for groundwater management in the United States and the disparate rules that govern groundwater allocation at the state level constitute a substantial barrier to the development of a comprehensive solution to transboundary groundwater management.²⁶

19. Barbara J. Morehouse et al., *The Implications of Sustained Drought for Transboundary Water Management in Nogales, Arizona and Nogales, Sonora*, 40 NAT. RESOURCES J. 783, 784 (2000).

20. Eckstein & Eckstein, *supra* note 7, at 213. Unconfined or “water-table” aquifers have an impermeable layer preventing escape of the stored aquifer at the base and permeable materials above. Confined or “artesian” aquifers have, in addition to the impermeable base layer, an impermeable layer above the stored water that, when pierced, propels the compressed water toward the surface. *Id.* at 211-212.

21. Hebard, *supra* note 18, at 296-97.

22. *See id.*

23. Robert D. Hayton, *Institutional Alternatives for Mexico-U.S. Groundwater Management*, in INTERNATIONAL GROUNDWATER LAW, *supra* note 10, at 135, 136-38.

24. *See* Hebard, *supra* note 18, at 311. For an English summary of the key Mexican water law provisions, see CEC, SUMMARY OF ENVIRONMENTAL LAW IN MEXICO, Chap. 9, at http://www.cec.org/pubs_info_resources/law_treat_agree/summary_enviro_law/publication/index.cfm?varlan=english (last visited Sept. 18, 2004).

25. For a useful though somewhat dated overview of groundwater laws in the four western states of Arizona, California, Colorado and Oklahoma, see generally Kevin L. Patrick & Kelly E. Archer, *A Comparison of State Groundwater Laws*, 30 TULSA L.J. 123 (1994).

26. *See* Mumme, *supra* note 14, at 349.

The convergence of factors such as population growth along the border, the lack of adequate sub-national and national legal institutions to control groundwater pumping, and the absence of international agreements regulating shared aquifer use and protection creates a situation where there is nothing to prevent either nation from “stealing its neighbor’s water” or polluting a critical shared water resource.²⁷ The role of international law in facilitating bi-national or multi-national cooperation in basin management is heightened by the jurisdictional fragmentation of national and sub-national regimes and by the constitutional disqualification of states and other sub-national levels of government from entering into agreements with foreign nations or local authorities of a foreign nation. Only international law can provide the basis for authoritative agreements allocating rights, responsibilities and duties to national parties sharing a resource.²⁸ Yet the characteristics of transboundary groundwater vary from one basin to the next, making groundwater as a shared resource less amenable to global agreements than surface waters. While a single mechanism for arriving at a comprehensive solution may not be appropriate, there is reason to be optimistic regarding the achievement of basin-by-basin or case-by-case international agreements on groundwater management that respond better to the diversity of institutional, legal, social, geo-physical, and hydrologic characteristics of each basin.²⁹

This Note will explore the principal mechanisms available to regulate transboundary groundwater resources, emphasizing the development and evolution of international law applicable to the United States–Mexico context. The analysis will look first at the history of international customary law and the development of multilateral conventions and model treaties that address transboundary groundwaters. The focus of the analysis will then move to the regional context of the North American Free Trade Agreement, and specifically to the institutional mechanisms and procedures established under the North American Agreement on Environmental Cooperation. Finally, the role of the International Boundary and Water Commission, established by treaty agreements between the United States and Mexico, is examined.

27. INTERNATIONAL GROUNDWATER LAW, *supra* note 10, at 162.

28. Joseph W. Dellapena, *Treaties as Instruments for Managing Internationally-Shared Water Resources: Restricted Sovereignty vs. Community of Property*, 26 CASE W. RES. J. INT’L L. 27, 32 (1994) (noting that while customary international law has largely failed to fulfill the need for fostering cooperation over shared waters, formal agreements between parties will be essential to promote cooperation and prevent future conflict).

29. Mumme, *supra* note 14, at 349.

II. LEGAL FOUNDATIONS OF TRANSBOUNDARY GROUNDWATER MANAGEMENT

International law has largely ignored or discounted the importance of groundwater as a shared resource.³⁰ The relative invisibility of international groundwater law reflects both a general lack of understanding of the hydrological characteristics of aquifers and the underdeveloped state of domestic water law in many countries.³¹ In the early 1980s, Professor Albert Utton,³² a leading figure in the study and promotion of transboundary resource law, observed that “[t]he laws governing groundwater nationally are inadequately developed, and the law governing transboundary groundwaters is only at the beginning state of development.”³³ Since that time, significant progress has been made with regard to the development of international agreements, treaties, and principles to govern or influence transboundary groundwaters. The following sections discuss the key developments in customary international law, international conventions, multi-state agreements, and bilateral treaties with an emphasis on water management along the United States–Mexico border.

A. The Development of International Groundwater Law

Despite a long-standing tradition of ensuring common access to shared waterpoints in boundary zones and the more contemporary awareness of the danger posed by contamination of transboundary watercourses, the formal regulation of transboundary groundwater is a relatively recent development in international law.³⁴ European boundary treaties from the 18th and 19th centuries ensured access for neighboring populations and their livestock by providing for common access to fountains and wells in border areas, as in the boundary treaty of August 27, 1785, between France and Spain that defined the border between Val Carlos and Quinto Real.³⁵ Other early international agreements that directly

30. See Caponera & Alhéritière, *supra* note 16, at 25-26.

31. INTERNATIONAL GROUNDWATER LAW, *supra* note 10, at 159. Professor Utton attributes the “near legal vacuum” in domestic and international law regarding groundwater resources to the defining invisibility of the resource, noting that “it has been, in fact, a question of being out of sight and out of mind.” *Id.*

32. The late Professor Utton was a co-founder and Director of the International Transboundary Resources Center (now the Utton Transboundary Resources Center) and the Natural Resources Center at the University of New Mexico School of Law and served as the Editor-in-Chief of the Natural Resources Journal.

33. Albert E. Utton, *The Development of International Groundwater Law*, 22 NAT. RESOURCES J. 95, 98 (1982).

34. Julio Barberis, *The Development of International Law of Transboundary Groundwater*, 31 NAT. RESOURCES J. 167, 186 (1991).

35. *Id.* at 182.

concerned groundwater, though often as a secondary or even tertiary concern, include the 1888 Agreement between the United Kingdom and France, representing Somalia and Djibouti respectively, granting the parties common rights to the Hadou well; references to springs and ground waters along the border between Germany and Belgium recorded in the Versailles Treaty ending World War I; and the 1947 treaty between the Allies and Italy governing the use of springs in the Commune of Gorizia by Italy and Yugoslavia.³⁶

The only international treaty that primarily concerns the shared utilization of a transboundary aquifer was signed between the French Préfecture de Haute-Savoie and the Swiss Canton of Geneva in 1977.³⁷ In addition to addressing both water extraction and artificial recharge,³⁸ the treaty is also unique in that it was arranged at a local rather than international level.³⁹ Despite the growing recognition of the importance of groundwater in national fresh water consumption and the greater availability of technical information regarding the location and hydrologic characteristics of transboundary aquifers, international agreements in this area remain relatively rare, especially when compared to surface water agreements.⁴⁰

1. Customary Norms and Principles of International Law Applied to Groundwater Management

The law of transboundary groundwater resources flows primarily from the customary norms and principles of international law that govern shared surface waters.⁴¹ The key principles governing transboundary groundwater are limited territorial sovereignty, the obligation not to cause appreciable harm, and

36. Eckstein & Eckstein, *supra* note 7, at 224-25.

37. For an unofficial English translation, see Arrangement on the Protection, Utilization, and Recharge of the Franko-Swiss Genevese Aquifer, Sept. 1977, Fr.-Switz., at <http://www.internationalwaterlaw.org/RegionalDocs/Franko-Swiss-Aquifer.htm> (last visited Feb. 20, 2004). The treaty is also reprinted in Yves Lejeune, RECUEIL DES ACCORDS INTERNATIONAUX CONCLUS PAR LES CANTONS SUISSES: EN VIGUEUR AU 1 JANVIER 1980 (1982).

38. *Id.*

39. See Eckstein & Eckstein, *supra* note 7, at 227.

40. See *id.*

41. Customary international law is not binding on the parties. While its value is sometimes dismissed as being primarily hortatory, broadly accepted principles of international law are often drawn upon in drafting treaties and other multi-party agreements and in assessing the legal grounding of arguments made in a court of law. As such, its value goes beyond mere encouragement to provide a consensual foundation for engaging in and evaluating the outcomes of conduct that extend beyond one nation's boundaries. See generally SAX ET AL., *supra* note 3, at 771-73.

equitable and reasonable use.⁴² While other principles, including the prior notice obligation and the duty to negotiate, may be added to this subset, the former three are of central importance to the emerging law of transboundary water resources.

a. Territorial Sovereignty

The fundamental challenge for international customary law regarding transboundary water resources is to temper the natural and often exclusive preoccupation with national self-interest by recognizing that downstream nations and communities have legitimate expectations about the water resources that enter into or pass through their territory. Assertions of extreme territorial sovereignty have been made by nations in response to perceived threats to “their” water resources, or to deny the legitimate demands of downstream nations to an equitable share of a transboundary water resource.⁴³ A well-known example of the expression of extreme national sovereignty was the Harmon Doctrine, which stated that the United States had absolute sovereignty over the waters of the Rio Grande in Colorado, New Mexico, and Texas before the river reached the border with Mexico.⁴⁴ However, subsequent treaties with Mexico recognized legitimate Mexican claims to a portion of the waters of the Rio Grande and the Colorado River. The treaties also reflect, at the very least, a more nuanced understanding of this doctrine, if not its rejection by the United States.

Downstream states may also adopt extreme positions regarding transboundary waters, for example by asserting a right to the full and undisturbed flow of a river through an upstream neighbor’s territory.⁴⁵ This extreme riparianism, like the extreme sovereignty argument, has been largely rejected as unworkable, impractical, and anti-developmental.⁴⁶ The result has been general acceptance of the principle of limited sovereignty.

b. Obligation Not to Cause Appreciable Harm

Sic utere tuo ut alienum non laedas, the classic property law maxim

42. See Barberis, *supra* note 34, at 186; Gabriel Eckstein, *Application of International Water Law to Transboundary Resources, and the Slovak-Hungarian Dispute over Gabčíkovo-Nagymaros*, 19 SUFFOLK TRANSNAT’L L. REV. 67, 72-84 (1995).

43. See A. Dan Tarlock, *International Water Law and the Protection of River System Ecosystem Integrity*, 10 BYU J. PUB. L. 181, 190-91 (1996).

44. *Id.* at 191 n.43.

45. See *id.* at 191.

46. See *id.* Tarlock concludes that “international law has rejected both the extreme claims of exclusive upstream sovereignty – the Harmon Doctrine – and an absolute servitude in favor of downstream states because they equally permit individual states to control the use of transnational resources.” *Id.*

recognizing a duty to cause no injury to another through the enjoyment of one's property interest, is widely recognized as a key principle in international law as well.⁴⁷ In general, each State is obligated not to cause harm to another, either directly through its own actions or by allowing its territory to be used in such a way as to cause injury to another country.⁴⁸ In regard to a shared aquifer, the harm that one state may cause to another takes the form of deterioration in water quality or quantity or in the condition of the associated underground environment.⁴⁹ When considering whether one state's actions have caused or will cause harm to another's territory, a number of authorities and treaties have suggested that the harm in question must be "substantial" for the duty to be violated.⁵⁰ While the duty to prevent substantial harm appears to be well-grounded in international law, the lack of international consensus as to the scope of the duty and the standard of liability to apply in cases of violation deprives the principle of any meaningful deterrence capacity.⁵¹

c. Equitable Utilization

The principle of equitable and reasonable utilization holds that "each riparian state is entitled to a reasonable and equitable share in the beneficial uses of an international water resource."⁵² It incorporates the principle of *sic utere tuo ut alienum non laedas* discussed above, while balancing the possible detrimental consequences of an upstream nation's use of a shared resource against the beneficial results of the use.⁵³ This equitable share of the water resource includes a right to a fair development opportunity of the waters as long as the result does not deprive other parties of their equitable share of the resource or cause substantial deterioration in the value of the resource (for example, through pollution). What constitutes equitable and reasonable use may be determined by applying a number of factors that include: geography; hydrology; climatic and ecologic circumstances; past, present, and potential uses of the water; population; the economic and social needs of the basin; the availability of alternative sources of supply; the avoidance of unnecessary waste; and compensation of one state as a

47. Eckstein, *supra* note 42, at 75.

48. JULIO A. BARBERIS, INTERNATIONAL GROUNDWATER RESOURCES LAW 38 (Food and Agriculture Organization of the United Nations, FAO Legislative Study No. 40, 1986). Barberis gives as an example of harm to the geologic structure of an aquifer damage that results from underground nuclear testing in a neighboring country. *Id.*

49. *Id.*

50. Eckstein, *supra* note 42, at 77-78.

51. See Tarlock, *supra* note 43, at 193.

52. Eckstein, *supra* note 42, at 78-79.

53. *Id.* at 79-80.

means for resolving conflicts.⁵⁴

The principle of equitable utilization is also tied to the principle of limited territorial sovereignty inasmuch as the equitable nature of the principle requires tempering one nation's self-interest with the needs and legitimate aspirations of another.⁵⁵ Sovereignty is not a basis for withholding resources from downstream states or for preventing upstream nations from making reasonable use of the resource. This has been held by some to be the "core – and only certain – principle of international law" relating to transboundary water resources.⁵⁶

2. The International Law Association and the Formalization of International Water Law

Fifty years ago, the International Law Association (ILA), concerned by the unsettled state of international legal principles for resolving international water conflicts, embarked on a study of the law governing the use of international fresh water resources.⁵⁷ At the end of World War II, long-standing international river disputes erupted across the globe: between India and Pakistan over the Indus; Egypt and Sudan over the Nile; Israel and its neighbors over the Jordan; and Canada and the United States over the Columbia.⁵⁸ International lawyers attempting to sort out the respective rights of nations sharing international fresh water resources were confronted with competing theories and no settled doctrine articulating a common view of the law on the utilization of international waters.⁵⁹

At its 1954 conference in Edinburgh, the ILA appointed Professor Clyde Eagleton of New York University to chair a committee "to study the various legal, economical and technical aspects" of the "rights and obligations between states as to inland waters."⁶⁰ In a series of reports presented to subsequent ILA conferences, the Committee on the Uses of the Waters of International Rivers, known as The Rivers Committee, advanced principles drawn from international custom and norms governing the use of international fresh water resources.⁶¹ The

54. See A. Dan Tarlock, *Safeguarding International River Ecosystems in Times of Scarcity*, 3 U. DENV. WATER L. REV. 231, 241 (2000); Eckstein, *supra* note 42, at 80. The criteria were established under Article IV of the Helsinki Rules by the International Law Association, *see infra* note 64.

55. See Eckstein, *supra* note 42, at 79-80.

56. Tarlock, *supra* note 54, at 240.

57. Charles B. Bourne, *The International Law Association's Contribution to International Water Resources Law*, 36 NAT. RESOURCES J. 155, 155 (1996).

58. *Id.* at 156.

59. *Id.*

60. *Id.* (citing INT'L LAW ASS'N, REPORT OF THE FORTY-SIXTH CONFERENCE, Edinburgh (1954), at vii).

61. In "A Statement of Principles Upon Which to Base Rules of Laws Concerning the Uses of International Rivers," the Rivers Committee advanced eight principles of international law that could serve as the basis for the development of formal laws. *See id.* at 159-60.

reports argued for the adoption of equitable utilization as the cornerstone of international water law.⁶² This position was not without controversy and sparked opposition both from within the Committee and from the general Conference members. The controversy reflected both the general political salience of the issues addressed as well as the particular national perspectives of Committee members from countries engaged in fierce competition over critical water resources.⁶³ By the 1966 ILA Conference in Helsinki, the Rivers Committee had refined its recommendations governing the use of international freshwater resources and all of the articles (rules) advanced in the Report of the Committee were adopted by the Conference.⁶⁴

Article IV of the Helsinki Rules on the Uses of the Waters of International Rivers provides that “[e]ach basin State is entitled, within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin.”⁶⁵ This Article alone communicates three important emerging agreements on international water law. First, the Helsinki Rules assume that a limited territorial sovereignty will apply to resolving conflicts over international watercourses. This is in contrast to the more rigid and nationalistic principle of absolute territorial sovereignty, such as the Harmon Doctrine discussed earlier, that have been widely rejected as unproductive.⁶⁶ Second, in adopting this position, the ILA clearly advanced the principle of

62. Bourne, *supra* note 57, at 160. The American chairmanship of this committee likely influenced the decision to adopt a concept gaining adherents among American scholars but with limited currency in other countries.

63. *See id.* at 157-59. Committee membership swelled from eight in 1954 to over thirty-six when it was dissolved in 1966, with members (ILA members act in their individual capacity regardless of any official function they might hold in their country of origin) from a number of countries actively engaged in river disputes, including India, Pakistan, Israel, Syria, Sudan, Egypt, Canada, and the United States. *Id.* at 158. Their presence undoubtedly added weight and perhaps a certain amount of resistance to the process of moving away from stark concepts of territorial sovereignty to principles of no harm embodied in the maxim of *sic utere tuo* and the principle of equitable utilization. For example, Mr. S.M. Sikri, a member of the Rivers Committee who at one point served as the Chief Justice of India, was a strong proponent of the territorial sovereignty theory, stating at a 1958 ILA Conference that “I must say that I am still of the opinion that strictly speaking the Harmon Doctrine is still the law” *Id.* at 158-59 (citation omitted).

64. INT’L LAW ASS’N, REPORT OF THE FIFTY-SECOND CONFERENCE, Helsinki (1966) at 484-532 [hereinafter HELSINKI RULES], http://www.internationalwaterlaw.org/IntlDocs/Helsinki_Rules.htm. The Conference specified that the body of articles were to be known henceforth as the 1966 Helsinki Rules and this term is used throughout this Note.

65. *See* HELSINKI RULES, *supra* note 64, art. IV.

66. *See* Albert Utton, *The Transfer of Water from an International Border Region: A Tale of Six Cities and the All American Canal*, 16 N.C. J. INT’L L. & COM. REG. 477, 482 (1991).

equitable utilization as the dominant theory of law.⁶⁷ Finally, the relevant unit of analysis for shared freshwater systems is identified as the drainage basin rather than the river itself.⁶⁸ The importance of the selection of the basin as the harmonizing unit for analysis and legal agreements among co-basin states is that it extends the geographic area out from the banks of the river to include both the lands and tributaries that make up a common drainage basin. The drainage basin is considered to be a more environmentally relevant unit for resource management and has the further advantage of bringing into consideration tributary watercourses, the unregulated use of which could seriously impact the volume and quality of water entering the shared river.⁶⁹

While the principal purpose of the Helsinki Rules was to lay the legal foundation for the regulation of international rivers, transboundary groundwater was not excluded from consideration.⁷⁰ Groundwater is identified in Article II of the Helsinki Rules as a core component of an international drainage basin, which is said to include “surface and underground waters, flowing into a common terminus.”⁷¹ Groundwater that is connected with surface water is thereby made subject to the same legal considerations as surface waters, and both are to be governed by the principle of equitable utilization, as recommended by the ILA.⁷² Groundwater that is not hydrologically connected to an international river would not be included under Article II, leaving confined aquifers and those whose hydrological linkage to the transboundary river is less evident – even though the aquifer itself is known to span the international boundary – to be outside of the Helsinki Rules. Although this is the sole direct reference to groundwater in the Helsinki Rules, the Helsinki Conference gave top priority to groundwater among the subjects identified for future study by the ILA.⁷³

Following the adoption of the Helsinki Rules in 1966, the ILA Executive Council established the Committee on International Water Resources Law, headed by Judge E. J. Manner of Finland, to further clarify the international legal

67. Bourne, *supra* note 57, at 165.

68. *Id.* at 175-76.

69. *Id.* at 169-70. The Rivers Committee constituted a separate sub-committee to work on pollution issues. The sub-committee drafted Articles that placed pollution within the context of equitable utilization, but stopped well short of advocating a general rule of abatement where one country's (equitable) use resulted in significant downstream pollution. The legal conclusions regarding pollution were adopted as Articles IX, X, and XI in the Helsinki Rules. *Id.* See also Ludwik A. Teclaff, *Evolution of the River Basin Concept in National and International Water Law*, 36 NAT. RESOURCES J. 359 (1996); see generally TECLAFF, *supra* note 1 (presenting a thorough review of the history of the organization of water resources at the basin level and related treaties and laws).

70. Bourne, *supra* note 57, at 205.

71. HELSINKI RULES, *supra* note 64, art. II, at 484-85.

72. Bourne, *supra* note 57, at 205.

73. *Id.*

principles governing shared freshwater resources.⁷⁴ The Manner Committee established a sub-group to take up the study of the legal principles affecting groundwater.⁷⁵ This subcommittee's final report was approved by the Manner Committee and presented to the membership of the ILA at the 1986 ILA Conference in Seoul, South Korea.⁷⁶

The resulting Seoul Rules on International Groundwaters, consisting of four articles with extensive commentary on each, were adopted by the Seoul Conference and remain the guiding statement of the legal principles governing transboundary groundwater resources.⁷⁷ Article I extends the application of the Helsinki Rules to all types of aquifers, even those that do not connect with surface waters, and removes the "flowing into a common terminus" requirement.⁷⁸ Article II clarifies that aquifers that are hydrologically interdependent are also part of the international drainage basin. Therefore, aquifers that lie wholly within the territory of a basin state, but whose waters are hydrologically connected to international surface waters, are part of the international basin and subject to the principle of equitable utilization and other provisions of the Helsinki Rules. Similarly, aquifers that are not connected to transboundary surface waters but that are intersected by an international boundary are part of the international basin.⁷⁹ The third paragraph under Article II presents a seemingly innocuous principle,

74. *See id.* at 177-78. The Committee on International Water Resources Law came to be known as the Manner Committee after its chairman, Judge E. J. Manner of Finland, and is referenced hereafter in this note as such. *Id.*

75. *See id.* at 205. It is of interest to note that the chair of the subcommittee, R.D. Hayton, was a central figure in the drafting of the Bellagio Draft Treaty on Transboundary Groundwater, discussed *infra* in section II.A(4).

76. *See id.*

77. INT'L LAW ASS'N, REPORT OF THE SIXTY-SECOND CONFERENCE, Seoul (1986), at 21, 251-74 [hereinafter SEoul RULES], available at http://www.internationalwaterlaw.org/IntlDocs/Seoul_Rules.htm (last visited Sept. 18, 2004).

78. *See id.*, art. I, at 251.

The waters of an aquifer that is intersected by the boundary between two or more States are international groundwaters and such an aquifer with its waters forms an international basin or part thereof. Those states are basin states within the meaning of the Helsinki Rules whether or not the aquifer and its waters form with surface waters part of a hydraulic system flowing into a common terminus. *Id.*

79. *See id.*, art. II, at 259.

1. An aquifer that contributes water to, or receives water from, surface waters of an international basin constitutes part of an international basin for the purposes of the Helsinki Rules.

2. An aquifer intersected by the boundary between two or more States that does not contribute water to, or receive water from, surface waters of an international drainage basin constitutes an international drainage basin for the purposes of the Helsinki Rules. *Id.*

that “basin states, in exercising their rights and performing their duties under international law, shall take into account any interdependence of the groundwater and other waters including any interconnections between aquifers, and any leaching into aquifers caused by activities and areas under their jurisdiction.”⁸⁰

While some observers have doubted that this provision has implications beyond the general application of the principle of equitable utilization under the Helsinki Rules,⁸¹ the reference to surface water leaching into aquifers is of particular salience to United States–Mexico transboundary concerns.⁸² For example, seepage from the unlined sections of the All-American Canal and Coachella Canal carrying Colorado River water to the Imperial Irrigation District is an important source of groundwater recharge for the highly profitable agricultural industry in Mexico’s Mexicali Valley and the source of longstanding dispute between the United States and Mexico.⁸³ The United States Bureau of Reclamation, with the strong backing of Southern California’s Metropolitan Water District (MWD) and the Imperial Irrigation District, developed plans in the 1980s to line the canal as a means of “saving” or capturing water lost through seepage.⁸⁴

The Mexican authorities, fearing the impact of a loss of an important source of groundwater recharge to the Valley’s 20,000-30,000 acres of farmland, brought the dispute to the International Boundary and Water Commission (IBWC). The United States delegation to the IBWC “flatly rejected” Mexico’s complaints and the American Secretary to the IBWC stated in a New York Times interview that “[w]hat we are saying is that the United States Government considers the waters in the All-American Canal to be United States waters, diverted to the United States under the 1944 [U.S.-Mexico Colorado River Water] Treaty. The United States has the right to take whatever measures it wants to conserve those waters.”⁸⁵ Nevertheless, by placing the issue of surface water

80. SEOUL RULES, *supra* note 77, art. II(3), at 259.

81. Bourne, *supra* note 57, at 206-07.

82. The reference may be addressing the issue of cross-media pollution, a concern not only in urban areas where surface waters may pollute aquifers that provide drinking water for urban populations but also in rural areas where high salinity levels in U.S. return flow irrigation water created serious problems for Mexican farmers using the related seepage water. This is taken up below in the section on IBWC Minute 242, *see infra* at II.C(1)(a).

83. *See* Utton, *supra* note 66, at 478-79.

84. *See* Mumme, *supra* note 14, at 349-50. These plans bore fruit a generation later in the largest transfer of water from rural to urban use in United States history. *See* discussion *infra* section II.C(1)(a).

85. Douglas L. Hayes, *The All-American Canal Lining Project: A Catalyst for Rational and Comprehensive Groundwater Management on the United States – Mexico Border*, 31 NAT. RESOURCES J. 803, 822 (1991) (quoting Manuel R. Ybarra, American Secretary to the International Boundary and Water Commission, in N.Y. Times, Oct. 1, 1989, §1, at 1, col. 1). The U.S. position suggests that the Harmon Doctrine, while formally discredited as an official policy stance, has retained considerable “unofficial” vigor.

leeching and inter-aquifer transmission into the domain of a basin state's responsibilities "in exercising their rights and performing their duties under international law," Art. II(3) rejects the view that this is solely a matter of national law and practice.

The ILA's efforts to generate formal rules from the disparate and inchoate strands of customary international freshwater law and principles over the last half-century and to submit them to comprehensive review and eventual acceptance by a diverse body of water law practitioners, officials, and specialists merit recognition and commendation. The 1966 Helsinki Rules first brought transboundary groundwater resources into the framework of international water law and subjected both surface and hydrologically connected groundwater to the dominant principle of equitable utilization. This principle has been adopted by various international bodies and reaffirmed in non-binding declarations at a number of United Nations conferences.⁸⁶ Nevertheless, the progress in the evolution of international norms and principles for transboundary aquifers represented by the Helsinki and Seoul Rules has "had limited influence on state practice and treaty development."⁸⁷

3. Convention on the Law of the Non-Navigational Uses of International Watercourses

While the International Law Association was building and refining an international understanding of and commitment to a core set of principles governing shared water resources, the United Nations and other international organizations were incorporating these same principles into multilateral agreements and international conventions. The United Nations' 1997 Convention on the Non-Navigational Uses of International Watercourses⁸⁸ has been described as a "unique milestone" in the history of the development of international groundwater resources law.⁸⁹

The International Watercourses Convention is a framework agreement regarding the use, protection, preservation, and management of international

86. See Tarlock, *supra* note 43, at 191-92.

87. See Eckstein & Eckstein, *supra* note 7, at 228-29.

88. *United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses*, G.A. Res. 51/229, U.N. GAOR, 51st Sess., U.N. Doc. A/51/229 (1997), reprinted in 36 I.L.M. 700 [hereinafter *International Watercourses Convention*].

89. See Eckstein & Eckstein, *supra* note 7, at 229 (noting that while the Convention "supports the doctrine of hydrological unity and acknowledges the important interrelationship of surface and underground water within the hydrological cycle" it also raises questions about the applicability of international law to particular aquifer types. *Id.* at 229-31).

watercourses for purposes other than navigation.⁹⁰ Article 2 of the Convention defines “watercourse” as “a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.”⁹¹ The International Watercourses Convention advances a number of foundational principles, beginning in Article 5 with the principle of “equitable and reasonable utilization and participation.”⁹² Environmental considerations are injected into the calculation of equitable utilization by internalizing the often competing values of development and conservation in the definition of the principle.

Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present Convention.⁹³

Other principles recognized in the express language of the Convention include the obligation not to cause significant harm (Article 7), the general obligation to cooperate (Article 8), and the duty of notification concerning planned measures with possible adverse effects (Article 12).⁹⁴ The Convention successfully bridges the traditional focus of water treaties on the allocation of shared waters with the broader environmental considerations that have dominated international resource discussions in recent decades, such as the 1972 Stockholm Conference on the Human Environment,⁹⁵ the 1977 World Water Conference in Mar del Plata,⁹⁶ and the 1992 United Nations Conference on Environment and Development in Rio de Janeiro.⁹⁷ Part IV of the Convention takes up the “protection, preservation and management” of watercourse ecosystems, and Article 20 states that “[w]atercourse States shall, individually and, where

90. *International Watercourses Convention*, *supra* note 88, art. 1. The focus of the Convention on non-navigational uses reflects the international recognition of the problems attendant to increasing competition for freshwater resources due to among other facts, rapid population growth and pollution. These concerns are identified in the Preamble. *Id.* at 703.

91. *Id.* art. 2(a).

92. *Id.* Part II. General Principles, art. 5.

93. *Id.* Part II. General Principles, art. 5(2).

94. *International Watercourses Convention*, *supra* note 88, Part II. General Principles, art. 7, 8 and Part III. Planned Measures, art. 12.

95. *Conference on the Human Environment*, U.N. GAOR, U.N. Doc.A/C.48/14 (1972), *reprinted in* 11 I.L.M. 1416.

96. *Report of the United Nations Water Conference*, U.N. Doc. E/Conf.70/CBP/1 (1977), *reprinted in* 15 I.L.M. 734.

97. *Río Declaration on Environment and Development: Conference on Environment and Development*, U.N. GAOR, U.N. Doc. A/C.151/5/Rev. 1 (1992), *reprinted in* 31 I.L.M. 874 (1992).

appropriate, jointly, protect and preserve the ecosystems of international watercourses.”⁹⁸

The scope of the Convention’s applicability is not without ambiguity, however. The definition of watercourses provided in Article 2(a) seemingly limits the applicability of the Convention to certain types of aquifers, that is, to those that join with surface waters. The definition also resurrects the language of the 1966 Helsinki Rules by referring to waters that flow “into a common terminus.” This represents a retreat from the broad applicability of the Seoul Rules to all aquifers that reached an international boundary, including isolated aquifers that were transected by a border and those that while lying wholly within the territory of one state, are hydraulically linked to a transboundary watercourse.⁹⁹ The utility of the qualifier “normally” in the context of waters that flow into a common terminus is also unclear.¹⁰⁰ Despite the importance of the Convention as a framework agreement for encouraging transboundary water management while providing a mechanism for dispute resolution, the Convention is not a definitive statement of the status of groundwater under international law. As one specialist has observed, “the scope of the document may raise more questions than provide answers about the status of groundwater resources under international law.”¹⁰¹

The 1966 Helsinki Rules introduced and the 1986 Seoul Rules on International Groundwater expanded upon the core principles governing the shared use of international waters. The Helsinki Rules advanced the innovative and controversial principle of equitable utilization as the core concept underlying shared use, bolstered by the customary principles of the duty to avoid substantial harm and the duty to notify co-basin States of actions that may have adverse effects on the shared resource.¹⁰² The Seoul Rules adopted the Helsinki Rules and their commitment to equitable utilization and applied them to all international fresh water systems, including all aquifers that contributed to or were affected by

98. *International Watercourses Convention*, *supra* note 88, Part IV. Protection, Preservation and Management, art. 20.

99. *See* SEOUL RULES, *supra* note 77, and text of art. II, *supra* note 79.

100. For example, would this include seasonal surface waters that drain into a larger river, but exclude isolated aquifers that are recharged by upstream surface waters, are transected by an international boundary, but do not discharge into a defined terminus? The Mimbres Aquifer, which provides water to communities in southwest New Mexico and northern Chihuahua, comes to mind in this regard.

101. Eckstein & Eckstein, *supra* note 7, at 231.

102. *See* Bourne, *supra* note 57, at 214-15. Charles Bourne, in his valuable history of the International Law Association’s half-century commitment to advancing the international law of transboundary waters, records some of the comments of members of the Rivers Committee opposed to the principle of equitable utilization. A common critique of equitable utilization as a general principle was that the circumstances in water basins are highly particularized and therefore “no international laws have developed which could be applicable to all circumstances.” *Id.* (quoting Count Edmund Hartig of Austria in a memorandum to the Chairman of the Rivers Committee dated August 5, 1965).

international watercourses and those that were intersected by national borders. With the adoption in 1997 by the U.N. General Assembly of the Convention on the Law of the Non-Navigational Uses of International Watercourses, the once highly contested principle of equitable utilization was advanced as the model and guide for international agreements regarding transboundary water resources.

4. The Bellagio Draft Treaty on Transboundary Groundwater

Despite the substantial progress made by the International Law Association and international organizations such as the United Nations in articulating and formalizing a shared body of principles to govern international surface and underground fresh water resources, nations have been hesitant to relinquish the ability to act out of perceived national self interest.¹⁰³ As one long-time international water law specialist has concluded, “[i]nternational water law remains a modest restraint on unilateral water resources development.”¹⁰⁴

The lack of authoritative legal and institutional arrangements available under international customary law and the relative weakness of institutions dealing with international aquifers led a multidisciplinary group of international experts under the general guidance of Professor Utton to formulate a model international groundwater treaty.¹⁰⁵ The Bellagio Draft Treaty, named for the Italian research center maintained by the Rockefeller Foundation that hosted the drafting committee, was intentionally designed to be adapted by nations seeking a “reasonable agreement responsive to the necessities facing two or more countries . . . with respect to their transboundary aquifers”¹⁰⁶ The overarching goal of the model treaty is “to achieve joint, optimum utilization of the available waters, facilitated by procedures for avoidance or resolution of differences over shared groundwaters in the face of the ever increasing pressures on this priceless resource.”¹⁰⁷ The Bellagio Draft Treaty sets out to accomplish

103. The comments of Dr. Nagendra Singh, a member of the Rivers Committee from India, are as appropriate today as when they were recorded in 1965. See Bourne, *supra* note 57, at 214. In a lengthy report rejecting the concept of equitable utilization, Dr. Singh argued that “the ideas regarding the concept of equitable sharing are not clear,” and that “states must be free to develop their uses in accordance with their needs.” *Id.*

104. Tarlock, *supra* note 43, at 192.

105. See Robert D. Hayton & Albert E. Utton, *Transboundary Groundwaters: The Bellagio Draft Treaty*, 20 NAT. RESOURCES J. 663, 664 (1989) [hereinafter *The Bellagio Draft Treaty*]. The Bellagio Treaty grew out of an initiative launched by Professor Utton and Ambassador César Sepulveda of Mexico in 1977 called the U.S.-Mexico Transboundary Resources Study Group. The Group’s purpose was to assess and formulate a practical response to growing problems of transboundary aquifers along the U.S.-Mexico border, resulting in an unofficial “draft agreement” between the two countries called the “Ixtapa Draft.” See Ann Berkley Rodgers & Albert E. Utton, *The Ixtapa Draft Agreement Relating to the Use of Transboundary Groundwaters*, 25 NAT. RESOURCES J. 713 (1985).

106. *The Bellagio Draft Treaty*, *supra* note 105, at 670.

107. *Id.* at 665.

this goal by asserting a common interest among the parties in the reasonable and equitable development and management of groundwaters in the border region.¹⁰⁸ The treaty acknowledges two general purposes of the agreement: (1) to attain the optimum utilization and conservation of transboundary groundwaters while protecting the underground environment, and (2) to develop and maintain a reliable technical database on transboundary aquifers and their waters.¹⁰⁹

The emphasis on the gathering, analysis, and exchange of technical data on transboundary waters as a core requirement and purpose of the treaty signals the movement from the hortatory function of many international agreements to the practical, solution-oriented purposefulness of bilateral and multilateral treaties. Article V of the Bellagio Draft Treaty charges the international Commission assigned to implement the treaty with “the creation and maintenance of a comprehensive and unified database” that collects and catalogues information pertaining to transboundary groundwaters, and is made available in the languages of the Parties.¹¹⁰ As the authors note in the comment to that Article, “[t]here can hardly be anything more important in effecting international water resources management than the factual basis required for rational decision making.”¹¹¹ The centrality of comprehensive information to the effective management of shared groundwaters is underscored in the Draft Treaty by making the creation of a unified, comprehensive database mandatory.¹¹²

The Bellagio Draft Treaty calls for the creation of a bilateral institution, referred to as the Commission, to carry out the functions and responsibilities of the Parties.¹¹³ The Commission has limited independent authority and is instead conceived of as a common vehicle through which the Parties can pursue shared objectives such as data collection, the study of the shared water resource (Article V), the identification of transboundary groundwater conservation areas (Article VII), and the development of comprehensive management plans for declared conservation areas (Article VIII).¹¹⁴ Enforcement of water quality and quantity regulations and related measures remains the responsibility of each Party or of its political subdivisions.¹¹⁵ In the case of the United States–Mexico border, the authors of the Bellagio Draft Treaty identified the International Boundary and Water Commission (IBWC) discussed in Section C.1. below, as the likely candidate for assuming the responsibilities of the Commission.¹¹⁶

The Bellagio Draft Treaty was received with great interest and optimism

108. *Id.* art.II, at 682.

109. *Id.* art.II(2).

110. *Id.* art. V(1), at 688.

111. *The Bellagio Draft Treaty*, *supra* note 105, art. V, Comment 1, at 688-89.

112. *Id.* art. V, Comment 1, at 689.

113. *Id.* art. III, at 684.

114. *Id.* at 688-97.

115. *Id.* art. IV, at 687.

116. *The Bellagio Draft Treaty*, *supra* note 105, art. III, Comment 1., at 684-85.

by international water experts and water law specialists.¹¹⁷ It is generally recognized as an important advancement in the understanding of the legal requirements of managing international drainage basins.¹¹⁸ It has not, however, been given serious formal consideration at senior levels of the governments of the United States or Mexico. While the movement toward a formal groundwater treaty between the United States and Mexico does not appear to be on the table, elements of the Bellagio Draft Treaty, in particular coordinated binational data collection and information sharing along with formal and informal discussions at more local levels between local governments and community organizations, is slowly gaining ground.¹¹⁹ Examples of this are discussed below in the review of tri-national and bi-national institutions working in the U.S.-Mexico border region.

B. NAFTA and the North American Agreement on Environmental Cooperation

The political process in the 1980s seeking to deepen economic integration of the three neighboring North American countries of Mexico, Canada and the United States ignited strong protests by organized labor and environmental groups. These groups feared that economic integration would set off a “race to the bottom,” thereby reversing the gains of organized labor in the United States and Canada, accelerating the movement of jobs from its higher paying neighbors to Mexico, and destroying the environment in Mexico and along the border as industries moved to take advantage of the perceived weaker enforcement of environmental standards in Mexico.¹²⁰ To ensure sufficient bipartisan support to gain passage of the base legislation for the regional free trade agreement, President Clinton negotiated two supplemental agreements to address

117. See Hebard, *supra* note 18, at 284-85 (“With the number of people sharing transboundary aquifers increasing, there can be no greater challenge than to [attain the fundamental goal] . . . as desired in the Bellagio Draft Treaty.”); Marilyn O’Leary, *The Bellagio Draft Treaty as a Tool for Solving Border Groundwater Issues*, 11 U.S.-MEX. L. J. 57 (2003) (“It is time to take another look at the provisions of the Bellagio Draft Treaty.”); M. Diane Barber, *The Legal Dilemma of Groundwater Under the Integrated Environmental Plan for the Mexican-United States Border Area*, 24 ST. MARY’S L. J. 639, 697 (1993) (“Given the turmoil and complexity of the domestic legal regimes surrounding groundwater, the Bellagio Draft Treaty should be adopted . . .”).

118. See Mumme, *supra* note 14, at 343.

119. For example, see Hebard, *supra* note 18, at 284-85, for a review of data collection activities in the Mimbres Basin located in southwestern New Mexico and northwestern Chihuahua. Hebard notes that prior to the data collection exercise, the lack of information about the closed aquifer that supplies communities on both sides of the border “has resulted in inappropriate policies, rendered current unilateral plans useless, hindered impact analysis, and impeded the consideration of options.” *Id.* at 281.

120. See Gustavo Vega-Canovas, *NAFTA and the Environment*, 30 DENV. J. INT’L L. & POL’Y 55, 56 (2001).

labor and environmental concerns while stopping short of including any provisions that risked imposing significant costs on U.S. businesses.¹²¹ Mexico, Canada, and the United States entered into the North American Free Trade Agreement (NAFTA)¹²² in late 1992, followed nine months later by the North American Agreement on Environmental Cooperation (NAAEC).¹²³

The NAAEC's objectives include: fostering the protection and improvement of the environment; promoting sustainable development; increasing cooperation between the Parties to better conserve, protect, and enhance the environment, including wild flora and fauna; strengthening cooperation on the development of environmental laws and regulations while enhancing environmental compliance and enforcement; and promoting transparency and public participation in the development of environmental laws, regulations, and policies.¹²⁴ To accomplish these broad objectives, the NAAEC created a tri-national body to facilitate environmental activities among the country-parties and to mediate environmental disputes called the North American Commission for Environmental Cooperation (CEC), which in turn consists of a Council, a Secretariat, and a Joint Public Advisory Committee.¹²⁵

The institutional design of the CEC incorporates an impressive balancing of the need to establish a high-level authoritative body of international or regional stature without posing an overt threat to concepts of national sovereignty over domestic environmental issues that are ultimately of considerable political salience. This is accomplished by vesting broad investigatory powers in the organization while withholding the power to enunciate enforceable decisions. The Council is the governing body of the CEC and is composed of the cabinet-level official responsible for the environment from each country, namely the Minister of Environment in Mexico and Canada and the Administrator of the Environmental Protection Agency in the United States. The Secretariat serves at the direction of the Council yet its officials are independent of the party governments, which ensures a significant degree of independence for this regional body.¹²⁶ The Joint Public Advisory Committee (JPAC) is comprised of fifteen members, an equal number appointed by each Party, and may advise the Council on any matter within the scope of the NAAEC. The JPAC may also provide technical, scientific and

121. *See id.*

122. North American Free Trade Agreement, Dec. 17, 1992, Can.-Mex.-U.S., 32 I.L.M. 289.

123. North American Agreement on Environmental Cooperation, Sept. 14, 1993, Can.-Mex.-U.S., 32 I.L.M. 1480 (entered into force Jan. 1, 1994) [hereinafter NAAEC].

124. *Id.* arts. 1(a), (b), (c), (f), (g), (h). The fact that NAAEC is supplemental to a regional agreement to build and facilitate free trade among the Parties is not lost in the full list of objectives. The full list of objectives also includes an objective to "avoid creating trade distortions or new trade barriers." *Id.* art.1(e).

125. *Id.* art. 8.2.

126. *See* Vega-Canovas, *supra* note 120, at 58.

other information to the Secretariat.¹²⁷

The NAAEC provides three mechanisms for addressing national and regional environmental issues. First, the Secretariat has the authority under Article 13 to prepare reports related to the CEC's annual program without specific approval of the Council.¹²⁸ The Secretariat may also prepare reports "on any other environmental matter related to the cooperative functions of this agreement," unless two of the three members of the Council object within thirty days of notification of the Council.¹²⁹ The other mechanisms for resolving environmental disputes that arise from a party's failure to enforce its environmental laws include a "citizen suit" provision and an inter-Party dispute mechanism. Articles 14 and 15 create a citizen submission mechanism whereby an individual citizen or non-governmental organization may petition the CEC alleging that a country-party has failed to enforce its environmental laws.¹³⁰ Following review of a petition from an organization or individual, the Secretariat may find that there is sufficient basis to request a response from the Party concerned.¹³¹ If a number of threshold conditions are met, the Secretariat following its review of the Party's response will request authorization from the Council to prepare a factual report. By a vote of two-thirds of the members, the Council allows the factual report to be developed, and by a similar vote authorizes the publication of the factual record upon its completion.¹³²

Inter-Party dispute settlement is restricted to claims that a party has persistently failed to effectively enforce its own environmental regulations.¹³³ This sets the bar very high because few countries will engage in a pattern of systematic non- or under-enforcement in lieu of simply amending or voiding the regulation in question. Environmental regulatory systems, like other modern state-initiated systems of structuring individual or corporate conduct, depend not on persistent enforcement of the regulations but on voluntary compliance by the

127. NAAEC, *supra* note 123, art. 16.5.

128. *Id.* art. 13.1. The CEC currently has programs in four priority areas: Pollutants and Health; Environment, Economy and Trade; Conservation of Biodiversity; and Law and Policy. CEC, Our Programs and Projects, *at* http://www.cec.org/programs_projects/index.cfm?varlan=english (last visited Oct. 10, 2003).

129. NAAEC, *supra* note 123, art. 13.1.

130. *Id.* art. 14-15. Article 45 of the Agreement defines a non-governmental organization as "any scientific, professional, business, non-profit, or public interest organization or association which is neither affiliated with, nor under the direction of, a government." *Id.* art. 45.1.

131. NAAEC, *supra* note 123, art. 14.2. Article 45 further narrows the applicability of article 14 by exempting government action or inaction to "effectively enforce its environmental law" that "reflects a reasonable exercise of their discretion . . . or results from bona fide decisions to allocate resources to . . . other environmental matters determined to have higher priorities. . . ." *Id.* art. 45.1.

132. *Id.* art. 15.

133. *Id.* art. 22-24.

regulated parties.¹³⁴

1. Article 13 Reports

Article 13 of the NAAEC allows the Secretariat to prepare a report “on any matter within the scope of the annual program” without Council approval, and on other environmental matters related to the broad cooperative functions of the Agreement, unless two of the three members of the Council object. Given the scope of the four thematic areas identified in the CEC work program, the range of issues available to the Secretariat for special study is enormous.¹³⁵ Only issues arising from charges that a party has failed to enforce its environmental laws are outside the scope of the Article 13 process. These issues are taken up separately in the citizen submission process detailed under Articles 14 and 15.

The Secretariat also has broad discretion in the sources of information to be accessed in drafting its report. In addition to those available under Article 14 and 15, the Secretariat in developing the Article 13 report may draw upon information “gathered through public consultations, such as conferences, seminars and symposia.”¹³⁶ This process of public consultation responds directly to the NAAEC objective of “promot[ing] transparency and public participation in the development of environmental laws, regulations and policies.”¹³⁷ By involving the public in its fact-finding, the Secretariat is able to use transparency as a “sunshine method” that can have the effect of dramatically increasing the pressure on states to change their conduct, despite the lack of authority under the NAAEC to compel compliance by a Party.¹³⁸ Transparency also works to make the Article 13 procedure less susceptible than the citizen submissions process to actions that would either prevent publication or that would shelve controversial reports by the concerned Party.¹³⁹

a. The CEC Article 13 Report on Silva Reservoir Migratory Birds

While the CEC is not required to consider public requests for Article 13 reports, two of the five reports issued to date under Article 13 authority were proposed by non-governmental organizations. The first report involved the investigation of the death of thousands of waterfowl at the Silva Reservoir in the Mexican state of Guanajuato in December 1994 and resulted from a request by the

134. See Vega-Canovas, *supra* note 120, at 58-59.

135. John K. Knox, *A New Approach to Compliance with International Environmental Law: The Submissions Procedure of the NAFTA Environmental Commission*, 28 *ECOLOGY L.Q.* 1, 110-11 (2001).

136. NAAEC, *supra* note 123, art. 13.2.

137. *Id.* art. 1(h).

138. Knox, *supra* note 135, at 23.

139. *Id.* at 112.

United States-based National Audubon Society, Grupo de los Cien Internacional, and Centro Mexicano de Derecho Ambiental.¹⁴⁰ The investigation eventually concluded that Mexico was not responsible for the bird kill and called on the Mexican government to make a comprehensive evaluation.¹⁴¹ The Silva Reservoir report has been credited with instigating a suite of actions including the development of an action program for the state of Guanajuato, creation of the state's first environmental council, and the organization of relevant technical workshops.¹⁴² By attracting the interest of the CEC in the investigation, national non-governmental organizations (NGOs) were able to shine a spotlight on an important environmental incident that may have generated only a perfunctory response from Mexican authorities had the CEC not intervened. Similarly, the CEC mechanism allowed an international NGO to become actively involved in the investigation in a manner that would almost certainly not have been approved otherwise.¹⁴³

Article 13 reports have the advantage of being relatively non-confrontational. An individual or organization bringing an Article 14 submission, in contrast, is placing the Secretariat in the position of determining the merits of a specific charge brought against a Party. In the case of the Silva Reservoir incident, the NGOs that brought the issue to the CEC decided to petition the Secretariat for an investigation under Article 13 rather than under Article 14, reportedly to avoid creating a confrontational atmosphere.¹⁴⁴ The intervention of the Secretariat raised the profile of the bird kill, provided access to technical resources, and ensured that an objective investigation would be conducted by an institution that owed some deference to the Mexican government as a country-party to the NAAEC.¹⁴⁵ The resulting investigation enjoyed the active collaboration of the Mexican government, engaged the local population and regional authorities in the larger issue of environmental planning, and provided a positive model of NGO-government collaboration in an area that has been frequently characterized by distrust.

b. CEC Article 13 Report on the Upper San Pedro River

On November 14, 1996, the Southwest Center for Biological Diversity¹⁴⁶ and Dr. Robin Silver filed a charge of failure to enforce national environmental

140. *Id.* at 111.

141. See CEC, 1994-95 CEC SECRETARIAT REPORT ON THE DEATH OF MIGRATORY BIRDS AT THE SILVA RESERVOIR, (1995), http://www.cec.org/files/pdf/silvae_en.pdf (last visited Oct. 10, 2003).

142. Vega-Canovas, *supra* note 120, at 60.

143. *Id.* at 61.

144. *Id.* at 60-61.

145. *Id.*

146. The Southwest Center for Biological Diversity changed its name in 1999 to the Center for Biological Diversity.

laws against the United States under Article 14 of the NAAEC.¹⁴⁷ The citizen suit alleged that the Government had failed to comply with National Environmental Policy Act (NEPA) provisions requiring the filing of an environmental impact statement (EIS) that included a cumulative impact analysis of population increases from expansion plans at Fort Huachuca, a U.S. military facility in the San Pedro basin.¹⁴⁸ The increased water demand, it was claimed, would necessarily lead to increased pumping from the aquifer that fed the San Pedro River, resulting in the dewatering of the river and destruction of riparian habitat, thereby posing a threat to the adjacent national riparian conservation area.¹⁴⁹

At the same time, the Southwest Center for Biological Diversity also filed a petition with the CEC requesting that an Article 13 study be undertaken of the effect of groundwater pumping on riparian habitat for migratory birds in the entire Upper San Pedro River basin.¹⁵⁰ The Article 13 petition did not include the allegations against the United States for failure to enforce NEPA requirements; instead it called for a more ambitious assessment of the effects of all human activities on the San Pedro ecosystem, including the effects of mining and grazing in Mexico and groundwater pumping in the United States.¹⁵¹

The Secretariat determined that the petition met the Article 14(1) criteria and requested and received a response from the EPA.¹⁵² Instead of recommending to the Council the preparation of a factual record under Article 15, the Secretariat in May 1997 announced that it was launching under its Article 13 authority the Upper San Pedro Initiative, a three-phase program to assess the physical and biological conditions required to sustain and enhance the riparian migratory bird habitat of the upper San Pedro River basin.¹⁵³ On June 5, 1997, the Southwest Center withdrew its Article 14 petition.¹⁵⁴ The CEC denied that the study was sparked by the petition filed by the Southwest Center for Biological Diversity¹⁵⁵ and instead linked it to a suite of actions taken by the CEC related to migratory

147. See CEC, CITIZEN SUBMISSIONS ON ENFORCEMENT MATTERS, FORT HUACHUCA SUBMISSION ID: SEM-96-004, 11/14/1996, <http://www.cec.org/citizen/submissions/details/index.cfm?varlan=english&ID=35> (last visited Oct. 12, 2003).

148. See *id.*

149. Robert G. Varady, et al., *Water Management Options for the Upper San Pedro Basin: Assessing the Social and Institutional Landscape*, 40 NAT. RESOURCES J. 223, 228 (2000).

150. See Knox, *supra* note 135, at 113.

151. See *id.*

152. See Varady, et al., *supra* note 149, at 228.

153. See CEC, RIBBON OF LIFE: AN AGENDA FOR PRESERVING TRANSBOUNDARY MIGRATORY BIRD HABITAT ON THE UPPER SAN PEDRO RIVER 2 (1999), available at http://www.cec.org/programs_projects/other_initiatives/ribbon/index.cfm?varlan=english [hereinafter CEC, RIBBON OF LIFE].

154. See CEC, *supra* note 147.

155. See Varady, et al., *supra* note 149, at 228.

songbirds, including its efforts since 1995 to launch a conservation program for North American migratory birds and CEC Council recognition of the San Pedro Riparian National Conservation Area as a “Globally Important Bird Area” in 1996.¹⁵⁶

Regardless of whether the citizen suit or the related petition for an Article 13 study of the San Pedro River ecosystem served as an impetus for the CEC’s decision, the submitters clearly suggested that the CEC’s action led to the withdrawal of their Article 14 submission. In their letter announcing the withdrawal of their submission, the submitters noted that “[w]e are extremely pleased that the Secretariat intends to prepare a report in an effort to protect and enhance the San Pedro Riparian Conservation Area and watershed, pursuant to Article 13 . . . please consider our Article 14 submission withdrawn. . . .”¹⁵⁷

The decision to launch the Upper San Pedro Initiative had at least two important consequences. First, the Initiative dramatically broadened the scope of the study. Rather than the very narrow Article 15 fact-finding investigation of whether the United States was enforcing its own EIS requirements in the case of Fort Huachuca’s expansion, the study initiated under the Secretariat’s Article 13 authority was designed as a three-phase ecosystem-based assessment of riparian habitat preservation in the Upper San Pedro watershed.¹⁵⁸ The stated objectives of the Initiative were:

- To initiate a process where diverse stakeholders from the region can develop and implement economically and environmentally sustainable strategies *for enhancing and preserving the riverine ecosystem of the upper San Pedro watershed*;
- To develop a model of cooperation that could have

156. See CEC, RIBBON OF LIFE, *supra* note 153, at 1.

157. Letter from Earthlaw on behalf of Southwest Center for Biological Diversity, to CEC Secretariat (Nov. 14, 1996) (announcing withdrawal of Fort Huachuca Submission I.D. SEM - 96 - 004) at <http://www.cec.org/files/pdf/sem/96-4-wit-e.pdf> (last visited Oct. 12, 2003).

158. CEC, RIBBON OF LIFE, *supra* note 153. The three phases of the study involved first the commissioning of a technical report by an interdisciplinary team of experts to look in detail at the effects of water use and availability on riparian migratory bird habitat. The Expert Study Team consisted of six specialists from the United States and Mexico representing expertise in the physical and biological sciences, law, and economics. The second phase of the study, initiated following the release of the draft report by the Expert Study Team, involved a public review and comment process organized by the Udall Center for Studies in Public Policy at the University of Arizona. The third phase of the study involved the formulation of policy recommendations by a thirteen-member Upper San Pedro Advisory Panel. The findings of the Expert Study Team and the recommendations of the Advisory Panel provided the substance of the Ribbon of Life report presented to the Council.

- relevance to other transboundary basins; and
- To inform the broader public about the regional importance of preserving migratory bird habitat and the challenges and *opportunities in conserving and protecting valued transboundary resources*.¹⁵⁹

The contextualizing of the issue as one involving the “riverine ecosystem” moved the field of analysis away from the banks of the watercourse to focus on the complex relationships between human activity and environment in the San Pedro watershed on both sides of the international boundary.¹⁶⁰ This shift in analysis is essential if the regulatory mechanisms incorporated in legal regimes developed to manage transboundary water resources are to address environmental objectives rather than simply recognize existing priority given to consumption of the water resource itself.

In addition to placing environmental values at the center of an analysis of transboundary water management, the launching of the Upper San Pedro Initiative led to the widespread popular discussion of the technical data underlying the hydrologic linkage between groundwater and surface waters.¹⁶¹ In a pure or balanced natural state, groundwater discharge is in dynamic equilibrium with aquifer recharge.¹⁶² Discharge from aquifers to support riparian vegetation and to augment surface waters at times of low subflow in the stream is replaced by recharge of the aquifer from precipitation. Groundwater extraction from a hydrologically linked aquifer disrupts the natural balance; discharge through pumping reduces the volume of discharge available to support baseflow during periods of low seasonal flow and during extended droughts.¹⁶³ According to the San Pedro Expert Study Team report, “in the upper San Pedro basin, pumping reduces the flow of the river and consequently adversely affects the riparian

159. CEC, *RIBBON OF LIFE*, *supra* note 153 (italics and bullets added).

160. The Expert Study Team report defines “riverine” as including “the aquatic and wetland ecosystems that occur in and along the river as well as the riparian vegetation and other life forms that occur along the river banks and throughout the floodplain.” CEC, *SUSTAINING AND ENHANCING RIPARIAN MIGRATORY BIRD HABITAT ON THE UPPER SAN PEDRO RIVER, EXECUTIVE SUMMARY OF THE SAN PEDRO EXPERT STUDY TEAM REPORT*, in CEC, *RIBBON OF LIFE*, *supra* note 153, Attachment 1, at 15 (1999).

161. The public review of the Expert Study Team findings involved over 650 participants in workshops and focus groups in the region. In addition, more than 300 written comments were submitted. *See* CEC, *RIBBON OF LIFE*, *supra* note 153, at 4.

162. This rudimentary description borrows heavily from that provided by the Expert Study Team Report. CEC, *supra* note 160, at 16.

163. *See* GLENNON, *supra* note 6, at 61. One 1988 study recorded a reduction in groundwater discharge to the river of 70 percent due to agricultural pumping and groundwater extraction by the city of Sierra Vista and Fort Huachuca. Glennon provides a comprehensive review of the history of the San Pedro River conflict, including the part played by the CEC study, in Chapter 4: *A River at Risk*. *Id.* at 51-69.

vegetation.”¹⁶⁴

While the findings of the Expert Study Team were not welcomed by all, including some local farmers and ranchers, developers, municipal leaders and even the Arizona state legislature,¹⁶⁵ the exposure to technical data and the opportunity to participate in public discussions educated local audiences on an important environmental issue, thereby providing a basis for more informed decision-making.¹⁶⁶ The development of a coordinated binational approach to protecting migratory bird habitat in the upper San Pedro basin will require a basic understanding of the hydrologic linkage between groundwater and surface water by the public – an understanding that is not currently reflected in Arizona law, Mexican law, or international conventions.¹⁶⁷ The CEC acknowledged the centrality of the ecosystem approach to analysis and the need for public awareness of basic hydrologic facts in its first conclusion from the Upper San Pedro River Initiative. “At a minimum, the lessons of cooperative transboundary resource management must begin with sound science, public access to information and a full menu of cooperative management tools and strategies that account for the interdependent ecological realities of watersheds and their inhabitants.”¹⁶⁸

2. Citizen Suits Under Articles 14 & 15

The citizen petition process under Article 14 provides a unique mechanism for a person or an NGO to bring suit against a party-member of the NAAEC for failure to enforce the nation’s environmental laws.¹⁶⁹ However, the process itself is daunting and at times has resulted in long delays.¹⁷⁰ Timeliness

164. CEC, *supra* note 160, at 16.

165. *See* Varady, et al., *supra* note 149, at 230-31. The Arizona legislature, responding to pressure from politically influential groups and perhaps piqued by what it perceived as an incursion on state sovereignty over water, a matter traditionally regulated by the states, passed a memorial attacking the report and calling on the federal government to “refuse to ratify or adopt future treaties that subject the states to international intrusion or authority over states’ environmental matters.” Frona M. Powell, *The North American Commission for Environmental Cooperation’s San Pedro Report: A Case Study and Analysis of the CEC Process*, 6 ENVTL. LAW. 809, 835 (2000) (citing Ariz. Leg., Memorial Urging the President and Congress of the U.S. to Refuse to Authorize, Endorse, Ratify or Adopt Any International Treaty or Federal Designation That Would Usurp the Authority of the States and Establish Their Own Environmental Standards, 43rd Legis., 2nd Reg. Sess. 1006 (Ariz. 1998)).

166. *See* Powell, *supra* note 165, at 836.

167. The lead institutional recommendation made by the Advisory Panel responded to this incoherence in federal, state and local laws by calling for a thorough public review of relevant laws and regulations “with a view toward modifying those that militate against a sustainable future for the river.” CEC, *supra* note 160, at 28.

168. CEC, RIBBON OF LIFE, *supra* note 153, at 7.

169. *See* Powell, *supra* note 165, at 821.

170. *Id.* at 824.

has been identified as a “threshold issue” for the public in regard to the effectiveness of the Article 14 and 15 process, and the lack of set time limits for a number of key steps in the citizen petition process has come under particular scrutiny.¹⁷¹ The NAAEC provisions under Articles 14 and 15 do not establish time limits for the initial review period under Article 14(1), the determination of whether to invite a response from the party under Article 14(2), or the review period for the Party response and the decision of whether to recommend that a factual record be made under Article 15. Nor do Article 14 and 15 set the time limit for the investigation of the allegations if a factual record recommendation is approved, or for drafting the initial and final versions of the factual record itself.¹⁷² According to complaints received by the JPAC during its review of the Article 14 and 15 submissions process from 1995-2000, over half of the active submissions remained pending for two years or more.¹⁷³ The JPAC review recommended cutting average review periods by more than two-thirds in most cases, from over six months for the combined reviews under Article 14(1) and (2) to 60 days, and from the average of just over nine months for the review of Party responses under Article 15(1) to a brief 30-60 days.¹⁷⁴ With the proposed guidelines in place, Secretariat recommendations for factual records could reach the Council in five to six months rather than the average of approximately eighteen months for the five-year period covered in the review.¹⁷⁵

While these measures would be a welcome improvement, they would not resolve what some observers see as the primary deficiencies of the NAAEC. These include the inability of the party filing the complaint to prosecute once the submission has been filed and, related to this, the lack of any enforcement mechanism to compel compliance with findings of the factual record in regard to a party who is found not to be enforcing its environmental laws.¹⁷⁶ The very absence of an overtly adversarial and punitive compliance-based approach has also been cited as a positive factor that, while affirming national sovereignty, also provides an “international framework through which parties, NGOs, and other concerned people can address environmental issues.”¹⁷⁷

The steady increase in citizen petitions filed under Article 14 lends credence to the perceived efficacy of the NAAEC approach, despite the lack of enforced remedies to the complaints brought against the parties. As of October 2003, the CEC Secretariat had received forty-two Article 14 submissions since it

171. CEC, LESSONS LEARNED: CITIZEN SUBMISSIONS UNDER ARTICLES 14 AND 15 OF THE NORTH AMERICAN AGREEMENT ON ENVIRONMENTAL COOPERATION 9 (June 6, 2001), http://www.cec.org/files/pdf/JPAC/rep11-e-final_EN.PDF (last visited Sept. 25, 2004) [hereinafter LESSONS LEARNED: Arts. 14 & 15].

172. NAAEC, *supra* note 123, arts. 14-15.

173. LESSONS LEARNED: ARTS. 14 & 15, *supra* note 171, at 9-10.

174. *Id.* at 14-15.

175. *Id.* at 15.

176. *See* Powell, *supra* note 165, at 824-25.

177. *See id.* at 824.

began the citizen suit process in 1995.¹⁷⁸ Of the forty-two submissions, eight resulted in the publication of factual records with the first such record involving the United States as the concerned party released on April 24, 2003.¹⁷⁹ In the June 2003 annual report from the Acting Executive Director of the Secretariat, only twelve of the thirty-nine submissions received had been dismissed on the grounds that they did not warrant further consideration under the base requirements established in Article 14.1 or 14.2, two had been terminated as subject to pending judicial or administrative proceedings by the party under Article 14.3(a), and five were not recommended to the Council for a factual record by the Secretariat.¹⁸⁰ While the Council holds the ultimate authority to reject any citizen suit brought forward by the Secretariat, in only two cases, one involving Mexico and the other involving Canada as the concerned party, did the Council dismiss submissions following notification from the Secretariat that preparation of a factual report was warranted.¹⁸¹ This evident exercise of forbearance by parties who are subject to citizen suits diminishes the basis for concern expressed by opponents of NAAEC that the Article 14 process was unduly subordinate to the interests of the parties as represented by the Council.¹⁸²

3. Inter-Party Dispute Resolution

The slow and intricate process designed for the resolution of inter-party disputes undercuts the effectiveness of the mechanism for addressing disagreements between parties over selective enforcement or non-enforcement of environmental regulations.¹⁸³ Under Article 22 of the NAAEC, a NAFTA party may seek consultation with any other party regarding a perceived “persistent pattern of failure ... to effectively enforce its environmental law.”¹⁸⁴ If the consultation does not resolve the dispute, any party may request a special session of the Council to address the complaint.¹⁸⁵ Should this also fail to resolve the issue, an arbitral panel may be convened to address the issues under dispute.¹⁸⁶

An action plan mutually agreeable to the parties is to be developed to

178. See CEC, CITIZEN SUBMISSIONS ON ENFORCEMENT MATTERS: CURRENT STATUS OF FILED SUBMISSIONS, at <http://www/cec/org/citizen/status/index.cfm?varlan=english> (last visited Oct. 10, 2003).

179. See *id.*

180. See CEC, REPORT OF THE ACTING EXECUTIVE DIRECTOR, COMMISSION FOR ENVIRONMENTAL COOPERATION, Tenth Regular Session of the CEC Council, Doc. 1711/01-00/096, 19-21 (June 16, 2003), http://www.cec.org/files/PDF/PUBLICATIONS/ED-rpt-Council-2003_en.pdf (last visited Sept. 25, 2004).

181. See *id.* at 21.

182. See Powell, *supra* note 165, at 824-5.

183. See *id.*

184. NAAEC, *supra* note 123, art. 22.1. Article 45 defines “persistent pattern” as “a sustained or recurring course of action or inaction.” *Id.* art. 45.1.

185. *Id.* art. 23.1.

186. *Id.* art. 24.1.

resolve the environmental enforcement deficiency, or the panel may impose an action plan if agreement between the opposing parties cannot be reached. Ultimately, the panel may impose a fine¹⁸⁷ and, in the case of non-payment, suspend NAFTA benefits to an extent commensurate with the value of the fine.¹⁸⁸ Each step of the process provides for review and response by the Party against whom the complaint has been submitted and for further review of that party's response by the complainant. Given the complexity of the process and the lengthy delays that are built in to encourage resolution of the problem, it is not surprising that there have been no initiatives regarding persistent failure to enforce environmental law brought against a Party since the establishment of the CEC.¹⁸⁹

C. Bilateral Agreements and the IBWC

Two treaties apportion the shared waters of the major river systems that define and traverse the boundary between the United States and Mexico.¹⁹⁰ Neither, however, includes any direct reference to transboundary groundwater. Rather, their scope is limited to the major boundary rivers and specifically to the surface waters of the Rio Grande, the Colorado River, and the Tijuana River. The first of these was the 1906 Convention between the United States and Mexico, which provided for the distribution of the waters of that part of the Rio Grande/Rio Bravo running from the head works of the Acequia Madre, known as the Old Mexican Canal near the city of Juárez, Mexico, to Fort Quitman, Texas.¹⁹¹ Article I of the 1906 Rio Grande Treaty provided for the delivery of 60,000 acre-feet of water annually to the head works of the Acequia Madre, while Article II specified the monthly distribution schedule for the water, patterned on the delivery of water to the proposed irrigation system for lands near El Paso, Texas.¹⁹²

Two aspects of the treaty are of particular interest. First, the 1906 Rio Grande Treaty deals expressly and exclusively with the allocation of water for the sole purpose of irrigation, as the full title of the convention indicates.¹⁹³ Unlike subsequent agreements regarding the allocation of the major boundary rivers, no hierarchy of purposes is proposed for the use of the water, including for domestic

187. *Id.* art. 34.4(b).

188. *Id.* art. 36.1.

189. Vega-Canovas, *supra* note 120, at 59.

190. Convention Between the United States and Mexico Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes, May 21, 1906, U.S.-Mex., 34 Stat. 2953, [hereinafter 1906 Rio Grande Treaty]; Treaty Between the United States of America and Mexico Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, February 3, 1944, U.S.-Mex., 59 Stat. 1219, [hereinafter 1944 Water Treaty].

191. *See* 1906 Rio Grande Treaty, *supra* note 190.

192. *See id.* art. I-II. The Rio Grande is known as the Rio Bravo in Mexico.

193. *See id.*

purposes.¹⁹⁴ Second, specific provisions are made for reducing the delivery of water for reason of “extraordinary drought or serious accident to the irrigation system in the United States” in direct proportion to the reduction in water delivered to U.S. irrigators.¹⁹⁵ While the inclusion of a mechanism for revising the delivery of water during times of drought is significant for its recognition of the equitable apportionment principle of international common law applied to shared watercourses,¹⁹⁶ the treaty does not provide a definition of the meaning of “extraordinary drought,” thereby leaving the determination of when the diminished allocation mechanism comes into play subject to dispute.

The second treaty, signed in 1944 to allocate the waters of the three major river systems that define the border, the Colorado River, the Tijuana River, and the Rio Grande, is of substantially greater importance to the long-term management of the boundary waters between the two countries.¹⁹⁷ The 1944 Water Treaty provided a definitive allocation of the waters of the Colorado River (art. 10) and the section of the Rio Grande/Rio Bravo between Fort Quitman and the Gulf of Mexico (art. 4) that has remained unchanged to this time, while calling for the investigation and preparation of plans for the equitable distribution of the waters of the Tijuana River system (art. 16).¹⁹⁸ In addition to the allocation of waters, the 1944 Water Treaty also calls for the construction of necessary infrastructure to channel and distribute the water on both sides of the border, the development of hydro-electric plants, and plans for flood control.¹⁹⁹

A hierarchy of uses for the shared waters is provided in Article 3, with the order of preference establishing domestic and municipal uses in top priority, followed by agriculture and stock-raising, electric power, other industrial uses, navigation, fishing and hunting, and “any other beneficial uses which may be determined.”²⁰⁰ The recognition of domestic uses as the top priority reflects the significance of rapidly growing urban populations prior to World War II, while the remaining uses emphasize the multiple-use conception of waterways that arose along with industry and manufacturing and is now the dominant model for exploitation of major river systems in the West.²⁰¹ No preference in water use is

194. See e.g., 1944 Water Treaty, *supra* note 190, art. 3 (establishing an order of preference for the joint use of international waters).

195. 1906 Rio Grande Treaty, *supra* note 190, art. II.

196. See e.g., Barberis, *supra* note 34, at 175-76.

197. 1944 Water Treaty, *supra* note 190. The 1944 Water Treaty complements the 1906 Rio Grande Treaty by providing for the allocation of waters between Fort Quitman, Texas (in the area of El Paso-Ciudad Juárez) and the Gulf of Mexico. *Id.* art. 4.

198. 1944 Water Treaty, *supra* note 190, art. 16.

199. *Id.* arts. 5, 6, 7, 12, 13.

200. *Id.* art. 3.

201. See Tarlock, *supra* note 43, at 182-86. Tarlock makes the point that the multiple-use model of optimal exploitation of river systems not only provided the conceptual framework for the harnessing of the rivers of the Western United States during the first

provided for the environmental or ecological functions of the rivers and their watersheds, and even the inclusion of fish and wildlife is restricted to the purpose of consumption rather than protection or conservation.²⁰² This has led to substantial criticism in recent times from analysts who see the hierarchy of preferred uses as anachronistic.²⁰³ According to Stephen Mumme, a leading authority on the IBWC and border water issues, “[p]rotecting instream flows and preserving biodiversity (wetlands, habitat, et cetera) by strict construction, among the least valued uses of water under the treaty as written may (by contemporary standards) outrank the value of navigation or fishing and hunting (functions accorded higher priority by the 1944 Water Treaty).”²⁰⁴ Public health was granted particular importance in the planning of infrastructure for the shared use of these boundary waters with the provision that all of the listed uses would be subject to any sanitary measures or works that the two governments mutually agreed upon.²⁰⁵ Article 3 also provided that the two governments “hereby agree to give preferential attention to the solution of all border sanitation problems.”²⁰⁶

1. The International Boundary and Water Commission

The 1944 Water Treaty entrusted considerable authority to the International Boundary and Water Commission for the execution of the terms of the Treaty and the settlement of disputes between the Parties.²⁰⁷ The IBWC is an expanded version of the International Boundary Commission established under an 1889 Treaty between the United States and Mexico to resolve territorial disputes arising from changes in the physical course of the Rio Grande and Colorado River.²⁰⁸ The Commission consists of two Sections, one for the United States and one for Mexico, each of which is staffed by a Commissioner, two principal engineers, a legal adviser, and a secretary.²⁰⁹ The Commission has the status of an international body; each Commissioner is to be accorded diplomatic status by the other government, and the core staff of each Section is entitled to the privileges

two-thirds of the 20th century, but was also exported throughout the world and especially to developing countries in Africa, Asia and Latin America. *Id.* at 183-84.

202. 1944 Water Treaty, *supra* note 190, art. 2.

203. See Stephen P. Mumme, *Managing Acute Water Scarcity on the U.S.-Mexico Border: Institutional Issues Raised by the 1990's Drought*, 39 NAT. RESOURCES J. 149, 155 (1999).

204. *Id.* at 155-56.

205. 1944 Water Treaty, *supra* note 190, art. 3.

206. *Id.*

207. *Id.* art. 2.

208. Convention Between the United States of America and the United States of Mexico to Facilitate the Carrying Out of the Principles Contained in the Treaty of November 12, 1884, and to Avoid the Difficulties Occasioned by Reason of the Changes Which Take Place in the Bed of the Rio Grande and that of the Colorado River, March 1, 1889, U.S.-Mex., 26 Stat. 1512 [hereinafter 1889 Treaty].

209. See 1944 Water Treaty, *supra* note 190, art. 2.

and immunities provided to diplomatic officers.²¹⁰ For all matters that involve joint action or joint agreement by the two governments, each Section is to act through its respective foreign office, the Department of State in the United States and the Ministry of Foreign Relations in Mexico. All infrastructure constructed or used in fulfillment of the Treaty that lies wholly within the territory of a Party is placed under the exclusive jurisdiction and control of the national Section, unless otherwise expressly provided by the Treaty or subsequent formal agreement.²¹¹

The IBWC is endowed with important rule making and enforcement powers as well as general supervisory and planning authority.²¹² The rule-making power is exercised through the recording of Minutes that reflect the decisions of the Commission in regard to significant issues raised by the governments or deemed critical to the implementation of the Treaty by the IBWC itself.²¹³ Unless joint action by the governments is required by the treaty, a Minute becomes effective after thirty days unless challenged by one of the governments.²¹⁴ Of the roughly 130 Minutes recorded by the IBWC, the great majority refer to the planning and authorization of construction projects, followed by measures to compensate for drought and other emergency situations and measures to address border sanitation problems.²¹⁵ The success of the IBWC in receiving the accord of the two governments for most of the agreements reached by the Commission has been attributed to the body's apolitical nature and the technical expertise of the members of the two Sections.²¹⁶ Alberto Szekely, then the Research Director of the International Transboundary Resources Center at the University of New Mexico, while noting the challenges currently faced by the IBWC, underscored its longevity and unusual record of success.

The marvel of the IBWC experience was that, even as late as 1989, it had existed and developed for 10 decades . . .

210. *See id.*

211. *See id.*

212. *See id.* art. 24-25.

213. *See id.* art. 25.

214. The 1944 Water Treaty, *supra* note 190, art. 25. "Except where the specific approval of the two Governments is required by any provision of this Treaty, if one of the Governments fails to communicate to the Commission its approval or disapproval of a decision of the Commission within thirty days reckoned from the date of the Minute in which shall have been pronounced, the Minute in question and the decisions which it contains shall be considered to be approved by that Government." *Id.* This provision is consistent with the decision-making procedure established for the Commission in the 1889 treaty. *See* 1889 Treaty, *supra* note 208, art. VIII.

215. Minutes, Int'l Boundary and Water Commission at http://www.ibwc.state.gov/html/body_minutes.htm (last visited November 17, 2003).

216. Alberto Szekely, *How to Accommodate an Uncertain Future into Institutional Responsiveness and Planning: the Case of Mexico and the United States*, 33 NAT. RESOURCES J. 397, 399 (1993).

practically oblivious to the political turmoil and other disputes which plagued the bilateral relationship between the two countries during the previous 100 years. That can only mean that its work was not dependent on political considerations, but rather was handled on the basis of a common understanding and awareness of the need to resolve the issues from a technical, economic, and even ecological perspective, for the mutual benefit of the two countries.²¹⁷

Nevertheless, the narrow formulation of the primary technical concerns of the IBWC has also restricted its ability to address effectively the ecological concerns that have emerged since the 1980s and hampered consideration of the watershed or basin as the primary unit of analysis.²¹⁸

a. IBWC Minute 242: Colorado River Water Salinity and Effect on Groundwater

The strong technical orientation and apolitical culture of the Commission did not, however, lead to efforts to address the mining of shared aquifers with the same resolve shown in untangling the obstacles to effective surface water management. Despite the seemingly inescapable connection between population growth, industrial development, and groundwater demand, the IBWC has managed largely to avoid addressing the issue of transboundary groundwater management throughout its nearly 114 years of combined operation.²¹⁹ The principal exception to the Commission's avoidance of groundwater issues appeared in IBWC Minute 242, signed in 1973, with the extravagantly optimistic title of the "Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River."²²⁰ Rising salinity levels of water reaching one of Mexico's premier agricultural regions, the Mexicali Valley, led to protests from the Mexican Government and the adoption of a Minute that defined acceptable

217. *Id.* at 397-98.

218. See Leonard B. Dworsky & Albert E. Utton, *Assessing North America's Management of its Transboundary Waters*, in *The North American Experience Managing International Transboundary Water Resources: The International Joint Commission and the International Boundary and Water Commission*, Part 2, 33 NAT. RESOURCES J. 413, 446-47 (1993); Stephen P. Mumme, *The Case for Adding an Ecology Minute to the 1944 United States-Mexico Water Treaty*, 15 TUL. ENVTL. L.J. 239, 242-43 (2002).

219. Including the period subsequent to the 1889 Treaty establishing the International Boundary Commission.

220. Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River, Minute 242, Int'l Boundary and Water Commission, Aug. 30, 1973, Mex.-U.S., 24 U.S.T. 1968 [hereinafter IBWC, Minute 242]. Note that the title of the Minute was less a statement of optimism than a forceful reminder that this was the sole and exclusive remedy that the United States was willing to provide to compensate Mexico for the injury sustained from the water's high salinity level.

salinity levels, provided for the construction of a bypass canal to shuttle overly saline waters into a wetland area in Mexico, and provided financial and technical assistance for the improvement and rehabilitation of those areas of the Mexicali Valley that were harmed by the salinity problem.²²¹

The truly startling aspect of this Minute was not the detailed planning and investments designed to redress the threat posed by salinity to the fertile soils of the Mexicali Valley, but the announcement of a forthcoming binational agreement on groundwater management:

Pending the conclusion by the Governments of the United States and Mexico of a comprehensive agreement on groundwater in the border areas, each country shall limit pumping of groundwaters in its territory within five miles (eight kilometers) of the Arizona-Sonora boundary near San Luis to 160,000 acre-feet (197,358,000 cubic meters) annually.²²²

The clear anticipation of and call for a “comprehensive agreement on groundwater in the border areas” found in paragraph 5 of the Minute was never realized, and little progress in developing a formal agreement has been recorded to date, thirty years after the signing of Minute 242.²²³

Even the more modest commitment of providing notice and consultation of “any new development of either the surface or the groundwater resources . . . that might adversely affect the other country”²²⁴ appears to be jeopardized by the recent agreement authorizing the transfer of Colorado River water from rural to urban consumers in California brokered by Secretary of the Interior, Gale Norton.²²⁵ The Colorado River Water Delivery Agreement facilitates a massive transfer of Colorado River water from agricultural to urban use by, among other measures, lining sections of the All-American and Coachella Canals.²²⁶ No reference is made in the agreement to the impact this will have on recharge of the aquifer feeding Mexico’s Mexicali Valley, nor is any form of compensation to Mexico identified in the agreement.²²⁷ The Allocation Agreement calls for lining approximately twenty-three miles of the All-American Canal (Art. 3.3), 33.2 miles of the Coachella Canal (Art. 3.11), and other related seepage recovery works (Art.

221. *Id.*

222. *Id.* para. 5, 205.

223. *See generally* Mumme, *supra* note 14.

224. IBWC, Minute 242, *supra* note 220, para. 6.

225. *See* U.S. DEPT. OF INTERIOR, Colorado River Water Agreement, at <http://www.doi.gov/issues/colorado.html> (last visited March 10, 2004).

226. *Id.*

227. *Id.*

2.2).²²⁸

Still, Minute 242 and, in a more general sense, the minuting process for establishing regulations under the IBWC provides an authoritative and well-understood mechanism for developing a common understanding of and approach to sharing transboundary groundwater resources and converting that understanding into a formal bilateral agreement.

b. Minute 306: The Colorado River Delta

While the IBWC has generally remained within the exploitation-based multiple use model of river development, it has recently addressed issues that reflect growing bilateral concern for the ecological impacts of the harnessing of major river systems, specifically of the effect of reduced instream flows and water delivery on the ecology of the Colorado River Delta.²²⁹ The recently approved Minute 306 establishes a conceptual framework for binational cooperation on studies of the riparian and estuarine ecology of the Colorado River Delta.²³⁰ The IBWC anchors this expedition into the realm of ecosystem dynamics to Article 13 of the 1944 Water Treaty, which authorizes the Commission to “study, investigate, and prepare plans for flood control on the Lower Colorado River between Imperial Dam and the Gulf of California.”²³¹ The Minute charges a binational technical task force with the examination of the effect of flows on the existing riparian and estuarine ecology of the Colorado River and its delta.²³² The

228. Allocation Agreement Between the United States of America and the Metropolitan Water District et al., signed Oct. 10, 2003, at http://www.sdcwa.org/manage/pdf/QSA_Alloc.pdf (last visited March 10, 2004).

229. See generally, Robert Glennon & Peter W. Culp, *The Last Green Lagoon: How and Why the Bush Administration Should Save the Colorado River Delta*, 28 *ECOLOGY L.Q.* 903 (2002). Glennon and Culp argue that a Delta restoration program “falls squarely within the jurisdiction” of the IBWC given its role in the control of salinity of Colorado River waters as addressed by IBWC Minute 242 and by the authority granted in the area of border sanitation by Minute 261. *Id.* at 978-79. IBWC Minute 261 was drafted in response to instructions from Presidents Jimmy Carter and Jose Lopez Portillo to resolve border sanitation problems. *Id.* The Minute grants the Commission the authority to identify sanitation problems, define the quality standards that should be applied, set the course of action to be followed, and establish the time schedule for the plan’s execution. Recommendations for the Solution to the Border Sanitation Problems, Int’l Boundary and Water Commission Minute No. 261, Sept. 24, 1979, U.S.-Mex., 31 U.S.T. 5099.

230. Conceptual Framework for United States-Mexico Studies for Future Recommendations Concerning the Riparian and Estuarine Ecology of the Limitrophe Section of the Colorado River and its Associated Delta, Int’l Boundary and Water Commission Minute No. 306, Dec. 12, 2000, U.S.-Mex., State Dept. No. 01-22, 2000 WL 33155946 [hereinafter IBWC, Minute 306].

231. The 1944 Water Treaty, *supra* note 190, art. 13.

232. IBWC, Minute 306, *supra* note 230.

task force is to place particular emphasis on defining the habitat needs of fish and marine and wildlife species of concern to each country.²³³

The expansion of the IBWC's scope of action to include ecological uses of the waters regulated by the 1944 Water Treaty suggests that a similar case could be made for a more active role in regulating transboundary groundwater. Like ecological considerations, groundwater is not specifically referenced in the text of the 1944 Water Treaty. Nevertheless, it is clearly a primary consideration in the execution of Minute 261 regarding border sanitation problems. These problems in turn are anchored in the mandate to the IBWC provided in Article 3 of the 1944 Water treaty to "give preferential attention to the solution of all border sanitation problems" and the call for a comprehensive agreement on groundwater recorded in Minute 242.²³⁴

III. SUMMARY AND CONCLUSIONS

Transboundary groundwater management has been an issue of growing global concern since the end of World War II. Recognizing the unsettled status of international water law in general, the International Law Association initiated a process of formalization of legal principles and laws governing shared water resources that has spanned five decades.²³⁵ Initially focused on surface waters and rivers in particular, underground water resources were later added to the analysis. Non-binding principles emphasizing equitable utilization and the obligation to cause no substantial harm all within the context of limited territorial sovereignty were advanced in the mid 1960s,²³⁶ extended to groundwater aquifers in the mid 1980s,²³⁷ and adopted by vote of the United Nations General Assembly in 1997.²³⁸

Despite the mounting consensus on both the importance of transboundary groundwater management and on the core principles governing the rights, duties, and responsibilities of the Parties, application of this consensus in the form of bi- or multi-party agreements or treaties has been rare. This lack of progress in formalizing transboundary agreements has also characterized the United States–Mexico relationship. The concern that led Professor Albert Utton and Ambassador Cesar Sepulveda in the 1970s to initiate a collaborative study group that drafted the informal Ixtapa Agreement on transboundary groundwater between Mexico and the United States has only increased.²³⁹ Severe

233. *Id.*

234. 1944 Water Treaty, *supra* note 190, art. 3; IBWC, Minute 242, *supra* note 220, para. 5.

235. *See* Bourne, *supra* note 57.

236. HELSINKI RULES, *supra* note 64.

237. SEOUL RULES, *supra* note 77.

238. *International Watercourses Convention*, *supra* note 88.

239. Ann Berkley Rodgers & Albert Utton, *The Ixtapa Draft Agreement Relating to the Use of Transboundary Groundwaters*, 25 NAT. RESOURCES J. 715 (1985).

transboundary groundwater conflicts have erupted along the United States–Mexico border, including the Mexicali Valley in the west, the Mimbres Aquifer in the New Mexico–Chihuahua region, and the El Paso–Ciudad Juárez area in the east.

The mechanisms for addressing transboundary issues have also multiplied since the 1960s with the signing of NAFTA-based environmental agreements, such as the North American Agreement on Environmental Cooperation and the formation of the Commission for Environmental Cooperation.²⁴⁰ Existing binational institutions, such as the International Boundary and Water Commission, have also addressed groundwater concerns, albeit with hesitation and often a limited (sometimes self-imposed) mandate to look at water quality issues only.²⁴¹ With the increased availability of institutional mechanisms to focus, and even compel, government action and the growing local interest in finding workable solutions, the continued inaction of central authorities may be effectively challenged.

Above all else, transboundary groundwater is a local concern. Even when the ramifications of resource neglect and unilateral takings impact neighboring communities and important regional industries, it is unlikely that national authorities will be spurred to initiate bilateral negotiations unless there is a resounding demand for specific concrete actions from communities and state governments. The technical appropriateness and political palatability of the proposed solutions depend on the wide availability and accessibility of comprehensive data among all the parties that depend upon the shared resource. Professor Utton and the other contributors to the Bellagio Draft Treaty correctly identified the central importance of the information function.²⁴² Groundwater, the invisible resource, will remain unseen unless brought out into the open by the application of accepted hydrological principles that capture in meaningful measure the scope and complexity of the problem. Local concerns will remain unheard until communities and politicians on both sides of the border use this information to develop practical solutions and demand national recognition of the economic, social, and environmental benefits at stake.



240. See NAAEC, *supra* note 123.

241. See IBWC, Minute 242, *supra* note 220.

242. *The Bellagio Draft Treaty*, *supra* note 105.