

2008

Boundary Waters Treaty of 1909 as a Model for Interjurisdictional Water Governance

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Recommended Citation

Robert H. Abrams, Boundary Waters Treaty of 1909 as a Model for Interjurisdictional Water Governance, 54 Wayne L. Rev. 1635 (2008)

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THE BOUNDARY WATERS TREATY OF 1909 AS A MODEL FOR INTERJURISDICTIONAL WATER GOVERNANCE

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Table of Contents

I. INTRODUCTION	1635
II. A SNAPSHOT OF THREE AMERICAN DOMESTIC WATER CONFLICTS THAT USEFULLY MIGHT CONSIDER A WATER ALLOCATION AND MANAGEMENT REGIME INCLUDING BWT/IJC ELEMENTS	1637
<i>A. Catawba River: North Carolina and South Carolina</i>	1637
<i>B. Apalachicola-Chattahoochee-Flint (ACF) Basin: Georgia, Alabama, and Florida</i>	1639
<i>C. Sparta Aquifer: Mississippi and Tennessee (and as Many as Six Other States)</i>	1640
III. GETTING INITIAL AGREEMENT OF SOVEREIGNS ENGAGED IN A PRESENT WATER DISPUTE	1642
<i>A. Nations Acting Like Nations v. American States Acting Parochially</i>	1642
<i>B. The Problem of an Advantaged Party: Of Physical and Legal Advantages</i>	1645
IV. A PICTURE SO BLEAK THAT EVEN A STUBBORN STATE MIGHT COMPROMISE	1656
V. WHAT ELEMENTS THE BWT MIGHT OFFER TO LASTING WATER CONFLICT RESOLUTION	1659
VI. CONCLUSION—PRESENT SUCCESSES AND PUTTING THEORY TO THE TEST	1664
APPENDIX A	1669

I. INTRODUCTION

As the Boundary Waters Treaty of 1909 (BWT)¹ reaches its centennial it has earned many of the plaudits bestowed on it. The BWT accomplished a number of key Great Lakes specific matters in ways that are unlikely ever to be revisited. Besides establishing the location of the international border, the BWT addressed key matters of navigational

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1. Boundary Waters Treaty, U.S.-Gr. Brit. (for Can.), Jan. 11, 1909, 36 Stat. 2448 [hereinafter BWT].

rights, giving Canada access to waters wholly within the United States, most prominently Lake Michigan, but also addressing transit from the lakes to the ocean via the St. Lawrence River.² Beyond those one-time and unique boundary settling and issues of navigation in the Great Lakes region, the BWT created a governance structure that has minimized water-related conflict in its century of operation. At the core of the BWT's operation is one of the best respected international bodies, the International Joint Commission (IJC).³ The IJC has thrived, despite its potential for impasse at the hands of its evenly divided voting authority, by building a record of impeccable research and analysis and promoting bi-national consensus. Over time, the BWT and the IJC have addressed the whole range of water use issues, ranging from navigation, to diversions, to water quality. At times, such as with the Great Lakes Water Quality Agreement,⁴ the approach to a problem has extended into additional non-treaty agreements of the two nations, but even then, the underlying BWT structure of equal representation and the exemplary commitment to a science-based approach of the IJC provided the fulcrum for enduring improvement of the waters. Quite certainly, the interjurisdictional management of the shared water resource performed by the BWT and IJC helped maintain harmonious relations between the United States and Canada for the past century.

In an age of increasing interjurisdictional water conflict and water management concern, the BWT's list of accomplishments, reached in a harmonious manner, raises the possibility that, perhaps, the management mechanisms of the BWT might beneficially be used in other contexts. This Article will take up that possibility in the context of three contemporary American interstate water allocation disputes. These disputes are (1) a relatively simple cross-border complaint by a downstream state, South Carolina, that North Carolina cities are using too much water of the Catawba River;⁵ (2) the basin-wide dispute regarding water use and allocation in the Apalachicola-Chattahoochee-Flint Basin;⁶ and (3) the claim of the State of Mississippi that the water utility company serving Memphis, Tennessee and its growing urban area, is violating Mississippi's rights and those of her citizens to groundwater of the regional Sparta Aquifer, also referred to at times as the Memphis

2. See generally *id.*

3. See *id.* art. III.

4. Great Lakes Water Quality Agreement, U.S.-Can., Apr. 15, 1972, 23 U.S.T. 301; amended Nov. 22, 1978, 30 U.S.T. 1383; amended Nov. 18, 1987, T.I.A.S. No. 11551.

5. See *infra* Part II.A.

6. See *infra* Part II.B.

Sands Aquifer.⁷ This is, necessarily, an imprecise exercise because of the differences in the resources subject to management, the sovereigns, the eras, the institutional capabilities of the parties, and, most speculatively, the political feasibility of getting initial agreement to put something like the BWT in place. What emerges is the belief that only some aspects of the BWT structure will work in other settings. Thus, the BWT cannot be transplanted on a wholesale basis to the Catawba, ACF, or Sparta Aquifer, but, importantly, what is transferrable includes several of the key elements of BWT/IJC governance.

II. A SNAPSHOT OF THREE AMERICAN DOMESTIC WATER CONFLICTS THAT USEFULLY MIGHT CONSIDER A WATER ALLOCATION AND MANAGEMENT REGIME INCLUDING BWT/IJC ELEMENTS

A. Catawba River: North Carolina and South Carolina

This water use conflict took on high relief in 2007 when South Carolina sought, and was granted leave, to file an original action in the United States Supreme Court.⁸ The complaint⁹ alleges that North Carolina, the upstream state on the Catawba River,¹⁰ has authorized past interbasin diversions from the Catawba, most recently in 2007. The complaint further alleges that the existing and threatened additional diversions are depriving South Carolina of an equitable share of the Catawba's water.¹¹ The authorized transfers total forty-eight million

7. See *infra* Part II.C.

8. See *South Carolina v. North Carolina*, 128 S. Ct. 349 (2007) (granting motion for leave to file bill of complaint).

9. Motion of the State of South Carolina for Leave to File Complaint, Complaint, and Brief in Support of Its Motion for Leave to File Complaint, *South Carolina*, 128 S. Ct. 349 (2007) (No. 138, Original (06A1150)), 2007 WL 3283683 [hereinafter *South Carolina Motion*]. The factual material in the text is drawn from this document, which contains the Motion for Leave to File, the Complaint, and the Brief in Support of the Motion to File that has a series of attached affidavits. In places, additional facts are taken from the Brief of North Carolina in Opposition to the Motion for Leave to File, *South Carolina*, 128 S. Ct. 349 (2007) (No. 138, Original (06A1150)), 2007 WL 3283684 [hereinafter *North Carolina Brief*], and the subsequent Reply Brief of South Carolina, *South Carolina*, 128 S. Ct. 349 (2007) (No. 138, Original (06A1150)) 2007 WL 3324204 [hereinafter *South Carolina Brief*].

10. *South Carolina Motion*, *supra* note 9, at 1, 3. Roughly 225 miles after it crosses into South Carolina, the Catawba is joined by the Big Wateree Creek and together they form the Wateree River, so the basin is at times described as the Catawba-Wateree, but the entire focus of the dispute is on the interbasin diversion of water out of the Catawba by North Carolina before transit into South Carolina. *Id.*

11. *Id.* at 2.

gallons per day (mgd)¹² which is equivalent to a flow rate of 74.4 cubic feet per second (cfs). The hydrograph of the river fluctuates very widely across the seasons, but in a dry year, such as 2001, that level of diversion out of the basin constitutes ten percent or more of the river's flow for more than half of that drought year.¹³

North Carolina contends that its actions are not inequitable, and that the emphasis of South Carolina on flows reaching it in drought years alone obscures a proper assessment of the equities.¹⁴ First, North Carolina tends to focus only on the most recent ten mgd diversion,¹⁵ the amount of the most recently allowed interbasin transfer of Catawba water. Second, North Carolina emphasizes that in most years and large portions of drought years South Carolina is receiving ample amounts of water, noting that the most recent addition to the diversion "constitutes less than 0.4% of the average flow of the Catawba River."¹⁶ Importantly for equitable apportionment jurisprudence, North Carolina points to the harms that it, too, suffers in drought years.¹⁷ North Carolina further claims it is making strenuous conservation efforts during drought events, and emphasizes the role that the diversion of Catawba water plays in limiting harm in the importing basins of North Carolina.¹⁸ Those aspects of the situation also factor into equitable apportionment jurisprudence.¹⁹ Finally, North Carolina believes that the extreme low flows of which South Carolina complains will be avoided as a result of FERC relicensing of the eleven Duke Energy dams on the Catawba.²⁰ In that proceeding there are careful studies and extensive modeling of basin flows.²¹ The expected result of the FERC process will be an operations plan that ensures a minimum flow of 1100 cfs of the Catawba below Lake Wylie, which is located at and forms a part of the interstate boundary.²² That low flow limit would constitute a considerable increase from the current operating parameters that allow flows out of Lake Wylie

12. *Id.*

13. *See infra* Appendix A (reproducing the 2001 hydrograph).

14. *See* North Carolina Brief, *supra* note 9, at 8-10, 18-20.

15. *See, e.g., id.* at 7.

16. *Id.*

17. *Id.* at 18.

18. *Id.* at 21 (reproducing Declaration of Thomas Fransen, ¶¶ 16a-20a & Declaration of John Morris, ¶¶ 42a-44a).

19. *See generally* Colorado v. New Mexico I, 459 U.S. 176 (1982).

20. North Carolina Brief, *supra* note 9, at 12-15.

21. Catawba-Wateree CHEOPS Operations Model, North Carolina Department of Environment and Natural Resources, *available at* http://www.ncwater.org/Data_and_Modeling/Catawba (last visited Apr. 12, 2009).

22. North Carolina Brief, *supra* note 9, at 3.

to be as little as 411 cfs.²³ More concretely, North Carolina asserts the new operating plan, if made part of the Duke Energy relicensing, would more than counterbalance its upstream interbasin transfers.²⁴

*B. Apalachicola-Chattahoochee-Flint (ACF) Basin: Georgia, Alabama, and Florida*²⁵

This water dispute is in the process of taking a place of prominence in the water annals of the eastern states alongside the Chicago Diversion and the allocation of the use of Delaware River water among its basin states. Numerous law review articles have addressed the subject,²⁶ and

23. *Id.*

24. *Id.* at 4.

25. There is a welter of litigation and an even greater welter of commentary regarding this dispute. The most recent court decision as of this writing is *Southeastern Federal Power Customers, Inc. v. Geren*, 514 F.3d 1316 (D.C. Cir. 2008). A good summary of the earlier stages of the multi-faceted litigation can be found at *Alabama v. Army Corps of Engineers*, 424 F.3d 1117 (11th Cir. 2005). See also *Georgia v. Army Corps of Engineers*, 302 F.3d 1242 (11th Cir. 2002).

26. The following is a *partial* list of ACF articles: Robert Abrams, *Water Federalism and the Army Corps of Engineers Role in Eastern States Water Allocation*, 31 U. ARK. LITTLE ROCK L. REV. 395 (2009) [hereinafter *Water Federalism*]; Jessica A. Bielecki, *Managing Resources with Interstate Compacts: A Perspective from The Great Lakes*, 14 BUFF. ENV'T. L.J. 173 (2007); Natasha Meruelo, *Considering a Cooperative Water Management Approach in Resolving the Apalachicola-Chattahoochee-Flint Basin Water Wars*, 18 FORDHAM ENV'T. L. REV. 335 (2007); Robert P. Fowler, Jeffrey H. Wood & Thomas L. Casey, III, *Maintaining The Navigability of America's Inland Waterways*, NAT. RESOURCES & ENV'T. 16 (Fall 2006); Amall Golden Gregory, LLP, *Eleventh Circuit Allows Settlement on Lake Lanier Between Corps Atlanta Area Governments*, GA. ENV'T. L. LETTER (2005); Drew Melville, *Whiskey is for Drinking: Recent Water Law Developments in Florida*, 20 J. LAND USE & ENV'T. L. 489 (2005); J.B. Ruhl, *Water Wars, Eastern Style: Divvying Up the Apalachicola-Chattahoochee-Flint River Basin*, 131 J. CONTEMP. WATER RES. & EDUC. 47 (2005); Josh Clemons, *Interstate Water Disputes: A Road Map for the States*, 12 S.E. ENV'T. L.J. 115 (2004); Douglas L. Grant, *Interstate Allocation of Rivers Before the United States Supreme Court: The Apalachicola-Chattahoochee-Flint River System*, 21 GA. ST. U. L. REV. 401 (2004); J.B. Ruhl, *Equitable Apportionment of Ecosystem Services: New Water Law for a New Water Age*, 19 J. LAND USE & ENV'T. L. 47 (2003); C. Hansell Watt, IV, Comment, *Who Gets the Hooch?: Georgia, Florida, and Alabama Battle for Water from the Apalachicola-Chattahoochee-Flint River Basin*, 55 MERCER L. REV. 1453 (2003); Robert Abrams, *Interstate Water Allocation: A Contemporary Primer for Eastern States*, 25 U. ARK. LITTLE ROCK L. REV. 155 (2002) [hereinafter *Interstate Water Allocation*]; Dustin S. Stephenson, *The Tri-State Compact: Falling Waters and Fading Opportunities*, 16 J. LAND USE & ENV'T. L. 83 (2000); C. Grady Moore, *Water Wars: Interstate Water Allocation in the Southeast*, 14 NAT. RESOURCES & ENV'T. 5 (1999); Jeffrey Uhlman Beaverstock, Comment, *Learning to Get Along: Alabama, Georgia, Florida and the Chattahoochee River Compact*, 49 ALA. L. REV. 993 (1998); Carl Erhardt, *The Battle*

three separate federal court lawsuits that have generated three significant appellate opinions ruling on aspects of the controversy²⁷ and the simultaneous litigation in different venues has led to the convocation of multi-district litigation. Still, to a significant degree, the case remains unresolved on its merits. The story of the ACF dispute is already a long tale, one in which the public dispute among the states surfaced more than twenty years ago. It has simple elements, and elements as complex as the diversity of the basin's urban and rural economies and as divergent as are the region's high savannah and Gulf Coast ecology.

The simplest to understand and most visible aspect of the dispute is the need of metropolitan Atlanta, which has few viable water supply options, to obtain a reliable, drought-safe supply of water. That interest is clouded by the unconvincing conservation efforts of that metropolitan region. Even though domestic use of the water would be largely non-consumptive (landscape irrigation, in contrast, is not), holding the water to replenish drought depleted reservoir levels cuts downstream flows so much that Alabama industrial, navigational, and recreational uses suffer. Similarly, depleted flows risk eradication of endangered sturgeon and mussel species, while at the bottom of the basin, Florida depends on sustained flows to modulate salinity levels in the estuary that are necessary to protect its oystering industry and help sustain regional tourism.

C. Sparta Aquifer: Mississippi and Tennessee (and as Many as Six Other States)

The City of Memphis, Tennessee operates its own utilities, under the auspices of the Memphis Light, Gas, and Water Division (MLGW).²⁸ Mississippi's²⁹ complaint in its lawsuit alleges:

[A] substantial portion of Memphis' water supply comes from high-quality aquifer ground water unlawfully diverted and withdrawn by MLGW from underneath lands situated exclusively within and belonging to Mississippi. Memphis-MLGW is the largest pumper and user of Mississippi's ground

Over "The Hooch": *The Federal-Interstate Water Compact and the Resolution of Rights in the Chattahoochee River*, 11 STAN. ENVTL. L.J. 200 (1992).

27. See cases cited *supra* note 25.

28. First Amended Complaint, ¶¶ 5-6, *Hood ex rel. Mississippi v. City of Memphis*, 533 F. Supp. 2d 646 (N.D. Miss. 2006) (No. 2:05-cv-0032), 2006 WL 3853655 [hereinafter *Mississippi Amended Complaint*].

29. See *Hood ex rel. Mississippi v. City of Memphis*, 533 F. Supp. 2d 646 (N.D. Miss. 2008).

water from wells and wellfields operated in and encompassed within the Memphis area.³⁰

Mississippi's complaint alleges that Memphis is now drawing sixty mgd from a portion of the Sparta Aquifer³¹ underlying Mississippi³² and that water is, in essence, Mississippi property.³³ On that basis, Mississippi claims damages for past conversion and seeks declaratory and injunctive relief forbidding future misappropriation of Mississippi's water.³⁴ Despite taking on the mantle of *parens patriae* on behalf of its citizens,³⁵ the complaint alleges no specific harms to any Mississippi individuals. Similarly, beyond its overarching claims relating to the corpus of the water that give rise to common law tort claims, Mississippi claims no specific violation of laws governing the withdrawal of water, other than as a possible inference from a boilerplate assertion of lack of right that includes a reference to lack of a permit to withdraw the water.³⁶

Thus far, the lawsuit has been limited to procedural wrangling that led to a dismissal for failure to join the State of Tennessee. The court concluded that Tennessee was both "necessary" and "indispensible" under its analysis of Federal Rule of Civil Procedure 19(a) and (b) respectively.³⁷ Assuming that ruling is upheld on appeal,³⁸ a lawsuit making Tennessee a party would have to be in the nature of an equitable

30. *Id.* ¶ 7.

31. For a general description of the Sparta Aquifer, see Sparta Fact Sheet, *infra* note 33.

32. Mississippi Amended Complaint, *supra* note 28, ¶ 16.

33. The aquifer underlies parts of Arkansas, Tennessee, Louisiana, Mississippi, Missouri, Kentucky, Texas, and Alabama, but the principal areas are in only the first four of those states. See *The Sparta Aquifer: A Sustainable Water Resource*, U.S. Geological Survey, available at <http://pubs.usgs.gov/fs/fs-111-02> (last visited Apr. 12, 2009) [hereinafter *Sparta Fact Sheet*]. For an overview of the aquifer's characteristics, see *Mississippi Embayment Aquifer System*, available at http://www.spartaaquifer.com/docs/miss_embayment.pdf (last visited Apr. 12, 2009).

34. *Id.* ¶¶ 11-13.

35. *Id.* ¶ 3.

36. *Id.* ¶¶ 16, 19, 20, 29, 33, 42. Based on a search of Westlaw databases (MS-CS and MS-STAT-ANN), there appear to be no reported cases under the Mississippi statutes governing water use that involve groundwater withdrawals. See also 7 MS PRAC. ENCYCLOPEDIA MS LAW § 63:68; see generally MISS. CODE ANN. § 51-3-5 (West 2008) (imposing requirements for all water withdrawals).

37. *Hood*, 533 F. Supp. 2d at 650. Tennessee could not be joined because it refused to waive its sovereign immunity.

38. There are strong reasons to argue the decision is incorrect. See *infra* note 85.

apportionment and be lodged in the United States Supreme Court pursuant to its original jurisdiction.³⁹

III. GETTING INITIAL AGREEMENT OF SOVEREIGNS ENGAGED IN A PRESENT WATER DISPUTE

One salient obstacle to achieving an interjurisdictional water agreement among sovereigns is that entry into the agreement necessarily entails some loss of sovereignty. Although it may seem counter-intuitive, at a political and governance level, this perceived surrender of sovereignty is a greater problem in interstate relations than it is in international relations: it is easier for nations to make concessions of sovereignty than it is for the several American states to do so. A second major obstacle to entry into a dispute resolution system in the selected interstate disputes, is the pendency of the controversy. When the dispute is at hand, at least one party is likely to be in a position of power in relation to the dispute, sometimes because that disputant can impose its will as a physical matter, sometimes because that disputant can impose its will through existing legal mechanisms. In those cases, entering a management agreement is both a surrender of sovereignty and a surrender of perceptible advantage. This section of the Article briefly addresses the politics of surrendering sovereignty by giving a flavor to the nature of the problem. The more extensive discussion focuses on lost advantage. That discussion begins with the BWT as an example of a case in which offsetting physical advantages were instrumental to reaching an agreement in the first place. The discussion thereafter reviews the three interstate disputes, in which there are not a parallel series of offsetting advantages. Later sections of the Article will suggest that the political hesitancy to surrender state sovereignty and the corresponding hesitancy to surrender perceived advantage should be outweighed by the benefits of having a fair and reliable interjurisdictional water resource agreement.

A. Nations Acting Like Nations v. American States Acting Parochially

As described more fully below in the section on physical advantage,⁴⁰ the United States and Canada were in a position to inflict on

39. The lack of specific claims of present injury to would-be Mississippi water users who are deprived of water by Memphis' actions is a strong reason to argue that the Court would not grant Mississippi leave to file a complaint at this time. That possibility would be further enhanced if the Rule 19 dismissal of the current lawsuit is error. The pitfalls of an equitable apportionment proceeding in this case are discussed *infra* at note 85.

40. See *infra* Part III.B.

one another water management actions that might be described as “mutually assured frustration” if the two nations did not agree on a cooperative water management system. That alone is reason enough to have joined in the BWT. In addition, however, there are other aspects of their nationhood and economic relations that augered in favor of initial entry into the BWT, which factors have promoted ongoing cooperation.⁴¹ First, both the United States and Canada are great and vast nations. They act like nations; they have departments of state, they predicate their behavior on the need to maintain good long-term diplomatic relations with one another. That diplomatic cast, almost pompous in its manner, engenders a degree of formality and civility in the nations’ dealings with one another. The several states, being a much smaller stage, often take a more strident tone in their dealings. Water rivalries have frequently prompted hotly partisan rhetoric, and absurdly bellicose threats, not pallid diplomatic euphemisms. As an example, a New Jersey legislator proposed recommissioning the battleship New Jersey for an attack on the State of Delaware as part of the furor over a Delaware action that limited a proposed New Jersey-based operation that extended into the Delaware River that divides the two states.⁴² Similarly hostile comments have punctuated the ACF dispute. For example, U.S. Rep. John Linder, R-Georgia, while commenting on the bona fides of Florida’s position, is quoted as saying: “What we’ve learned from this is what a blunt weapon the Endangered Species Act has become, where some obscure bureaucrat in Fish and Wildlife and some obscure judge can decide that mussels are more important than our children and grandchildren.”⁴³

41. See Shi-Ling Hsu & Austen L. Parrish, *Litigating Canada-U.S. Transboundary Harm: International Environmental Lawmaking and the Threat Of Extraterritorial Reciprocity*, 48 VA. J. INT’L L. 1, 7-14 (2007) [hereinafter *Reciprocity*].

42. *New Jersey v. Delaware*, 128 S. Ct. 1410, 1418-19 (2008). Additional public threats included a reciprocal threat by Delaware to call out its militia to meet the threatened attack, and New Jersey’s threat to open an economic front in the dispute by withdrawing its pension funds from Delaware banks. *Id.* The dispute was eventually resolved in Delaware’s favor on a boundary law issue by the Supreme Court. *Id.* at 1427.

43. Karyn Chenoweth, *Georgia Gov. Sonny Perdue Declares State of Emergency*, MONSTERSANDCRITICS.COM, Oct. 20, 2007, available at http://www.monstersandcritics.com/news/usa/news/article_1367125.php/Georgia_Gov._Sonny_Perdue_declares_state_of_emergency (last visited Apr. 12, 2009). Governor Sonny Perdue of Georgia had made similar comments, he also criticized Florida’s position, saying that

[u]tilizing the endangered species act as a weapon in this battle is somewhat disingenuous. We know what this is about, we know its about the bay and the quality of the bay and the oysters and that very powerful, very loud political constituency. Let’s don’t try to make it about a federal law that really it’s not all about, about mussels or about sturgeons.

Also moderating the level of tension between the two nations are vast and vital economic ties that demand compromise in virtually all settings, even those as contentions as water disputes. "Cooperation has been, in many ways, essential because Canada and the United States are strikingly interdependent. U.S.-Canada trade in services, cross-border investments, and tourism surpasses \$42 billion yearly."⁴⁴ Within the United States, the several states economic ties to one another, though sometimes strong and of great magnitude, are not ones that the state governments can command. Put differently, states have very limited power to affect one another's economic livelihood. The movement of interstate commerce predominantly is a function of market conditions and, to a degree, regulations imposed by the federal government and not by the states. Even if a state government attempted to exercise its police power authority in regulating commerce, retaliatory efforts to affect commerce directed against another state are forbidden by the operation of the "dormant" Commerce Clause of the federal constitution.⁴⁵ Thus, the states lack the economic ties and the economic leverage that promotes compromise.

The moderating factors that modulate U.S.-Canadian relations, in general, do not exist in the domestic American interstate context. The shared necessity that led the United States and Canada to negotiate so balanced an agreement as the BWT seems to be absent in every one of the three interstate settings. All three of the examples include in their history an effort, even an excruciatingly extended effort in the case of the ACF, to reach a negotiated agreement. All have failed to this point in time. That history and the lack of political reward for "compromising away" perceived sovereign prerogatives, make negotiating interstate water agreements a difficult business. There are two different times of opportunity, at the very pinnacle of a crisis and in the lull after the crisis has receded. The time when negotiations are most difficult is the period in which the unresolved present dispute is driving public sentiment toward a hard-line position.

At the height of a crisis, such as a drought so severe that the salt front of the Delaware River was within a few hundred feet of Philadelphia's municipal supply intake,⁴⁶ bargains can be struck. Particularly in the context of the United States federal system, if an

Gov. Sonny Perdue *Questions Fla. Argument in Water Wars*, ACCESSNORTHGA.COM, available at <http://www.accessnorthga.com/detail.php?n=215180> (last visited Apr. 12, 2009).

44. Hsu & Parrish, *Reciprocity*, *supra* note 41, at 8.

45. See, e.g., *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941 (1982).

46. See *infra* note 144 and accompanying text.

unresolved interstate water dispute threatens significant public health or economic dislocations, the national government will impose a solution that may be to no state's liking.⁴⁷ The states in that setting may prefer to put their own agreement in place. When a crisis has receded, for example after the rains have come and the reservoirs are full, the strident politics of the moment have passed and the desire for a better management strategy in the future has a chance to take form. In that setting, to be acceptable, an agreement in return for a surrender of sovereignty must offer benefits that can be easily expressed and understood by the state's legislators and citizens. The ability to combat out of basin diversions, for example, was the kind of clear benefit that made entry into the Great Lakes-St. Lawrence River Basin Water Resources Compact⁴⁸ more feasible for the compacting states. In fact, the greatest achievements of that agreement reside in its management capacity, which was much harder to promote to the legislatures and the general public.

B. The Problem of an Advantaged Party: Of Physical and Legal Advantages

The prospects for transferability of the BWT approach to the extant Catawba, ACF, or Sparta Aquifer interjurisdictional water disputes are diminished by the fact that in every case, at least one side or, perhaps both, believe that the result of an agreement very likely will be less favorable to them than relying on self help or a resort to judicial intervention. The decisional calculus or operational principles incorporated into a water management agreement will include features that at least one of the prospective parties finds too favorable to the opponent in the instant dispute. This is especially true with a BWT-like decisional system that relies on consensus to function in an equal voting and representation model.⁴⁹ The BWT model grants either party the ability to stalemate action, which highlights the lost advantage that one side believes it is obtaining from the status quo.⁵⁰ Thus, since both sides must agree to enter into a shared governance relationship, it remains to be seen why a sovereign would forego its perceived advantage and assent to the agreement in the first place.

47. To a degree, this has happened in the ACF dispute. *See supra* Part II.B.

48. Great Lakes-St. Lawrence River Basin Water Resources Compact, Pub. L. No. 110-342, 122 Stat. 3739 (2008).

49. *See BWT, supra* note 1, arts. VII & VIII. *See also infra* Part IV.

50. *See generally supra* note 49.

The BWT presents one example of foregone physical advantage,⁵¹ but it is a special case because the broad physical relationship of the nations placed physical advantage with different parties in different watersheds or even different parts of the same watershed. To a considerable extent, the BWT grew out of a water controversy that was touched off by a proposed United States dam and diversion project that would supply water for agricultural use.⁵² At a very crude physical level, in most interjurisdictional water allocation disputes, the upstream party has the physical power to impose its will on the downstream party. Absent a treaty or an interjurisdictional tribunal authorized to allocate the resource, that physically superior position provides the upstream party with little incentive to compromise or to enter into a legally binding sharing agreement.⁵³ Unlike the typical setting, however, the dispute that helped precipitate the adoption of the BWT was one in which both nations had the physical power to adversely affect the other—one of the rivers in question crossed the border first in one direction and then in the other.

To be more specific, in 1903, the United States proposed to divert water from the St. Mary River into the Milk River in Montana before those rivers flowed into the Canadian Province of Alberta.⁵⁴ The Canadians on the St. Mary River strenuously opposed the plan, but invoking the then-current Harmon Doctrine,⁵⁵ the United States proceeded with preparations for the planned diversion.⁵⁶ In response, the Canadian government announced that it was approving the application of

51. With independent nations that have not entered into a treaty on the subject, there is not a system of legal arrangements that could provide an enforceable legal advantage to one party or the other.

52. See *infra* notes 54-56 and accompanying text.

53. On the domestic level in the United States, since there are background principles of interstate water allocation that favor the earlier developing state, the party with the advantage under those principles may not be the party with the physical advantage. See *Colorado v. New Mexico II*, 467 U.S. 310 (1984). For a more complete description of those principles, see generally A. DAN TARLOCK, *LAW OF WATER RIGHTS AND RESOURCES* (2008).

54. For a concise retelling of the story of the Milk River and its role in the adoption of the BWT, see, for example, Tom Perkins, National Water and Climate Center, *NRCS Snow Survey Centennial Celebration*, at 5-6, available at <ftp://ftp.wcc.nrcs.usda.gov/downloads/centennial/article3820061218.pdf> (last visited Apr. 12, 2009).

55. Named after the then-Secretary of State Judson Harmon, the doctrine is exemplified by the position of the United States in the case of *United States v. Texas*, 162 U.S. 1 (1896). The gist of the doctrine, now repudiated, was that the rules, principles and precedents of international law imposed no liability or obligation on the United States to let parts of the waters that were diverted upstream by the United States flow to Mexico (or Canada). See *id.*

56. Perkins, *supra* note 54, at 6.

a Milk-to-St. Mary River diversion in its territory, which would have negated the benefits of the American project, since the American project's potentially benefitted lands were even further downstream, after the Milk had turned southward and flowed back into the United States.⁵⁷ Against this backdrop, the United States both altered the project to protect the Canadian interests on the St. Mary River and took the further step of entering into the BWT, in at least partial recognition of the need for compromise given the superior physical position of Canada over some of the trans-border water resources.⁵⁸

The Milk-St. Mary dispute is not an isolated instance in which Canada holds "upstream power," slightly more than half of the waterways flowing across the 5000 mile U.S.-Canadian border flow from Canada to the United States.⁵⁹ This parity of physical power creates an ideal situation for a commitment to compromise on a more or less equal basis: both parties have the ability to take domestic actions that could impose significant negative consequences on its neighbor across the border. This fact alone tends to distinguish the BWT from the domestic American settings where its application might be beneficial. In at least two of those disputes there is a party that either is physically dominant, or has a legal advantage. In both of those cases, the neighbor for whom the current status quo is more beneficial will be reluctant to bargain away its perceived advantage.

The American domestic conflict that best exemplifies a case of the physically superior position is the Catawba River dispute. North Carolina is upstream and has the power to dam and divert the water before it reaches South Carolina.⁶⁰ As exemplified by the history of the BWT, it is equally salient that the regional topography places North Carolina upstream of South Carolina on all significant interstate watercourses they share.⁶¹ Under that scenario, it is difficult to discern any strong reason for North Carolina to compromise or agree to a parity-based water allocation and management agreement like that of the BWT.

57. *Id.*

58. See Albert Utton, *Canadian International Waters*, in 5 *WATERS AND WATER RIGHTS* § 50.01, at 53-56 (Robert Beck, ed., repl. Vol. 1998). See also BWT, *supra* note 1, art. VI (addressing, specifically, the Milk-St.Mary matter).

59. David G. Lemarquand, *Preconditions to Cooperation in Canada-United States Boundary Waters*, 26 *NAT. RESOURCES J.* 221, 223 (1986).

60. Under the background principles of interstate water allocation law, North Carolina also enjoys the advantage of being the earlier developing economic user of the water, which creates a legal advantage. See generally TARLOCK, *supra* note 53.

61. See Part II.A.

The American domestic conflict that best exemplifies a case of the legally superior position is the ACF Basin dispute.⁶² As already noted, this dispute has taken on the character of a legal wrestling match over events at the upstream end of the basin.⁶³ The upstream state, Georgia is not in a position to take physical control of the water it claims is needed for Atlanta's municipal supply because that water is already under the effective control of the United States Army Corps of Engineers (Corps) through its operation of the Buford Dam and the associated reservoir, Lake Lanier.⁶⁴ Here, efforts at negotiation and compromise are long past. The basin states spent more than a decade seriously attempting to reach a compromise.⁶⁵ They even entered into an interstate compact in which they agreed to pursue a process that would lead to agreement.⁶⁶ Once that process failed, the states' energies shifted back to a competition in which each state's goal is to require the Corps to operate its dams in the basin in a manner favorable to them.⁶⁷ As one state (Georgia) and then the others (Florida and Alabama)⁶⁸ gain an ascendant legal position, that side's willingness to negotiate a compromise seems to evaporate.

This phenomenon, where the legally ascendant party scuttles negotiations, was on display in the ACF controversy in late 2007 and early 2008. The basin was again being gripped by a severe drought. As that period began, Georgia held the upper hand: it had engineered a settlement and consent decree in the suit brought by the hydropower interests against the Corps over the operations at Buford Dam.⁶⁹ The Corps had been allocating additional storage to municipal supply to the detriment of hydroelectric generation.⁷⁰ The increased storage and subsequent delivery to Atlanta harmed the pecuniary interest of a group comprised of purchasers of the comparatively inexpensive hydropower

62. See Part II.B.

63. See *id.*

64. *Alabama*, 424 F.3d at 1122.

65. *Id.*

66. *Id.*

67. *Id.*

68. In the main, Georgia is aligned against the two other states. Alabama and Florida have similar, but nevertheless distinct objectives for the management of the basin's water. For example, Alabama is benefitted by a flow regime that holds water in the basin's mid-section for power plant cooling and maintaining navigation and flatwater recreation, whereas Florida wants that same water released in a way that mirrors the natural hydrograph and ensures adequate flushing of Apalachicola Bay to prevent a change in its salinity level. See, e.g., Abrams, *Water Federalism*, *supra* note 25; Robert Abrams, *Settlement of the ACF Controversy: Sisyphus at the Dawn of the 21st Century*, *HAMLIN L. REV.* (forthcoming 2008) (on file with author) [hereinafter *ACF Controversy*].

69. *Alabama*, 424 F.3d at 1124.

70. *Id.*

who claimed a violation of contractual rights.⁷¹ By offering the hydropower interests what amounted to financial concessions, the District of Columbia consent decree had paved the way for the Corps' increased deliveries of water for municipal use to continue. Thus, Georgia was bargaining from a position of power backed by the consent decree and an Eleventh Circuit Court of Appeals decision that set aside a preliminary injunction issued by the Alabama United States District Court that would have prohibited the Corps from acting in reliance on the consent decree.⁷²

On a different legal front, the 2007 drought had led to several attempts by Florida to invoke the Endangered Species Act (ESA) to require the Corps to operate the dams differently.⁷³ The need for a Fish and Wildlife Service (FWS) biological opinion and an apparent federal desire for a compromise solution brought Secretary of the Interior Kempthorne into the fray. Drawing on his western states water background, he was serving as a facilitator of tri-state negotiations. Georgia, with its recent legal victories was reluctant to offer concessions.⁷⁴ Georgia's hand was further strengthened because the Corps' Interim Operating Plan (IOP) for the basin, which had the approval of the Fish and Wildlife Service as ESA-compliant, favored Georgia.⁷⁵ The ESA set the absolute minimum downstream release obligation of the Corps, and the IOP gave the endangered sturgeon and mussels extremely little in comparison to what Florida and Alabama were claiming was necessary to prevent extinction.⁷⁶ Thus, as a legal matter, the status quo was the best severe drought result Georgia could possibly attain.

Secretary Kempthorne, however, continued to pursue negotiations with the three state governors trying to achieve consensus on a long-term operating plan.⁷⁷ According to the public statements, some progress was

71. *Id.*

72. The pending lawsuits were not dismissed, and Alabama and Florida were allowed to file amended complaints. *Id.* at 1135-36.

73. Meruelo, *supra* note 26, at 348.

74. *Id.* at 350.

75. *Id.* at 349.

76. *Id.*

77. It is possible to speculate that the items Secretary Kempthorne was seeking to negotiate were not related to the extreme drought scenario. On that issue, Secretary Kempthorne was almost certain to support the FWS position about what was necessary. A revised long term operating plan also would address efforts to manage the reservoirs in wetter years in a way that would make the system better prepared for droughts when they occurred. Politically, however, the extreme low flow scenarios were more critical to the states because of the prevailing drought condition and the possibility that climate change might make drought more common or even endemic.

being made, when suddenly the legal tables turned.⁷⁸ The consent decree in the hydropower case had been on appeal in the District of Columbia Circuit Court of Appeals. On February 5, 2008, the decision in *Southeastern Federal Power Consumers, Inc., v. Geren* not only invalidated the consent decree, it found that the Corps needed express congressional authorization to continue to allocate so much storage space in Lake Lanier to municipal supply.⁷⁹ Just as quickly, the shoe was on the other foot, and now Florida and Alabama were unwilling to agree to proposals on the table because the legal position taken by the District of Columbia Circuit Court of Appeals put them in the legally advantaged position.⁸⁰ Absent some new legal development, the Corps was not allowed to hold so much water in storage for municipal supply, which meant other authorized purposes of the several dams, including hydropower, navigation, and recreation, would be more prominent in Corps operations and serving those purposes would lead to greater releases. The ink was not dry on the ruling when Governor Riley of Alabama issued a press release on February 5, 2008, in which he proclaimed that “[t]he ruling invalidates the massive water grab that Georgia tried to pull off.”⁸¹ A February 15 meeting of the three states failed to reach an agreement, after which the Alabama-Florida position hardened around their newfound legal victory.⁸² When on March 1, 2008, the negotiations broke down, Secretary Kempthorne, in a somewhat testy public statement, discontinued the process and indicated that he would see to it that a permanent operating plan was in place by June of 2008.⁸³

Both the Catawba and the ACF present the problem of an advantaged party (or a party that perceives itself as advantaged) being unwilling to agree to a negotiated settlement, far less to an equality-based regime like that of the BWT. The Sparta/Memphis Sands Aquifer dispute is not as

78. *Id.*

79. *Se. Fed. Power Consumers, Inc., v. Geren*, 514 F.3d 1316 (D.C. Cir. 2008).

80. *See id.*

81. Press Release of Governor Bob Riley (Feb. 5, 2008), *available at* http://governorpress.alabama.gov/pr/pr-2008-02-05-01-water_war_win.asp (last visited Apr. 12, 2009).

82. By February 27, 2008—even before the March 1, 2008 extended deadline for tri-state negotiations—the head of the Atlanta Regional Commission stated that “[i]t has been reported that the Governor of Alabama has informed all parties that he will not continue to negotiate and is ready to go to court with regard to the ACT. We anticipate he will follow suit with the ACF.” Atlanta Regional Commission Minutes (Feb. 27, 2008), *available at* [www.atlantaregional.com/documents/dr_arc_board_notes_02_27_08\(1\).pdf](http://www.atlantaregional.com/documents/dr_arc_board_notes_02_27_08(1).pdf) (last visited Apr. 12, 2009).

83. *See* Letter from Dick Kempthorne, Secretary of Interior (Mar. 1, 2008), *available at* http://www.doi.gov/news/08_News_Releases/080301.html (last visited Apr. 12, 2009).

easily cast as one in which there is a clearly advantaged party, either physically or legally.⁸⁴ What seems to be the opening posture of the parties is that Memphis (and presumably Tennessee) feels it is advantaged by the status quo: it is taking low cost, high quality water from the aquifer with apparent impunity due to its ability to fend off this initial attempt at legal redress. Correspondingly, Mississippi feels itself aggrieved by that course of action and Mississippi apparently believes it has a legally advantaged position stemming from its property interest in the groundwater. With the Rule 19 dismissal of its case, Mississippi has suffered a temporary legal setback, but Mississippi appears to believe that it can obtain a judicial forum either with a successful appeal of the presently pending suit or an original jurisdiction suit in the Supreme Court.⁸⁵ There is not likely to be serious settlement discussion or any prospect for a BWT/IJC type governance arrangement in the near term future if the parties continue to adhere to their current strategies.

Physically, the nature of the groundwater resource negates an easy-to-visualize physical advantage analysis similar to the superiority upstream position on a surface water course. The movement of water in aquifers is more complex than in typical surface water systems.⁸⁶ Aquifers are largely unseen—most knowledge of them is gleaned from widely spaced data points (wells), collected core samples, and controlled small scale short term tests of transmissivity that are used to construct models of how water is stored in the aquifer and how it moves in response to pumping. Most basically, even without any real knowledge of hydrogeology, it is plain that pumping draws water toward the well and distorts the natural movement of the groundwater in the aquifer.

For a period in United States water law, the underground movement of water before it was pumped or came to the surface was treated as inscrutable and unknowable.⁸⁷ The person who “captured” the water at

84. See Part II.C.

85. Tracing out those two paths is beyond the scope of this Article. In this author's opinion, however, the Rule 19 dismissal is inappropriate because full relief can be given between the two parties present in the litigation without prejudice to the rights of others, most notably the State of Tennessee. The overarching nature of an equitable apportionment, were one ever to be held, ensures that Tennessee's rights are not at risk in this lawsuit. See Robert Abrams, *Secure Water Rights in Interstate Waters*, in *WATER LAW: TRENDS, POLICIES, AND PRACTICE* (Kathleen Marion Carr & James D. Crammond eds., 1995). Moreover, there is venerable precedent for interstate water conflict adjudication in cases not involving states as parties. See *Bean v. Morris*, 221 U.S. 485 (1911).

86. See, e.g., WILLIAM BLOMQUIST, *DIVIDING THE WATERS* 24 (1992). An important corollary of this fact is that to create a clear idea of groundwater movement, “[t]he information requirements are enormous.” *Id.* at 25.

87. See, e.g., *Wheatley v. Baugh*, 25 Pa. 528, 534 (1855).

the surface was deemed its owner, and the doctrine took on the name the absolute ownership rule.⁸⁸ As pumping technology improved, and a stronger pump could pull the water away from a weaker pump, this doctrine was also labeled “the law of the biggest pump.”⁸⁹ The more precise description would be that if two wells are pumping from the same aquifer, the larger pump will prevail once the influence of the two wells intersects. So while almost all states have abandoned the absolute ownership doctrine as their groundwater law, as a matter of physical advantage, the larger pump still wins and gives a degree of physical advantage.⁹⁰

This aspect of wells and aquifers has potential consequences for the Memphis-Mississippi groundwater dispute. The United States Geological Survey (USGS) has undertaken several studies of the Sparta Aquifer.⁹¹ The primary focus and modeling in these efforts has been directed at overuse of the aquifer in Arkansas, where unsustainable pumping of the shallower alluvial aquifer by rice farmers on the Grand Prairie has caused many of those farmers to start pumping the higher quality Sparta Aquifer water.⁹² This change in irrigation source water has, in turn, created an overdraft pattern⁹³ in the Sparta Aquifer that threatens to deprive many Arkansas communities of their best source of drinking water.⁹⁴

88. See JOSEPH SAX, BARTON THOMPSON, JR., JOHN LESHY & ROBERT ABRAMS, *LEGAL CONTROL OF WATER RESOURCES* 415 (4th ed. 2006).

89. *Id.* at 417-20 (4th ed. 2006).

90. The advantage lasts, at least until the competing groundwater pumper enlarges his/her pump.

91. See, e.g., T.P. Schrader, *Potentiometric Surface in the Sparta-Memphis Aquifer of the Mississippi Embayment*, United States Geological Survey (2007), available at <http://pubs.usgs.gov/sim/3014/pdf/sim3014.pdf> (last visited Apr. 12, 2009).

92. See, e.g., Paul McKee & Brian Clark, *Development and Calibration of a Groundwater Flow Model for the Sparta Aquifer of Southeastern Arkansas and North-Central Louisiana and Simulated Response to Withdrawals, 1998-2027*, at 8 (2003), available at <http://pubs.usgs.gov/wri/wri03-4132> (last visited Apr. 12, 2009).

93. Overdraft occurs when the amount of water withdrawn from an aquifer exceeds the amount of water recharged to the aquifer. Analogous to the way in which a bank account declines when withdrawals exceed deposits, in an aquifer the potentiometric surface (water table) declines during overdraft. If the overdraft continues, the water table will fall below the bottom of some wells and those wells will fail. Eventually, even with deeper wells, the aquifer will be drained, or the cost of pumping the water will become so great that it is no longer worth producing.

94. See, e.g., David A. Freiwald & Sherrel F. Johnson, *Monitoring of Sparta Aquifer Recovery in Southern Arkansas and Northern Louisiana 2003-07*, United States Geological Survey (2007), available at <http://pubs.usgs.gov/fs/2007/3102> (last visited Apr. 12, 2009).

A similar competition for groundwater could arise between Mississippi irrigation and Memphis' municipal use in that portion of the Sparta Aquifer. There is no indication given in the pending litigation materials of the extent of agricultural irrigation from the Sparta Aquifer in the vicinity of the Memphis wellfields.⁹⁵ Nevertheless, the aquifer's high rate of hydraulic conductivity and productiveness⁹⁶ make the aquifer a target of opportunity for high volume pumping that typically attends agricultural use. The amount of water needed for irrigation of crops dwarfs the amount of water used for municipal supply. As an example, a single six mile on a side square farm growing rice in the region would almost certainly pump more water in a growing season than the sixty mgd that Memphis allegedly "misappropriates" from beneath the Mississippi side of the state line in an entire year.⁹⁷

Although such pumping is physically and theoretically possible, the absence of any mention of irrigation in the litigation is an indication not very much is taking place at this time. As climate change increases summer temperatures and alters precipitation patterns to more intense rainfall events and more frequent periods of drought, that inferred lack of irrigation from that portion of the Sparta Aquifer may end.⁹⁸ If interstate competition for the Sparta water emerges, attention will return to the legal rules that will apply in an interstate groundwater apportionment and which state is likely to be advantaged by the likely result.

At present, there are no definitive precedents allocating interstate groundwater, although there are several indications that groundwater would be subject to equitable apportionment using the same standards as surface water.⁹⁹ Were an equitable apportionment initiated, a first order of business would be to consider what impact, if any, Mississippi's claim of ownership is likely to have on the proceedings. On this issue, the

95. See Mississippi Amended Complaint, *supra* note 28.

96. See Sparta Fact Sheet, *supra* note 31.

97. The calculation is as follows: 1 mgd = 1120 acre feet per year, so Memphis' 60 mgd = 67,200 acre feet per year. A farm of 36 square miles contains 23,040 acres. Rice grows submerged, so even in a warm humid climate, a water duty of 3 acre-feet per acre would be reasonable (low, in fact) and would require 69,120 acre-feet of water. That water duty amounts to only one and one-half inches per week over a 24-week growing season, which would be a conservative figure considering the amount of water that would evaporate and the amount that would infiltrate into the soil, not to mention the amount that is evapotranspired by the plants. Seepage would not recharge the Sparta Aquifer, which is confined in that part of its expanse. See Sparta Fact Sheet, *supra* note 31, Fig. 1.

98. See Noah Hall, Brent Stuntz & Robert Abrams, *Climate Change and Freshwater Resources*, 22 NAT. RESOURCES & ENV'T 30 (2008).

99. See SAX, ET AL., *supra* note 88, at 872-73 (citing cases). Cf. *Idaho v. Oregon*, 444 U.S. 380 (1980) (discussing equitable apportionment of anadromous fish runs).

influence of the *Sporhase*¹⁰⁰ dormant commerce clause case would undermine the Mississippi position. Even if the groundwater underlying Mississippi lands in its natural setting is property of Mississippi, Mississippi cannot embargo its export,¹⁰¹ especially in the absence of any showing of particularized harm, which is a key element in equitable apportionment cases.¹⁰² The Mississippi “ownership” position is further undercut by its implicit reliance on a static view of water in an aquifer. Groundwater “flows” within an aquifer. In the Sparta Aquifer, studies have shown water moves from the high ground recharge areas at the edges of the aquifer toward the centerline of the Mississippi Embayment, where the Sparta is at its deepest levels.¹⁰³ Other than this general movement of water, the other groundwater flow characteristic of the Sparta Aquifer in the Memphis area has long been the influence of pumping.¹⁰⁴ One report states: “Flow in the Memphis aquifer has been transient since the onset of pumping in 1886. Recharge occurs in the outcrop area in the southeastern and eastern parts of the study area, and flow is predominantly into the centers of pumping from all directions.”¹⁰⁵

At present, Arkansas, which overlies the Sparta Aquifer to the west of the current pumping dispute, is not being affected by the pumping in the Memphis area. A schematic cross section of the Mississippi Embayment, shows that the Sparta Aquifer dips significantly in the center, roughly having its deepest notch under the thread of the

100. *Sporhase*, 458 U.S. 941.

101. Justice Stevens’ opinion in *Sporhase* held out a possibility of restriction that appears to be unavailable to Mississippi. “A demonstrably arid State conceivably might be able to marshal evidence to establish a close means-end relationship between even a total ban on the exportation of water and a purpose to conserve and preserve water.” *Id.* at 958.

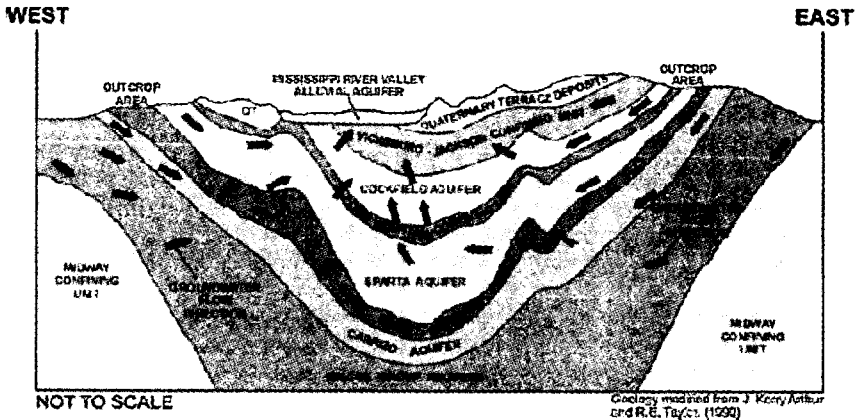
102. See *Colorado v. New Mexico I*, 459 U.S. 176. See *infra* note 107 and accompanying text.

103. *Mississippi Embayment Aquifer System*, *supra* note 33.

104. On the western side of the midline of the embayment in Arkansas, there also is a southerly component to the flow. Sparta Fact Sheet, *supra* note 31. If that same southerly movement of water was also present on the eastern side of the embayment, that would mean portions of the groundwater found under Mississippi would be water that had previously been found beneath Tennessee. That flow pattern further supports Memphis and Tennessee because the zone of source water for the MLGW will lie mostly to the north of the wells.

105. J.V. Brahana & R.E. Broshears, *Hydrogeology and Ground-Water Flow in the Memphis and Fort Pillow Aquifers in the Memphis Area, Tennessee*, at 23, United States Geological Survey (2001), available at <http://water.usgs.gov/pubs/wri/wri894131/pdf/wri89-4131.pdf> (last visited Apr. 12, 2009).

Mississippi River itself.¹⁰⁶ That shape explains why most studies focus on one side of the river or the other, since there are yet to be instances in which the potentiometric surface (water table) of the Sparta has dropped sufficiently for water to be drawn across the centerline of the aquifer from one side of the embayment to the other.



With the Mississippi property claim out of the way, the next exercise is to anticipate how the Supreme Court would view the Memphis-Mississippi dispute under equitable apportionment doctrine. The current methodology is set out in Justice Marshall's opinion for the Court in the first of two rulings on the Vermejo River dispute between Colorado and New Mexico.¹⁰⁷ As a threshold matter, "a state seeking to prevent or enjoin a diversion by another state bears the burden of proving that the diversion will cause it real or substantial injury or damage."¹⁰⁸ In the *Vermejo* case, the Court found New Mexico had made that showing because it had persuaded the Court it was already using the entire flow of the river so that any diminution of flow would cause it injury.¹⁰⁹ The Mississippi complaint in its pending lawsuit offers no allegations of injury caused by lack of water that it would otherwise be using,¹¹⁰ and for that reason, if there are not other facts that were not alleged by Mississippi, Tennessee would prevail in an equitable apportionment case.

106. See Sparta Fact Sheet, *supra* note 31, Fig. 2 (showing generalized schematic of geohydrologic west-east cross section illustrating trough-like appearance of embayment and generalized flow directions).

107. *Colorado v. New Mexico I*, 459 U.S. 176.

108. *Id.* at 187 n.13 (internal quotation marks and citations omitted).

109. This factual predicate was challenged in extensive detail by Justice Stevens. See *Colorado v. New Mexico II*, 467 U.S. at 325-339 (Stevens, J., dissenting).

110. See Mississippi Amended Complaint, *supra* note 28.

IV. A PICTURE SO BLEAK THAT EVEN A STUBBORN STATE MIGHT COMPROMISE

Even if the outcome of equitable apportionment litigation in the groundwater context can be predicted,¹¹¹ there is reason to anticipate that litigation is a Prisoner's Dilemma in which all parties lose by playing, and in which any victories won will be Phyrric victories. That dour prediction stems from two divergent lines of argument, inconclusiveness and cost, that can be exemplified by following the history of the Arkansas River dispute between Kansas and Colorado, the case that introduced the doctrine of equitable apportionment. Reviewing the history of that case is particularly appropriate as part of a celebration of the 100th anniversary of the BWT—the two are of kindred age and spirit. As with the BWT, Justice Brewer's conception of the interstate dispute placed a remarkable emphasis on equal and reciprocal sovereignty. "One cardinal rule, underlying all the relations of the states to each other, is that of equality of right."¹¹² Litigation to settle the Arkansas River dispute was first brought to the United States Supreme Court on May 20, 1901¹¹³ and initially ruled upon by the Court in 1907.

In the first plenary equitable apportionment decision, the Court held that Kansas had not shown sufficient injury at the hands of the upstream diversions made in Colorado.¹¹⁴ The Court, however, noting that its determination was equitable in nature and dependant on the facts presented, made it clear that over time the equities might change and become such that Kansas would be entitled to a decree.¹¹⁵ Justice Brewer's opinion states:

The decree will also dismiss the bill of the state of Kansas as against all the defendants, without prejudice to the right of the plaintiff to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the

111. See *Colorado v. New Mexico II*, 467 U.S. 310. But see *Kansas v. Colorado*, 206 U.S. 46 (1907). See also Abrams, *Interstate Water Allocation*, *supra* note 25 (describing the current legal "bias" of *Colorado v. New Mexico II* in favor of interstate water allocation to support existing development over allocation favoring potential future water development and its contrast with more traditional policies of equality among states typified by *Kansas v. Colorado*, the Court's first equitable apportionment case).

112. *Kansas v. Colorado*, 206 U.S. 46, 97.

113. See *Kansas v. Colorado*, 185 U.S. 125, 126 (1902) (granting leave to proceed with the bill in equity).

114. *Kansas v. Colorado*, 206 U.S. at 117.

115. *Id.*

substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river.¹¹⁶

The dispute was reprised mid-century, when Kansas again claimed overuse upstream in Colorado and was again heard on the merits and rebuffed by the Court.¹¹⁷ This time, the Court pointedly suggested that the parties ought to enter into an interstate compact. The reasoning of Justice Roberts in urging that form of resolution bears quotation in full:

The reason for judicial caution in adjudicating the relative rights of states in such cases is that, while we have jurisdiction of such disputes, they involve the interests of quasi-sovereigns, present complicated and delicate questions, and, due to the possibility of future change of conditions, necessitate expert administration rather than judicial imposition of a hard and fast rule. Such controversies may appropriately be composed by negotiation and agreement, pursuant to the compact clause of the Federal constitution. We say of this case, as the court has said of interstate differences of like nature, that such mutual accommodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power.¹¹⁸

The states followed the suggestion that they enter into a compact,¹¹⁹ but by 1995, Kansas was again complaining, this time alleging that Colorado's groundwater pumping activities were causing violations of Kansas' rights under the compact.¹²⁰ Owing to the complex hydrological issues involved, the case featured an immense amount of controversy over expert modeling of the movement of groundwater and its discharge to surface water. Almost absurdly to the legal ear, an important part of the Supreme Court decision reads as follows: "Because the Spronk method for determining 'usable' river flows [resulting after groundwater pumping depletions] was less compatible with Kansas' hydrological model than the other methods proposed, we conclude that the Special

116. *Id.*

117. *Kansas v. Colorado*, 320 U.S. 383 (1943), *reh'g denied* 321 U.S. 803 (1944).

118. *Id.* at 392 (footnotes omitted).

119. *Arkansas River Compact*, 63 Stat. 145 (1949).

120. *See Kansas v. Colorado*, 514 U.S. 673 (1995).

Master properly rejected the Spronk method in favor of the Durbin approach, as modified by the Larson coefficients.”¹²¹

This time around, the Court ruled that Kansas had shown unlawful depletion of the water reaching Kansas and ordered the case back to the Special Master to fashion a remedy. The case returned to the Court in 2001 where the Special Master’s remedial determinations were upheld.¹²² When it seemed the case was finally at an end (Colorado had already paid a monetary award of more than \$34 million in lieu of making up the past depletions in kind) a final dispute cropped up related to taxing costs. In particular, the parties disagreed about the amount of taxable costs that would be allowed for expert witness fees for their days of attendance at hearings before the Special Master.¹²³ Colorado is seeking application of a very specific provision of the Judicial Code that states, “a witness shall be paid an attendance fee of \$40 per day for each day’s attendance.”¹²⁴ Over the 270 days of hearings before the Special Master, there was a considerable amount of expert testimony. The parties had already agreed that if the statutory limit applies, Kansas would be entitled to \$162,927.94.¹²⁵ Kansas, however, is seeking an actual cost figure for expert-witness attendance which amounts to \$9,214,727.81, a difference of \$9,051,799.87.¹²⁶ The figure is almost shocking on its own account. It is even more shocking when it is remembered that this is not the total cost to Kansas of its expert witnesses, just the cost for days of attendance at hearings. This figure does not include Colorado’s experts at all. This figure does not even suggest how much other expense might be involved for attorneys and in-house staff that are not experts.¹²⁷ All of this expense was incurred to obtain a judgment of \$34 million for underdeliveries of water that occurred over a two decade period.¹²⁸ The cost of the water war almost certainly exceeded the value of the water over which it was fought.

Litigating the equitable apportionment of the Sparta Aquifer likely would not be as messy as litigating the impacts of groundwater withdrawals on the flow of the Arkansas River. Even so, if the depletion

121. *Id.* at 686-87.

122. *Kansas v. Colorado*, 533 U.S. 1 (2001).

123. *See* 28 U.S.C. § 1920 (2008).

124. 28 U.S.C. 1821(b) (2008).

125. *See* Robert Abrams, *How Much Can Be Charged for Expert-Witness Appearance Fees in Interstate Water Litigation?*, 2008-09 PREVIEW OF UNITED STATES SUPREME COURT CASES, Issue 3, at 188-90 (2008).

126. *See id.*

127. *See* Joseph Dellapenna, *Interstate Struggles Over Rivers: The Southeastern States and the Struggle Over the ‘Hooch*, 12 N.Y.U. ENVTL. L.J. 828, 888-89 (2005).

128. *See Kansas v. Colorado*, 533 U.S. at 9 n.2.

of the aquifer becomes a serious matter that draws in several of the aquifer states, this is litigation that no state wants. The Arkansas River litigation and its three trips to the Supreme Court ought to serve as a cautionary tale—a negotiated agreement that guarantees mutual respect and offers a predictable and reasoned outcome might be far preferable to “winning” a protracted legal battle that is subject to being rekindled as conditions change. Equitable apportionment is inordinately costly and often remains inconclusive. Even the winner of such a Pyrrhic victory ought to prefer a fair and lasting water allocation and management agreement.

V. WHAT ELEMENTS THE BWT MIGHT OFFER TO LASTING WATER CONFLICT RESOLUTION

Thus far, very little has been said about how the BWT actually addresses interjurisdictional water allocation disputes. Articles VII through X are of primary interest. Article VII establishes the IJC and sets the principle of equality in place by fixing its membership at six commissioners, three appointed by each government.¹²⁹ Article VIII announces the primary substantive principles that the commissioners are to apply. In part, it states as follows:

This International Joint Commission shall have jurisdiction over and shall pass upon all cases involving the use or obstruction or diversion of the waters with respect to which under Articles III and IV of this treaty the approval of this Commission is required, and in passing upon such cases the Commission shall be governed by the following rules or principles which are adopted by the High Contracting Parties for this purpose:

The High Contracting Parties shall have, each on its own side of the boundary, equal and similar rights in the use of the waters herein-before defined as boundary waters.

The following order of precedence shall be observed among the various uses enumerated hereinafter for these waters, and no use shall be permitted which tends materially to conflict with or restrain any other use which is given preference over it in this order of precedence:

- (1) Uses for domestic and sanitary purposes;

129. BWT, *supra* note 1, art. VII.

(2) Uses for navigation, including the service of canals for the purposes of navigation;

(3) Uses for power and for irrigation purposes.

The foregoing provisions shall not apply to or disturb any existing uses of boundary waters on either side of the boundary. .

..

The majority of the Commissioners shall have power to render a decision. In case the Commission is evenly divided upon any question or matter presented to it for decision, separate reports shall be made by the Commissioners on each side to their own Government. The High Contracting Parties shall thereupon endeavor to agree upon an adjustment of the question or matter of difference, and if an agreement is reached between them, it shall be reduced to writing in the form of a protocol, and shall be communicated to the Commissioners, who shall take such further proceedings as may be necessary to carry out such agreement.¹³⁰

Article IX allows either government to make a reference to the IJC on boundary issues and the IJC is “to examine into and report upon the facts and circumstances of the particular questions and matters referred, together with such conclusions and recommendations as may be appropriate”¹³¹ Article X allows the IJC to resolve questions referred by the “consent of the two Parties.”¹³² This allows the use of the IJC as a decision maker in cases not ordinarily within its Article VIII jurisdiction. This provision has never been used,¹³³ whereas the Article IX referrals for reporting and recommendations has been a major element in the IJC’s work over the years.¹³⁴

Standing back from the BWT/IJC arrangement, as an interjurisdictional water management agreement it incorporates a small number of key elements that might have transferrable application to other interjurisdictional water management settings:

130. *Id.* art. VIII.

131. *Id.* art. IX.

132. *Id.* art. X.

133. See Noah D. Hall, *Transboundary Pollution: Harmonizing International and Domestic Law*, 40 U. MICH. J.L. REFORM 681, 706 (2007).

134. See Noah D. Hall, *Toward a New Horizontal Federalism: Interstate Water Management in the Great Lakes Region*, 77 U. COLO. L. REV. 405, 418 (2006).

- Equal decisional authority to each participating sovereign¹³⁵
 - Tie votes take no action, but separate reports are made to each government, which then try to resolve the issue at that level
- Decisional jurisdiction over navigation under a principle of equal access¹³⁶
- Decisional jurisdiction over diversion (allocation) subject to a series of use priorities¹³⁷
 - Domestic and sanitary
 - Navigation
 - Power and irrigation
 - Specific provisions for Niagara¹³⁸ and the Milk-St. Mary dispute¹³⁹
 - Grandfathering of uses existing at the time of treaty formation
- Reference jurisdiction for study and reporting¹⁴⁰

One non-legislated feature of the BWT/IJC of note is the reputation the IJC and its staff have earned for scientific excellence and objectivity in the study and reporting process. In recent years, the IJC has also adopted processes that ensure broad public participation and transparency.¹⁴¹ In the water dispute arena, which is politically charged and where decisions can be of immense economic and ecological importance, these characteristics build credibility for the process and in obtaining support for potentially unpopular decisions.

The most fundamental principle of the BWT is equality, most obviously manifested by the equal representation and voting power of each nation on the IJC.¹⁴² That aspect of the BWT decisional process is among the most difficult to transfer to governance in the interstate context, and doing so would be problematic. The interstate disputes are

135. *But, supra* note 1 arts. VII & VIII.

136. *Id.* art. I.

137. *Id.* art. VIII.

138. *Id.* art. V. The allocation of the hydroelectric benefits was important enough to be addressed in the treaty itself.

139. *Id.* art. VI.

140. *Id.* art. IX.

141. See International Joint Commission, *Ninth Biennial Report on Great Lakes Water Quality* (Perspective and Orientation—Communication and Public Participation) (1998), available at <http://www.ijc.org/php/publications/html/9br/achievee.html#pers> (last visited Apr. 12, 2009).

142. BWT, *supra* note 1, art. VII.

manifestations of a failure to be able to achieve a consensus. To be sure, having a respected IJC-like body involved from the outset might avoid serious disputes in many cases, but even a single case of impasse where one state then takes advantage of the other's inability to obtain relief is one case too many. The BWT process for equally divided votes, reports accompanying a de facto remand to the governments,¹⁴³ is not likely to achieve a compromise when the jointly operated expert agency has failed to achieve a consensus position and reported their differences to their respective governments. The future credibility and authority of the governance mechanism suffers. In the state frustrated by the impasse the agreement and its processes will be perceived as ineffective at the most important thing it was charged with doing, solving hard water allocation problems fairly. The realistic alternative is to give the governing commission final decisional authority, under a decision making procedure that does not permit impasse.

The other bedrock element of the BWT/IJC framework is the clearly enunciated decisional principles that are announced in advance. This element is not only transferrable; it is mandatory. Setting the decisional standard is the one effort that holds a possibility for uniting the states and bringing them into an agreement—in several regards it is relatively easy to agree on what uses of water are most important, after which it is not difficult to construct a principled way to make decisions that implement the agreed priorities.

Water disputes generate emotional responses because of the role of water in the human sense of place, the survival and functioning of society, and the ecosystem that supports it. It is possible to set priorities for water use that are capable of winning broad assent across jurisdictional lines.¹⁴⁴ In setting specific priorities, the BWT list is not a model for most twenty-first century domestic United States interstate water allocation disputes. The BWT's high priority for navigation makes sense in the context of both the era of its formation and the resource base involved, given the immense importance of the Great Lakes-St. Lawrence River system as highways of commerce. In this day and age, an age of interstate highways, and comprehensive transcontinental rail systems, navigation may have a place in a hierarchy of uses, but it will be lower than it was in 1909. If water is scarce, other uses are likely to be more important because the cargo can move by other means.

143. *Id.* art. VIII.

144. For an effort to do so, see Robert Abrams and Noah Hall, *Framing Water Policy in a Carbon Affected and Carbon Constrained Environment* (forthcoming 2009) (on file with author) [hereinafter *Framing*].

The BWT priorities are flawed as a contemporary model in other ways. The BWT priorities do not even mention the role of water in sustaining natural systems, a cardinal omission. When vital ecological functions are threatened, they fall just below domestic use in the hierarchy. Similarly, the BWT's equation of power with irrigation is too lacking in guidance. In the passage of a century since 1909, the role of energy in the economy has been a driver that has raised standards of living, its efficient use will be a part of global competitiveness, its reformation to be less carbon dependant is a matter of global necessity and national security.¹⁴⁵ By contrast, most irrigation, the largest water consuming activity, is of relatively low value, much of it supporting vast farming enterprises that grow forage crops to feed livestock, or commodity crops that are made profitable by governmental subsidies. To the extent that food and fiber are essential and irrigation supports their production, the United States has many humid regions where most of the same crops can be grown with little or no irrigation and without the attendant competition for water where water is truly scarce. More bluntly, energy generation activities should outrank irrigation.

Urging that the priorities of the BWT should not be those installed as the guideposts of modern water allocation decision making is not intended as a criticism of them in their time and context. Instead, their lack of rote transferability is a vivid illustration of the fact that the role of water, and society's understanding of that role has changed over in the past century. Rather than being a reason to dismiss the lessons of the BWT, that mutability is a reason to understand that allocative principles embedded in a lasting framework water allocation agreement should have an internal mechanism for renewal and modification.¹⁴⁶ This added capacity is more urgent at the present time because of the impact of a changing climate on water availability and water demand.¹⁴⁷ If it seems too radical for the decisional body to have the power to reorder priorities subject to some form of ratification by the states, then the BWT/IJC report and recommendation process would be a good method to initiate changes in governing principles.

145. *Id.*

146. For example, the BWT was supplemented by the Great Lakes Water Quality Agreement. *See supra* note 4.

147. *See* Hall, et al., *supra* note 98; *see also* Abrams & Hall, *Framing*, *supra* note 144.

VI. CONCLUSION—PRESENT SUCCESSES AND PUTTING THEORY TO THE TEST

It is fair to ask if there are any present models of interstate water governance agreements that take a form suggested by extrapolation of the workable aspects of the BWT/IJC model. There are two prominent examples, one well established and the other freshly minted. The first is the governance of the Delaware River water resource complex under the Delaware River Basin Compact and, most importantly, the broad resource management and decisional power vested in the Delaware River Basin Commission.¹⁴⁸ The second, of course, is the recently enacted and congressionally ratified Great Lakes-St. Lawrence River Basin Water Resources Compact.¹⁴⁹ This agreement very astutely reserves to each of the basin states its historic police power regulatory role, but accomplishes basin governance by adopting common standards for water management, and an overarching composite control over out-of-basin diversions.¹⁵⁰

It also is fair to ask whether systems of that nature could operate successfully to resolve or avoid the interstate water allocation controversies of the Catawba River, the ACF, or the Sparta Aquifer. On the Catawba, having priorities that come into play under drought conditions might eliminate or reduce upstream withdrawals for irrigation to levels that are sufficiently protective of downstream South Carolina interests for higher priority uses that no curtailment of the interbasin municipal supply transfers would be necessary. Concurrently, there ought to be a pre-established drought management plan that requires increasingly stringent levels of water conservation for municipal use—radically reducing landscape irrigation, limiting car washing and other uses. The standards can increase or decrease in stringency as pre-established benchmark water availability levels are measured. In a case like the Catawba, a transferee basin that is receiving the benefits of an interbasin transfer for its municipal use should be required to make like efforts at conservation as are being required in the basin of origin, and

148. See Delaware River Compact, 75 Stat. 688 (1961). Also similar in its management aspects is the Susquehanna River Compact, 84 Stat. 1509 (1970). See also Douglas L. Grant, *Interstate Water Allocation Compacts: When the Virtue of Permanence Becomes the Vice of Inflexibility*, 74 U. COLO. L. REV. 105 (2003).

149. Great Lakes-St. Lawrence River Basin Water Resources Compact, Pub. L. No. 110-342, 122 Stat. 3739 (2008).

150. For the framework principles of that agreement and their federalism aspects, see Hall, *supra* note 134.

should reduce its diversion if doing so is feasible.¹⁵¹ The movement to a proactive water management system in the Catawba seems possible for other reasons as well. There is a degree of interstate consultation already being practiced, even if it did not avert the lawsuit. Prior to approving the latest application for a diversion out of the Catawba, North Carolina water officials discussed the matter with South Carolina officials to inquire about their views as an aid in assessing the potential benefits of the diversion in the importing basin, which also flowed into South Carolina.¹⁵² If master principles and priorities were in place, given the relatively large amounts of water available in all but the driest years, an agreement is feasible. It is worth noting that those same principles that might benefit North Carolina in moving Catawba water to serve municipal growth in a neighboring basin today, also would benefit South Carolina in the future if municipal growth occurs there.¹⁵³

The ACF situation is tractable under most flow conditions, thus the real impact of an agreement comes into play only for droughts, and, even then, only for severe droughts. If a priorities based management system is put in place, it becomes fairly easy to predict the “hard cases” in which very high priorities will suffer at the hands of higher priorities. As a starting point, assume the priority list is human domestic use, ecosystem protection, energy, and food/fiber production, in that order. As suggested above in the Catawba example, as part of the planning, Atlanta and its metropolitan region should be required to implement long term conservation efforts,¹⁵⁴ knowing shortages are endemic, and more severe restrictions on all non-essential use as short term conditions require.¹⁵⁵ The plan also should include Flint River conservation, and the possibility of reductions or curtailment of irrigation, even after planting.¹⁵⁶ What the

151. This sort of equalized conservation effort of all those benefiting from basin waters is an element plainly missing in the ACF, where Georgia did not impose drought-linked conservation measures in the Flint Basin during either the 2007 or 2008 drought, even though Flint water could have helped provide ecological flows to the Apalachicola River and estuary. See Abrams, *ACF Controversy*, *supra* note 68, n. 54-62 (current draft).

152. See North Carolina Brief, *supra* note 9, at 21 (reproducing Declaration of Thomas Fransen ¶ 42).

153. If there is really not enough water for all municipalities, a drought plan might have as a rule reductions to equal levels of per capita use, so that the burden of having to do with less water would fall equally on citizens in both states.

154. Long term conservation measures include such things as low flow plumbing fixtures as building code requirements, phase out of non-natural and non-drought resistant landscaping, and possibly rainwater capture systems (at least in the Ocmulgee basin).

155. See *supra* Part II.B.

156. The Georgia system now in place makes Flint River irrigation curtailment decisions on a one time per season basis in March, based solely on conditions predicted

recent history has already made clear is that the upstream power interests will accept transfer payments rather than water without objection. The municipal use, under the conservation conditions suggested here, is almost entirely non-consumptive, so the real conflict is over maintaining water in the reservoir as a hedge against continuing drought and releasing that water to provide endangered species flows and flushing flows to Apalachicola Bay, and possibly having sufficient water available in the river's middle reaches for nuclear power plant cooling in Alabama. If the drought is that bad, the priority system says other uses, including irrigation in the Flint Basin, will already be curtailed and recreation and navigation uses will just have to do the best they can with the water that is present. If, at that point, providing water that supports the millions of people in the metro Atlanta region is in issue, the priority system would say the water stays in Lake Lanier to be used, as required, for the most necessary of the basin's water needs. If the drought is that long and that severe, the damage to the ecosystem may well occur even if small additional releases are made. Those natural systems have endured droughts across thousands of years and this one will be little different. If global climate change is at work, and droughts are now more frequent and severe, the ecosystem will have to adjust in any event.

Finally, there is the Sparta Aquifer problem.¹⁵⁷ From the Mississippi complaint it is hard to tell whether there is a real water shortage issue or merely a perceived invasion of Mississippi's claimed interest in the groundwater being pumped.¹⁵⁸ What seems clear to a naïve outsider is that the high quality Sparta Aquifer water ought to be used for municipal supply because it is more valuable in that use than it is for any other. If there is no harm being done to the aquifer's long term productive capacity, there is no good reason to limit the use Memphis is making.

Assume instead, that there are Mississippi users whose wells have failed in competition with the municipal wells of Memphis, but again assume that there is no long term harm being done to the aquifer. That would present a classic situation of what is called well interference and is distinguishable from overdraft.¹⁵⁹ In a well interference setting, the aquifer has enough water and recharge to serve all its users on a sustainable basis. For that reason, the conflict is a local one that can be adjusted in any of a number of ways so that both users can continue their uses. The most common result in a setting like that is to impose the cost

for the Flint watershed rather than the entire ACF Basin. See GA. CODE ANN. § 12-5-540 (2006). See also Abrams, *ACF Controversy*, *supra* note 68, n. 63-67 (current draft).

157. See *supra* Part II.C.

158. See Mississippi Amended Complaint, *supra* note 28.

159. SAX, ET AL., *supra* note 88, at 403-05.

of accommodation on the high volume user, Memphis.¹⁶⁰ Memphis is in a position to both spread and shift the cost to municipal users, who will pay a great deal to have the tap water run and their toilets flush.

As a third hypothetical, assume that there is a resource competition for Sparta Aquifer water that is resulting in unsustainable overdraft. Considering the regional economy in that part of Mississippi, it seems that the high volume water use competing with Memphis for the Sparta Aquifer water would be irrigation, which can be done equally well with lower quality water.¹⁶¹ On the Mississippi side, in a region as humid and as blessed with surface and aquifer resources, there is likely to be sufficient water for irrigation from surface sources or from the highly productive alluvial aquifer or the moderately productive Cockfield Aquifer.¹⁶² If that switch in sourcing failed to alleviate the conflict, and conservation failed to alleviate the conflict, then a priority system would give the disputed Sparta Aquiferwater to municipal use.

This completes an eclectic journey across a century of water allocation disputes that stretch from the 5000 mile long United States-Canadian border, to the Atlantic seaboard, to the plains of Georgia and the Gulf Coast, and to the Mississippi River Valley. The tour has demonstrated that water allocation disputes occur in places having very ample water resources faced with occasional scarcity, as well as in regions like the Milk and St. Mary Rivers, where the climate is consistently arid and water makes the land productive and settlement feasible. The tour has elements of a quest, seeking principles of inter-sovereign water dispute resolution and on-going water management that are transferable from one time and place to another. The Boundary Waters Treaty of 1909 has achieved considerable enduring success. In its roots and institutions, in particular the International Joint Commission and its objective approach to the resource and its preference-based

160. A particularly illuminating description of this facet of American water law is found in *Henderson v. Wade Sand & Gravel Co.*, 388 So. 2d 900, 902 (Ala. 1980). The court there explains that the previously dominant absolute ownership rule was replaced by the American reasonable use rule in the context of cities pumping with high capacity wells that "lowered the water table beyond the reach of the domestic wells of the neighboring farmers. The rule forced the cities to pay damages to the farmers or provide them with better wells and pumps and was an application of common tort policies of distributing losses and of requiring those who receive the benefits from a harmful activity to pay its costs." *Id.* Cf. RESTATEMENT (SECOND) OF TORTS, § 858 cmt. h, illus. 7 & 850A cmt. l (1979) (suggesting the Restatement Second approach to groundwater well interference caused by municipal pumping would result in municipal liability for additional cost to replace supply of injured groundwater users).

161. The use of Sparta Aquifer water for irrigation is exactly what the neighboring state of Arkansas is trying hard to prevent. See Sparta Fact Sheet, *supra* note 31.

162. See *id.* Fig. 1.

decision making, the BWT contains elements that can be the basis for other interjurisdictional water allocation and management agreements.

APPENDIX A

2001 (Drought Year) Hydrograph at Gauge Station Five Miles Below Lake Wylie.

Source: Reproduced from South Carolina Motion, *supra* note 9, at 20:

Figure 1. Measured average daily flow of the Catawba River in the year 2001, measured at USGS gage 02146000, located 3.5 miles below Lake Wylie.

