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A River Runs Through It: The Future of the Columbia River Treaty, Water Rights, Development, and Climate Change

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A RIVER RUNS THROUGH IT: THE FUTURE OF THE COLUMBIA RIVER TREATY, WATER RIGHTS, DEVELOPMENT, AND CLIMATE CHANGE

Scott McKenzie

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INTRODUCTION

The Columbia River Treaty (Treaty) has served successfully as an instrument for flood control and hydropower in the Columbia River Basin (Basin) since 1961.¹ Today, different uses such as restoring fish populations, agricultural irrigation, and providing drinking water demand a share of the Basin's shrinking water supply.² As early as 2014, negotiations for the next Treaty can begin.³ The United States and Canada will need to update the instrument and transition from a focus on disaster mitigation and electrical production to a flexible basin-wide, transboundary water-management organization that can dynamically balance new goals for the use of the Basin's water.⁴

These changes will challenge the administration of the Columbia River (River) to renew its openness to input from stakeholders in the jurisdictions that are tied together in the common course in the Basin. Proposed changes to the Treaty will attempt to harmonize fishermen, farmers, and consumers of drinking water and electricity by bringing federal and state law into consensus with international water law.⁵

The first section of this paper reviews the political, economic, and environmental development of the Basin and Treaty.⁶ The second section looks at water governance in the Western United States and under international law.⁷ The third section concludes that instead of adhering to the rigid policies in the original Treaty, the United States and Canada would be better served by creating a transboundary water-management organization that will manage the Basin as a single unit and rely on input from the public and the scientific community to allocate water.⁸ These changes will put the Treaty in

1. Matthew McKinney et al., *Managing Transboundary Natural Resources: An Assessment of the Need to Revise and Update the Columbia River Treaty*, 16 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 307, 321 (2010).

2. *Id.* at 309, 314.

3. *See id.* at 320.

4. *See generally id.* (discussing the need to revise and update the Columbia River Treaty).

5. *See generally id.*

6. *See infra* Part I.

7. *See infra* Part II.

8. *See infra* Part III.

line with trends in international water law and make the Treaty flexible enough to adapt to newer uses that have become increasingly important since its inception.

I. PHYSICAL AND POLITICAL HISTORY OF THE COLUMBIA RIVER BASIN AND TREATY

The River originates at Columbia Lake in British Columbia, Canada, and flows for 480 miles before crossing the international border and entering Washington State.⁹ It joins with its largest tributary, the Snake River, and empties into the Pacific Ocean after passing through Oregon.¹⁰ The Basin is one of the largest basins in North America.¹¹ The Basin encompasses 259,000 square miles and is 730 miles at its widest point.¹² It is about 85% in the United States and 15% in Canada and covers parts of seven American states and one Canadian province.¹³

The River's water level varies tremendously along the journey and during different seasons. At the international boundary line, water measurements have ranged from 680,000 cubic feet per second (cfs) to 12,900 cfs.¹⁴ This fluctuation has a number of causes, including seasonal snowmelt and the differential topography between

9. CAN. DEP'TS OF EXTERNAL AFFAIRS & N. AFFAIRS & NAT'L RES., THE COLUMBIA RIVER TREATY AND PROTOCOL: A PRESENTATION 15 (1964) [hereinafter CANADA].

10. *Id.* The Snake River covers an equally impressive 1,225 miles. *Id.*

11. David R. Gilbert & Randolph R. Sleight, *The Riddle of the River: How David Thompson Explored and Mapped the Middle and Upper Columbia River*, in GREAT RIVERS HISTORY: PROCEEDINGS AND INVITED PAPERS FOR THE EWRI CONGRESS AND HISTORY SYMPOSIUM 28 (Jerry R. Rogers ed., 2009). The Columbia is the fourth-largest river in North America. Its length and volume are surpassed only by the Mississippi, Mackenzie, and St. Lawrence rivers. CANADA, *supra* note 9, at 14.

12. CANADA, *supra* note 9, at 15. The total size of the Basin is about the size of Texas. Jeffrey T. Payne et al., *Mitigating the Effects of Climate Change on the Water Resources of the Columbia River Basin*, 62 CLIMATIC CHANGE 233, 234 (2004).

13. Bernt Matheussen et al., *Effects of Land Cover Change on Streamflow in the Interior Columbia River Basin (USA and Canada)*, 14 HYDROLOGICAL PROCESSES 867, 869 (2000). The states and provinces the River covers are Oregon, Montana, Idaho, Nevada, Wyoming, Utah, Washington, and British Columbia. Despite the small size of the Basin in Canada, approximately 30% the total river flow originates there. CANADA, *supra* note 9, at 15.

14. CANADA, *supra* note 9, at 15. At Revelstoke, another point along the River, the difference between the highest and lowest recorded streamflows was a shocking ninety-nine times greater. *Id.* at 16.

mountains, plains, and forests.¹⁵ For example, there is far less precipitation in the rain shadow of the Cascade Mountains than along the Pacific Coast. Unfortunately, in its natural state, the River's mercurial flow causes significant flooding and difficulty maximizing the tremendous hydropower potential.¹⁶

A. Early History Of The River And Basin

The modern period of development in the Basin is less than 250 years old.¹⁷ In this short time, there have been a surprising number of treaties focused on state ownership of the area.¹⁸ An early British

15. Matheussen et al., *supra* note 13, at 870. The rate of precipitation ranges from a torrential 2,500 mm/year in the Washington Cascades to only 200 mm/year in the Columbia River Plateau and Snake River Plain. *Id.* A large amount of the precipitation comes in the form of snow. Melting in the spring and summer significantly contributes to the Columbia River and its tributaries. *Id.* Based on hydrological factors, the Basin can be broadly broken into "Eastern" and "Western" sections with The Dalles in Oregon acting as a dividing line. Alan F. Hamlet & Dennis P. Lettenmaier, *Effects of Climate Change on Hydrology and Water Resources in the Columbia River Basin*, 35 J. AM. WATER RESOURCES ASS'N 1597, 1598 (1999).

16. See CANADA, *supra* note 9, at 16.

17. See Gilbert & Sleight, *supra* note 11, at 28. The Columbia River was likely first sighted by Spanish explorers. *Id.* In 1775, it was described by Spaniard Bruno de Heceta and was found on maps. *Id.* Early explorers had difficulty going up the river due to its strong currents, which limited their ability to map it extensively. *Id.* In 1792, the river was named after the ship of the United States fur trader, Captain Robert Gray. *Id.* It should be noted that the measure of 250 years does not include the experiences of the area's indigenous people, who have been described as some of the most advanced in the Americas. JEAN BARMAN, *THE WEST BEYOND THE WEST: A HISTORY OF BRITISH COLUMBIA* 15–20 (3d ed. 2007).

18. There are a number of treaties concerning the political history of this region, which was variously claimed solely or jointly by Russia, Spain, France, Great Britain, the United States, and Canada. See Debora A. Person, *Wyoming Pre-Statehood Legal Materials: An Annotated Bibliography—Part II*, 7 WYO. L. REV. 333, 336–45 (2007). Person discusses the impact of various treaties on the region. *Id.* at 336 ("Granting Spain sovereignty over lands both discovered and yet to be discovered in the New World by Columbus not previously possessed by any Christian owner." (citing 1 EUROPEAN TREATIES BEARING ON THE HISTORY OF THE UNITED STATES AND ITS DEPENDENCIES TO 1648, 56 (Frances Gardiner Davenport ed., 1917))); *id.* at 336–37 ("As a result of losing the French and Indian War with Britain and being heavily indebted to Spain for its assistance during the war, France ceded title to all of its interests west of the Mississippi River to Spain." (citing Treaty of Fontainebleau, Fr.-Spain, Nov. 3, 1762, 4 EUROPEAN TREATIES, *supra*, at 86)); *id.* at 337 ("Russia claimed portions of the Oregon Country based on settlements as far south as fifty-five degrees north latitude. The Spanish seized two British ships in Nootka Sound at Vancouver Island. . . . Both powers reserved the right to trade. . . . This began a shift away from the policy of basing claims to lands on initial exploration of a region and toward the idea of more permanent colonization as proof of possession." (citing Treaty of Escorial, Gr. Brit.-Spain, Oct. 28, 1790, WILLIAM RAY MANNING, *THE NOOTKA SOUND CONTROVERSY* 284–85 (1905))); *id.* ("Under pressure from Napoleonic France, Spain ceded the Louisiana Territory back to France." (citing Treaty of San Ildefonso, Fr.-Spain, Oct. 1, 1800, 4 EUROPEAN TREATIES, *supra*, at 181)); *id.* at 337–38 (citing Treaty of Cession, U.S.-Fr., Apr. 30, 1803, 8 Stat. 200). These treaties

explorer working with a fur trading company was the first to map the Basin region.¹⁹ His efforts gave Great Britain (and its colony at the time, Canada) an edge over the United States during negotiations for the borderline, which has now become part of the world's longest undefended international border.²⁰

In the nineteenth century, the discovery of gold in the Rocky Mountains encouraged European settlers to develop the interior of the Basin.²¹ By 1866, the commercial fishing and canning industry had become prominent in the region and employed a significant portion of the population.²² This was soon followed in 1896 by the first major physical development of the River.²³ The U.S. Army Corps of Engineers built locks—a series of destructive rapids—in Oregon, around the Cascades, to improve navigation.²⁴ The locks dramatically increased commercial transportation and development along this portion of the river.²⁵

America and Canada realized that the water along their border had the potential to create troubling legal and political conflicts. To proactively prevent disagreements, the countries signed the Boundary

regarded ownership of the land between Western powers, but were not binding (or considered) to include the areas' indigenous people. *Id.* at 335. Later treaties with these people included the Treaty with the Yakima Nation, Treaty with the Tribes of Middle Oregon, Treaty with the Walla-Walla Cayuses, and Umatilla Tribes, and Treaty with the Nez Perce. Treaty with the Tribes of Middle Oregon, June 25, 1855, 12 Stat. 963; Treaty with the Nez Percés, June 11, 1855, 12 Stat. 957; Treaty with the Yakima, June 9, 1855, 12 Stat. 951; Treaty with the Wallawalla, Cayuse, etc., June 9, 1855, 12 Stat. 945.

19. Gilbert & Sleight, *supra* note 11, at 29–30.

20. There are a number of treaties specifically involving this international boundary, including the Convention with Great Britain. This treaty stipulated that it was an “[a]greement for joint occupation for ‘any country that may be claimed by either party on the northwest coast of America, westward of the Stony Mountains . . . for a term of ten years.’” Person, *supra* note 18, at 338 (quoting Convention with Great Britain, U.S.-Gr. Brit., Oct. 20, 1818, 8 Stat. 248). Following that treaty was the Oregon Treaty. *Id.* at 339. The Oregon Treaty, “[a]lso known as the Washington Treaty . . . established the boundary in the territory on the Northwest Coast of America lying westward of the Rocky Mountains.” *Id.* at 339 (citing Treaty with Great Britain, U.S.-Gr. Brit., June 15, 1846, 9 Stat. 869). “It ended the joint occupancy claims that had existed since 1818.” *Id.* This pioneering cartographer David Thompson believed the boundary could have been drawn based on the forty-seventh parallel, but it was ultimately set at the forty-ninth. Gilbert & Sleight, *supra* note 11, at 39.

21. Matheussen et al., *supra* note 13, at 870.

22. Barbara Cosens, *Transboundary River Governance in the Face of Uncertainty: Resilience Theory and the Columbia River Treaty*, 30 J. LAND, RESOURCES & ENVTL. L. 229, 242 (2010).

23. *Id.*

24. *Id.*

25. *Id.* at 243.

Waters Treaty of 1909 (Boundary Treaty) to allocate “rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along their common frontier, and to make provision for the adjustment and settlement of all such questions as may hereafter arise”²⁶

The Boundary Treaty established basic principles for how the two countries would share management of their water resources and has gradually become part of the corpus of international water law.²⁷ The Boundary Treaty’s principles include “mutual obligation to protect shared natural resources, institutional governance independent from national self-interest, and dispute resolution through investigation and information exchange”²⁸ Because it contains a prohibition on transboundary water pollution, some international legal experts refer to the Boundary Treaty as the first environmental treaty.²⁹

The Boundary Treaty did more than outline legal principles: the document also created an institution to facilitate the ongoing management of transboundary waters.³⁰ The International Joint Commission (IJC) was created to monitor and administer these resources.³¹ Additionally, through the “reference” function, the IJC could also answer questions from the United States or Canada regarding proposed uses or concerns—much like a nonbinding advisory opinion from the International Court of Justice.³² The IJC

26. Treaty Between the United States and Great Britain Relating to Boundary Waters Between the United States and Canada, U.S.-Gr. Brit., Jan. 11, 1909, 36 Stat. 2448 [hereinafter *Boundary Waters Treaty*]; Herb Gray, *Keynote Opening Address*, 54 WAYNE L. REV. 1451, 1453 (2008).

27. Noah D. Hall, *The Centennial of the Boundary Waters Treaty: A Century of United States-Canadian Transboundary Water Management*, 54 WAYNE L. REV. 1417, 1418 (2008).

28. *Id.* at 1418–19.

29. *See id.* at 1445–46.

30. *Id.* at 1422.

31. *Id.*

32. CANADA, *supra* note 9, at 20–21. The IJC is incorporated into the Treaty as well. Under the Boundary Treaty and the Columbia River Treaty, the IJC can arbitrate disputes on any topic. LUDWIK A. TECLAFF, *THE RIVER BASIN IN HISTORY AND LAW* 168 (1967). The major difference is under the Columbia Treaty, only one party needs to ask for a decision. Under the Boundary Treaty, both countries must submit a complaint. Importantly, after an exchange of notes between the two countries, there is a stipulation that no “general principle or precedent” from the Treaty would apply to other shared waters between the two countries. CANADA, *supra* note 9, at 166. If the IJC takes more than three months to reach a decision, the governments may independently refer the issue to a special arbitration panel. The countries may also refer disputes to the International Court of Justice or use other methods to resolve their dispute if a venue is agreed upon. *Id.* at 139; TECLAFF, *supra*, at 168. The two countries have never

has six guiding principles: “consultation and consensus building; providing a forum for public participation; engagement of local governments; joint fact-finding; objectivity and independence; and flexibility.”³³ The decisions and recommendations are made directly to the federal governments of each country and are available to the public.³⁴

The IJC helps to maintain positive diplomatic relations between the United States and Canada by functioning as an apolitical intermediary over contentious transboundary water issues.³⁵ The majority of the IJC’s decisions have been surprisingly amicable: an overwhelming number of decisions were unanimously made and adopted by the United States and Canada.³⁶

The first part of the twentieth century saw the United States and Canada continue to develop their water resources separately, despite the cooperation promoted by the IJC. During this period, the United States used its water resources more extensively than Canada.³⁷ The United States mainly focused on constructing dams to generate hydropower and aid navigation.³⁸ However, these dams were not designed for flood control, because engineers recognized that Canada had the best locations for this purpose.³⁹

submitted a dispute for binding arbitration to the ICJ but have referred a number of questions. Noah D. Hall, *The Evolving Role of Citizens in United States–Canadian International Environmental Law Compliance*, 24 PACE ENVTL. L. REV. 131, 140 (2007). The IJC had its first meeting on January 10, 1912, after ratification by the two principal countries. Gray, *supra* note 26, at 1453. The United States has a similar, but unrelated, relationship with Mexico known as the International Boundary and Waters Commission (IBWC). INT’L BOUNDARY & WATER COMMISSION, <http://www.ibwc.gov/> (last visited Feb. 12, 2013).

33. *The IJC and the 21st Century*, INT’L JUST. COMMISSION, <http://www.ijc.org/php/publications/html/21ste.htm> (last visited Feb. 12, 2013).

34. Gray, *supra* note 26, at 1456.

35. *Id.* at 1457.

36. Each country appoints three commissioners, despite their unequal populations and the amount of the Basin in each country. *Id.* at 1451. The leader of the Executive branch in each country appoints these commissions, but they are apolitical appointees and maintain a strong sense of independence. Thus far, only two of the IJC’s decisions were not unanimous. *Id.* at 1455.

37. TECLAFF, *supra* note 32, at 165.

38. Cosens, *supra* note 22, at 242–43.

39. To compare the development of flood control dams on United States rivers: in 1948 the Columbia had a total storage capacity of only 6% of its average annual flow, while the Colorado River had a storage capacity four times its average annual flow, and the Missouri River had a storage capacity over two times its average annual flow. *Id.* at 243.

B. The Columbia River Treaty: Creation, Management, And Impacts

In 1944, the United States and Canada asked the IJC to study potential improvements to the Columbia River.⁴⁰ The IJC created the International Columbia River Engineering Board (ICREB) to explore these development options.⁴¹ However, some stakeholders were insufficiently motivated to work together and slowed a final report and further action.⁴²

In 1948, a powerful flood struck the region and caused massive destruction stretching from Trail, British Columbia to Vanport, Oregon.⁴³ This destruction, particularly in Vanport, spurred the ICREB to submit three plans for development of the Columbia River in January 1959.⁴⁴ These documents were technical in nature and did not lay out step-by-step goals for their implementation or provide solutions for the complex legal issues created by bilateral development.⁴⁵

The ICREB's plans suggested that the Basin's water be used for hydropower generation and flood control without distinctions between political boundaries.⁴⁶ In December 1959, the IJC sent the ICREB's recommendations to Canada and the United States, and the two countries began discussing the legal framework that would guide this development.⁴⁷ Negotiations addressed fiduciary issues that were contingent on liability and managerial responsibility. Canada wanted

40. CANADA, *supra* note 9, at 21. This request was proposed by the United States and agreed to by Canada. It asked the Commission to

determine whether a greater use than is now being made of the waters of the Columbia River system would be feasible and advantageous . . . having in mind (a) domestic water supply and sanitation, (b) navigation, (c) efficient development of water power, (d) the control of floods, (e) the needs of irrigation, (f) reclamation of wet lands, (g) conservation of fish and wildlife, and (h) other beneficial purposes.

Id.

41. *Id.* This Board submitted its first report on November 1, 1950. *Id.* at 22.

42. *Id.* at 22–24.

43. U.S. ARMY CORPS OF ENGINEERS, COLUMBIA RIVER TREATY: HISTORY AND 2014/2024 REVIEW 3 (2009). At the time, Vanport was the second largest city in Oregon. The flood resulted in 30,000 people losing their homes and fifty deaths. *Id.*'

44. *Id.*

45. CANADA, *supra* note 9, at 20.

46. TECLAFF, *supra* note 32, at 166–67. This flood control has been primarily focused on the area of the river near Portland, Oregon. Payne et al., *supra* note 12, at 234.

47. CANADA, *supra* note 9, at 20.

financial contributions for several reasons: to help with the construction of dams; to compensate it for land lost by filling reservoirs; to receive a kickback for savings the United States would enjoy from flood control mitigation; and to receive revenue from the United States' improved hydropower capacity.⁴⁸ This last issue became known as the “downstream benefit theory.”⁴⁹

The agreement signed by the two countries called for constructing waterworks on the main stem of the Columbia River and two tributaries (the Kootenay and Clark Ford-Pend d'Oreille).⁵⁰ It also included building three dams on the Canadian side: the Duncan, Hugh Keenleyside (also known as the Arrow), and the Mica.⁵¹ A fourth dam, the Libby, would be built in the United States, but its massive reservoir would reach into British Columbia's Lake Kootenay.⁵²

On January 17, 1961, the United States and Canada signed the Columbia River Treaty.⁵³ The Treaty mainly covers the location of the dams and each country's financial contribution or compensation.⁵⁴ The Treaty also includes two annexes that cover management details of flood control, hydropower, and the calculation of Canada's “downstream benefit” payments.⁵⁵ Practically, the United States gained significant reservoir space in Canada for

48. TECLAFF, *supra* note 32, at 166.

49. *Id.* at 166.

50. CANADA, *supra* note 9, at 14, 30.

51. CANADA, *supra* note 9, at 28; TECLAFF, *supra* note 32, at 167; U.S. ARMY CORPS OF ENG'RS, *supra* note 43, at 4–5.

52. This is an excellent example of the bilateral nature of the treaty. Joseph L. Fisher, *Foreword* to JOHN V. KRUTILLA, *THE COLUMBIA RIVER TREATY: THE ECONOMICS OF AN INTERNATIONAL RIVER BASIN DEVELOPMENT*, at v (1967). Canada was also able to realize other benefits, such as additional storage at the Mica dam, hydropower at Mica, and hydropower at Revelstoke. U.S. ARMY CORPS OF ENG'RS, *supra* note 43, at 6.

53. Columbia River Basin Treaty: Cooperative Development of Water Resources, U.S.-Can., Jan. 17, 1961, 15 U.S.T. 1555 (entered into force Sept. 16, 1964) [hereinafter Columbia River Basin Treaty]; CANADA, *supra* note 9 at 20. The United States Senate approved the Treaty in March 16, 1961. *Id.* Canada required further assurances by the United States. Canada signed on January 22, 1964, after these were made in an Exchange of Notes and Protocol. *Id.* at 20–25. British Columbia, as a province of Canada, was concerned about the appropriation of its natural resources and its compensation. Fisher, *supra* note 52, at v. The Treaty was described as “one of the most far-reaching water development efforts in North America.” *Id.*

54. Columbia River Basin Treaty, *supra* note 53, art. II, XVIII.

55. TECLAFF, *supra* note 32, at 168.

floodwater storage.⁵⁶ These stored waters would be managed by Canada to maximize the generation capabilities of American hydropower dams.⁵⁷

The new dams doubled the hydroelectric capacity of the River.⁵⁸ The downstream benefits payment gave Canada half the electricity generated by its prudent management.⁵⁹ Canada can use this electricity itself, or sell it back to American utility companies.⁶⁰

Administration of the dams for flood protection and hydropower production is the responsibility of operating entities.⁶¹ In the United States, the operating entity is the Bonneville Power Administration (BPA), while in Canada it is the British Columbia Hydro and Power Authority.⁶² These operating entities organize their plans for hydropower production far in advance, which promotes cross-border planning and cooperation. The Treaty stipulates that the operating entities prepare plans for flood control storage capacity and hydropower production by drafting Assured Operating Plans (AOP) that are projected six years into the future.⁶³ The rough details of the AOP are refined by small, specific changes in the Detailed Operating Plan (DOP).⁶⁴ The DOP is also the document that addresses issues other than hydropower and flood prevention, including

56. Fisher, *supra* note 52, at v.

57. CANADA, *supra* note 9, at 28. Other uses for the Columbia include mining, agriculture, forestry, fishing, and wildlife. At the time the Treaty was signed, the parties concluded that hydropower and flood control were the best uses. *Id.* at 42–44.

58. U.S. ARMY CORPS OF ENG'RS, *supra* note 43, at 5.

59. TECLAFF, *supra* note 32, at 167. This is known as the “Canadian Entitlement.” *Id.* at 167 n.406. It also required the building of the Pacific Northwest-Pacific Southwest Intertie because the Northwest had insufficient electrical demand to purchase the amount that the project would supply. Cosens, *supra* note 22, at 244. At the completion of the Intertie, utilities in the Southwest United States signed thirty-year contracts for electrical supply. *Id.* This payment was far less than if electricity was sold year-to-year, but the certainty of these payments helped Canada finance construction of dams. *Id.*

60. TECLAFF, *supra* note 32, at 167.

61. CANADA, *supra* note 9, at 136.

62. *Id.* The Bonneville Power Administration generally sells electricity produced by the dams in the Columbia River Basin, while the Federal Columbia River Power System is responsible for the operation of dams created by the Treaty as well as other ones on the river itself. Robin Kundis Craig, *Of Fish, Federal Dams, and State Protections: A State's Options Against the Federal Government for Dam-Related Fish Kills on the Columbia River*, 26 ENVTL. L. 355, 356 (1996).

63. U.S. ARMY CORPS OF ENG'RS, *supra* note 43, at 5.

64. *Id.*

environmental protection.⁶⁵ Finally, the Permanent Engineering Board helps implement the Treaty and assists with smoothing out differences between the two independent operating entities.⁶⁶

The final part of the Treaty concerns its termination. The terms of the treaty state that it is in force for sixty years.⁶⁷ Either country must give notice ten years before they intend to withdraw.⁶⁸ Therefore, the soonest a new treaty can come into force is 2024, but notice must be given by 2014.⁶⁹ In the unlikely event that the Treaty is terminated, and no replacement is ratified, the Basin's waters will again be managed by the Boundary Treaty.⁷⁰ While the operating entities have provided solutions to many of the problems that have arisen since the start of the Treaty, they do not have a formal role in negotiating a new one.⁷¹ Negotiations are limited to the federal governments of both countries.⁷²

The Treaty led the United States to create the Pacific Northwest Coordination Agreement (PNCA), which was signed in 1964 and renewed in 1997.⁷³ This agreement encouraged the development of

65. *Id.* This document includes protection for fish populations. *Id.* There is also a document known as the Treaty Storage Regulation, which is based on the DOP, sets storage requirements in the reservoirs, and can be used to address issues such as floods, hydropower, or fisheries. Cosens, *supra* note 22, at 254.

66. "The U.S. Secretaries of Army and Energy each appoint a PEB member and the governments of Canada and British Columbia each appoint a Canadian member." U.S. ARMY CORPS OF ENGR'S, *supra* note 43, at 4.

67. CANADA, *supra* note 9, at 142; Columbia River Basin Treaty, *supra* note 53, art. IV.

68. CANADA, *supra* note 9, at 142; Columbia River Basin Treaty, *supra* note 53, art. XIX. The province of British Columbia must give its consent before Canada can terminate the treaty. U.S. ARMY CORPS OF ENGR'S, *supra* note 43, at 8.

69. The year 2024 is sixty years after ratification, which occurred in 1964, though the treaty was completed and signed in 1961. Columbia River Basin Treaty, *supra* note 53, art. 21. The treaty can be terminated any time after 2024, but ten years' notice must be given. The soonest this could happen, 2014, is rapidly approaching, making policy questions increasingly salient. Other policy options exist such as a "partner treaty," amendments, protocols, using a Presidential Executive Order to restructure the advisors, or adjusting the annual operating plans. McKinney et al., *supra* note 1, at 320–22.

70. Boundary Waters Treaty, *supra* note 26, art. XIV.

71. Nigel Bankes, *Environment: Garrison Dam, Columbia River, the IJC, NGOs*, 30 CAN.-U.S. L.J. 117, 121–22 (2004). Some experts point out that there are risks with putting too much trust in the operating entities. *Id.* at 125–26. The entities are dominated by power companies and lack the same level of accountability that elected officials have. *Id.*

72. U.S. ARMY CORPS OF ENGR'S, *supra* note 43, at 7. In the United States, the State Department gives guidance on treaties, while the President has authority to conclude treaties with the advice and consent of the Senate. *Id.* at 8. In Canada the executive branch undertakes this responsibility. *Id.*

73. *Id.* at 7.

additional hydropower projects along the River by bringing together eighteen different business groups, federal agencies, states, and local municipalities.⁷⁴ At the time the PNCA was signed, the Basin was the largest hydropower system in the world and was responsible for 96% of the electricity produced in the Pacific Northwest.⁷⁵ Today, there are 214 dams along the River with a combined output of 36,400 megawatts of hydropower generation.⁷⁶

In 1961, few opportunities were made available for public comment and participation.⁷⁷ In fact, some of the project planners viewed public participation as “in the way.”⁷⁸ This foreshadowed a recurring hostility to public comment, participation, and needs. The Treaty’s limited scope can be contrasted with issues that members of the public also care about, such as agricultural irrigation, public drinking water, and restoring fish populations.⁷⁹

II. GOVERNANCE ISSUES: THEORETICAL AND PRACTICAL

The Columbia River and the Columbia Treaty have both become entangled in a mesh of legal and governance problems. The River is described as having “increasing and irreconcilable competition for water with no available increases in supply.”⁸⁰ Current trends point to increased demand, but studies show the only way to maintain current objectives is to decrease demand.⁸¹ This means that any changes to

74. *Id.*

75. CANADA, *supra* note 9, at 16. The Treaty is credited with maintaining the low costs of electricity in the region. Michael C. Blumm & Andy Simrin, *The Northwest Power Act: Point & Counterpoint: The Unraveling of the Parity Promise: Hydropower, Salmon, and Endangered Species in the Columbia Basin*, 21 ENVTL. L. 657, 662–63 (1991).

76. Payne et al., *supra* note 12, at 234. Of these dams, thirty are federally owned and the other 184 are municipally owned or independent. These federal dams amount to approximately 70% of the hydropower output in the United States. *Id.*

77. Bankes, *supra* note 71, at 119; A. Dan Tarlock & Patricia Wouters, *Are Shared Benefits of International Waters an Equitable Apportionment?*, 18 COLO. J. INT’L ENVTL. L. & POL’Y 523, 524 (2007).

78. Bankes, *supra* note 71, at 118; *see generally* JAMES WOOD WILSON, *PEOPLE IN THE WAY: THE HUMAN ASPECTS OF THE COLUMBIA RIVER PROJECT* (1973).

79. W. R. Derrick Sewell, *The Columbia River Treaty and Protocol Agreement*, 4 NAT. RESOURCES J. 309, 311 (1964).

80. Hamlet & Lettenmaier, *supra* note 15, at 1620.

81. *Id.* This is primarily due to booming population in the region. *Id.*

the Treaty will have to deal with the possibility of conflicts between competing users.⁸² This tension is exacerbated by political issues that result in the representation of different stakeholders at varying levels of governance and across-the-broad geography of the Basin's many jurisdictions. Issues important in Oregon may be less so in Washington, and what is important to many citizens in a metropolitan city may be alarming to a rancher.

This section starts with a discussion of how water is managed in the Western United States. Then this section discusses of the newer uses for the water that are not explicitly accounted for in the Treaty, including fishing, irrigation, and hydropower. This part also considers how climate change is expected to impact water resources in the region. The section concludes by looking at international water law, which has been influenced by the Treaty, and discusses how the evolution of this body of law can serve to guide negotiations for a future Treaty.

A. Western Water Law And Development

Water rights in the western United States follow the doctrine of prior appropriation.⁸³ Prior appropriation was primarily devised to clearly delineate property rights in water.⁸⁴ This doctrine developed to facilitate users' sharing of this resource, which is scarcer in the Western United States than the Eastern, because they knew that their rights were protected and easily defended in court during droughts.

The doctrine of prior appropriation has unique characteristics: the state administers water permits, water rights are allocated primarily for a "beneficial use," and water rights persist indefinitely.⁸⁵ Further,

82. Dan Tarlock, *How Well Can Water Law Adapt to the Potential Stresses of Global Climate Change?*, 14 U. DENV. WATER L. REV. 1, 31 (2010).

83. Reed D. Benson, "The Supreme Court of Science" Speaks on Water Rights: *The National Academy of Sciences Columbia River Report and Its Water Policy Implications*, 35 ENVTL. L. 85, 95 (2005). Because water is in more limited supply in the Western United States, water rights there have split from the doctrine of riparian rights that exist in the relatively wet East. See generally JOHN W. JOHNSON, UNITED STATES WATER LAW: AN INTRODUCTION (2009).

84. Janet C. Neuman, *Run, River, Run: Mediation of a Water-Rights Dispute Keeps Fish and Farmers Happy—For a Time*, 67 U. COLO. L. REV. 259, 316 (1996).

85. Benson, *supra* note 83, at 95.

during times when water is limited, senior rights holders have priority over junior ones, and rights holders can change how they use the water unless it has negative impacts on other rights holders.⁸⁶

There are concerns that the law of prior appropriations is not adapting quickly enough to society's current needs and does not reflect what humanity now knows about the environmental costs of development.⁸⁷ For example, the "beneficial use" rule originally assumed that a rights holder would divert water from the streambed, often for irrigation purposes. In its modern application, the rule now includes "instream" uses such as dams.⁸⁸ Similarly, before the environmental and social costs of development were known, the system seemed a better reflection of human use. However, including all these costs with a modern, nuanced understanding of human consumption patterns shows that the law of prior appropriations,

reward[s] and emphasize[s] consumptive use and allow[s] overappropriation, so that rivers contain little or no water for significant periods of time each year. In the face of advancing knowledge and understanding of watersheds as ecosystems that need to be treated as wholes, the system continues to deal with watersheds in fragmented parts and to treat water itself as a commodity completely severable from its watershed context. . . . [T]he laws continue to operate on a seniority system rather than considering costs and benefits, efficiencies, or highest and best uses. . . . [T]hese . . . laws [are] the "Lords of Yesterday."⁸⁹

The federal government has not been involved in the distribution of water rights, allowing states to craft their own policies.⁹⁰ Further,

86. *Id.* at 95–96.

87. *Id.* at 131 n.221.

88. *Id.* at 97. For a more complete history of the evolution of instream use legislation in the West see generally Cynthia F. Covell, *A Survey of State Instream Flow Programs in the Western United States*, 1 U. DENV. WATER L. REV. 177 (1998).

89. Neuman, *supra* note 83, at 317 (quoting acclaimed Western water rights lawyer and academic Charles Wilkinson).

90. Benson, *supra* note 83, at 95. This arrangement was codified though the Federal Reclamation

there is no requirement that states coordinate their distribution of rights.⁹¹ Instead of working together to make decisions based on consensus, as the IJC does at an international level, individual states have gone to the Supreme Court time and time again to have riparian disputes adjudicated.⁹² Some interstate compacts do exist, but many of these came after the federal government gave the states financial incentives to create an equitable division of water. The fact that the federal government has traditionally deferred to state policy gives rise to growing tension caused by more recent federal involvement in River uses such as fish populations and irrigation.⁹³

Prior appropriations can become onerously complex because of this legal wrangling. For example, one plan to improve fish stocks called for water to be diverted from the main stem of the River to augment water taken from the Umatilla River for agricultural irrigation.⁹⁴ This plan required the United States Bureau of Reclamation to receive an approved instream water right from the Oregon State Water Resources Department and an “exchange order” to switch the water between the two rivers so that it could keep the rights holders in their original order.⁹⁵

Oregon law allows any party to object to a redistribution of water rights, and two environmental groups did so.⁹⁶ These groups, WaterWatch and Oregon Trout, were less concerned about the specific project than about the way that the process was conducted and its implications for expanding irrigation.⁹⁷ As a result of these lawsuits, some parties were concerned that there would be political fallout if the deal fell through, and members of Congress urged the parties to quickly mediate their differences. Thus, a relatively simple plan that had already been agreed to by most of the state, local, and

Act which lets the federal government “defer” to the states on issues of water rights. Neuman, *supra* note 84, at 272 (citing 43 U.S.C. §§ 371–600e (1988)).

91. Benson, *supra* note 83, at 112.

92. Even these Supreme Court decisions have not prevented future litigation. *Id.*

93. Michael R. Moore, Aimee Mulville & Marcia Weinberg, *Water Allocation in the American West: Endangered Fish Versus Irrigated Agriculture*, 36 NAT. RESOURCES J. 319, 320 (1996).

94. Neuman, *supra* note 84, at 271.

95. *Id.* at 272–75.

96. *Id.* at 273–75.

97. *Id.* at 272–75.

indigenous stakeholders quickly became so contentious that it required intervention from Washington D.C.⁹⁸

B. Competing Uses, Conflicted Jurisdictions

The River's water can have many uses in addition to the hydropower generation and flood control that are the focus of the Treaty. Society's values have changed since the Treaty's inception to include a strong interest in other uses such as restoring fish populations, improving food production through increased irrigation, and drinking water.⁹⁹ Water planners in the Pacific Northwest have come under increasing pressure to accommodate the water needs of these newer uses, while maintaining the core requirements set in the Treaty.¹⁰⁰

1. Anadromous Fish and the Aquatic Environment

Attempts to restore anadromous fish populations—such as salmon and steelhead trout—in the Basin clearly illustrate the issue of competing interests. The National Academy of Sciences' Columbia River report explains that the most dangerous time for these fish populations comes when large man-made withdrawals of water from the Basin occur simultaneously with naturally lower water flows.¹⁰¹ For these fish, this is an unlucky combination of events, which has been more common as water resources are exploited throughout the basin.¹⁰² The impact of these dramatically lower water flows on the anadromous fish population is so severe that in 1992, the Columbia

98. *Id.* at 276.

99. McKinney et al., *supra* note 1, at 310. In an added twist, many experts and members of the public also believe it is important to maintain hydropower generation because of its low CO₂ emissions relative to coal power production. *Id.* Other important values include recreation, cultural resources, and navigation. U.S. ARMY CORPS OF ENG'RS, *supra* note 43, at 8.

100. The Washington Department of Ecology is the agency responsible for issuing new water use permits in the state. Benson, *supra* note 83, at 88.

101. *Id.* at 94.

102. COMM. ON WATER RES. MGMT., INSTREAM FLOWS, & SALMON SURVIVAL IN THE COLUMBIA RIVER BASIN, NAT'L RESEARCH COUNCIL, MANAGING THE COLUMBIA RIVER: INSTREAM FLOWS, WATER WITHDRAWALS, AND SALMON SURVIVAL 2 (2004); Benson, *supra* note 83, at 118.

was described as the “most endangered river system in the country.”¹⁰³

In the past, these fish species were plentiful in the Basin. When Meriwether Lewis and William Clark visited the area in 1805, they witnessed an incredible fish population that they estimated numbered between 10 and 16 million.¹⁰⁴ Today, these same species of fish are at risk because their complicated lifecycle—they hatch from eggs in freshwater, swim to the ocean to feed and mature, then return to the freshwater to lay new eggs—makes them vulnerable to changes caused by river development.¹⁰⁵ These fish pass up to nine dams on their way to the ocean, with each dam having the potential to kill more than 15% of those trying to pass.¹⁰⁶

These fish are vitally important for the region. First, the business of catching and processing them has become a sizeable part of the economy. Second, in addition to being a link in the food chain and a part of the ecological web, the fish function like a canary in a mineshaft and provide an indicator of the overall environmental health. If fish populations are destroyed, many other species may not be far behind. Third, these fish have a special role in the culture of many indigenous groups in the region.¹⁰⁷

Policies that minimize harm to the fish have been slow in coming. The wide scope of the fish populations’ economic, environmental, and cultural value was not fully appreciated in 1961 when the Treaty

103. Henry B. Lacey, *New Hope for Pacific Salmon?* Northwest Resource Information Center v. Northwest Power Planning Council, Idaho Department of Fish & Game v. National Marine Fisheries Service, and the *Aftermath of Judicial Impatience*, 14 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 333, 335 (2008).

104. Willis E. McConnaha, Richard N. Williams & James A. Lichatowich, *Introduction and Background of the Columbia River Salmon Problem*, in RETURN TO THE RIVER: RESTORING SALMON TO THE COLUMBIA RIVER 2 (Richard N. Williams ed., 2006) (estimation of the fish population from the Northwest Power Planning Council).

105. Sean Phelan, Comment, *A Pacific Rim Approach to Salmon Management: Redefining the Role of Pacific Salmon International Consensus*, 33 ENVTL. L. 247, 252 (2003).

106. Blumm & Simrin, *supra* note 75, at 664, 683.

107. *Id.* at 668–69. Estimates suggest that the salmon support 60,000 jobs in the Pacific Northwest. Lacey, *supra* note 103, at 335. The Supreme Court described the centrality of the fish to indigenous people as “not much less necessary . . . than the atmosphere they breathed.” United States v. Winans, 198 U.S. 371, 381 (1905).

was created. The Treaty almost completely ignores fish while focusing considerably on flood control and hydropower.¹⁰⁸

The rights of indigenous people to the fish are an important aspect to managing the River.¹⁰⁹ The indigenous groups have signed federal treaties, which give them some rights over the fish. The first of these treaties came in the 1850s with governors of Washington and Oregon.¹¹⁰ Early settlers did not follow the provisions of these treaties, however, and the indigenous people often had to protect their rights by going court. After almost 120 years, the court in *Sohappy v. Smith* found, based on the treaties, the indigenous groups must be included in the management of these fish.¹¹¹

State, federal, and tribal organizations have all exerted control over proposed solutions to declining fish populations.¹¹² However, the management of fish and wildlife is the domain of states and not a federal program.¹¹³ Numerous strategies have been crafted in an attempt to save these fish. A key element in these plans focuses on expanding hatcheries, which currently introduce 235 million salmon and steelhead fish yearly.¹¹⁴ The cost for increasing fish stocks is immense—an estimated 6.4 billion dollars between 1982 and 2001.¹¹⁵

108. “[O]ther purposes such as fisheries, irrigation, and recreation are merely treated as operational ‘constraints.’” Blumm & Simrin, *supra* note 75, at 704.

109. McConnaha, Williams & Lichatowich, *supra* note 104, at 15.

110. *Id.* at 19.

111. *Sohappy v. Smith*, 302 F. Supp. 899, 911 (D. Or. 1969). Later, this judgment was adopted in *United States v. Washington*, 384 F. Supp. 312, 345 (W.D. Wash. 1974). These rulings upheld the rights conveyed in the 1855 treaties. For example, the Yakima Treaty states:

The exclusive right of taking fish in all the streams, where running through or bordering said reservation, is further secured to said confederated tribes and bands of Indians, as also the right of taking fish at all usual and accustomed places, in common with the citizens of the Territory, and of erecting temporary buildings for curing them; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.

Treaty with the Yakima art. 3, June 9, 1855, 12 Stat. 951.

112. See McConnaha, Williams & Lichatowich, *supra* note 104, at 15.

113. There is a long history of the federal government shifting power to regulate wildlife, but it has “consistently recognized and supported states’ roles in protecting wildlife” Craig, *supra* note 62, at 361.

114. McConnaha, Williams & Lichatowich, *supra* note 104, at 3.

115. *Id.*

By the 1970s, the many stakeholders along the River decided fish populations had become so low that the issue needed to be treated with the same level of regard as hydropower and flood control.¹¹⁶ In an attempt to solve some of the constraints caused by these different stakeholders, the federal government, through the Northwest Power Act, created the Northwest Power Planning Council (NPCC).¹¹⁷ This organization had representatives from different Basin groups, including “hydropower operators, hatchery operators, harvest managers, water managers, fish habitat managers, [and the] BPA”¹¹⁸ The NPCC devised a “water budget,” which was intended to account for the different needs of the Basin’s users.¹¹⁹ The NPCC did not find success in solving the fish population problem, and these stakeholders came together in a meeting known as the Salmon Summit.¹²⁰

At the Summit, stakeholders discovered that fish stocks continued to plummet because the NPCC was not devoting the amount of water recommended by the federal, state, and indigenous groups to help the fish population rebound.¹²¹ Additionally, fish populations continued to suffer due to poor coordination between the stakeholders, which slowed the implementation of projects.¹²² Differences in the ways

116. Blumm & Simrin, *supra* note 75, at 658. These recommendations included considering improving fish reproductive rates, as well as limiting fishing in the Pacific Ocean. *See* Phelan, *supra* note 105, at 258, 262. Past international agreements focused on regulating ocean fishing. *Id.* at 262. The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) was designed primarily to deal with anticipated electrical shortfalls, but also hoped to improve salmon populations. 16 U.S.C. §§ 839-839h (1980); Lacey, *supra* note 103, at 337–38.

117. Lacey, *supra* note 103, at 337 n.14.

118. Blumm & Simrin, *supra* note 75, at 687. The Northwest Power Act could have been a progressive law. The Act dealt with the Basin as a single unit that needed programs to help improve salmon stocks instead of dividing the basin in small zones and moving forward “project-by-project.” *Id.* at 704. The Act also called for reorganizing how institutions that manage the River interact. *Id.* at 658. Finally, the Act elevated indigenous groups to the same level as state and federal fish and wildlife agencies. *Id.* at 668–69. The Canadian counterpart to the BPA is the Columbia Basin Trust. *See* Cosens, *supra* note 22, at 251.

119. Lacey, *supra* note 103, at 346.

120. *Id.* at 353.

121. Improved flows help young fish swim to the ocean and complete their life cycle. Blumm & Simrin, *supra* note 75, at 671; *see also* *Nw. Res. Info. Ctr., Inc. v. Nw. Power Planning Council*, 35 F.3d 1371, 1380 (9th. Cir. 1994); Lacey, *supra* note 103, at 338 (“[T]he Council has frequently refused to adopt measures thought by fish and wildlife agencies and tribes to be necessary to restore healthy salmon runs.”).

122. *See* McConnaha, Williams & Lichatowich, *supra* note 104, at 17.

that fish and hydropower projects were undertaken, despite each interest having an equal right to the water, is illustrative of this poor coordination: fish issues were treated “project-by-project,” while hydropower uses were dealt with by using a basin-wide framework.¹²³

Federal law protected populations of several fish species by listing them as threatened or endangered under the Endangered Species Act (ESA) in 1991.¹²⁴ This law contrasts the federal government’s role in species preservation with the states’ role in water and wildlife management.¹²⁵ The ESA forced states to comply with mandates aimed at protecting the fish, pushed the states to reform their water laws, kick-started greater compliance through a range of federal agencies, and increased compliance with existing laws across jurisdictions.¹²⁶

State, federal, and tribal group interests have collided in the courtroom a number of times. An important, yet typical, case was *Northwest Resource Information Center, Inc. v. Northwest Power Planning Council*.¹²⁷ This litigation considered the implications of the NPCC’s failure to follow certain recommendations made during the rulemaking process for its proposal to restore salmon runs.¹²⁸ The court held that the NPCC did not properly explain why it rejected these recommendations, though it noted, “only small steps are possible, in light of entrenched river user claims of economic hardship.”¹²⁹ Though not binding on any of the parties, the court’s

123. Blumm & Simrin, *supra* note 75, at 704. Most of the fish recovery projects are undertaken by the BPA, which devotes approximately \$240 million a year of its \$2 billion revenue to that purpose. McConnaha, Williams & Lichatowich, *supra* note 104, at 15.

124. As of 2006, there were “13 groups of salmon and steelhead, termed Evolutionarily Significant Units . . . under the Endangered Species Act . . .” McConnaha, Williams & Lichatowich, *supra* note 104, at 15. These fish species include the Sockeye, Chinook, and Steelhead. *Id.* at 18. The ESA also covers White Sturgeon and Bull Trout in the Kootenai River. *Id.* It was too late for the native population of Coho salmon in the Snake River, which became extinct before 1992. *Id.*

125. Moore, Mulville & Weinberg, *supra* note 93, at 320.

126. See Craig, *supra* note 62, at 375–78. In other regions, such as the Upper Colorado or Platte, the ESA has effectively encouraged cooperative water use. Benson, *supra* note 83, at 114.

127. *Nw. Res. Info. Ctr., Inc. v. Nw. Power Planning Council*, 35 F.3d 1371 (9th Cir. 1994); Lacey, *supra* note 103, at 358–60.

128. *Nw. Res. Info. Ctr., Inc.*, 35 F.3d at 1395. It is worth noting that many industrial users of the River were codefendants and wanted to challenge the NPCC’s management of the river. *Id.* at 1384.

129. *Id.* at 1395.

ruling included extensive dicta, which suggested the NPCC should listen to the recommendations from groups aligned to restore salmon populations.¹³⁰

Attempts by the federal government to create an entity that would manage the interests of different stakeholders failed.¹³¹ Clearly some interests were being ignored, and stream flow requirements mandated by treaty were not being met. This failure underscored the inadequate forums for public comment and weak interagency discussion.¹³²

Fish populations have been described as a “litmus test,” to see if it is possible to sustain current water use patterns, while maintaining “contemporary environmental values.”¹³³ Much as they serve as an indicator of environmental health, the fish can also represent a test for the effective administration of the Basin.¹³⁴ Sadly, fish stocks have not rebounded to their predevelopment levels.¹³⁵

2. Agricultural Irrigation and Drinking Water

The massive irrigation diversions needed to sustain large-scale agricultural production is another contentious water use issue in the Basin.¹³⁶ Starting in the mid-1800s, water withdrawals from the Basin significantly impacted many tributaries.¹³⁷ By the turn of the century, settlers had formed irrigation districts and sought federal funding to expand irrigation and farm production.¹³⁸ Later, the United States Bureau of Reclamation built large-scale irrigation projects on the River’s tributaries.¹³⁹

130. *Id.* at 1392, 1395.

131. Blumm & Simrin, *supra* note 75, at 705.

132. *Id.* at 707.

133. Moore, Mulville & Weinberg, *supra* note 93, at 319.

134. *See id.* at 325–26.

135. Lacey, *supra* note 103, at 337–38.

136. Benson, *supra* note 83, at 90.

137. *Id.* at 91–92.

138. Neuman, *supra* note 84, at 269. Neuman notes that while the Pacific Northwest region may conjure images of lush green trees and precipitation, there are many areas within the Basin that require extensive irrigation to be agriculturally productive. *Id.* at 262–63.

139. Benson, *supra* note 83, at 91–94. For example, the dam on the Owyhee River was the highest dam in the world at the time it was constructed. *Id.* at 92.

Irrigation is the River's largest off-stream use, accounts for 80% of human withdrawals, and is changing the Basin's streamflows.¹⁴⁰ For example, east of the Cascade Mountains, dams are used to irrigate seven million acres of farmland.¹⁴¹ Relatedly, supplying drinking water consumes a smaller amount of water but has been expanding with the region's population growth.¹⁴² Massive diversions of water on this scale have environmental and political ramifications.

Federal funding encourages the growth of irrigation projects.¹⁴³ Throughout the Basin's history, the federal government has provided financing to develop agricultural resources.¹⁴⁴ However, not all irrigation projects come with federal financing; some are locally funded.¹⁴⁵

Prior appropriations guarantees conflict because irrigation and drinking water compete with other instream uses such as hydropower, flood protection, and restoring fish populations.¹⁴⁶ Agricultural interests staunchly opposed changes to water distribution, describing proposals as "fanatical."¹⁴⁷ At the same time, metropolitan water authorities argue that drinking water is a river's most important use.¹⁴⁸ States have policies that limit the number of new water use permits, but there is concern that if one state falls out of the prior appropriations regime, others may follow suit and create a race to the bottom, as more and more water is diverted out of the

140. *Id.*

141. Lacey, *supra* note 103, at 344.

142. Benson, *supra* note 83, at 92.

143. Professor Engelbert provides an in-depth discussion of the history of development, water, and federal power, particularly in the American West. Ernest A. Engelbert, *Federalism and Water Resources Development*, 22 LAW & CONTEMP. PROBS. 325, 328–30 (1957).

144. *Id.*

145. *Id.* at 329.

146. *See generally* Benson, *supra* note 83. Washington, Oregon, and Idaho felt they had to place a moratorium on new withdrawals after the salmon were listed as an endangered species. This policy was unpopular with agriculture stakeholders. *Id.* at 97.

147. *Id.* at 127–28.

148. For example, Los Angeles has had numerous legal issues involving Mono Lake. Ludwik A. Teclaff, *The River Basin Concept and Global Climate Change*, 8 PACE ENVTL. L. REV. 355, 361 (1991); *see, e.g.*, Cal. State Water Resources Control Bd., Water Right Decision D-1631 (Sept. 28, 1994), available at http://www.waterboards.ca.gov/publications_forms/publications/general/docs/monolake_wr_dec1631_a.pdf.

Basin for irrigation.¹⁴⁹ While few would argue that human usage is an unimportant consideration in a river's overall use, clearly it is not the only factor that the Treaty must consider.

C. Climate Change And The Columbia River Basin

Climate change will significantly impact the Basin. The IJC darkly described the future: “[T]he 21st century will bring potentially disruptive change in the environmental conditions of the U.S.-Canada boundary area. Old problems will intensify and new problems will appear.”¹⁵⁰ The Nobel Peace Prize winning United Nations Intergovernmental Panel on Climate Change (IPCC) concluded that human influences were causing the world's atmosphere to warm.¹⁵¹ The IPCC found global warming will disparately impact the Earth's climate.¹⁵² There is significant uncertainty about the Earth's exact rate of warming and the precise impact of climate change, but few believe this disproves the existence of global warming. Despite some limitations, technological advances and increased funding have helped scientists make predictions about the scale of a single river basin.¹⁵³ Some of the most important impacts that climate change will cause include:

drastically alter[ed] precipitation and streamflow regimes, . . . floods or drought or both in succession (e.g., floods

149. Benson, *supra* note 83, at 130. The number of water rights permits is staggering. Since 1860, 4000 of them have been issued in the Umatilla Basin of Oregon alone, of which 83% were for agriculture. Neuman, *supra* note 84, at 268.

150. *The IJC and the 21st Century*, *supra* note 33; see also BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, RECLAMATION, SECURE WATER ACT SECTION 9503(C)—RECLAMATION CLIMATE CHANGE AND WATER 18 (2011); Reed D. Benson, *Federal Water Law and the “Double Whammy”*: *How the Bureau of Reclamation Can Help the West Adapt to Drought and Climate Change*, 39 *ECOLOGY L.Q.* 1047 (2012).

151. *The IJC and the 21st Century*, *supra* note 33.

152. See generally WORKING GRP. II, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY (Martin Parry et al. eds., 2007). The National Assessment of Climate Change picked the Columbia River Basin as a representative area of study in the Pacific Northwest. Hamlet & Lettenmaier, *supra* note 15, at 1599.

153. Teclaff, *supra* note 148, at 385. Additional factors such as “population pressure, variability of water supply, increased demand for water, pollution, and conflicts of use” are changing our relationship with water resources. *Id.* at 373. Other authors have noted an increased demand for renewable energy is also having an impact. Cosens, *supra* note 22, at 229.

from unseasonably early snowmelt, followed by lower streamflow and faster evaporation as temperatures rise). Rising sea levels, one of the more readily calculable effects, would cause a loss of present coastal wetlands and river estuaries, as well as the contamination of fresh surface and ground waters through salt-water intrusion. Damage to watershed forests from climate stress could have impacts throughout an entire river basin, causing soil erosion and altering the amount, timing, and succession of flows downstream.¹⁵⁴

Climate models suggest one of the biggest impacts of climate change will be shifts in precipitation patterns. The Basin will have less snowfall in the winter and snowmelt will come faster in the spring.¹⁵⁵ The overall amount of water in the River will be reduced, but this may result in higher flows during the winter months with the source of water during the summer shifting from the United States to Canada.¹⁵⁶

These changes will have a profound effect on management of the Basin's water resources. One area of concern is the Basin's flood control measures.¹⁵⁷ Climate change will decrease the Basin's hydropower potential and force water managers to reevaluate the cost-to-benefit calculus for flood protection and hydropower production.¹⁵⁸ Hydropower production falls into two categories: firm power—the minimum that must be produced and delivered under

154. Teclaff, *supra* note 148, at 373 (footnote omitted).

155. Hamlet & Lettenmaier, *supra* note 15, at 1597, 1609. In a river fed by snowmelt, small temperature changes can result in large increases in runoff because of “reduced winter snow accumulation, earlier peak snowmelt, higher winter runoff and higher evapotranspiration” Payne et al., *supra* note 12, at 234. The impacts on the Basin are in line with climate change predictions around the world.

156. See Matthew S. Markoff & Alison C. Cullen, *Impact of Climate Change on Pacific Northwest Hydropower*, 87 CLIMATIC CHANGE 451 (2008). While there is uncertainty to climate modeling, specifically the interaction between climate change and events such as El Niño, experts believe that the science behind precipitation changes is reliable enough to be considered in the policy-making process. Hamlet & Lettenmaier, *supra* note 15, at 1615–18.

157. Payne et al., *supra* note 12, at 234.

158. *Id.* at 235 (noting the change in power generation will be most likely in the late summer and early autumn).

contract—and non-firm power—excess that can be sold.¹⁵⁹ Specifically, climate change is expected to result in less firm production potential in the summer and fall.¹⁶⁰ This causes less hydropower production and decreased revenues.

Climate change will also put increased strain on the River's anadromous fish populations,¹⁶¹ will increase the chance of drought, and increase irrigation.¹⁶² For the operating entities, this will create conflict between traditional uses such as hydropower production and flood control and new uses such as fish population recovery, irrigation, and drinking water.¹⁶³ During summer months, as the streamflow falls, managers may have to make choices between maintaining hydropower and having enough water to promote the recovery of fish stocks.¹⁶⁴ This strain will be acute because during summer, demands peak while streamflow is at its lowest.¹⁶⁵

D. The Evolution Of International Law

To understand the direction that changes to the Treaty should take, it is critical to also understand how the legal world has shifted. The Treaty has specific real world objectives, but also exists in a dynamic world of evolving international law. Just as uses for the River's water have changed, so has its legal context.¹⁶⁶ The River is hardly the only international river. There are over 260 transboundary watercourses

159. *See id.*

160. *Id.*

161. Hamlet & Lettenmaier, *supra* note 15, at 1597. In particular, the authors point out the case of salmon and the role the river plays for indigenous people. They also point out potential losses for the River's recreational uses. *Id.*

162. The 1992 drought cost the Bonneville Power Administration \$273 million. *Id.* at 1615. Different simulations predict a double to quadruple increase in the frequency of severe droughts. *Id.* There is a unique concern that prolonged droughts will stress an already-fragile system. *Id.*

163. Keeping the streamflow consistent with Environmental Protection Agency guidelines may require hydropower reduction by 10–20%. Payne et al., *supra* note 12, at 254. Changes to streamflow could also impact navigation. Hamlet & Lettenmaier, *supra* note 15, at 1622.

164. "Managers will be faced with the choice of either spring and summer releases for salmon runs, or summer and autumn hydroelectric power production." Zbigniew W. Kundzewicz et al., *Freshwater Resources and Their Management*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 152, at 193; Hamlet & Lettenmaier, *supra* note 15, at 1620.

165. Cosens, *supra* note 22, at 255.

166. A. Dan Tarlock, *How Well Can International Water Allocation Regimes Adapt to Global Climate Change?*, 15 J. LAND USE & ENVTL. L. 423, 432 (2000).

and a number of principles have emerged for their governance.¹⁶⁷ International water law is made up in part from treaties, such as the Columbia Treaty, as well as customary international law.¹⁶⁸ There are a number of principles for international water law that are already incorporated in the Treaty. International water law started from the prior appropriations system, but has evolved to include additional concepts such as equitable apportionment and basin-wide management.¹⁶⁹

1. Equitable Apportionment, No Significant Harm and Timely Notification

A bedrock principle of international water law is equitable apportionment, meaning all coriparian states have the right to the water.¹⁷⁰ This concept originally involved a water quota that governed how much water each country could receive in a year, but has evolved into a broader concept, governing how states share responsibility for the utilization of water.¹⁷¹ Two branches of equitable apportionment have emerged: “classic” and “shared benefits.”¹⁷²

Classic equitable apportionment was seen in older treaties, such as the 1929 treaty between Egypt and Great Britain (signing on behalf of its colony, Sudan), concerning the use of the Nile River.¹⁷³ Both states were entitled to a set amount of water they could take from the

167. Alex Grzybowski, Stephen C. McCaffrey & Richard K. Paisley, *Beyond International Water Law: Successfully Negotiating Mutual Gains Agreements for International Watercourses*, 22 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 139, 139–40 (2010).

168. *Id.* at 140.

169. Tarlock, *supra* note 166, at 430.

170. Tarlock & Wouters, *supra* note 77, at 526. As previously mentioned, the 1961 Columbia River Treaty may have been the first international treaty to incorporate this concept; it seems crucial that a future treaty include equitable apportionment before states ratify it. *Id.* at 527. It is worth noting that generally, this concept is meant to protect the downstream states from abuses by the upstream states. *See id.* In this case, the United States has more basin development, but is still in a weaker position.

171. Much of international water law is based on United States Supreme Court law, which applies the same principle to states that share a watercourse. *Id.* at 525.

172. *Id.* at 526–27.

173. Exchange of Notes between His Majesty’s Government in the United Kingdom and the Egyptian Government on the Use of Waters of the Nile for Irrigation, Egypt-U.K. art. III, May 7, 1929, 43 L.N.T.S. 93.

river, without restrictions on how that water could be used.¹⁷⁴ Shared-benefits equitable apportionment was first seen in the Columbia River Treaty.¹⁷⁵ In this type of equitable utilization, countries work together to use the river's water; countries that receive a larger benefit from the water compensate other countries.¹⁷⁶ This ensures a more efficient use of the river's water.

Equitable apportionment has limitations. By itself, it does not connect economic development to environmental costs. For example, the Treaty shares the benefits and costs of hydropower and flood control, but obviously neglects the cost of harming fish populations.¹⁷⁷ The goal of all agreements should be to “promote development, social equity, and environmental protection in a fair and sustainable manner . . . not simply to shift monetary resources within the basin.”¹⁷⁸ As more focus is placed on reconsidering the Columbia Treaty, this concept must be kept in mind.

Two other related principles of international water law are no “significant harm” and “timely notification.”¹⁷⁹ The concept of no significant harm applies to all pollution, but is commonly used in the context of shared water resources.¹⁸⁰ No significant harm means one state cannot impair water in a way that negatively affects downstream states. In the past, this focused on pollution, mainly from chemicals, but today, water impairment could include actions such as thermal pollution, which makes the water less suitable for fish and other aquatic species.¹⁸¹ In the context of the Basin, there are legitimate concerns that dams will increase the river's temperature and harm the development of young anadromous fish.

174. *Id.* (“Sudan may not take out more than 126 cubic metres per second before 1936 with the understanding that the periods set forth in the above article will remain unchanged until the stipulated figure of 126 cubic meters per second is reached.”).

175. Tarlock & Wouters, *supra* note 77, at 527.

176. *Id.* at 528.

177. *Id.* at 531.

178. *Id.* at 536.

179. Grzybowski, McCaffrey & Paisley, *supra* note 167, at 141.

180. *Id.* at 142.

181. *Id.*

The principle of “timely notification” mandates that a state notify others if it drafts plans to change the streamflow.¹⁸² This principle ensures the other basin states will have adequate warning and allows them to raise an objection, change their own use of the river, or work towards a satisfactory compromise, such as altering the plans for a new dam.¹⁸³ Just as the principles of equitable use and no significant harm have evolved over time, timely notification has evolved to include the idea that notification should be given for laws a state may pass that may impact coriparian states.¹⁸⁴ Even if the Treaty does not explicitly state this principle, it incorporates it by having provisions against the unilateral construction of waterworks on the River.¹⁸⁵

2. Basin-Wide Management

The final principle of international water law is basin-wide management.¹⁸⁶ River basins naturally function as a single ecological system—even though they can be enormously large with tributaries that branch in myriad directions.¹⁸⁷ Basin-wide management strives to reflect the natural state of the basin by rejecting plans that utilize each tributary independently or allow each country to push forward with development on its own.¹⁸⁸ Basin-wide management brings rewards for all stakeholders beyond what they could achieve on their own.¹⁸⁹

Over fifty years ago, United Nations Secretary General Dag Hammarskjöld noted that promoting the management of water through basin-wide development should be international law.¹⁹⁰ This

182. *Id.*

183. *Id.* at 143.

184. *Id.*

185. Grzybowski, McCaffrey & Paisley, *supra* note 167, at 149.

186. Teclaff, *supra* note 148, at 365. For a history of the evolution of modern water law, see generally Ludwik A. Teclaff, *Evolution of the River Basin Concept in National and International Water Law*, 36 NAT. RESOURCES J. 359 (1996).

187. Teclaff, *supra* note 148, at 355.

188. Professor Teclaff cites three reasons for this evolution: “1) improved technology in building concrete dams; 2) fear of the reckless depletion of many natural resources, including water; and 3) horrendous industrial pollution of rivers and lakes.” *Id.* at 356.

189. KRUTILLA, *supra* note 52, at 3.

190. Teclaff, *supra* note 148, at 366.

was reaffirmed by other international organizations and codified in the Helsinki Rules in 1966.¹⁹¹ Today, many international legal jurists consider basin-wide management part of customary international law.¹⁹²

Basin-wide management recognizes that countries that share a river are in a position of permanent physical dependence on each other.¹⁹³ Uneven development is not only a problem for downstream riparian states: development on any part of the river can affect the whole basin because of complex stream biology and ecology.¹⁹⁴ For example, a dam low on the Columbia could reduce anadromous fish populations much higher up. This change would impact species that feed on the fish as well as species the fish eat.

The Treaty has been described as trying to “reassemble under the umbrella of reciprocity and reason what in nature may have been divided by boundaries”¹⁹⁵ Many basins around the world use a transboundary water-management organization (TWMO) to facilitate the development of their rivers. These organizations help transcend nation-level conflict and move the parties towards a consensus on the use of their shared resource.¹⁹⁶

TWMO’s are designed to perform several functions: to develop and manage the water basin as a unit, without regard to international borders; to share the benefits of that development and management according to some agreed-upon formula; and to create a procedure for investigating and resolving inevitable disputes constructively.¹⁹⁷ Examples of these organizations and the countries that participate in them include the Amazon Cooperation Treaty Organization (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela), the Niger Basin Authority (Benin, Bukino Faso, Cameroon, Ivory Coast),

191. *Id.*

192. *Id.* at 365.

193. *Id.* at 366.

194. Modification downstream may have impacts on the water quality of the upstream tributaries. KRUTILLA, *supra* note 52, at 3.

195. CANADA, *supra* note 9, at 110–11.

196. Teclaff, *supra* note 148, at 365–68.

197. N. Kliot, D. Shmueli & U. Shamir, *Institutions for Management of Transboundary Water Resources: Their Nature, Characteristics and Shortcomings*, 3 WATER POL’Y 229, 244 (2001).

and the International Commission for the Protection of the Rhine (Germany, France, Luxembourg, the Netherlands, Switzerland).¹⁹⁸

The simplicity of basin-wide management poses specific challenges, including threats to transfer water out of the basin. For example, Canada threatened to transfer water that would go to the Libby Dam out of the basin during negotiation for the Treaty.¹⁹⁹

III. THE FUTURE OF THE COLUMBIA RIVER TREATY

The goal of the future Treaty should be to create a transboundary water-management organization, which would rely on public and scientific input to guide its development goals. This would be the most effective way to shift the Treaty from addressing only hydropower and flood control, to being flexible enough to manage newer uses such as fish populations, agricultural irrigation, and drinking water. This solution places the Treaty back in line with the mainstream of international law. As discussed, the Treaty exists at two levels. First, it is a contract between two countries with specific goals: reducing floods and improving hydropower production in the region.²⁰⁰ It has been hugely successful at achieving these goals. Hydropower production has been strong, and powerful floods like the one that destroyed Vanport, Oregon, no longer plague basin states. To implement these goals, the Treaty created an administrative structure,²⁰¹ which uses the Treaty as a blueprint to manage the Basin down to the day-to-day level through operating entities like the Bonneville Power Administration, and roadmaps like the Assured Operating Plan.²⁰² Second, the treaty is an instrument of international law, incorporating principles such as equitable apportionment, no

198. *Transboundary Water Management Organizations*, INT'L WATER L. PROJECT, http://internationalwaterlaw.org/institutions/transboundary_wmos.html (last visited Apr. 6, 2013).

199. Some out-of-basin transfers are large in scale. The North American Water and Power Alliance was proposed to combat drought conditions in Western North America, and included plans to transfer water from Alaska to Northern Mexico. Teclaff, *supra* note 148, at 359–62; Tarlock & Wouters, *supra* note 77, at 531.

200. Grzybowski, McCaffrey & Paisley, *supra* note 167, at 149.

201. *Id.* at 150.

202. *See id.*

significant harm, and timely notification. While it was progressive in 1961, the law surrounding international watercourses has continued to evolve.

A transboundary water-management organization could set new goals for the countries managing the river by implementing a basin-wide perspective on all the uses of the River's water. This TWMO would reflect current values by being receptive to input from citizens. It would also oversee the distribution of water rights while providing water managers the flexibility necessary to accommodate newer, environmentally and socially important uses, thereby bringing it back to the forefront of international water law.

A. A Transboundary Water Management Organization For The Columbia

The Treaty addresses issues that were important when it was drafted. A new treaty can include interests that are important today and remain open to accommodating future issues. By creating a TWMO the Treaty will incorporate a vehicle for additional flexibility. The transboundary water-management organization can identify and manage river-use goals such as saving fish populations, agricultural irrigation, and drinking water.

This proposed TWMO would be similar to the Great Lakes Commission, contained in the Great Lakes Basin Compact,²⁰³ and would embody the IJC's suggestion of an "ecosystem-based international watershed board."²⁰⁴ However, the TWMO would differ from the current Permanent Engineering Board by having power to set policy and oversee the management of water rights.

203. Tarlock, *supra* note 82, at 31.

204. *The IJC and the 21st Century*, *supra* note 33 ("These boards would be available for monitoring, alerting, studying, advising, facilitating and reporting on a range of transboundary environmental and water-related issues. They could also serve an ombudsman-like role by receiving, considering and investigating comments and complaints from the public about transboundary watershed environmental issues. Anticipating and responding to the growing public demand for decision-making that begins in communities and builds upward, these watershed boards would also assure coordination with the increasing number of local and regional transboundary relationships and institutions. The Commission would establish the boards at appropriate times, on a staged basis, following consultations with relevant federal, state, provincial, and other authorities as well as bilateral inter-governmental organizations, and after taking steps to identify relevant interests and issues in the watershed.").

The TWMO would reform the prior appropriations doctrine.²⁰⁵ Because this would be a basin-wide organization, it would avoid creating a basin full of different standards. A TWMO can address the issues such as “beneficial use[.]” by reframing them in light of modern ecology.²⁰⁶ For example, some states include uses that are in the “public interest” as beneficial uses. Groups looking to improve water flow for salmon needs typically use this route. However, these groups have found difficulty in making states follow these policies.²⁰⁷ In practice, those looking to pursue the public interest have been burdened by the states’ lack of transparency and have found that the public interest is an amorphous concept that varies between jurisdictions.²⁰⁸ These problems could be solved by a single, clear, inclusive, and modern definition of beneficial use.²⁰⁹

The TWMO would need to be a multi-jurisdictional organization to review new use permits.²¹⁰ Therefore, the TWMO would “engage other states and other governmental entities, including tribes and federal agencies” in the process of making water permitting decisions.²¹¹ This would address the earlier-discussed problems that arose from the current state-based, water-permitting system that exists under prior appropriations. States have failed to deal with the reality of climate change and problems associated with water shortages. For some uses, such as saving anadromous fish populations, the basin-wide, transboundary water-management organization is the only real solution because the current system leaves too many gaps in the implementation of programs designed to save them.²¹²

A TWMO could help current water users adapt through a number of methods, including “reallocation of existing uses: conservation;

205. Benson, *supra* note 83, at 122–23.

206. *See id.* at 119–20.

207. *Id.*

208. *Id.* at 120.

209. *Id.*

210. The Academy made other suggestions regarding the river, including water markets and conservation measures. *Id.* at 89–90.

211. Benson, *supra* note 83, at 133. There have been numerous management suggestions, such as encouraging basic conservation, the creation of a “water bank,” and market-based transfers. *Id.* at 102.

212. Tarlock, *supra* note 82, at 31.

temporarily forgoing a use; or, permanently foregoing a use.”²¹³ However, some users will be negatively affected as the amount of available water shrinks. This TWMO must strive for cooperation among all stakeholders. Mountains of litigation and the all-too-real conflict between federal, state, tribal, and nongovernmental interests are evidence of the animosity of different groups to what they perceive as a misuse of the Columbia’s water. By bringing in all stakeholders, a TWMO can become a place that “create[s] coordinated multiscalar action in which each actor provides its unique contribution.”²¹⁴ Increasing public input will also improve the difficulties that come from the prior appropriations system.²¹⁵ The TWMO’s flexibility will better adapt to the waters’ yearly and seasonal fluctuation.²¹⁶ One way that a TWMO can do this is by helping users change their consumption patterns.²¹⁷ To do this, the TWMO will need provide the public with greater access to information about their environment, which will help them make informed decisions about their needs.²¹⁸

A TWMO would improve the ability of river management to adapt during times of diminished water, rather than being bound by rules that dictate hydropower production and flood protection.²¹⁹ This

213. Tarlock, *supra* note 166, at 428.

214. Hari M. Osofsky, *Diagonal Federalism and Climate Change Implications for the Obama Administration*, 62 ALA. L. REV. 237, 285 (2011).

215. Benson, *supra* note 83, at 122–23.

216. *Id.* at 123.

217. Teclaff, *supra* note 148, at 383. The United States Army Corps of Engineers acknowledged the option, stating, “now we also recommend nonstructural solutions—measures that modify human behavior.” *Id.* at 386.

218. *Id.* at 387. This concept was made more clear by the 1998 UNECE Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters, June 25, 1998, 38 I.L.M. 517. It has been suggested that the need for environmental information may be a human right. Kravchenko describes the normative scope of this right:

Maximum disclosure and transparency of governmental files should exist; [a]ny exceptions for access to information should be narrowly drawn, with only limited and justifiable exemptions; [i]nformation should be provided free of charge or at reasonable cost; and [a]dministrative or judicial remedies for denial of access to information should be available.

Svitlana Kravchenko, *Is Access to Environmental Information a Fundamental Human Right?*, 11 OR. REV. INT’L L. 227, 228–29 (2009).

219. Cosens, *supra* note 22, at 231; *see generally* McKinney et al., *supra* note 1. Similar flexibility in mediation was instrumental not only in bringing all interested parties together, but also in crafting a successful solution in the case of the Umatilla Basin. Neuman, *supra* note 84, at 332.

organization would “document and discuss the effects of significant proposed new water withdrawals.”²²⁰ This added flexibility will also help provide a more sustainable framework for ecological and human needs.²²¹ Flexibility and adaption are the easiest and most cost-effective ways to deal with the oncoming period of water stress.²²²

The TWMO would help all proposed uses receive the level of coordination that helped successfully achieve the current goals of hydropower and flood control. One of the biggest problems identified during the National Academy of Sciences study was that hydropower was generally well-coordinated, whereas other water use decisions and projects were fragmented.²²³ This led to confusion about the status of water permits and the priority that should be given to uses such as fish management.²²⁴

Finally, a TWMO aligns with tenets of modern international water law.²²⁵ It is the vehicle by which basin-wide management could be realized.²²⁶ This entity would also uphold the international water law principles of equitable apportionment, no significant harm, and timely notification.²²⁷ When signed, the Treaty was a strong force in promoting international water law; a TWMO would keep it up to speed with this evolving area of law.

B. The TWMO Uses Public And Scientific Input To Guide Its Management

The current Treaty’s major drawback is that it was designed for only two goals. Both society and the environment demand reconsideration of those uses. To ensure that the Treaty and TWMO

220. Benson, *supra* note 83, at 109.

221. Cosens, *supra* note 22, at 237.

222. Tarlock, *supra* note 82, at 7–8.

223. COMM. ON WATER RES. MGMT., INSTREAM FLOWS, & SALMON SURVIVAL IN THE COLUMBIA RIVER BASIN, *supra* note 102, at 47, 50.

224. See Benson, *supra* note 83, at 112 (“This seemingly modest recommendation for regional review of individual permit applications is contrary to a basic assumption of water management in the West—that each state will make its own decisions about allocation of ‘its’ waters to serve its own interests.”).

225. Eve Vogel, *Regionalization and Democratization Through International Law: Intertwined Jurisdictions, Scales and Politics in the Columbia River Treaty*, 9 OR. REV. INT’L L. 337, 348 (2007).

226. *Id.* at 349.

227. Grzybowski, McCaffrey & Paisley, *supra* note 167, at 141.

stay current, it must be open to public and scientific input. This will help basin managers make the tough tradeoffs between hydropower or flood control and other uses.²²⁸

The IJC has recognized that citizens are a driving force for pushing governments to deal with politically risky issues.²²⁹ However, many Canadian and United States programs do not allow adequate citizen participation.²³⁰ There is limited citizen participation in international law, which is traditionally the domain of national governments.²³¹ For example, citizens do not generally have standing to bring an international environmental dispute against a government, unlike in trade and investment cases.²³² But the United States and Canada have recently worked closely together in the Great Lakes region to include more public participation, providing a template for the TWMO.²³³

Openness to public input must also include improving public access to the decision making process. Public access to information and the ability to comment is one of the most important parts of a future transboundary water-management organization. No issue is as important as the public's ability to provide input in river basin management.²³⁴ As former Secretary of the Interior Gale Norton said

228. Payne et al., *supra* note 12, at 254 (“The starkest result of this study is an evolving tradeoff between reservoir releases to maintain instream flows for fish, and hydropower production.”).

229. There are many reasons why governments have been reluctant to deal with environmental issues vis-à-vis other states. These include concerns about retaliation or the fear of establishing unfavorable precedent. The IJC noted that public involvement “drives the development of regulations, conduct of cleanup actions, implementation of preventive measures and changes in societal attitudes.” Hall, *supra* note 3227, at 132.

230. For example, while the Boundary Waters Treaty was a historical step forward for environmental treaties, it did not provide a forum for citizen participation. Similarly, the Trail Smelter arbitration, an early pollution case between the United States and Canada, was conducted by an ad hoc tribunal, and did not give a role to the average citizen affected by noxious, transboundary pollution. *Id.* at 137.

231. *Id.* at 131–32.

232. *Id.* There have long been calls for an international environmental court. However the process has run into problems ranging from confusion about the jurisdiction of the court, to resistance from potential member states. See generally RICHARD MACRORY & MICHAEL WOODS, MODERNISING ENVIRONMENTAL JUSTICE: REGULATION AND THE ROLE OF AN ENVIRONMENTAL TRIBUNAL (2003).

233. These include the Great Lakes Water Quality Agreement, which increased public involvement with the IJC; the Air Quality Agreement, which required the relevant implementing agencies be open to public comment; and the North American Agreement on Environmental Cooperation—a mechanism for public to submit complaints relating to the enforcement of environmental regulation. See generally *The IJC and the 21st Century*, *supra* note 33.

234. Teclaff, *supra* note 148, at 383. This will become even more important as the population grows and the issues become more complicated. *The IJC and the 21st Century*, *supra* note 33.

of the National Academy of Sciences, “its call for flexibility would represent . . . a truly fundamental shift.”²³⁵ The issue of public participation is even more pressing because of intense conflicts between stakeholders, and the “fragmented” structure created by the jurisdictions that the River cuts through.²³⁶ Opening avenues for input at all stages of the river management process is important.²³⁷ More than a mere forum must be available, there needs to be the use of “meaningful public comment” that guides and informs the choices made by the transboundary water-management organization.²³⁸ Bringing stakeholders in the Basin together will minimize the conflict inherent in these different interests.²³⁹

Similar to the public information issue is the need to consider more scientific information in the decision making process. This is acute because of reduced federal expenditures for science and environmental protection.²⁴⁰ Science does not hold all the answers to these complex social problems, but rather provides information on the range of possible results for different options. For example, scientists who work with climate change models point out that greater funding would help them design more detailed and accurate forecasts, which can help inform decisions made by policy makers.²⁴¹ From a more practical standpoint, better forecasts for the streamflows in the Basin will require that water managers use climate change forecasts, instead of relying on historical data that looks at the past “water supply, demand, values, and ecosystem health.”²⁴² For example, many of the forecasting tools that are in place for the

235. Benson, *supra* note 83, at 124.

236. *The IJC and the 21st Century*, *supra* note 33. This must be done in a “continuous, consistent, and integrative way to capitalize on accumulated knowledge, mutual understanding, and trust.” *Id.*

237. Vogel, *supra* note 225, at 373.

238. Cosens, *supra* note 22, at 241.

239. This is known by some as the “development of social capital.” *The IJC and the 21st Century*, *supra* note 33.

240. *Id.* at 22.

241. Scientists stress this does not invalidate their data, but also make clear more accurate data could be more helpful. Current predictions have been in line with past models. Hamlet & Lettenmaier, *supra* note 15, at 1622. Further, this should be no reason to delay action due to climate change: “[A]waiting final proof of cause and effect jeopardizes both current and future generations.” *The IJC and the 21st Century*, *supra* note 33.

242. Cosens, *supra* note 22, at 230.

Columbia Treaty do not take into account longer term, cyclical climatic events, such as El Niño.²⁴³ By incorporating a greater focus on current scientific findings on these issues, the TWMO will be in a better position mitigate future water shortages.

CONCLUSION

The Columbia River Basin Treaty was groundbreaking when it was drafted in 1961. It was a complex instrument that brought the mutual benefits from flood control and hydropower generation to both countries. However, since the time it was drafted, social values have shifted and the era of constantly available water is drawing to a close. While hydropower will remain an important use of the River's water in the future, other interests such as restoring fish populations, agricultural irrigation, and drinking water are becoming equally important. At the same time, international law now recognizes basin-wide management as an important principle. This creates a system for more efficient utilization of water, to the benefit of all countries involved.

There are significant obstacles to change. The prior appropriations system has created entrenched interests and has slowed water permitting for other uses. Newer uses of the River's water have suffered due to states' inability to transcend their own interests and work together in an effective way to address these issues.

The opportunity to update the Treaty is available as early as 2014.²⁴⁴ The instrument will need to include greater flexibility to enable it to adapt to today's new uses and to stay relevant into tomorrow. A transboundary water-management organization would be the most efficient way to utilize the areas' resources because it controls the permitting process and fulfills basin-wide management. This organization will bring together stakeholders from around the Basin, and will listen to input from the public and scientists; it will

243. Hamlet & Lettenmaier, *supra* note 15, at 1620.

244. Cosens, *supra* note 22, at 244.

guide its activities and help with the difficult task of allocating the scarce resource, water.

The next Columbia River Basin Treaty will need to be an astute document that brings together the many different stakeholders in the Basin. If it rises to the challenge, it will be a document that allows managers to quickly adapt to balance the needs of the River's many users. In the end, this will create a better Columbia River for everyone.