

# [***ARTICLE: Safeguarding International River Ecosystems in Times of Scarcity***](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:42FS-2W20-00C3-W0XP-00000-00&context=1516831)

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**Text**

**[\*232]** **I. INTRODUCTION: THE UNITED NATIONS CONVENTION ON THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES**

On May 21, 1997, the United Nations approved and opened for signature the Convention on the Law of the Non-Navigational Uses of International Watercourses ("Convention"). [[1]](#footnote-2)1 On one level, if the Convention ever comes into force and is adopted by the United States, it will not have a substantial impact on the use of our international bodies of water. [[2]](#footnote-3)2 Article 3 of the Convention provides that "nothing in the present Convention shall affect the rights or obligations of a watercourse State arising" from prior agreements; the article only expresses the hope that countries will "consider harmonizing" pre-existing treaties with the Convention. [[3]](#footnote-4)3 Thus, the Convention is subordinate to existing allocation treaties. Our shared waters with Canada and Mexico are subject to several well-developed treaty regimes. Separate treaties govern the Columbia, the ***Colorado***, and the Rio Grande ***Rivers*** between the United States and Canada or Mexico. The Boundary Waters Treaty of 1909 regulates the use of the Great Lakes, the Saint Lawrence ***River***, and other Canada-United States boundary waters and their tributaries. [[4]](#footnote-5)4

On another level, however, the Convention could have two significant impacts on existing treaty regimes. Like many international agreements, the principles of the Convention reflect established or emerging customary international law. Thus, the Convention may influence: (1) the interpretation of existing treaties [[5]](#footnote-6)5 and (2) the substance and structure of supplemental agreements to adjust to new uses. [[6]](#footnote-7)6

This article examines the possible influence of the Convention on the **[\*233]** United States' shared international ***rivers*** and lakes by focusing on the emerging relationship between international water law and the protection of riverine and coastal ecosystems through adaptive management regimes. This article accomplishes two things: (1) it places the relationship in the context of the worldwide debate regarding the function of watercourses; and (2) it uses the growing concern over the degradation of ***Colorado*** ***River*** Delta as a case study to explore the possible application of the Convention to an existing international water allocation regime.

**II. INTERNATIONAL WATER LAW: COMPETING VISIONS**

The Convention was adopted as the function of international water law expands and changes, reflecting two competing visions of water use: multiple-use and ecosystem conservation and management. The *grundnorm* of international water law posits that the use of international water bodies be shared among riparian and littoral states. [[7]](#footnote-8)7 A relatively sophisticated but undeveloped and untested international law regime is evolving to provide the ground rules for shared use. This emerging regime is a major restraint on selfish assertions of state sovereignty and a is positive step toward the peaceful settlement of water disputes. [[8]](#footnote-9)8 However, this regime makes two crucial assumptions that are increasingly at variance with the rapidly emerging concept of environmentally sustainable resource use and management which seeks to balance the maintenance of flows required to perform the necessary ecosystem services with the support of traditional consumptive and non-consumptive uses. [[9]](#footnote-10)9 International water use law assumes that international ***rivers*** will be used primarily for carry-over storage and consumptive use and that the major constraint on consumptive use is the duty not to cause substantial transboundary pollution. [[10]](#footnote-11)10

International water law currently plays a limited role in striking a balance between the two visions of multiple-use and ecosystem conservation and management for many reasons. The principle reason for the current limited use of international water law is that the allocation rules are so open-ended that, at best, international water law provides only a procedural framework for dispute resolution. [[11]](#footnote-12)11 The role of law in **[\*234]** international water allocation is inherently marginal [[12]](#footnote-13)12 because stronger incentives for nations to assert exclusive incompatible claims rather than to seek shared solutions often exist. In this environment, ecosystem integrity remains subordinate to optimum use. However, some signs indicate that environmentally based ***river*** management will increasingly become equally as important as mass allocations among riparian states. At a minimum, the Convention reinforces powerful changes in our perception of the function of ***river*** systems.

The dominant water use vision of the twentieth century sought to develop and manage large ***rivers*** to promote the "optimum" development of these systems. Under this vision, the flow of large ***river*** systems has been perceived as a natural resource or "commodity" which should be extensively developed to benefit those living in or outside the basin. [[13]](#footnote-14)13 Scientific conservation [[14]](#footnote-15)14 provides the basis for this vision, positing that the entire ***river*** system should be intensively developed and managed to maximize economic potential through large-scale, multiple-use projects. [[15]](#footnote-16)15

After World War II, the idea of multiple purpose regional water development was exported to the developing world, [[16]](#footnote-17)16 influencing international water law. The traditional vision of a ***river*** system as a commodity for use to the maximum extent possible remains the dominant vision worldwide. While the traditional vision is alive and well in the People's Republic of China and many other parts of the developing world, developed and developing countries increasingly question the traditional vision.

Scientific conservation provided the intellectual foundation for massive **[\*235]** worldwide, large-scale water development. However, it is now recognized that this development facilitated the destruction of the ecological integrity of many large ***river*** systems and their floodplains by allowing nations to alter the natural flow of ***rivers*** through dams, diversion systems, and flood control projects. Thus, in the past two decades, the law has reevaluated the benefits of multiple purpose development and we are now beginning to calculate the high social and environmental costs of maximum development. In brief, the argument is that many multiple-use projects represent an inefficient allocation of resources, cause environmental degradation, and are often socially inequitable. [[17]](#footnote-18)17

In the United States, the costs of multiple purpose development were primarily environmental and fiscal, although some Native American tribes suffered the loss of tribal lands. The emphasis on supply augmentation foreclosed the consideration of less environmentally destructive alternatives, such as water markets, demand management, [[18]](#footnote-19)18 and adaptive management, to meet demand. In the developing world, the costs are environmental, fiscal, and social. Foreign driven projects often have devastating impacts on local subsistence economies. [[19]](#footnote-20)19 Due to the international environmental and human rights movements, the idea that regional multiple purpose ***river*** projects will provide economic development has been challenged. Developing countries have opposed dam projects because they displace minority populations, inequitably distribute water, and often fail to deliver the promised economic benefits. [[20]](#footnote-21)20 For example, throughout the world, structural flood control measures are often self-defeating. Structural flood control measures destroy natural flood control landscapes such as wetlands and create a moral hazard. [[21]](#footnote-22)21 Dams, levees, flood insurance, and generous disaster relief programs inefficiently encourage people to assume the risks of floodplain development.

The process of "environmental accounting" has recently led to a more radical ecological ideal of the function of ***river*** systems and their floodplains. [[22]](#footnote-23)22 The newer ecological integrity vision is less clearly articulated than multiple-use because it rests on a more complex view of **[\*236]** the human role in the functioning of natural systems. [[23]](#footnote-24)23 The ecological integrity vision sees ***river*** systems as dynamic, ever-changing, functioning ecosystems which serve a variety of functions from the maintenance of consumptive uses to the maintenance of the historic natural "services" of ***rivers***. The new vision is not a simple ***river*** preservation concept because it will be realized, if at all, within the framework of environmentally sustainable use and development. [[24]](#footnote-25)24 ***River*** use must always accommodate a sustainable, non-wasteful level of consumptive use. [[25]](#footnote-26)25 International water law also potentially includes a justice component. In exercising their claimed international right to develop, individuals and defined groups may have a right to a minimum amount of non-polluted water for human consumption and sustainable development. [[26]](#footnote-27)26

The newer "***river***-as-ecosystem" concept starts with the premise that we must try to integrate human uses of a ***river*** system with the maintenance of natural environmental sustainability [[27]](#footnote-28)27 both in the design of new projects and in the re-engineering and operation of existing facilities. [[28]](#footnote-29)28 A recent, precedent setting report on Middle East water use concluded "maintaining and enhancing ecosystem goods and services is essential for the economic development and welfare" of the region especially over the "medium and longer terms." [[29]](#footnote-30)29 A prime example of ecosystem services is the maintenance of fresh/salt water balances in the deltas and estuaries of the great ***rivers*** of the world. The baseline, or norm, is the historic hydrographic of the ***river*** and the functions sustained by the flow of the ***river*** over time. [[30]](#footnote-31)30 These functions include the maintenance of natural systems, such as wetlands, and human economies. Consistent with this **[\*237]** analysis, Hungary, Croatia, and Yugoslavia have agreed to create a joint wetlands nature reserve where the Drava and Danube ***Rivers*** meet as "part of a broader effort to rethink the management of Europe's ***rivers*** . . . to return to a more natural approach." [[31]](#footnote-32)31 In addition, the flow cycle of the pre-Aswan Dam Nile ***River*** is the classic example of the ecological-social vision, [[32]](#footnote-33)32 while the post-dam ***river*** is a prime example of the commodity vision.

**III. THE JURISPRUDENCE OF EQUITABLE UTILIZATION**

Equitable utilization of shared, scarce resources is the fundamental principle of international water law. The concept is derived largely from United States water law and is designed primarily to promote fair development opportunities among all riparian states. However, recent international efforts to restate and reform international water law, by addressing existing and potential environmental degradation, have supplemented the objective of promoting fair development. The Convention remains primarily an allocation framework and is both progressive and regressive compared to other formulations of rules. The Convention attempts to incorporate more environmentally sensitive rules compared to past international water law principles. [[33]](#footnote-34)33 While this is a positive step, the additional principles that encourage aquatic ecosystem management must supplement the emerging allocation rules. Because the Convention incorporates a number of international environmental rules, it can be the starting point for the development of an international law of riverine ecosystem management.

A. THE UNITED STATES MODEL: ***RIVERS*** AS COMMODITIES

United States water law serves as the principal model for international water law. [[34]](#footnote-35)34 Interstate ***rivers*** vein throughout America and many interstate and inter-basin conflicts have arisen. In the United States' federal system, states cannot wage war on each other. [[35]](#footnote-36)35 Interstate disputes must be solved either by the exercise of the original jurisdiction of the United States Supreme Court, quasi-treaties, or congressional interstate compacts. [[36]](#footnote-37)36 **[\*238]** Principles of federalism and international law establish a rule of interstate entitlements. [[37]](#footnote-38)37 The principle of equitable apportionment between basins and states is the basis for interstate water law. [[38]](#footnote-39)38

Equitable apportionment is an adaptation of the two major legal systems in force in the United States: the common law of riparian rights and the doctrine of prior appropriation, which applies in the arid regions. [[39]](#footnote-40)39 United States water law can be explained as an effort to remove legal barriers to maximum or multiple-use and to allow the creation of individual, correlative property rights in water to the maximum extent possible. [[40]](#footnote-41)40 For example, in the Western United States, prior appropriation promotes multiple-use by recognizing a relatively firm property right to store and consume as much of the natural flow as possible and to use water outside the watershed. The powerful rule of prior appropriation developed on small streams to support hydraulic mining, but was projected on progressively large geographic scales. [[41]](#footnote-42)41

Equitable apportionment promoted multiple purpose development by projecting the principle that prior uses required protection unless compelling, competing considerations existed across state lines. This principle both protected vested rights and encouraged states to quantify their future claims through interstate compacts to enable federally financed regional water development. In the early twentieth century, the United States Supreme Court ("Court") adjudicated water use disputes across state lines pursuant to its original jurisdiction. Upstream withdrawals along the Arkansas ***River*** in ***Colorado*** reduced available supplies downstream in Kansas. [[42]](#footnote-43)42 In the Midwestern United States, the reversal of the flow of the Chicago ***River*** caused pollution to be discharged by the city of Chicago into the Mississippi ***River*** and triggered a lawsuit by Missouri. [[43]](#footnote-44)43 The state alleged that Chicago's discharge contributed to a typhoid epidemic in Saint Louis. [[44]](#footnote-45)44 The Missouri and Kansas lawsuits required the Court to develop a law of interstate water use. The result was the law of equitable **[\*239]** apportionment to resolve interstate conflicts. The Court initially looked to the classic rule of international law that all states have equal legal rights to fashion the principle of equitable apportionment [[45]](#footnote-46)45 because all riparian states are of equal dignity.

In the United States federal system, states are only quasi-sovereign. Thus, it was possible for the Court to hold that the use of common resources, such as interstate streams and groundwater basins, must be shared among ***co***-riparian states. Formally, the Court has developed a "flexible doctrine" for apportionment that balances the need to accommodate new uses with the protection of existing economies. [[46]](#footnote-47)46 The open-ended equitable apportionment formula applied by the Court purports to weigh the comparative merits of different ***river*** uses over a long period of time. In reality, the Court consistently has rewarded early development by protecting prior uses against subsequent uses. In 1982, the Court suggested that it would not protect an inefficient existing use to permit a new and more efficient use of the water when "reasonable conservation measures [by existing users] can offset the reduction in supply due to diversion." [[47]](#footnote-48)47 Two years later it recanted this heresy and preserved the priority of a small reclamation district, leaving open the possibility, however, that a new diversion could displace an existing one if the state made a strong showing that an immediate demand for a highly valued use existed. [[48]](#footnote-49)48

Unless states agree to an interstate compact that guarantees future shares to slower developing states, equitable apportionment often contributes to the degradation of large ***river*** systems by stimulating a race-to-develop. The bias against conservation and the displacement of inefficient uses makes protection of flow rates difficult. Thus, in prior appropriation states, equitable apportionment has not protected instream flows. Eastern, or "humid" states, better protect instream flows because the Court generally follows the law of the states in which the conflict arises. Thus, in common law or riparian rights states, the flow can be often protected if it is being "used." For example, the Court has protected the ecological integrity of the Great Lakes system by substantially limiting out of basin diversions to protect pre-existing navigation uses. [[49]](#footnote-50)49 The Court has also prevented diversions that might impair the waste assimilative capacities of a ***river***. [[50]](#footnote-51)50

The recent attempts to claim instream flows on the Platte ***River*** illustrate the resistance of the law of equitable apportionment to new management concepts. In the 1930s, the Court adjudicated rights to the North Platte ***River*** between Nebraska and Wyoming users. [[51]](#footnote-52)51 Nebraska reopened the decree in the 1980s to protest some new diversions by **[\*240]** Wyoming. [[52]](#footnote-53)52 The first decision in the reopened decree litigation did not address environmental issues. [[53]](#footnote-54)53 Fortunately, the Court's opinion does not preclude environmental management of the Platte; it only renders it less legally secure. The three basin states, ***Colorado***, Nebraska, and Wyoming, subsequently signed a Memorandum of Agreement with the Secretary of the Interior and developed a basin-wide wildlife protection plan resulting in the emergence of a multi-jurisdiction management regime which includes flow augmentation, foregoes new projects, and modifies existing projects to increase storage. [[54]](#footnote-55)54 However, the fact remains that no public or private entity can claim rights to a wildlife protection flow under the equitable apportionment doctrine. [[55]](#footnote-56)55

B. MODERN INTERNATIONAL WATER LAW: EQUALITY AMONG STATES AND BASINS

Modern international water law starts with the assumption that all states whose territories contribute to an international drainage basin have a right to an equitable share, which includes a right to a fair development opportunity of the waters of the basin. [[56]](#footnote-57)56 All nations must adjust their use to accommodate the needs of other states because sovereignty is not a basis to withhold resources from downstream states or to prevent upstream states from using their fair share of the resource. This remains the core--and only certain--principle of international water law.

The doctrine of equitable utilization participation is a rule of customary international law. [[57]](#footnote-58)57 The equitable utilization participation principle was adopted prior to the rise of the worldwide environmental movement in the late 1960s and has been reaffirmed in subsequent non-binding declarations such as the 1972 Stockholm Conference on the Human Environment ("1972 Stockholm Conference"), [[58]](#footnote-59)58 the 1977 World Water Conference in Mar del Plata, [[59]](#footnote-60)59 the 1992 United Nations Conference on Environment and Development in Rio de Janeiro ("Rio Declaration"), [[60]](#footnote-61)60 and most recently in **[\*241]** the Convention. [[61]](#footnote-62)61 Modern international water law rejects the idea that upper riparian states have an absolute right, by virtue of their territorial sovereignty, to water that originates in their boundaries. Modern international water law equally rejects the idea that lower states have an absolute servitude that entitles them to the natural flow of all ***rivers***. [[62]](#footnote-63)62 The United States asserted the former in the notorious Harmon Doctrine, [[63]](#footnote-64)63 but the subsequent state practice of recognizing the claims of Mexico to a share of the ***Colorado*** and Rio Grande ***Rivers***, [[64]](#footnote-65)64 and the long history of the shared use of international waters between Canada and the United States, have led to the conclusion that exclusive sovereignty was never a widely accepted state practice. [[65]](#footnote-66)65

International water law promotes development although it must accommodate two conflicting legal principles: equitable sharing and the exclusive right of each state to develop its resources to a greater degree than must occur in a federal system. [[66]](#footnote-67)66 Both principles ultimately lead to the protection of prior uses and the idea that the entire dependable flow of the ***river*** should be dedicated to consumptive uses. The tests to determine reasonable and equitable use change with different formulations, but all derive from the 1967 Helsinki Rules. [[67]](#footnote-68)67 The relevant factors to consider in determining what constitutes reasonable and equitable uses of the water include: geography; hydrology; climate; past utilization; population; the economic and social needs of the basin; and the availability of alternative sources of supply. [[68]](#footnote-69)68 In theory, the international standard gives somewhat less weight to pre-existing uses and more protection to environmental values and social equity compared to the United States doctrine. However, **[\*242]** flexibility is achieved at the cost of indeterminacy and the net result is that rapid, uncoordinated, multiple-use development is rewarded over environmental protection. [[69]](#footnote-70)69

C. THE GABCIKOVO-NAGYMAROS DAM DECISION

The role of international environmental and water law in protecting riverine ecosystems is underdeveloped but emerging. Little hard law exists despite the many declarations, sets of rules, principles, and the Convention. [[70]](#footnote-71)70 The International Court of Justice ("ICJ") illustrates in the Gabcikovo-Nagymaros dam decision, both the underdevelopment and emergence of hard law. [[71]](#footnote-72)71 In the Gabcikovo-Nagymaros decision, the ICJ affirmed the primacy of equitable apportionment and suggested that the doctrine can include an aquatic ecosystem conservation component, but rejected an ecosystem protection claim by a downstream riparian state. [[72]](#footnote-73)72 The opinion offers some hope that international environmental and water law will recognize that riparian states have a right to the protection of their riverine ecosystems from the actions of other states and that cooperation and shared management may be required to enjoy this right. The facts of the case were not ideal for the establishment of such a claim, but the foundation for future protection through adaptive aquatic ecosystem management can be found in both the majority opinion and especially in the Separate Opinion of Vice President Weeramantry. [[73]](#footnote-74)73

In 1997, the Gabcikovo-Nagymaros decision was ICJ's first major case that related to the allocation and environmental protection of an international ***river***, the Danube. The case grew out of a joint ***river*** basin investment treaty entitled the Treaty on the Construction and Operation of the Gabcikovo-Nagymaros Barrage System ("1977 Treaty"), signed on September 16, 1977. The 1977 Treaty was signed at the height of the Cold War between then Czechoslovakia and Hungary for the construction of the multiple purpose Gabcikovo-Nagymaros hydroelectric, navigation improvement, and flood control lock and dam project on the Danube between Bratislava and Budapest. [[74]](#footnote-75)74 The project consisted of two series of interconnected locks, each in the territory of one state, a dam in the joint territory (the Gabcikovo dam), and another dam downstream solely in **[\*243]** Hungary (the Nagymaros dam). [[75]](#footnote-76)75 Article 14 of the 1977 Treaty provided that the two countries would agree to the establishment of a Danube water balance between the two dams "unless natural conditions or other circumstances temporarily require a greater or smaller discharge" to insure that the contemplated Gabcikovo bypass canal and hydroelectric plant to be built in Czechoslovakian territory did not impair the flow of the Danube for navigation. [[76]](#footnote-77)76

During the 1980s, the project became controversial in Hungary for economic and environmental reasons. [[77]](#footnote-78)77 By the spring of 1989, the Gabcikovo dam was eighty-five percent complete and the bypass canal was between sixty and ninety-five percent complete; Hungary, however, had only constructed the coffer dam for its promised downstream Nagymaros dam in the Danube bend. [[78]](#footnote-79)78 After growing concerns about the economic feasibility of the project and unresolved environmental risks, Hungary unilaterally suspended work on the project in 1989 and suspended the 1977 Treaty as a "mistake" after breaking away from the then-Soviet Union in 1990. [[79]](#footnote-80)79 Hungary justified the suspension of the 1977 Treaty as an "ecological state of necessity." [[80]](#footnote-81)80 The possible ecological risks raised by Hungary included the replacement of Danube groundwater flow with stagnant upstream reservoir water, the silting of the Danube, eutrophication, and the threat to aquatic habitats from peaking power releases. [[81]](#footnote-82)81 The newly-established Slovakia continued to implement an alternative solution, formulated by Czechoslovakia prior to the 1993 division of the two countries, which involved a dam and diversion solely on her territory. [[82]](#footnote-83)82 Hungary unilaterally terminated the 1977 Treaty in 1992. [[83]](#footnote-84)83

The ICJ decided the respective states' rights under the 1977 Treaty and did not directly apportion the flow of the Danube. [[84]](#footnote-85)84 To justify termination, Hungary invoked a number of familiar contract defenses, including impossibility and changed circumstances, and asserted that the emerging precautionary principle imposed "an *erga omnes* obligation of prevention of damage. . . ." and thus precluded her continued performance of the treaty. [[85]](#footnote-86)85 To defend suspension of the 1977 Treaty, Hungary invoked Article 33 of the *International Law Commission Draft Articles on the International Responsibility of States*, which allows a state to avoid an international obligation when so doing is the only means to "safeguard . . an essential interest of the State against a grave and imminent peril." [[86]](#footnote-87)86 In a **[\*244]** significant expansion of the concept of state necessity, the ICJ agreed that the environmental risks related to an essential state interest. [[87]](#footnote-88)87 However, the ICJ rejected some of the broader proposed readings of the precautionary principle and interpreted Article 33 to require "that a real 'grave' and 'imminent peril' existed in 1989 and that the measures" of the state were "the only possible response." [[88]](#footnote-89)88 Article 33 embodies a limited precautionary principle, but to invoke it a state must demonstrate by credible scientific evidence that a real risk will materialize in the near future and is thus more than a possibility. [[89]](#footnote-90)89 The ICJ found that Hungary's evidence of risk and the possible range of alternatives did not meet the standards of Article 33. [[90]](#footnote-91)90

Hungary also argued that the rejection of the 1977 Treaty was justified by changed environmental and political circumstances, but neither was found sufficient to justify non-performance of the treaty. [[91]](#footnote-92)91 By a fourteen to one vote, the ICJ concluded that the 1977 Treaty created a territorial regime on the reach of the Danube that was unaffected by the break up of the former Czechoslovakia. [[92]](#footnote-93)92 The ICJ rejected Hungary's environmentally changed conditions defense because the possibility that subsequent environmental information would require a modification of the project was not completely unforeseen in 1977 and did not preclude a mutual adjustment by the two countries. [[93]](#footnote-94)93 The ICJ deemed environmental risks not to be the kind of exceptional circumstances that require a court to disturb the principle of *pacta sunt servanta*. [[94]](#footnote-95)94 Thus, the 1977 Treaty regime remained in place. However, the ICJ acknowledged that changed environmental conditions might effect the operation of a project. [[95]](#footnote-96)95 Thus, new knowledge of ecological risk may impose a duty on parties to a complex ***river*** basin development treaty to consider the information in the ongoing implementation of the treaty and management of the ***river***.

Slovakia was unable to convince the ICJ to order Hungary to complete the project because Slovakia had also breached the 1977 Treaty through its unilateral diversion which violated the doctrine of equitable apportionment and the doctrine that self-help must be proportional to a suffered injury. [[96]](#footnote-97)96 **[\*245]** The ICJ first held that Slovakia's alternative, which temporarily diverted ninety percent of the flow of the Danube, violated the 1977 Treaty regime because it contemplated joint, not unilateral, actions. [[97]](#footnote-98)97 Thus, Slovakia could not justify its unilateral actions as mitigating damages because "an injured State which has failed to take the necessary measures to limit damage sustained would not be entitled to claim compensation for that damage which could have been avoided." [[98]](#footnote-99)98 Under customary international water law, Slovakia's territorial alternative was an illegal diversion because she deprived "Hungary of its right to an equitable and reasonable share of the natural resources of the Danube . . ." [[99]](#footnote-100)99 In the end, the ICJ voted thirteen to two that the two states must undertake good faith negotiations consistent with both international environmental norms such as sustainable development [[100]](#footnote-101)100 and the law of international water courses to develop a new management scheme in the context of the already constructed projects in Slovakia. [[101]](#footnote-102)101

The ICJ's opinion, limited as it is, firmly establishes that international ***rivers*** are shared resources subject to the principle of equitable apportionment and that all riparian states have equal rights to enjoy both the commodity and non-commodity ecological benefits of the ***river***, hydrologically connected groundwater, and the riparian corridors. For this reason, the Gabcikovo-Nagymaros dam decision is an extremely important international and environmental protection precedent because the opinion integrates the merging norms of international environmental protection and the law of international watercourses into the law of treaties and water management, clearly establishing that the doctrine of equitable apportionment is the *grundnorm* of international water law. The case: (1) confirms that multiple purpose ***river*** basin development treaties may establish a continuing (and environmentally sensitive) management regime that cannot be unilaterally abrogated; (2) recognizes that sustainable development and ecological risk assessment may be incorporated into the customary rules of international water law; and (3) holds that these customary rules can apply to treaties negotiated prior to the recognition of these emerging norms.

Vice President Weeramantry of Sri Lanka, issued a separate opinion that adopts the interrelated principles of environmentally sustainable development and cautionary environmental assessment and management as *erga omnes* customary rules. [[102]](#footnote-103)102 After an extensive survey of the **[\*246]** emergence of international environmental law and the Asian history of balancing resource use and nature protection, he concluded that among the principles

which may be extracted from the systems already referred to are such far-reaching principles as the principle of trusteeship of earth resources, the principle of intergenerational rights and the principle that development and environmental conservation must go hand in hand. Land is to be respected as having a vitality of its own and being integrally linked to the welfare of the community. . . . Sustainable development is thus not merely a principle of modern international law. It is one of the most ancient ideas in the human heritage. Fortified from the insights that can be gained from millennia of human experience, it has an important role to play in the service of international law. [[103]](#footnote-104)103

**IV. THE INCOMPLETE INCORPORATION OF ENVIRONMENTAL PROTECTION DUTIES INTO INTERNATIONAL WATER LAW**

While equitable utilization is a sound principle of international law, considerable tension exists between the concept and sustainable aquatic ecosystem protection and management. Equitable utilization was part of international law before the concept of international environmental law began to coalesce in the 1970s after the 1972 Stockholm Conference and environmentalists viewed the doctrine with some distrust because it seems to allow "reasonable environmental degradation." [[104]](#footnote-105)104 This distrust reflects the inevitable tension between protecting and using nature. All international efforts to promote environmental protection exist in the context of the right to develop--vigorously championed by developing countries [[105]](#footnote-106)105 --and the background principle of water law which has never **[\*247]** been preservation of the natural hydrologic regime. Perhaps for these reasons, the Rio Declaration does not directly mention equitable utilization; however, the Rio Declaration and preparatory conference documents **[\*248]** incorporate the basic ideas of equitable apportionment. [[106]](#footnote-107)106 Principle 2 reaffirms both the right to exploit sovereign resources and the duty to avoid damage to the environment of other states. [[107]](#footnote-108)107 This is reinforced in Principles 17 and 19 which mandate international environmental assessments and require that a state undertaking an activity "that may have a significant adverse transboundary environmental effect" notify potentially affected states and consult with them "at an early stage and in good faith." [[108]](#footnote-109)108 Preparatory documents reaffirm the importance of shared use of transboundary resources. [[109]](#footnote-110)109 This section of the article examines three examples of the tension between equitable utilization and sustainable aquatic ecosystem protection and management.

A. GLOBAL CLIMATE CHANGE: LIMITED BARRIERS TO ADAPTATION

Projected changes in the global climate from carbon dioxide ("***CO***[2]") emissions create additional stresses for international water allocation regimes and dependent ecosystems. After a period of retreat from the extreme predictions of the 1980s, the scientific community seems to be coalescing around the view that the problem *is* a serious one, [[110]](#footnote-111)110 although this view is much contested. If changes occur, existing allocation regimes will face challenges because they are premised on the availability of a guaranteed supply of water or the average annual flow augmented by carry-over storage. [[111]](#footnote-112)111 If droughts and increased evaporation occur, the available water from international ***rivers*** will be consistently less than the parties to the allocation regimes originally expected and existing allocation regimes have no mechanisms to adjust to these changed conditions. [[112]](#footnote-113)112 Many "experts" have suggested that increased reliance on markets or existing allocation regimes can mitigate the projected effects of global climate change. [[113]](#footnote-114)113 However, international water allocation is a prime example of **[\*249]** the lack of adaptation mechanisms in existing allocation institutions and the fact that adaptation solutions remain untested and problematic.

International ***river*** agreements are often negotiated so that a dam can be built accompanied by the expectation that any shortages will be short-term and mitigated by the carry-over storage of the reservoir. The resulting treaties often provide only for temporary reallocations and contain no mechanism to address long term declines in expected available supply. For example, the 1959 Nile Waters Agreement allocates a fixed amount of water to Egypt and the Sudan, but does not bind the other basin states and provides only a weak mechanism for short-term drought relief. [[114]](#footnote-115)114 The Mexican-United States Treaty ("1944 Water Treaty"), which allocates the ***Colorado*** ***River*** between the two countries, provides that the United States need not fulfill its delivery duty in extraordinary drought. [[115]](#footnote-116)115 Because it is not clear that this would apply to global warming, Mexico is not guaranteed a clear entitlement if long term supplies decline. If the normal drought mechanisms are used, the resulting allocations may be widely perceived as inefficient and unfair and will not be followed. Water marketing may be possible but will be difficult between sovereign nations. [[116]](#footnote-117)116 In short, adaptation is not a realistic option when an allocation regime lacks mechanisms to deal with changed conditions. [[117]](#footnote-118)117

B. THE PRIORITY OF DEVELOPMENT OVER ENVIRONMENTAL PROTECTION

The core idea of equal development opportunity is at the heart of the Convention. Thus, equal development will be the basis for the argument that development has priority over aquatic ecosystem protection. The innovations of the Convention are commendable, but the fact remains that the protection of a ***river*** system's ecological integrity remains secondary to the promotion of development. Specifically, the Convention makes it difficult to promote the protection of the ecological integrity of ***river*** systems for two principal reasons. First, the new rules largely exclude floodplain and wetland protection and focus almost exclusively on pollution prevention. Second, ***rivers*** are still not viewed as ecosystems.

Article 5 of the Convention enjoins states to use watercourses in an "equitable and reasonable manner." [[118]](#footnote-119)118 The next sentence reinforces the **[\*250]** idea that development is primary and environmental protection is secondary stating that, "in particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse." [[119]](#footnote-120)119 Article 6 follows Article 5 and lists seven non-weighted factors relevant to the determination of what is equitable and reasonable. [[120]](#footnote-121)120 While the factors are the subject of extensive debate, the important point is that they promote development by either protecting existing development or facilitating new development. For example, Article 6(e) rewards states that develop first because existing uses are a relevant factor. [[121]](#footnote-122)121 Slower developing states are equally encouraged to develop by the ability to show a "social and economic need" for the water, recognition of the value of "potential" as well as existing uses, and the ability to argue the comparative efficiency of different water uses, although this is a high burden to sustain. [[122]](#footnote-123)122

1. Pollution: A Use to be Tolerated or Mitigated

The reporters of the Convention were sensitive to the tension between development and environmental protection. The reporters tried to mitigate this tension, one of the most difficult problems the drafters of the Convention faced. [[123]](#footnote-124)123 The final version of the Convention incorporates some elements of the idea of ecosystem protection into multiple-use development, but the integration is incomplete and the Convention still promotes the continuation of this problem [[124]](#footnote-125)124 because pollution prevention and ecosystem degradation remain subordinate to use. Pollution reduction and prevention is an important component of ecosystem protection, as illustrated by the joint Canada-United States Great Lakes pollution control strategy. [[125]](#footnote-126)125 However, the focus on pollution can be too narrow because it ignores more subtle threats to ecosystems from diversions, barriers, and land use practices. Modern environmentally sensitive legal regimes try to correct this problem by mandating or encouraging long-term, monitored, adaptive ecosystem management, but the concept remains vague, controversial, [[126]](#footnote-127)126 and very difficult and costly to integrate into existing ***river*** **[\*251]** management regimes. International rules adopt the view that adverse environmental impacts are an inevitable consequence of development that can often be mitigated rather than prevented.

Article 7 initially enjoined states to use water "in such a way as not to cause appreciable harm to other watercourse states," but two objections surfaced that led to a major revision. [[127]](#footnote-128)127 Proponents of multiple-use development criticized the Article 7 standard as a departure form the common understanding of equitable apportionment because it subordinates development to environmental quality. [[128]](#footnote-129)128 Environmentalists made the opposite criticism that the section does add a new environmental protection dimension, but does not prohibit all harm, rather only harm "capable of being established by objective evidence;" thus, it does not include the crucial concept of risk prevention. [[129]](#footnote-130)129 The basic solution, proposed by the last reporter, was to subordinate the duty to prevent pollution to the right of equitable utilization, but to create a flexible process to resolve disputes. Article 7 was redrafted to impose a duty on states and create a process not to cause significant pollution, subject to an extraordinary circumstances exception.

Watercourse States shall exercise due diligence to utilize an international watercourse in such a way as not to cause significant harm to other water course states, absent their agreement, except as may be allowable under an equitable and reasonable use of the watercourse. A use which causes significant harm in the form of pollution shall be presumed to be an inequitable and unreasonable use unless there is: (a) a clear showing of special circumstances indicating a compelling need for ad hoc adjustment; and (b) the absence of any imminent threat to human health and safety. [[130]](#footnote-131)130

The final version of Section 7 was changed in the United Nations prior to adoption and accords equitable utilization a strong preference over the no-harm doctrine. [[131]](#footnote-132)131 Section 7 is a victory for slower developing upstream states [[132]](#footnote-133)132 and provides:

1. Watercourse states shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse states.

2. Where significant harm nevertheless is caused to another watercourse state, the State whose use causes such harm shall, in the absence of an agreement to such use, take all appropriate measures, having due regard **[\*252]** for the provisions of articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation. [[133]](#footnote-134)133

Compared to prior formulations of equitable apportionment, the Convention is a step forward because it places more emphasis on conservation and alternatives. [[134]](#footnote-135)134 Article 6(a) requires the consideration of "geographic, hydrographic, hydrological, climatic, *ecological* and other factors of a natural character," and (g) makes available alternatives of "comparable" value to a planned use relevant in deciding whether a use is equitable and reasonable. [[135]](#footnote-136)135 Unlike United States law, [[136]](#footnote-137)136 Article 6(f) makes "conservation, protection, development and the economy of use of the water resources" a relevant factor to take into account in determining whether a use is reasonable and equitable. [[137]](#footnote-138)137

2. The Isolation of ***River*** Corridors from the Water: ***Rivers*** Are Canals Not Ecosystems

International water law remains a channel--not watershed or ecosystem-based--legal regime. This focus is inherently biased toward development and against ecosystem protection. The Convention applies to international watercourses not ***river*** systems. The Convention defines the term "watercourse" as "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and naturally flowing into a common terminus." [[138]](#footnote-139)138 The definition is progressive because it includes connected groundwater and recognizes that groundwater depletion is a major cause of stream and riverine ecosystem degradation but land in watersheds and confined aquifers probably remain separate from the rules. Thus, management initiatives can exclude necessary land management options so the definition can be fairly characterized as narrow. [[139]](#footnote-140)139

Ultimately, the definition is a step-backward from previous definitions of international ***river*** systems. More generally, domestic and international legal regimes maintain a persistent but artificial separation of ***rivers*** from the floodplains [[140]](#footnote-141)140 and wetlands. Thus, this separation influences domestic **[\*253]** and international legal regimes (and which they influence) to prevent water use rules--premised on the need to share a common resource--from becoming a basis for land use regulation. Further, under some interpretations of equitable apportionment, traditional practices such as the use of flood waters for irrigation may be inefficient and impose a duty on a riparian state to conserve water for the benefit of downstream states. Waste counts against a state in the balancing test, and conservation has traditionally meant that water should be efficiently consumed.

The Convention, however, does contain several innovative new environmental protection rules. For example, Article 20 requires that states protect the ecosystems of international watercourses, and Article 22 requires a state to "take all measures necessary to prevent the introduction of species, alien or new" into a ***river*** system if the species "may have effects detrimental to the ecosystem of the watercourse." [[141]](#footnote-142)141 This standard originates from the objections that Canada lodged against the United States Garrison Diversion Unit in North Dakota. [[142]](#footnote-143)142

The current risks faced by the Upper San Pedro ***River*** illustrate the need to view international ***rivers*** as integrated ground and surface water systems with broad corridor ecosystems. On the Upper San Pedro, a small ***river*** that flows north from the state of Sonora, Mexico into Arizona where it joins the Gila ***River***, downstream groundwater depletion may destroy the largest surviving expanse of broadleaf riparian forest in the region. [[143]](#footnote-144)143 "Pumping reduces the flow of the ***river*** and consequently adversely affects riparian vegetation" [[144]](#footnote-145)144 unless the perennial flows in the Upper San Pedro Basin can be sustained. In 1998, Congress created the San Pedro National Conservation Area made up, in part, of retired farmland and water rights on the upper reaches of the United States portion of the ***river***. However, this effort will not preserve the corridor. The only viable solution recommended by an expert study commissioned by the Council on Environmental Cooperation was to extend the protected area to straddle the Mexican-United States border. [[145]](#footnote-146)145 It is possible to re-establish high quality riparian habitat in Mexico by redistributing United States pumping and retiring irrigated agriculture and grazing. The solution will not be easy. The solution options include actually reversing the urban and agricultural **[\*254]** growth in the region [[146]](#footnote-147)146 through land retirement and the acquisition of conservation easements to prevent the potential expansion of irrigated agriculture.

3. Preservation of the Flow of ***Rivers*** for Ecosystem Maintenance is Problematic

General duties to protect ecosystems will not be effective because downstream states lack effective control of both the rate and quality of the flow of international ***rivers*** under international water law. Upstream states do not need to seek the consent of downstream states to make a diversion because they have a right to a fair share of the ***river***. In short, international law does not provide a natural flow rule. [[147]](#footnote-148)147 The material injury rule, which is at the heart of equitable apportionment, allows upstream states to progressively use water, which creates the risk of environmental damage, but not legally cognizable damage. For example, upstream diversions may generally increase the salinity of ***rivers*** by allowing salt water to migrate upstream. In addition, pollution is often limited to serious and identifiable pollution rather than less visible, cumulative impacts from environmentally destructive watershed land use practices. The presumed remedy is *post hoc* mitigation rather than prevention. [[148]](#footnote-149)148

Flow control is limited because the rules appear to adopt the conventional, narrow definition of harm as a demonstrated injury. The rules do not include any concept of future environmental risk, making it difficult to prevent harm. The controversy over the proposed Windy Craggy mine on the Tatshenshini ***River*** in British Columbia, Canada, which is upstream from two national parks in Alaska and one in Canada, illustrates the limits of a simple harm prevention standard and the need for the inclusion of risk analysis and prevention in international water law. In 1988, the Geddes Resources, a mining company, applied to the government of British Columbia to open a copper mine on the ***river***. [[149]](#footnote-150)149 Intense environmental opposition to the mine arose from the risk of long term acid drainage and consequent damage to salmon fisheries, which led British Columbia to scrub the mining plan and to preserve the Tatshenshini as a UNESCO World Heritage Site. [[150]](#footnote-151)150

Windy Craggy illustrates the potential value of applying the principles of international water law to resolving international water controversies. The Windy Craggy controversy also suggests that there are ways in which **[\*255]** international water law could be made more useful to decision-makers. Among the limitations to existing international water law is its inability to deal with situations where risk of international water pollution is the issue. A partial solution might be to extend international water law to include a principle of informed negotiated consent that would build on the foundation set by the principle of equitable utilization and reasonable use in the Helsinki Rules and help to meld the Helsinki Rules to the ILC Draft Rules. [[151]](#footnote-152)151

Finally, flow protection requires continuous management. However, the rules do not promote management because they assume that mitigation is a single, final solution. Article 17 requires that a notifying state negotiate with a potential victim state if the proposed use will be inequitable. [[152]](#footnote-153)152 The purpose of the negotiation is to arrive at "an equitable resolution of the situation." [[153]](#footnote-154)153 An adaptive management regime could be an equitable resolution of many conflicts, but the resolution connotes a final mitigation solution. As discussed in the next section, environmentally sustainable use requires the development of continuous management regimes rather than on time, often poorly implemented and assessed mitigation solutions.

**V. THE ELEMENTS OF A MANAGEMENT REGIME**

A. THE LEGAL BASIS OF SHARED MANAGEMENT

The future of international ***river*** basin use will be increasingly based on the environmentally sustainable management of the total system. Existing facilities may have to be re-engineered and re-operated to simulate pre-dam flows to promote sustainable ***river*** and ***river*** corridor uses. New facilities will be subject to more stringent flow maintenance and monitoring conditions and will incorporate the ability to respond more flexibly to environmental problems. Environmental sustainable use and management recognizes that most artificial systems are permanent landscape features, but seeks to use adaptive management to achieve use patterns that start from the assumption that the historic hydrographic of the ***river*** becomes the norm, and inconsistent uses the exception.

The shared use principle of international water law can incorporate the idea of ecosystem protection and management because both international water and environmental law rest on the law of state responsibility for transboundary harm. [[154]](#footnote-155)154 The law is evolving toward the recognition of more permanent ecological risk protection duties beyond the foundation principle that states have a duty not to allow state agencies and private parties, **[\*256]** subject to the state's regulatory jurisdiction, [[155]](#footnote-156)155 to use their territories in a manner that causes substantial harm to other states and their nationals. [[156]](#footnote-157)156 The basic duty seems firmly grounded in modern international practice, [[157]](#footnote-158)157 but the actual deterrence effect of the rule is minimal. To complicate matters, no consensus exists as to the scope of the duty and the standard of liability. [[158]](#footnote-159)158 For example, liability rules exist for environmental damage resulting from inequitable uses of water, [[159]](#footnote-160)159 but no broad recognized right of compensation for general environmental degradation exists in the absence of demonstrable injury to specific consumptive and non-consumptive uses. [[160]](#footnote-161)160 Moreover, a *post hoc* duty to compensate is, in and of itself, an inadequate incentive for states to engage in meaningful cooperation, sharing, and environmental management. [[161]](#footnote-162)161

**[\*257]** The idea of shared resource management, as opposed to use, is a less developed international law principle. Yet, shared resource management is a logical extension of the duties to inform and consult as well as a liberal reading of the law of state responsibility for transboundary damage. These duties are intended to facilitate mitigation of adverse environmental impacts. Mitigation is expanding from a single and final action to on-going management. International environmental law principles developed since the 1972 Stockholm Conference have influenced the progressive expansion of international water law to include cooperation and prevention duties. The Convention incorporates four primary harm prevention duties when states exercise their sovereign right to develop their water resources. States have a corollary duty to inform, consult, engage in good faith negotiations, and to repair or compensate for any damages caused by the inequitable use of water. [[162]](#footnote-163)162 However, only a breach of the duty to compensate is universally considered wrongful and the remaining duties are relatively weak. For example, the duty to inform was dropped from the 1972 Stockholm Conference resolution at the insistence of Brazil, although this defect was cured by Principle 19 of the Rio Declaration which includes a good faith duty to consult at the early stages of a project. [[163]](#footnote-164)163

A widely recognized duty of consultation on international ***rivers*** exists, [[164]](#footnote-165)164 although many nations continue to object to the principle and refuse to consult. [[165]](#footnote-166)165 The duty to inform does not include the duty to forego. The Convention includes a duty to notify, [[166]](#footnote-167)166 exchange information, and consult with other riparian states about the possible effects of planned activities. [[167]](#footnote-168)167 A potential victim state has "six months within which to study and evaluate the possible effects" [[168]](#footnote-169)168 and the notifying state must supply "any additional data and information that is available and necessary for an accurate evaluation" of the activity. [[169]](#footnote-170)169

Management duties can also be derived from the emerging precautionary principle [[170]](#footnote-171)170 which posits that states have the power, if not the **[\*258]** duty, [[171]](#footnote-172)171 to prevent serious risks from materializing in the absence of provable environmental harm, if evidence of significant environmental risks exists. While the principle is still vague, [[172]](#footnote-173)172 it probably includes a duty to avoid foreseeable, significant risks, although issues regarding the burden of proof remain unresolved. [[173]](#footnote-174)173 The precautionary principle both reinforces and expands the duties to consult and inform. Precaution projects the substitution of risk for provable harm that underlies United States and European toxic pollutant regulation, as an international duty among states and *erga omnes*. [[174]](#footnote-175)174

Precaution is a logical response to a science-based legal regime such as international environmental law. [[175]](#footnote-176)175 As the international response to ozone depletion illustrates, the precautionary principle works best when two factors reinforce each other. First, the risks of the activity must be sufficiently understandable and severe to pose political liabilities on governments that ignore them. Second, as has been the case with ozone but less so in global climate change, subsequent science must confirm the seriousness of the identified risk. The usual remedy is to prevent or limit the use of substances that pose environmental risks, but adaptive management with feedback mechanisms is an equally possible application of the precautionary principle. Precaution and the emerging duties to avoid conflicts by advance notice could expand to include a full environmental impact assessment. [[176]](#footnote-177)176 A full environmental impact assessment can lead to **[\*259]** management because it identifies a range of alternatives and identifies gaps in scientific knowledge that must be filled for effective management to succeed. This link was made in the decision of the ICJ in the Gabcikovo-Nagymaros dam case discussed above in Part III.C. [[177]](#footnote-178)177 In his separate opinion, Vice President Weeramantry observed that the emerging precautionary principle supports the imposition of a continuing duty of environmental assessment and monitoring of both the construction and operation of large water and other development projects. [[178]](#footnote-179)178 "EIA, being a specific application of the larger general principle of caution, embodies the larger obligation of continuing watchfulness and anticipation." [[179]](#footnote-180)179

The implementation of the ecological integrity model in international water law requires the formulation of the standards informed both by new scientific and ethical paradigms. The new science of ***river*** management can be informed by the ethical assumption of an obligation to future generations, which reflects the twentieth century's humility toward nature. [[180]](#footnote-181)180 The underlying philosophical principle of much environmental management is inter-generational equity. [[181]](#footnote-182)181 The basic idea is that "we as a species, hold the natural and cultural environment of our planet, both with members of the present generation and with other generations, past and future," and the principle has been rapidly adopted as an ethical norm against which major international agreements and mandates must be tested. [[182]](#footnote-183)182 The precise contours of intergenerational duties are not self-defining, but the core idea that each generation has a duty to manage its common patrimony for the benefit of the next generation rejects both the prevailing ethic that resources should be immediately consumed because their future versus present value is likely to be low, and the more "radical" ecological visions of the restoration and maintenance of pre-human environments. [[183]](#footnote-184)183

Adoption of intergenerational equity fundamentally changes the nature **[\*260]** of the water resource decision-making process and allocation norms, regardless of the precise content of the duty. Present actions must be evaluated in terms of the long-term consequences. All present value economic calculations of commodity values must be weighted against calculations that estimate the future value of the resource and incorporate the assumption that environmental quality is the marginal value of natural or non-degraded resources which is likely to increase over time. This is the essence of the difference between the economics of sustainable development and traditional cost-benefit calculations. [[184]](#footnote-185)184 One example of the application of intergenerational equity is the incorporation of non- or passive use values into decision-making. Passive use values are, in effect, a proxy to measure the aggregate value of natural resources over time. If the passive use values are evaluated over a longer period of time and over a broader community, they more accurately measure changing preferences.

B. THE SCIENCE AND OBJECTIVES OF AQUATIC ECOSYSTEM ***RIVER*** MANAGEMENT

The primary objective of modern ***river*** management is the science-based practice of adaptive management. Glen Canyon Environmental Studies ("GCES"), a National Academy of Sciences/National Research Council committee, provides the scientific basis for the re-operation of the Glen Canyon Dam to provide for a flow regime that is less environmentally disruptive and for beach building flood flows which attempt to restore the sediment balance in the ***Colorado*** ***River*** through the Grand Canyon. [[185]](#footnote-186)185 After a decade of monitoring, the GCES articulated a possible new management vision:

A different kind of management principle, which might be called the principle of naturalness, applies to national parks. Management is minimized, and where it must occur, it is directed toward the maintenance of environmental regime that as nearly as possible resembles the natural or undisturbed condition of the environment. It seems unreasonable to consider the future operation of Glen Canyon Dam without also considering the principle of naturalness as it might apply to the Grand Canyon National Park. [[186]](#footnote-187)186

The non-equilibrium ecology, which rejects the earlier ecological theory of a balance of nature and the associated romantic idea that nature should be a place without humans, provides the basis for the vision of modern ***river*** management and theories of biodiversity conservation. In his path-breaking book, *Discordant Harmonies*, Daniel Botkin has "deconstructed" the equilibrium paradigm as a misguided effort to match **[\*261]** science to theological and scientific visions of a perfect universe. [[187]](#footnote-188)187 Botkin's basic argument is that the images of nature that have influenced ecology are static when in fact the kinds of problems that we face require a dynamic view of nature. He argues that the dynamic view of nature starts from the premises that human action is one of the principal forces operating on ecosystems and that system disturbances are both predictable and random. [[188]](#footnote-189)188 A new regulatory science, conservation biology, [[189]](#footnote-190)189 is emerging to deal with the persistent problem of generating scientific information that can inform management decisions by designing research agendas tailored toward specific management issues. Examples of specific management issues include determining the minimum viable habitat for an endangered species or the disturbance regimen necessary to sustain the ecosystem. By focusing on the integration and progressive nature of scientific research, management regimes can adjust to new information and changed ecological conditions.

Ecosystems are patches or collections of conditions that exist for finite periods of time. As a leading aquatic ecologist has written, water resource systems are "inherently variable, patchy, and often require disturbance to persist." [[190]](#footnote-191)190 This has three consequences that are partially reflected in the Glen Canyon Dam experience. The first is that all future management must be adaptive. [[191]](#footnote-192)191 "Adaptive planning and management invoke a decision-making process based on trial, monitoring, and feedback" so that goals can be modified, as necessary, in light of new information. [[192]](#footnote-193)192 The second is that management objectives, or baselines, must be consistent with the idea of altered systems. The accelerating interaction between humans and the natural environment makes it impossible to return to an ideal state of nature. [[193]](#footnote-194)193 At best, ecosystems can be managed rather than restored or preserved. Third, all management will be a series of calculated risky experiments. "Nature moves and changes and involves risks and uncertainties and . . . our own judgments of our actions must be made against this moving target." [[194]](#footnote-195)194

**[\*262]** **VI. INTERSTATE AND INTERNATIONAL FLOW RESTORATION EXPERIMENTS**

Integration of adaptive management into existing and future international water regimes will be extremely difficult, but not impossible. The root of the difficulty is that water management has been traditionally conceived as part of the process of protecting vested entitlements by ensuring that they will be satisfied in times of scarcity. Firm allocation treaties build up strong expectations that existing entitlements will continue in perpetuity and create strong, and partially legitimate, fears among all participants that any change would make them worse, not better off. The continued protection of vested and potential entitlements in international watercourses must be an essential element of any environmental management strategy, but protection duties under the Convention, treaties, and domestic and customary international law should not operate to preclude the consideration and adoption of innovation management strategies. Innovation is not necessarily incompatible with the protection of vested entitlements. This is especially important because in the future, a major ***river*** management task will be the restoration of degraded ***rivers***. Major ***river*** systems such as the ***Colorado***, Columbia, [[195]](#footnote-196)195 Missouri, and Nile are facing substantial environmental problems due to the construction of large dams. These projects were built for three primary purposes, water supply, power, and flood control, but they are now being modified to satisfy new and additional objectives, primarily environmental and recreational. [[196]](#footnote-197)196 Experiments are now underway on many ***river*** systems, large and small, to restore the system to a baseline that reverses the most harmful effects of human use and alteration of natural system functions. [[197]](#footnote-198)197

These changes can be accommodated with vested entitlements because it is possible to achieve the objective of the entitlement through new management regimes that have a risk-sharing component. The rhetoric of water rights based on priority has obscured the risks inherent in all water rights and created an unjustified illusion of firm water rights. Ultimately, water rights can be better understood as a practical, intuitive response to the seasonable unreliability of supplies. The construction of large carry-over storage reservoirs, which reduce but do not eliminate the inherent risks, has worked to mask these risks. Water rights are subject not only to the fixed risks of priority but also to the new risks created by new demands on the system. This is not an argument for wholesale reallocation. It asserts only that because risk is inherent in water entitlements, there are no inherent legal barriers to the adoption of management solutions that equitably reassign the risks of water shortages to accommodate all relevant **[\*263]** users and nations in a basin. Thus, the focus should be on the actual expectations that lie behind a use, rather than the perpetual enforcement of the entitlement, so that alternative ways of satisfying those expectations in ways that accommodate new uses can be found. [[198]](#footnote-199)198

The potential to integrate management into existing allocation regimes and the constraints that property rights-based regimes pose is illustrated by a number of on-going international and domestic ***river*** restoration efforts. For example, a large-scale systematic experiment is underway in the Florida Everglades to restore the slow moving, seasonable north-south sheet flows disrupted by the development of urban areas and agricultural districts above the Everglades. [[199]](#footnote-200)199 The United States and the state of Florida will spend up to $ 8 billion dollars over a twenty year period to recapture and store water diverted from the north-south flow and discharged into the Atlantic Ocean and the Gulf of Mexico. [[200]](#footnote-201)200 Another experiment is underway in California to preserve the fresh-salt water balance in the San Francisco Bay Delta [[201]](#footnote-202)201 in a way that engages all stakeholders in the search for non-zero sum solutions. Further, the Commission on Environmental Cooperation released its Factual Record on the under-enforcement of Canadian fish protection legislation by BC [British Columbia] Hydro on the Upper Columbia ***River*** System in June 2000. [[202]](#footnote-203)202

A. THE MURRAY-DARLING BASIN

An important flow maintenance and ecosystem restoration experiment is underway on Australia's largest ***river*** system, the Murray-Darling Basin. [[203]](#footnote-204)203 While the population of the basin is relatively small, it contains **[\*264]** forty-two percent of Australia's agriculture, most of the country's major small inland cities, and the Australian capital territory, Canberra. [[204]](#footnote-205)204 Australia is a federal state and the Murray-Darling Basin is an interstate ***river*** system. [[205]](#footnote-206)205 The Darling ***River*** originates in southern Queensland and the ***River*** Murray and its major tributaries originate in the Snowy Mountains of New South Wales and Victoria. [[206]](#footnote-207)206 The Darling joins the Murray near Mildura, Victoria, where the American Chaffee brothers established an irrigation colony, and empties into the Pacific Ocean near Adelaide, South Australia. [[207]](#footnote-208)207 The system has experienced a great deal of ecosystem degradation, especially salinity, due to diversions and dams. [[208]](#footnote-209)208 In 1992, the federal government and the basin states agreed to the Murray-Darling Basin Initiative ("Initiative") to conserve the ecosystem of the ***river*** system. [[209]](#footnote-210)209 The Initiative led to the adoption of the federal-state Murray-Basin Agreement [[210]](#footnote-211)210 ("Agreement") and the creation of the Murray-Darling Basin Commission ("Commission"), a joint federal-state commission overseen by a federal-state ministerial council. Unlike an interstate compact in the United States, or an international treaty, the Agreement imposes much more detailed management duties on the parties and new agreements constantly amend it. The Agreement both allocates the flow among the basin states [[211]](#footnote-212)211 and vests the Commission with the power to control releases from specified upstream storage facilities. The Commission now runs the ***river***, overseen by the ministerial council and a stakeholder advisory board. [[212]](#footnote-213)212

The most important potential international precedent is the Commission's adoption of a base flow regime and the imposition of the regime on existing users throughout the basin. The Commission has initiated a process to set environmental or base flows for ecosystem restoration based on the impacts of different flows on the riverine environment. [[213]](#footnote-214)213 On developed ***river*** basins, the problem with establishing new flow or hydrographic regimes is that vested rights have been **[\*265]** previously acquired, or at least users claim them. Both the federal and state governments recognized the need to limit water withdrawals, establish base flows, and to stabilize and restore productive agricultural areas, especially those degraded by salinization. [[214]](#footnote-215)214 In 1996, the Commission announced the Cap, which is the "cornerstone of a number of policies designed to manage water resources for scarcity: water trading, environmental flows and the security of property rights." [[215]](#footnote-216)215 The Cap imposes yearly diversion limits on the four basin states and the Australian Capital Territory. [[216]](#footnote-217)216 New South Wales agriculture accounts for many of the stresses on the system, and the Commission imposed a state Cap based on 1993-94 withdrawal levels. [[217]](#footnote-218)217 The Caps will vary from year to year according to the supply. Each state administers the Cap, which will require aggressive management as agricultural water diversions increase in both New South Wales and Queensland. [[218]](#footnote-219)218

Australia is prone to prolonged periods of severe drought which alternate with wet years. [[219]](#footnote-220)219 Diversions are increasing upstream in Queensland as well in many of New South Wales inland irrigated agricultural districts. [[220]](#footnote-221)220 In 1996-97, three major sub-basins in New South Wales exceeded the Cap. [[221]](#footnote-222)221 Achievement of the Cap will require many innovative management strategies such as conjunctive use of ground and surface water, an abandonment of the "use it or lose it" administration of water licenses, and the implementation of an accounting system to balance water use over a period of time. [[222]](#footnote-223)222 Still, the Commission predicted that all states would meet the Caps, except New South Wales. [[223]](#footnote-224)223 Only one basin, the Lahlan, clearly exceeded the Cap in its first years of implementation, 1997-98, but usage in other major basins is approaching the Cap, especially if development is allowed to increase. [[224]](#footnote-225)224 The ability of the Cap to help restore the Murray-Darling Basin will not be known for years. However, the initial experience suggests that plans, which first try to maintain the status quo and then promote gradual and modest rollbacks in existing uses, can be both fair, efficient, and promote environmental **[\*266]** objectives. In major ***river*** systems, wasteful agricultural water use and use in excess of legal entitlements almost always exist. This provides ***river*** managers with some flexibility to experiment without the undue dislocation of legitimate user expectations.

B. RE-ENGINEERING GLEN CANYON DAM ON THE ***COLORADO*** ***RIVER***

Re-engineering international ***rivers*** will be especially challenging due to the high level of scientific, cross-national, and financial cooperation required; the reluctance of nations to change shared control of transboundary water; and because new flow regimes may conflict with entitlements based on prior use established under the equitable apportionment rules. Although modern international law is moving toward creating agreements that are open to change, treaties are viewed as eternal compacts. Efforts to revise the operating regime for Glen Canyon Dam on the ***Colorado*** ***River***, an international ***river***, illustrate that efforts to restore a shadow of a pre-dam flow on the ***Colorado*** are possible, but can be impeded by the entitlements generated by multiple purpose development. Re-engineering possibilities exist to improve the Canyon ecosystem, but resistance exists because they may frustrate the expectations of the basin generated by the entitlement regime.

The construction of Glen Canyon Dam on the ***Colorado***, and its operation for hydroelectric power generation, has altered the downstream environment through the Grand Canyon. [[225]](#footnote-226)225 The net result of the construction of Glen Canyon Dam and other carry-over storage and hydroelectric generating dams is that the ***Colorado*** has permanently become an artificial ***river***. [[226]](#footnote-227)226 Ecosystems often require disturbance cycles to sustain them, and Glen Canyon Dam altered the natural hydrographic of the ***Colorado***. [[227]](#footnote-228)227 In the early 1980s, a number of consequences of the substitution of an artificial disturbance regime began to surface. Beaches eroded; the endemic fish were jeopardized by the substitution of colder clear water for the warm, more turbid natural flow regime; and rafting trips were subjected to pulsating flows from the daily power release cycle. In 1986, the Bureau of Reclamation and the Western Power Administration began to collect information about these changes and after initial resistance agreed to prepare an environmental impact statement. [[228]](#footnote-229)228 Four National Academy of Sciences reports assess the policy utility of this research. [[229]](#footnote-230)229

Congress intervened in the process with the passage of the Grand **[\*267]** Canyon Protection Act of 1992 ("the Act"). [[230]](#footnote-231)230 Section 1802 of the Act requires that the Secretary of the Interior operate the dam in a manner consistent with the "Law of the ***River***," including the Endangered Species Act, to "mitigate adverse impacts to, and improve the values for which the Grand Canyon National Park and the Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use." [[231]](#footnote-232)231 The Act is a direct outcome of the identification of the need for a different release pattern from the Glen Canyon Dam both to build beaches and to retard beach erosion. In 1990, the GCES scientists proposed a research flow program to test the impacts of less fluctuation and the spring beach building pulses on the corridor. [[232]](#footnote-233)232 Initially, the Department of Interior opposed the legislation because the research flows had not been implemented and evaluated, but this opposition ended after Bureau of Reclamation and the Western Area Power Administration agreed to an experimental interim flow regime in late 1991. [[233]](#footnote-234)233

Research indicates that ecosystem management does not necessarily require a fundamental change in reservoir operations and thus may not be inconsistent with equitable entitlements. When the GCES began, many scientists and others thought that the Glen Canyon Dam had trapped the sediment necessary to sustain the beaches of the Canyon. [[234]](#footnote-235)234 Sophisticated sediment transport research done by the United States Geological Service ("USGS") and other federal agencies demonstrated that tributaries entering the mainstem below Glen Canyon Dam contain a sufficient amount of sand to maintain beaches and backwaters. [[235]](#footnote-236)235 The problem was not the mass balance of sand in the system but the way in which it moved post-dam. [[236]](#footnote-237)236 The alteration of the pre-dam hydrographic eliminated seasonable floods, except when the reservoir could not contain the run-off, and replaced them with a combination of steady and fluctuating flows produced by the generation of peaking power that eroded the beaches. [[237]](#footnote-238)237 The scientists recommended controlled floods (or beaching building flows, as the Bureau of Reclamation prefers to call them) and reduced ramping rates (the decline in the rate discharge from the turbines) to reduce beach loses. [[238]](#footnote-239)238 The Bureau of Reclamation now operates Glen Canyon Dam to limit upramp rates to 4,000 c.f.s. per hour and maximum allowable releases to 25,000 c.f.s. with an understanding that flows above 20,000 c.f.s. will be infrequent. [[239]](#footnote-240)239 In 1996, the Bureau of Reclamation released a beach building flood flow, and the studies on the effects of the flow continue. [[240]](#footnote-241)240

**[\*268]** Historically, the "Law of the ***Colorado*** ***River***," which is a permanent inter-basin mass allocation scheme, did not include the idea that the flow of the ***river*** was a use to be protected. Both the Upper and Lower Basins are entitled to 7.5 million acre-feet per year and Mexico is entitled to 1.5 million acre-feet per year. [[241]](#footnote-242)241 Subsequent legislation, Supreme Court decrees, and a compact fix individual state shares. Large mainstem and tributary storage reservoirs secure the delivery obligations of the Upper Basin. States and other water right holders view any change in the operating rules for these dams and reservoirs as violations of the "Law of the ***Colorado*** ***River***" due to the potential decrease in carry-over storage although the mass allocations remain unpaired. There is a need to recognize that all entitlements have an element of risk and that adaptive management can act as a risk minimization mechanism.

C. RESTORING THE ***COLORADO*** ***RIVER*** DELTA

The efforts to restore the ***Colorado*** ***River*** Delta ("Delta") illustrate the potential role that the Convention could play in reinforcing the nascent restoration regime. Along with the Nile ***River***, the Delta is one of the great desert estuaries in the world. [[242]](#footnote-243)242 Today, the Delta's 150,000 acres are only a remnant of its original 1,930,000-acre area. [[243]](#footnote-244)243 Nonetheless, the Delta remains an important biodiversity reserve for a large number of endangered and non-endangered species, as the Mexican government recognized in 1993 when it designated the Biosphere Reserve of the Upper Gulf of California and the ***Colorado*** ***River*** Delta. [[244]](#footnote-245)244 The nub of the problem is that the ***Colorado*** is almost entirely diverted and consumed in the both United States and Mexico by the time it empties into the Delta. Thus, the area receives insufficient, unreliable flows. Today, only twenty to twenty-five percent of the ***Colorado***'s flow reaches the Delta, and this water comes from flood releases, return irrigation flows, and municipal wastewater. [[245]](#footnote-246)245 Hoover and Glen Canyon Dams severely damaged the ecosystem because no freshwater reached the Delta in the years required to fill the reservoirs. [[246]](#footnote-247)246 Since Glen Canyon Dam was filled in 1981, the Delta is slowly rebounding in spite of erratic flood flows and the poor quality of much of the water that reaches it. [[247]](#footnote-248)247

Experts estimate that the Delta could still survive "through some level **[\*269]** of protection for flows that are presently occurring but are not mandated" [[248]](#footnote-249)248 because "large, continuous flows of water in the ***river*** are not necessary to support the remaining delta riparian habitats." [[249]](#footnote-250)249 The Delta needs a scheme of perennial flows of 32,000 acre-feet per year and flood or pulse flows of 260,000 acre-feet approximately every four years. [[250]](#footnote-251)250 Flood flows occur as part of the variable water supply of the region. [[251]](#footnote-252)251 The real problem is how to maintain flood flows in periods of prolonged drought. Water supplies during prolonged drought can come from reservoir releases consistent with the Bureau of Reclamation's annual operating plan, the purchase of compact entitlements from states with a surplus, or the purchase of existing water rights.

The federal government controls all water stored in the Lower ***Colorado*** mainstem dams. [[252]](#footnote-253)252 Thus, the first option would ultimately require federal authorization and an amendment to the 1944 Water Treaty. [[253]](#footnote-254)253 In effect, this would be a re-negotiation of the 1922 and 1948 compacts, which makes the task difficult to accomplish, since the 1922 Compact allocated the ***Colorado*** in perpetuity. [[254]](#footnote-255)254 The ***Colorado*** is fully allocated, if not over-allocated, among the seven basin states and between the United States and Mexico. As is much of water allocation, the "Law of the ***Colorado*** ***River***" is a hypothetical risk allocation scheme in a worst-case scenario-- prolonged extreme drought. The existing treaty is as rigid a risk allocation scheme as exists in the world and contains no provision for any permanent dedication of water to the Delta. [[255]](#footnote-256)255 Mexico is further handicapped in any efforts to take exclusive responsibility for the Delta because it is entitled to only 1.5 million acre-feet compared to the 15 million acre-feet that the two United States basins share. [[256]](#footnote-257)256 The Delta gets only what Mexico does not use or returns. However, the Glen Canyon "beach building flow" release experiment, described in the previous **[\*270]** section Part VIII.B, suggests that a schedule of flow releases need not be constant or permanent and thus "interruptible" restoration flows can be consistent with the satisfaction of all entitlements. Nevertheless, some "safety net" must be created to deal with sustained droughts when no temporary surplus exists and the ecosystem has exceeded its capacity to rebound from a period of water deprivation.

Voluntary transfers from existing agricultural uses to Delta conservation and restoration may prove feasible. However, the real and imagined legal barriers are considerable and thus the transaction costs of any transfer would be high. Water marketing has been proposed as a restoration strategy because transfers in treaty states may not require a compact or treaty amendment. [[257]](#footnote-258)257 Economists and many western water critics have long criticized western water law because it ignores higher, alternative values of water. Critics assert that too much water is used to grow surplus or low-valued crops, too much water is used in a wasteful manner, and that increased transfers are desirable. Prior appropriation allocates the risks of shortages by a simple principle--priority of use. The question is how flexible the water transfer system will be in the future. Two sets of problems, one institutional, the other distributional, must be addressed. The first question is whether water users will respond sufficiently to market incentives. The second and more difficult question is whether the redistributions commanded by the market are fair and consistent with ecosystem sustainability in both the short and long run. [[258]](#footnote-259)258

International water transfers face a number of barriers that differ in degree, if not in kind, from those faced by domestic water transfers. The first barrier is conceptual or physiological. In order for water to be transferred, it must be perceived as a commodity. Domestic legal systems that allow the creation of semi-exclusive water rights solve this problem. Once a property right to a share of a resource exists, the major step toward commodification has been taken. Alienability is a standard (but not inevitable) attribute of property rights. The first problem with cross-border water transfers is that many countries will exhibit a dual attitude toward water. Water will be recognized as a commodity within, but not outside, the countries' borders. Countries will invoke state sovereignty as the basis for the right to keep water out of the market. Canada has taken this position with respect to its waters as a result of the possibility of the transport of bulk water from the Great Lakes and other waters for resale in arid countries. Classic international law gives a country complete control over the development and use of its resources so long as the country does not cause or allow transboundary pollution. No dormant commerce clause exists in international law that requires a country to share its resources with other countries. The only possible check on state sovereignty are GATT or among Canada, Mexico and the United States, the NAFTA. [[259]](#footnote-260)259 However, **[\*271]** GATT and NAFTA only embody the principle that *if* a country decides to turn a natural resource into a commodity, it must permit trade in a non-discriminatory manner. Thus, the issue is political, not legal.

The dichotomy between water as a sovereign resource of national patrimony and a commodity runs through water allocation agreements. Transfers of compact surplus entitlements between the Upper and Lower Basin and among Lower Basin states have been proposed to accommodate new environmental and urban needs. In 1999, the Bureau of Reclamation authorized voluntary transfers of surplus entitlements among Lower Basin states, [[260]](#footnote-261)260 but the idea has been fiercely opposed by many stakeholders in the Basin as inconsistent with the "Law of the ***River***." Articles 3 and 8 of the Convention have been cited for the proposition that the Compact precludes inter-state, inter-basin, or international water transfers. [[261]](#footnote-262)261 Article 3(a) gives each basin a perpetual right to "the exclusive beneficial consumptive use" of 7,500,000 acre-feet and Article VIII provides that all rights, except 5,000,000 acre feet of present perfected rights, shall be satisfied "solely from the water apportioned to that Basin in which they are situated." [[262]](#footnote-263)262 Too much is read into these words. The provisions were primarily intended to preserve the Upper Basin's future rights against the faster growing Lower Basin. In addition, the provisions were intended to block an appropriation of surplus waters beyond those expressly allocated by the compact and to limit any future Lower Basin rights to the 7,500,000 acre-feet plus the hypothetical 1,000,000 acre-feet surplus. These provisions should be waivable by the intended beneficiaries if no other state right holders or a federal interest is injured.

The ***Colorado*** ***River*** Basin states and stakeholders must ultimately come to the realization that the scientific and economic assumptions behind the ***Colorado*** ***River*** compacts must be adjusted to the changing demands on the ***river*** both in the United States and Mexico. The 1944 Water Treaty between Mexico and the United States has been amended to incorporate salinity levels into the Mexican delivery obligation [[263]](#footnote-264)263 setting the precedent to address environmental problems on the Mexican reach of the ***Colorado***. Voluntary transfers among basin states and between the United States and Mexico are a fair way to address environmental problems. [[264]](#footnote-265)264 Any water transfer must be consistent with the "Law of the ***River***," federal Reclamation law, and state transfer law. [[265]](#footnote-266)265 The Convention cannot overcome the many legal obstacles to an international transfer, but its new focus on the protection of aquatic water quality and ecosystem integrity suggests that international water marketing consistent with its objectives should be presumed legal under the domestic law of the transferring nation.

**[\*272]** **VII. CONCLUSION**

International water law is in the middle of a paradigm shift from multiple-use to environmentally sustainable development and management to promote aquatic biodiversity. Principles developed between the 1972 Stockholm and 1992 Rio de Janeiro United Nations environmental conferences provide the legal norms for environmentally sustainable ***river*** management. Both science and ethics must be applied to the international law of ***river*** use and management to adapt international water law to ecosystem protection. Historically, post-project damage payments or minor project modifications in the name of mitigation have dealt with environmental problems. In contrast, international environmental law increasingly approaches pollution and environmental destruction from the front end through the precautionary or prevention principle. States are encouraged to prevent environmental destruction by addressing the problems before, not after, development occurs through cooperative, ongoing management regimes. This approach is partially reflected in the Convention and the ICJ Gabcikovo-Nagymaros Project decision but needs further development.

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1. 1 Convention on the Law of the Non-Navigational Uses of International Watercourses, May 21, 1997, [*36 I.L.M. 700*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [hereinafter International Watercourses Convention]. [↑](#footnote-ref-2)
2. 2 For a pessimistic assessment of the future of the Convention, *see* Lucius Caflisch, *Regulation of the Uses of International Waterways: The Contribution of the United Nations, in* THE UNITED NATIONS AT WORK 3 (Martin Ira Glassner ed., 1998). [↑](#footnote-ref-3)
3. 3 International Watercourses Convention, *supra* note 1, art. 3(3), [*36 I.L.M. at 704*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) (permitting countries to modify the International Watercourses Convention in subsequent agreements). [↑](#footnote-ref-4)
4. 4 Treaty Relating to Boundary Waters between the United States and Canada, Jan. 11, 1909, U.S.-Gr. Brit., [*36 Stat. 2448.*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:5C8C-P800-01XN-S238-00000-00&context=1516831) The treaty does not apply equally to all the Great Lakes. Technically, Lake Michigan is a tributary water rather than a boundary water since it is the only Great Lake wholly within the United States. However, the consistent practice of the two nations is to treat Lake Michigan as part of the boundary water system. *See* Richard B. Bilder, *Controlling Great Lakes Pollution: A Study in United States-Canadian Environmental Cooperation*, 70 MICH. L. REV. 469, 482 (1972). [↑](#footnote-ref-5)
5. 5 Stephen C. McCaffrey, An Overview of the United Nations Convention on the Law of the Non-Navigational Use of International Watercourses (1999 paper prepared for the Third Annual International Water Law Seminar, *Securing Water Rights and Managing Water Scarcity: Law and Policy in Practice*, hosted by the Water Law & Policy Programme, University of Dundee, Scotland). *See also* Stephen C. McCaffrey & Mpazi Sinjela, *The 1997 United Nations Convention on International Watercourses*, [*92 AM. J. INT'L L. 97, 106 (1998).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SC8-9RC0-00CV-70K4-00000-00&context=1516831) [↑](#footnote-ref-6)
6. 6 *See* David J. Lazerwitz, *The Flow of International Water Law: The International Law Commission's Law of Non-Navigational Uses of International Watercourses*, 1 IND. J. GLOBAL LEGAL STUD. 247 (1993). [↑](#footnote-ref-7)
7. 7 This principle is consistent with the modern characterization of international law as a system to promote distributive justice to scarce resources among the international community. In his seminal book, Thomas M. Franck describes the Convention as an effort "to provide for distribution of a scarce resource through the application of broadly conceived equity." THOMAS M. FRANCK, FAIRNESS IN INTERNATIONAL LAW AND INSTITUTIONS 74 (1995). [↑](#footnote-ref-8)
8. 8 *See* DANIEL HILLEL, ***RIVERS*** OF EDEN: THE STRUGGLE FOR WATER AND THE QUEST FOR PEACE IN THE MIDDLE EAST (1994) (examining a water dispute that many predict could lead to a war). [↑](#footnote-ref-9)
9. 9 The utility of sustainable development as a resource management principle remains contested. *See, e.g.*, TOWARD SUSTAINABLE COMMUNITIES (Daniel A. Mazmanian & Michael E. Kraft eds., 1999). However, in the past two decades, no alternative principle has emerged to supplant sustainable development. [↑](#footnote-ref-10)
10. 10 *See infra* notes 11-12. [↑](#footnote-ref-11)
11. 11 Richard Kyle Paisley & Timothy L. McDaniels, *International Water Law, Acceptable Pollution Risk and the Tatshenshini* ***River***, 35 NAT. RESOURCES J. 111, 122-23 (1995). [↑](#footnote-ref-12)
12. 12 Any legal system, especially the international legal system, "represents a kind of regulatory commons, where effective action is dependent upon alliances of groups overcoming collective action barriers and pressuring administrators to respond." Thomas W. Merrill, *Golden Rules For Transboundary Pollution*, [*46 DUKE L.J. 931, 985 (1997).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3RR5-MN90-00CV-501C-00000-00&context=1516831) *But see* Eyal Benvenisti, *Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law*, [*90 AM. J. INT'L. L. 384, 392-94 (1996).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3T-8WP0-00CV-710S-00000-00&context=1516831) [↑](#footnote-ref-13)
13. 13 One of the principle themes of modern environmental history is the influence of Western European law and economic theory on the perception of all resources as commodities. *See, e.g.*, WILLIAM CRONON, NATURE'S METROPOLIS: CHICAGO AND THE GREAT WEST (1991). [↑](#footnote-ref-14)
14. 14 In a previous article, I explored the intellectual origins of scientific conservation and its influence on domestic and international law. *See* A. Dan Tarlock, *International Water Law and the Protection of* ***River*** *System Ecosystem Integrity*, 10 BYU. J. OF PUB. L. 181 (1996). [↑](#footnote-ref-15)
15. 15 The theory that water projects yield large economic developments has always been more of an article of faith among politicians and water managers rather than a rigorously empirically verified hypothesis. One of the leading students of multiple purpose planning, Irving K. Fox, characterized the debate as one between economic rationality, which emphasized reallocation and conservation, and the development model, which saw water as the engine of perpetual economic growth. *See* Irving K. Fox, *Policy Problems in the Field of Water Resources, in* WATER RESEARCH 271 (Allen V. Kneese & Stephen C. Smith eds., 1965); *see also* W.R. Derrick Sewell, *The Changing Content of Water Resources Planning: The Next Twenty-five Years, in* WATER IN A DEVELOPING WORLD: THE MANAGEMENT OF A CRITICAL RESOURCE 57 (Albert E. Utton & Ludwik Teclaff eds., 1978). [↑](#footnote-ref-16)
16. 16 BRUCE RICH, MORTGAGING THE EARTH: THE WORLD BANK, ENVIRONMENTAL IMPOVERISHMENT, AND THE CRISIS OF DEVELOPMENT 224-39 (1994). [↑](#footnote-ref-17)
17. 17 *See* DAVID LEWIS FELDMAN, WATER RESOURCES MANAGEMENT: IN SEARCH OF AN ENVIRONMENTAL ETHIC (1991). [↑](#footnote-ref-18)
18. 18 *See* SANDRA POSTEL, LAST OASIS: FACING WATER SCARCITY 165-82 (Worldwatch Envtl. Alert Series) (Linda Stark ed., 1997). [↑](#footnote-ref-19)
19. 19 *See* W.M. ADAMS, WASTING THE RAIN: ***RIVERS***, PEOPLE AND PLANNING IN AFRICA (1992). [↑](#footnote-ref-20)
20. 20 *See* RICH, *supra* note 16; *see also* THE ENVIRONMENTAL AND SOCIAL EFFECTS OF LARGE DAMS (Edward Goldsmith, et al. eds., 1984). A recent United Nations Development Programme study concludes dams and diversions have extripated or put at risk 20% of the world's freshwater fish. People and Ecosystems: The Fraying Web of Life. <[*http://wri.org/wri.org/wri/wrr2000>*](http://wri.org/wri.org/wri/wrr2000>). [↑](#footnote-ref-21)
21. 21 INTERAGENCY FLOODPLAIN MGMT. REV. COMM., ADMINISTRATION FLOODPLAIN MGMT. TASK FORCE, SHARING THE CHALLENGES: FLOODPLAIN MANAGEMENT INTO THE 21ST CENTURY 142-43 (1994). [↑](#footnote-ref-22)
22. 22 Professor Ludwik A. Teclaff is one of the leading advocates of the need to recognize the benefits of historic flood patterns as well as the benefits of flood control. *See* Ludwik A. Teclaff, *Treaty Practice Relating to Transboundary Flooding*, 31 NAT. RESOURCES J. 109, 115-18 (1991); LUDWIK A. TECLAFF, THE ***RIVER*** BASIN IN HISTORY AND LAW (1967). [↑](#footnote-ref-23)
23. 23 *See* DANIEL B. BOTKIN, DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY (1990). [↑](#footnote-ref-24)
24. 24 EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY 238-45 (1989). [↑](#footnote-ref-25)
25. 25 *See* WESTERN WATER POL'Y REV. ADVISORY COMM'N, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 3-1 to 3-3 (1998) (endorsing the concept of sustainable consumptive use). [↑](#footnote-ref-26)
26. 26 *See* Stephen C. McCaffrey, *A Human Right to Water: Domestic and International Implications*, 5 GEO. INT'L ENVTL. L. REV. 1, 12 (1993). [↑](#footnote-ref-27)
27. 27 For a helpful introduction to modern ecology and its influence on environmental management for attorneys, *see* Judy L. Meyer, *Changing Concepts of System Management, in* SUSTAINING OUR WATER RESOURCES 78, 80-88 (1992) (Water Sci. & Tech. Bd. Tenth Anniversary Symp.); Judy L. Meyer, *The Dance of Nature: New Concepts in Ecology*, [*69 CHI.-KENT L. REV. 875 (1994);*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S41-1VH0-00CT-S0HJ-00000-00&context=1516831) *see also* A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, [*27 LOY. L.A. L. REV. 1121 (1994).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-1GR0-00CW-C18S-00000-00&context=1516831) *See generally* REED F. NOSS & ALLEN Y. COOPERIDER, SAVING NATURE'S LEGACY: PROTECTING AND RESTORING BIODIVERSITY 46 (1994) (arguing that changes in environmental management build on the substitution of a non-equilibrium for an equilibrium paradigm in ecology). [↑](#footnote-ref-28)
28. 28 *See supra* notes 22-25. [↑](#footnote-ref-29)
29. 29 COMMITTEE ON SUSTAINABLE WATER SUPPLIES FOR THE MIDDLE EAST, WATER FOR THE FUTURE: THE WEST BANK AND GAZA STRIP, ISRAEL, AND JORDAN 66 (1999). [↑](#footnote-ref-30)
30. 30 *See* A. Dan Tarlock, *The Missouri* ***River****: The Paradox of Conflict Without Scarcity*, [*2 GREAT PLAINS NAT. RESOURCES J. 1, 11-12 (1997);*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S11-N4P0-00C3-W076-00000-00&context=1516831) A. Dan Tarlock, ***River*** *Management in the Twenty-first Century: The Vision Thing*, 6 ***RIVERS*** 43, 45, 48 (1997). For a specific application of this concept to a major international ***river***, *see* Independent Sci. Group, *Return to the* ***River****: An Ecological Vision for the Recovery of the Columbia* ***River*** *Salmon*, [*28 ENVTL. L. 503 (1998).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3W4G-RB70-00CW-B0B7-00000-00&context=1516831) [↑](#footnote-ref-31)
31. 31 Marlise Simons, *Where War Roiled Danube, Nature is Peacemaker*, N.Y. TIMES, Dec. 15, 1999, at A4. [↑](#footnote-ref-32)
32. 32 Nile ***River*** irrigation began to be modified in the nineteenth century. Barrages and dams were constructed to regulate the Nile's flow, but historic patterns were relatively maintained until the construction of the High Aswan Dam. *See* H.E. HURST, THE NILE: A GENERAL ACCOUNT OF THE ***RIVER*** AND THE UTILIZATION OF ITS WATERS (1957). [↑](#footnote-ref-33)
33. 33 *See* International Law Comm'n, *The Law of the Non-Navigational Uses of International Watercourses*, 3 ***COLO.*** J. INT'L ENVTL. L. & POL'Y 1 (1992). [↑](#footnote-ref-34)
34. 34 *See* A. Dan Tarlock, *The Law of Equitable Apportionment Revised, Updated, and Restated*, 56 U. ***COLO.*** L. REV. 381 (1984). [↑](#footnote-ref-35)
35. 35 In 1934, Arizona's governor ordered a unit of the state National Guard to occupy the Parker Dam construction site to prevent the Department of the Interior from carrying out a contract with the Metropolitan Water District of Southern California, but the mini-war did not prevent the dam. Jack L. August, Jr., THE VISION IN THE DESERT: CARL HAYDEN AND HYDROPOLITICS IN THE AMERICAN SOUTHWEST 146-48 (1999). [↑](#footnote-ref-36)
36. 36 Id. at 382-84. [↑](#footnote-ref-37)
37. 37 Id. at 402-03. [↑](#footnote-ref-38)
38. 38 Id. at 394-95. [↑](#footnote-ref-39)
39. 39 Id. at 384. [↑](#footnote-ref-40)
40. 40 Justice Gregory J. Hobbs, Jr., of the ***Colorado*** Supreme Court, characterized the purpose of the beneficial use requirement in western water law as the advancement of "the fundamental principles of ***Colorado*** and western water law that favor optimum use, efficient water management, and priority administration, and disfavor speculation and waste." [*Santa Fe Trail Ranches Property Owners Ass'n v. Simpson, 990 P.2d 46, 54 (****Colo.*** *1999).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3Y27-KN70-0039-40TN-00000-00&context=1516831) [↑](#footnote-ref-41)
41. 41 *See* A. Dan Tarlock, *From Natural Scarcity to Artificial Abundance: The Legacy of California Water Law and Politics*, 1 WEST-NORTHWEST 71, 75-84 (1994) (providing a history of the role that prior appropriation played in the development of California). [↑](#footnote-ref-42)
42. 42 [*Kansas v.* ***Colorado****, 206 U.S. 46 (1906).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) The litigation continued, in one form or another, for over a century, and Kansas eventually prevailed against ***Colorado*** after losing two original jurisdiction actions. In 1947, the states negotiated an interstate compact. In 1985, Kansas brought an original action to enforce the compact, claiming that ***Colorado*** exceeded its compact share. In 1995, the Court upheld the Special Master's finding that post compact high capacity wells in ***Colorado*** caused material depletion in useable ***river*** flows in Kansas in violation of the [*Arkansas* ***River*** *Compact, Kansas v.* ***Colorado****, 514 U.S. 673, 680 (1995),*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S3D-0XY0-003B-R3M8-00000-00&context=1516831) and remanded the case for a trial to determine Kansas's remedies. *Id.* [↑](#footnote-ref-43)
43. 43 [*Missouri v. Illinois, 200 U.S. 496, 497 (1906).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-BCW0-003B-H336-00000-00&context=1516831) [↑](#footnote-ref-44)
44. 44 [*Id. at 503.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-BCW0-003B-H336-00000-00&context=1516831) [↑](#footnote-ref-45)
45. 45 [*Kansas, 206 U.S. at 97.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-B060-003B-H2B5-00000-00&context=1516831) [↑](#footnote-ref-46)
46. 46 [***Colorado*** *v. New Mexico, 459 U.S. 176, 183 (1982).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-57V0-003B-S1W7-00000-00&context=1516831) [↑](#footnote-ref-47)
47. 47 [*Id. at 190.*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-57V0-003B-S1W7-00000-00&context=1516831) [↑](#footnote-ref-48)
48. 48 [***Colorado*** *v. New Mexico II, 467 U.S. 310, 323-24 (1984).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-3DB0-003B-S3CH-00000-00&context=1516831) [↑](#footnote-ref-49)
49. 49 [*Wisconsin v. Illinois, 278 U.S. 367, 419-20 (1929).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-F7S0-003B-725H-00000-00&context=1516831) [↑](#footnote-ref-50)
50. 50 [*New Jersey v. New York, 282 U.S. 336, 346-47 (1931).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-DHV0-003B-703X-00000-00&context=1516831) [↑](#footnote-ref-51)
51. 51 [*Nebraska v. Wyoming I, 325 U.S. 589, 656-57 (1945).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-JYY0-003B-S45W-00000-00&context=1516831) [↑](#footnote-ref-52)
52. 52 [*Nebraska v. Wyoming II, 507 U.S. 584, 587 (1993).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S70-NFH0-003B-R51C-00000-00&context=1516831) [↑](#footnote-ref-53)
53. 53 *See id.* [↑](#footnote-ref-54)
54. 54 Margaret Zallen, *Integrating New Values With Old Uses in the Relicensing of Kingsley Dam and Related Facilities: Making Part of the Problem a Part of the Solution, in* DAMS: WATER AND POWER IN THE NEW WEST, (18th Annual Summer Conference Nat. Resources L. Ctr., University of ***Colorado*** School of Law, 1997). [↑](#footnote-ref-55)
55. 55 Nebraska water law and the federal Endangered Species Act both recognize instream flow rights. *See* J. David Aiken, *Instream Appropriations in Nebraska, in* INSTREAM FLOW PROTECTION IN THE WEST 313, 314 (Lawrence J. MacDonnell et al. eds., 1993). [↑](#footnote-ref-56)
56. 56 Commentators have advocated an expanded sharing principle, a "community of property" model which is premised on ***co***-riparian cooperation. Under this model, ***rivers*** and associated resources are jointly managed without regard to international borders, on the principle that all riparian states are entitled to equitable participation in the development of the resource. Unfortunately, this theory does not yet reflect state practice. [↑](#footnote-ref-57)
57. 57 Gabcikovo-Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, 149 (Sept. 25). *See* Sharon A. Williams, *Public International Law and Water Quantity Management in a Common Drainage Basin: The Great Lakes*, 18 CASE W. RES. J. INT'L L. 155, 165 (1986). [↑](#footnote-ref-58)
58. 58 Conference on the Human Environment, June 16, 1972, [*11 I.L.M. 1416*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:42HW-9NG0-0041-42VV-00000-00&context=1516831) [hereinafter Stockholm Conference Report]. [↑](#footnote-ref-59)
59. 59 World Water Conference, Mar. 7-18, 1977, ***15 I.L.M. 734.*** [↑](#footnote-ref-60)
60. 60 Conference on Environment and Development: Rio Declaration on Environment and Development, June 14, 1992, [*31 I.L.M. 874, 879*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MTY0-0041-41KS-00000-00&context=1516831) [hereinafter Rio Declaration]. [↑](#footnote-ref-61)
61. 61 International Watercourses Convention, *supra* note 1, [*36 I.L.M. at 700.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-62)
62. 62 *See* 5 WATERS AND WATER RIGHTS 3 (Robert E. Beck ed., 1991) (discussing the development of international water law). [↑](#footnote-ref-63)
63. 63 The Harmon Doctrine refers to an 1895 opinion by United States Attorney General of Ohio, Judson Harmon, advising the Secretary of State that the United States had absolute sovereignty over the waters of the Rio Grande ***River*** in ***Colorado***, New Mexico, and Texas before it reached the Mexican border. [*21 Op. Att'y Gen. 274, 281 (1895).*](https://advance.lexis.com/api/document?collection=administrative-materials&id=urn:contentItem:3RHK-H020-002F-V4WX-00000-00&context=1516831) *See generally* Jacob Austin, *Canadian-U.S. Practice and Theory Respecting the International Law of International* ***Rivers****: Study and Influence of the Harmon Doctrine*, 37 CAN. BAR REV. 393 (1959). [↑](#footnote-ref-64)
64. 64 *See* Charles J. Meyers, *The* ***Colorado******River***, 19 STAN. L. REV. 1, 1-2 (1966); Charles J. Meyers & Richard L. Noble, *The* ***Colorado******River****: The Treaty with Mexico*, 19 STAN. L. REV. 367, 367-69 (1967). [↑](#footnote-ref-65)
65. 65 *See* Austin, *supra* note 62; *see also* Stephen C. McCaffrey, *The Harmon Doctrine One Hundred Years Later: Buried, Not Praised*, 36 NAT. RESOURCES J. 549 (1996). [↑](#footnote-ref-66)
66. 66 Principle 21 of the 1972 Stockholm Conference illustrates the tension between these two concepts:

    States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

    Stockholm Conference Report, *supra* note 57, [*11 I.L.M. at 1420.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:42HW-9NG0-0041-42VV-00000-00&context=1516831) [↑](#footnote-ref-67)
67. 67 Helsinki Rules on the Uses of the Waters of International ***Rivers***, 52 INT'L L. ASS'N 484 (1966) [hereinafter Helsinki Rules]. [↑](#footnote-ref-68)
68. 68 *Id.*, art. V. [↑](#footnote-ref-69)
69. 69 The difficulty of applying the rules to the Jordan ***River*** in the Middle East is a prime example of the indeterminacy of apportionment standards. *See* Sharif S. Elmusa, *Dividing Common Water Resources According to International Water Law: The Case of Palestinian-Israeli Waters*, 35 NAT. RESOURCES J. 223 (1995). [↑](#footnote-ref-70)
70. 70 *See* Patricia K. Wouters, *An Assessment of Recent Developments in International Watercourse Law through the Prism of Substantive Rules Governing Use Allocation*, 36 NAT. RESOURCES J. 417, 419-21 (1996); *Forward* to, INTERNATIONAL WATER LAW: SELECTED WRITINGS OF PROFESSOR CHARLES B. BOURNE xiii-xxvi (1997). [↑](#footnote-ref-71)
71. 71 Gabcikovo-Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7 (Sept. 25). [↑](#footnote-ref-72)
72. 72 *See id.* [↑](#footnote-ref-73)
73. 73 *See id.* [↑](#footnote-ref-74)
74. 74 *Id.* at 16-17. *See generally* Paul R. Williams, *International Environmental Dispute Resolution: The Dispute Between Slovakia and Hungary Concerning Construction of the Gabcikovo and Nagymaros Dams*, [*19 COLUM. J. ENVTL. L. 1 (1994).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-75)
75. 75 *See Gabcikovo-Nagymaros Project*, 1997 I.C.J. at 20. [↑](#footnote-ref-76)
76. 76 [*Id. at 22.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-77)
77. 77 *See id.* [↑](#footnote-ref-78)
78. 78 [*Id. at 52.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-79)
79. 79 [*Id. at 37, 222.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-80)
80. 80 [*Id. at 36-37.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-81)
81. 81 Gabcikovo-Nagymaros Project (Hung. v. Slovk.) 1997 I.C.J. 7, 35 (Sept. 25). [↑](#footnote-ref-82)
82. 82 [*Id. at 25.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-83)
83. 83 *See id.* [↑](#footnote-ref-84)
84. 84 [*Id. at 62.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-85)
85. 85 *Id.* [↑](#footnote-ref-86)
86. 86 [*Id. at 39.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3V-2MV0-00CT-T0R9-00000-00&context=1516831) [↑](#footnote-ref-87)
87. 87 Gabcikovo-Nagymaros Project (Hung. v. Slovk.) 1997 I.C.J. 7, 41 (Sept. 25). [↑](#footnote-ref-88)
88. 88 *Id.*; *see also* Afshin A-Khavari & Donald R. Rothwell, *The IJC and Danube Dam Case: A Missed Opportunity for International Environmental Law?*, [*22 MELB. U. L. REV. 507, 515 (1998)*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3WJW-7XB0-00CW-904M-00000-00&context=1516831) (arguing that a required level of scientific certainty will defeat the operation of the precautionary principle). [↑](#footnote-ref-89)
89. 89 *Gabcikovo-Nagymaros Project*, 1997 I.C.J. at 41. [↑](#footnote-ref-90)
90. 90 *See id.* [↑](#footnote-ref-91)
91. 91 *Id.* at 64. [↑](#footnote-ref-92)
92. 92 *Id.* at 11. [↑](#footnote-ref-93)
93. 93 *Id.* at 82. [↑](#footnote-ref-94)
94. 94 *Id.* at 143-44, 224. [↑](#footnote-ref-95)
95. 95 Gabcikovo-Nagymaros Project (Hung. v. Slovk.) 1997 I.C.J. 7, 92 (Sept. 25). *See* [*Upper Snake* ***River*** *Chapter of Trout Unlimited v. Hodel, 921 F.2d 232, 234 (9th Cir. 1990)*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-0PD0-003B-52H4-00000-00&context=1516831) (holding National Environmental Policy Act (NEPA) did not apply to the operations of dams constructed before NEPA's passage). *But see* [*Oregon Natural Desert Ass'n v. Green, 953 F. Supp. 1133, 1147 (D. Or. 1997)*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4N-HB90-00B1-F2B0-00000-00&context=1516831) (holding NEPA requirement applied to ongoing management activities). [↑](#footnote-ref-96)
96. 96 *See Gabcikovo-Nagymaros Project*, 1997 I.C.J. at 7. [↑](#footnote-ref-97)
97. 97 *Id.* at 50. [↑](#footnote-ref-98)
98. 98 *Id.* at 44. [↑](#footnote-ref-99)
99. 99 *Id.* at 45. [↑](#footnote-ref-100)
100. 100 *Id.* at 83 (downgrading sustainable development to a "concept" rather than a principle). [↑](#footnote-ref-101)
101. 101 In 1995, Slovakia and Hungary signed a temporary agreement to divide the water in the Danube between the original ***river*** bed and the Moson branch. The increased water flow was expected to repair the ecological damage at the expense of an annual decrease of 150 gigawatt hours of electric production at Gabcikovo. *Hydroelectric and Other Renewable Energy* (last modified May 24, 1996) <[*http://www.eia.doe.gov/oiaf/ieo96/hydro.html>*](http://www.eia.doe.gov/oiaf/ieo96/hydro.html>). [↑](#footnote-ref-102)
102. 102 Gabcikovo-Nagymaros Project (Hung. v. Slovk.) 1997 I.C.J. 7, 88 (Sept. 25) (separate opinion of Vice-President Weeramantry). [↑](#footnote-ref-103)
103. 103 *Id.* at 110. *See* Eva M. Kornicker Uhlmann, *State Community Interests, Jus Cogens and Protection of the Global Environment: Developing Criteria for Peremptory Norms*, [*11 GEO. INT'L ENVTL. L. REV. 101, 125-28 (1998)*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3WWJ-WPV0-00CV-908N-00000-00&context=1516831) (discussing the jurisprudential basis for Vice-President Weeramantry's suggestion that international environmental law norms may evolve into *erga omnes* obligations). [↑](#footnote-ref-104)
104. 104 *See generally* LYNTON KEITH CALDWELL, INTERNATIONAL ENVIRONMENTAL POLICY: FROM THE TWENTIETH TO THE TWENTY-FIRST CENTURY (3d ed. 1996). [↑](#footnote-ref-105)
105. 105*See* Bengt Broms, *Natural Resources: Sovereignty Over, in* 10 ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW 306 (1987) (discussing the history of the relationship between the right to develop and state sovereignty). Modern environmental law, of course, challenges unlimited sovereignty. *See, e.g.*, Kerstin Odendhal, DIE UMWELTPFLICHTIGKEIT DER SOUVERANITAT [THE ENVIRONMENTAL RESPONSIBILITY OF SOVEREIGNTY] (1998) (stating the sovereign right to develop continues to be the "real" practice of the international community).

     The principle of the right to develop is beginning to play a role in water use controversies. The Canadian Provinces and the U.S. states which border the Great Lakes are concurrently concerned about the environmental and other risks posed by possible water withdrawals for bulk tanker shipments, and the right to develop is the conceptual basis for an anti-export strategy. Some international trade experts, especially in Canada, have opined that Article XI of the General Agreement of Tariffs and Trade ("GATT") and the North American Free Trade Agreement ("NAFTA") invalidate all flat export bans. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 [hereinafter GATT]; North American Free Trade Agreement, Dec. 8-17, 1993, ***32 I.L.M. 289 & 605*** [hereinafter NAFTA]. Article XI bans "prohibitions or restrictions other than duties, taxes or other charges. . . "on exports and imports, but Article XX(g) allows a state to defend an export ban that is necessary to conserve "exhaustible natural resources." GATT, arts. XI & XX(g). The three NAFTA countries have agreed to exclude non-bottled water from the agreement. The text provides in part:

     The NAFTA creates no rights to natural water resources of any party to the Agreement unless water, in any form, has entered into commerce and become a good or product, it is not covered by the provisions of any trade agreement including the NAFTA. And nothing in the NAFTA would oblige any NAFTA Party to either exploit its water for commercial use, or to begin exporting water in any form. Water in its natural state in lakes, ***rivers***, reservoirs, aquifers, water basins and the like is not a good or product, is not traded, and therefore is not and never has been subject to the terms of any trade agreement.

     *Accord for the Prohibition of Bulk Water Removal From Drainage Basins* (last modified Dec. 1, 1999) <[*http://www.ccme.ca/1e\_about/1eg\_communiques/1eg7\_water.html>*](http://www.ccme.ca/1e_about/1eg_communiques/1eg7_water.html>) [hereinafter*Accord*]. Canada's North American Free Trade Implementation Act similarly provides that water in packages, products, or tanks is a good, but that natural surface or groundwater, is not. R.S.C., ch. 44, § 7(2) (1993) (Can.). This "soft" declaration does not, of course, settle the issue.

     All Canadian provinces, with the exception of Quebec, have agreed to a ban on bulk water removal from the Canadian portion of the country's major drainage basins. *See Accord*. The policy will be implemented by each province and contains several exemptions and exclusions such as bottled water, water packaged in small portable containers, water used in food production, water to meet short term safety, security or humanitarian needs "and other purposes as determined by individual jurisdictions to meet environmental and other management needs consistent with the objective of the Accord." *Id.* The Water Resources Act of 1986 allows any Great Lakes state to veto any withdrawal outside of the basin. [*42 U.S.C. § 1962d-20*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:8SHT-0712-D6RV-H4XM-00000-00&context=1516831)(d) (1994).

     The opposite argument is that neither GATT nor NAFTA change the basic principle that state sovereignty allows a state to decide whether to allow trade in raw natural resources. Several World Trade Organization ("WTO") decisions reject the conservation defense when a nation has attempted to conserve marine resources outside of its territory. However, the WTO decisions do not preclude the application of environmental and other conservation measures to a nation's internal waters because they are premised on the protection of state sovereignty over internal resources. Recent WTO Appellate decisions have qualified Article XX by holding that export restrictions must not only fall within the enumerated list in Article XX but they must also be consistent with the "chapeau" which provides that "such measures are not [to be] applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." WTO Appellate Body, Report of the Appellate Body in U.S.--Standards for Reformulated and Conventional Gasoline, [*35 I.L.M. 603, 617 (1996);*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-M3B0-0041-400P-00000-00&context=1516831)*see also* WTO Appellate Body, Report of the Appellate Body of U.S.--Import Prohibitions of Certain Shrimp and Shrimp Products, 36 I.L.M. 832, WT/DS58/AB R (Oct. 1998) (complaint by India, Malaysia, Pakistan, and Thailand holding the U.S.'s failure to justify the application of different standards to different exporting countries and recognized the right of WTO members to preserve their environmental resources); Bret Puls, *The Murky Waters of International Environmental Jurisprudence: A Critique of Recent WTO Holdings in the Shrimp/Turtle Controversy*, [*8 MINN. J. GLOBAL TRADE 343 (1999);*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3X7M-0DD0-00CV-N080-00000-00&context=1516831)GATT Dispute Panel Report on Mex. Complaint Concerning U.S. Restrictions on Imports of Tuna, 1991 WL 771248 (Sept. 3, 1991); GATT Dispute Panel Report on EEC & Neth. Complaint Concerning U.S. Restriction on Imports of Tuna, 1994 WL 907620 (June 16, 1994). Traditional water conservation management does not violate the fundamental premise of trade law that all trade partners be treated in a non-discriminatory manner. *See generally* INTERNATIONAL JOINT COMM'N, PROTECTION OF THE WATERS OF THE GREAT LAKES: FINAL REPORT TO THE GOVERNMENTS OF CANADA AND THE UNITED STATES (2000). [↑](#footnote-ref-106)
106. 106 Rio Declaration, *supra* note 59. [↑](#footnote-ref-107)
107. 107 *Id.*, princ. 2, [*31 I.L.M. at 876.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MTY0-0041-41KS-00000-00&context=1516831) [↑](#footnote-ref-108)
108. 108 *Id.*, princs. 17 & 19, [*31 I.L.M. at 879.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MTY0-0041-41KS-00000-00&context=1516831) [↑](#footnote-ref-109)
109. 109 *See generally* Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources: Report of the Secretary General of the Conference, A/CONF.151/PC/100/ADD.22, *reprinted in* 1 AGENDA 21 & THE UNCED PROCEEDINGS 513-57 (1992). [↑](#footnote-ref-110)
110. 110 *See* Gretta Goldenman, *Adapting to Climate Change: A Study of International* ***Rivers*** *and Their Legal Arrangements*, 17 ECOLOGY L.Q. 741, 762-66 (1990). [↑](#footnote-ref-111)
111. 111 The latest United States assessment warns of increased droughts, earlier spring runoffs, lower summer flows, and higher evapotranspiration rates. U.S. National Assessment of the Potential Consequences of Climate Variability and Change. <[*http://www.nacc.usgcrp.gov/sectors/water/draft-report/full\_report.html>*](http://www.nacc.usgcrp.gov/sectors/water/draft-report/full_report.html>) (last visited 6/12/00). [↑](#footnote-ref-112)
112. 112 *See* Lazerwitz, *supra* note 6, at 269-70. [↑](#footnote-ref-113)
113. 113 I have addressed these issues at greater length in A. Dan Tarlock, *Now, Think Again About Adaptation*, 9 ARIZ. J. OF INT'L & COMP. L. 169 (1992). Water marketing has been proposed as an adaptation strategy. Economists and many western water critics have long criticized western water law because it ignores higher, alternative values of water. Critics assert that too much water is used to grow surplus or low-valued crops, too much water is used in a wasteful manner, and that increased transfers are desirable. Prior appropriation allocates the risks of shortages by a simple principle--priority of use. The question is how flexible the water transfer system will be in the future. Two sets of problems, one institutional, the other distributional must be addressed. The first question is whether water users will respond sufficiently to market incentives. The second and more difficult question is whether the redistributions commanded by the market are fair and consistent with ecosystem sustainability in both the short and long run. *See* COMMITTEE ON WESTERN WATER MGMT., NATIONAL RES. COUNCIL, WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT (1992). [↑](#footnote-ref-114)
114. 114 *See* Goldenmann, *supra* note 109, at 749-56. [↑](#footnote-ref-115)
115. 115 Treaty Respecting Utilization of Waters of the ***Colorado*** and Tijuana ***Rivers*** and of the Rio Grande, Feb. 3 & Nov. 14, 1944, U.S.-Mex., [*59 Stat. 1219*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:5CBP-FY70-01XN-S099-00000-00&context=1516831) [hereinafter the 1944 Water Treaty]. [↑](#footnote-ref-116)
116. 116 *See supra* note 111. [↑](#footnote-ref-117)
117. 117 See Meyers & Noble, *supra* note 63. [↑](#footnote-ref-118)
118. 118 International Watercourses Convention, *supra* note 1, art. 5, [*36 I.L.M. at 711.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-119)
119. 119 *Id.* [↑](#footnote-ref-120)
120. 120 *Id.*, art. 6, [*36 I.L.M. at 719.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-121)
121. 121 *Id.* [↑](#footnote-ref-122)
122. 122 *Id.* [↑](#footnote-ref-123)
123. 123 *See* Albert Utton, *Which Rule Should Prevail in International Water Disputes: That of Reasonableness or That of No Harm?*, 36 NAT. RESOURCES J. 635 (1996). [↑](#footnote-ref-124)
124. 124 *See* Robert Rosenstock, *The Forty-Fifth Session of the International Law Commission*, [*88 AM. J. INT'L L. 139 (1994).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3T-8YC0-00CV-7176-00000-00&context=1516831) [↑](#footnote-ref-125)
125. 125 *See* NATIONAL RES. COUNCIL, THE GREAT LAKES WATER QUALITY AGREEMENT: AN EVOLVING INSTRUMENT FOR ECOSYSTEM MANAGEMENT (1985); Symposium, *Prevention of Groundwater Contamination in the Great Lakes Region*, [*65 CHI.-KENT L. REV. 345 (1989).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S41-22T0-00CT-S0XF-00000-00&context=1516831) [↑](#footnote-ref-126)
126. 126 Many ecologists criticize the concept of adaptive ecosystem management as simply a restatement of multiple-use development. *See* NOSS & COOPERIDER, *supra* note 27, at 210-13. Proponents of multiple-use development often see the concept as a new anti-development regime. *See e.g.*, Rebecca Thomson, *Ecosystem Management: Great Idea, But What Is It, Will It Work, and Who Will Pay?*, 9 NAT. RESOURCES & ENV'T 42 (1995). [↑](#footnote-ref-127)
127. 127 *See* Edith Brown Weiss et al., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 875-80 (1998) (providing a history of the drafting of Article 7). [↑](#footnote-ref-128)
128. 128 *See* International Law Comm'n, *supra* note 33, at 4-8. [↑](#footnote-ref-129)
129. 129 *See* Paisley & McDaniels, *supra* note 11, at 124-25. [↑](#footnote-ref-130)
130. 130 *First Report of the Non-Navigational Uses of International Watercourses*, 45th Sess., Report ,1 at 10, U.N. Doc. A/CN.4/451 (1993). [↑](#footnote-ref-131)
131. 131 *See* Charles B. Bourne, *The Primacy of the Principle of Equitable Utilization in the 1997 Watercourses Convention*, 1997 CAN. Y.B. OF INT'L L. 215, 221-24 (1997). [↑](#footnote-ref-132)
132. 132 *See* McCaffrey, *supra* note 26, at 12; Joseph W. Dellapenna, *Adapting the Law of Water Management: To Global Climate and Other Hydrological Stresses*, 35 J. AMER. WATER RES. ASS'N 1301, 1319 (1999). [↑](#footnote-ref-133)
133. 133 International Watercourses Convention, *supra* note 1, art. 7, [*36 I.L.M. at 706.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-134)
134. 134 Note, Come Hell or High Water: A Water Regime for the Jordan ***River*** Basin, [*75 WASH. U. L.Q. 919 (1997).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3RR5-MFX0-00CW-300N-00000-00&context=1516831) [↑](#footnote-ref-135)
135. 135 International Watercourses Convention, *supra* note 1, art. 6, [*36 I.L.M. at 706*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) (emphasis added). [↑](#footnote-ref-136)
136. 136 *See supra* Part III.A. [↑](#footnote-ref-137)
137. 137 International Watercourses Convention, *supra* note 1, art. 6, [*36 I.L.M. at 706.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-138)
138. 138 *Id.*, art. 2, [*36 I.L.M. at 704.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-139)
139. 139 The San Pedro ***River*** depletions must be addressed by the creation of a long binational conservation area. *See infra* note 141. [↑](#footnote-ref-140)
140. 140 [↑](#footnote-ref-141)
141. 141 International Watercourses Convention, *supra* note 1, arts. 20 & 22, [*36 I.L.M. at 710.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-142)
142. 142 *See* Charles M. Carvell, *The North Dakota Garrison Diversion Project and International Environmental Law*, 60 N.D. L. REV. 603 (1984). [↑](#footnote-ref-143)
143. 143 *See* SAN PEDRO EXPERT STUDY TEAM, SUSTAINING AND ENHANCING RIPARIAN MIGRATORY BIRD HABITATION ON THE UPPER SAN PEDRO ***RIVER*** (Commission on Envtl. Cooperation 1999) <[*http://www.cec.org/pubs\_info\_resources/publications/mandate\_pubs/sanped.cfm?varlan=english>*](http://www.cec.org/pubs_info_resources/publications/mandate_pubs/sanped.cfm?varlan=english>). [↑](#footnote-ref-144)
144. 144 *Id.* at 16. [↑](#footnote-ref-145)
145. 145 *Id.* at 18. [↑](#footnote-ref-146)
146. 146 *Id.* at 17-18. [↑](#footnote-ref-147)
147. 147 *See* Lake Lanoux Arbitration (Fr. v. Spain), 24 I.L.R. 101 (Arb. Trib. 1957) (widely read to reject any right to the undiminished flow of an international stream); Charles B. Bourne, *The Right to Utilize Waters of International* ***Rivers***, 1965 CAN. Y.B. INT'L L. 187, 190- 203 (1965) (providing a full exposition of the rise and fall of the theory of natural flow). [↑](#footnote-ref-148)
148. 148 *See* Toru Iwama, *Emerging Principles and Rules for the Prevention and Mitigation of Environmental Harm, in* ENVIRONMENTAL CHANGE AND INTERNATIONAL ENVIRONMENTAL LAW: NEW CHALLENGES AND DIMENSIONS 107 (Edith Brown Weiss ed., 1992). [↑](#footnote-ref-149)
149. 149 Paisley & McDaniels, *supra* note 11, at 114. [↑](#footnote-ref-150)
150. 150 *Id.* at 117. [↑](#footnote-ref-151)
151. 151 Id. at 131. [↑](#footnote-ref-152)
152. 152 International Watercourses Convention, *supra* note 1, art. 7, [*36 I.L.M. at 709.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-153)
153. 153 *Id.* [↑](#footnote-ref-154)
154. 154 Dante A. Caponera, *The Role of Customary International Water Law, in* WATER RESOURCES POLICY FOR ASIA: PROCEEDINGS OF THE REGIONAL SYMPOSIUM ON WATER RESOURCES POLICY IN AGRO-SOCIO ECONOMIC DEVELOPMENT 365 (Mohammed Ali et al. eds., 1987). [↑](#footnote-ref-155)
155. 155 State responsibility for the conduct of private parties who cause injury to the territory of another state is widely asserted in international law, although the basis for the duty and its scope are disputed. The basic principle is that a state must exercise due diligence to prevent conduct, if performed by the state, which would breach its primary international duties. This is thought to include the duty to regulate and to enforce regulations. *Developments in the Law: International Environmental Law*, [*104 HARV. L. REV. 1494-96 (1991).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S41-29J0-00CV-51KM-00000-00&context=1516831) Section 601 of the *Restatement of the Foreign Relations of the United States* endorses this duty to regulate and enforce regulations and limits the state duty to take necessary environmental protection measures to "the extent practicable under the circumstances." David D. Caron describes this standard as conservative compared to the fault-based, due diligence standard of international law. David J. Caron, *The Law of the Environment: A Symbolic Step of Modest Value*, 14 YALE J. INT'L L. 528, 535 (1989) [↑](#footnote-ref-156)
156. 156 The Trail Smelter Case (U.S. v. Can.), 3 R.I.A.A. (1938), is the basis for the two most authoritative statements of state liability which extends to the failure to police and regulate those acting within a state's territory. State liability for acts which injure the other is re-enforced by the *Corfu Channel* decision. Corfu Channel Case (U.K. v. Alb.), 1949 I.C.J. 4 (Apr. 9). Given the paucity of precedents and the great diversity in state practice in response to environmental insults, the international community continues to debate the issue of whether substantive duties on states, which make trans-frontier pollution a wrongful act, exist. *See e.g.*, Karl Zemanek, *State Responsibility and Liability, in* ENVIRONMENTAL PROTECTION AND INTERNATIONAL LAW 187-88 (Winfried Lang et al. eds., 1991). [↑](#footnote-ref-157)
157. 157 Johan G. Lammers, *International and European Community Law Aspects of Pollution of International Watercourses, in* ENVIRONMENTAL PROTECTION AND INTERNATIONAL LAW 115 (Winfried Lang et al. eds., 1991). [↑](#footnote-ref-158)
158. 158 The issue is whether states are absolutely (strictly) liable or whether they are only liable for intentional environmental insults and the failure to use due care. The argument for a fault-based regime is that this is most consistent with the principle of sovereignty and past practice. The International Law Commission has divided international law into the old state responsibility and the new international liability to broaden the debate to include "absolute" or strict liability, but the consensus is that this is a distinction without a difference. Francisco Orrego Vicuna, *State Responsibility, Liability, and Remedial Measures Under International Law: New Criteria for Environmental Protection, in* ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW: [*NEW CHALLENGES AND DIMENSIONS, supra*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-3DB0-003B-S3CH-00000-00&context=1516831) note 146, at 139. The strict liability rule is criticized, in part, because it discourages serious negotiations. Merrill, *supra* note 12. [↑](#footnote-ref-159)
159. 159 Paul R. Williams, *Can International Legal Principles Play a Positive Role in Resolving Central and East European Transboundary Environmental Disputes?*, 7 GEO. INT'L ENVTL. L. REV. 421, 438 (1994). [↑](#footnote-ref-160)
160. 160 *See* William Bush, *Compensation and the Utilization of International* ***Rivers*** *and Lakes: The Role of Compensation in the Event of Permanent Injury to Existing Uses of Water, in* THE LEGAL REGIME OF INTERNATIONAL ***RIVERS*** AND LAKES 309, 315 (Ralph Zacklin et al. eds., 1981). In contrast to the prior Helsinki Rules, the Convention does not provide for compensation. Helsinki Rules, *supra* note 66, art. V, sec. 2(j). [↑](#footnote-ref-161)
161. 161 See Stephen C. McCaffrey, *Water, Politics and International Law, in* WATER IN CRISIS: A GUIDE TO THE WORLD'S FRESH WATER RESOURCES 92 (Peter Gleick ed., 1993). [↑](#footnote-ref-162)
162. 162 An exhaustive study of the influence of hard and soft international environmental law on the right to develop water resources observes that modern sharing rules are premised on the assumption that "the elasticity of the equitable utilization principle leads to a whole series of procedural rules because, without such rules, States often recognize the limits of their rights only when they unintentionally deprive another State of its equitable share." HAROLD HOHMANN, PRECAUTIONARY LEGAL DUTIES AND PRINCIPLES OF MODERN INTERNATIONAL ENVIRONMENTAL LAW 116 (1994). [↑](#footnote-ref-163)
163. 163 Rio Declaration, *supra* note 59, princ. 19, [*31 I.L.M. at 879.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MTY0-0041-41KS-00000-00&context=1516831) [↑](#footnote-ref-164)
164. 164 *See* Charles B. Bourne, *Procedure in the Development of International Drainage Basins*, 22 U. TORONTO L.J. 172, 191 (1972). [↑](#footnote-ref-165)
165. 165 For a history of Brazil's objections to the duty to consult (written by an Argentinian scholar) see Guillermo J. Cano, Argentina, Brazil, and the de la Plata ***River*** Basin: A Summary of Their Legal Relationship, in WATER IN A DEVELOPING WORLD 126 (Albert E. Utton & Ludwik Teclaff, eds., 1978). [↑](#footnote-ref-166)
166. 166 International Watercourses Convention, *supra* note 1, art. 12, [*36 I.L.M. at 707-08.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-167)
167. 167 *Id.*, art. 11, [*36 I.L.M. at 707.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-168)
168. 168 *Id.*, art. 13, [*36 I.L.M. at 708.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-169)
169. 169 *Id.*, art. 14, [*36 I.L.M. at 708.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-170)
170. 170 *See* Ellen Hey, *The Precautionary Concept in Environmental Policy and Law: Institutionalizing Caution*, 4 GEO. INT'L ENVTL. L. REV. 303, 312-18 (1991). For example, in 1983, the German government took the position that regulation of pollution in the North Sea was not dependent upon the proof of harm. The Second North Sea Declaration reflects the view of Germany. In addition, other marine conventions, United Nations sustainable development declarations, the ozone convention, and regional hazardous waste treaties reflect this view. However, the idea of ecological risk prevention remains underdeveloped. [↑](#footnote-ref-171)
171. 171 *See* Gunther Handl, *Environmental Security and Global Change: The Challenge to International Law*, 1 Y.B. INT'L ENVTL. L. 3 (1990). [↑](#footnote-ref-172)
172. 172 *See id.* at 22-24 (providing a skeptical view of the precautionary principle). [↑](#footnote-ref-173)
173. 173 James E. Hickey Jr. & Vern R. Walker, *Refining The Precautionary Principle in International Environmental Law*, [*14 VA. ENVTL. L.J. 424 (1995).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3S3T-TY00-00CV-S0YY-00000-00&context=1516831) [↑](#footnote-ref-174)
174. 174 *See* HOHMANN, *supra* note 160 (arguing that the precautionary principle is a logical product of the trend toward planned environmental management and that it has been so widely adopted in binding and non-binding agreements that it has become an "instant" customary doctrine of international law). [↑](#footnote-ref-175)
175. 175 Environmentalism derives its primary force from the universal warning messages of elite science. As James Rosenau has written:

     Politicians cannot exercise control over environmental outcomes without recourse to scientific findings. They may claim that the findings are not clear-cut or remain subject to contradictory interpretations, but they are nonetheless dependent on what practices of science uncover about the laws of nature . . . Criteria of proof are at the heart of environmental politics . . . the outcomes of environmental issues depend as much on the persuasiveness of evidence as on the various criteria of power--superior resources, greater mass support, skill at coalition formation--that sustain or resolve other types of issues.

     James N. Rosenau, *Environmental Challenges in a Global Context, in* ENVIRONMENTAL POLITICS IN THE INTERNATIONAL ARENA: MOVEMENTS, PARTIES, ORGANIZATIONS, AND POLICY 257, 258 (Sheldon Kamieniecki ed., 1993). [↑](#footnote-ref-176)
176. 176 Gunther Handl, The Principle of "Equitable Use" as Applied to Internationally Shared Natural Resources: its role in Resolving Potential International Disputes over Transfrontier Pollution, 14 Revue Belge De Droit 40 (1979). Article 12 of the Convention includes as part of the duty to notify other riparian states of possible significant adverse effects, the duty to include "the results of any environmental impact assessment" that was done by the notifying state. International Watercourses Convention, *supra* note 1, art. 12, [*36 I.L.M. at 707-08.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-177)
177. 177 *See* discussion *supra* Part III.C. [↑](#footnote-ref-178)
178. 178 *See id.* [↑](#footnote-ref-179)
179. 179 Gabcikovo-Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, 113 (Sept. 25). [↑](#footnote-ref-180)
180. 180People around the world in the 1990s are perceiving the earth as more than a globe to be surveyed, or developed for the public good in the short term, or to be protected from threats to its well-being both human and natural. It is all of these in some degree, but has additional dimensions. People in many cultures accept its scientific description as a matter of belief. They recognize a commitment to care for it in perpetuity. They accept reluctantly an obligation to come to terms with problems posed by growth in numbers and appetites. This is not simply anxious analysis of economic and social consequences of political policies toward environmental matters. The roots are in a growing solemn sense of the individual as part of one human family for whom earth is its spiritual home." Gilbert F. White, *Reflections on Changing Perceptions of the Earth, in* ANNUAL REVIEW OF ENERGY AND THE ENVIRONMENT 9 (1994). [↑](#footnote-ref-181)
181. 181 Weiss, *supra* note 24, at 238 (arguing that present generations owe conservation duties to future generations and that "conservation of quality . . . cautions against water withdrawals that may result in pollution of water supplies . . . that will be expensive or impossible for future generations to repair"). [↑](#footnote-ref-182)
182. 182 *Id.* at 17. [↑](#footnote-ref-183)
183. 183 *Id.* at 22-24. [↑](#footnote-ref-184)
184. 184 *See* DAVID PEARCE ET AL., SUSTAINABLE DEVELOPMENT: ECONOMIC AND ENVIRONMENT IN THE THIRD WORLD (1990). [↑](#footnote-ref-185)
185. 185 NATIONAL RES. COUNCIL, DOWNSTREAM: ADAPTIVE MANAGEMENT OF GLEN CANYON DAM AND THE ***COLORADO*** ECOSYSTEM (1999). [↑](#footnote-ref-186)
186. 186 *Id.* at 56. (unfortunately, "to date, the Adaptive Management Program has not produced a scientific and stakeholder-based consensus regarding the desired state of the ecosystem . . . ."). [↑](#footnote-ref-187)
187. 187 *See* Botkin, *supra* note 23. [↑](#footnote-ref-188)
188. 188 *Id.* [↑](#footnote-ref-189)
189. 189 *See* NOSS & COOPERIDER, *supra* note 27, at 84-86. [↑](#footnote-ref-190)
190. 190 Meyer, *supra* note 27, at 78. [↑](#footnote-ref-191)
191. 191 COMMITTEE ON RESTORATION OF AQUATIC ECOSYSTEMS, NATIONAL RES. COUNCIL, RESTORATION OF AQUATIC ECOSYSTEMS: SCIENCE, TECHNOLOGY, AND PUBLIC POLICY 357 (1992). [↑](#footnote-ref-192)
192. 192 *Id.* [↑](#footnote-ref-193)
193. 193 The philosophical basis for the new ecology can be found in Bill McKibben's widely read, *The End of Nature*, which argues the modern mind separates humanity from nature and thus, the romantic visions of harmony between humanity and nature are impossible. *See* BILL McKIBBEN, THE END OF NATURE (1989); *see also* Jonathan Baert Wiener, *Law and the New Ecology: Evolution, Categories, and Consequences*, 22 ECOLOGY L.Q. 325 (1995) (book review of Jonathan Baert Weiner, THE BREAK OF THE FINCH: A STORY OF EVOLUTION IN OUR TIME (1994)). [↑](#footnote-ref-194)
194. 194 Botkin, *supra* note 23, at 190. [↑](#footnote-ref-195)
195. 195 Literature concerning the principal environmental problem, the loss of historic salmon runs, is vast. *See e.g.*, Michael C. Blumm, et al., *Beyond the Parity Promise: Struggling to Save the Columbia Basin Salmon in the Mid-1990s*, ***27 ENVTL. L. 21 (1997);*** William Stelle, Jr., *Overcoming the Seven Myths of Columbia* ***River*** *Salmon Recovery*, [*28 ENVTL. L. 493 (1998).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3W4G-RB70-00CW-B0B6-00000-00&context=1516831) [↑](#footnote-ref-196)
196. 196 *See* Michael Collier, et al., DAMS AND ***RIVERS***: A PRIMER ON THE DOWNSTREAM EFFECTS OF DAMS 3 (1996) (U.S.G.S. Circular 1126). [↑](#footnote-ref-197)
197. 197 *See generally* RESTORATION OF AQUATIC ECOSYSTEMS, *supra* note 189. [↑](#footnote-ref-198)
198. 198 *See* A. Dan Tarlock, *The Creation of New Risk Sharing Water Entitlement Regimes: The Case of the Truckee-Carson Settlement*, [*25 ECOLOGY L.Q. 674 (1999).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3WHC-GWN0-00CV-J037-00000-00&context=1516831) [↑](#footnote-ref-199)
199. 199 See William K. Stevens, *Putting Things Right in the Everglades*, N.Y. TIMES, Apr. 13, 1999, at D1. [↑](#footnote-ref-200)
200. 200 *Id.* [↑](#footnote-ref-201)
201. 201 After the 1996 completion of Phase I by the identification of three alternative restoration and protection strategies, the process progressed to Phase II, the identification of a preferred alternative. Phase II will end in late 1999 with the preparation of the Final Programmatic Environmental Impact State/Environmental Impact Report. The Revised Phase II report outlines the draft preferred alternative. CALFED Bay-Delta Program, *Revised Phase II Report* (June 1999) <[*http://www.calfed.water.ca.gov/adobe\_pdf/revised\_draft\_eis\_eir>*](http://www.calfed.water.ca.gov/adobe_pdf/revised_draft_eis_eir>). Eighteen characteristics such as in and out of Delta water quality, operational flexibility, fisheries impacts, and risk to export water supplies were identified to assess three synthesis alternatives. The Report recommends a preferred alternative, which is the adoption of adaptive management to implement eight strategies over a 30 year period.*Id.* at 25, 28. The eight strategies are: (1) long-term levee protection; (2) a water quality program to make significant reductions in point and non-point source pollution; (3) ecosystem restoration; (4) increased water use efficiency among all state water users; (5) the development of "an active and properly regulated water market which will allow water to move between users;" (6) locally-led watershed management activities; (7) new storage, including groundwater options; and (8) a through-Delta conveyance based on the existing Delta configuration. *Id.* at 25, 27-28. [↑](#footnote-ref-202)
202. 202 Commission on Environmental Cooperation, FACTUAL RECORD SEM 97-001 (BC Aboriginal Fisheries Commission et al, June, 2000). [↑](#footnote-ref-203)
203. 203 *See* MURRAY-DARLING BASIN COMM'N, ANNUAL REPORT 1998-99 (1999) <[*http://www.mdbc.gov/au/MDBasin/index.html>*](http://www.mdbc.gov/au/MDBasin/index.html>) [hereinafter ANNUAL REPORT]. [↑](#footnote-ref-204)
204. 204 MURRAY-DARLING BASIN COMM'N, *The Murray-Darling Basin: An Introduction* <[*http://www.mdbc.gov.au/MDBasin/Introduction/MDB\_Introduction.html>*](http://www.mdbc.gov.au/MDBasin/Introduction/MDB_Introduction.html>); MURRAY-DARLING BASIN COMM'N,*Agriculture* <[*http://www.mdbc.gov.au/MDBasin/Resources/Agriculture/Agriculture.html>*](http://www.mdbc.gov.au/MDBasin/Resources/Agriculture/Agriculture.html>); MURRAY-DARLING BASIN COMM'N,*Detailed Statistics: Agriculture* <[*http://www.mdbc.gov.au/MDBasin/Detail\_Stats/Agriculture.html>*](http://www.mdbc.gov.au/MDBasin/Detail_Stats/Agriculture.html>). [↑](#footnote-ref-205)
205. 205 MURRAY-DARLING BASIN COMM'N, *History of the Murray-Darling Basin Agreement* <[*http://www.mdbc.gov.au/Initiative/Agreement/History.html>*](http://www.mdbc.gov.au/Initiative/Agreement/History.html>). [↑](#footnote-ref-206)
206. 206 MURRAY-DARLING BASIN COMM'N, *The Murray-Darling Basin: An Introduction* <[*http://www.mdbc.gov.au/MDBasin/Introduction/MDB\_Introduction.html>*](http://www.mdbc.gov.au/MDBasin/Introduction/MDB_Introduction.html>); MURRAY-DARLING BASIN COMM'N,*The* ***River*** *Murray System* <[*http://www.mdbc.gov.au/RMS/RMS.html>*](http://www.mdbc.gov.au/RMS/RMS.html>). [↑](#footnote-ref-207)
207. 207 *Id.* [↑](#footnote-ref-208)
208. 208 ANNUAL REPORT, *supra* note 200, at 19-20, 32-34. [↑](#footnote-ref-209)
209. 209 *Id.* at 7; *see also* Murray-Darling Basin Agreement, June 1992 (with additions to July 1999), Austl.-N.S.W.-Vict.-S. Austl., <[*www.mdbc.gov.au>*](HTTP://www.mdbc.gov.au). [↑](#footnote-ref-210)
210. 210 *Murray-Darling Basin Agreement, supra* note 206. [↑](#footnote-ref-211)
211. 211 *Id.*, pt. X. [↑](#footnote-ref-212)
212. 212 *Id.*, pts. III & IV. [↑](#footnote-ref-213)
213. 213 *Id.*, pts. V & VI. [↑](#footnote-ref-214)
214. 214 *Id.* [↑](#footnote-ref-215)
215. 215 Annual Report 1998-1999, supra note 200, at 24. The ministerial council has commissioned a five year review of the Cap to "identify any impediments and constraints to its full operation." MURRAY-DARLING BASIN COMM'N, REVIEW OF THE CAP IMPLEMENTATION 1997-1998, REPORT OF THE INDEPENDENT AUDIT GROUP (1998) [hereinafter REVIEW OF THE CAP IMPLEMENTATION]. [↑](#footnote-ref-216)
216. 216 ANNUAL REPORT, *supra* note 200. [↑](#footnote-ref-217)
217. 217 MURRAY-DARLING BASIN COMM'N, MURRAY-DARLING BASIN CAP ON DIVERSIONS: WATER YEAR 1997/98 STRIKING THE BALANCE (1998) [hereinafter MURRAY-DARLING BASIN CAP ON DIVERSIONS]. [↑](#footnote-ref-218)
218. 218 *Id.* [↑](#footnote-ref-219)
219. 219 *See generally* MURRAY-DARLING BASIN COMM'N, WATER AUDIT MONITORING REPORT 1996/97 (1998). [↑](#footnote-ref-220)
220. 220 *Id.* at 11-13, 17-19. [↑](#footnote-ref-221)
221. 221 *Id.* at 10. [↑](#footnote-ref-222)
222. 222 MURRAY-DARLING BASIN CAP ON DIVERSIONS, *supra* note 214, at 10. [↑](#footnote-ref-223)
223. 223 *Id.* [↑](#footnote-ref-224)
224. 224 Water diversions in the Murrumbidgee Valley are approaching the upper confidence levels of the Cap irrigation is projected to increase. REVIEW OF THE CAP IMPLEMENTATION, supra note 212. [↑](#footnote-ref-225)
225. 225 *See* PHILIP L. FRADKIN, A ***RIVER*** NO MORE: THE ***COLORADO*** ***RIVER*** AND THE WEST 184 (1981). [↑](#footnote-ref-226)
226. 226 *Id.* [↑](#footnote-ref-227)
227. 227 *Id.* [↑](#footnote-ref-228)
228. 228 *See* U.S. DEP'T OF INTERIOR, OPERATION OF GLEN CANYON DAM, FINAL ENVIRONMENTAL IMPACT STATEMENT 73-76 (1995). [↑](#footnote-ref-229)
229. 229 COMMITTEE TO REV. THE GLEN CANYON ENVTL. STUD., NATIONAL RES. COUNCIL, ***RIVER*** AND DAM MANAGEMENT: A REVIEW OF THE BUREAU OF RECLAMATION'S GLEN CANYON ENVTL. STUD. 3 (1987); ***COLORADO*** ***RIVER*** ECOLOGY AND DAM MANAGEMENT 1 (1991); ***RIVER*** RESOURCE MANAGEMENT IN THE GRAND CANYON x-xi (1996); DOWNSTREAM: ADAPTIVE MANAGEMENT OF GLEN CANYON DAM AND THE ***COLORADO*** ***RIVER*** ECOSYSTEM viii (1999). [↑](#footnote-ref-230)
230. 230 Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, ***106 Stat. 4699 (1992).*** [↑](#footnote-ref-231)
231. 231 *Id.* § 1802. [↑](#footnote-ref-232)
232. 232 *See* U.S. DEP'T OF INTERIOR, *supra* note 225. [↑](#footnote-ref-233)
233. 233 *Id.* [↑](#footnote-ref-234)
234. 234 *Id.* [↑](#footnote-ref-235)
235. 235 *Id.* [↑](#footnote-ref-236)
236. 236 *Id.* [↑](#footnote-ref-237)
237. 237 *See* U.S. DEP'T OF INTERIOR, *supra* note 225.. [↑](#footnote-ref-238)
238. 238 *Id.* [↑](#footnote-ref-239)
239. 239 *Id.* [↑](#footnote-ref-240)
240. 240 *Id.* [↑](#footnote-ref-241)
241. 241 *See* Meyers, *supra* note 63; *see also*, Paul L. Bloom, *Law of the* ***River****: A Critique of an Extraordinary Legal System, in* NEW COURSES FOR THE ***COLORADO*** ***RIVER*** 139 (Gary Weatherford & F. Lee Brown eds., 1983) (providing an introduction to the "law of the ***river***"). [↑](#footnote-ref-242)
242. 242 CARLOS VALDES-CASILLAS ET AL., INFORMATION DATABASE AND LOCAL OUTREACH PROGRAM FOR THE RESTORATION OF THE HARDY ***RIVER*** WETLANDS, LOWER ***COLORADO*** ***RIVER*** DELTA, BAJA CALIFORNIA AND SONORA, MEXICO (North American Wetland Conservation Council, 1998). [↑](#footnote-ref-243)
243. 243 DANIEL F. LUECKE ET AL., A DELTA ONCE MORE: RESTORING RIPARIAN AND WETLAND HABITAT IN THE ***COLORADO*** ***RIVER*** DELTA 1 (1999). [↑](#footnote-ref-244)
244. 244 *Id.* at 8. [↑](#footnote-ref-245)
245. 245 *Id.* at 1. [↑](#footnote-ref-246)
246. 246 *Id.* at 2. [↑](#footnote-ref-247)
247. 247 *Id.* at 1. [↑](#footnote-ref-248)
248. 248 *Id.* at 12. [↑](#footnote-ref-249)
249. 249 LUECKE ET AL., *supra* note 240, at 20. [↑](#footnote-ref-250)
250. 250 *Id.* at 42. [↑](#footnote-ref-251)
251. 251 *Id.* [↑](#footnote-ref-252)
252. 252 [*Arizona v. California, 373 U.S. 546, 546-47 (1963),*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-H3B0-003B-S2D7-00000-00&context=1516831) *supplemental decree*, [*376 U.S. 340, 340 (1964).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-H350-003B-S2D6-00000-00&context=1516831) [↑](#footnote-ref-253)
253. 253 1944 Water Treaty, *supra* note 113. [↑](#footnote-ref-254)
254. 254 LUECKE ET AL., *supra* note 237, at 12. [↑](#footnote-ref-255)
255. 255 The precarious position of the Delta is reflected in Mexico's comments to the final Department of Interior rule, [*64 Fed. Reg. 59,006 (1999)*](https://advance.lexis.com/api/document?collection=administrative-codes&id=urn:contentItem:3XSH-NC70-006W-832C-00000-00&context=1516831) (to be codified at 43 C.F.R. pt. 414), which allows voluntary transfers of surplus ***Colorado*** ***River*** entitlements among Lower Basin states. Mexico expressed concerns that the storage of surplus entitlements prior to transfer would result in a 1% annual decrease of the total quantity of water projected to reach Mexico between 1999 and 2015. The Department of Interior responded that there could be a decrease in flood control releases reaching the Delta and stood on the legal position that "at present, Reclamation has no authority or discretion over the type of use or location of use of ***Colorado*** ***River*** water once it reaches Mexico." [*64 Fed. Reg. 58,992-58,993 (1999).*](https://advance.lexis.com/api/document?collection=administrative-codes&id=urn:contentItem:3XSH-NC70-006W-832C-00000-00&context=1516831) [↑](#footnote-ref-256)
256. 256 Mexico's share is a first priority because Article X of the 1944 Water Treaty guarantees her this amount subject to an "extraordinary drought" or serious damage to upstream irrigation systems. *See* Meyers & Noble, *supra* note 63. Article III(c) of the ***Colorado*** ***River*** Compact provides that any (then) future Mexican allocation be supplied (1) from any surplus waters and, "if such surplus shall prove insufficient" (2) the deficiency should be borne equally by the two basins. [***COLO.*** *REV. STAT. § 37-61-101*](https://advance.lexis.com/api/document?collection=statutes-legislation&id=urn:contentItem:61P5-WY01-DYDC-J33S-00000-00&context=1516831) (1973). [↑](#footnote-ref-257)
257. 257 *See* David J. Guy, *When the Law Dulls the Edge of Chance: Transferring Upper Basin Water to the Lower* ***Colorado******River*** *Basin*, 1991 UTAH L. REV. 25, 36 (1991). [↑](#footnote-ref-258)
258. 258 Tarlock, *supra* note 111, at 173-78; A. Dan Tarlock, *Western Water Law, Global Warming, and Growth Limitations*, 24 LOY. L.A. L. REV. 979, 998-99 (1991). [↑](#footnote-ref-259)
259. 259 *See supra* note 104. [↑](#footnote-ref-260)
260. 260 [*64 Fed. Reg. 59,006 (1999)*](https://advance.lexis.com/api/document?collection=administrative-codes&id=urn:contentItem:3XSH-NC70-006W-832C-00000-00&context=1516831) (to be codified as 43 C.F.R. pt. 414). [↑](#footnote-ref-261)
261. 261 International Watercourses Convention, *supra* note 1, arts. III & VIII, [*36 I.L.M. at 704-07.*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:3SGP-MRC0-0041-41CP-00000-00&context=1516831) [↑](#footnote-ref-262)
262. 262 *Id.* [↑](#footnote-ref-263)
263. 263 International Boundary and Water Commission, Minute 242, [*12 I.L.M. 1105 (1973).*](https://advance.lexis.com/api/document?collection=analytical-materials&id=urn:contentItem:42MV-FN20-0041-43DS-00000-00&context=1516831) [↑](#footnote-ref-264)
264. 264 *See* DALE PONTIUS, ***COLORADO*** ***RIVER*** BASIN STUDY 24 (Western Water Pol'y Rev. Comm'n 1997). [↑](#footnote-ref-265)
265. 265 [*United States v. Alpine Land & Reservoir* ***Co****., 697 F.2d 851, 858 (9th Cir. 1983).*](https://advance.lexis.com/api/document?collection=cases&id=urn:contentItem:3S4X-0TK0-003B-G43F-00000-00&context=1516831) [↑](#footnote-ref-266)