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EQUITY AND THE COLORADO RIVER COMPACT

BY

JASON A. ROBISON & DOUGLAS S. KENNEY*

The Colorado River and the elaborate body of laws governing its flows (Law of the River) are at a critical juncture, with a formidable imbalance between water supplies and demands prompting diverse efforts to evaluate and to think anew about Colorado River governance. One such effort is the Colorado River Governance Initiative (CRGI) at the University of Colorado Law School. Incorporating CRGI research undertaken over the past two-and-a-half years, this Article focuses on the interstate compact constituting the foundation of the Law of the River—the Colorado River Compact (Compact)—and approaches the water apportionment scheme established by this Compact as a subject of central importance in current efforts to navigate the future of the river. Lying at the base of the Compact is a commitment to equity—“equitable division and apportionment of the use of the waters of the Colorado River System”—which poses the fundamental question explored in this Article: To what extent does the Compact’s apportionment scheme fulfill this commitment to equity in its existing form? After providing an initial overview of the Compact, this Article considers the meaning of “equity” as a norm, setting the stage for a subsequent examination of water supplies and demands in the basin and of longstanding interpretive disputes involving the Compact’s key terms. This examination reveals several equity-related concerns associated with the composition of the Compact’s apportionment scheme and the governance structure devised for it. A discussion of these concerns occupies the final Part of this Article. Framing this discussion is our perspective that the Compact’s commitment to equity is a venerable one and that the concerns raised in this final Part need to be addressed

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in ongoing dialogue about Colorado River governance in order to fulfill this commitment in contemporary times.

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I. INTRODUCTION

It might be impossible to overstate the importance of the Colorado River to the southwestern United States—both within the Colorado River Basin and across expansive adjacent areas dependent on the river's life-giving flows.¹ In innumerable ways, the river has shaped the face of the region. It has facilitated, and continues to enable, the growth of major metropolitan areas like Albuquerque, Denver, Las Vegas, Los Angeles, Phoenix, Salt Lake City, and San Diego.² It provides lifeblood for hallmark

¹ See BUREAU OF RECLAMATION, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, INTERIM REPORT NO. 1, at SR-2, SR-10 (2011), available at <http://www.usbr.gov/lc/region/programs/crbstudy/Report1/StatusRpt.pdf> [hereinafter STATUS REPORT] (describing the importance of the Colorado River Basin to the surrounding Basin States and providing a useful map of the Colorado River Basin and adjacent areas where water is diverted from the Colorado River and its tributaries).

² *Id.* at SR-5.

national parks of unsurpassed natural beauty and immense cultural, historical, and scientific value, including the Grand Canyon.³ It gives sustenance to diverse American Indian tribes struggling to create viable homelands in modern U.S. society,⁴ as well as to myriad farming and ranching communities whose labor feeds the nation (and beyond). Measured by any metric—economic⁵ or otherwise—the Colorado River is a defining feature of the U.S. Southwest. Its fate bears immeasurably on the fate of the region.

Paralleling the significance of the Colorado River to the U.S. Southwest is the complexity of the body of laws devised for its governance. Colloquially called the “Law of the River,” this body of laws encompasses an international treaty, two interstate compacts, a historic U.S. Supreme Court decision (*Arizona v. California*),⁶ and several dozen federal statutes and regulations.⁷ Evolving continuously over roughly the past century,⁸ the Law

³ See CTR. FOR PARK RESEARCH, NAT’L PARKS CONSERVATION ASS’N, NAT’L PARKS OF THE COLORADO RIVER BASIN: WATER MANAGEMENT, RESOURCE THREATS, AND ECONOMICS 3, 20 (2011), available at http://www.npca.org/about-us/center-for-park-research/colorado_river_basin/Colorado-River-Report.pdf (identifying the effect that management of dams along the Colorado River and its tributaries has on national park units located in the Colorado River Basin).

⁴ See U.S. GEOLOGICAL SURVEY, FEDERAL LANDS AND INDIAN RESERVATIONS (2005), available at <http://nationalatlas.gov/printable/images/pdf/fedlands/fedlands3.pdf> (detailing locations of the numerous Indian reservations and other federal lands within the Colorado River Basin).

⁵ See SOUTHWICK ASSOCS., ECONOMIC CONTRIBUTIONS OF OUTDOOR RECREATION ON THE COLORADO RIVER AND ITS TRIBUTARIES 2 (2012), available at <http://www.southwickassociates.com/portfolio-view/economic-contributions-of-outdoor-recreation-on-the-colorado-river-its-tributaries> (identifying total value of all spending associated with recreational activities involving the Colorado River and its tributaries as \$25.6 billion per year).

⁶ 373 U.S. 546 (1963).

⁷ For an excellent survey of the laws comprising the Law of the River, see Lawrence J. MacDonnell, *Colorado River Basin*, in 4 WATERS AND WATER RIGHTS 5, 13–25 (Amy K. Kelley ed., 3d ed. 2011). For electronic copies of these laws, see John Weisheit, *The Hoover Dam Documents*, ON THE COLORADO, Dec. 18, 2010, <http://www.onthecolorado.com/articles.cfm?mode=detail&id=1292710182151> (last visited Nov. 18, 2012).

⁸ See generally NORRIS HUNDLEY, JR., WATER AND THE WEST: THE COLORADO RIVER COMPACT AND THE POLITICS OF WATER IN THE AMERICAN WEST (2d ed. 2009) [hereinafter WATER AND THE WEST] (providing a seminal account of the genesis of the Colorado River Compact and subsequent evolution of major components of the Law of the River). Additional sources offering outstanding accounts of different aspects of the history of the Law of the River and the Colorado River Basin include: WILLIAM DEBUYS, A GREAT ARIDNESS: CLIMATE CHANGE AND THE FUTURE OF THE AMERICAN SOUTHWEST 139–41, 165–72 (2011) (examining the history and litigation surrounding Arizona’s allocation of the Colorado River); PHILIP L. FRADKIN, A RIVER NO MORE: THE COLORADO RIVER AND THE WEST (Univ. of Cal. Press paperback ed. 1996) (1981) (comprehensively detailing the history and politics of the Colorado River Basin’s development); MARK W. T. HARVEY, A SYMBOL OF WILDERNESS: ECHO PARK AND THE AMERICAN CONSERVATION MOVEMENT (1994) (examining the clash between conservation and development interests in the 1950s over the proposed Echo Park Dam in Dinosaur National Monument); MICHAEL HILTZIK, COLOSSUS: HOOVER DAM AND THE MAKING OF THE AMERICAN CENTURY (2010) (describing the attempt to tame the Colorado River through the construction of Hoover Dam and how it defined the West and America); NORRIS HUNDLEY, JR., DIVIDING THE WATERS: A CENTURY OF CONTROVERSY BETWEEN THE UNITED STATES AND MEXICO (1966) (detailing the gradual formation of a treaty by the United States and Mexico governing their respective interests in the Colorado River); Norris Hundley, Jr., *The West Against Itself: The Colorado River—An Institutional History*, in NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 9 (Gary D. Weatherford & F. Lee Brown eds., 1986) (providing a concise overview of major events in the evolution of the

of the River stands as a testament to the ingenuity needed to craft a workable interstate water allocation scheme in an arid and semi-arid region where this most precious and coveted natural resource dictates who rises and falls, who enjoys life and livelihood, and who—in no uncertain terms—does not. As does the vitality of the Colorado River, the makeup of the Law of the River bears pivotally on the fates of sovereigns and diverse water users who have critical interests in the river.

Both the Colorado River and the Law of the River have entered into a critical stage in recent decades. Unprecedented challenges face policy makers seeking to navigate through a period aptly labeled the “era of limits.”⁹ Painting with a broad brush, the core issue of this era is overuse, an outcome inadvertently facilitated by an earlier period of overallocation.¹⁰ An imbalance between water supplies and demands exists in the Colorado River Basin—with demands exceeding supplies on an annual basis consistently since the early- to mid-2000s—and this gap is projected to widen in the future absent significant reforms.¹¹ Although several innovative measures have emerged to address this supply-demand imbalance during the past two decades,¹² it remains to be seen whether these measures will be

Law of the River); RUSSELL MARTIN, *A STORY THAT STANDS LIKE A DAM: GLEN CANYON AND THE STRUGGLE FOR THE SOUL OF THE WEST* (Univ. of Utah Press ed. 1999) (examining the struggle between conservation and development interests in conjunction with the authorization and construction of Glen Canyon Dam in the 1950s and 1960s); CHARLES F. WILKINSON, *FIRE ON THE PLATEAU: CONFLICT AND ENDURANCE IN THE AMERICAN SOUTHWEST* (paperback ed. 2004) (detailing the explosive industrial development of the Colorado Plateau in the mid-twentieth century and illuminating its effects on American Indian tribes and the Plateau today); Charles F. Wilkinson, *Land of Fire, Land of Conquest: The Colorado Plateau and Some Questions for Its Future*, 13 J. ENERGY NAT. RESOURCES & ENVTL. L. 337, 356–68 (1993) (discussing the development and impact of water, mining, and other natural resources laws on the Colorado Plateau over the past several decades from the perspective of the Navajo and Hopi reservations, and exploring possibilities for the tribes’ future).

⁹ This term comes from a historical model developed by Mr. Jim Lochhead breaking the past 100 years in the evolution of the Law of the River into three eras. Mr. Lochhead refers to the current era as the “era of limits.” See Felix L. Sparks, Article Update, *Synopsis of Major Documents and Events Relating to the Colorado River*, 3 U. DENV. WATER L. REV. 339, 340–42 (2000).

¹⁰ See *id.* at 340–41.

¹¹ See, e.g., BUREAU OF RECLAMATION, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, PHASE 4: DEVELOPMENT AND EVALUATION OF OPPORTUNITIES FOR BALANCING WATER SUPPLY AND DEMAND, REQUEST FOR IDEAS 6–8 (2011), available at <http://www.usbr.gov/lc/region/programs/crbstudy/OptionsSubmittalReport.pdf> (offering projections of future supply-demand imbalances in the Colorado River Basin).

¹² A key example of these innovations is the formation of the 2007 Interim Guidelines, which emerged in response to sustained drought in the Colorado River Basin during the past decade and aim to promote efficient and flexible water use in the Lower Basin. Bureau of Reclamation, *Lower Colorado Region, Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead*, <http://www.usbr.gov/lc/region/programs/strategies.html> (last visited Nov. 18, 2012). For an electronic copy of the Record of Decision for these Guidelines, see U.S. DEP’T OF THE INTERIOR, RECORD OF DECISION, COLORADO RIVER INTERIM GUIDELINES FOR LOWER BASIN SHORTAGES AND COORDINATED OPERATIONS FOR LAKE POWELL AND LAKE MEAD (2007), available at <http://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf> [hereinafter INTERIM GUIDELINES ROD]. Also notable for its innovation is the Lower Basin water banking program established in 1999. The

sufficient for this purpose. It is entirely foreseeable—and rings an optimistic tone—that the best is yet to come.

But what precisely will the “best” legal and policy innovations look like in the future of Colorado River governance? And even more fundamentally: How exactly should these innovations be formulated and consensus reached regarding them? These questions underlie a host of efforts currently under way that aim to assess, in one form or another, the present state of Colorado River governance. Diverse entities are engaged in this assessment process, including a variety of academic institutions,¹³ federal and state agencies,¹⁴ private sector participants,¹⁵ and non-governmental organizations.¹⁶ Among these entities is the Colorado River Governance Initiative (CRGI)—a research initiative encompassed within the Western Water Policy Program at the University of Colorado Law School.¹⁷ The work product of the CRGI over the past two-and-a-half years informs the focus and substance of this Article.

At the core of the CRGI’s work is a broad-based normative question: How should the Colorado River be governed in contemporary times? Myriad conditions in the twenty-first century differ from those existent at earlier stages in the Law of the River’s history. Climate change is an elephant in the room in this regard, with potentially profound impacts on the amounts of

federal regulations creating this program are set forth at: Storage and Release of Colorado River Water and Intentionally Created Unused Apportionment in Lower Division States, 43 C.F.R. pt. 414 (2011).

¹³ In addition to the CRGI’s efforts, the Colorado River Basin was one of five major basins recently examined in conjunction with Harvard University’s Water Federalism Project. For more information on that project, see Jason A. Robison et al., *Forging Ahead in the Era of Limits: The Evolution of Interstate Water Policy in the Colorado River Basin*, Colorado River Basin Background Paper prepared for Water Federalism Conference, Harvard University, April 19–21, 2012, available at http://watersecurityinitiative.seas.harvard.edu/sites/default/files/Colorado%20River%20Basin%20Background%20Paper_0.pdf. Also notable in this realm is the Western Water Assessment—a joint effort of the University of Colorado and the National Oceanic and Atmospheric Administration. For a list of WWA’s projects, visit http://www.wwa.colorado.edu/colorado_river/index.html (last visited Nov. 18, 2012).

¹⁴ Critical among federal efforts in this arena is the U.S. Bureau of Reclamation’s Colorado River Basin Water Supply and Demand Study. The goal of this study is to identify current and future imbalances in water supplies and demands in the basin and to develop and analyze various strategies for resolving these imbalances. Bureau of Reclamation, Lower Colo. Region, *Colorado River Basin Water Supply & Demand Study*, <http://www.usbr.gov/lc/region/programs/crbstudy.html> (last visited Nov. 18, 2012).

¹⁵ *E.g.*, Protect the Flows, *Who We Are*, <http://protectflows.com/who-we-are> (last visited Nov. 18, 2012).

¹⁶ See Nat’l Parks Conservation Ass’n, *NPCA Launches Colorado River Program*, <http://www.npca.org/about-us/regional-offices/southwest/colorado-river-program.html> (last visited Nov. 18, 2012); Carpe Diem West, *Colorado River Futures Program*, <http://carpediemwest.org/what-we-do/colorado-river-futures-program> (last visited Nov. 18, 2012).

¹⁷ For information about the CRGI, see Univ. of Colo. at Boulder, *Western Water Policy Program: Colorado River Governance Initiative (CRGI)*, <http://waterpolicy.info/projects/CRGI> (last visited Nov. 18, 2012). Electronic copies of CRGI reports, technical memoranda, and conference materials can be found at: Univ. of Colo. at Boulder, *Western Water Program: Colorado River Information Portal*, <http://waterpolicy.info/projects/CRIP/index.html> (last visited Nov. 18, 2012).

annual flows within the Colorado River Basin.¹⁸ Equally distinct in many respects is the evolving structure of economies at the local, state, and regional levels. A similar perspective applies to advancements in scientific knowledge and technology in fields like climatology, ecology, geography, and hydrology. So too have societal values changed over the past century of U.S. history. We think differently (albeit diversely) about how water ought to be used—both with regard to competing water uses and users.¹⁹ To what extent is the Law of the River responsive to the distinct conditions and values of contemporary times? Conversely, to what extent is it disconnected from contemporary circumstances? The perceived adequacy of Colorado River governance hinges on the varied answers given to these questions.

Whether pursued by the CRGI or similar entities, any inquiries into the existing state of Colorado River governance necessarily run up against the document positioned as the cornerstone of the Law of the River: the Colorado River Compact.²⁰ Forged in the spirit of cooperative federalism in 1922,²¹ the Compact establishes an apportionment scheme that controls how water is allocated within and adjacent to the Colorado River Basin, a vast drainage area encompassing portions of seven western states—Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming—and two states in northwestern Mexico—Baja California and Sonora.²² Without

¹⁸ See, e.g., COLO. RIVER GOVERNANCE INITIATIVE, RETHINKING THE FUTURE OF THE COLORADO RIVER, DRAFT INTERIM REPORT OF THE COLORADO RIVER GOVERNANCE INITIATIVE 8 (2010) [hereinafter INTERIM REPORT] (on file with author) (in discussing projected impacts of climate change on future annual flows in Colorado River Basin, the report states that “greater than 90% of the climate models project decreases of 10-30% for the time period 2041-2060”). A full discussion of current and projected water supply and demand conditions in the Colorado River Basin is contained *infra* Part IV.A.

¹⁹ See, e.g., HARVEY, *supra* note 8, at 292-93 (discussing the historic controversy over construction of Echo Park Dam in Dinosaur National Monument). See generally MARTIN, *supra* note 8 (discussing authorization and construction of Glen Canyon Dam vis-à-vis emergence of environmentalism in Colorado River Basin); Roderick Nash, *Wilderness Values and the Colorado River*, in NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 201, 201-13 (Gary D. Weatherford & F. Lee Brown eds., 1986) (discussing the genesis and evolution of wilderness values related to Colorado River and Colorado River Basin).

²⁰ Colorado River Compact, ch. 189, 1923 Colo. Sess. Laws 684 (1923) (codified as amended at COLO. REV. STAT. §§ 37-61-101 to -104 (2012)). The Compact was negotiated in 1922 pursuant to congressional authorization. The Act authorizing the negotiations cited as reasons supporting formation of the Compact the generally arid nature of the region and the avoidance of water disputes among the states. See Act of Aug. 19, 1921, Pub. L. No. 67-56, 42 Stat. 171. By 1925, six states had ratified the Compact, but it was not until 1928 that Congress approved it with enactment of the Boulder Canyon Project Act, Pub. L. No. 70-642, 45 Stat. 1057 (1928). The final state to ratify the agreement was Arizona in 1944. Each of the states has enacted the Compact as part of their state codes. We provide citations to Colorado’s enactments for simplicity and convenience.

²¹ See generally WATER AND THE WEST, *supra* note 8 at 138-214 (offering a detailed account of the negotiation and eventual formation of the Compact).

²² Colorado River Compact, arts. II(f)-(g), III(a)-(b) (codified at COLO. REV. STAT. § 37-61-101 (2012)) (apportioning water between the “Upper Basin” and “Lower Basin” and defining basins to encompass portions of seven U.S. states). Mexico is entitled to water from the Colorado River based on a treaty with the United States formed after, but anticipated by, the Compact. See *id.* art. III(c); DAVID L. ALLES, THE DELTA OF THE COLORADO RIVER 2 (2007),

delving into the details of the Compact's apportionment scheme, suffice it to say that much like a constitution,²³ this scheme serves as *the* foundation of the Law of the River. The Compact constructs the framework through which Colorado River governance occurs.

Should the Colorado River Compact be exempted from the ongoing examination currently underway with regard to Colorado River governance? Is it beyond scrutiny based on (among other factors) the settled expectations it has engendered among the sovereigns and water users dependent on the flows of the Colorado River?²⁴ No doubt the lives and livelihoods of more than 30 million people are implicated by these questions.²⁵ They hold significance for all quarters within and adjacent to the Colorado River Basin: the cities, farming and ranching communities, Indian tribes, recreational areas, and the river and landscape themselves. Yet the salience of these questions nonetheless requires they be treated as more than just rhetorical ones. The Compact cannot and should not be left out of ongoing dialogue about the future of Colorado River governance. It is founded on a basic commitment to fairness in water allocation—"equitable apportionment."²⁶ Pressing concerns regarding the Compact's ability to fulfill this commitment in contemporary times should not be repressed in public discourse. They should be vetted openly and candidly. It is better to know where things stand with the Compact—even if that spot is a tight one that requires the utmost ingenuity and fair-mindedness going forward.

The work of the CRGI has proceeded from this vantage point since its inception in early 2010. This Article synthesizes a good deal of this work in order to address a basic question foreshadowed in the previous paragraph: Does the Colorado River Compact fulfill its commitment to equity? To be clear, we view this commitment as a venerable one, and we wholeheartedly wish to see the Compact succeed in this regard. A critical step in achieving this success, however, is to "face the music"—that is, to carefully consider the existing makeup of the Compact's apportionment scheme, including conflicting interpretations of its key terms, in relation to current and projected future hydrological conditions in the Colorado River Basin. This inquiry provides much food for thought about the Compact's equity, including identifying several issues to which attention would be well paid if

available at <http://fire.biol.wvu.edu/trent/alles/TheDelta.pdf> (describing the course of the Colorado delta through the Mexican states of Baja California and Sonora).

²³ This analogy is drawn from Robert W. Adler, *Revisiting the Colorado River Compact: Time for a Change?*, 28 J. LAND RESOURCES & ENVTL. L. 19, 21 (2008) ("[T]he compact has a legal and rhetorical status and resistance to change similar to that of a constitution.").

²⁴ See *id.* ("[T]hrough the eyes of its supporters, implementers, and commentators, [the Compact] is viewed as a document whose stature and significance defies even the serious suggestion of change . . .").

²⁵ See STATUS REPORT, *supra* note 1, at SR-2 ("Today, more than 30 million people in the seven western states of Arizona, California, Nevada, . . . Colorado, New Mexico, Utah, and Wyoming . . . rely on the Colorado River and its tributaries to provide some, if not all, of their municipal water needs.").

²⁶ Colorado River Compact, art. I(a) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

the Compact indeed is to effect an equitable apportionment. Our overarching goal in this Article is to prompt engagement with these issues.

With this goal in mind, we have broken the Article into four main Parts. Part II lays a foundation. It highlights the express commitment to equity in the Compact's text and provides overviews of the Compact's apportionment scheme and the governance structure devised for it. Part III then takes a close look at the meaning of "equity" as a norm in the context of water allocation. It identifies a handful of principles associated with the norm, grouping these principles into two broad categories based on whether they involve "substantive equity" or "procedural equity." With these principles as a backdrop, Part IV provides a contemporary perspective on 1) water supply and demand conditions in the Colorado River Basin, and 2) major interpretative disputes looming over key terms framing the Compact's apportionment scheme. Part V offers our views on three significant equity-related issues stemming from the challenging reconciliation of the Compact's apportionment scheme (again, including interpretive conflicts related to it) with current and projected future hydrological conditions in the basin. We call for these equity-related concerns to be addressed in ongoing dialogue about the future of Colorado River governance. The spirit of the Compact depends on it.

II. "EQUITABLE DIVISION AND APPORTIONMENT" VIA THE COMPACT

Emerging out of negotiations in 1922 involving representatives from the federal government and the seven western states with portions of territory within the Colorado River Basin,²⁷ the apportionment scheme established by the Colorado River Compact constitutes the framework through which water is allocated within and adjacent to the basin.²⁸ This framework underlies an array of subsequent components of the Law of the River put into place both to address allocation-related matters left open by the scheme and to provide for the infrastructure, and the operation thereof, needed to implement it. Taken together, the Compact's apportionment scheme and the body of laws erected atop it—e.g., the U.S.-Mexico Treaty of 1944,²⁹ the Upper Colorado River Basin Compact (Upper Basin Compact),³⁰

²⁷ See generally WATER AND THE WEST, *supra* note 8 (describing the genesis of the Colorado River Compact). For a copy of the minutes of the compact negotiations, see COLO. RIVER COMM'N, MINUTES AND RECORD OF THE FIRST EIGHTEEN SESSIONS OF THE COLORADO RIVER COMMISSION NEGOTIATING THE COLORADO RIVER COMPACT OF 1922 (1922), available at <http://www.riversimulator.org/Resources/LawOfTheRiver/MinutesColoradoRiverCompact.pdf>.

²⁸ See WATER AND THE WEST, *supra* note 8, at 182.

²⁹ Treaty on Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande, U.S.-Mex., at p. 2, Feb. 3, 1944, T.S. 994 [hereinafter U.S.-Mexico Treaty].

³⁰ Upper Colorado River Compact, COLO. REV. STAT. §§ 37-62-101 to -106 (2012) (apportioning annual water use entitlements from the Upper Colorado River System among the states of Arizona, Colorado, New Mexico, Utah, and Wyoming); see also Act of Apr. 6, 1949, Pub. L. 81-37, 63 Stat. 31 (granting congressional consent to the Upper Basin Compact).

and the *Arizona v. California* Decree³¹—all comprise an integrated regime for apportioning the use of water from the Colorado River System.³² A basic sense of the makeup of the Compact’s apportionment scheme is essential to a broader appreciation of this integrated regime—and, of course, goes to the heart of this Article.

This Part sketches out the contours of the Compact’s apportionment scheme. After highlighting the Compact’s textual references to equity in the first section, the remainder of the Part delves into the specific features of the scheme. The second section offers general descriptions of the entitlements conferred to the Upper and Lower Basins and related flow obligations imposed by the Compact. In turn, the third section provides a brief account of the governance structure applicable to the scheme, drawing attention to the absence of an interstate commission or, comparable formal entity, responsible for implementing it.

A. *The Spirit of Equity*

Our interest in examining the Compact’s apportionment scheme in relation to the norm of equity in this Article is partly a matter of methodology. As detailed below in Part III, the norm of equity is well-suited for this purpose because it allows for consideration of diverse, and often competing, factors associated with the makeup of water allocation regimes.³³ It provides an umbrella framework within which these factors can be considered alongside one another. A distinct rationale for focusing on equity in this piece, however, is purely textual and historical. The Compact expressly emphasizes equity in its provisions, and it is for this reason that we refer to the norm as the Compact’s “spirit” in this section and elsewhere throughout the Article.

Article I of the Compact is the main provision where equity is addressed explicitly. This article sets forth the Compact’s “major purposes.”³⁴ Stated prominently and unequivocally, its “primary purpose”³⁵ is

³¹ *Arizona v. California*, 373 U.S. 546, 564–65 (1963) (holding that Congress—in passing the Boulder Canyon Project Act—intended to create its own comprehensive scheme for apportioning the use of water from the Colorado River mainstem among the Lower Division states). The consolidated decree, which combines the original 1963 decree with several supplemental decrees issued in the decades following the original *Arizona v. California* decision, can be found at: *Arizona v. California* (Decree), 547 U.S. 150 (2006).

³² See generally W. Water Policy Program, *Law of the River Apportionment Scheme*, <http://www.waterpolicy.info/archives/docs/Categorization%20of%20Laws,%20Jan%202012.pdf?p=1672> (last visited Nov. 18, 2012) (providing typology identifying the common types of laws at different levels of the Law of the River’s apportionment scheme).

³³ See *infra* Part III.A.

³⁴ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101 (2012)).

³⁵ This phrase (“primary purpose”) is drawn from the report prepared for Congress by Herbert Hoover, the federal representative and commission chairman at the compact negotiations. RAY LYMAN WILBUR & NORTHCUTT ELY, *THE HOOVER DAM DOCUMENTS* at A24 (1948), available at <http://www.riversimulator.org/Resources/LawOfTheRiver/HooverDamDocs/HooverDam1948.pdf> [hereinafter HOOVER DAM DOCUMENTS] (“The primary purpose of the compact is to make an equitable division and apportionment of the waters of the river.”).

“to provide for the equitable division and apportionment of the use of the waters of the Colorado River System.”³⁶ This text mirrors that of the federal legislation authorizing negotiation of the Compact, which conferred Congress’s consent for the basin states “to negotiate and enter into a compact . . . providing for an equitable division and apportionment . . . of the water supply of the Colorado River and of the streams tributary thereto.”³⁷ Also reflecting this text are the opening remarks of then-Secretary of Commerce Herbert Hoover, the federal representative who served as chairman of the interstate commission tasked with negotiating the Compact. Chairman Hoover noted that the commission had been established in order “to consider and if possible to agree upon a compact between the seven states of the Colorado River Basin, providing for an equitable division of the water supply of the Colorado River and its tributaries.”³⁸ The Compact’s apportionment scheme is expressly directed to this end in Article I.³⁹

Notwithstanding its general (purposive) nature, Article I and the commitment to equity expressed therein should not be considered inconsequential—at least the article was not viewed in this light by Delph Carpenter, the influential commissioner for the State of Colorado at the Compact negotiations who is regarded as the “father” of the Compact.⁴⁰ Carpenter construed Article I as a guide to the Compact’s meaning, expressing this viewpoint in an exchange at the negotiations concerning whether the article should be cut from a draft of the Compact. In line with a remark by chairman Hoover regarding the article’s “psychological value,”⁴¹ Carpenter opposed this deletion, stating:

[I]f there is any question as to what the intent of the drafters of the compact was, they will turn to the article on “purposes” to try to find a guide to that intent It is not alone a preamble, – it is . . . a declaration of principles. It is a guide to the intent of the framers, and as such it must be very, very carefully drafted in the final compact.⁴²

Also reflecting an intention (albeit implicitly) that the Compact’s apportionment scheme equitably allocate the use of water from the Colorado River System are several Compact provisions contemplating “further equitable apportionment” at a future date. This phrase initially appears after the statement of purposes in Article I, which provides that “[t]o these ends the Colorado River Basin is divided into two Basins, and an

³⁶ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101 (2012)).

³⁷ Act of Aug. 19, 1921, Pub. L. No. 67-56, 42 Stat. 171, 172.

³⁸ COLO. RIVER COMM’N, *supra* note 27, at 2.

³⁹ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁴⁰ For an outstanding biography of Delph Carpenter, see DANIEL TYLER, *SILVER FOX OF THE ROCKIES: DELPHUS E. CARPENTER AND WESTERN WATER COMPACTS* (2003).

⁴¹ Minutes of the 22nd Meeting of the Colorado River Commission (Nov. 22, 1922), *in* COLO. RIVER COMM’N, *MINUTES AND RECORD OF SESSIONS NINETEEN THRU TWENTY SEVEN OF THE COLORADO RIVER COMMISSION NEGOTIATING THE COLORADO RIVER COMPACT 167* (1922), *available at* <http://www.riversimulator.org/Resources/LawOfTheRiver/MinutesColoradoRiverCompact.pdf>.

⁴² *Id.*

apportionment of the use of part of the water of the Colorado River System is made to each of them with the provision that further equitable apportionments may be made.”⁴³ In turn, Article III sets forth the specific procedures through which such “[f]urther equitable apportionment of the beneficial uses of the waters of the Colorado River System” can be brought about.⁴⁴ Broadly speaking, these procedures call for appointment of federal and state representatives “whose duty it shall be to divide and apportion equitably between the Upper Basin and Lower Basin the beneficial use of the unapportioned water of the Colorado River System.”⁴⁵

Additional provisions illustrating an emphasis on equity vis-à-vis the Compact’s apportionment scheme are discussed below in Part V.⁴⁶ In contrast to the express references to equity just noted in Articles I and III, these additional provisions do not include the terms “equitable,” “equitably,” or the like, although their focus on equity seems plain—at least as we conceive of the norm in Part III.

It should be noted that the Compact’s incorporation of the term “equitable apportionment” was not without historical precedent. Two decades before compact negotiations began in 1922, the Supreme Court acted pursuant to its original jurisdiction under Article III, Section 2 of the U.S. Constitution⁴⁷ and announced its authority to engage in equitable apportionment of the use of interstate rivers.⁴⁸ A seminal case decided by the Supreme Court in this area, *Wyoming v. Colorado*,⁴⁹ played a key role in spurring on the compact negotiations.⁵⁰ Thus, although they had not previously been used to resolve interstate water disputes in the United States,⁵¹ compacts were understood as one of two methods for equitably

⁴³ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁴⁴ *Id.* art. III(f) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁴⁵ *Id.* art. III(g) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁴⁶ *See infra* Part V.A.

⁴⁷ The Supreme Court’s original jurisdiction extends to “all Cases affecting Ambassadors, other public Ministers and Consuls, and *those in which a State shall be Party.*” U.S. CONST. art. III, § 2, cl. 2 (emphasis added).

⁴⁸ *Kansas v. Colorado*, 185 U.S. 125, 145 (1902).

⁴⁹ 259 U.S. 419 (1922) (holding that priority of appropriation is a controlling factor when engaging in equitable apportionments involving states that adhere to the prior appropriation doctrine). In modern times, the Court considers multiple factors beyond temporal priority when crafting an equitable apportionment, and has described its doctrine as flexible, non-formulaic, and requiring the exercise of informed judgment. *Colorado v. New Mexico*, 459 U.S. 176, 183–84 (1982). *See generally* Douglas L. Grant, *Equitable Apportionment Suits Between States*, in 3 WATERS AND WATER RIGHTS 45-1 (Amy K. Kelley ed., 3d ed. 2011).

⁵⁰ WATER AND THE WEST, *supra* note 8, at 177–80.

⁵¹ The unprecedented use of interstate compacts in this context was noted in a memorandum prepared for the House Judiciary Committee by the Colorado Commissioner at the compact negotiations, Delph Carpenter, in conjunction with hearings held in 1921 addressing the federal act authorizing the negotiations. *See* HOOVER DAM DOCUMENTS, *supra* note 35, at A91.

apportioning interstate rivers (the other being Supreme Court litigation) at the time of the compact negotiations.⁵²

Also worth mentioning in passing is the fact that the Compact is not alone among major components of the Law of the River in its express references to equity. Mirroring the purposive statement in Article I of the Compact is Article I of the Upper Basin Compact. This article identifies the Upper Basin Compact's first purpose as "to provide for the equitable division and apportionment of the use of the waters of the Colorado River System, the use of which was apportioned in perpetuity to the Upper Basin by the Colorado River Compact."⁵³

B. Apportionment Scheme

Notwithstanding the light shed on the purposes of the Colorado River Compact by the equity-related provisions discussed above—at least from the viewpoints of Delph Carpenter and like-minded others—these provisions reveal little about the specific features of the Compact's apportionment scheme.⁵⁴ Article III contains the vast majority of provisions defining this scheme. These provisions incorporate various definitions set forth in Article II. They likewise dovetail with an important provision in Article VIII. As outlined in this section, a relatively quick study of the Compact's apportionment scheme can be made by walking through paragraphs (a) through (e) of Article III and then turning briefly to Article VIII.⁵⁵

Article III(a) and (b) set forth entitlements for the "Upper Basin" and "Lower Basin." Article III(a) apportions "from the Colorado River System in perpetuity to the Upper Basin and to the Lower Basin respectively the exclusive beneficial consumptive use of 7,500,000 acre feet of water per annum."⁵⁶ In turn, Article III(b) augments the Lower Basin's entitlement in

⁵² See *id.* at A90 (noting existence of two methods of equitable apportionment and describing Supreme Court litigation as "the substitute, under our form of government, for war between the States").

⁵³ Upper Basin Compact, art. I(a), Pub. L. 81-37, 63 Stat. 31 (1949) (codified at COLO. REV. STAT. § 37-62-101 (2012)). Notably, the Colorado River Compact, Upper Basin Compact, and equitable apportionment doctrine are certainly not unique as areas of water law where equity is treated as a pivotal norm. Equitable utilization is the governing norm in international water law. See generally Joseph W. Dellapenna, *International Law Applicable to Water Resources Generally*, in 3 WATERS AND WATER RIGHTS 49-87 (Amy K. Kelley ed., 3d ed. 2011) (identifying the prevailing emphasis on equitable utilization in international water law). Equity likewise influences the shape of legal doctrines devised for water allocation at the state level within the United States. See generally Harrison C. Dunning, *State Equitable Apportionment of Western Water Resources*, 66 NEB. L. REV. 76 (1987) (discussing equity in relation to riparian and prior appropriation doctrines).

⁵⁴ For a succinct description of the provisions defining the Compact's apportionment scheme (and related aspects of the Compact), see Charles J. Meyers, *The Colorado River*, 19 STAN. L. REV. 1, 12-18 (1967).

⁵⁵ As fleshed out in Part IV, numerous disagreements currently exist concerning the meaning of key terms contained in these Articles. In order to avoid describing these contested provisions in a seemingly biased way, we have incorporated large portions of the Compact's text into this section.

⁵⁶ Colorado River Compact, art. III(a) (codified at COLO. REV. STAT. § 37-601-101 (2012)).

Article III(a) by providing that, “[i]n addition to the apportionment in paragraph (a) the Lower Basin is hereby given the right to increase its beneficial consumptive use of such waters by one million acre feet per annum.”⁵⁷ Taken together, these two provisions entitle the Upper and Lower Basins to use 7.5 and 8.5 million acre-feet (maf) of water per year, respectively, from the Colorado River System—16.0 maf in total.⁵⁸ One acre-foot equals 325,851 gallons of water.⁵⁹

As is evident from the quoted text, Article III(a) and (b) contain several operative terms that need to be examined closely. Two of these terms bear on the nature of the entitlements conferred by these provisions. Of critical importance in this vein is “Colorado River System,” which is defined as “that portion of the Colorado River and its tributaries within the United States of America.”⁶⁰ Also significant is “beneficial consumptive use”—a term left undefined by the Compact and subject to competing definitions in the Upper and Lower Basins.⁶¹

Alongside these two terms are the definitions given for the entities to which Article III(a) and (b) confer entitlements—namely, the “Upper Basin” and “Lower Basin.”⁶² The former refers to:

⁵⁷ *Id.* art. III(b) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁵⁸ An enlightening discussion of the reason for the scope of the Upper and Lower Basins’ entitlements in Article III(a) and (b) appears in a statement prepared by Richard E. Sloan, the legal advisor to the Arizona Commissioner at the compact negotiations, W.S. Norviel. See HOOVER DAM DOCUMENTS, *supra* note 35, at A69.

⁵⁹ U.S. Geological Survey, *Water Science Glossary of Terms*, <http://ga.water.usgs.gov/edu/dictionary.html> (last visited Nov. 18, 2012).

⁶⁰ Colorado River Compact, art. II(a) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁶¹ Specifically, different methods exist in the Upper and Lower Basins for measuring the amount of beneficial consumptive use associated with: 1) entitlements held by the Upper Basin states under the Upper Basin Compact, and 2) entitlements held by the Lower Division states under the *Arizona v. California* Decree. Compare Upper Basin Compact, art. VI, Pub. L. 81-37, 63 Stat. 31 (1949) (codified at COLO. REV. STAT. § 37-62-101 (2012)) (“The Commission shall determine the quantity of the consumptive use of water, which use is apportioned by Article III hereof, for the Upper Basin and for each State of the Upper Basin by the inflow-outflow method in terms of man-made depletions of the virgin flow at Lee ferry . . .”), *with* Decree, 547 U.S. 150, 153 sec. I(A) (2006) (“‘Consumptive use’ means diversions from the stream less such return flow thereto . . .”). As noted later in this section, the Compact does contain a definition for “domestic use” that encompasses a wide variety of water uses. Colorado River Compact, art. II(h) (codified at COLO. REV. STAT. § 37-61-101 (2012)). The Compact likewise refers to the use of water for agricultural, domestic, power, and navigation purposes, prescribing the relative priorities of these uses. *Id.* art. IV(a)–(b) (codified as amended at COLO. REV. STAT. § 37-61-101 (2012)). Enlightening discussions of the meaning of “beneficial consumptive use” as this term appears in Article III(a) and (b) can be found in two reports prepared by the Colorado Commissioner at the compact negotiations, Delph Carpenter, copies of which can be found in HOOVER DAM DOCUMENTS, *supra* note 35, at A80, A102.

⁶² The Compact commissioners initially considered formulating an apportionment scheme framed around state-based entitlements—i.e., irrespective of states’ locations in the upper and lower portions of the basin—but they ultimately found this approach impractical. A succinct description of this turning point in the compact negotiations appears in the report prepared by the Wyoming Commissioner, Frank C. Emerson, for the Wyoming legislature. See HOOVER DAM DOCUMENTS, *supra* note 35, at A126.

[T]hose parts of the States of Arizona, Colorado, New Mexico, Utah and Wyoming within and from which waters naturally drain into the Colorado River System *above* Lee Ferry, and also all parts of said States located [outside] the drainage area of the Colorado River System . . . beneficially served by waters diverted from the System above Lee Ferry.⁶³

The latter is defined similarly, referring to:

[T]hose parts of the States of Arizona, California, Nevada, New Mexico and Utah within and from which waters naturally drain into the Colorado River System *below* Lee Ferry, and also all parts of said States located [outside] the drainage area of the Colorado River System . . . beneficially served by waters diverted from the System below Lee Ferry.⁶⁴

Notably, these definitions contrast with those provided for the “States of the Upper Division” (“Colorado, New Mexico, Utah, and Wyoming”)⁶⁵ and the “States of the Lower Division” (“Arizona, California, and Nevada”),⁶⁶ as these terms appear in Article III(c) and (d).

Whereas Article III(a) and (b) both address entitlements, Article III(c) and (d) share a common focus on flow obligations. Article III(c) is concerned with flow obligations to Mexico based on the U.S.-Mexico Treaty of 1944.⁶⁷ This treaty entitles Mexico to use 1.5 maf of water per year from the Colorado River.⁶⁸ Article III(c) provides that this water “shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in [Article III(a) and (b)].”⁶⁹ In turn,

[I]f such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in [Article III(d)].⁷⁰

As just referenced in the last clause of Article III(c), the flow obligation imposed by Article III(d) applies to the states of Upper Division, providing that these states “will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre feet for any period of ten consecutive years reckoned in continuing progressive series.”⁷¹

⁶³ Colorado River Compact, art. II(f) (codified at COLO. REV. STAT. § 37-61-101) (emphasis added). The dividing point between the Upper and Lower Basins, “Lee Ferry,” is located on “the main stream of the Colorado River one mile below the mouth of the Paria River.” *Id.* art. II(e) (codified at COLO. REV. STAT. § 37-61-101).

⁶⁴ *Id.* art. II(g) (codified at COLO. REV. STAT. § 37-61-101) (emphasis added).

⁶⁵ *Id.* art. II(c) (codified at COLO. REV. STAT. § 37-61-101).

⁶⁶ *Id.* art. II(d) (codified at COLO. REV. STAT. § 37-61-101).

⁶⁷ U.S.-Mexico Treaty, *supra* note 29.

⁶⁸ *Id.* art. 10(a), T.S. 994 at 21.

⁶⁹ Colorado River Compact, art. III(c) (codified at COLO. REV. STAT. §37-61-101 (2012)).

⁷⁰ *Id.*

⁷¹ *Id.* art. III(d) (codified at COLO. REV. STAT. § 37-61-101).

Appearing beneath the provisions conferring entitlements in Article III(a) and (b), and those prescribing flow obligations in Article III(c) and (d), is a fifth key paragraph—Article III(e). It sets forth an important condition applicable to relations between the Upper Division and Lower Division states, providing that the “States of the Upper Division shall not withhold water, and the States of the Lower Division shall not require the delivery of water, which cannot reasonably be applied to domestic and agricultural uses.”⁷² “Domestic use” is defined liberally to encompass “the use of water for household, stock, municipal, mining, milling, industrial and other like purposes,” excluding “the generation of electrical power.”⁷³

The foregoing five paragraphs of Article III—including the definitions incorporated therein from Article II—constitute the foundational provisions of the Compact’s apportionment scheme. However, Article VIII contains an important proviso: “Present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact.”⁷⁴ Like the term “beneficial consumptive use” in Article III(a) and (b), the Compact does not define “present perfected rights” as it appears in Article VIII, and the term is construed differently in the Upper and Lower Basins. The essence of the distinction concerns the specific date used to determine whether an entitlement (water right) constitutes a “present perfected right”—the date of the Compact’s signing (November 24, 1922) or the date of its entry into force (June 25, 1929).⁷⁵

The provisions surveyed throughout this section have been parsed out in a multitude of ways over roughly the past century of the Compact’s history. Several of the most salient constructions are highlighted below in Part IV in the overview of interpretative disagreements between the Upper and Lower Basins. A good deal of ground remains to be covered before addressing these competing interpretations, however, including a brief discussion of the governance structure (or lack thereof) established for the Compact’s apportionment scheme.

⁷² *Id.* art. III(e) (codified at COLO. REV. STAT. § 37-61-101).

⁷³ *Id.* art. II(h) (codified at COLO. REV. STAT. § 37-61-101).

⁷⁴ *Id.* art. VIII (codified at COLO. REV. STAT. § 37-61-101). The water used by holders of present perfected rights must be counted against the entitlement of the sub-basin (Upper or Lower Basin) in which these rights exist. *Id.* art. III(a) (codified at COLO. REV. STAT. § 37-61-101) (providing that the 7.5 maf entitlements apportioned to Upper and Lower Basins by Article III(a) “shall include all water necessary for the supply of any rights which may now exist.”). Article VII—the so-called “wild Indian Article”—also constitutes an important aspect of the Compact’s apportionment scheme. It states tersely that “[n]othing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.” *Id.* art. VII (codified at COLO. REV. STAT. § 37-61-101). For a brief account of the unflattering discussion surrounding Article VII at the compact negotiations, see WATER AND THE WEST, *supra* note 8, at 210–12.

⁷⁵ Compare Upper Basin Compact, art. IV(c), Pub. L. 81-37, 63 Stat. 31, 34 (1949) (codified at COLO. REV. STAT. § 37-62-101) (excluding “rights perfected prior to November 24, 1922” from curtailment procedures), with Decree, 547 U.S. 150, 154 sec. I(H) (2006) (“Present perfected rights’ means perfected rights [acquired in accordance with state law], existing as of June 25, 1929, the effective date of the Boulder Canyon Project Act.”).

C. Governance Structure

Perhaps the key point to note with regard to the governance structure created by the Colorado River Compact is that an interstate commission (or comparable formal governance entity) has not been created to implement the apportionment scheme.⁷⁶ Governance entities do exist for other key components of the Law of the River. The International Water and Boundary Commission administers the U.S.-Mexico Treaty of 1944,⁷⁷ engaging in measurement and reporting activities associated with flow conditions and deliveries of treaty water.⁷⁸ The Upper Colorado River Commission performs similar functions with respect to the apportionment scheme established by the Upper Basin Compact.⁷⁹ Acting on behalf of the Secretary of the Interior, the Bureau of Reclamation likewise is tasked with an array of responsibilities stemming from the allocation scheme set forth in the *Arizona v. California* Decree governing use of water from the Colorado River mainstem by the Lower Division states.⁸⁰ Notwithstanding the importance of these entities in their respective domains, however, the joint federal-state commission empanelled to negotiate the Colorado River Compact—the Colorado River Commission—disbanded after the Compact's formation in 1922.⁸¹ A permanent interstate commission, or similar basinwide entity, has not since been established.⁸²

Despite the absence of a permanent Colorado River Commission, several provisions of the Compact are nonetheless notable based on their treatment of governance-related matters. Article VI generally addresses dispute resolution in this vein. It contemplates the appointment of commissioners empowered “to consider and adjust [any] claim or controversy” arising between the basin states concerning “the meaning or performance of any of the terms of this compact” and “the allocation of burdens incident to the performance of any article of this compact or the delivery of waters as herein provided.”⁸³ The resolutions reached via this process are subject to ratification by the relevant state legislatures, and the process is not intended to supplant other available methods of dispute resolution (legislative or judicial).⁸⁴

⁷⁶ See, e.g., MacDonnell, *supra* note 7, at 50. (“Many interstate compacts provide for the establishment of commissions to make decisions, collect data, and implement compact provisions. The Colorado River Compact of 1922 creates no such entity. None of the many other elements of the Law of the River provides a means of basin governance either.”).

⁷⁷ U.S.-Mexico Treaty, *supra* note 29, art. 2, T.S. 944 at 5–8.

⁷⁸ *Id.* arts. 12(d), 24(g), T.S. 944 at 26, 44.

⁷⁹ See Upper Basin Compact, art. VIII, Pub. L. 81-37, 63 Stat. at 35 (codified at COLO. REV. STAT. § 37-62-101 (2012)).

⁸⁰ Decree, 547 U.S. 150, 164 sec. V (2006).

⁸¹ Cf. MacDonnell, *supra* note 7, at 14, 48, 50 (noting that the negotiated Compact, while providing for basin-state governors to appoint commissioners to oversee future controversies, failed to create an interstate governance entity).

⁸² See *id.* at 50 (discussing the historical lack of coordination among the basin states).

⁸³ Colorado River Compact, art. VI (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁸⁴ *Id.* (“Nothing herein contained shall prevent the adjustment of any such claim or controversy by any present method or by direct future legislative action”); *id.* art. IX

Of a similar but more forward-looking nature are the provisions identified above providing for “further equitable apportionment” in Article III(f) and (g). These provisions allow for such apportionment “of the beneficial uses of the waters of the Colorado River System unapportioned by [Article III(a), (b), and (c)] . . . at any time after October first, 1963, if and when either Basin shall have reached its total beneficial consumptive use as set out in [Article III(a) and (b)].”⁸⁵ As noted above, the process prescribed for this apportionment generally entails the appointment of federal and state representatives “whose duty it shall be to divide and apportion equitably between the Upper Basin and Lower Basin the beneficial use of the unapportioned water.”⁸⁶

Also worth noting alongside the measures outlined in Articles III and VI are several provisions in Article V generally addressing the collection and dissemination of hydrological data for the Colorado River Basin. These provisions call for cooperation among state water resource officials and the “directors” of the U.S. Bureau of Reclamation and U.S. Geological Survey with regard to the “flow, appropriation, consumption, and use of water in the Colorado River Basin” and “the annual flow of the Colorado River at Lee Ferry.”⁸⁷

Turning to the next Part of our discussion, both the substantive terms of the Compact’s apportionment scheme fleshed out in the previous section, and the processes associated with the governance structure devised for this scheme touched on here, implicate the norm identified at the outset as the spirit of the Compact—“equity.” What considerations come into play when assessing the “equity” of water allocation regimes—the Compact’s and otherwise? How do these factors relate with one another? Are they reconcilable in some way? To what extent do they vary across time? We grapple with these and related questions below.

III. ON “EQUITY”

Our interest in considering the equity of the Compact’s apportionment scheme undoubtedly would be a fool’s errand without some conception of what “equity” looks like as a norm. Although the previous Part offered a fair amount of information about the apportionment scheme itself—including the Compact’s textual commitment to “equitable division and

(codified at COLO. REV. STAT. § 37-61-101 (2012)) (“Nothing in this compact shall be construed to limit or prevent any State from instituting or maintaining any action or proceeding, legal or equitable, for the protection of any right under this compact or the enforcement of any of its provisions.”).

⁸⁵ *Id.* art. III(f) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁸⁶ *Id.* art. III(g) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁸⁷ *Id.* art. V(a)–(c) (codified at COLO. REV. STAT. § 37-61-101 (2012)). This article refers to the “Director of the United States Reclamation Service.” The U.S. Reclamation Service is now the “U.S. Bureau of Reclamation,” and the title of its administrative head is the “Commissioner.” See Bureau of Reclamation, *The Bureau of Reclamation: A Very Brief History*, <http://www.usbr.gov/history/borhist.html> (last visited Nov. 18, 2012).

apportionment”⁸⁸—it shed virtually no light on our sense of the norm’s precise meaning. This Part takes up that critical task. After discussing the contextual nature of equity in an initial section, we consider a handful of principles associated with the norm in two subsequent sections. These principles are organized into distinct categories based on whether they relate to what we have termed “substantive equity” or “procedural equity.” We subsequently rely on these principles to frame the discussion below in Part V addressing several equity-based concerns related to the existing makeup of the Compact’s apportionment scheme.

A. Context

“Equity” is commonly regarded as being synonymous with fairness,⁸⁹ but this broad equation lacks the specificity needed to enable us to use equity as a lens for thinking about the Compact’s apportionment scheme in a meaningful way. What exactly does it mean to be “fair” in the context of water allocation? This question pervades water law doctrine⁹⁰ and academic scholarship.⁹¹ It is important on a number of levels. Among other things, apportionment schemes composed or implemented in ways perceived as unfair promise to cause friction among favored and marginalized water users, undermine the legitimacy of legal and political institutions, and obstruct the development of progressive water laws and policies.⁹² The Compact actually attests to these dynamics in Article I, listing as major purposes below its threshold commitment to “equitable division and

⁸⁸ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101 (2012)).

⁸⁹ See, e.g., CONCISE OXFORD AMERICAN THESAURUS 270 (Oxford Univ. Press, 2006).

⁹⁰ The challenge of conceptualizing “equity” is reflected in the Supreme Court’s multi-factor approach to equitable apportionment. See *Colorado v. New Mexico*, 459 U.S. 176, 183 (1982) (“Equitable apportionment . . . is a flexible doctrine which calls for the exercise of an informed judgment on a consideration of . . . all relevant factors, . . . [O]ur aim is always to secure a just and equitable apportionment without quibbling over formulas.”) (internal quotations and citations omitted). Equitable utilization doctrine in international water law is equally concerned with this basic yet nuanced determination. See Dellapenna, *supra* note 53, at 49-126 to 49-134.

⁹¹ For academic scholarship addressing the norm of equity in the context of water law and policy, see generally Helen Ingram et al., *The Importance of Equity and the Limits of Efficiency in Water Resources*, in WATER, PLACE, AND EQUITY 1 (John M. Whiteley et al. eds., 2008) [hereinafter *Importance of Equity*]; Helen Ingram et al., *Water and Equity in a Changing Climate*, in WATER, PLACE, AND EQUITY 271 (John M. Whiteley et al. eds., 2008) [hereinafter *Water and Equity*]; Stephen P. Mumme, *From Equitable Utilization to Sustainable Development: Advancing Equity in U.S.-Mexico Border Water Management*, in WATER, PLACE, AND EQUITY 117 (John M. Whiteley et al. eds., 2008); Charles W. Howe, *Water Resources Planning in a Federation of States: Equity Versus Efficiency*, 36 NAT. RESOURCES J. 29 (1996); SARAH F. BATES ET AL., SEARCHING OUT THE HEADWATERS: CHANGE AND REDISCOVERY IN WESTERN WATER POLICY 182-87 (1993); Helen M. Ingram et al., *Replacing Confusion with Equity: Alternatives for Water Policy in the Colorado River Basin*, in NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 177 (Gary D. Weatherford & F. Lee Brown eds., 1986) [hereinafter *Replacing Confusion*]; David H. Getches, *Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Institution*, 68 U. COLO. L. REV. 573, 590-601 (1997).

⁹² See BATES ET AL., *supra* note 91, at 178-79, 183; *Importance of Equity*, *supra* note 91, at 9; *Replacing Confusion*, *supra* note 91, at 178-79, 195-96.

apportionment” both “to promote interstate comity” and “to remove causes of present and future controversies.”⁹³ To accomplish these and similar goals, what basic ideas of fairness need to be taken into account vis-à-vis these schemes? As alluded to above, numerous factors potentially bear on this question.

We attempt to bring clarity to the meaning of “equity” in the following two sections by focusing on a handful of principles associated with the norm. Before turning to these equity-related principles, however, a couple of comments about the general nature of the norm need to be made. The overarching point we wish to highlight is that context plays a pivotal role in people’s assessments of the equity of water allocation schemes. Equity is an inherently contextual norm. The perceived fairness or unfairness of an apportionment scheme depends upon the particular circumstances associated with the scheme at a given point in time.⁹⁴

This core point regarding the contextual nature of equity really speaks to two things. First, thinking about the makeup of apportionment schemes from the perspective of equity involves taking stock of the full scope of values associated with the diverse water users and uses governed by the schemes (i.e., the total circumstances).⁹⁵ Offsetting factors always come into play, and it is unrealistic to expect these factors to be reconciled in a perfect way.⁹⁶ Second, change is a constant, and it is problematic to assume that prevailing views about the equity of apportionment schemes in one historical context will continue to hold sway indefinitely. Even the most equitable scheme devised in one setting may be rendered inequitable by

⁹³ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101) (2012)).

⁹⁴ See *Importance of Equity*, *supra* note 91, at 8 (“The principles of equity are complex and contingent on circumstances, varied and nuanced, and cannot be fully understood until put back into the life cycle of living things. Consequently, there is no simple principle or set of principles . . . which can be set out as rules and universally applied in all places and circumstances.”); see also *id.* at 3 (“Any articulation of the role of equity must recognize . . . that if equity is to emerge, it must do so in specific places under specific circumstances—there is no ‘one size fits all’ conception of equity that is workable.”); see also *id.* at 29 (“In virtually every case of water and equity, history is important.”); *Replacing Confusion*, *supra* note 91, at 185 (“What equity can mean . . . will depend importantly on the particular and even unique conditions characterizing water policy in the Colorado Basin.”).

⁹⁵ The Supreme Court’s multi-factor approach to equitable apportionment illustrates the diversity of values implicated by interstate water allocation and the non-formulaic balancing process associated with reconciling them. See *Colorado v. New Mexico*, 459 U.S. 176, 183 (1982) (identifying a non-exhaustive list of factors used for equitable apportionment and the “delicate adjustment of interests” associated with reconciliation (quoting *Nebraska v. Wyoming*, 325 U.S. 589, 618 (1945)); *Water and Equity*, *supra* note 91, at 271 (“[E]quity can only be served through processes of decision making that reflect the full range of values with which water is associated.”); see also *id.* at 276 (“Additional levels of complexity and conflict arise because there are many other values that are not utilitarian in nature.”); *Importance of Equity*, *supra* note 91, at 4 (“The efficiency framework, like other frameworks, is based on values. Individual preferences count.”).

⁹⁶ Striving for equity with regard to the makeup of water apportionment schemes is thus an aspirational process. See *Importance of Equity*, *supra* note 91, at 8 (“Like the concept of democracy, equity is not some objective state of being, but rather an ideal, vision, or aspiration that continues to challenge citizens to strive toward achieving it in greater depth, scope, and authenticity.”).

changed circumstances.⁹⁷ In sum, “equity” is defined by context, which speaks to the diversity of values affected by water allocation schemes and the variation in these values across time.

B. Principles

Having equated “equity” generally with fairness and drawn attention to its contextual nature above, the remainder of this Part examines a handful of principles that flesh out our conception of the norm’s meaning. These principles can be thought of as constituent parts of the norm. They account for commonsensical considerations that come into play when thinking about whether water allocation schemes are composed and implemented in a fair manner. Some of the principles relate to the substantive terms of these schemes—e.g., the scope and types of entitlements held by water users and the relative priorities of these entitlements. We use the term “substantive equity” to refer to this category of principles.⁹⁸ In contrast, other principles focus on the governance structures for apportionment schemes, including whether adequate processes exist for implementing these schemes in a diligent, participatory, and transparent way. This latter group of principles falls into the category of “procedural equity.”⁹⁹

Taken together, the principles in both of these categories are intended to offer a broad conception of “equity” useful for thinking about the makeup of the Compact’s apportionment scheme. To be clear, we do not make an originalist claim in this regard. Our conception of equity is not intended to track precisely the conceptions reflected in provisions of the Compact—those in Article I, Article III, or otherwise. Although we discuss several of these provisions in Part V in relation to our conception of the norm,¹⁰⁰ we do not claim our conception is fully synonymous with how the Compact commissioners conceived of equity and sought to craft the Compact’s apportionment scheme around it.¹⁰¹ No doubt there was variation in this regard. In a similar respect, although we frame the principles below around the norm of equity, we acknowledge that they involve considerations worth taking into account in a freestanding way—that is, irrespective of their connection to equity as an umbrella norm. A final caveat: We have no

⁹⁷ The dynamic nature of equity is reflected in re-opener provisions allowing for modification of equitable apportionment decrees issued by the Supreme Court. *See, e.g., Nebraska v. Wyoming*, 507 U.S. 584, 591–93 (1993) (discussing circumstances under which decrees may be modified); *see also Replacing Confusion*, *supra* note 91, at 195 (“[W]ater represents satisfaction of a socially defined and legitimated ‘need,’ Socially defined needs conflict and change under new circumstances . . .”).

⁹⁸ *See infra* Part III.B.1 and text accompanying notes 103–15 (discussing the concept of “substantive equity”).

⁹⁹ *See Getches*, *supra* note 91, at 590 (“[E]quity demands that water serve a broad range of public interests and a process for reaching decisions that is generally fair.”).

¹⁰⁰ *See infra* Part V.A.

¹⁰¹ Put differently, we intend our conception of equity to be useful for thinking about the makeup of apportionment schemes that (unlike the Compact’s) do not contain textual commitments to the norm.

delusions about treating the norm of equity exhaustively here. The principles below capture equity-related considerations that resonate with us based on our analysis of the Compact's apportionment scheme, but other relevant considerations and associated principles undoubtedly exist.

With these clarifications in mind, we proceed through the two categories of principles just identified—those related to substantive equity and procedural equity. Relying heavily on seminal academic scholarship addressing equity in the context of water law and policy, our survey of these principles involves providing general descriptions of their respective meanings. In turn, we discuss specific provisions of the Compact (and other components of the Law of the River) that illustrate the importance of, and tensions between, these principles below in Part V.¹⁰²

1. Substantive Equity

Thinking initially about the substantive equity of apportionment schemes—which generally concerns the definition, allocation, and relative priorities of entitlements—four key principles are worth considering: 1) reciprocity, 2) fidelity, 3) reliability, and 4) flexibility.

At its core, the principle of reciprocity¹⁰³ is based on the notion of distributional fairness.¹⁰⁴ Apportionment schemes should be even-handed in how they define entitlements in water resources (permitted types and amounts of water uses), allocate these entitlements among different types of water users, and establish the relative priorities of the entitlements.¹⁰⁵ Apportionment schemes should be composed to avoid enabling water users to unfairly utilize (or monopolize)¹⁰⁶ water resources on any of these bases—for example, by conferring excessively large entitlements to water users, forbidding water users from holding entitlements for certain purposes

¹⁰² See *infra* Part V.A–B.

¹⁰³ See *Replacing Confusion*, *supra* note 91, at 186 (discussing reciprocity as a distributive principle around which a broader equity framework is constructed: “[r]eciprocity” captures one sense of equity, namely, the notion that distributive advantages and costs should be shared by all members of the relevant community”) (emphasis omitted).

¹⁰⁴ Getches, *supra* note 91, at 590 (“The idea that water is a social good—something setting it apart from ordinary commodities and property—leads to the conclusion that it should be distributed fairly and in the broad interests of the public.”); BATES ET AL., *supra* note 91, at 185 (“A hard look at water policy should seek distributional fairness.”); see also *id.* at 182 (“People are frustrated with a policy that allows one user to flood-irrigate alfalfa in a time of drought, while others are forced to curtail their uses or even go without any water at all. Decisions based on political or economic strength alone offend a sense of fairness.”).

¹⁰⁵ We conceive of the principal of reciprocity as encompassing concerns about intergenerational equity and environmental sustainability that might otherwise be treated as freestanding principles. See BATES ET AL., *supra* note 91, at 187–92 (discussing the principle of ecology); *Replacing Confusion*, *supra* note 91, at 189 (discussing intergenerational responsibility as a distributive principle around which a broader equity framework is constructed, and arguing that “the present use of water resources should take account of future generations.”) (emphasis omitted).

¹⁰⁶ See BATES ET AL., *supra* note 91, at 183 (“[S]ociety’s balance is threatened when control of wealth becomes so absolute or extensive that one or a few individuals monopolize resources crucial to survival or to satisfying basic needs of society.”).

without reasonable justification,¹⁰⁷ or prioritizing entitlements so as to unduly insulate water users from fluctuations in water supply conditions.¹⁰⁸ Subsumed within this principle are considerations of efficiency. Apportionment schemes should mandate water conservation by entitlement holders¹⁰⁹—expressing this mandate clearly in the terms of entitlements—and likewise should be responsive to the relative economic value of competing water uses.

Existing in some degree of tension with the principle of reciprocity is the principle of fidelity,¹¹⁰ which essentially concerns honoring commitments made to entitlement holders. The general notion underlying this principle is that apportionment schemes should fulfill promises made to water users concerning fundamental aspects of entitlements—e.g., their existence, definition, and allocation priority. Involuntary reallocation of entitlements and/or deviation from their key terms should not be considered inequitable *per se* under this principle. However, given their gravity, such measures are justified only if compelling circumstances warrant them (based on counterbalancing equities)¹¹¹ and adequate remedial measures have been put into place, including clear, reasonable timelines and fair compensation as appropriate.¹¹²

The principle of fidelity dovetails with the principle of reliability. As reflected plainly in its title, the gist of this principle is that apportionment schemes should be composed so as to enable water users to rely on their entitlements.¹¹³ Entitlements should be defined with sufficient specificity to

¹⁰⁷ See *Replacing Confusion*, *supra* note 91, at 187 (discussing how the principle of value pluralism—separate from the principle of reciprocity—dictates that “users’ rights to employ water to pursue whatever values they consider legitimate should be respected, provided [such] use does not degrade the resource or harm others”) (emphasis omitted).

¹⁰⁸ See *id.* at 186 (describing how the principle of reciprocity dictates “in the case of water allocation [that] those who use more should expect to have to sacrifice more under conditions of scarcity”).

¹⁰⁹ See BATES ET AL., *supra* note 91, at 180–82 (discussing the principle of conservation, which “demands that the advantages and disadvantages of every water use be carefully weighed” and “asks that a proposed use be considered in relation to the whole community, that the use be no more than necessary, [and] that its harmful effects on others be minimized or avoided”).

¹¹⁰ See *Replacing Confusion*, *supra* note 91, at 188 (discussing the fulfillment of promises as a distributive principle around which a broader equity framework is constructed: “equity assumes the obligation to obey promises agreed to in good faith in the course of negotiation and compromise”) (emphasis omitted).

¹¹¹ See *id.* at 188–89 (discussing circumstances where equity may compel deviation from promises). See also *Importance of Equity*, *supra* note 91, at 12 (“The principle of equity suggests that past promises must be considered, even if they are outweighed by needs to provide equity to existing deserving but underserved populations Equity dictates that present day decisions not unduly burden the scope of future human choices.”).

¹¹² See *Importance of Equity*, *supra* note 91, at 26–27 (discussing compensation for parties forced to make sacrifices due to counterbalancing equities).

¹¹³ See, e.g., Robert Haskell Abrams, *Interstate Water Allocation: A Contemporary Primer for Eastern States*, 25 U. ARK. LITTLE ROCK L. REV. 155, 155 (2002) (discussing the importance of reliability and predictability regarding water rights in the American West: “allocation becomes vital as a means of providing predictability and security of right under conditions of scarcity and competition for the use of the limited supply of water”).

provide water users with a clear sense of the types and amounts of water use permitted by the entitlements. Allocation rules likewise should enable entitlement holders to foresee to a reasonable degree the extent to which they will be able to use water in different circumstances—specifically, in conjunction with fluctuations in water supplies. Beyond providing clarity in both of these respects, apportionment schemes should strive to ensure that water resources will indeed be available to fulfill entitlements held by water users.

Cutting against the principle of reliability—to greater or lesser extents—is the principle of flexibility,¹¹⁴ which directly reflects the notion that equity is defined by context as discussed above. The essence of this principle is that apportionment schemes should contain measures to facilitate reallocation of water resources among entitlement holders based on changes in circumstances (both short and long term). Such changes may come in a variety of forms, including: 1) fluctuation in climatic and hydrologic conditions, 2) advancements in scientific knowledge and technology, 3) diversification and restructuring of economic systems, and 4) reprioritization of societal values. Regardless of the specific type of changes involved, the core point is that apportionment schemes should be composed so as to enable them to stay abreast of these changes, rather than to grow antiquated. Apportionment schemes should not be beholden to distributive arrangements divorced from contemporary conditions and values.¹¹⁵

2. Procedural Equity

Moving on to “procedural equity”¹¹⁶—that is, equity associated with the processes and composition of governance structures for apportionment schemes—at least three important principles fall within this category: 1) inclusivity, 2) diligence, and 3) transparency.

¹¹⁴ See, e.g., *Water and Equity*, *supra* note 91, at 298 (“Essential to adoption of any system of values designed to promote equity is the need to adopt policies that are self-correcting; that acknowledge, in other words, the fallibility of any policy framework and the need to permit and embrace policy change.”).

¹¹⁵ See BATES ET AL., *supra* note 91, at 186 (“Simply enforcing old rights and laws can be downright unfair to interests throughout the community.”). Circumstances warranting water reallocation—and thus highlighting the importance of designing adaptable and flexible apportionment schemes—may involve redressing historical inequities stemming from past prejudicial treatment of marginalized water users. See, e.g., Getches, *supra* note 91, at 591–95 (describing the legal struggle of American Indian tribes in the Colorado River Basin to obtain adequate water supplies for their reservations as ostensibly secured by entitlements (“reserved rights”) announced in *Winters v. United States*, 207 U.S. 564 (1908)). Reallocation of water resources for environmental purposes also may be warranted based on changes in societal values. See *id.* at 595–601 (discussing the environmental impacts of water development in the Colorado River Basin and the evolving role played by environmental concerns in Colorado River governance).

¹¹⁶ See *Importance of Equity*, *supra* note 91, at 21 (“Equity requires fair, open, and transparent decision-making processes in which all individuals and groups affected by water decisions have an opportunity to participate.”); Getches, *supra* note 91, at 590 (“[E]quity demands that water serve a broad range of public interests and a process for reaching decisions that is generally fair.”).

The essence of the principle of inclusivity is that governance structures devised for apportionment schemes should be composed to provide opportunities for the full scope of parties whose interests are affected by the schemes to participate meaningfully in implementation processes.¹¹⁷ These parties may include sovereigns, such as federal, state, or tribal governments; water users (i.e., those with interests in consumptive and non-consumptive water uses); and members of the general public. Similar to the principle of reciprocity discussed above,¹¹⁸ the principle of inclusivity entails recognizing the interdependence of these parties' diverse interests and crafting the governance structure so as to allow for even-handed participation by them. Collaboration is viewed as a positive thing under this principle.

Potentially—though not necessarily—running contrary to the principle of inclusivity is the principle of diligence, which generally accounts for the idea that adequate measures need to be put into place in order to ensure that the substantive terms of apportionment schemes are implemented fully and accurately—i.e., that water users abide by the terms of their entitlements, allocation priorities are adhered to, and so forth. Governance structures need to be composed toward this end, incorporating and standardizing monitoring processes, reporting requirements, accounting methods, and similar measures. This principle stems from the perspective that the substantive terms of apportionment schemes should be honored—more specifically, that the mandates embodied within apportionment schemes constitute shared commitments and that governance structures need to be tailored accordingly.¹¹⁹

Issues concerning a lack of diligence in the implementation of apportionment schemes sometimes relate closely to issues of transparency, with the latter type of issues speaking volumes about the importance of openness in governance processes.¹²⁰ The principle of transparency stems from this vantage point. Its core tenet is that governance structures should be composed so as to promote transparency with respect to the processes used for implementing the substantive terms of apportionment schemes.¹²¹

¹¹⁷ See *Water and Equity*, *supra* note 91 at 299–300 (discussing the importance of structuring decision-making processes so they are not pre-determined but instead encourage open deliberation); BATES ET AL., *supra* note 91, at 182 (“The essential importance of water places a special value on the manner in which decisions are made respecting its use and availability. The whole community must be considered in those decisions, and all interests must have a meaningful opportunity to participate.”); see also *id.* at 186 (“Water decisions will be fairer if decision makers must answer to those affected by their decisions. Laws should require governments to account for impacts of their water decisions at all levels.”); *Replacing Confusion*, *supra* note 91, at 188 (discussing participation as an important equity-related principle).

¹¹⁸ See *supra* notes 103–09 and accompanying text.

¹¹⁹ See *Replacing Confusion*, *supra* note 91, at 188 (“[E]quity assumes the obligation to obey promises agreed to in good faith in the course of negotiation and compromise.”).

¹²⁰ See, e.g., *Water and Equity*, *supra* note 91, at 300 (discussing value of transparency in policymaking processes aimed at promoting equity).

¹²¹ *Importance of Equity*, *supra* note 91, at 21 (“Equity requires fair, open, and transparent decision-making processes . . . [A]ny approach to management should emphasize process as much as substance—providing the widest possible debate and deliberation.” (quoting DAVID LEWIS FELDMAN, WATER RESOURCES MANAGEMENT (1991))).

These processes should be structured in an open and straightforward manner so as to invite engagement by parties whose interests are affected by the schemes. Rationales supporting decisions and attendant actions related to implementation processes should be communicated in explicit, comprehensible terms. These rationales likewise should be responsive to the full scope of viewpoints expressed on relevant matters.

To what extent does the Colorado River Compact realize the spirit of “equity” as that norm is broken down in this section—both with respect to the substantive terms of the apportionment scheme and the governance structure (or lack thereof) devised for it? Different people most certainly will come to different conclusions about this question. We offer our thoughts on it below. Before doing so, however, much more context is needed—particularly, a close look at water supply and demand conditions in the Colorado River Basin and important conflicting interpretations of the Compact implicated by these conditions.

IV. A CONTEMPORARY PERSPECTIVE ON THE RIVER AND COMPACT

Although a variety of legal and policy challenges currently face Colorado River governance, the core issue of overuse (facilitated by prior overallocation) directly or indirectly underlies virtually all of these challenges. As highlighted in the first section below, the trend in recent years has been for water demands to exceed water supplies in the Colorado River Basin, a pattern projected to persist absent changes in the status quo.¹²² Implicated by this supply-demand imbalance are a host of longstanding disputes between the Upper and Lower Basins involving conflicting interpretations of key provisions framing the Compact’s apportionment scheme. Several such disputes are surveyed in the second section of this Part. The supply-demand imbalance promises to aggravate these historic disagreements—perhaps ultimately requiring their resolution, via Supreme Court litigation or otherwise. All told, current and projected water supply limitations in the basin intertwine inextricably with these interpretive disputes to raise serious concerns about the extent to which the Compact fulfills its commitment to equity. We offer our perspectives on this subject in Part V.

A. A River No More?

Viewed from an ecological perspective, the Colorado River has been aptly described as “a river no more,”¹²³ with significant flows not having

¹²² Of course the scope of water resources available for use in and around the basin bears significantly on the extent to which future water demands will increase. Water demands cannot exceed water supplies indefinitely.

¹²³ This phrase is drawn from FRADKIN, *supra* note 8. For excellent discussions of ecological conditions in the Colorado River Basin, see generally ROBERT W. ADLER, RESTORING COLORADO RIVER ECOSYSTEMS: A TROUBLED SENSE OF IMMENSITY (2007), and Robert W. Adler, *An Ecosystem Perspective on Collaboration for the Colorado River*, 8 NEV. L.J. 1031 (2008).

reached the river's delta at the Gulf of California consistently for half a century.¹²⁴ This pattern correlates with a steady trend of increasing demands for water from the Colorado River System during roughly the past 100 years.¹²⁵ Projected to continue in the future absent significant reforms,¹²⁶ this trend runs in the opposite direction of water supply projections for the basin over the next 50 years, thereby posing the thorny issue of how to bring water supply and demand levels into balance.¹²⁷ This section provides an overview of important information about the basin's hydrology related to the existing and projected future imbalances between water supplies and demands, paying particular attention to information bearing on the interpretive disputes discussed in the following section.

According to an ongoing study examining water supply and demand levels in the Colorado River Basin being conducted by the U.S. Bureau of Reclamation, the average annual natural inflow into the basin—which represents basinwide water supply—has been 16.4 maf during the past 100 years.¹²⁸ Notably, this annual average does not account for inflows from the primary tributary in the Lower Basin, the Gila River.¹²⁹ Broadly speaking, the historical record shows considerable variation in the amounts of natural inflow into the basin both annually and across the past century,¹³⁰ with higher flows observed throughout the period surrounding formation of the Colorado River Compact in 1922.¹³¹ As is typical with many river systems in the West, the water supply in the basin depends heavily on snowmelt from high-elevation areas in the Upper Basin.¹³² Roughly 92% of the natural flow into the Colorado River is contributed by runoff upstream of Lees Ferry, Arizona,¹³³ which is located roughly two miles upstream of the dividing point

¹²⁴ INTERIM REPORT, *supra* note 18, at 3 (identifying the historical pattern and scholarship addressing this issue).

¹²⁵ See STATUS REPORT, *supra* note 1, at SR-4 fig.1, SR-7 fig.2 (identifying historical trends in water use and supply levels in the Colorado River Basin).

¹²⁶ See BUREAU OF RECLAMATION, *supra* note 11, at 7 (projecting future water demand levels in the Colorado River Basin up to 2060).

¹²⁷ As noted above, this supply-demand imbalance is the central focus of the U.S. Bureau of Reclamation's ongoing Basin Study. Bureau of Reclamation, *Colorado River Basin Water Supply & Demand Study*, <http://www.usbr.gov/lc/region/programs/crbstudy.html> (last visited Nov. 18, 2012).

¹²⁸ STATUS REPORT, *supra* note 1, at SR-2.

¹²⁹ *Id.* at SR-2 n.4, SR-4 fig.1, SR-7 fig.2, SR-31. It also should be noted that the Bureau of Reclamation has used *historical* flows based on U.S. Geological Survey records to represent *natural* flows for other Lower Basin tributaries—e.g., the Paria River, Little Colorado River, Virgin River, and Bill Williams River. *Id.* at SR-2 n.4, SR-4 fig.1, SR-7 fig.2, SR-31. As acknowledged by the Bureau of Reclamation, this treatment of the Lower Basin tributaries—i.e., exclusion of Gila River inflows and use of historical flows rather than natural flows for the other tributaries—“limits the ability of the [Basin Study] to fully assess the natural supply of the Basin.” *Id.* at SR-31.

¹³⁰ See *id.* at SR-4 fig.1, SR-7 fig.2 (identifying natural flow variability).

¹³¹ See *id.* (identifying flow levels during this period).

¹³² BUREAU OF RECLAMATION, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, TECHNICAL REPORT B – WATER SUPPLY ASSESSMENT B-12 (2012), available at <http://www.usbr.gov/lc/region/programs/crbstudy/Report1/Updates/TechRptB.pdf>.

¹³³ *Id.* at B-21.

between the Upper and Lower Basins under the Compact—a location referred to as “Lee Ferry.”¹³⁴

Flow levels at Lees Ferry are particularly important due to the fact that Lee Ferry is the point at which the Upper Division states (again, Colorado, New Mexico, Utah, and Wyoming) are responsible for fulfilling their flow obligations prescribed by Article III(c) and (d) of the Compact.¹³⁵ As has been recognized for several decades, the commissioners who negotiated the Compact estimated annual flows at Lees Ferry well above those subsequently observed in the historical record and derived from tree ring studies (paleo reconstructions).¹³⁶ These paleo reconstructions—some of which extend back more than 1,200 years—estimate average flows at Lees Ferry of 13.0 maf to 14.7 maf per year.¹³⁷ The 100-year historical record places these flows at roughly 15.0 maf annually.¹³⁸ It is worth highlighting that the period from 2000 to 2010 represents the lowest 11-year average of annual flows at Lees Ferry in recorded history—12.1 maf per year, approximately 20% below the average from the historical record¹³⁹—although paleo reconstructions show droughts of this severity or greater have occurred in the past.¹⁴⁰

Looking forward, the vast majority of climate change studies project declines in annual flows at Lees Ferry of 10% to 30% by the middle of the twenty-first century,¹⁴¹ with estimates ranging from 6% to 45% overall.¹⁴² Assuming flow levels of 15.0 maf based on the historical record, declines of 10% to 30% translate to average Lees Ferry flows of 13.5 maf to 10.5 maf annually.¹⁴³ Relying on the range of annual flow levels from paleo reconstructions—again, 13.0 maf to 14.7 maf¹⁴⁴—the corresponding range of potential average Lees Ferry flows is 9.1 maf (13.0 maf reduced by 30%) to

¹³⁴ Colorado River Compact, art. II(e) (codified at COLO. REV. STAT. § 37-61-101 (2012)). A useful map identifying “Lees Ferry” (the gauging station site) and “Lee Ferry” (the dividing point between the Upper and Lower Basins) can be found at: BUREAU OF RECLAMATION, THE COLORADO RIVER DOCUMENTS 2008, at 2-9 (2010), available at <http://www.riversimulator.org/Resources/LawOfTheRiver/HooverDamDocs/ColoradoRiverDoc2008.pdf>.

¹³⁵ *Id.* at 2-10.

¹³⁶ INTERIM REPORT, *supra* note 18, at 14, 70. Reflecting wet conditions prevalent during the early twentieth century, records used by compact negotiators suggested annual Lees Ferry flows of at least 16.8 maf, while the U.S. Bureau of Reclamation suggested a more conservative estimate of 16.4 maf. *Id.* at 70. Individual negotiators relied on considerably higher amounts. *See id.*; HOOVER DAM DOCUMENTS, *supra* note 35, at A60, A103, A118, A127 (identifying estimates of over 18.0 maf of natural flows annually).

¹³⁷ INTERIM REPORT, *supra* note 18, at 67–68, 70.

¹³⁸ *See* STATUS REPORT, *supra* note 1, at SR-2 (noting average of “approximately 15.0 maf of natural flow into the Upper Basin” per year based on the historical record); INTERIM REPORT, *supra* note 18, at 67 (noting 15.2 maf of average annual flows at Lees Ferry per the historical record).

¹³⁹ STATUS REPORT, *supra* note 1, at SR-3.

¹⁴⁰ *Id.* *See also* INTERIM REPORT, *supra* note 18, at 67–68 (discussing the relatively wet and invariable conditions in the basin throughout the twentieth century as compared to past centuries assessed by paleo reconstructions).

¹⁴¹ INTERIM REPORT, *supra* note 18, at 17, 71.

¹⁴² *Id.* at 71.

¹⁴³ *Id.* at 17.

¹⁴⁴ *Id.* at 67–68, 70.

13.23 maf (14.7 maf reduced by 10%). Although their precise amounts remain to be seen, these flow reductions are expected to be accompanied by increases in the frequency and duration of droughts and also changes in precipitation patterns involving reduced late-season snowpack and earlier spring runoff.¹⁴⁵

Turning to water demands, the general trend in the Colorado River Basin over the past decade has been for water use levels to exceed water supply levels, with the demand and supply line averages intersecting for the first time in the late 1990s.¹⁴⁶ According to the U.S. Bureau of Reclamation, water use in the basin increased by 23% between 1971 and 1999, from approximately 13.0 maf to 16.0 maf.¹⁴⁷ Over this period, water use in the Upper Basin grew from approximately 3.0 maf to 3.3 maf, and water use in the Lower Basin grew from roughly 6.6 maf to 8.0 maf.¹⁴⁸ In conjunction with drought conditions over the past decade, water use in the basin decreased to around 15.0 maf as of 2008, including 3.8 maf of use in the Upper Basin and 7.6 maf of use in the Lower Basin.¹⁴⁹ Notably, none of these figures account for the use of water from the Gila River and other Lower Basin tributaries.¹⁵⁰

An array of scenarios could emerge with respect to future water demands in the Colorado River Basin.¹⁵¹ Factors influencing the scope of these demands include population growth; water-use efficiency in various sectors (agriculture, municipal, etc.); economic restructuring and diversification; energy portfolios and demands; water flow needs for environmental purposes (recreation, species and habitat protection, pollution control, etc.); and changes in societal values related to water use.¹⁵² Overall, based on six scenarios currently being evaluated by the U.S. Bureau of Reclamation, annual water demands in the basin are projected to

¹⁴⁵ *Id.* at 71.

¹⁴⁶ STATUS REPORT, *supra* note 1, at SR-7 fig.2; BUREAU OF RECLAMATION, *supra* note 11, at 7 fig.2. Water demands exceeded water supplies in the basin on an annual or short-term basis at several points in the latter half of the twentieth century. STATUS REPORT, *supra* note 1, at SR-4 fig.1.

¹⁴⁷ STATUS REPORT, *supra* note 1, at SR-25, SR-27 fig.9.

¹⁴⁸ *Id.* Annual deliveries of treaty water to Mexico ranged from 1.5 maf to 1.7 maf (excluding spills) during this period, and annual evaporation losses from reservoirs increased from approximately 1.7 maf to 2.3 maf. *Id.*

¹⁴⁹ *Id.* at SR-27 fig.9. The precise water use levels were: Upper Basin—3.788 maf; Lower Basin—7.586 maf; treaty water deliveries—1.5 maf; and reservoir evaporation losses—1.683 maf. *Id.* Taken together, these uses total 14.557 maf. In addition to this total, roughly half a million acre-feet were lost due to phreatophyte and operational inefficiency losses. *Id.*

¹⁵⁰ *Id.* at SR-27 fig.9, n.1.

¹⁵¹ *See generally* BUREAU OF RECLAMATION, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, TECHNICAL MEMORANDUM C – QUANTIFICATION OF WATER DEMAND SCENARIOS (2012), available at <http://www.usbr.gov/lc/region/programs/crbstudy/TechMemoC/TMCreport.pdf> [hereinafter WATER DEMAND SCENARIOS] (examining six different water demand scenarios in the basin).

¹⁵² *See id.* at C-6 to C-10 (identifying factors used in projecting water demand scenarios); INTERIM REPORT, *supra* note 18, at 58–65 (discussing water demands vis-à-vis the factors of population growth and energy development).

increase to between 18.1 maf and 20.4 maf by 2060.¹⁵³ Similar to the preceding figures, these figures do not account for water demands from the Gila River and other Lower Basin tributaries.¹⁵⁴ Excluding treaty water deliveries to Mexico, reservoir evaporation, and other losses, annual water demand is projected to grow to 6.0 maf in the Upper Basin and slightly above 10.0 maf in the Lower Basin under the highest-demand scenario.¹⁵⁵

How does the water supply and demand information surveyed in this section square with the Compact's apportionment scheme? More specifically, how does the Compact call for allocating water from the Colorado River System in light of the foregoing hydrological conditions? These questions are misleading in that they suggest the Upper and Lower Basins share a common understanding of key provisions defining the Compact's apportionment scheme. In a number of respects, the opposite is true, as is revealed in the following section.

B. Cracks in the Foundation

Considering the duration and iterative nature of the Law of the River's evolution over roughly the past century, the emergence of divergent viewpoints on the meaning of, and relationships between, the nuanced laws accumulated throughout this process is perhaps unsurprising. A wide range of issues currently exists related to the construction and reconciliation of these laws, including several major issues involving conflicting interpretations of key provisions framing the Compact's apportionment scheme. We focus on four such issues in this section. All of these issues significantly influence how the Compact—depending upon how it is interpreted—calls for water to be allocated in and around the Colorado River Basin in light of current and projected future hydrological conditions. Our purpose in drawing attention to these issues is not to engage in full-fledged legal analyses of them but rather to consider how the allocation patterns stemming from the conflicting interpretations bear on the Compact's commitment to equity. Three of these issues relate to Article III(c) and the Upper and Lower Basins' flow obligations to Mexico. The fourth issue concerns Article III(d) and the flow obligation it imposes on the Upper Division states. We survey these issues in this section and then revisit them in Part V.

1. Flows to Mexico

Article III(c) is the longest of the five provisions in Article III that play key roles in shaping the Compact's apportionment scheme. Its length

¹⁵³ WATER DEMAND SCENARIOS, *supra* note 151, at C-17 to C-19, C-19 fig.C-5. On an annual basis, this projection contemplates treaty water deliveries of 1.5 maf to Mexico, reservoir evaporation losses of 2.0 maf, and phreatophyte and operational efficiency losses of roughly 0.75 maf. *Id.* at C-19 fig.C-5.

¹⁵⁴ *Id.* at C-19.

¹⁵⁵ *Id.* at C-21 fig.C-6.

parallels the range of disputes rooted in its text. Broadly speaking, these disputes concern the respective obligations of the Upper and Lower Basins to contribute flows toward Mexico's 1.5 maf annual entitlement to Colorado River water established by the U.S.-Mexico Treaty of 1944.¹⁵⁶ Supplying these flows constitutes a national obligation generally regarded as the highest priority of the Law of the River.¹⁵⁷ At issue with regard to these flow contributions are three important matters examined below: 1) the status of water in the Lower Basin tributaries, 2) the method of determining the existence of "surplus" water, and 3) the coverage of channel losses in the Lower Basin.¹⁵⁸

a. Lower Basin Tributaries

Tracing back to the Compact negotiations in 1922,¹⁵⁹ the critical issue of whether the Lower Basin tributaries are encompassed within the Compact's apportionment scheme is a politically charged one foreseeably requiring resolution in coming decades. To be clear, this issue has two dimensions. The first dimension, which is not our main focus here, concerns Article III(a) and (b). If the Lower Basin tributaries are subsumed within the Compact's apportionment scheme, then the use of water from these tributaries must be taken into account when assessing whether water use in the Lower Basin falls within or outside of the 8.5 maf entitlement set forth in these provisions.¹⁶⁰ We discuss equity-related concerns raised by this matter

¹⁵⁶ U.S.-Mexico Treaty, *supra* note 29, art. 10(a), T.S. 944 at 21.

¹⁵⁷ For scholarship describing the Mexican treaty obligation as the highest priority of the Law of the River, see Lawrence J. MacDonnell et al., *The Law of the Colorado River: Coping with Severe Sustained Drought*, 31 WATER RESOURCES BULL. 825, 826 (1995), and John U. Carlson, *The Colorado River Compact: A Breeding Ground for International, National, and Interstate Controversies* 11 (June 5-7, 1989) (on file with the authors). Article III(c) supports this view of the Mexican treaty obligation by requiring the Upper and Lower Basins to make equal contributions toward treaty flows if "surplus" water is not available for this purpose. See *infra* Part IV.B.1.b; see also Colorado River Basin Project Act, 43 U.S.C. § 1512 (2006) (declaring satisfaction of the Mexican Water Treaty supply requirements a "national obligation"); *id.* § 1552 (designating Mexico's Article III(c) entitlement as the first priority of releases from Lake Powell).

¹⁵⁸ These three issues are analyzed in greater detail in COLO. RIVER GOVERNANCE INITIATIVE, RESPECTIVE OBLIGATIONS OF THE UPPER AND LOWER BASINS REGARDING THE DELIVERY OF WATER TO MEXICO: A REVIEW OF KEY LEGAL ISSUES (2012), available at <http://www.waterpolicy.info/archives/docs/Obligations%20Regarding%20the%20Delivery%20of%20Water%20to%20Mexico.pdf?p=1689>.

¹⁵⁹ For useful discussions of how this issue was addressed at the compact negotiations, see *id.* at 11-20. See also WATER AND THE WEST, *supra* note 8, at 196-204, 258, 292.

¹⁶⁰ See *supra* notes 56-58 and accompanying text (providing text of Article III(a) and (b)). In short, Article III(a) entitles the Lower Basin to use 7.5 maf of water from the Colorado River System annually, and Article III(b) augments this entitlement by authorizing an additional 1.0 maf of use per year. These articles do not prohibit water use in the Lower Basin from exceeding 8.5 maf annually *per se*, but they preclude the Lower Basin from acquiring legal title to water use beyond this amount—i.e., absent further equitable apportionment pursuant to Article III(f) and (g). This construction of Article III is set forth in a report prepared for the Colorado Senate by

below in Part V. Turning to Article III(c), however, the second dimension of this issue involves whether water in the Lower Basin tributaries must be considered when determining whether “surplus” water exists to supply Mexico’s treaty entitlement. As noted in Part II, Article III(c) calls for this treaty water to be “supplied first from the waters which are surplus over and above the aggregate of the quantities specified in [Article III(a) and (b)].”¹⁶¹ Are the Lower Basin tributaries exempt from the Compact’s apportionment scheme such that their water is overlooked when determining whether “surplus” water exists within the meaning of this provision? The Upper and Lower Basins’ views on this issue are diametrically opposed.

The Lower Basin contends for exclusion of these tributaries from the Compact’s apportionment scheme, an argument that may rely on the Supreme Court’s holding in *Arizona v. California* for support.¹⁶² In this historic case, the Court interpreted the Boulder Canyon Project Act as establishing an apportionment scheme governing water use from the Colorado River mainstem by Arizona, California, and Nevada, holding that the Lower Basin tributaries were not encompassed within this scheme.¹⁶³ Omitting the details of this holding and the associated apportionment scheme here,¹⁶⁴ this precedent may provide a basis for arguments favoring similar treatment of the Lower Basin tributaries under the Compact. In addition to affecting the scope of the Lower Basin’s entitlement in Article III(a) and (b), these arguments, if successful, would control how the existence of “surplus” water would be determined under Article III(c). As identified above, Lower Basin tributary water would not be accounted for when determining whether surplus water “over and above the aggregate of the quantities specified in [Article III(a) and (b)]”¹⁶⁵ exists to satisfy Mexico’s treaty entitlement.

The Upper Basin naturally takes the opposite position on this issue: The use of Lower Basin tributary water counts against the 8.5 maf entitlement in Article III(a) and (b), and this water likewise must be considered when determining whether “surplus” water exists to supply

the Colorado Commissioner at the compact negotiations, Delph Carpenter, a copy of which can be found in HOOVER DAM DOCUMENTS, *supra* note 35, at A101.

¹⁶¹ Colorado River Compact, art. III(c) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

¹⁶² For useful commentary on the Lower Basin’s position, see Carlson, *supra* note 157, at 15–16; John U. Carlson & Alan E. Boles, Jr., *Contrary Views of the Law of the Colorado River: An Examination of Rivalries Between the Upper and Lower Basins*, 32 ROCKY MTN. MIN. L. INST. 21, § 21.05[2][a] (1986); David H. Getches, *Competing Demands for the Colorado River*, 56 U. COLO. L. REV. 413, 425 (1985).

¹⁶³ Decree, 373 U.S. 546, 565–66 sec. I (1963).

¹⁶⁴ Seminal scholarship examining *Arizona v. California* includes Norris Hundley, Jr., *Clio Nods: Arizona v. California and the Boulder Canyon Project Act – A Reassessment*, 3 W. HIST. Q. 17 (1972); Meyers, *supra* note 54, at 43–73; Joseph L. Sax, *Problems of Federalism in Reclamation Law*, 37 U. COLO. L. REV. 49 (1964); Edward B. Clyde, *The Colorado River Decision—1963*, 8 UTAH L. REV. 299 (1963); and Frank J. Trelease, *Arizona v. California: Allocation of Water Resources to People, States, and Nation*, 1963 SUP. CT. REV. 158 (1963).

¹⁶⁵ Colorado River Compact, art. III(c) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

Mexico's treaty entitlement under Article III(c).¹⁶⁶ Among other arguments, the Upper Basin relies on the definition of "Colorado River System" in Article II(a) for support, emphasizing how this term encompasses "that portion of the Colorado River *and its tributaries* within the United States of America."¹⁶⁷ This term is expressly used in Article III(c).¹⁶⁸ It is also incorporated into Article III(a) and (b) in relation to the Upper and Lower Basins' entitlements.¹⁶⁹

b. "Surplus" Water

The Lower Basin tributaries issue is not the only one involving conflicting views held by the Upper and Lower Basins about how the existence of "surplus" water is determined under Article III(c). The inclusion or exclusion of the Lower Basin tributaries from the Compact's apportionment scheme bears on the scope of water sources accounted for when making this determination. A related but distinct issue concerns the method by which the determination is made.¹⁷⁰ Is the existence of "surplus" water determined by assessing whether water exists over and above the individual amounts set forth in the Upper and Lower Basins' entitlements—7.5 maf and 8.5 maf, respectively? Or is the collective amount of water use authorized by these entitlements—16.0 maf—the relevant baseline for determining the existence of "surplus" water? These questions encapsulate the Upper and Lower Basins' competing positions on this issue.

Adopting the first position, the Upper Basin contends that "surplus" water consists of water over and above the 7.5 maf and 8.5 maf of use authorized by the Upper and Lower Basins' individual entitlements.¹⁷¹ On

¹⁶⁶ For useful scholarship addressing the Upper Basin's position, see Carlson, *supra* note 157, at 15–19; Carlson & Boles, *supra* note 162; and Getches, *supra* note 162.

¹⁶⁷ Colorado River Compact, art. II(a) (codified at COLO. REV. STAT. § 37-61-101 (2012)) (emphasis added). See *infra* Part V.A.1 (discussing implications of construing the Compact to exclude the Lower Basin tributaries).

¹⁶⁸ Article III(c) provides: "If . . . the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the *Colorado River System*, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in [Article III(a) and (b)]." Colorado River Compact, art. III(c) (codified at COLO. REV. STAT. § 37-61-101 (2012)) (emphasis added).

¹⁶⁹ See *id.* art. III(a) (codified at COLO. REV. STAT. § 37-61-101 (2012)) (apportioning from the "Colorado River System" to the Upper and Lower Basins entitlements to use 7.5 maf of water annually); *id.* art. III(b) (entitling the Lower Basin to increase its use of "such waters" by 1.0 maf per year).

¹⁷⁰ A fuller discussion of this issue—including a close look at predecessor provisions to Article III(c) considered at the compact negotiations—can be found at COLORADO RIVER GOVERNANCE INITIATIVE, *supra* note 158, at 26–40.

¹⁷¹ For useful scholarship identifying the Upper Basin's position, see Lawrence J. MacDonnell, *The Disappearing Colorado River*, 9 W. ECON. F., Fall 2010, at 1, 2–3; W. Patrick Schiffer et al., *From a Colorado River Compact Challenge to the Next Era of Cooperation Among the Seven Basin States*, 49 ARIZ. L. REV. 217, 220–21 (2007); James S. Lochhead, *An Upper Basin Perspective on California's Claims to Water from the Colorado River Part I: The Law of the River*, 4 U. DENVER WATER L. REV. 290, 320 (2001); Carlson, *supra* note 157, at 19–20; Carlson

this view, if water use in the Lower Basin exceeds 8.5 maf in a given year—accounting for use on the mainstem *and* its tributaries—then the water used in excess of this entitlement constitutes “surplus” for purposes of Article III(c). According to the Upper Basin, its obligation to contribute flows toward Mexico’s treaty entitlement is relieved to the extent such “surplus” water exists. Thus, if water use in the Lower Basin is 10.0 maf in a given year, then the 1.5 maf of “surplus” water must be put toward Mexico’s treaty entitlement, and the Upper Basin’s obligation under Article III(c) must be relieved accordingly.

Rooted in the text of Article III(c), the Lower Basin’s opposing argument contends that “surplus” water refers to water over and above the aggregate of the 7.5 maf and 8.5 maf of use authorized by the Upper and Lower Basins’ entitlements—again, 16.0 maf.¹⁷² Article III(c)’s express use of the term “aggregate” is pivotal to this interpretation. The relevant text provides that waters needed to satisfy Mexico’s treaty entitlement “shall be supplied first from the waters which are surplus over and above the *aggregate of the quantities* specified in [Article III(a) and (b)].”¹⁷³ According to the Lower Basin, the Upper Basin’s position entails reading the term “aggregate” out of this text—i.e., such that the provision calls for supplying treaty water to Mexico “first from the waters which are surplus over and above . . . the quantities specified in [Article III(a) and (b)].” On the Lower Basin’s view, if the supply of water in the Colorado River System in a given year exceeds 16.0 maf—excluding water in the Lower Basin tributaries—then water over and above that amount constitutes “surplus” within the meaning of Article III(c). If such “surplus” water does not exist (partially or fully), then the Upper Division states are responsible for contributing half of the flows needed to satisfy Mexico’s treaty entitlement.

& Boles, *supra* note 162; Edward W. Clyde, *Institutional Response to Prolonged Drought*, in *NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY* 109, 116 (Gary D. Weatherford & F. Lee Brown eds., 1986) [hereinafter *Institutional Response*]; Edward W. Clyde, *Conflicts Between the Upper and Lower Basins on the Colorado River*, in *RESOURCES DEVELOPMENT: FRONTIERS FOR RESEARCH* 113, 127–28 (Franklin S. Pollak ed., 1960) [hereinafter *Conflicts*]. A recent (albeit generally stated) expression of the Upper Basin’s position can be found in Letter from Scott Balcomb et al., Governors’ Representatives on Colo. River Operations of the States of Colo., N.M., Utah, and Wyo., to Herb Guenther et al., Governors’ Representatives of the States of Ariz., Cal., and Nev. (Oct. 7, 2004) (on file with the authors) (stating that a deficiency per Article III(c) has not been shown to exist and therefore the Upper Basin has no obligation to share in it).

¹⁷² Useful scholarship identifying the Lower Basin’s position includes MacDonnell, *supra* note 171, at 3 n.12; Schiffer et al., *supra* note 171, at 221–22; Carlson, *supra* note 157, at 15; Carlson & Boles, *supra* note 162, § 21.05[2][b]; *Institutional Response*, *supra* note 171, at 113; Getches, *supra* note 171, at 421–22; Meyers, *supra* note 54, at 16–17.

¹⁷³ Colorado River Compact, art. III(c) (codified at COLO. REV. STAT. §§ 37-61-101 (2012)) (emphasis added).

c. Channel Losses

A third contentious issue involving Article III(c) comes into play when “surplus” water is not available to supply Mexico’s treaty entitlement—that is, in “deficiency” conditions. The relevant text within Article III(c) addressing the Upper and Lower Basins’ obligations to contribute treaty flows in such conditions provides: “[T]he burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in [Article III(d)].”¹⁷⁴ This text plainly calls for the Upper and Lower Basins to equally bear the Mexican treaty burden. What is less clear is whether treaty water deliveries required of the Upper Division states must account for channel losses in the Lower Basin (i.e., in conjunction with carriage of the water to the international border). Are the Upper Division states obligated to cover an equal portion of these losses?¹⁷⁵

The Lower Basin answers this question in the affirmative.¹⁷⁶ In its view, Article III(c) obligates the Upper Division states to contribute not only one-half of the flows required to satisfy Mexico’s 1.5 maf entitlement, but also one-half of the channel losses that occur as the treaty water moves from Lee Ferry to the designated points of delivery at the Mexican border. According to the Lower Basin, the treaty flow contribution required of the Upper Division states in any given year involving a deficiency encompasses both of these amounts.

Relying on the text of Article III(c), the Upper Basin takes the opposing stance, asserting that the Upper Division states are not obligated to cover half of the channel losses incurred when moving treaty water through the Lower Basin in deficiency conditions.¹⁷⁷ From the Upper Basin’s perspective, Article III(c) only compels the Upper Division states to deliver one-half of the flows required to supply Mexico’s treaty entitlement, and the delivery of this water at Lee Ferry constitutes satisfaction of this obligation. Critical to the Upper Basin’s view is Article III(c)’s express designation of Lee Ferry as the delivery point for these flows: “the States of the Upper Division shall deliver *at Lee Ferry* water to supply one-half of the deficiency.”¹⁷⁸ In accordance with the Upper Basin’s view, the Upper Division states are

¹⁷⁴ *Id.*

¹⁷⁵ This issue is discussed in greater detail in COLORADO RIVER GOVERNANCE INITIATIVE, *supra* note 158, at 41–57. Included in this discussion is a good deal of material drawn from the compact negotiations, including exchanges among the commissioners addressing this issue and relevant predecessor provisions of Article III(c).

¹⁷⁶ For commentary noting the Lower Basin’s position, see Schiffer et al., *supra* note 171, at 225; Carlson, *supra* note 157, at 20; Carlson & Boles, *supra* note 162, § 21.05[2][c]; Getches, *supra* note 162, at 422–23.

¹⁷⁷ The Upper Basin’s position is identified in: MacDonnell, *supra* note 171, at 2–3; WATER AND THE WEST, *supra* note 8, at 204 n.77; Carlson, *supra* note 157, at 21; Carlson & Boles, *supra* note 162, § 21.05[2][c]; and Getches, *supra* note 162, at 422–23.

¹⁷⁸ Colorado River Compact, art. III(c) (codified at COLO. REV. STAT. § 37-61-101 (2012)) (emphasis added).

responsible for covering channel losses associated with delivering treaty water per Article III(c) upstream of Lee Ferry, and the Lower Division states must follow suit downstream of this point.

2. *Flows to the Lower Basin*

The nature of the flow obligation imposed on the Upper Division states by Article III(d) constitutes yet another subject in relation to which the Upper and Lower Basins seemingly stand worlds apart. The text of this provision bears repeating here: “The States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre feet for any period of ten consecutive years reckoned in continuing progressive series”¹⁷⁹ As discussed below in Part V, the way in which this text is interpreted significantly influences the way in which the Compact’s apportionment scheme calls for allocating water in and around the Colorado River Basin under current and projected future hydrological conditions. Much hinges on the Upper and Lower Basins’ competing views of this text. Does it prescribe a static, quantified delivery obligation that adheres irrespective of fluctuations in the basin’s hydrology or relative levels of water use in the Upper and Lower Basins? This question reflects the crux of the Upper and Lower Basins’ conflicting interpretations of Article III(d).

The Upper Basin answers the foregoing question with a resounding “no,” maintaining that Article III(d) does not require the Upper Division states to deliver 75.0 maf of water at Lee Ferry every consecutive ten-year period irrespective of the conditions just noted. Emphasizing the use of the term “depleted” in Article III(d)—“[t]he States of the Upper Division will not cause the flow of the river at Lee Ferry to be *depleted* below”¹⁸⁰ the prescribed amount—the Upper Basin construes the provision as imposing a non-depletion obligation, not a delivery obligation.¹⁸¹ From this perspective, the flow obligation of the Upper Division states apparently would be reduced in proportion to naturally-caused depletions of flows—e.g., due to climate change. In further support of its position, the Upper Basin construes

¹⁷⁹ *Id.* art. III(d) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

¹⁸⁰ *Id.* (emphasis added).

¹⁸¹ For a lengthy review of this interpretation and the variety of Law of the River provisions related to it, see generally COLO. RIVER GOVERNANCE INITIATIVE, DOES THE UPPER BASIN HAVE A DELIVERY OBLIGATION OR AN OBLIGATION NOT TO DEplete THE FLOW OF THE COLORADO RIVER AT LEE FERRY? (2012), available at <http://waterpolicy.info/archives/docs/Delivery%20Obligation%20memo.pdf?p=1693>. See also ERIC KUHN, RISK MANAGEMENT STRATEGIES FOR THE UPPER COLORADO RIVER BASIN 13 (2012), available at http://www.crwcd.org/media/uploads/Kuhn_on_Risk_Mgt_Strategies_of_the_UCRB.pdf (“The 75 million is not a delivery requirement because nature, and/or presumably pre-1922 Compact water rights, could deplete the flow below this amount without a violation of Article III(d).”); MacDonnell, *supra* note 171, at 4 (noting that this interpretation “would reduce the flow obligation according to the reduction in water availability attributable to climate change”).

the relationship between Article III(a) and (d) as such that the former provision takes precedence over the latter.¹⁸²

A much different interpretation of Article III(d) is held by the Lower Basin, which views the provision as imposing a concrete delivery obligation. Regardless of fluctuations in average annual flows at Lee Ferry, and regardless of the relative amounts of water use in the Upper and Lower Basins vis-à-vis the Article III(a) and (b) entitlements, the Lower Basin contends that the Upper Division states are obligated to deliver 75.0 maf of water at Lee Ferry every consecutive ten-year period.¹⁸³ The use of the term “deplete” in Article III(d) does not change the nature of the flow obligation on this view. Nor is Article III(d) trumped by Article III(a). Such a construction overlooks the plausible possibility that the Upper Basin commissioners conceded to Article III(d) at the compact negotiations in order to cap the Lower Basin’s entitlement via Article III(a) and (b) and to reserve the remaining water for Upper Basin development.¹⁸⁴ The unforeseen paucity of that remaining water assertedly does not alter the flow obligation imposed by Article III(d).

It remains to be seen whether the Upper Basin or Lower Basin would prevail if the interpretive issues covered in this section were resolved by the Supreme Court or in another forum. As noted, our purpose in canvassing these issues has not been to engage in detailed legal analyses aimed at forecasting probable litigation outcomes. Although the resolution of these issues—via litigation or otherwise—is critically important to the future of Colorado River governance, our interest again lies in considering how the Upper and Lower Basins’ competing interpretations entail allocating water in light of current and projected future hydrological conditions in the Colorado River Basin. To what extent do these allocation patterns comport with the Compact’s commitment to equity? We take up this question and related ones in the next Part.

V. REALIZING EQUITY

In our view, the Colorado River Compact’s commitment to “equitable division and apportionment of the use of the waters of the Colorado River System”¹⁸⁵ constitutes a venerable precedent that should guide Colorado River governance on an intergenerational basis. We acknowledge that people hold diverse views on the meaning of equity in the context of water allocation—both in terms of the factors associated with the norm and their

¹⁸² See, e.g., MacDonnell, *supra* note 171, at 4 (“The argument is the flow obligation cannot override the specific apportionment to the Upper Basin, especially so long as the Lower Basin has sufficient water to consume 7.5 million acre-feet.”).

¹⁸³ See, e.g., COLO. RIVER GOVERNANCE INITIATIVE, *supra* note 158, at 2, 14 (“[T]he prevailing interpretation has been that the Upper Basin has the obligation to deliver 75 million-acre feet every ten years . . . downstream to the Lower Basin . . .”).

¹⁸⁴ See *id.* at 7–8, 23–24 (noting the potential concession).

¹⁸⁵ Colorado River Compact, art. I (codified at COLO. REV. STAT. § 37-61-101 (2012)) (emphasis added).

relative priorities. We recognize (and embrace) the fact that these views change across time. We likewise make no originalist claim that our conception of equity mirrors exactly ideas about the norm held by the commissioners who formed the Compact almost a century ago. Notwithstanding these caveats, we subscribe to the basic notion that our society's varied, evolving ideas about fairness should shape schemes apportioning water use from the Colorado River System, including governance structures devised for these schemes. The Law of the River's ongoing evolution should not proceed simply based upon the principle of might-makes-right translated into political or economic terms.¹⁸⁶ Positioned as the cornerstone of the Law of the River, equity should be a lodestar for dialogue about the future of the Compact¹⁸⁷—a dialogue of critical importance to the Colorado River and the roughly 30 million people dependent on its water.¹⁸⁸

To what extent does the Compact fulfill its commitment to equity? What equity-related concerns need to be taken into account if we are serious about honoring this commitment in contemporary times? How should we move forward in light of these concerns? What exactly should be done to address them? The questions are majestic ones that we can only begin to engage in this Part. We do so by focusing on the principles of equity set forth in Part III.¹⁸⁹

Relying on these equity principles, we highlight three salient issues below, each of which bears significantly on the perceived equity of the Compact's apportionment scheme and warrants consideration in contemporary discourse about Colorado River governance. Two of these issues pertain to the principles of substantive equity and are examined in the first section. We begin this section by drawing attention to the questionable distributional fairness of the Compact's apportionment scheme—specifically, in relation to how the scheme (depending upon how its key terms are interpreted) calls for allocating water between the Upper and Lower Basins in light of current and projected future hydrological conditions. After fleshing out this initial issue, we proceed to evaluate the Compact's apportionment scheme in relation to the principle of flexibility, illuminating the arguably skewed balance struck by the scheme with respect to this principle and the principles of fidelity and reliability. Subsequently

¹⁸⁶ See BATES ET AL., *supra* note 91, at 182 (noting how water policy decisions “based on political or economic strength alone offend a sense of fairness”).

¹⁸⁷ We acknowledge that the diverse parties engaged in this dialogue undoubtedly hold different views about the meaning of “equity” and correspondingly distinct positions regarding the optimal makeup of the Compact's apportionment scheme. Notwithstanding this diversity, our contention here is simply that the terms and substance of the parties' competing positions should address the Compact's commitment to equity, rather than treating this commitment as mere surplusage.

¹⁸⁸ STATUS REPORT, *supra* note 1, at SR-2 (“Today, more than 30 million people in the seven western states of Arizona, California, Nevada . . . and Colorado, New Mexico, Utah and Wyoming . . . rely on the Colorado River and its tributaries to provide some, if not all, of their municipal water needs.”).

¹⁸⁹ See *supra* Part III.B (discussing the principles of substantive and procedural equity).

addressed in the second section, the final issue broached below relates to the principles of procedural equity as they bear on the need for a functional governance structure to ensure the apportionment scheme is implemented. We broadly discuss the potential creation of a formal governance entity for this purpose.

A. Substantive Equity

1. Reciprocity

The principle of reciprocity can be summarily stated as follows for our purposes: Apportionment schemes should strive for distributional fairness in terms of how they define entitlements (permitted types and amounts of water use), allocate entitlements among different types of water users, and establish the relative priorities of entitlements.¹⁹⁰ This principle is relevant for considering a wide range of matters associated with the Law of the River, including historical and contemporary issues related to entitlements held by American Indian tribes in the Colorado River Basin as well as entitlements held for environmental purposes (e.g., for national parks and other federal lands).¹⁹¹ Stemming from our core interest in the Compact, we focus on reciprocity in this section solely with respect to relations between the Upper and Lower Basins as they are defined by the Compact.¹⁹² The takeaway point is that pressing questions currently exist regarding the distributional fairness of the Compact's apportionment scheme—specifically, the amounts of water potentially available for use in the Upper and Lower Basins based on their respective entitlements and obligations under the Compact. These fundamental issues of equity need to be addressed proactively in ongoing dialogue about Colorado River governance.

As detailed above in Part II,¹⁹³ the provisions of Article III framing the Compact's apportionment scheme evidence a recurring emphasis on distributional fairness with respect to Upper Basin–Lower Basin relations. Article III(a) confers annual entitlements of equal size (7.5 maf) to the Upper and Lower Basins. Article III(b) increases the Lower Basin's entitlement by 1.0 maf but nonetheless leaves the overall apportionment fairly even—7.5 maf and 8.5 maf, respectively. Article III(c) calls for treaty water to be supplied to Mexico from flows beyond those spoken for in Article III(a) and (b) if possible, and it requires this obligation to be borne equally by the Upper and Lower Basins if these flows need to be tapped into.

¹⁹⁰ For a fuller discussion of the principle of reciprocity, see *supra* Part III.B.1.

¹⁹¹ See, e.g., Getches, *supra* note 91, at 591–601 (examining tribal and environmental issues related to water allocation in the basin from an equity-based perspective).

¹⁹² To be clear, the discussion in this section is not aimed at assessing what an equitable apportionment would look like in the basin in the absence of the Compact—e.g., if prescribed anew by Supreme Court decree. As noted above, our interest lies in considering issues of distributional fairness stemming from the existing composition of the Compact's apportionment scheme—specifically, as the conflicting interpretations of the scheme's key terms entail allocating water in light of current and projected future hydrological conditions in the basin.

¹⁹³ See *supra* Part II.A.

Similarly illustrative is the decadal flow obligation imposed on the Upper Division states by Article III(d)—75.0 maf every consecutive ten years.¹⁹⁴ Irrespective of the specific amounts of these mandated flows (a disputed issue¹⁹⁵), requiring them on a decadal basis rather than an annual one affords the Upper Division states flexibility in coping with flow variability year to year. Article III(e)'s proscription against water hoarding also is relevant here, prohibiting the Upper Division states from withholding water, and the Lower Division states from requiring the delivery of water that cannot "reasonably be applied to domestic and agricultural uses."

Notwithstanding the indicia of distributional fairness contained in these provisions on paper, a different picture emerges when the conflicting interpretations of the provisions—and the allocation patterns stemming from these interpretations—are examined in light of current and projected future hydrological conditions in the Colorado River Basin.

The Lower Basin tributaries issue provides an initial illustration of this point—specifically, as it bears on the scope of the Upper and Lower Basins' entitlements in Article III(a) and (b). Simply put, if these provisions were interpreted as excluding the Lower Basin tributaries from the Compact's apportionment scheme, the Upper Basin would be entitled to use 7.5 maf of water from the Colorado River mainstem and tributaries collectively per year, while the Lower Basin would be entitled to use 8.5 maf of water annually from the mainstem alone.¹⁹⁶ Water use from the Lower Basin tributaries would not be governed by the Compact. This exemption holds obvious implications for the Compact's perceived distributional fairness.

Although it is unclear precisely how much water is available for use from the Lower Basin tributaries on an annual basis, several figures suggest this amount is not nominal. Covering the five-year period from 2001 to 2005, the Bureau of Reclamation's most recent Consumptive Uses and Losses Report containing these figures identifies the average amount of water use from the Lower Basin tributaries as approximately 2.19 maf per year, excluding water uses categorized as "exports" in the report.¹⁹⁷ The annual

¹⁹⁴ The equitable nature of Article III(d) in this regard was noted by Herbert Hoover in his post-negotiation analysis of the Compact presented to the U.S. House of Representatives. See *HOOVER DAM DOCUMENTS*, *supra* note 35, at A34 ("The period of 10 years was fixed . . . as being long enough to allow equalization between years of high and low flow, and as representing a basis fair to both divisions.").

¹⁹⁵ See *supra* Part IV.B.2.

¹⁹⁶ To be clear, we make no presumption about how the apportionment scheme set forth for the Lower Division states in the *Arizona v. California* Decree might bear on whether the Lower Basin is entitled to use 8.5 maf from the Colorado River mainstem in any given year. Nor do we assume that water supply conditions in the basin would enable this amount of use. Our point is simply that the Compact itself would allow it if Article III(a) and (b) were interpreted as pertaining solely to the use of Colorado River mainstem water in the Lower Basin.

¹⁹⁷ BUREAU OF RECLAMATION, COLORADO RIVER SYSTEM CONSUMPTIVE USES AND LOSSES REPORT: 2001–2005, at iv (2012), available at <http://www.usbr.gov/uc/library/envdocs/reports/crs/pdfs/cul2001-05.pdf> [hereinafter CONSUMPTIVE USES AND LOSSES REPORT]. The precise amount of average annual use was 2.186 maf during this period. The figures on which this average is based are set forth in: *id.* at 36–40. The Bureau of Reclamation has prepared a provisional Consumptive Uses and Losses Report for the 2006–2010 period; however, this report focuses

average is 3.74 maf if these “exports” are accounted for.¹⁹⁸ Equally indicative of the potential significance of the Lower Basin tributaries are figures recently produced by the Bureau of Reclamation in conjunction with its basinwide water supply and demand study identifying annual use levels for the Gila River alone (the primary Lower Basin tributary) as falling between roughly 3.25 maf and 3.5 maf per year from 2001 to 2005.¹⁹⁹

Solely for the sake of discussion, if we treat the amounts of water used out of the Lower Basin tributaries in the figures above—e.g., the 3.74 maf annual average from 2001 to 2005 (again, accounting for “exports”)—as representing a hypothetical “tributary entitlement,” and we assume the Lower Basin also were to possess an 8.5 maf mainstem entitlement stemming from a favorable interpretation of Article III(a) and (b), the total amount of use authorized by the collective entitlement would be 12.24 maf per year. As noted above, the Upper Basin’s annual entitlement would be 7.5 maf in the same circumstances. Although the former figure (12.24 maf) is used here *only* for purposes of illustration, the overarching point is that the Lower Basin tributaries issue implicates a potentially significant amount of water and a correspondingly altered ratio between the Upper and Lower Basins’ entitlements as those are set forth in Article III(a) and (b).

In addition to the Lower Basin tributaries issue, the Upper and Lower Basins’ conflicting interpretations of Article III(d)—that is, the decadal flow obligation imposed on the Upper Division states—play a critical role in determining the relative amounts of water available for use in the Upper and Lower Basins. If Article III(d) were interpreted as imposing a static delivery obligation per the Lower Basin’s view, an amount of water far short of the

solely on the Upper Basin and does not contain figures for Lower Basin tributary use. Electronic copies of these reports can be found at Bureau of Reclamation, Upper Colo. Region, *Colorado River System Consumptive Uses and Losses Reports*, <http://www.usbr.gov/uc/library/envdocs/reports/crs/crsul.html> (last visited Nov. 18, 2012).

¹⁹⁸ Specifically, accounting for “exports,” the amounts of use from the Lower Basin tributaries between 2001 and 2005 were 3.8002 maf, 3.7212 maf, 3.6917 maf, 3.6508 maf, and 3.8364 maf, respectively. CONSUMPTIVE USES AND LOSSES REPORT, *supra* note 197, at 36–40. The precise annual average based on these amounts was 3.74006 maf. Per the Bureau of Reclamation’s methodology, these figures apparently count as “exports” water diverted from the Colorado River mainstem via the Central Arizona Project for use within the Gila River system. *See, e.g., id.* at 36 n.4 (“Outside system exports for the Gila River in Arizona includes the Central Arizona Project diversion from the mainstem. While this diversion is not truly ‘exported’ water, this method was chosen to account for the CAP water used in the system.”).

¹⁹⁹ BUREAU OF RECLAMATION, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY, INTERIM REPORT NO. 1, TECHNICAL REPORT C – WATER DEMAND ASSESSMENT app. C5-16 fig.10 (2011), available at <http://www.usbr.gov/lc/region/programs/crbstudy/Report1/TechRptC.pdf>. These figures account for reservoir evaporation losses of less than 250,000 acre-feet per year. *Id.* These figures likewise account for the use of water delivered to the Gila River system from the Colorado River mainstem via the Central Arizona Project. *Id.* at app. C5-15 (“There are multiple sources of water that supply consumptive uses in the Gila River tributary, including tributary water, mainstream Colorado River water that is delivered via the Central Arizona Project (CAP), and non-tributary groundwater.”). This report also contains provisional figures identifying annual levels of water use from three other Lower Basin tributaries—the Little Colorado River, Virgin River, and Bill Williams River—between 2001 and 2005. *Id.* at app. C5-10 fig.4, app. C5-11 fig.6, app. C5-13 fig.8.

Upper Basin's ostensible 7.5 maf entitlement potentially could be available for use in that sub-basin. As discussed above in Part IV, paleo reconstructions estimate average annual flows of 13.0 maf to 14.7 maf at Lees Ferry,²⁰⁰ and the vast majority of climate change models project 10% to 30% declines in these flows by mid-century.²⁰¹ If we rely on the more conservative estimate of 10% declines, the corresponding range of average annual flows at Lees Ferry is 11.7 maf to 13.2 maf. In turn, if we deduct 7.5 maf from these amounts—assuming the 75.0 maf flow obligation in Article III(d) is indeed a static one, and annualizing this decadal obligation to 7.5 maf per year—the amount of water remaining available for use in the Upper Basin ranges from 4.2 maf to 5.7 maf. This range is of course much lower if 30% declines are assumed: 1.6 maf to 2.8 maf.²⁰²

Potentially further chipping away at the amount of water available for use in the Upper Basin are the Article III(c) issues discussed above. If the Lower Basin's view were to prevail regarding the meaning of "surplus" water in Article III(c), the Upper Division states would be obligated to contribute 0.75 maf annually toward Mexico's treaty entitlement in years when the supply of water in the Colorado River System is less than 16.0 maf.²⁰³ This obligation would adhere irrespective of the relative levels of water use in the Upper and Lower Basins.

Also stemming from Article III(c) is the Upper Basin's potential obligation to cover half of the channel losses incurred when moving treaty water through the Lower Basin. The precise amount of these losses is unclear. As with water use from the Lower Basin tributaries, however, the figures could be significant. According to the U.S. Bureau of Reclamation, reservoir evaporation losses along the Colorado River mainstem in the Lower Basin averaged 1.32 maf per year between 1996 and 2000,²⁰⁴ falling slightly below this level from 2001 to 2008.²⁰⁵ Coupled with these evaporation losses are losses due to phreatophytes—"deep-rooted plants that obtain

²⁰⁰ See, e.g., INTERIM REPORT, *supra* note 18, at 67.

²⁰¹ *Id.* at 17, 71.

²⁰² If we assume 30% declines from the 13.0 maf to 14.7 maf range taken from paleo reconstructions, the corresponding range of average annual Lees Ferry flows is 9.1 maf to 10.3 maf. Deducting annualized flows of 7.5 maf per Article III(d), the remaining amount of available water falls between 1.6 maf and 2.8 maf. In light of this range, it is worth noting that present perfected rights in the Upper Basin may total roughly 2.2 maf annually, although there is uncertainty surrounding this precise figure. INTERIM REPORT, *supra* note 18, at 47–48.

²⁰³ As noted above, the Lower Basin tributaries issue—i.e., the exclusion or inclusion of these tributaries vis-à-vis the Compact's apportionment scheme—bears on the scope of water sources considered when determining whether 16.0 maf of water exists in the Colorado River System in a given year. See discussion *supra* Part IV.B.1.a.

²⁰⁴ BUREAU OF RECLAMATION, COLORADO RIVER SYSTEM CONSUMPTIVE USES AND LOSSES REPORT: 1996–2000, at 31 tbl.LC-1 (2012), available at <http://www.usbr.gov/uc/library/envdocs/reports/crs/pdfs/cul-1996-2000.pdf>. The precise figure for these losses was 1.3183 maf per year. *Id.*

²⁰⁵ See WATER DEMAND SCENARIOS, *supra* note 151, at C-42 fig.C-16 (demonstrating the decline in reservoir evaporation losses between 2001 and 2008 and attributing this trend to lower average reservoir storage). Average annual reservoir evaporation losses along the Colorado River mainstem in the Lower Basin were approximately 1.10 maf between 2001 and 2005. CONSUMPTIVE USES AND LOSSES REPORT, *supra* note 197, at 33 tbl.LC-1.

water from the water table or in the vadose zone just above the water table²⁰⁶—which averaged 0.64 maf per year along the Colorado River mainstem in the Lower Basin between 2000 and 2008.²⁰⁷ If the Lower Basin's view were to prevail on the channel losses issue, an annual flow contribution of roughly 0.9 maf might be required of the Upper Division states, assuming both types of losses noted here are accounted for. Alternatively, accounting solely for reservoir evaporation losses, this flow contribution might be roughly 0.6 maf per year.

Admittedly, the material above involves a host of contingencies, both with respect to the prevailing interpretations of Article III and the hydrological data and projections. While fully acknowledging this fact, the discussion nonetheless raises important questions about an apparent disjuncture between the 7.5 maf / 8.5 maf apportionment set forth for the Upper and Lower Basins in Article III(a) and (b), and the variety of more skewed allocation patterns associated with the interpretive disputes. Although we are wary of bias and alarmism, the potential diminution of the Upper Basin's 7.5 maf entitlement to a level far below that mark—particularly in light of the possible exemption of the Lower Basin tributaries from the Compact's apportionment scheme—gives us pause.²⁰⁸ Major issues of distributional fairness are at stake in this regard—issues going to the heart of the framework atop which the entirety of the Law of the River rests. If the Compact's commitment to equity is to be taken seriously—and we contend that it should—then these interpretive disputes and the issues of distributional fairness posed by them must be addressed, and ultimately resolved, in a timely manner. They need to be approached with courage, candor, and an even-handed basinwide perspective in order for Colorado River governance to evolve meaningfully in the years ahead.²⁰⁹

²⁰⁶ WATER DEMAND SCENARIOS, *supra* note 151, at C-42.

²⁰⁷ *Id.* at C-43, C-44 fig.C-17.

²⁰⁸ Although not highlighted in the discussion above, it is worth reiterating that the Upper Basin contributes 92% of the natural flows in the Colorado River System. BUREAU OF RECLAMATION, *supra* note 134, at B-21. The Supreme Court has described the origin of waters in interstate rivers as an irrelevant factor for purposes of its equitable apportionment doctrine. *Colorado v. New Mexico*, 467 U.S. 310, 323 (1984). However, this approach differs from that taken in international water law, where the relative flow contributions of basin states are regarded as an operative consideration in determining their "reasonable and equitable" shares. *See, e.g.*, JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 891 (4th ed. 2006) (identifying treatment of origin factor under Helsinki Rules and noting distinction with equitable apportionment doctrine).

²⁰⁹ We acknowledge that the seemingly pressing need to resolve the interpretive disputes addressed in this section may be diminished (at least temporarily) by the implementation of large-scale projects aimed at augmenting water supplies in the Colorado River Basin. Examples of such augmentation projects and other policy options for addressing the supply-demand imbalance in the basin can be found at U.S. Bureau of Reclamation, *Colorado River Basin Water Supply & Demand Study: Options Received to Resolve Water Supply and Demand Imbalances*, <http://www.usbr.gov/lc/region/programs/crbstudy/imbalanceoptions.html> (last visited Nov. 18, 2012).

2. Flexibility

Enmeshed with the issues of reciprocity just discussed is a concern over the lack of flexibility in the Compact's apportionment scheme. We identified the basic notion underlying this principle in Part III. Apportionment schemes should be composed to facilitate reallocation of water resources among entitlement holders based on ongoing changes in contemporary conditions and values.²¹⁰ Because these changes are a constant—e.g., fluctuation in climatic and hydrologic conditions, advancements in scientific knowledge and technology, diversification and restructuring of economic systems, reprioritization of societal values, etc.—apportionment schemes should contain measures to enable allocation patterns to shift in conjunction with these trends. This flexibility is integral to avoiding and/or redressing issues of distributional fairness stemming from potential disconnects between the composition of apportionment schemes and the contemporary circumstances in which they are operating. In short, flexibility is essential to realizing equity, and the equity of the Compact should be closely examined under this metric.

In drawing attention to the principle of flexibility as it bears on the Compact's apportionment scheme, we certainly do not intend to overlook the countervailing principles of fidelity and reliability—as defined in Part III.²¹¹ The relationship between these principles is an important matter. Are the principles inherently and irreconcilably at odds? Does the notion that apportionment schemes should be composed to enable adaptation to contemporary circumstances mean *per se* that commitments to entitlement holders must be broken (and through unfair processes), and that entitlement holders cannot rely on their entitlements to a reasonable degree? These questions are obviously loaded, and the answer to them is “no.” Equity is realized by striking a balance between these principles. Our interest in the discussion below is to consider precisely how that balance has been struck in the Compact's apportionment scheme.

On one hand, we acknowledge there are arguably very few limits to the flexibility of the Compact's apportionment scheme—at least in terms of the possible forms it might assume in the future if sufficient political will exists. Collaboration among the sovereigns—federal, state, and tribal—and diverse water users with interests in the Colorado River System could foreseeably yield a variety of arrangements aimed at integrating flexibility into the apportionment scheme without forsaking the principles of fidelity and reliability. We look forward to the innovative measures that may come about in this realm going forward.

On the other hand, examining the Compact's apportionment scheme in its existing form, one of our major equity-related concerns involves the extent to which the Compact prioritizes fidelity and reliability over flexibility. Like above, Article III illustrates this dynamic. Consider initially the nature of the entitlements conferred to the Upper and Lower Basins in

²¹⁰ For a full discussion of the principle of flexibility, see *supra* Part III.B.1.

²¹¹ See *supra* Part III.B.1 for a full discussion of the nature of these two principles.

Article III(a) and (b). These entitlements are squarely quantity-based. They authorize the Upper and Lower Basins to use specific quantities of water from the Colorado River System annually: “[T]he exclusive beneficial consumptive use of 7,500,000 acre feet of water per annum”²¹² for both sub-basins and, for the Lower Basin, “the right to increase its beneficial consumptive use of such waters by one million acre per annum.”²¹³ Likewise, the entitlements are permanent in nature, “apportioned from the Colorado River System *in perpetuity* to the Upper Basin and the Lower Basin.”²¹⁴ Article III(c) and (d) contain similarly firm quantified flow obligations. Article III(c)’s flow obligation is tethered to Mexico’s 1.5 maf treaty entitlement.²¹⁵ In turn, although it is subject to the conflicting interpretations noted above, Article III(d) obligates the Upper Division states not to cause flows at Lee Ferry from being depleted below “75,000,000 acre feet for any period of ten consecutive years reckoned in continuing progressive series.”²¹⁶

Articles VII and VIII also are worth highlighting in this regard—specifically, based on how they emphasize fidelity. Notwithstanding the absence of American Indian tribes at the compact negotiations,²¹⁷ Article VII contains an important broadly-stated disclaimer bearing on entitlements held by these tribes in water from the Colorado River System: “Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.”²¹⁸ In a similar respect, Article VIII evidences how the Compact commissioners were cognizant of pre-existing entitlements generally, providing: “Present perfected

²¹² Colorado River Compact, art. III(a) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

²¹³ *Id.* art. III(b) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

²¹⁴ *Id.* art. III(a) (codified at COLO. REV. STAT. § 37-61-101 (2012)) (emphasis added).

²¹⁵ U.S.-Mexico Treaty, *supra* note 29, art. 10, T.S. 944 at 21. Notably, the article establishing Mexico’s 1.5 maf annual entitlement provides for augmented deliveries of up to 1.7 maf as well as reduced deliveries of less than 1.5 maf “[i]n the event of extraordinary drought or serious accident to the irrigation system in the United States.” *Id.* art. 10(b). Moreover, as this Article goes to press, the United States and Mexico have just signed a treaty minute, Minute 319, putting into place interim measures enabling Mexico to use the water afforded by its entitlement in a more flexible manner—*i.e.*, to arrange for augmented or reduced (deferred) annual deliveries of this water. Minute 319, Interim International Cooperative Measures in the Colorado River Basin Through 2017 and Extension of Minute 318 Cooperative Measures to Address the Continued Effects of the April 2010 Earthquake in the Mexicali Valley, Baja California, U.S.-Mex., § III.1, 4, November 20, 2012 (on file with authors). For an up-to-date list of all of the treaty minutes that have been enacted see Int’l Boundary & Water Commission, *Minutes Between The United States and Mexican Sections of the IBWC*, www.ibwc.state.gov/Treaties_Minutes/Minutes.html (last visited Nov. 23, 2012).

²¹⁶ Colorado River Compact, art. III(d) (codified at COLO. REV. STAT. § 37-61-101 (2012)). As discussed below, the decadal nature of this flow obligation does afford the Upper Division states some degree of flexibility in meeting it, as would the Upper Basin’s construction of Article III(d) identified above in Part IV.B.2.

²¹⁷ WATER AND THE WEST, *supra* note 8, at 211 (“No attempt was made to discover how many Indians were in the basin or what their water needs were. The commission simply assumed that the water rights of Indians were ‘negligible.’”).

²¹⁸ Colorado River Compact, art. VII (codified at COLO. REV. STAT. § 37-61-101 (2012)).

rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact.”²¹⁹

By drawing attention to the foregoing provisions, we by no means wish to convey the impression that their emphasis on fidelity and reliability is categorically misplaced—quite the opposite in many respects. Yet the core question driving this discussion is worth reiterating: Where in the Compact’s apportionment scheme is the counterbalancing emphasis on flexibility? We are challenged to find provisions analogous to those surveyed above.

Article III(d) does seem notable for its flexibility to an extent. It does not prescribe minimum annual flows at Lee Ferry. As noted above, its flow obligation is decadal rather than annual in nature, which affords the Upper Division states flexibility in coping with variation in annual flow levels. Conceding Article III(d)’s relevance in this regard, however, the Compact’s emphasis on flexibility nonetheless seems proportionately minimal.

The marginal emphasis on flexibility in the Compact’s apportionment scheme is distinguishable from the approach taken in other important areas of interstate water law in the United States. The equitable apportionment doctrine provides one illustration of this dynamic. Decrees entered by the Supreme Court in its equitable apportionment cases contain re-opener provisions allowing for their modification due to changed conditions.²²⁰ Equally distinct with regard to this dynamic are the Upper Basin Compact and the *Arizona v. California* Decree.

Perhaps the most remarkable flexibility-oriented feature of the Upper Basin Compact is its entitlements. Conferring a small quantity-based entitlement to Arizona,²²¹ the other entitlements established for the Upper Basin states are percentage-based. Specifically, they are defined according to percentages of the “total quantity of consumptive use per annum apportioned in perpetuity to and available for use each year by [the] Upper Basin under the Colorado River Compact.”²²² Colorado, New Mexico, Utah, and Wyoming are entitled to 51.75%, 11.25%, 23%, and 14%, respectively, of this consumptive use per year.²²³ As the available amount of this consumptive use varies in accordance with the basin’s hydrology, so does the scope of the Upper Basin states’ entitlements—a much different approach than that in Articles III(a) and (b) of the Compact.

²¹⁹ *Id.* art. VIII (codified at COLO. REV. STAT. § 37-61-101 (2012)).

²²⁰ *See, e.g.,* *Nebraska v. Wyoming*, 534 U.S. 40, 54–56 (2001). The modified decree entered in this case allows for its further modification in accordance with “[a]ny change in conditions making modification of the Modified Decree or the granting of further relief necessary or appropriate.” *Id.* at 55. Notably, parties seeking modification of these decrees must make a showing of “substantial injury,” as “the interests of certainty and stability counsel strongly against reopening an apportionment of interstate water rights absent considerable justification.” *Nebraska v. Wyoming*, 507 U.S. 584, 593 (1993).

²²¹ Upper Basin Compact, art. III(a)(1), Pub. L. No. 81-37, 63 Stat. 31 (1949) (codified at COLO. REV. STAT. § 37-62-101 (2012)) (entitling Arizona to 50,000 acre-feet of annual consumptive use from the Upper Colorado River System).

²²² *Id.* art. III(a)(2) (codified at COLO. REV. STAT. § 37-62-101 (2012)).

²²³ *Id.*

In at least three related ways, the apportionment scheme prescribed by the *Arizona v. California* Decree also is notable for its flexibility. This scheme governs the use of water from the Colorado River mainstem by the Lower Division states (again, Arizona, California, and Nevada).

First, the *Arizona v. California* Decree conditions the amount of water released annually to water users in the Lower Division states upon the available water supply. Specifically, the amount of water released hinges on a determination by the Secretary of the Interior regarding whether the mainstem water supply in the Lower Basin is sufficient to satisfy varying levels of consumptive use in the Lower Division states.²²⁴ “Normal” conditions exist when the water supply allows for 7.5 maf of consumptive use in a given year. Arizona, California, and Nevada are entitled to 2.8 maf, 4.4 maf, and 0.3 maf of such use, respectively.²²⁵ In contrast, “surplus” and “deficiency” conditions adhere when the water supply allows for more or less, respectively, than 7.5 maf of annual consumptive use by these states.²²⁶

Second, like the Upper Basin Compact, the *Arizona v. California* Decree establishes percentage-based entitlements for the Lower Division states during surplus conditions. Arizona, California, and Nevada are entitled to use 46%, 50%, and 4%, respectively, of any mainstem water in excess of 7.5 maf that is made available for consumptive use in the Lower Basin.²²⁷

Third, the *Arizona v. California* Decree authorizes the release of water apportioned to, but unused in, one of the Lower Division states in a given year to a different Lower Division state.²²⁸ This provision has enabled the recent development of innovative programs in the Lower Basin aimed at promoting efficient and flexible water use, including a water banking program²²⁹ and an “intentionally created surplus” program.²³⁰ These programs are complex, but generally speaking, they both allow water to be temporarily allocated among the Lower Division states in ways that deviate from the entitlements set forth for the states in the Decree. In order for this deviation to occur, water users must enter into agreements with the Secretary of the Interior whereby they commit to not using a portion of the water associated with their state’s entitlement. In turn, relying on these agreements, the Secretary can reallocate this water on an annual basis to water users in a different Lower Division state pursuant to the Decree.²³¹

²²⁴ Decree, 547 U.S. 150, 155 sec. II(B) (2006).

²²⁵ *Id.* sec. II(B)(1).

²²⁶ *Id.* sec. II(B)(2)–(3).

²²⁷ *See id.* sec. II(B)(2).

²²⁸ *Id.* sec. II(B)(6).

²²⁹ *See* Offstream Storage of Colorado River Water and Development and Release of Intentionally Created Unused Apportionment in the Lower Division States, 43 C.F.R. § 414.1 (2011).

²³⁰ The intentionally created surplus (ICS) program was established by the 2007 Interim Guidelines. *See supra* note 12 and accompanying text. The provisions defining the ICS program are contained in § XI.G.3 of the Record of Decision for the Guidelines. INTERIM GUIDELINES ROD, *supra* note 12, § XI.G.3.

²³¹ 43 C.F.R. § 414.3 (2011) (discussing storage and interstate release agreements formed in conjunction with the Lower Basin water banking program); INTERIM GUIDELINES ROD, *supra* note 12, §§ XIA.1, XIF.11, XIF.15, XI.G.3.C (discussing the delivery and forbearance agreements

As shown by this brief overview, the Compact's apportionment scheme is markedly different from those put into place by the Upper Basin Compact and the *Arizona v. California* Decree in terms of its minimal emphasis on flexibility. At least the current form of the Compact's apportionment scheme strikes a distinct balance between this principle and the principles of fidelity and reliability—again, we look forward to seeing what lies ahead.

Ultimately, the rub of this arguably skewed balance comes back to the issues of distributional fairness addressed above. The integration of flexible measures into the Compact's apportionment scheme could go a long way toward facilitating allocation patterns between the Upper and Lower Basins that are more even-handed than those associated with the existing interpretive disputes. Perhaps the Upper and Lower Basins' entitlements in Article III(a) and (b) might serve as a baseline from which a more fluid and dynamic apportionment can be crafted. Regardless of the specific forms such measures may take, a greater emphasis on allocational flexibility at the basinwide level seems critical to realizing an equitable apportionment in coming decades. This topic and the innovations associated with it require attention, creativity, and open-mindedness in contemporary discourse regarding Colorado River governance.

B. Procedural Equity

Essential to the success of efforts aimed at addressing the reciprocity- and flexibility-related issues discussed above is a threshold procedural matter—namely, the existence of a functional governance structure to facilitate successful implementation of the Compact's apportionment scheme. In accord with the principles of procedural equity surveyed in Part III, this governance structure should be composed along at least three lines. It should: 1) provide the diverse parties whose interests are affected by the scheme with meaningful opportunities to participate in the processes associated with implementing it (principle of inclusivity); 2) establish adequate measures to ensure the substantive terms of the scheme are implemented—fully and accurately (principle of diligence); and 3) promote openness and engagement in the processes devised for implementing the scheme (principle of transparency). Although not intended to be exhaustive, we consider these principles critical to realizing commitments to both substantive and procedural equity.

Support for a governance structure framed along these lines can be found in the Compact itself. Article V calls for cooperation among state water resource officials and the directors of the U.S. Bureau of Reclamation and U.S. Geological Survey to: 1) “promote the systematic determination and coordination of the facts as to flow, appropriation, consumption and use of water in the Colorado River Basin,” and 2) “secure the ascertainment

associated with delivery of intentionally created surplus, defining delivery agreements, and defining forbearance agreements).

and publication of the annual flow of the Colorado River at Lee Ferry.”²³² In light of these provisions, Article V has been construed as authorizing formation of “a continuing Colorado River Commission comparable to that which negotiated the compact.”²³³ Also worth revisiting is Article VI. It authorizes the appointment of commissioners to address a wide range of disputes potentially arising among the basin states, including those related to “the meaning or performance of any of the terms of this compact” and “the allocation of burdens incident to the performance of any article of this compact or the delivery of waters as herein provided.”²³⁴

Other major components of the Law of the River offer even clearer evidence of the merits of a governance structure shaped in this mold. As noted in Part II, formal governance entities have been established (or designated) to implement the apportionment schemes set forth in other key components of the Law of the River—specifically, the International Water and Boundary Commission for the U.S.-Mexico Treaty of 1944, the Upper Colorado River Commission for the Upper Basin Compact, and the Bureau of Reclamation for the *Arizona v. California* Decree. Reflecting commitments to inclusivity and transparency, a host of consultation and public participation requirements apply to the activities of these entities under these and related laws.²³⁵ Equally notable are myriad provisions within the Law of the River prescribing monitoring processes aimed at collecting

²³² Colorado River Compact, art. V(a)–(b) (codified at COLO. REV. STAT. § 37-61-101 (2012)).

²³³ HOOVER DAM DOCUMENTS, *supra* note 35, at 27–28. This broad construction of Article V differs from narrower ones given by compact negotiators. *See, e.g.*, Report of Delph E. Carpenter, Commissioner for Colorado (December 15, 1923), *in* HOOVER DAM DOCUMENTS, *supra* note 35, at A79 (1945) (“Records of the river flow at Lee Ferry are under the control of the State Engineers of the seven States and two representatives of the United States, but the authority of such officials terminates with the ascertainment and publication of the facts.”).

²³⁴ Colorado River Compact, art. VI (codified at COLO. REV. STAT. § 37-61-101 (2012)).

²³⁵ *See* Colorado River Basin Project Act, § 601(b)(1), 43 U.S.C. § 1551(b)(1) (2006) (requiring Secretary of Interior to consult with the Upper Colorado River Commission and Lower Basin states while preparing five-year reports that account for annual consumptive uses and losses on the mainstem and major tributaries of the Colorado River System); *id.* § 602(b), 43 U.S.C. § 1552(b) (requiring consultation between the Secretary of Interior and basin state representatives in relation to the modification of long-range operating criteria for Colorado River reservoirs); Grand Canyon Protection Act of 1992, Pub. L. 102-575, § 1804(c), 106 Stat. 4671 (requiring consultation between the Secretary of Interior, Governors of basin states, and various parties within the general public during the preparation of operating criteria and plans set forth in this section and section 602(b) of the Colorado River Basin Project Act); *id.* § 1805(c) (requiring consultation between the Secretary of Interior, Secretary of Energy, Governors of basin states, Indian tribes, and various parties within the general public in relation to monitoring programs aimed at ensuring compliance with the section 1802(a) mandate); 43 C.F.R. § 414.3(c) (2011) (requiring the Secretary of Interior to provide a means for public input on proposed storage and interstate release agreements and prescribing criteria for secretarial review of agreements); *id.* § 414.3(g) (requiring the Secretary of Interior to consult with the International Boundary and Water Commission prior to executing Storage and Interstate Release Agreements); INTERIM GUIDELINES ROD, *supra* note 12, § XI.G.7 (providing for consultation between the Secretary of Interior and basin states on a wide range of matters associated with implementation of the Interim Guidelines).

flow, use, and related data;²³⁶ reporting requirements;²³⁷ and accounting methods.²³⁸ All of these provisions speak to the principle of diligence.

Nonetheless, although the foregoing entities and measures are indispensable within their respective domains, they do not put into place a basinwide governance structure—particularly, as relevant here, with respect to implementation of the Compact’s apportionment scheme.²³⁹ Put differently, diligent administration of the apportionment schemes in the U.S.-Mexico Treaty of 1944, Upper Basin Compact, and *Arizona v. California* Decree by the entities just noted does not equate with the same treatment of the Compact’s framework scheme within which these subsidiary schemes are situated. As noted in Part II, the Colorado River Commission disbanded after negotiating the Compact in 1922, and a comparable entity has not since been created.²⁴⁰

Having drawn attention to the absence of a formal governance structure for the Compact’s apportionment scheme, we will not digress here into the specific forms that such a structure might take.²⁴¹ Perhaps a joint

²³⁶ See U.S.-Mexico Treaty, *supra* note 29, arts. 12(d), 24(f), T.S. 944 at 26 (authorizing the International Boundary and Water Commission to measure flows and water deliveries so as to ensure treaty compliance); Upper Basin Compact, art. VIII(d), Pub. L. 81-37, 63 Stat. 31 (1949) (codified at COLO. REV. STAT. § 37-62-101 (2012)) (authorizing the Upper Colorado River Commission to engage in water gauging; collect data on flows, storage, diversions, and use; make findings on use, reservoir losses, deliveries, and necessary curtailments; and issue annual reports of activities).

²³⁷ See U.S.-Mexico Treaty, *supra* note 29, art. 24(g), T.S. 944 at 44 (requiring the International Boundary and Water Commission to submit annual (and other) reports regarding treaty matters); Decree, 547 U.S. 150, 164 sec. V (2006) (requiring the United States to prepare and make available records of various matters related to the use of mainstem water in the Lower Basin, including releases from federal facilities, mainstem diversions, return flows, consumptive use levels, and deliveries to Mexico); Colorado River Basin Project Act, § 601(b)(1), 43 U.S.C. § 1551(b)(1) (2006) (requiring the Secretary of Interior to prepare five-year reports accounting for annual consumptive uses and losses on mainstem and major tributaries of the Colorado River System); *id.* § 602(b), 43 U.S.C. § 1552(b) (requiring the Secretary of Interior to prepare an annual operating plan for all Colorado River reservoirs); Grand Canyon Protection Act, § 1804(c)(2) (requiring the Secretary of Interior to submit annual reports addressing operations conducted in the previous year and operations projected for the upcoming year).

²³⁸ See 43 C.F.R. § 414.4(b) (2011) (establishing accounting methods to be used by Secretary of Interior for water stored, diverted, or released in conjunction with storage and interstate release agreements); INTERIM GUIDELINES ROD, *supra* note 12, § XI.G.3.D (outlining the Secretary of Interior’s procedures for accounting for, and verifying the creation and delivery of, Intentionally Created Surplus).

²³⁹ See, e.g., MacDonnell, *supra* note 7, at 50–54 (noting the absence of a basinwide governance institution). For an enlightening discussion of governance issues in the basin, see *id.* at 50–54.

²⁴⁰ See *id.* at 50 (noting that the Colorado River Compact does not create an interstate commission); Paul L. Bloom, *Law of the River: Critique of an Extraordinary Legal System*, in NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 139, 143 (Gary D. Weatherford & F. Lee Brown eds., 1986) (noting the absence of a “seven-state Colorado Commission”).

²⁴¹ The potential design of a regional commission—or other governance structure—for the Colorado River has been addressed by many authors, including Getches, *supra* note 91; Douglas S. Kenney, *Institutional Options for the Colorado River*, 31 WATER RESOURCES BULL. 837 (1995); and Bloom, *supra* note 240, at 143, 153–154.

federal-state commission like the Upper Colorado River Commission might be worth considering on a basinwide scale. An alternative approach would be the more federalized structure surrounding the Bureau of Reclamation in relation to the Colorado River mainstem in the Lower Basin. Overall, a variety of institutional designs likely can be conceived that would comport with the principles of procedural equity outlined above.

Rather than surveying the potential forms of such a governance structure, our core point is simply to emphasize the value (arguably, the necessity) of having some type of permanent, formally composed entity in place to perform at least two essential tasks in relation to the Compact's apportionment scheme.²⁴² One is to ensure the terms of the scheme are implemented. The other is to provide a forum in which current and future conflicts over the meaning of these terms can be addressed and potentially resolved in lieu of Supreme Court litigation.²⁴³

Issues currently obstructing implementation of the Compact's apportionment scheme warrant considering formation of a formal governance entity tailored to these priorities. As an initial matter, methodological issues plague efforts to obtain accurate measurements of annual use levels and flow levels for the Lower Basin tributaries.²⁴⁴ Assuming that these tributaries are governed by the Compact (a contentious issue),²⁴⁵ both types of measurements are essential to diligent administration of the Compact's apportionment scheme. Accurate measurements of annual use levels are critical for determining whether water use in the Lower Basin exceeds the 8.5 maf entitlement set forth in Article III(a) and (b). If so, according to the Upper Basin, the obligation of the Upper Division states to contribute treaty water to Mexico under Article III(c) is relieved to the

²⁴² The governance entity of course could go far beyond performing these two functions, including serving as a venue for consensus-based innovations to the apportionment scheme (including flexibility-oriented measures).

²⁴³ A formal agreement reached by the Basin States in conjunction with formation of the Interim Guidelines in 2007 (Basin States' Agreement) evidences the states' common interest in resolving interpretive disputes involving the Compact outside of the Supreme Court. This Agreement obligates the states to engage in mandatory consultation before initiating any judicial or administrative proceeding involving interpretation of Article III(a)–(e) of the Compact. A copy of the Basin States' Agreement is included as Attachment A to: Letter from the Arizona, California, Colorado, New Mexico, Utah and Wyoming Governors' Representatives on Colorado River Operations, to Hon. Dirk Kempthorne, Secretary of the Interior (Apr. 23, 2007), *available at* <http://www.usbr.gov/lc/region/programs/strategies/DEIScomments/State/BasinStates.pdf>. *See also* INTERIM GUIDELINES ROD, *supra* note 12, at § XI.G.7.B.2 (providing for consultation between the Secretary of the Interior and the Basin States' Governors or representatives in relation to claims or controversies arising under the Interim Guidelines and other federal law). It admittedly remains to be seen whether the creation of a formal governance entity would facilitate resolution of the existing interpretive disputes—for example, what the processes prescribed for dispute resolution within the entity would look like, or whether the basin states actually would agree to engage in these processes in lieu of litigation for different types of disputes. Our purpose in highlighting the potential value of a formal governance entity is not to examine these (and related) matters in detail here, but rather to call for them to be given due consideration in ongoing discourse about Colorado River governance.

²⁴⁴ *See* STATUS REPORT, *supra* note 1, at SR-31 to SR-32 (noting methodological issues).

²⁴⁵ *See supra* Parts IV.B.1.a, V.A.1.

extent such excess (“surplus”) water exists.²⁴⁶ In a related vein, accurate measurements of annual flow levels in these tributaries are pivotal for assessing the overall amount of flows within the Colorado River System in a given year. According to the Lower Basin, if this amount is less than 16.0 maf, then Article III(c) requires the Upper Division states to contribute half of the flows required to satisfy Mexico’s treaty entitlement.²⁴⁷

In addition to being hampered by methodological and related interpretive issues associated with the Lower Basin tributaries, implementation of the Compact’s apportionment scheme also is hindered by the Upper and Lower Basins’ conflicting interpretations of the scheme’s other definitional terms, including Article III(d)’s contested flow obligation. It is worth considering whether the existence of a formal governance entity might have prevented the emergence or persistence of these interpretive disputes at earlier points in the Compact’s history. A similar perspective applies to avoidance of novel disputes arising over the Compact’s terms in the future. Although we will not revisit the existing interpretive disputes here,²⁴⁸ suffice it to say that their existence in earlier stages of the Law of the River’s evolution was one thing and their continuation in the future is another. Buffering the need to resolve these conflicts has been a generally broad margin between water supply and demand levels in the basin throughout most of the twentieth century.²⁴⁹ The days of this buffer now appear behind us. In short, implementation of the Compact’s apportionment scheme in the years ahead seemingly necessitates resolution of these disputes, whether in the context of a formal governance entity or otherwise.

To sum up this section, the establishment of a formal governance structure for the Compact’s apportionment scheme might be a solid step toward resolving and/or avoiding methodological and interpretive issues impeding the scheme’s implementation. It is a potential measure deserving consideration in ongoing dialogue about Colorado River governance. Although we leave the specific makeup of a formal entity open in this discussion, the principles of procedural equity provide general guidelines for institutional design in this regard. Admittedly, successful implementation of the Compact might occur in the future without the creation of a formal governance structure—for example, via the informal governance arrangements of the status quo. But perhaps not—and a lot rides on this “but,” including the spirit of the Compact.

²⁴⁶ See *supra* Part IV.B.1.b.

²⁴⁷ See *supra* Part IV.B.1.b.

²⁴⁸ In addition to the interpretive disputes discussed above in Part II.B, we reiterate that a standardized method for measuring “beneficial consumptive use” within the meaning of Article III(a) and (b) does not yet exist. See *supra* note 61 and accompanying text. Nor is there a standardized date by which to determine the existence of “present perfected rights” as that term appears in Article VIII. See *supra* note 75 and accompanying text.

²⁴⁹ See STATUS REPORT, *supra* note 1, at SR-4 fig.1 (identifying margin between average water supply and use levels in basin, excluding the Gila River, over a 103-year historical record).

VI. CONCLUSION

The Colorado River Commission was on the right track in emphasizing equity as the norm around which the Compact's apportionment scheme should be framed. Notwithstanding the commissioners' diverse views on what precisely an equitable apportionment should look like, as well as the distinctions between their conceptions of the meaning of "equity" and ours here, the basic notion that the Compact's apportionment scheme should be composed and implemented in a fair manner rings true. We find untenable and unsettling the opposite view—i.e., that the Compact should bring about an inequitable apportionment (substantively and procedurally) in the Colorado River Basin. Likewise, although we recognize the rhetorical flourish and potential political motivations associated with emphasizing "equity" in the Compact's text, we firmly believe this commitment should be made real in the here and now. It should be guarded and championed with vigor in contemporary times as the spirit of the Compact.

Depending upon the particular measures it entails, the process of fulfilling the Compact's commitment to equity may admittedly be analogous to moving a mountain. Arguably even more taxing than the potential rigors of this endeavor, however, are the foreseeable consequences of simply abiding by the notion that when it comes to the Compact, sleeping dogs just must be left to lie. If a close look at the Compact's commitment to equity is not justified by the confluence of the existing interpretive disputes and current and projected future hydrological conditions in the basin, then we respectfully are hard-pressed to conceive of circumstances that might warrant integrating the foundation of the Law of the River into ongoing dialogue about Colorado River governance. Extrapolating on the Compact's commitment to equity, we have offered modest input in this Article about three key concerns worth vetting in this dialogue.

We find troubling potentially major issues of distributional fairness rooted in longstanding interpretive disputes between the Upper and Lower Basins over framing provisions of the Compact's apportionment scheme. These issues generally stem from an apparent disjuncture between the 7.5 maf / 8.5 maf apportionment set forth in Article III(a) and (b) of the Compact and the variety of more skewed allocation patterns associated with the interpretive disputes. Persisting in some cases for almost a century, these disputes portend to whittle down the Upper Basin's entitlement considerably while at the same time exempting the Lower Basin tributaries from the Compact's apportionment scheme. In short, it is unclear to what extent Colorado River governance can move forward in great strides without these disputes being resolved.

Implicated by these concerns of reciprocity is the seemingly precarious balance struck in the Compact between fidelity and reliability on one hand, and flexibility on the other. Undoubtedly, the sky may be the limit in terms of casting the Compact's apportionment scheme in a more flexible mold. We await innovations in this vein with genuine enthusiasm. In its current form, however, the Compact appears distinct from other major components of the Law of the River in its lack of flexibility-oriented features. Drawing on such

features existent elsewhere in the Law of the River, to what extent might the Compact evolve in coming decades to become more flexible? Resolving some of the major issues of distributional fairness might hinge on this question. We hope (and expect) it will be treated as a high priority going forward.

Finally, promising potential gains across the board with regard to procedural equity—that is, successful implementation of the Compact’s apportionment scheme—is the prospect of establishing a more formal, ongoing, and inclusive governance structure. In raising this point, we do not dismiss the possibility that existing informal governance arrangements may be up to the tasks of ironing out the potentially game-changing interpretive disputes outside of the Supreme Court and ensuring that the Compact’s framing provisions are indeed implemented. One way or the other, though, these things need to happen. It is incumbent on basin leaders and the citizenry alike to ensure the letters comprising the Compact’s text are not dead ones.

Looking toward the future, Colorado River governance needs to be shaped by an acknowledgment that proactive measures aimed at fulfilling the Compact’s commitment to equity place the U.S. Southwest on a much better pathway than one characterized by habitual legal uncertainty, marginal implementation, and recurring parochial conflict. Engagement with the equity-related issues canvassed in this Article (and others like them) is integral to charting a course along this higher road. There is no reason to expect that legal and policy innovations derived from dialogue about these issues will be any less novel than those developed at earlier stages of the Law of the River’s evolution. We are incredibly optimistic about the capacity that exists in this regard, and we look forward to being part of the conversations from which these innovations will take root. Hopefully, their novelty will be matched by their equity. The fate of the Colorado River as a sublime, defining facet of the U.S. Southwest warrants nothing less.