Climate Change and Tribal Water Rights: Removing Barriers to Adaptation Strategies*

Judith V. Royster†

I. INTRODUCTION

The effects of climate change on water resources in the United States are well understood in general outline. Specific effects will vary by region of the country, but the identified impacts include lower precipitation and increased drought in the south; increased precipitation in the north, but in the form of less frequent, heavier rains; less snowpack and earlier snowmelt, leading to higher water levels and potential flooding earlier in the spring, and less water available in summer when water is most needed for irrigation and instream flows; increased evaporation; increased water temperatures; increased water pollution; and increased demand for water.[1] Taken together, these effects of climate

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† Professor of Law and Co-Director, Native American Law Center, University of Tulsa College of Law.

1. A number of scholars have collected and summarized these effects. *See, e.g.*, Kathleen A. Miller, *Grappling with Uncertainty: Water Planning and Policy in a Changing Climate*, 5 ENVTL. & ENERGY L. & POL'Y J. 395, 403-06 (2010); Carolyn Brickey et al., *How To Take Climate Change into Account: A Guidance Document for Judges Adjudicating Water Disputes*, 40 Envtl. L. Rep. (Envtl. Law Inst.) 11,215, 11,218-20 (Dec. 2010). For detailed discussions, see generally CLIMATE CHANGE SCIENCE AND POLICY (Stephen H. Schneider et al.

change will likely have "profound impacts on water resource availability."[2]

Although the effects of climate change will be felt nationwide, their impact on tribal communities may be particularly severe.[3] Tribes' relationship to water is not only economic, but cultural and spiritual.[4] Water drives the economy for many tribes, supporting agriculture, energy production, fisheries, grazing, towns, and communities. Water is also central to the culture of many tribes, providing habitat for the fish, wildlife, and native plant species that are important sources of food, medicines, and rituals. And water is sacred, embodying a spiritual dimension beyond its uses.[5]

Addressing the effects of climate change on tribal water resources thus raises not only legal and policy concerns, but also "important ethical" considerations as well.[6] Just as the environmental justice movement focused attention on the disproportionate environmental harms visited on minority and low-income communities in the United States, the related concept of climate justice focuses on the inequitable effects of climate change worldwide.[7] While environmental justice is concerned with environmental quality, climate justice is concerned with the "equitable distribution of the benefits of climate change adaptation."[8] The very communities that likely contributed the least to causing climate

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eds., 2010); INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION & VULNERABILITY (Martin Parry et al. eds., 2007).

2. Kathleen A. Miller et al., *Water Allocation in a Changing Climate: Institutions and Adaptation*, 35 CLIMATIC CHANGE 157, 157 (1997).

3. *See* JONATHAN M. HANNA, NATIVE COMMUNITIES AND CLIMATE CHANGE: PROTECTING TRIBAL RESOURCES AS PART OF NATIONAL CLIMATE POLICY 1, 11-13 (Jonathan M. Hanna ed., 2007); *see also* Elizabeth Ann Kronk, *Effective Access to Justice: Applying the* Parens Patriae *Standing Doctrine to Climate Change-Related Claims Brought by Native Nations*, 32 PUB. LAND & RESOURCES L. REV. 1, 3-4 (2011); Garrit Voggesser, *The Tribal Path Forward: Confronting Climate Change and Conserving Nature*, 4 WILDLIFE PROF. 24, 25 (2010); Sarah Krakoff, *American Indians, Climate Change, and Ethics for a Warming World*, 85 DENV. U. L. REV. 865, 872-86 (2008).

4. Krakoff, *supra* note 3, at 884 (citations omitted).

5. *See* Regis Pecos, *Will the* Winters *Commitment to Justice Endure? It Depends on Us*, *in* THE FUTURE OF INDIAN AND FEDERAL RESERVED WATER RIGHTS: THE *WINTERS* CENTENNIAL 331, 331-36 (Barbara Cosens & Judith V. Royster eds., 2012); Steven M. Karr, *"Water We Believed Could Never Belong to Anyone": The San Luis Rey River and the Pala Indians of Southern California*, 24 AM. INDIAN Q. 381, 381-82 (2000) (citations omitted).

6. HANNA, *supra* note 3, at 1.

7. *See* Rebecca Tsosie, *Climate Change, Sustainability and Globalization: Charting the Future of Indigenous Environmental Self-Determination*, 4 ENVTL. & ENERGY L. & POL'Y J. 188, 210-12 (2009).

8. J.B. Ruhl, *Climate Change Adaptation and the Structural Transformation of Environmental Law*, 40 ENVTL. L. 363, 409 (2010).

change may "suffer the most from the consequences of climate change and their own inability to engage in effective adaptation."[9]

Governmental responses to climate change have proceeded in two overlapping sets of strategies. The initial focus of response was on mitigation strategies.[10] With greenhouse gas (GHG) emissions identified as the primary culprit, reducing GHGs became the first necessity. But as important as the reduction in GHG emissions is, the decades of emissions have created harm that cannot be undone just through mitigation. Thus the second generation of climate change strategies—adaptation—took on increasing importance. Unlike mitigation, which attempts to avoid or minimize climate change, adaptation strategies respond to the impacts of climate change.[11] Neither approach is effective alone. Mitigation alone only stabilizes or reduces the impacts of climate change, but adaptation by itself accepts the inevitability of climate change's adverse effects.[12] Although the two sets of approaches have some tensions and conflicts, "the cold war between mitigation and adaptation is finally thawing."[13] Between the two approaches, continued mitigation and adaptation to existing conditions, there is hope that the effects of climate change may at least be ameliorated.

In the context of Indian tribes and climate change, the third-generation issue is who decides what adaptation strategies should be employed.[14] Given that adaptation strategies are a necessary part of the response to climate change, an issue arises as to whether strategies within Indian country[15] will be developed and chosen by the federal government

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9. Tsosie, *supra* note 7, at 212 (citations omitted).

10. Ruhl, *supra* note 8, at 365-67.

11. *See, e.g.*, Zmarak Shalizi & Franck Lecocq, *To Mitigate or To Adapt: Is That the Question? Observations on an Appropriate Response to the Climate Change Challenge to Development Strategies*, 25 WORLD BANK RES. OBSERVER 295, 298-99 (2010). Shalizi and Lecocq posit that adaption strategies may be either reactive, responding to adverse effects after they occur, or proactive measures intended to limit the damage or reduce the need for reactive measures. *Id.* at 299.

12. *See* Rebecca Tsosie, *Indigenous People and Environmental Justice: The Impact of Climate Change*, 78 U. COLO. L. REV. 1625, 1658-60 (2007); *see also* Shalizi & Lecocq, *supra* note 11, at 304 (advocating "an integrated portfolio of actions").

13. Ruhl, *supra* note 8, at 370. See *id.* at 365-71 for the history of mitigation versus adaptation.

14. *See* Sarah Krakoff, *Radical Adaptation, Justice, and American Indian Nations*, 4 ENVTL. JUST. 207, 208 (2011).

15. Indian country encompasses all lands "set apart for the use of the Indians as such, under the superintendence of the [federal] government." *See, e.g.*, United States v. Pelican, 232 U.S. 442, 449 (1914) (citations omitted). In 1948, Congress codified the definition of Indian country to include all lands within reservations, all dependent Indian communities, and all allotments "the Indian titles to which have not been extinguished." 18 U.S.C. § 1151 (2006). The Supreme Court has stated that Congress's intent was to incorporate the common law approach,

on a national scale or developed and chosen by each tribe to meet the particular needs of each reservation. Tribal self-determination mandates that adaptation strategies for Indian country be decided by the governing tribes. Recognizing tribes as governments with the right and ability to govern means that tribes are responding to climate change "as active agents and not as victims."[16]

Tribal adaptation to climate change to meet tribal needs, however, is more than a matter of tribal initiative and tribal institutions. Federal law must ensure that tribal adaptation is possible. To do this, to promote climate justice in Indian communities, federal law must allow Indian tribes the flexibility to design and implement adaptation strategies that meet each tribe's needs.[17] In order for Indian tribes to exercise true self-determination in adaptation strategies, federal laws and policies must support a wide range of options. At the very least, federal law should not impede or impose barriers to tribal decision making concerning adaptation approaches.

In the context of tribal water rights, however, too many federal Indian laws and policies are antiadaptive. Federal approaches to tribal water rights too often stand in the way of tribes' ability to develop adaptation strategies focused on the needs of specific reservations facing particular circumstances. Eliminating, or even easing, these federal law barriers is a necessary precursor for tribes to address the third-generation issues of dealing with climate change and water resources.

This Article identifies and discusses five barriers that federal law and policy place in the path of tribal adaptation strategies. The first three of these barriers arise primarily from a federal statute that forces most adjudication of tribal water rights into state courts. State court interpretations of federal reserved rights law in determinations of tribal water rights have varied considerably. This variability, in turn, creates three sets of restrictions: on the measure used to quantify tribal water rights, on the sources of water subject to tribal rights, and on the use of the tribal water rights. Part II of this Article describes the federal statute and the problem of state court determinations and then addresses each of

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"to designate as Indian country all lands set aside by whatever means for the residence of tribal Indians under federal protection, together with trust and restricted Indian allotments." Okla. Tax Comm'n v. Sac & Fox Nation, 508 U.S. 114, 125 (1993) (citations omitted).

16. Rebecca Tsosie, *Indigenous Peoples and Global Climate Change: Intercultural Models of Climate Equity*, 25 J. ENVTL. L. & LITIG. 7, 15 (2010).

17. For example, the Environmental Protection Agency recognizes the central role of tribes in adapting to climate change impacts in Indian country. *See* U.S. ENVTL. PROTECTION AGENCY, NATIONAL WATER PROGRAM 2012 STRATEGY: RESPONSE TO CLIMATE CHANGE 56-58 (Public Comment Draft, Mar. 2012).

the three restrictions that arise from that approach. A fourth restriction on tribal adaptation strategies is a matter of regulatory policy: a restriction on tribes' ability to promulgate water codes to regulate water uses; this restriction is discussed in Part III. And the fifth restriction, addressed in Part IV, arises both from federal law and from an approach used in negotiated water rights settlements: restrictions on tribes' ability to engage in water marketing.

These various constraints confine tribes' ability to use and reallocate water resources in response to the effects of climate change. Reallocating water is difficult: "[C]hanging entrenched legal rules, informal entitlements, and institutions tailored to antiquated social needs and goals requires overcoming history and human nature."[18] And for Indian tribes, it also requires overcoming federal law impediments to tribal adaptive responses.

II. STATE GENERAL STREAM ADJUDICATIONS AND ANTIADAPTIVE DECISIONS

Prior to the mid-1970s, tribal water rights were primarily determined in adjudications in federal court.[19] States lacked jurisdiction over tribes and their property rights, including tribal rights to water. In 1952, however, Congress enacted the McCarran Amendment, which expressly authorized the joinder of the United States as a party to state general stream adjudications.[20] General stream adjudications, provided for in every western state, are massive, complex, comprehensive proceedings involving all rights to water in a river system. At the conclusion of the adjudication, the state should have a record of all water rights owners within that river system, including their priority dates, points of diversion, permitted uses, flow rates, and quantity of use.[21]

In 1971, the United States Supreme Court held that the federal government could be joined in these general stream adjudications to litigate federal reserved rights[22] and in 1976 extended that to the determination of tribal reserved rights as well.[23] Although Indian tribes argued in a subsequent case that the McCarran Amendment did not waive tribal sovereign immunity to suit, the Supreme Court found that

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18. Holly Doremus & Michael Hanemann, *The Challenges of Dynamic Water Management in the American West*, 26 UCLA J. ENVTL. L. & POL'Y 55, 62 (2008).

19. *See* John E. Thorson et al., *Dividing Western Waters: A Century of Adjudicating Rivers and Streams, Part II*, 9 U. DENV. WATER L. REV. 299, 331, 335 (2006).

20. 43 U.S.C. § 666(a) (2006).

21. *See* Thorson et al., *supra* note 19, at 305-06.

22. United States v. Dist. Court in & for Eagle, 401 U.S. 520, 524 (1971).

23. Colo. River Water Conservation Dist. v. United States, 424 U.S. 800, 810-12 (1976).

essentially irrelevant.[24] Agreeing that tribes could not be compelled to join as parties, the Court nonetheless held that tribal water rights could be determined in state general stream adjudications.[25] Tribes were thus faced with the choice of waiving their immunity and joining in the lawsuit or allowing the federal government to litigate their rights for them. Tribes in general have chosen to become parties.

Nothing in the McCarran Amendment divested federal courts of jurisdiction to determine tribal rights to water. In the interests of avoiding piecemeal litigation, however, the Supreme Court announced that federal courts should generally abstain in favor of state general stream adjudications.[26] But the Court cautioned state courts that they were under "a solemn obligation to follow federal law" in their determinations of tribal water rights.[27]

The result of turning tribal water rights determinations over to state courts, however, has resulted in anything but a uniform application of federal law. State courts have approached fundamental tribal water rights questions—the purposes of reservations and therefore the measure of quantifying water rights, whether groundwater is a source of tribal water rights, and the uses to which tribes may put their water—in variable and often incompatible ways.[28] In many instances, these state court interpretations of federal law—made possible through the McCarran Amendment—have placed restrictions on tribal water rights that serve as barriers to tribal adaptation strategies in the face of climate change. This Part will address those three restrictions that result from inconsistent state court determinations of tribal water rights—measure of quantification, availability of groundwater, and use of tribal water rights—and then suggest a means of bringing federal law back into the judicial determination of tribal reserved rights to water.

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24. *See* Arizona v. San Carlos Apache Tribe, 463 U.S. 545, 566-68 (1983).

25. *Id.* at 569-70.

26. *Colo. River Water Conservation Dist.*, 424 U.S. at 819; *cf.* United States v. Adair, 723 F.2d 1394, 1404 (9th Cir. 1983) (upholding the district court's refusal to abstain on the grounds that only tribal rights were at issue and no state proceedings were underway when the federal lawsuit was filed).

27. *San Carlos Apache Tribe*, 463 U.S. at 571.

28. *Compare In re* Gen. Adjudication of All Rights To Use Water in the Gila River Sys. & Source (*Gila River I*), 989 P.2d 739, 748 (Ariz. 1999), *with* Confederated Salish & Kootenai Tribes of the Flathead Reservation v. Stults, 59 P.3d 1093, 1098-99 (Mont. 2002), *and In re* Gen. Adjudication of All Rights To Use Water in the Big Horn River Sys. (*Big Horn I*), 753 P.2d 76, 100 (Wyo. 1988), *aff'd by an equally divided court*, Wyoming v. United States, 492 U.S. 406 (1989).

A. Restrictions as to Measure of Quantification

Under the doctrine of tribal reserved rights to water, sufficient water is reserved to fulfill the purposes for which the land reservation was set aside. First announced in the 1908 case of *Winters v. United States*, the *Winters* reserved rights doctrine provides that tribes have vested water rights as of the date their reservations are created.[29] These water rights arise from the reservation of the land, are prior and paramount to subsequent state law rights, and are not lost through nonuse.[30]

Determining the tribal water right is crucial to designing adaptation strategies. Scholars of water law and climate change have noted "the tension between the value of certainty and the need for flexibility."[31] Much of water law, western water law in particular, is built on the need for stability and certainty. Climate change adaptation, on the other hand, requires more flexibility in allocation and regulation than traditional state approaches support.[32] But tribal adaptation to climate change must be premised on the amount of water available to the tribe. Tribes do not have the luxury of allocation authority over all waters within their territories. Tribes, rather, have rights to that amount of water necessary to meet the purposes for which their lands were set aside. Without some certainty as to what those rights are, including the amount of water reserved, tribes cannot plan and design climate change adaptation strategies.

Quantification is particularly important in western states, all of which use some form of the prior appropriation doctrine for state law water rights. Under this doctrine, a water user has the right to that amount of water that is put to a beneficial use as defined by state law. Two fundamental principles govern prior appropriation rights.[33] The "use it or lose it" principle provides that the water must be continually put to a beneficial use or the water user loses the right.[34] The "first in time, first in right" principle provides that junior users, those with later priority dates to the water, must give way in times of shortage to holders of senior priority dates.[35]

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29. *See* 207 U.S. 564, 577 (1908).

30. COHEN'S HANDBOOK OF FEDERAL INDIAN LAW § 19.01(1) (Nell Jessup Newton ed., 2012) [hereinafter COHEN'S HANDBOOK].

31. Miller, *supra* note 1, at 399.

32. *Id.*; *see also* Doremus & Hanemann, *supra* note 18, at 62-63.

33. *See* Colo. River Water Conservation Dist. v. United States, 424 U.S. 800, 805 (1976).

34. COHEN'S HANDBOOK, *supra* note 30, § 19.01(1).

35. *Id.*

In order to achieve a workable system of water rights within each western state, tribal reserved rights to water must be integrated with these state appropriation rights.[36] As a result, the quantification of tribal water rights is crucial. Because tribal reserved rights carry very early priority dates, they are often among the most senior, if not the most senior, water rights on a stream system. Knowing the quantity of these tribal rights determines the amount of water available for junior users and helps protect the tribal reserved right against interference from junior uses.

In the early decades of determining tribal water rights, the federal courts focused on agriculture. In the *Winters* case, the United States on behalf of the tribes sought to enjoin upstream junior irrigators.[37] In a year of drought, the upstream users were diverting so much water that insufficient water reached the reservation to irrigate the tribes' fields. Because the concern was irrigation water, the litigation focused on that need. The district court required the upstream irrigators to allow 5,000 inches of water to reach the reservation, the United States Court of Appeals for the Ninth Circuit upheld the injunction, and the Supreme Court affirmed.[38] At no time in *Winters* did the courts determine that irrigation was the sole measure of the tribal reserved right; it was simply the aspect of the water right that was at issue in the case.

Then in 1963, in *Arizona v. California*, the Court accepted the special master's award of water to the five tribes at issue in the case based on an agricultural measure of practicably irrigable acreage (PIA).[39] This was, the Court stated, "the only feasible and fair way by which reserved water for the reservations can be measured."[40] There is no indication, however, that the Court intended PIA to be the only measure of reserved water rights for all tribes.[41] In fact, the Court focused on the irrigation needs of the five tribes by noting the necessity of irrigation water on reservations that were primarily "hot, scorching sands," and citing early legislative statements that "[i]rrigating canals are essential to the prosperity of these Indians."[42]

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36. *Id.* § 19.03(5)(a).

37. *Id.* § 19.02.

38. Winters v. United States, 207 U.S. 564, 578 (1908); Winters v. United States, 148 F. 634, 685-86 (9th Cir. 1906).

39. Arizona v. California (*Arizona I*), 373 U.S. 546, 600 (1963).

40. *Id.* at 601.

41. *See* William H. Veeder, *Indian Prior and Paramount Rights to the Use of Water*, 16 ROCKY MTN. MIN. L. INST. 631, 659 (1971) ("There can be no immutable criterion by which to measure Indian rights.").

42. *Arizona I*, 373 U.S. at 599 (quoting Cong. Globe, 38th Cong., 2d Sess. 1321 (1865)).

Subsequent to these Supreme Court decisions, the lower federal courts did not confine tribal reserved rights to the PIA measure, but found that the purposes of creating Indian reservations often required "maintaining streamflows for wildlife, watershed, and aesthetic purposes."[43] Federal courts determined, for example, that tribes with historic fisheries were entitled to a water right to maintain sufficient instream flows to support the fish.[44] State general stream adjudications, by contrast, have proved to be "hostile forums in which tribes must be prepared to compromise their claims for streamflows."[45]

In state general stream adjudications, PIA has generally been the default measure. The Wyoming Supreme Court, for example, used PIA as the sole measure of the Wind River Tribes' water right, based on a determination that agriculture was the sole purpose of the reservation.[46] The court rejected a "homeland" provision in the treaty as not stating a purpose of the reservation, but merely setting the lands aside.[47] It further rejected tribal claims for water based on other purposes, including mineral development, fisheries, wildlife, and aesthetics.[48] Despite the Wyoming approach of rejecting nonagricultural purposes, however, the most likely explanation for the prominence of PIA is simply that "no satisfactory substitute has emerged."[49]

Climate change, however, demands a broader approach to the quantification of tribal reserved water rights. PIA was adopted for the reservations at issue in *Arizona I* as a "fair" way of measuring the water right. But PIA, "in light of global climate change, is no longer an equitable doctrine."[50] As explained by the Arizona Supreme Court, PIA

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43. Michael C. Blumm et al., *The Mirage of Indian Reserved Water Rights and Western Streamflow Restoration in the McCarran Amendment Era: A Promise Unfulfilled*, 36 ENVTL. L. 1157, 1159 (2006).

44. United States v. Adair, 723 F.2d 1394, 1410 (9th Cir. 1983); Colville Confederated Tribes v. Walton, 647 F.2d 42, 48 (9th Cir. 1981).

45. Blumm, Becker & Smith, *supra* note 43, at 1161 (examining case studies of six adjudications involving tribal claims to instream flows, five of which involved McCarran Amendment adjudications, and none of which resulted in the tribe being able to substantially improve streamflows through the adjudication process).

46. *Big Horn I*, 753 P.2d 76, 96, 99 (Wyo. 1988), *aff'd by an equally divided Court*, Wyoming v. United States, 492 U.S. 406 (1989).

47. *Id.* at 97.

48. *Id.* at 98-99.

49. *In re* Gen. Adjudication of All Rights To Use Water in the Gila River Sys. & Source (*Gila River II*), 35 P.3d 68, 79 (Ariz. 2001) (en banc) (quoting A. Dan Tarlock, *One River, Three Sovereigns: Indian and Interstate Water Rights*, 22 LAND & WATER L. REV. 631, 659 (1987) (internal quotation marks omitted)).

50. Michelle Uberuaga Zanoni, *Evaluating the Consequences of Climate Change on Indian Reserved Water Rights and the PIA: The Impracticably Irrigable Acreage Standard*, 31 PUB. LAND & RESOURCES L. REV. 125, 146 (2010).

rewards those tribes with agricultural lands and disadvantages tribes with lands unsuitable to agriculture, "forces tribes to pretend to be farmers" by having to assert irrigation rights in an era when agriculture is no longer a small farm industry, and arguably does not meet the minimum needs of the tribal communities.[51] In addition, the PIA standard may disadvantage tribes seeking water rights in later decades when technological advances in irrigation mean that agricultural acreage requires less water for the same result. The effects of climate change on both water resources and agriculture exacerbate these inequities.[52]

The general approach of the federal courts in determining tribal water rights was to take a broad view of the purposes of Indian reservations, as reflected in the treaties, agreements, and executive orders creating the reservations. As recognized by the Ninth Circuit, "The general purpose [of a reservation], to provide a home for the Indians, is a broad one and must be liberally construed."[53] Under that approach, federal courts generally determined that Indian tribes had a water right for more than the single purpose of agriculture. Subsequently, however, state general stream adjudications such as that in Wyoming took a narrow view of reservations purposes, and then quantified the tribal reserved right to water solely on the basis of that cramped reading of treaties and federal policy.

More recently, the Arizona Supreme Court has returned to the federal courts' understanding of the purpose of Indian reservations as establishing a homeland for the tribes.[54] The quantification of a homeland right to water, the Arizona court found, could not be determined by PIA alone, but required a factual determination of each reservation's water needs.[55] The court suggested a nonexclusive list of factors to be considered in quantifying a tribe's water rights, including the tribe's history and culture; the "geography, topography, and natural resources" of the reservation; and the tribe's economy, history of water use, and present and projected population.[56]

This type of flexible, tailored approach to determining the purpose of reservations, and therefore the quantity of water necessary to fulfill that purpose, is not only consistent with the long-standing approach of the federal courts, but also consistent with the tribes' needs for flexibility

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51. *Gila River II*, 35 P.3d at 78-79.
52. Zanoni, *supra* note 50, at 143-45.
53. Colville Confederated Tribes v. Walton, 647 F.2d 42, 47 (9th Cir. 1981) (citations omitted).
54. *See Gila River II*, 35 P.3d at 74.
55. *Id.* at 79.
56. *Id.* at 79-80.

to design climate change adaptation strategies. Because tribes will need to design and implement strategies for water allocation to account for the impact of climate change, starting that process with a quantification that meets more than agricultural needs lays the foundation for tribal action.[57] But the inconsistent determinations of state courts leave some tribes without that proper quantification of their water rights.

B. Restrictions as to Water Sources

An important aspect of adaptation to climate change is the conjunctive management of water rights:[58] the legal recognition that surface waters and most groundwater are hydrologically interconnected and need to be managed as an integrated system.[59] The concept of conjunctive management involves, at a minimum, taking account of the impacts that uses of one water source have on the other source. At a more sophisticated level, conjunctive management integrates both types of water uses into a single schedule and even assures water rights holders the ability to use whichever source is best at any given time.

Although conjunctive management is crucial to climate change adaptation, judicial approaches to tribal reserved rights to groundwater stymie tribal efforts at conjunctive management.[60] In the lower federal courts, a number of decisions had indicated that groundwater could or should be an available source to satisfy tribal water rights.[61] Subsequent state court decisions, however, vary widely, from no right to groundwater, to a conditional right to groundwater, to fully realized rights to groundwater.[62]

The first definitive ruling on tribal reserved rights to groundwater came in 1988, when the Wyoming Supreme Court held unequivocally that groundwater was not a source of reserved water rights for the Wind

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57. *See* Zanoni, *supra* note 50, at 140-41, 148 (citations omitted).

58. *See* Miller, Rhodes & MacDonnell, *supra* note 2, at 171.

59. *See* 2 WATERS AND WATER RIGHTS § 18.03, at 18-22 to -23, 18-29 to -30 (Amy K. Kelley ed., 3d ed. 2011); *see also* Barton H. Thompson, Jr., *Beyond Connections: Pursuing Multidimensional Conjunctive Management*, 47 IDAHO L. REV. 273 (2011); Frank J. Trelease, *Conjunctive Use of Groundwater and Surface Water*, 27 ROCKY MTN. MIN. L. INST. 1853 (1982).

60. *See* Judith V. Royster, *Conjunctive Management of Reservation Water Resources: Legal Issues Facing Indian Tribes*, 47 IDAHO L. REV. 255, 262-67 (2011).

61. *See* United States v. Anderson, 736 F.2d 1358, 1366 (9th Cir. 1984); Gila River Pima-Maricopa Indian Cmty. v. United States, 695 F.2d 559, 561 (Fed. Cir. 1982); Tweedy v. Tex. Co., 286 F. Supp. 383, 385 (D. Mont. 1968).

62. *See generally* Judith V. Royster, *Indian Tribal Rights to Groundwater*, 15 KAN. J.L. & PUB. POL'Y 489 (2006) (discussing state courts' approaches to tribal rights to groundwater).

River Tribes.[63] A decade later, the Arizona Supreme Court expressly rejected Wyoming's approach, holding that the important issue was not surface water versus groundwater, but whether the water was necessary to fulfill the purposes for which the reservation had been set aside.[64] But the Arizona court nonetheless found only a conditional right to groundwater, determining that a tribal right to groundwater would exist only "where other waters are inadequate to accomplish the purpose of a reservation."[65] The Montana Supreme Court, by contrast, subsequently ruled that tribal water rights should be extended to groundwater on the same basis as surface waters.[66]

Negotiated water settlements similarly take a variety of approaches to tribal rights to groundwater. Several settlements adopt the Montana approach, providing that the tribal water right may be satisfied from either surface waters or hydrologically connected groundwater.[67] At least one is more consistent with the Arizona approach, confining tribal groundwater use to augmentation water in times of shortage.[68] Other settlements contain provisions that relegate tribal use of groundwater sources as secondary to use of surface water sources. For example, one settlement limits groundwater use to domestic and livestock purposes,[69]

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63. *Big Horn I*, 753 P.2d 76, 100 (Wyo. 1988), *aff'd*, Wyoming v. United States, 492 U.S. 406 (1989); *see also* Pyramid Lake Paiute Tribe of Indians v. Ricci, 245 P.3d 1145, 1147-49 (Nev. 2010) (refusing to reopen a 1944 federal water decree to allow a claim for additional rights to groundwater).

64. *Gila River I*, 989 P.2d 739, 747 (Ariz. 1999).

65. *Id.* at 748.

66. Confederated Salish & Kootenai Tribes of the Flathead Reservation v. Stults, 59 P.3d 1093, 1099 (Mont. 2002); *see also* United States v. Wash. Dep't of Ecology, 375 F. Supp. 2d 1050, 1058, 1068-70 (W.D. Wash. 2005), *order vacated*, United States *ex rel.* Lummi Indian Nation v. Wash. Dep't of Ecology, No. C01-00472, 2007 WL 4190400 (W.D. Wash. Nov. 20, 2007), *aff'd*, United States *ex rel.* Lummi v. Dawson, 328 F. App'x 462 (2009). The district court order, vacated after the parties reached a settlement, held that tribal reserved rights "extend to groundwater." *Wash. Dep't of Ecology*, 375 F. Supp. 2d at 1058.

67. *See* Consent Decree ¶ 3 & Attachment 4, *In re* SRBA, No. 39576 (Idaho Dist. Ct, 5th Jud. Dist. Jan. 30, 2007), http://www.srba.state.id.us/nezperce.htm (agreement ratified by Snake River Water Rights Act of 2004, Pub. L. No. 108-447, 118 Stat. 3431); Confederated Tribes of the Warm Springs Reservation Water Rights Settlement Agreement, art. IV § B.3-4, art. V § A.2 (Nov. 17, 1997); JON C. HARE, INDIAN WATER RIGHTS: AN ANALYSIS OF CURRENT AND PENDING INDIAN WATER RIGHTS SETTLEMENTS pt. IV, § 7 (1996) (analyzing Northern Cheyenne compact; compact was ratified by Northern Cheyenne Indian Reserved Water Rights Settlement Act of 1992, Pub. L. No. 102-374, 106 Stat. 1186).

68. *See* HARE, *supra* note 67, pt. IV, § 4 (Fort Hall Agreement, ratified by Fort Hall Indian Water Rights Act of 1990, Pub. L. No. 101-602, 104 Stat. 3059).

69. *See* PETER W. SLY, RESERVED WATER RIGHTS SETTLEMENT MANUAL 29 (1988) (Colorado Ute settlement).

while another provides that groundwater withdrawals may not deplete the connected stream system.[70]

Although the water settlement acts vary as significantly as the state court decisions, the settlements have an adaptation aspect that the judicial decisions do not. In both situations, tribes with surface water rights only, and in some circumstances those with conditional rights, are not able to access and use the groundwater beneath their reservations. The right to use that groundwater will, instead, be granted by the state under principles of state water law. This inability to coordinate the two sources, to engage in conjunctive management, makes it far more difficult for tribes to devise adaptation strategies in response to climate change effects on water resources. But in the case of negotiated settlements, the settling tribe has, at least theoretically, considered the groundwater issue and chosen whether to bargain for full groundwater rights or to accept a more limited groundwater right in exchange for other considerations. The settlement, in other words, is adapted to the needs of the parties.

The variance in state court decisions, on the other hand, is not due to the particular needs of the parties, but to inconsistent applications of federal law. Under the *Winters* doctrine, water is impliedly reserved to fulfill the purposes of the reservation.[71] Although the *Winters* case itself concerned rights to the water of the Milk River, nothing in that decision limited its reasoning to surface waters.[72] Nor did anything in that decision limit subsequent federal rulings. To the contrary, federal courts uniformly indicated that groundwater should be an available source of *Winters* rights.[73] When state courts began to decide the issue, they offered no reasoning for eliminating or conditioning the tribal reserved right to groundwater. The Wyoming Supreme Court simply stated that it did not wish to be the first court to overtly hold in favor of such a right.[74] The Arizona Supreme Court ably critiqued Wyoming's approach, but then abruptly and without explanation held that groundwater would be available only if surface waters were inadequate.[75] Only the Montana Supreme Court recognized that "the only federal authority which has

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70. *See* HARE, *supra* note 67, pt. IV, § 6 (Jicarilla Apache Tribe Settlement, ratified by Jicarilla Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-441, 106 Stat. 2237).

71. COHEN'S HANDBOOK, *supra* note 30, § 19.02.

72. Winters v. United States, 207 U.S. 564, 565 (1908); Confederated Salish & Kootenai Tribes of the Flathead Reservation v. Stults, 59 P.3d 1093, 1098-99 (Mont. 2002).

73. United States v. Cappaert, 508 F.2d 313, 317 (9th Cir. 1974) (citations omitted); Tweedy v. Tex. Co., 286 F. Supp. 383, 385 (D. Mont. 1968).

74. *Big Horn I*, 753 P.2d 76, 99-100 (Wyo. 1988), *aff'd*, Wyoming v. United States, 492 U.S. 406 (1989).

75. *Gila River I*, 989 P.2d 739, 745-48 (Ariz. 1999).

been cited to this Court by either party supports the conclusion that there is no distinction between surface water and groundwater for purposes of determining what water rights are reserved because those rights are necessary to the purpose of an Indian reservation."[76]

As with the question of quantifying tribal water rights, the groundwater determinations vary considerably. Some state courts scrupulously follow federal law, while others condition the federal approach without explanation, or even appear to disregard federal decisions entirely.[77] In these latter decisions, tribes are restricted in their access to the groundwater beneath their reservations and consequently in their ability to design adaptation strategies based on conjunctive management.

C. Restrictions as to Use

A prime adaptation strategy for water resources is the flexibility to put the water to use in ways that best benefit the reservation community. As one scholar notes, water allocation decisions, along with those concerning land use, "are likely to be the hottest of hot button issues as climate change effects take hold over the landscape."[78] A tribe's ability to shift water from agricultural use to instream flows, for example, may be central to the tribe's ability to respond to climate change pressures on water resources.

In *Arizona I*, the Supreme Court approved the use of practicably irrigable acreage to measure the water rights of the lower Colorado River tribes involved,[79] but specifically noted that PIA was merely a measure of quantity. Nothing in the PIA standard for quantification, the Court stated, was to "constitute a restriction of the usage of [the water rights] to irrigation or other agricultural application."[80] In other words, the tribes could use their water for any purpose the tribe determined. With the exception of a water right specifically decreed for instream flow to protect fisheries,[81] federal courts have agreed that tribes determine the

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76. *Confederated Salish*, 59 P.3d at 1098.

77. *Gila River I*, 989 P.2d at 748; *Confederated Salish*, 59 P.3d at 1098-99; *Big Horn I*, 753 P.2d at 100.

78. Ruhl, *supra* note 8, at 402.

79. *Arizona I*, 373 U.S. 546, 600-01 (1963).

80. Arizona v. California (*Arizona II*), 439 U.S. 419, 422 (1979).

81. *See* United States v. Adair, 723 F.2d 1394, 1410-11 (9th Cir. 1983). An instream flow right is a nonconsumptive right to water and may not be transferred to a consumptive use. It is not so much a right to use the water, as the right to prevent others from drawing down the stream below a certain water level. *Id.* at 1411.

uses to which their reserved water rights are dedicated.[82] As the Ninth Circuit noted, "[P]ermitting the Indians to determine how to use reserved water is consistent with the general purpose for the creation of an Indian reservation—providing a homeland for the survival and growth of the Indians and their way of life."[83]

Once litigation moved to the state courts under the McCarran Amendment, however, variable standards appeared. The Wyoming Supreme Court, which awarded the Wind River Tribes a quantity of water based on PIA, barred the tribes from dedicating a portion of their unused PIA water to an instream flow.[84] The three justices in the majority each wrote separately to offer distinct rationales: one argued that the tribes could use their water for agricultural and subsumed uses only,[85] a second that the tribes could not devote water to an instream flow because that use was prohibited by state law,[86] and the third that the tribes could only change the use of their water right after they had put it to agricultural use.[87] None of the justices in the majority addressed the fact that the Supreme Court had expressly rejected any connection between an agricultural quantification and restriction to agricultural use.

By contrast to Wyoming, state courts that properly apply federal standards to determine the purposes of Indian reservations and the quantification of the tribal water right also do not restrict tribes' use of the water. The Arizona Supreme Court, which found a homeland purpose, indicated that tribes retained decision-making authority concerning the uses of their water rights.[88] The court based its reasoning on simple fairness, noting that no other water rights users are confined to nineteenth century uses and that "nothing should prevent tribes from diversifying their economies if they so choose and are reasonably able to do so."[89]

Flexibility in the use of water rights is sufficiently important that tribes routinely preserve it in negotiated settlements. A significant number of water settlement acts provide that tribes may use their water for any purpose[90] or specify allowable purposes in addition to agriculture,

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82. Colville Confederated Tribes v. Walton, 647 F.2d 42, 48-49 (9th Cir. 1981).

83. *Id.* at 49.

84. *In re* Gen. Adjudication of All Rights To Use Water in the Big Horn River Sys. (*Big Horn II*), P.2d 273, 278 (Wyo. 1992).

85. *Id.* at 278 (Macy, J., delivering the opinion of the court).

86. *Id.* at 284 (Thomas, J., concurring).

87. *Id.* at 285-86 (Cardine, J., concurring).

88. *Gila River II*, 35 P.3d 68, 76 (Ariz. 2001) (en banc).

89. *Id.*

90. *See, e.g.*, White Mountain Apache Tribe Water Rights Quantification Act of 2010, Pub. L. No. 111-291, § 306(a)(5), 124 Stat. 3064; Soboba Band of Luiseño Indians Settlement

such as municipal, industrial, recreational, and cultural uses.[91] Several settlement acts expressly provide that instream flows are allowable uses of tribal water rights.[92]

Tribes' ability to decide how to use their reserved water rights may be the central aspect necessary for tribal adaptation strategies. A tribe that may only use its water right for irrigation and related purposes, such as household use and livestock watering, is unable to design or implement water allocation and management strategies in response to the impacts of climate change.

D. Bringing Federal Law back into Adjudications

State courts that determine tribal reserved rights as part of general stream adjudications thus vary considerably in their applications of federal law principles. Some state courts closely follow federal law; others depart in significant and substantial ways. In some part, this is structural to state court adjudication: state judges are generally elected and often subject to great pressure in water rights adjudications.[93] But regardless of the reason, the fact is that the "initial determination [of forum] may prove to be dispositive of the resulting water rights adjudication."[94]

Not only do state court decisions often depart from federal principles, but when they do, they generally do so in ways that impede tribes' ability to adapt to climate change.[95] State courts may limit the purposes of reservations and thus the quantity of water to which a tribe is entitled.[96] State courts may deny tribes full access, or even any access, to the groundwater of their reservations.[97] And state courts may limit what

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Act of 2008, Pub. L. No. 110-297, § 9(b)(1), 122 Stat. 2975; Northern Cheyenne Indian Reserved Water Rights Settlement Act of 1992, Pub. L. No. 102-374, § 9(a)(1), 106 Stat. 1186.

91. *See, e.g.*, Snake River Water Rights Act of 2004, Pub. L. No. 108-447, § 7(b)(1)(A), 118 Stat. 2809; Yavapai-Prescott Indian Tribe Water Rights Settlement Act of 1994, Pub. L. No. 103-434, § 102(a)(8), 108 Stat. 4526.

92. *See, e.g.*, Zuni Indian Tribe Water Rights Settlement Act of 2003, Pub. L. No. 108-34, § 8(b)(1)(E), 117 Stat. 782; Fort Hall Indian Water Rights Act of 1990, Pub. L. No. 101-602, § 6(c), 104 Stat. 3059.

93. Stephen M. Feldman, *The Supreme Court's New Sovereign Immunity Doctrine and the McCarran Amendment: Toward Ending State Adjudication of Indian Water Rights*, 18 HARV. ENVTL. L. REV. 433, 449-50 (1994) (citations omitted).

94. *Id.* at 434 (citations omitted); *see also* Blumm, Becker & Smith, *supra* note 43, at 1161 (noting that state courts are "hostile forums" for the adjudication of tribal reserved rights).

95. *See Big Horn I*, 753 P.2d 76 (Wyo. 1988), *aff'd*, Wyoming v. United States, 492 U.S. 406 (1989); *Big Horn II*, 835 P.2d 273 (Wyo. 1992); *Gila River I*, 989 P.2d 739 (Ariz. 1999).

96. *See, e.g.*, *Big Horn I*, 753 P.2d at 98-100.

97. *See, e.g.*, *id.* at 99-100; *Gila River I*, 989 P.2d at 747.

uses tribes can make of their water rights.[98] All of these misapplications of federal law are antiadaptive.

One option to resolve the issue is for state courts to do what the Supreme Court admonished them to do: "follow federal law."[99] But that directive has not been followed in many state court proceedings. The other option, then, is to allow tribal reserved rights determinations to proceed in federal court. One author has advocated eliminating state courts' authority to hear tribal reserved rights altogether and making federal courts the "exclusive forum" for the adjudication of tribal water rights.[100] A more moderate proposal, however, would achieve the same results for tribes of helping assure them a forum that would apply federal law. And that is that tribes should have the option of choosing federal court over a general stream adjudication.[101]

First, an Indian tribe now has the right to bring suit in federal court to assert its water rights. In the McCarran Amendment cases, the Court was clear that federal courts retain jurisdiction to hear reserved rights cases, despite the abstention doctrine.[102] If the tribe, or the United States on its behalf, brings suit in federal court to determine tribal water rights, the federal court should retain jurisdiction unless the tribe chooses to have the issues determined as part of a general stream adjudication. Express tribal consent should be required for federal abstention in favor of a state general stream adjudication.

Second, tribal reserved rights issues should be removable to federal court from a state general stream adjudication. In announcing the abstention doctrine in favor of general stream adjudications, the Court noted that the McCarran Amendment was designed to avoid "piecemeal adjudication of water rights in a river system."[103] In fact, however, state general stream adjudications do not proceed in one huge undifferentiated lawsuit. Instead, as a practical matter, tribal reserved rights issues are litigated and decided separately from other issues.[104] If they can be determined separately by state courts and then integrated into the final schedule of rights, there is no reason why they cannot be determined separately by federal courts and then integrated with state law rights as

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98. *See, e.g.*, *Big Horn II*, 835 P.2d at 278.

99. Arizona v. San Carlos Apache Tribe, 463 U.S. 545, 571 (1983).

100. Feldman, *supra* note 93, at 435.

101. *See* Judith V. Royster, *Indian Water and the Federal Trust: Some Proposals for Federal Action*, 46 NAT. RESOURCES J. 375, 389-91 (2006).

102. Colo. River Water Conservation Dist. v. United States, 424 U.S. 800, 807-09 (1976).

103. *Id.* at 819.

104. *See, e.g.*, *Gila River II*, 35 P.3d 68, 70-71 (Ariz. 2001) (en banc); *Big Horn I*, 753 P.2d 76, 185 (Wyo. 1988), *aff'd*, Wyoming v. United States, 492 U.S. 406 (1989).

well. Neither is more "piecemeal" than the other. As a result, both the tribes and the United States, upon the written request of the tribe involved, should be authorized to remove the tribal reserved rights issues to federal court.

Having tribal water rights resolved in federal court will not, of course, be a panacea. But in the course of tribal water rights adjudications over several decades, federal courts have been more amenable to applying federal law principles to their reserved rights determinations.[105] State courts have been inconsistent.[106] Tribes are not only entitled to federal-law determinations of their water rights under Supreme Court precedent, but to a forum that will conscientiously apply federal law to the resolution of those rights. Keeping the flexibility for tribes to participate in state general stream adjudications if they wish, or file in federal court or remove to federal court the federal issue of tribal reserved rights, helps assure the proper consideration and application of federal law.

III. RESTRICTIONS ON TRIBAL WATER CODES

Overcoming the adjudicative barriers to tribal adaptive strategies is crucial. But what if a tribe has a homeland water right, including groundwater, and free determination of the purposes to which to put that water? The tribe still needs a legislative or administrative process to administer those water rights. The tribe needs a water code: that is, a system for determining priorities of use, monitoring water uses, and addressing violations.[107] A water code not only places decision making over tribal water resources with the tribe, but can incorporate the flexibility necessary to allow the tribe to adapt its water rights to climate change factors.

For many tribes, enacting a water code is a matter only of legislative will and tribal priorities.[108] For others, however, federal policy stands as an impediment. Any tribe whose constitution requires secretarial approval of tribal laws must have its tribal water code approved by the Secretary of the Interior. And the Secretary imposed a moratorium in

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105. *See, e.g.*, United States v. Cappaert, 508 F.2d 313, 320-21 (9th Cir. 1974); Tweedy v. Tex. Co., 286 F. Supp. 383, 385 & n.3 (D. Mont. 1968).

106. *Gila River II*, 989 P.2d at 748; Confederated Salish & Kootenai Tribes of the Flathead Reservation v. Stults, 59 P.3d 1093, 1099 (Mont. 2002); *Big Horn I*, 753 P.2d at 100.

107. *See generally* Thomas W. Clayton, *The Policy Choices Tribes Face When Deciding Whether To Enact a Water Code*, 17 AM. INDIAN L. REV. 523, 563-87 (1992) (discussing the reasons for enacting a code, the realities faced when administering one, and the options available to different tribes).

108. *See, e.g.*, NAVAJO NATION WATER CODE ANN. tit. 22, §§ 1101-2405 (1984).

1975 on the approval of any law that "purports to regulate the use of water."[109] That moratorium was issued pending departmental regulations, but because no regulations were ever promulgated, tribes subject to the secretarial approval provision remain frustrated in their ability to adopt a water code.

As with the importance of groundwater and unfettered choice of use, the importance of water codes is illustrated by their inclusion in negotiated water settlements. One-third of the twenty-seven water settlement acts contain specific provisions for tribal water codes.[110] In recognition that tribes are in the best position to determine how to use and allocate their water resources, only a few of those acts require secretarial approval of the water codes.[111]

The recommendation for addressing this restriction on tribes' ability to engage in adaptive strategies is simple. The outdated moratorium should be lifted. The Department of the Interior should be working with tribes interested in developing water codes, encouraging their development rather than placing barriers in the path of effective water regulation. At present, only those tribes that do not require secretarial approval of tribal laws and those tribes with specific authorization in their settlement acts are freely able to take advantage of the adaptive capabilities of water codes.

IV. RESTRICTIONS ON WATER MARKETING

Water marketing, the voluntary transfer of water use from one party to another, has gained considerable traction in western states as an important means of reallocating water from lower-value uses to higher-value uses.[112] Scholars have long advocated tribal water marketing as a means for tribes to capture the economic benefit of their unused water

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109. *See* Steven J. Shupe, *Water in Indian Country: From Paper Rights to a Managed Resource*, 57 U. COLO. L. REV. 561, 579-81 (1986); *see also* David H. Getches, *Management and Marketing of Indian Water: From Conflict to Pragmatism*, 58 U. COLO. L. REV. 515, 527 (1988).

110. *See, e.g.*, White Mountain Apache Tribe Water Rights Quantification Act of 2010, Pub. L. No. 111-291, § 305(e), 124 Stat. 3064; Snake River Water Rights Act of 2004, Pub. L. No. 108-447, tit. X, § 7(b), 118 Stat. 2809; Yavapai—Prescott Indian Tribe Water Rights Settlement Act of 1994, Pub. L. No. 103-434, § 111(c), 108 Stat. 4526.

111. *See* Shoshone-Paiute Tribes of the Duck Valley Reservation Water Rights Settlement Act of 2009, Pub. L. No. 111-11, § 10805(b)(1), 123 Stat. 991; Zuni Indian Tribe Water Rights Settlement Act of 2003, Pub. L. No. 108-34, § 8(b)(1)(F)(i), 117 Stat. 782.

112. Robert Glennon, *Water Scarcity, Marketing, and Privatization*, 83 TEX. L. REV. 1873, 1884 (2005).

rights,[113] but water marketing may also provide tribes with a means of adapting to the effects of climate change on their water resources.

Water markets may be "particularly well suited" as adaptation strategies for climate change, because of "their flexibility, decentralized nature, and ability to create and harness economic incentives."[114] Water marketing may involve a straight lease of the water right in whole or in part,[115] but may also include more creative options to meet particular needs. Steven Shupe identified a number of these options, including a dry-year arrangement where water is leased during drought years only, financing for water project improvements in exchange for the water conserved by the improvements, and an exchange of water rights where one party is willing to pay to obtain a supply that is of higher quality or easier to transport or otherwise better suited to particular needs.[116] A potential alternative to water marketing is a deferral agreement, under which the tribe agrees to forego the use of its water rights in exchange for payments. Although a few tribes have entered into these agreements,[117] the late Dean David Getches has argued that they are de facto leases and thus subject to the same constraints as water markets.[118]

Indian tribes face a formidable federal restriction on their ability to participate in water markets. Under the Nonintercourse Act, which prohibits any "purchase, grant, lease, or other conveyance of lands, or of any title or claim thereto" without federal consent, tribal marketing of water rights is likely subject to congressional authorization.[119] Although Congress has freely authorized the lease and other encumbrance of tribal natural resources such as minerals, timber, and grazing lands, it has never enacted a general authorization to market tribal water rights. In the

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113. *See* Steven J. Shupe, *Indian Tribes in the Water Marketing Arena*, 15 AM. INDIAN L. REV. 185 (1990); Getches, *supra* note 109.

114. Jonathan H. Adler, *Water Marketing as an Adaptive Response to the Threat of Climate Change*, 31 HAMLINE L. REV. 729, 732 (2008); *see also* Miller, Rhodes & MacDonnell, *supra* note 2, at 172-73 (citations omitted); *cf.* Miller, *supra* note 1, at 412 (citations omitted) (arguing that the pro-market views "are valid to a point, but they typically fail to consider the fact that considerable transaction costs may be required for efficient water market transactions").

115. In the nontribal context, water marketing generally means the sale of water rights from one user to another. In the tribal context, however, tribes would market the water and not the water right; that is, tribes would remain the owners of the right to the water and lease the use of the water to others. *See* Shupe, *supra* note 113, at 187-90 (citations omitted) (discussing the difference between selling and leasing water rights).

116. *Id.* at 190-92 (citations omitted).

117. *See* Getches, *supra* note 109, at 546-57 (citations omitted); Robert H. Abrams, *The Big Horn Indian Water Rights Adjudication: A Battle for the Legal Imagination*, 43 OKLA. L. REV. 71, 74 (1990) (citations omitted). No federal court, however, has ruled on whether such agreements are subject to federal approval.

118. Getches, *supra* note 109, at 546 (citations omitted).

119. 25 U.S.C. § 177 (2006); Getches, *supra* note 109, at 546 n.162.

absence of that statutory authority, it appears that tribes do not have authority to lease their water rights apart from the land[120] and that the Secretary of the Interior lacks the authority to approve such a lease.

Congress has approved water marketing for specific tribes, however. Most of the water settlement acts contain provisions for water marketing.[121] In some respects, these settlement act provisions allow for adaptive use of tribal water marketing. Virtually all the settlement acts, for example, prohibit the permanent alienation of the water right, ensuring that ownership of the water right remains with the tribe.[122] A number of the acts provide or indicate that tribes may market water from any water source in which they hold rights.[123] One recent settlement act combined adaptive approaches, authorizing the tribe to lease water pursuant to a tribal water code, without the approval of the Secretary of the Interior.[124]

In other respects, however, the water marketing provisions of the settlement acts are antiadaptive. If one of the hallmarks of water marketing as an adaptive strategy is that markets "allow for continuous adjustment without central intervention,"[125] then tribal water marketing too often lacks that core value. A few of the settlement acts, for example, limit the tribes in the water sources they may tap for water marketing.[126]

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120. The Indian Long-Term Leasing Act appears to authorize water use by a lessee of tribal land. 25 U.S.C. § 415 (authorizing surface leases for a variety of purposes, "including the development or utilization of natural resources in connection with operations under such leases").

121. Several of these specify that the Secretary of the Interior must approve the water marketing. *See, e.g.*, Taos Pueblo Indian Water Rights Settlement Act of 2010, Pub. L. No. 111-291, § 506(e), 124 Stat. 3064; Northern Cheyenne Indian Reserved Water Rights Settlement Act of 1992, Pub. L. No. 102-374, § 5(c)(2), 106 Stat. 1186. A few provide that the Nonintercourse Act does not apply. *See, e.g.*, Ute Indian Rights Settlement Act of 1992, Pub. L. No. 102-575, § 503(b), 106 Stat. 4600.

122. Some ban permanent alienation. *See, e.g.*, Shivwits Band of the Paiute Indian Tribe of Utah Water Rights Settlement Act of 2000, Pub. L. No. 106-263, § 7(e), 114 Stat. 737; Jicarilla Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-441, § 7(b), 106 Stat. 2237. Others accomplish the same result by restricting the water marketing to certain years or a certain number of years. *See, e.g.*, White Mountain Apache Tribe Water Rights Quantification Act of 2010, Pub. L. No. 111-291, § 306(a)(1)(A)(i), 124 Stat. 3064; San Carlos Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-575, § 3706(b)(3), 106 Stat. 4600.

123. *See, e.g.*, Jicarilla Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-441, § 7(a), 106 Stat. 2237; Northern Cheyenne Indian Reserved Water Rights Settlement Act of 1992, Pub. L. No. 102-374, § 9(F), 106 Stat. 1186.

124. Snake River Water Rights Act of 2004, Pub. L. No. 108-447, § 7(g), 118 Stat. 2809.

125. Andrew P. Morriss, *Lessons from the Development of Western Water Law for Emerging Water Markets: Common Law vs. Central Planning*, 80 OR. L. REV. 861, 933 (2001).

126. *See, e.g.*, San Carlos Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-575, § 3706(b), 106 Stat. 4600; Fort McDowell Indian Community Water Rights Settlement Act of 1990, Pub. L. No. 101-628, § 407(a)(2), (d), (h), 104 Stat. 4469; Salt River Pima-Maricopa Indian Community Water Rights Settlement Act of 1988, Pub. L. No. 100-512, § 8(a)(2), (f), 102 Stat. 2549.

A common limitation in water settlements with tribes of the Southwest is that water may only be marketed to certain named municipalities.[127] But perhaps the most serious antiadaptive aspect of many water marketing provisions is the lease duration of 99–100 years. A substantial number of the settlement acts impose 99- or 100-year maximums on water leases or allow leasing with a specified range of years that amounts to a 99-year span.[128] Although these are listed as maximum lease terms, the possibility of a 99- to 100-year lease too often results in a lease term of that length. And a nearly century-long lease "can amount to a *de facto* sale" of the tribal property rights.[129] Not only can the span of time make it difficult for the tribe to recapture the water right at the end of the lease,[130] but any adaptive flexibility of water marketing is lost for several generations.

Congress should authorize water marketing for those tribes that wish to use markets as an adaptive strategy. Under the constraints of the Nonintercourse Act, authorization outside the case-by-case settlement acts requires a general water marketing statute. There are at least two approaches that Congress could take to such legislation. First, Congress could establish standards for water marketing, much as it has established standards for mineral leases and agreements or timber sales, and require each marketing lease or other arrangement to be approved by the Secretary of the Interior. Alternatively, it could authorize tribes to draw up water marketing plans for secretarial approval. Under an approved marketing plan, the tribe could enter into marketing transactions without waiting on federal approval of its actions.[131]

In order to allow full use of water marketing as an adaptation strategy, federal legislation should not unduly constrain tribes in their use of markets. Tribes should not be restricted to marketing water only from

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127. *See, e.g.*, White Mountain Apache Tribe Water Rights Quantification Act of 2010, Pub. L. No. 111-291, § 306(f)-(g), 124 Stat. 3064; San Carlos Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-575, § 3706(b)(3)-(5), 106 Stat. 4600; Ak-Chin Indian Community Act of 1978, Pub. L. No. 95-328, 92 Stat. 409, *amended by* Pub. L. No. 102-497, § 10(b), 106 Stat. 3258 (1992), *amended by* Pub. L. No. 106-285, § 2(b), 114 Stat. 878 (2000).

128. *See, e.g.*, White Mountain Apache Tribe Water Rights Quantification Act of 2010, Pub. L. No. 111-291, § 306(a)(1)(A)(i), 124 Stat. 3064 (100-year maximum); Jicarilla Apache Tribe Water Rights Settlement Act of 1992, Pub. L. No. 102-441, § 7(b), 106 Stat. 2237 (99-year maximum); Fort McDowell Indian Community Water Rights Settlement Act of 1990, Pub. L. No. 101-628, § 407(a)(2), 104 Stat. 4469 (years 2001-2099 inclusive).

129. *Discussion Draft of the Indian Energy Promotion and Parity Act of 2010: Hearing Before the S. Comm. on Indian Affairs*, 111th Cong. 10 (2010) (testimony of the National Congress of American Indians) (discussing 99-year land leases).

130. *Id.* ("Historic experience has shown that it is very difficult for a tribe to recover its property once a non-Indian residential community is established.").

131. *See* Royster, *supra* note 101, at 397.

certain sources, or only to certain municipal users. In particular, the length of a marketing lease should be designed to accord tribes flexibility. The terms of a water market lease must be long enough to ensure the lessee some stability of water use, but both Congress and the tribes should carefully consider whether 99-year leases serve tribal needs.

V. CONCLUSION

The effects of climate change on water resources will be substantial, and the impacts on tribal water resources are likely to be even more severe. Tribes hold rights to specific quantities of water, determined by the purposes for which their lands were set aside. Once those rights are quantified, they may not be increased in light of subsequent climate changes and conditions. Given that defined quantity, tribal adaptation strategies for water resources take on added importance.

As a central tenet of tribal self-determination, Indian tribes should make their own decisions about designing and implementing appropriate adaptation strategies. In order for tribes to do so, however, antiadaptive aspects of federal law must change. This Article has identified several ways in which federal law and policy frustrate tribal self-determination regarding adaptive strategies for water resources and suggested ways of reforming the federal approaches to ensure climate justice for tribal nations.