



The Water Report™

Water Rights, Water Quality & Water Solutions in the West

In This Issue:

Tribal Rights 1

Title XVI Programs ... 11

**Washington State
Water Management ... 22**

Water Briefs 29

Calendar 31

Upcoming Stories:

**Instream Flow
Dashboard**

**Mississippi v.
Tennessee**

**Yakima Basin
Integrated Plan:
Dissent**

& More!

TRIBAL RIGHTS TO WATER & FISHERIES

by Mason D. Morisset, Morisset, Schlosser, Jozwiak & Somerville (Seattle, WA)

Introduction

THE ORIGIN OF INDIAN RESERVED WATER RIGHTS

As climate change disrupts water supplies throughout the West, the water rights of United States Indian Tribes come under increased scrutiny. Many groups will eye unused tribal water while Tribes will be vigilant to preserve those rights.

The seminal Indian water rights case is *Winters v. United States*, 207 U.S. 564 (1908) (*Winters*). In *Winters*, the United States sought to restrain settlers from constructing water works to divert water from the Milk River, which would prevent water from flowing to the Fort Belknap Indian Reservation in Montana to irrigate Indian lands. The settlers argued that the Reservation rights for the Gros Ventre and Assiniboine Tribes was for land only and the Tribes did not have a right to demand that water be available to flow to the Reservation.

In rejecting these arguments, the US Supreme Court (Court) noted that the United States had the power to reserve water in connection with a land reservation for Indians, that the Indians would have assumed they would have sufficient water to irrigate their lands — without which their lands were worthless — and that the federal government did impliedly reserve such water rights. *Winters* at 576-77.

Later, in *Cappaert v. United States*, 426 U.S. 128 (1976) (*Cappaert*), the Court further delineated the scope of the right. In *Cappaert*, ranchers owning land adjacent to the Devil's Hole national monument were pumping groundwater and thereby depleting water in the underground pool supporting the Devil's Hole pupfish. This unique species was in danger of extinction if the drawdown of water in the underground pool was not arrested. In upholding an injunction against pumping by the Cappaerts, the Court affirmed that in setting up the monument the US had reserved appurtenant, unappropriated waters necessary for the purpose of preserving the pupfish. The Court specifically held that “the United States can protect its water from subsequent diversion, whether the diversion is of surface or groundwater.” *Id.* at 143. See also: *Agua Caliente Band v. Coachella Valley Water District, et al.*, 849 F.3d 1262, 1272 (9th Cir. March 7, 2017): “...we hold that the *Winters* doctrine encompasses both surface water and groundwater appurtenant to reserved land.”; and Cohen's Handbook of Federal Indian Law § 19.03[2][a] (Cohen's Handbook): “Reserved rights presumably attach to all water sources — groundwater, streams, lakes, and springs — that arise on, border, traverse, underlie, or are encompassed within Indian reservations.” The Court in *Cappaert* further articulated the *Winters Doctrine* and explicitly made clear that the *Doctrine* applied to Indian reservations.

The Court has long held that when the federal government withdraws its land from the public domain and reserves it for a federal purpose, the Government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the purpose of the reservation. In so doing the US acquires a reserved right in unappropriated water which vests on the date of the reservation and is superior to the rights of future appropriators. The *Winters Doctrine* applies to Indian reservations and other federal enclaves, encompassing water rights in navigable and nonnavigable streams. *Cappaert* at 138.

Tribal Rights**Primary Purpose****Allocated Lands****Treaty Rights****Aboriginal Ways****State Law****The Water Report**

(ISSN 1946-116X)

is published monthly by
Envirotech Publications, Inc.
260 North Polk Street,
Eugene, OR 97402

Editors: David Light
David Moon

Phone

541/ 517-5608

Fax

541/ 683-8279

email

TheWaterReport@yahoo.com

website:

www.TheWaterReport.com

Subscription Rates:

\$299 per year

Multiple & Electronic

Subscription Rates Available

Postmaster: Please send
address corrections to
The Water Report
260 North Polk Street
Eugene, OR 97402

Copyright© 2020 Envirotech
Publications, Incorporated

Establishing an Indian Reserved Water Right**Water Reserved to Meet the Purposes of the Reservation**

The *Winters Doctrine* reserves water rights for Indian Country by necessary implication. That is, when establishing reservations through treaties, executive orders or statutes, the United States would not have reserved land for the tribes without the water rights necessary to make the land suitable as a homeland. These water rights entitle tribes to the amount of water that is necessary for the primary purpose of the reservation as a homeland. This is usually measured by the amount of water necessary to irrigate all “practically irrigable acreage” of the reservation. *Arizona v. California*, 373 U.S. 546, 600 (1963). If the land could be cultivated through irrigation, the tribe is entitled to the water. Tribes are not limited to using the water for agriculture; the water can be used for other purposes. *Colville Confederated Tribes v. Walton*, 647 F.2d 42, 48-49 (9th Cir. 1981) (*Walton*).

Indeed, if a reservation was established for the purposes of hunting or fishing, by implication, water rights must account for these other purposes. *Id.* Indian recipients of allotted lands (and the subsequent Indian and non-Indian purchasers) retain all the *Winters* rights. *United States v. Powers*, 305 U.S. 527, 532-33 (1939). As the trustee and holder of title to *Winters* water rights, the US has an obligation to protect Indian water rights and water resources under the trust doctrine. [Editor’s note: allotted lands are reservation lands that were divided and conveyed to individual tribal members].

Winans Doctrine

Indian Treaties can also provide the source for tribal water rights by implication from the reserved fishing rights clauses. In 1905, the *Winans* case was a seminal case on the interpretation of Indian treaties, where the US Supreme Court held that certain rights to fish were reserved by the tribes. *United States v. Winans*, 198 U.S. 371 (1905) (*Winans*). The *Winans* decision serves as the source of some tribal reserved rights to water. See Cohen’s Handbook § 19.02, at 1209 (2012 ed.).

The leading authority on Indian Water Law, Cohen’s Handbook, stated: “While *Winters* is the origin of tribal rights to water implied from the federal government’s creation of reservations for the purpose of inducing tribes to transform their way of life, *Winans* may be the origin of tribal rights to water implied from a reservation of aboriginal ways of life.” *Id.* See also: Robert T. Anderson, *Indian Water Rights*, 98 Calif. L. Rep. 1133 (2010).

Reserved Water Rights are Not Subject to State Law

Indian water rights are independent of state water law concepts. Indian reserved water rights are federal water rights and “are not dependent upon state law or state procedures.” *Cappaert* at 145. Therefore, state water distribution legal schemes do not apply to Indian Country.

Entities That May Acquire a Water Right

Under state law, most states allow any “person” to acquire a water right, which may also include corporations, governments, associations, and other entities. It is typical for individuals to hold rights in their own name, or in any of the common forms of concurrent ownership, such as tenants in common or joint tenants.

As indicated above, under federal law tribes may also acquire water rights primarily through the federal reservation of water rights with the establishment of a reservation or other treaty rights.

Beneficial Use Principle

The requirement of beneficial use of water is typically necessary to establish the right to use water under state law. One court described this as follows:

First, [beneficial use] refers to the purposes, or type of activities, for which water may be used.

Use of water for the purposes of irrigated agriculture is a beneficial use...

Second, beneficial use determines the measure of a water right. The owner of a water right is entitled to the amount of water necessary for the purpose to which it has been put, provided that purpose constitutes a beneficial use. To determine the amount of water necessary for a beneficial use, courts have developed the principle of “reasonable use.” Reasonable use of water is determined by analysis of the factors of water duty and waste.

Wash. Dep’t of Ecology v. Grimes, 852 P.2d 1044, 1053 (Wash. 1993) (citations omitted).

However, creation of federally reserved water rights on an Indian reservation is *not* dependent on the beneficial use requirement. *In re Gen. Adjudication of All Rights to Use Water in Gila River Sys. & Source*, 35 P.3d 68, 71-72 (Ariz. 2001).

Priority Date and the Diversion Requirement

The priority date for a person’s right to use water is central to the state-based appropriation system and historically was set by the date on which a person formulated the intent to appropriate water and manifested that intent in some way. There does need to be an actual diversion of water to establish the effective date, and that diversion of water must be put to beneficial use and accomplished with due diligence. [Editor’s

<div data-bbox="115 176 347 218">Tribal Rights</div> <div data-bbox="136 254 326 289">Priority Dates</div> <div data-bbox="120 428 342 464">Reserved Rights</div> <div data-bbox="168 638 293 669">Non-Use</div> <div data-bbox="136 848 326 884">Appurtenancy</div> <div data-bbox="115 989 347 1020">Transfers Unclear</div> <div data-bbox="152 1304 315 1373">Basin Study (Supply)</div> <div data-bbox="168 1549 302 1619">Economic Disparity</div> <div data-bbox="136 1724 326 1793">Development Trends</div> <div data-bbox="120 1864 342 1934">Off-Reservation Use</div>	<p>note: many water rights in the West had their priority date established as of the date of the filing of a “Notice of Appropriation.”]</p> <p>These doctrines do not apply to tribal waters rights. Where the right is based on the establishment of a reservation, the date of the reservation determines the priority date. <i>Cappaert</i> at 138. Where the right is based on a treaty designed to protect aboriginal rights, the priority date may be “time immemorial.” See, e.g. <i>United States v. Adair</i>, 723 F.2d 1394, 1412-15 (9th Cir. 1983), <i>Joint Board of Control v. United States</i>, 832 F.2d 1127, 1131-32 (9th Cir. 1987).</p> <p>Water Available for Appropriation</p> <p>In most states, all waters are said to be owned by the public, or by the state for the benefit of the public, and are subject to appropriation for beneficial use. In general, the US deferred to state law for the use of water on lands either held by the US, or transferred to private parties under the various land disposal statutes. <i>Cal. Or. Power Co. v. Beaver Portland Cement Co.</i>, 295 U.S. 142 (1935). However, this general rule is subject to the qualification that “the power of the government to reserve the waters and exempt them from appropriation under the state laws is not denied, and could not be.” See: <i>Winters</i> at 577, citing <i>United States v. Rio Grande Dam & Irrigation Co.</i>, 174 U.S. 702 (1899) and <i>Winans</i>.</p> <p>Non-Use, Forfeiture, and Abandonment</p> <p>Like most other state law and common law property rights, water rights can be abandoned or forfeited due to non-use under state law principles.</p> <p>This doctrine does not apply to Indian tribes who do not lose their water rights because of such inadvertent actions. The rights are not terminated by non-use. <i>Winters</i> at 577. One reason is that the United States is the owner of the underlying interest in the lands to which the water right is appurtenant.</p> <p>Place of Use and Water Transfers</p> <p>Water rights are said to be appurtenant to the land on which they are used. They may only be used on that land, and from the point of diversion originally established. When the property (land) is sold, there is a presumption that the appurtenant water right is transferred with the land.</p> <p>These principles have not been well tested in the Indian water law context. Some reservations span more than one state and tribes may want to use their water anywhere within their reservation. In addition, many tribes do not understand why they should not be allowed to maximize the value of their rights in the form of water transfers to off-reservation areas.</p> <p>Some tribes have expressly been granted the right to lease their water through Congressional action (see, e.g., Jicarilla Apache Tribe Water Rights Settlement Act, Pub. L. No. 102-441, § 7, 106 Stat. 2237 (1992)). Others face challenges, including the federal Indian Non-Intercourse Act’s prohibition against conveyances of Indian property without federal consent (25 U.S.C. § 177).</p> <p style="text-align: center;">Indian Water Rights in the Colorado Basin</p> <p>The Colorado River serves as an example of the demands on western water sources that exceed available supply — Colorado River flow is inadequate to meet all tribal needs and non-tribal needs. Water security is key to economic development and growth within the Basin.</p> <p>The Colorado River Basin Water Supply and Demand Study (Basin Study), Technical Report C – Water Demand Assessment (Bureau of Reclamation, 2012), states that tribal rights comprise about 2.9 million acre-feet (maf) of Basin water, with about 1.36 maf of those rights in the Upper Basin and 1 maf in the Lower Basin. (Report available at: usbr.gov/lc/region/programs/crbstudy/finalreport/techrptC.html).</p> <p>The tribal rights amount to 19.33% of normal flow in the Basin when using 15.0 maf as the average annual flow. See Basin Study, Interim Rpt No. 1, Tech Rpt B, June, 2011.</p> <p>Tribal rights are, in general, the most senior water rights in the Basin and as such should be some of the most secure. However, the tribal lands and the people living on the tribal reservations are the most economically depressed and impoverished in the Basin. Water is only one factor in this economic disparity. When thousands of residents on tribal lands lack access to clean water and adequate sanitation, the path out of poverty is more difficult, making preservation and development of their water resources all the more challenging.</p> <p>The Basin Study identified trends for on-reservation tribal development. The different trends indicate the pace at which development might proceed. At present, none of the mainstem Tribes has the basic infrastructure or administrative flexibility needed to fully utilize its water rights. Moreover, in the more than 50 years since the decision in <i>Arizona v. California</i>, several of the Partnership Tribes have rights that are yet to be fully quantified.</p> <p>This demonstrated increase in the potential for shortages within the Basin suggests that flexibility in management and operations that permits the off-reservation use of tribal water (particularly in times of shortage) is one viable mechanism that could be employed to off-set adverse effects and create mutual gains for the Basin. The economic benefits returning to the Partnership Tribes could prove substantial.</p>
---	---

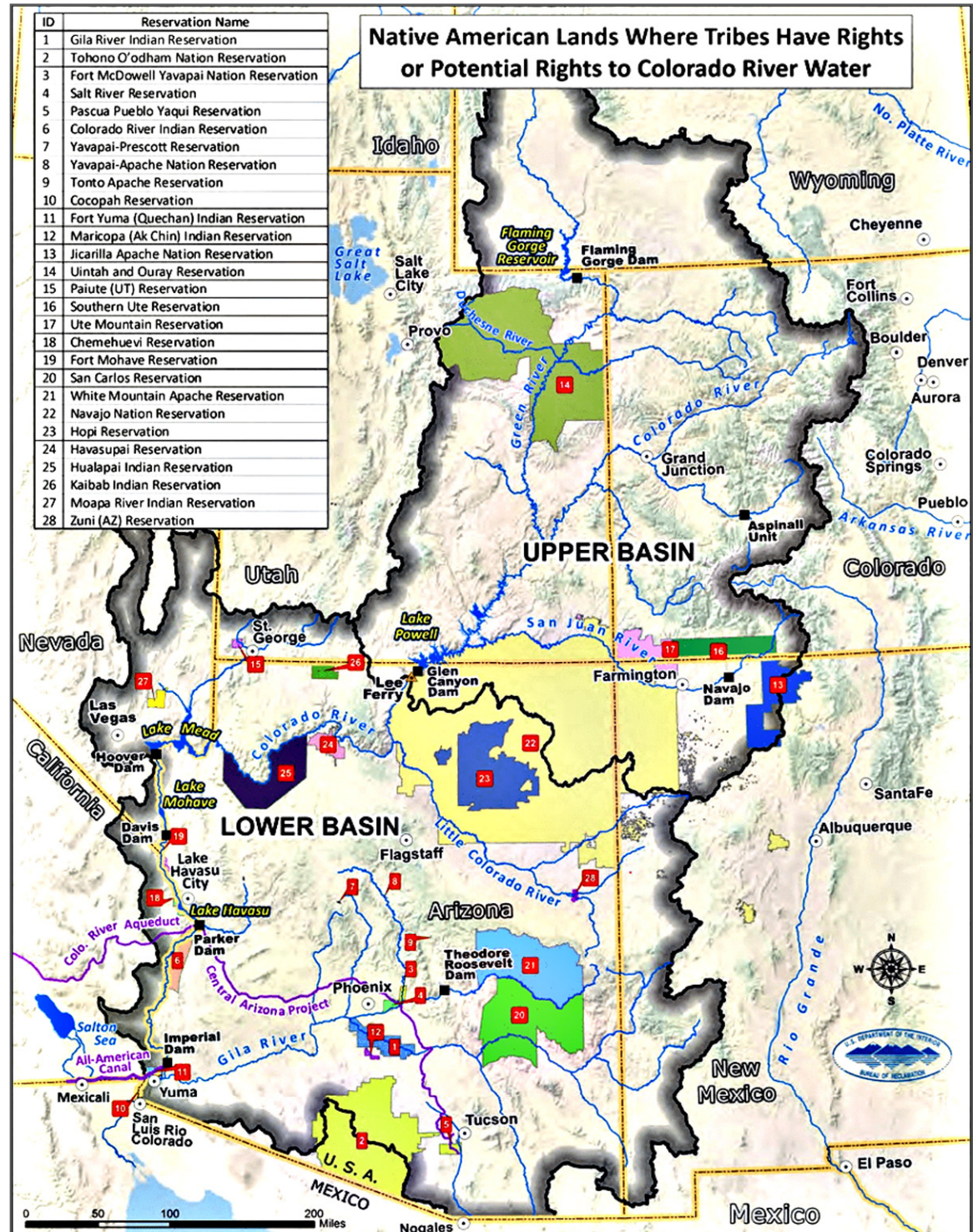
Tribal Rights

Governance Issues

Some additional factors relating to the area of Governance (originally identified in the Basin Study's *Surveys of Influencing Factors* and refined as *Administrative and Legal Constraints in the discussion of Challenges*) are at the top of the list of next steps for the Partnership Tribes and hold the greatest potential to also benefit the Basin.

Governance Issues include:

- Determination of tribal rights to water in the Basin
- Continuous, Sustainable Funding
- Environmental Water Uses
- Partnerships
- Conservation and Drought Management
- Data Collection and Tools for Water Management
- Educational Opportunities



<div data-bbox="115 180 345 222">Tribal Rights</div> <div data-bbox="193 258 267 289">Time</div> <div data-bbox="147 294 315 323">Immemorial</div> <div data-bbox="126 361 336 392">Instream Flows</div> <div data-bbox="120 501 342 533">Reserved Rights</div> <div data-bbox="120 676 342 709">Fishery Support</div> <div data-bbox="162 886 302 951">Depletion Protection</div> <div data-bbox="110 1129 350 1194">Aboriginal Rights Preserved</div> <div data-bbox="146 1339 318 1371">Senior Right</div> <div data-bbox="134 1516 326 1581">Full Quantity Protected</div> <div data-bbox="123 1829 337 1894">Tribal Rights to Fisheries</div>	<div data-bbox="440 149 1469 174"> Federal Reserved Water Rights For Instream Flows Necessary To Support Treaty Fisheries </div> <div data-bbox="378 178 1528 321"> <p>The <i>Winters</i> case is not the only source of Tribal water rights. Many Indian Tribes also have treaty-based water rights. A treaty between the United States and an Indian tribe is not a grant of rights to the Indians but, rather, a grant from them. <i>See Winans</i>. The Tribes possess certain rights, such as rights to fish and hunt, dating from time immemorial. <i>State v. Buchanan</i>, 978 P.2d 1070, 1078 (Wash. 1999) (<i>Buchanan</i>). Rights not expressly ceded in a treaty, as well as those expressly reserved, remain with the Tribe. <i>Id.</i></p> </div> <div data-bbox="378 325 1528 411"> <p>For example, Northwest Tribes retain a federal Indian reserved water right to instream flows sufficient to support treaty fishing rights. <i>United States v. Adair</i>, 723 F.2d 1394, 1410-11 (9th Cir. 1983), <i>cert. denied</i> 467 U.S. 1252 (1984) (<i>Adair</i>); & <i>Winans</i>.</p> </div> <div data-bbox="378 415 1528 501"> <p>At this time, state-permitted water diversions or withdrawals have reduced flows in many rivers and threaten the fish species that make up the Tribe's treaty fishery. Federal legal action may be necessary in order to protect and preserve Tribe's water rights and its treaty fishery.</p> </div> <div data-bbox="378 506 1528 619"> <p>Many treaties reserve the right of taking fish at usual and accustomed grounds and stations. <i>See, e.g. Treaty of Point Elliott</i>, Article V, 12 Stat. 927, II Kapp. 669. In the Treaty, the Tribes reserved the right to fish in the Rivers, their tributaries, and at other locations in Puget Sound. The right of hunting and gathering on open and unclaimed lands is also reserved. <i>Id.</i></p> </div> <div data-bbox="378 623 1528 680"> <p>In accordance with such Treaties and the "reservation of rights" doctrine, the Tribes retain a federal reserved water right to support their treaty hunting, fishing, and gathering rights. <i>See: Adair; Walton</i>.</p> </div> <div data-bbox="378 684 1528 856"> <p>These water rights include the right to sufficient instream flow to support the tribal treaty fishery. <i>Id.</i>; <i>see also Joint Board of Control v. United States</i>, 832 F.2d 1127, 1131-32 (9th Cir. 1987) (<i>Joint Board</i>); <i>United States v. Anderson</i>, 591 F. Supp. 1, 5-6 (E.D. Wash. 1982), <i>aff'd in part & rev'd in part on other grounds</i>, 736 F.2d 1358 (9th Cir. 1984). As stated by the Ninth Circuit in <i>Joint Board</i>, "[t]o the extent that the Tribes here did exercise aboriginal fishing rights, the treaty language clearly preserved those rights, and the water needed for them." <i>Joint Board</i> at 1131.</p> </div> <div data-bbox="378 861 1528 974"> <p>The water right includes "the right to prevent other appropriators from depleting the streams water below a protected level in any area where the non-consumptive right applies." <i>Adair</i> at 1411; <i>Joint Board</i> at 1131-32; <i>see also Kittitas Reclamation District v. Sunnyside Valley Irrigation District</i>, 763 F.2d 1032, 1033 (9th Cir. 1985), <i>cert denied</i>, 474 U.S. 1032 (1985).</p> </div> <div data-bbox="378 978 1528 1123"> <p>The priority date for water for the Treaty based reserved fishing right is time immemorial, not the date of the Treaty. As held in <i>Joint Board</i> at 1131, "the priority date of time immemorial obviously predates all competing rights asserted by...the irrigators in this case." The Treaty did not create the fishing right; rather, it recognized and preserved an existing right. <i>See: Winans</i> at 381; <i>Adair</i> at 1414; & <i>Buchanan</i> at 1078. As stated by the Ninth Circuit Court of Appeals in <i>Adair</i>:</p> </div> <div data-bbox="448 1127 1528 1213"> <p>[W]ithin the 1864 Treaty is recognition of the Tribe's aboriginal water rights and a confirmation to the Tribe of a continued water right to support its hunting and fishing lifestyle on the Klamath Reservation.</p> </div> <div data-bbox="448 1218 1528 1274"> <p>Such water rights necessarily carry a priority date of time immemorial. The rights were not created by the 1864 Treaty, rather, the treaty confirmed the continued existence of these rights.</p> </div> <div data-bbox="448 1278 737 1306"> <p>[Internal citations omitted]</p> </div> <div data-bbox="378 1310 534 1337"> <p><i>Adair</i> at 1414.</p> </div> <div data-bbox="378 1341 1528 1486"> <p>Because the priority date for Tribal fishing water rights is time immemorial, that right takes precedence over all competing and later non-Indian uses. <i>Joint Board</i> at 1131. Even if the priority date were the 1855 Treaty date, that priority date would still have clear seniority over all competing non-Indian uses. The Tribe's senior right is entitled to the full measure of its right before other junior holders can claim any water.</p> </div> <div data-bbox="378 1491 1528 1547"> <p>In <i>Joint Board</i>, the Ninth Circuit Court of Appeals specifically rejected the argument that the Tribe was not entitled to the full quantity of its fishing water right:</p> </div> <div data-bbox="448 1551 1528 1780"> <p>At oral argument, the Joint Board contended that the law would not permit the tribal fisheries to be protected in full if the result was to deprive a much larger number of farmers of the water needed for irrigation. This contention ignores one of the fundamental principles of the appropriative system of water rights. [Internal citations omitted]. 'Where reserved rights are properly implied, they arise without regard to equities that may favor competing water users.' [Internal citations omitted] To the extent that the Tribes enjoy treaty-protected aboriginal fishing rights, they can 'prevent other appropriators from depleting the streams waters below a protected level.'</p> </div> <div data-bbox="378 1785 597 1812"> <p><i>Joint Board</i> at 1132.</p> </div> <div data-bbox="378 1816 1528 1990"> <p>Great effort has gone into establishing and protecting tribal treaty rights to fisheries. Without sufficient water, that effort, and the resulting decisions affirming the tribal treaty right to fish would be effectively nullified. <i>See United States v. Washington</i>, 384 F. Supp. 312, <i>aff'd</i> 520 F.2d 676 (9th Cir. 1975), <i>cert. denied</i>, 423 U.S. 1086 (1976); <i>Puget Sound Gillnetters Ass'n v. United States District Court</i>, 573 F.2d 1117 (9th Cir. 1978), <i>aff'd</i>, <i>Washington v. Washington Commercial Passenger Fishing Vessel Assoc.</i>, 443 U.S. 658 (1979).</p> </div>
--	--

Tribal Rights**Trust
Responsibility****Water for Fish****“Homeland”
Purpose****Sufficient Water****Instream Flows****Tribal
Allotments****Treaty Right****Fishing Rights****Water Rights for
Fisheries**

The United States has a trust responsibility to protect tribal trust resources. This trust responsibility is held by all federal agencies. See *Pyramid Lake Paiute Tribe v. Department of the Navy*, 898 F.2d 1410, 1420 (9th Cir. 1990). The trust responsibility requires the US to protect tribal fishing and water rights, which are held in trust for the benefit of the tribes. See *Mitchell v. United States*, 463 U.S. 206, 224-226 (1982) (discussing, in general, United States’ responsibility as trustee to tribal resources); and *Joint Board* at 1132 (discussing United States’ duty, as trustee, to protect tribal water rights necessary for treaty fishing).

The need to preserve water for fish will remain a driving force in allocation of water in the west and will increase as climate change adversely affects in-stream flows.

Federal Reserved Water Rights Necessary to Fulfill Reservations’ “Homeland” Purposes**INCLUDING INSTREAM FLOWS FOR TREATY FISHERIES**

In addition to the “non-consumptive” reserved water rights necessary to support the treaty fishery, the Tribes also has an additional quantity of “consumptive” reserved water rights necessary to fulfill the tribal “homeland” purposes of their reservations. The priority date of the *Winters* right is the date that Congress or the Executive acted to reserve the lands. See *Winters & Cappaert*.

“The underlying purpose of all Indian reservations is the establishment of a permanent home for Indian people.” Cohen’s Handbook § 19.03[5][c], citing *Walton* at 42, 47; *Winters*; & *In re Gen. Adjudication of All Rights to Use Water in the Gila River Sys. and Source*, 35 P.3d 68, 74 (Ariz. 2001). The reserved trust lands on a Reservation, including trust allotments, carry with them sufficient water to sustain domestic uses, food production, and economic development activities of the Tribe. *Id.*

Preservation of the Tribe’s treaty fishery is also part of the “homeland” purpose of the Reservation. See: *Adair* at 1409-1410 (noting that “one of the ‘very purposes’ of establishing the Klamath Reservation was to secure to the Tribe a continuation of its traditional hunting and fishing lifestyle”). The Court in *Walton* at 47-48, found that providing a “homeland for the Indians” as well as “preservation of the Tribe’s access to fishing grounds” were dual purposes behind establishment of the Colville Reservation. Here, the Northwest Tribes have reserved rights to water in amounts necessary to provide a permanent “homeland,” including, but not limited to, instream flows sufficient to maintain and preserve its treaty fishery.

Many of the tribal trust lands within Reservations were originally tribal trust allotments. In *United States v. Powers*, 305 U.S. 527 (1939), the US Supreme Court held that allotments of tribal lands also hold reserved water rights. Indian homesteads reserved under the authority of the Indian Homestead Act of 1884 are on equal footing with allotments reserved under the General Allotment Act of 1887 and also hold reserved water rights. *United States v. Jackson*, 280 U.S. 183 (1930); *In re Yakima River Drainage Basin (Acquavella)*, Yakima County, Wash., Sup. Ct. Case No. 77-2-0148-5 (Memorandum Opinion re: Off-Reservation Indian Land, November 12, 1992 and Order re: Off-Reservation Indian Land, December 10, 1992) (holding that Indian homesteads retain reserved water rights). See also Cohen’s Handbook, at § 19.03[8][a], n. 208; R. B. Collins, *Indian Allotment Water Rights*, 20 Land & Water L. Rev. 421, 437 (1985) (both stating that allotments from the public domain or by purchase should be accorded reserved water rights subject to the same rules as tribal reserved rights). Thus, tribal allotments carry reserved water rights whether formed pursuant to the General Allotment Act or the Indian Homestead Act. Tribal reacquisition of such allotments vests the tribe with the water rights originally reserved. *Walton* at 49-51 (holding transfer of allotment conveys full quantity of water available to allottee with associated priority date).

In *Adair*, the court held that the treaty between the US government and the Klamath Indians included an implied water right to as much water on reservation lands as was needed to protect fishing rights. Although *Adair* dealt with water on old reservation lands, the case is analogous to the off-reservation fishing rights reserved by Washington State tribes since the Klamath reservation had been terminated and reserved fishing rights were thus, by definition, “off-reservation” (that is, no longer on Indian land).

In *Kittitas Reclamation District v. Sunnyside Valley Irrigation District*, 763 F.2d 1032 (9th Cir. 1985) (*Kittitas*), the court ruled in favor of protection of fishery habitat in a case involving “...the collision of two interests: the Yakama Nation’s interest in preservation of their fishing rights, and the Eastern Washington farmers’ interest in preservation of water needed for crops in dry spring and summer.” *Kittitas*, slip op. at 2. In *Kittitas*, a court-appointed water master had asked the district court for guidance when it became clear that diverting water for agricultural purposes would leave important salmon egg nests in spawning areas exposed, thus destroying those nests. The Ninth Circuit upheld the district court’s directive to the water master to release more water to protect fish. It rejected the argument that the court had no jurisdiction to protect treaty fishing rights:

No such limitation appears. The decree specifically stated that it did not adjudicate the rights of persons not made parties, including the Yakima Nation... . The court properly assumed jurisdiction to interpret the decree in light of the Nation’s treaty fishing right.

Kittitas, 763 F.2d 1032, 1034.

Both *Kittitas* and *Adair* stand for the proposition that fishing rights also imply water rights necessary to sustain the fishing right.

Tribal Rights	<p style="text-align: center;">Specific Findings on Quantity of Tribal Instream Flow Rights</p> <p>Although there have been few adjudications of the quantum of Tribal water rights for fish, the courts have made some specific rulings concerning tribal instream flow rights, including the following:</p> <ul style="list-style-type: none"> • 20 cubic feet per second (cfs) to maintain suitable water temperatures for fish spawning. <i>U.S. v. Anderson</i>, 736 F.2d 1358 (9th Cir. 1984). • 350 acre-feet per year to reestablish a fishery to replace salmon runs terminated by dam building. <i>Colville Confederated Tribes v. Walton (Colville II)</i>, 752 F.2d 397, 404-05 (9th Cir. 1985). • Instream rights exist sufficient to prevent appropriators from depleting stream flows from the protected level. <i>Adair</i>, 723 F.2d 1394, 1411 (9th Cir. 1983), <i>cert. denied</i> 467 U.S. 1252 (1984).
Quantity of Rights	
State Law Protection	<p style="text-align: center;">Instream Flow Water Rights Based On State Law</p> <p>Tribes are also entitled to use state law to protect instream flows for fisheries purposes. In <i>Postema, et al. v. Ecology, et al.</i>, 142 Wn.2d 68, 11 P.3d 726 (October 19, 2000) the Tulalip and Muckleshoot Tribes joined with other parties, including Washington State's Department of Ecology (Ecology), to argue that water for instream flows was a critical water right which could not be imperiled by subsequent requests for further diversions. The Washington Supreme Court case involved the consolidation of several appeals from the King County Superior Court and one from Snohomish County. These cases, in turn, arose from the several hundred permit applications batch-processed by Ecology in the mid-1990s. Many of the permits were denied on the basis that the withdrawals would be from wells in hydraulic continuity with nearby streams, which were either at or below minimum flows necessary for fisheries resources during at least part of the year. The State Supreme Court's opinion in <i>Postema</i> supports tribal views that instream flows necessary to support fish must be given a high level of protection. Tribes will continue to use the <i>Postema</i> precedent to block any further withdrawals of water where those withdrawals might imperil instream flows necessary for fisheries.</p>
Hydraulic Continuity	
Salmon Runs	<p style="text-align: center;">Northwest Tribal Fisheries: Needs & Threats</p> <p style="text-align: center;">FEDERAL ACTION MAY BE NECESSARY TO PROTECT TRIBAL WATER RIGHTS & TREATY FISHERIES</p> <p>Historically, the Northwest Rivers produced multiple runs of salmon annually, including both spring and fall Chinook (King), Coho (Silver), Chum (Dog), and, in odd numbered years, Pink (Humpback) salmon. In addition to salmon, Steelhead trout, Dolly Varden, char, and sea-run cutthroat trout spawn in the river and migrate to marine waters. All of these species are anadromous fish, i.e., fish that are hatched and spend a portion of their lives in fresh water but then migrate to the sea to mature, returning to their fresh water natal streams to spawn. Since time immemorial, the Northwest Tribes and their members have harvested these species for commercial, subsistence, and ceremonial purposes. The Tribe's treaty right guarantees the right of taking these fish.</p>
Fishery Flows	<p>Adequate instream flows are critical to the maintenance of the treaty fishery. As part of the treaty fishing rights litigation, the United States, the State of Washington, and Treaty Tribes identified five necessary elements of anadromous fish habitat, each of which require adequate instream flows.</p>
Fish Needs	<p>Anadromous Fish Need:</p> <ol style="list-style-type: none"> 1) access to and from the sea 2) an adequate supply of good-quality water 3) a sufficient amount of suitable gravel for spawning and egg incubation 4) an ample food supply 5) sufficient shelter <p><i>See United States Fish and Wildlife Service, et al., Joint Statement Regarding the Biology, Status, Management, and Harvest of the Salmon and Steelhead Resources of the Puget Sound and Olympic Peninsular Drainage Areas of Western Washington (1973). See also National Marine Fisheries Service, Proposed Recommendations for Amendment 14 to the Pacific Coast Salmon Plan for Essential Fish Habitat, March 26, 1988 Draft, p. 137.</i></p>
Salmonid Life Stages	<p>All life stages (eggs, larvae/alevins, juvenile and adult) of anadromous fish species require sufficient instream flows to support their habitat requirements. Migrating adult Chinook salmon require adequate flows as they travel the River to their spawning grounds. Low stream flows result in barriers that impede migration. Prior to and during spawning, adult Chinook salmon require deep pools with an abundance of large logs or other hiding structures in close proximity to spawning areas. Incubating eggs and alevins (the life stage between hatching and juvenile fish stage) require a continual supply of water through the redd (salmon spawning nest) to protect them from high temperatures, provide oxygen, and process waste. Emerging Chinook fry and juveniles require shallow stream margins and pools for rearing, and benefit from logs and other cover to avoid predation and to find food.</p>

Tribal Rights

Depleted Flows

Threatened Species

"Boldt" Litigation

State Actions

State-permitted water diversions and withdrawals have significantly depleted flows in many Northwest Rivers and directly threaten the treaty fishery. Low flows resulting from diversions and withdrawals result in: reduced wetted habitat; increased temperatures; and impaired channel configuration. As flows go down, productive, protective side channels may become shallow, isolated ponds where fish are trapped. As stream temperatures rise, oxygen content is reduced and potential for disease increases. Low flows and reduced habitat area also result in reduced food supply. Competition for food increases as the same number of fish are concentrated into a smaller area. Finally, dewatering of streams can leave salmon eggs dry, exposed, and lifeless.

Due in part to increased diversions of water for development and other uses, the Puget Sound Chinook salmon and the Puget Sound steelhead are currently listed as threatened species under the federal Endangered Species Act. The Biological Opinion prepared by the National Marine Fisheries Service on September 22, 2008 regarding Implementation of the National Flood Insurance Program in the State of Washington (the "FEMA Floodplain BiOp") identifies blockages by dams, water diversions, and shifts/changes in flow regimes as a cause in the decline of the Puget Sound Chinook salmon. FEMA Floodplain BiOp, p. 27. Similarly, habitat loss (which results from loss of stream flow) is cited as the "principal factor for decline of [Puget Sound] steelhead." *Id.* p. 30. See also p. 42 (noting that "salmon declines are particularly prevalent in Washington...due to greater human impacts on freshwater and estuarine habitats"). The FEMA Floodplain BiOp identifies the need for critical habitat consisting of spawning, rearing, and migration areas with adequate water quantity and quality. *Id.* at p. 45.

Tribes' Environmental Treaty Right

EVOLUTION OF WASHINGTON STATE'S "CULVERTS" CASE

In the well known fishing rights litigation commonly known as the "Boldt decision" (after the US District Judge issuing the initial decision), the federal court held that Treaties signed between the US and Western Washington Tribes in the 1850's were still viable legal documents that reserved important rights for the Tribes. Commonly referred to as the "Stevens Treaties" after Isaac Stevens, Governor of the Territory at the time, these Treaties guaranteed that usual and accustomed fishing places of the Tribes that signed the treaties were fishing locations where the tribes reserved and their members currently had the right to take fish. The Court affirmed a fifty-fifty share of the fish available for harvest. *United States v. Washington*, 384 F. Supp. 312, 332 (W.D. Wash. 1974), *aff'd sub nom.*, *Washington v. Fishing Vessel Ass'n*, 443 U.S. 658 (1979).

In continuing litigation in that case, the courts affirmed that the treaty right to fish includes the right to harvest shellfish embedded in the State's tidelands and bedlands. *United States v. Washington*, 157 F.3d 630 (9th Cir. 1998), *cert. denied*, 526 U.S. 1060 (1999). The Court also held that usual and accustomed places for shellfish harvesting are the same as those for salmon and include "all bedlands and tidelands under or adjacent to those areas." *United States v. Washington*, 873 F. Supp. 1422, 1431 (W.D. Wash. 1994), *aff'd in part, rev'd in part*, 135 F.3d 618 (9th Cir.), *amended*, 157 F.3d 630 (9th Cir. 1998), *cert. denied*, 526 U.S. 1060 (1999).

Left undetermined until recently, was the claim that the right to fish also included the right to have the environment and habitat protected so that fish might be available for a fishery. Such a right will substantially affect water rights and usage.

In the initial complaints filed in *United States v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), *aff'd sub nom.*, *Washington v. Fishing Vessel Ass'n*, 443 U.S. 658 (1979), the United States government and tribal governments alleged that an "environmental" right to have the fisheries resource protected from adverse state action also existed by implication from the reserved right to harvest fish. This issue was bifurcated for trial, and became known as "Phase II" of the litigation.

Plaintiff Tribes
US v. Washington

Tribal Rights

"Implied
Environmental
Right"

This bifurcated portion of the original fishing litigation was assigned to the Hon. William Orrick of the Northern Division of California. On motions for summary judgment, Judge Orrick found an "implied environmental right" in the Treaties.

Implicitly incorporated in the treaties' fishing clause is the right to have the fishery habitat protected from man-made despoliation. The most fundamental prerequisite to exercising the right to take fish is the existence of fish to be taken.

U.S. v. Washington, 506 F. Supp. 187 at 203 (1980).

It is equally beyond doubt that the existence of an environmentally acceptable habitat is essential to the survival of the fish, without which the expressly, or — reserved right to take fish would be meaningless and valueless. Thus, it is necessary to recognize an implied environmental right in order to fulfill the purposes of the fishing clause.

Id. at 205.

Opinion Vacated

Upon appeal, the Ninth Circuit issued a number of rulings, initially upholding the decision. On April 29, 1985, however, the Ninth Circuit Court issued an en banc opinion (all judges of the court) vacating the original opinion of the district court as inappropriate for a declaratory judgment action. The Ninth Circuit stated that the district court ruling was "contrary to the exercise of sound judicial discretion" in that the declaratory judgment procedure had been incorrectly used to announce legal rules "imprecise in definition and uncertain in dimension." *United States v. Washington*, 759 F.2d 1353, 1357 (9th Cir. 1985).

To pass review, said the Court, "the measure of the State's obligation will depend for its precise legal formulation on all of the facts presented by a particular dispute." *Id.* at 1357.

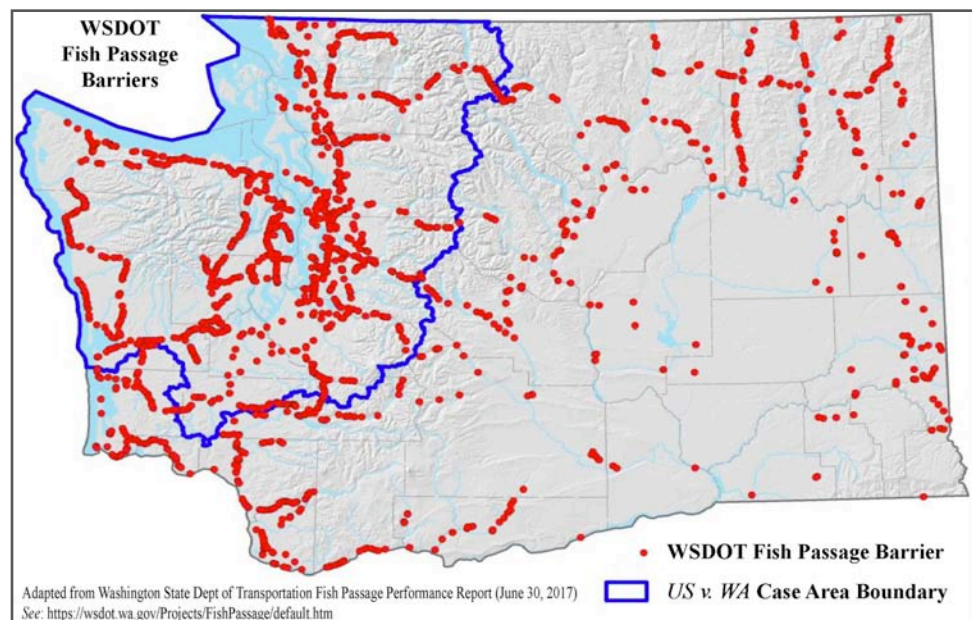
The Court returned the case to the district court for further proceedings based on specific factual situations. Not quickly finding a "particular dispute" to bring to the Court, the "Phase II" subproceeding was ultimately dismissed without prejudice on motion of the tribes. *United States v. Washington*, Case No. 9213, Docket No. 13291 (W.D. Wash. June 22, 1993).

"Fact Specific"
Focus

For many years, the Tribes searched for a more focused case to satisfy the Ninth Circuit's desire for a "fact specific" situation. Finally, in 2001, the Tribes noted that Washington State had admitted that hundreds of culverts under roads and highways of the State were having a seriously deleterious effects on fish habitat and fish populations. These deleterious effects included the loss of substantial habitat above blocking culverts. With less and less area for spawning, fish runs were rapidly and continually declining. The State's own documents admitted that:

Prior to development, within the Washington portion of the Columbia River Basin, an estimated 4550 stream miles were accessible to salmon. Today in that same area, primarily due to blockage by dams, only 3791 stream miles remain (Palmisano et al. 1993). Much of the remaining accessible habitat has been degraded from other impacts. Our network of freeways, city streets, and private roads has also taken a toll on salmon habitat. WDFW (1994) identified about 2400 culverts at road crossings that blocked access to nearly 3000 miles of stream habitat across the state."

Washington Department of Fish and Wildlife, *Final Environmental Impact Statement for the Wild Salmonid Policy*, Washington Department of Fish and Wildlife. 1997. Olympia, WA. p. 95, Ch 5.

Culvert
BlockageFish Passage
Barriers

Tribal Rights

“Culvert Case”

Habitat
Reduction

Fisheries Impact

“Right to
Take Fish”

Factual Findings

Split Opinion
Affirms

“Habitat” Right

Tribal
Water Needs

Relying on these and related “specific facts,” the Tribes and United States filed a new proceeding within the ambit of *U.S. v. Washington* (subproceeding 01-1, the so-called “Culvert Case”) alleging that such results were a violation of the Stevens Treaties in that the fish supply was being reduced to such an amount that the Treaty right to harvest fish was being illegally reduced. The Tribes requested that the State be ordered: “...to refrain from constructing and maintaining culverts under State roads that degrade fish habitat so that adult fish production is reduced, which in turn reduces the number of fish available for harvest by the Tribes.” *U.S. v. Washington*, Cause No. 9213. Sub proceeding No. 01-1, Docket # 1, p. 1.

The Tribes further alleged that there had been a significant decline of harvests and that a “significant reason for the decline of harvestable fish has been the destruction and modification of habitat needed for their survival.” *Id.* ¶¶ 2.5, 2.6, 2.7.

The Tribes noted that the State of Washington’s own estimate was that removal of obstacles presented by blocked culverts would result in an annual production increase of 200,000 fish.

After numerous attempts at a negotiated settlement, cross motions for summary judgment were filed by all parties. On August 22, 2007, the United States District Court issued an Order on Summary Judgment that adopted the implied environmental protection right as inherent in the Treaties. *U.S. v. Washington*, Cause No. 9213, Sub proceeding 01-1, (W.D. Wash.) Order of August 22, 2007, Docket No. 388.

Summary of the Culverts Decision

The District Court adopted key legal points put forward by the Tribes including the following:

- Federal treaty negotiators promised the tribes harvestable fish, forever. The District Court’s opinion emphasizes that the treaties secure “*the right to take fish, not just the right to fish.*” (bold emphasis in original) Order of August 22, 2007, p. 10.
- The treaties therefore include an “implied promise that neither the negotiators nor their successors would take actions that would significantly degrade the resource.” Order of August 22, 2007, p. 11.
- “The Tribes’ showing that fish harvests have been substantially diminished, together with the logical inference that a significant portion of this diminishment is due to the blocked culverts...is sufficient to support a declaration regarding the culverts’ impairment of treaty rights.” Order of August 22, 2007, p. 8.
- “It is not necessary for the Tribes to exactly quantify numbers of ‘missing’ fish... .” Thus, the tribes were not required to attempt the near-impossible task of proving the precise loss of fish from a specific project. Order of August 22, 2007, p. 5.
- On May 19, 2017, the Ninth Circuit affirmed the District Court Ruling (853 F.3d 946 (9th Cir. 2017)).
- By a split opinion, the US Supreme Court affirmed the Ninth Circuit on June 11, 2018 (18 S.Ct. 1832 (2018)).

Conclusion**OTHER IMPACTS OF THE TREATY “HABITAT” RIGHT**

Obviously, the need to *have fish* in order to *continue fishing* implies *having the water necessary to do so*.

In summary, all life stages of Salmon and Steelhead are negatively affected by state-permitted diversions that have reduced stream flows. The diversions are impairing maintenance of Tribal fisheries. The diversions are junior in priority to the time immemorial water rights of the Tribes. No resolution of the Tribal needs has been reached in most cases. Federal legal action brought by the United States on behalf of the Tribes may be necessary to protect the trust resources of the Tribe and to preserve the treaty right of taking fish.

But in any event, the needs of tribes for water to sustain their reservations, their way of life, and their fisheries will be a driving force in water allocation problems triggered by climate change.

For Additional Information:

Mason Morisset, Morisset, Schlosser, Jozwiak & Somerville, 206/ 386-5200 or m.morisset@msaj.com

Mason Morisset is the senior member of the law firm of Morisset, Schlosser, Jozwiak & Somerville, a professional services corporation in Seattle, Washington. He received his Bachelor’s Degree from Lewis & Clark College, Portland, Oregon in 1963, an M.A. in Political Science from the University of Washington in 1965, and his J.D. from the University of California at Berkeley in 1968. He is admitted to, and has successfully argued in, the United States Supreme Court, numerous federal Circuit Courts of Appeals, federal District Courts, United States Tax Court, Court of Federal Claims, and numerous state and tribal courts and administrative adjudicators. He has been an active litigator for over 50 years primarily in the area of natural resource litigation. He has argued numerous appellate cases and has successfully argued three cases to the United States Supreme Court, *Antoine v. Washington*, 420 U.S. 194 (1975) (treaty hunting rights); *Washington v. Fishing Vessel Association*, 443 U.S. 658 (1979) (the “Boldt” fishing rights decision); and *Arizona v. California*, 530 U.S. 392 (2000) (Quechan Tribe water rights on the Colorado River). He has argued to the Washington State Supreme Court and before the California State Court of Appeals on behalf of Indian Tribal water rights. He is the author of the WSBA Real Property Deskbook chapter on Indian Property Rights and several law review articles. He has lectured at more than 120 CLE seminars and symposia.

Title XVI

TITLE XVI WATER REUSE & RECYCLING

A COST-EFFECTIVE OPTION FOR EXPANDING WATER PORTFOLIOS?

by David L. Wegner, Woolpert Engineering (Tucson, AZ)

Introduction

The US Department of the Interior's Water and Reuse Program (Title XVI) was established through the Reclamation Wastewater and Groundwater Studies and Facilities Act of 1992 (Public Law No. 102-575). It has since been amended through Section 4009 of the Water Infrastructure Improvements for the Nation Act (WINN Act) in 2016 (Public Law 114-322). Title XVI is limited to the 17 western states.

Until 1992 water reuse or recycling had not been recognized as a significant part of the US Bureau of Reclamation's water program. That changed after several converging events occurred, impacting Western water supply as the demands for dependable water supplies continued to increase.

Water reuse and recycling, both with surface and groundwater, required a shift in the traditional approach to providing water in the West. Changing hydrology along with existing structural deficits in the existing water supplies make it imperative that local and regional water suppliers find additional ways to expand their existing water portfolios and allow for the creation of additional “wet water” supplies. [Editors’ note: in water management parlance “wet water” is water that exists in fact, distinguished from the “paper water” written into legal entitlements.]

Reused and recycled water will not replace the traditional sources of most of the water supplies for the West. Instead, reuse and recycling are intended to augment existing supplies and provide an expanded portfolio of available sources of water to provide more sustainable water supplies. This augmentation is needed in order to adjust to the uncertainty of traditional water supplies due to: drought; increased demand; and the challenges faced with the aging water infrastructure that transports water from great distances to agriculture and municipal users. Increasingly, water managers are looking to leverage funding from federal and state governments to expand and protect water supplies using: local municipal bonds; public financing; private public partnerships; and investment funds.

In 2012 the National Research Council (NRC) published a report on water reuse, exploring the potential for expanding the nation's water supply using municipal wastewater (NRC, 2012). The NRC recognized the use of water reuse should be made after careful consideration of both: 1) cost in comparison to other feasible water management alternatives; and 2) the cost of not pursuing any water management changes. New water supply options are likely to cost more than the existing supplies and therefore the cost of water reuse needs to be compared to the cost of other new-supply options.

The issue of water security has emerged as climate change impacts available supplies. Water is a critical element of a nation's security. Without adequate water supplies a nation's economy, health and environmental integrity can be threatened. Thankfully most water utility managers and leaders realize that maintaining water quantity and quality at an affordable price to all economic sectors is one of their most important jobs.

The objective of this article is three-fold: first, to discuss the history of the development of the Title XVI program; second, to outline how the program has been used to augment existing local and regional water supplies; and third, to discuss the role of Title XVI in the context of more traditional water development.

The Need for a Diversified Water Portfolio

The story of the American West is the story of the relentless quest to control and allocate the most precious resource: water. (Reisner, 1986)

So noted the jacket cover of *Cadillac Desert*, Marc Reisner's seminal book on water in the American West. *Cadillac Desert* was written at a time when water development in the West had largely been supported through large federal and state surface water construction projects.

Since the late 1990's and early 2000's the West has been in a period of variable water conditions (Ault et al. 2016). Drought has become more common, with low water supply years being the new condition. Current research indicates that low levels of available water are likely for the future, constraining the supply available from traditional water supply reservoirs (Stahle et al 2020). In several locations in the West, available water supply today is not adequate to provide the historic volume needed by growing population centers and their economies.

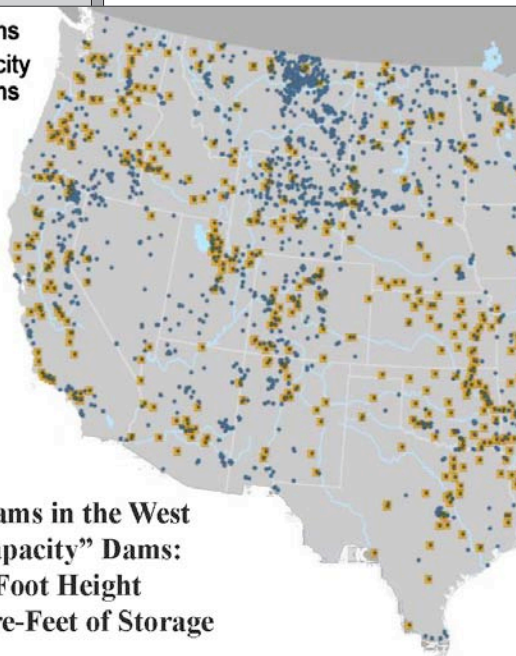
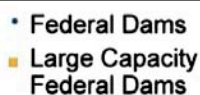
Reuse Legislation

Approach Shift

Supply Augmentation

Options/Costs

Water Security



Federal Dams in the West
“Large Capacity” Dams:
> 100 Foot Height
> 50,000 Acre-Feet of Storage

Adapted from Congressional Research Service R45981 (2019)

Title XVI

Imported Water

Historically, water to support development in the West has been imported from the mountains or large rivers (Table 1). These traditional sources are now limited and either declining or becoming less dependable. Some additional supplies for urban consumption may be supplied from water marketing and the reallocation of water previously used for other purposes. Often, irrigated agriculture has made do with more pumping of groundwater.

Table 1. Percentage of Imported Water for Major Western Population Centers

Population Center	Percentage of Water Imported	Primary Source of Imported Water
San Diego	80%	Colorado River
Los Angeles	85%	Colorado River, northern California
Phoenix	90%	Colorado River
San Francisco	65%	Hetch Hetchy, northern California
Salt Lake City	50%	Colorado River system
Las Vegas	90%	Colorado River

Conservation & Efficiency

Initially, expanding water demands have been met through groundwater pumping, conservation, and water efficiency measures. Conservation and water efficiency measures have been the most cost-effective way to create more wet water (St. Marie and Zafar, 2016; Walton 2020). These methods continue to be important on a local and personal level.

Having adequate water supplies for citizens and industries provides economic and social security. Expanding the water portfolio by providing alternative water supplies to augment existing imported water provides resilience and long-term sustainability to cities and industries.

New water supplies will need to come from non-traditional sources, including: stormwater capture; desalination; water pricing mechanisms (educated use management); economic incentives; water banks; stormwater capture; aquifer recharge; and recycling and reuse.

Non-Traditional Sources

Title XVI Program

Background

It was in the late 1980's — after several years of drought — that the Title XVI program emerged in the West.

In February 1991, the headlines in the Los Angeles Times newspaper read:

With the wet season two-thirds finished, the amount of snow and rain on California's mountains continued to fall far short of normal. Statewide, precipitation is less than 1/4 of normal and is the lowest on record for this time of year, having dropped below that of the record-setting drought of 1977. The Sacramento River Basin, a main source of water for Southern California, has an all-time low precipitation level of 23% of average. This also remains the fifth unusually dry winter in the Eastern Sierra, another key Los Angeles source.

Drought

Actions Initiated

As a result, the State of California and the federal government initiated several actions:

- State officials shut off water to farmers and cut deliveries to cities by half.
- US officials reduced water to farms by 75% and to urban areas by up to 50%.
- The Metropolitan Water District of Southern California reduced deliveries by 31%.
- Southern California water agencies implemented mandatory water rationing.
- A US House subcommittee began investigating ways to reform California water management.
- Governor Pete Wilson unveiled a five-point, \$100 million, plan hinged on creating a “water bank” for the future.

Reclaimed Water

Also as a result of the California drought, US Department of the Interior Secretary Manuel Lujan announced the implementation of a program to expand the water portfolio of Southern California using reclaimed water (DOI, 1991). The objectives were to: 1) expand the water portfolio for Southern California; and 2) to decrease southern California's dependence on imported water from northern California and from the Colorado River.

Subsequently, Congress passed and the President signed *Public Law 102-575*, which included Title XVI, entitled *Reclamation Wastewater and Groundwater Studies* (U.S. Congress, 1992). Title XVI authorized nine reclamation and reuse studies for demonstration purposes — six in California, two in Arizona, and one in Colorado. The legislation specifically limited the program to the 17 western states

Title XVI: West

<div>Title XVI</div> <div>Focus Areas</div> <div>Eligible Programs</div> <div>WaterSMART</div> <div>Non-Federal Partner</div> <div>Grant Types</div> <div>Reused Water Uses</div>	<div><p>serviced by the Reclamation Act of 1902. It also stipulated that the funds could not be used to address drainage or agricultural wastewater generated from the San Luis Unit of the Central Valley Project in California.</p><p>Title XVI initially had three areas of focus:</p><ol style="list-style-type: none">1) Appraisal Investigations to identify opportunities for water reclamation and reuse2) Feasibility Studies (supported and recommended for study through the prior Appraisal Investigations)3) Research and Demonstration Projects which would include the construction, operation and maintenance of cooperative demonstration projects for the development and assessment of appropriate treatment technologies for the reclamation of municipal, industrial, domestic, and agricultural wastewater, and naturally impaired ground and surface waters.<p>Title XVI Programs</p><p>The types of projects eligible under Title XVI program include (but are not limited to): water treatment facilities; pipelines to distribute reused water; and tanks and reservoirs to store reused water. The Title XVI program is administratively organized under the US Department of the Interior's (Interior's) WaterSMART (Sustain and Manage America's Resources for Tomorrow) Program. The objective of WaterSMART is to identify strategies to develop adequate supplies of clean water for drinking, economic activities, recreation, and ecosystem health. Interior's Bureau of Reclamation (Reclamation) implements its part of the WaterSMART program by: administering grants for water reuse; conducting research; and providing technical assistance and scientific expertise (GAO, 2018).</p><p>Title XVI projects require a local non-federal partner such as a water district, a water reuse authority, or a joint-power authority. These non-federal government entities often work with the private sector, in quasi Private-Public-Partnerships, to assess, plan, and develop water reuse infrastructure needed to meet local water supply needs.</p><p>Title XVI provides three types of grants to project sponsors:</p><ol style="list-style-type: none">1) Construction Projects associated with planning, design, and/or construction of water infrastructure for the treatment and distribution of water. Application: Fund up to 25% of total costs and/or up to \$20 million in federal funding plus 75% nonfederal cost share2) Feasibility Studies to identify specific water reuse opportunities, describe alternatives, and incorporate other considerations such as the financial capacity of the project sponsor. Application: Fund up to 50% of total study costs, up to \$450,0003) Research Studies to assist states, tribes, and local communities establish or expand water reuse markets, improved existing water reuse facilities, or streamline the implementation of new water reuse facilities. Application: Fund up to 25% of total study costs, up to \$300,000</div> <div><div><div>Typical Uses for Reused Water</div><p>1 A traditional wastewater treatment plant generally discharges treated wastewater into local rivers, streams, the ocean, or other bodies of water.</p><p>2 Wetlands</p><p>2 City</p><p>2 Farm</p><p>2 Industry</p><p>3 Groundwater recharge basin</p><p>2 When wastewater is reused, it generally undergoes additional treatment and can then be used for nonpotable purposes such as landscape and agricultural irrigation and industrial uses. Reused water can also be used to provide environmental and habitat benefits, such as restoring wetlands.</p><p>3 Reused water with additional, advanced treatment can be used to replenish groundwater, which may be extracted in the future as drinking water.</p><p>Groundwater</p><p>Groundwater</p></div><div>Source: Adapted from GAO Rpt 19-110 (Dec. 2018)</div></div>
---	--

Title XVI

Program Evolution

"Earmark" Labeling

Direct Funding (Reclamation)

Competitive Grants (WINN)

Projects & Studies

Evolution of Title XVI Program Funding

The appropriation of funding to support the Title XVI program has evolved through three primary phases since its inception. Collectively, from fiscal year 1992 through fiscal year 2017, Reclamation has awarded about \$715 million in water reuse grants for 46 construction projects and 71 studies (GAO, 2018).

PHASE I: 1992-2010

From initiation of the program in 1992 through fiscal year 2009 Congress directly authorized 53 projects. During this initial phase of the program, Congress authorized each project via a separate line item in Reclamation's Water and Related Resources budget (Congressional Research Service (CRS), 2010). Individually authorized projects became subject to "earmark" labeling — which resulted in limited funding. The program received an infusion of support in 2009 when the *American Recovery and Reinvestment Act of 2009* (ARRA) (P.L. 111-5) was enacted.

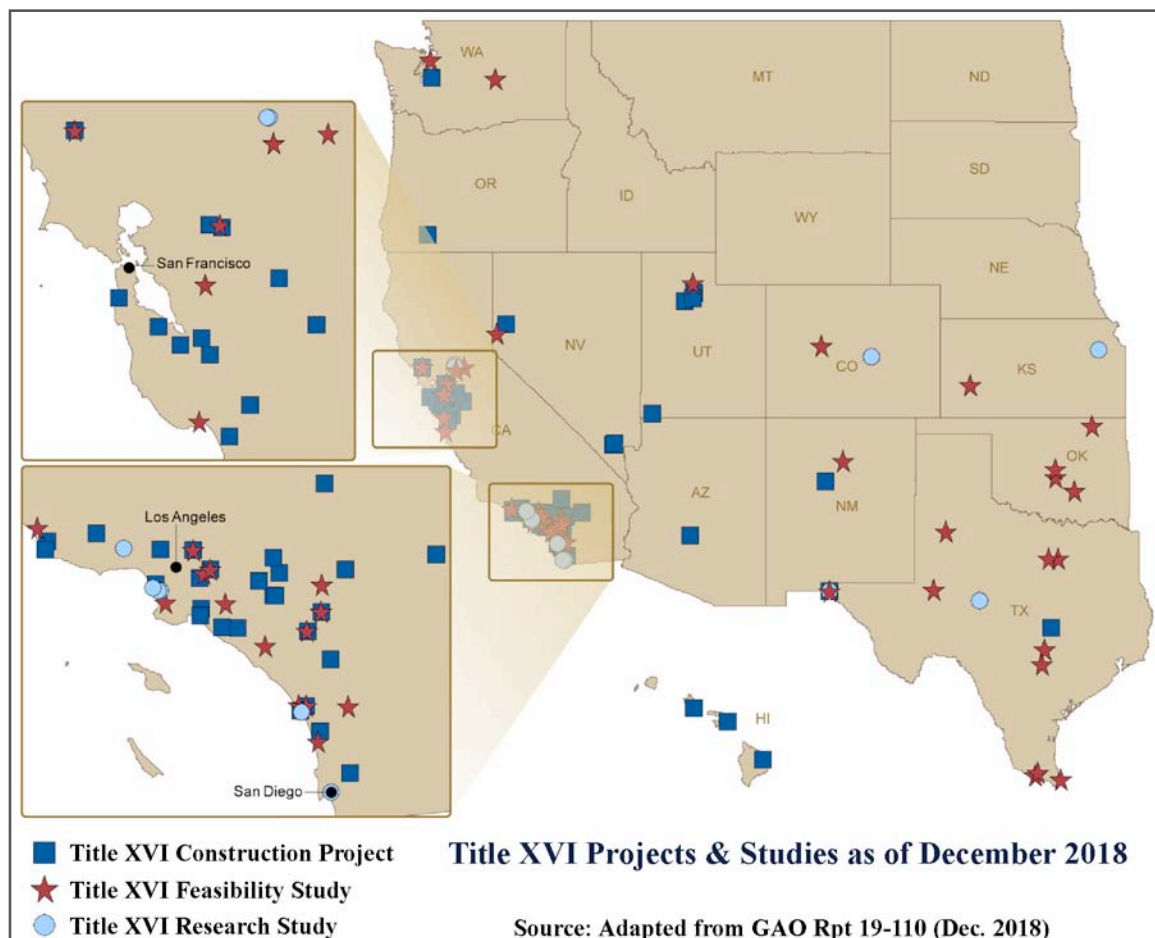
PHASE II: 2011-2016

In Fiscal Year 2011, Congress began appropriating funding directly to the Title XVI program through Interior's annual budget. This took away the need for Congress to appropriate funding for individual projects. This shift required Reclamation to develop and implement a competitive process to award Title XVI construction grants. Reclamation published criteria for prioritizing projects for funding. Eligible projects include those that have a completed Feasibility Study that has been reviewed by Reclamation and found to meet all of the requirements of *Reclamation Manual Release WTR 11-01*. See: www.usbr.gov/recman/

Only the 53 projects that were previously authorized by Congress were eligible to apply for Title XVI Construction grants and were required to meet Title XVI pre-construction requirements, including having a completed and Reclamation-approved feasibility study. In Fiscal Year 2011 Reclamation offered competitive funding for water reuse feasibility studies.

PHASE III: 2017-PRESENT

In 2016, the *Water Infrastructure Improvement Act for the Nation* (WINN) (P.L. 114-322) amended Title XVI into a competitive grant program subject to Secretary of the Interior approval after project proponents have completed agency-approved feasibility studies. This amendment allowed Interior to award grants for projects that had not received statutory authorization from Congress.



<div data-bbox="152 176 310 216">Title XVI</div> <div data-bbox="118 254 345 287">Research Studies</div> <div data-bbox="157 323 305 390">Three-Step Process</div> <div data-bbox="162 604 302 672">Leveraged Funding</div> <div data-bbox="168 779 295 812">Concerns</div> <div data-bbox="126 989 337 1022">Project Benefits</div> <div data-bbox="160 1654 303 1688">Cost Share</div> <div data-bbox="172 1724 290 1757">5:1 Ratio</div> <div data-bbox="147 1864 315 1898">Water Gains</div>	<p>In Fiscal Year 2016 Reclamation offered the first competitive funding opportunity for Title XVI water reuse research studies. With the passage of the WINN Act, \$50 million was authorized for new water reuse projects that <i>were not</i> individually congressionally-authorized through the traditional Title XVI process (GAO, 2018).</p> <p>To be eligible for Title XVI funding under the WINN Act, projects must first submit a completed feasibility study to Reclamation for review and approval. The submitted study is then evaluated for technical and financial feasibility and whether it provides a federal benefit in accordance with reclamation laws. Subsequent to evaluations, Reclamation submits a report to Congress identifying projects eligible to apply for funding under the competitive grant program established by the WINN Act. This three-step process is intended to provide adequate review and vetting to ensure projects meet national, regional, and local water sustainability goals.</p> <p style="text-align: center;">Title XVI Program Results</p> <p>Since the Title XVI program was enacted, over \$640 million in federal funding has been leveraged with more than \$2.4 billion in non-federal funding to design and construct water recycling projects in the Western US. With the increased advocacy of using Public-Private-Partnerships for water infrastructure, Title XVI appears to be a working hybrid approach to water development using appropriated funds to leverage local public and private funding.</p> <p>Several Members of Congress have voiced concerns over the Title XVI program costs and its impact on available funding for more traditional Reclamation activities and infrastructure replacement (CRS, 2010). Other Congressional Members have been interested to determine whether the Title XVI program helps provide additional water supplies quicker and at a competitive price. Some Members sought assurance that the program was supported by local water districts, municipalities, and small communities.</p> <p>Proponents of Title XVI projects have listed numerous reasons they think their projects are worth the investment.</p> <p>These Project Benefits include:</p> <ul style="list-style-type: none"> • Costs per Acre-Foot are comparable to the development of new surface water supplies and costs are decreasing as technology evolves. • Supply of Reuse Water Will Increase with time and will be dependable for years to come whereas surface water supplies will be diminishing due to hydrologic variability and increased demands. • Regulatory Timeline: Regulations related to developing reuse and recycled water require much less in terms of time (months), money, and staff investment. This is because the footprint for most reuse and recycled projects are consistent with existing projects. New surface projects require a considerable investment in time (years), money, and staff support. • Quicker Returns: Producing water that can be used for reuse and recycled water generally occurs within 12 to 24 months. Producing the first drop of useable water from surface development projects can range from five- to 20 years and some even longer. • Local Input: Local water quality concerns can be more effectively addressed in reuse projects than in larger regional efforts. • More Local Options: Expanding the portfolio of local water supplies provides options for local water utilities. • Easier Financing: Leveraging federal funds against local public and private money avoids many of the headaches associated with having to get federal appropriations over multiple years. <p style="text-align: center;">Does Title XVI Provide Value-Investing for Water?</p> <p>In 2006, the US Senate held a hearing on Reclamation's Reuse and Recycling Program. It was reported by Inland Empire Utility Agency that the federal cost share often makes the difference in determining whether a project qualifies for financing (IEUA 2006). Reviews by the GAO (2018) and the CRS (2010) indicate that on average the federal investment is leveraged at a 5:1 ratio. In Fiscal Year 2017 the Federal investment of \$714 million was leveraged against \$2.8 billion, a factor of 5:1. Of this \$714 million: 98% (\$703 million) has been allocated to construction; 1.5% (49.9 million) was allocated to completion of feasibility studies; and 0.5% (\$715 thousand) has been dedicated to research (GAO 2018).</p> <p>The quantity of water provided from Title XVI projects annually in fiscal year 2009 was estimated to be 245,111 acre-feet for 16 projects (CRS 2010). In 2018, Reclamation estimated that 431,000 acre-feet (Reclamation, 2020) of water was supplied through Title XVI programs.</p>
--	--

Title XVI**Development
Costs (Use)**

The cost of new water development has been a criticism leveled at Title XVI programs. Comparing a variety of sources of developed water yielded the relative costs per acre-foot shown in Table 2. To be able to compare the actual costs per acre-foot of various sources of water it is necessary to know for what the water is to be used. Costs for development of water reuse is considerably lower if the water is going to be used for non-consumptive use. If the water is to be used for: irrigation; environmental purposes; groundwater recharge; or for landscaping — then the costs of development cost less than new surface water development. Historically developed surface water supplies benefited from the state and American taxpayers subsidizing the cost of water development. It is likely that those subsidies will not become available again and that new forms of public and private financing of water projects will become the norm.

Table 2. Relative Costs of Water Supplies (per acre foot (af))

Type of Water Supply	Low End Cost (af)	High End Cost (af)	References
Surface Water			
Historical (subsidized)	\$19.49	\$99.67	BOR, 2019, CADWR 2019, Gleick 2020, SEA 2020, CDWR 2007
Current Costs:			
• Central Valley Project	\$240.00	\$1,325.00	
• State Water Project	\$850.00	\$1,456.00	
Reservoir Expansion	\$1,700.00	\$2,700.00	Stanford 2019
Stormwater Capture	\$59.00 \$150.00 (non-urban)	\$250,000.00 \$1,030.00 (urban)	Cooley 2019, Diringer et. al 2020
Groundwater Recharge	\$90.00	\$1,100.00	Stanford 2019
Desalination			St. Marie and Zafar, 2016, Cooley and Ajami 2012, Arroyo and Shirazi, 2012
• Seawater	\$1,900.00	\$3,000.00	
• Brackish	\$317.00	\$782.00	
Reuse/Recycling			Reznick et al., 2017, Cooley et al., 2019, St. Marie and Zafar, 2016, CA State Water Board and DWR, 2017
• Non-potable	\$400.00	\$5,800.00	
• Potable	\$1,763.90 (large projects)	\$2,319.00 (small projects)	
Urban Water Efficiency	\$137.00 saved costs	\$7,000.00 saved costs	Cooley, et al. 2019, St. Marie and Zafar 2016

Relative Costs**Non-Monetized
Benefits**

In addition to the economic benefits, the value of new water supply results in multiple non-monetized benefits, including:

- Environmental benefits through the conversion of treated wastewater to new water supply
- Reduction of the volume of treated wastewater discharged to sensitive or impaired surface waters, including the ocean
- Avoidance of construction impacts of new supply development
- Reduced dependence on imported water
- Creation of dependable and controllable local sources of water for cities
- Reduced demand on existing potable supplies
- Energy benefits from reduced electricity demand and transmission line constraints during peak use periods
- Increased water security and resiliency to drought and water shortage conditions

The combined result of developing new water supplies while realizing the non-monetized benefits of expanding the local and regional water portfolio is increased water sustainability and security. This does not mean that water scarcity and periodic shortages will not occur. Challenges will continue as the variability of climate change impacts on regional hydrology continues to expand. What it does mean is that the affect of the scarcity and shortages will be of lesser duration and will have fewer negative impacts on the local economy, population, and the environment.

**Sustainability
& Security**

Expanding Federal Role in Water Reuse	
Title XVI	The demand for scarce water supplies continues to expand in the west due to increased populations and continuing drought, as well as the challenges associated with increasing water demands associated with energy, environmental needs, and recreation.
Demands	Both the US Army Corps of Engineers (Corps) and Reclamation have been under increasing pressures to provide water supply for municipal and industrial purposes as their traditional water for irrigation, flood control, hydropower, and navigation have been either built out or have reached capacity. The era of building large new water projects to support regional development or to provide for safety has been completed. Increasing the federal tax burden to support expensive water projects has much less appeal for Congress and the public than it once did. In their place are demands associated with: growing populations; ecosystem and instream needs; changing agricultural requirements; energy costs of pumping and transporting water; pricing; and recreation desires. Supply factors, such as: water source contamination; environmental regulation; aging infrastructure; and adequate long-term climate change response are also on the agenda. All these pressing concerns are combining to focus interest on water sustainability and supply reliability.
Water Supply	Major aspects of the evolving federal role in addressing these issues include the following:
Supply Factors	Water Supply Act 1958 The federal role for municipal and industrial water development is vested in the Water Supply Act of 1958, which declared: ...[it] to be the policy of the Congress to recognize the primary responsibilities of the States and local interests in developing water supplies for domestic, municipal, industrial, and other purposes and that the Federal Government should participate and cooperate with States and local interests in developing such water supplies in connection with the construction, maintenance, and operation of Federal navigation, flood control, irrigation, or multiple purposes. (Mountain Scholar, 2020) Historically the federal agencies' role was focused on developing regional irrigation and water supply projects supplied by multiple-use dams and reservoirs.
Federal Role	Development of water for municipal and industrial use has historically been the responsibility of the state and local governments. Where the federal government has played a more local role was when municipal and industrial water development was incidental to the federal primary purposes of irrigation, flood control, hydropower, and navigation.
State & Local Role	Clean Water Act 1973, Amendments 1987 In 1973, the United States implemented the Clean Water Act and with it a grant program to construct water infrastructure to improve and protect water <i>quality</i> . Concurrently the US Environmental Protection Agency (EPA) implemented — at Congress' direction — the Clean Water State Water Revolving Fund. In 1987, the Safe Drinking Water State Revolving Fund was created as part of the 1987 Clean Water Act Amendments (P.L. 100-4 1987). EPA provides annual capitalization grants to states to finance their State Revolving Funds, with the states then providing low interest loans to communities and water districts to construct water infrastructure — including water reuse projects.
Quality Issues	In addition to State Revolving Funds, EPA also makes grants for drinking water available through several independent programs:
State Revolving Fund	<ul style="list-style-type: none"> • Water Infrastructure Improvements for the Nation (WIIN) Grants • Public Water System Supervision (PWSS) Grant Program • Tribal Public Water System Supervision (PWSS) Grant Program • Training and Technical Assistance for Small System Grants • Drinking Water State Revolving Fund (DWSRF)
Drinking Water Programs	Title XVI 1991 As noted above, initial development of Title XVI aimed directly at reducing Southern California's reliance on Colorado River water (CRS, 2010). In August 1991, Secretary of the Interior Manuel Lujan announced a program to develop a long-range strategy for the integration of fresh and reclaimed water management programs in Southern California (DOI, 1991). The objectives were four-fold: 1) increase water supplies to the area; 2) decrease the area's dependence on water imports; 3) help restore and protect the quality of existing groundwater reserves; and 4) assist in meeting environmental water needs.
Strategy Objectives	Water Infrastructure Finance and Innovation Act 2014 In 2014 — as part of the Water Resources Reform and Development Act (WRRDA) — Congress established the Water Infrastructure Finance and Innovation Act (WIFIA). WIFIA is designed to provide financial assistance for water infrastructure projects, including initiatives to build and upgrade wastewater and drinking water systems. The financial assistance is typically in the form of credit assistance through direct loans at US Treasury rates (which are lower than other forms of capital funding). During the three fiscal years of WIFIA use, \$161 million has been appropriated for program credit assistance (CRS, 2019). Water reuse and recycling projects were considered priorities for funding for FY 2019.
WIFIA Infrastructure	

<div data-bbox="147 178 311 216">Title XVI</div> <div data-bbox="136 258 324 321">Reuse Collaboration</div> <div data-bbox="112 499 347 569">Agricultural Incentives (EQIP)</div> <div data-bbox="128 709 331 743">EQIP Purposes</div> <div data-bbox="128 919 331 953">Myths/Options</div> <div data-bbox="118 1129 341 1199">Traditional Options Limited</div> <div data-bbox="160 1480 298 1549">Historic Importing</div> <div data-bbox="155 1619 303 1688">Snowpack Variability</div> <div data-bbox="144 1759 315 1793">Earthquakes</div> <div data-bbox="139 1864 319 1934">Groundwater Limitations</div>	<div data-bbox="378 149 828 174"> <p>National Water Reuse Action Plan 2020</p> <p>In September 2019, EPA and the Trump Administration announced the release of the draft National Water Reuse Action Plan (EPA, 2019). The Plan was not meant to be an EPA or federal plan. Instead the intent is for a collaborative effort between federal, state, and local entities across the water sector — with the goal of advancing water reuse. EPA laid out the business case for the Action Plan as an approach to replace the traditional, fragmented, “siloeed” approach often applied to water resources management. The goal is to enable and integrate water reuse as part of a broader, more comprehensive, strategy to meet diverse water quality and quantity needs. The Action Plan specifically identified the need to include water reuse as part of an integrated water resource management effort at the watershed or basin scale. On March 3, 2020 EPA announced via the Federal Register the release of the <i>National Water Reuse Action Plan: Collaborative Implementation (Version 1)</i> (Federal Register 2020). See TWR #194 and #198, Water Briefs.</p> </div> <div data-bbox="378 468 1533 669"> <p>Natural Resources Conservation Service’s Environmental Quality Incentives Program</p> <p>Financial assistance is available to agricultural producers through the Environmental Quality Incentives Program (EQIP), administered by the Natural Resources Conservation Service (NRCS) of the US Department of Agriculture. Farmers and forest landowners are also eligible to apply for financial assistance to conserve and improve water resources. EQIP funding can be used to replace or improve the management of irrigation systems to conserve scarce water resources. EQIP is also used to manage nutrient applications to protect water quality. (NRCS 2019).</p> <p>In 2018, the Farm Bill expanded EQIP’s purpose to include: new or expected resource concerns; adapting to, and mitigating against, increasing weather volatility; and addressing drought resiliency measures (P.L. 115-334). In addition, the legislation also expanded who could apply for EQIP funding to include: individual states; irrigation districts; groundwater management districts; acequias; land-grant Mercedes; or similar water distribution entities. Such entities are eligible to enter into an EQIP contract for implementation of water conservation or irrigation efficiency practices.</p> </div> <div data-bbox="378 873 1533 1136"> <p>Myths Regarding Federal Support of Water Reuse</p> <p>The challenges facing the development of new local water supplies and improving local water reliability and sustainability are inhibited by several myths and agency perspectives. The fuel for these myths is the perception that the western United States is running out of water. It is true that water supplies are limited and in many locations over-allocated both administratively and physically. While it may be difficult to consistently satisfy the varied water demands of the agricultural, urban, and environmental needs — this does not mean that there are not options to satisfy those needs.</p> <p>Myth #1. <i>Traditional water development coordinated through and funded by the federal government and taxes is a cost-effective use of taxpayer dollars.</i></p> <p>Traditional water development projects are faced with location, water supply, and financial challenges. Most of the locations in the west where dams could be built are:</p> <ul style="list-style-type: none"> • Already built-out • Currently being used for other purposes (cities, towns, national parks, etc.) • Geologically unsafe due to earthquake or land movement issues • Located far-removed from where the water is needed, thus requiring extensive pipelines, canals, and pumps to move the water to where it is needed <p>While these are engineering issues and can be resolved, large costs and disruption of existing public use are entailed. The costs associated with planning, regulation compliance, construction, and operation are substantial. The appetite for the federal taxpayer to subsidize large water projects has diminished as the states have assumed more responsibility for water management.</p> <p>Myth #2. <i>Imported water is more cost effective and sustainable than local water supplies.</i></p> <p>Historically, federal water development was financially supported through direct and indirect subsidies and by long-term repayment contracts backstopped by the federal government and ultimately the American taxpayer. Imported water is subject to many constraints that locally developed water is not — primarily disrupted infrastructure and supply related issues.</p> <p>Issues associated with predictability of water supplied by seasonal snowpack has been impacted by increased variability in local and regional hydrology. Climate scientists in government and academia have invested considerable research and analytical assessment in determining that western water supplies will likely diminish and become more variable in the future (Conover ed. 2009).</p> <p>A significant challenge, especially in California, is the potential destabilization of the imported water canals due to seismic activity. Both the State Water Project and the Central Valley Project canals cross multiple fault lines as they traverse the state. Other western states also face potential disruption of water distribution systems including Idaho, Colorado, New Mexico, Nevada, and Arizona (EPA 2018).</p> <p>Myth # 3. <i>Groundwater can replace surface water.</i></p> <p>Groundwater has for decades been the alternative water supply if surface water is diminished. The result in many areas has been that extraction of groundwater has led to: subsidence of land; reduction in non-agriculture well production; and diminishment of overall water quality.</p> </div>
--	--

Title XVI

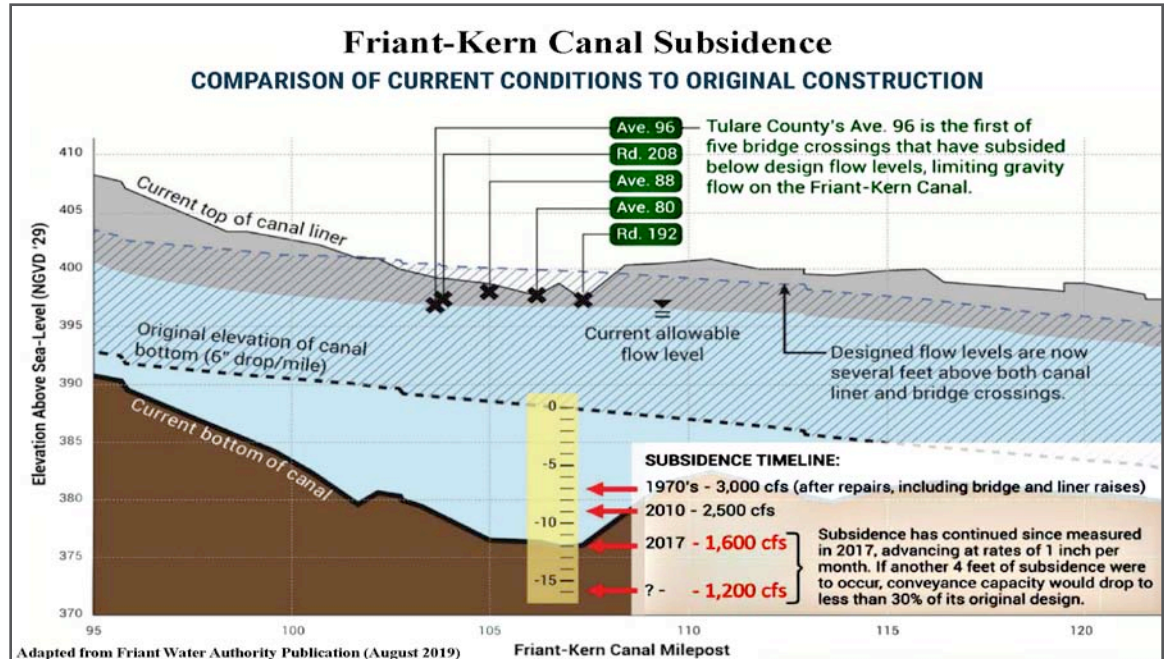
Reduced
Pumping

Subsidence

In 2014, the State of California passed the Sustainable Groundwater Management Act (SGMA – *see* TWRs #128 (Moon), #163, #170, #181), which is making efforts through local groundwater basin plans, to reduce pumping and move towards sustainable groundwater supplies. The reduction in groundwater pumping will likely lead to changing agricultural crops and practices and shifting economic impacts (Farm Progress 2020).

Water distribution in California is already being impacted by excessive groundwater withdrawal. In the Central Valley of California, the Friant-Kern Canal has had its capacity substantially reduced due to subsidence, resulting in a 60 percent reduction in deliveries to water districts. The subsidence occurred from 2012 to 2016 and coincided with the increased groundwater pumping after Reclamation reduced surface water deliveries (Farm Progress 2018).

The SGMA, along with the 1980 Arizona Groundwater Act (*see* Staudenmaier, TWR #33; Megdahl, TWR #104; Moon TWR #125) and actions taken by other western states recognizes the importance of managing and protecting freshwater resources both above and in the ground.

Development
Costs

Quicker Access

Costs/Benefits
Analysis

Better Options

Summary

There are multiple ways to create new, usable, "wet" water supplies for the growing West's urban needs. Calculating the cost of water development includes: the capital required to build a facility; the associated operation and maintenance (O&M) costs over the facility lifetime; replacement costs; the discount rate; expected lifetime; water production capacity; and water yield.

An additional element in assessing potential water development options is the length of time it will take for getting access to water. Local, smaller-scale projects typically, once authorization and funding are in place, can move through the permitting and construction phase quickly. Small-scale projects typically take from two years to five years to be completed and producing useable water supply. Larger water developments (dams, large canals, pumping plants, etc.) can take anywhere from five to 20 years (or longer) to be completed. This is largely due to: the need to get multiple annual appropriations; acquiring multiple permits; significant time for development of reports; construction surprises; and the acquisition of rights of way for both access and construction. For large projects useable water supplies are typically not available until the full project is completed and approved for use.

When assessing the economic viability of a water supply project, it is important to understand the difference between economic costs and benefits and financial accounting of costs and benefits (NRC, 2008b). Financial costs involve how much the utility must pay to construct and operate the water project, including interest costs. Economic costs account for all the costs to whomever they may accrue, including the costs to build and operate the project plus the costs that may be placed on the public associated with disruption, environmental costs, and other social costs. Benefits associated with a reliable water supply can be considerable.

Forward looking decision-makers, both locally and regionally, see that future support for local populations and economies requires developing alternative water supplies. They realize that the historic approach of constructing dams and reservoirs is limited due to: lack of suitable locations; subsidized federal funding not being available; and regulatory restrictions to protect publicly valued rivers. Compounding the issue today is the increasing variability of available surface water supplies associated with climate change and drought (Cooley et al 2019).

Title XVI

Viable Options

Reuse &
Recycling
Factors

Water reuse and recycling *is a viable option* for developing resilient, sustainable, and secure local water portfolios. It is not a replacement for the traditional water supplies. If used in combination with other options, it will improve local water resiliency and water security. It is meant to provide water security, local water control, and an option for those instances when imported surface or groundwater is limited or not available.

Conclusions

The following conclusions are based on information collected and analyzed in your author's review of water reuse and recycling programs. They form a basis from which a dialogue can be started with water managers and the public to determine what suite of options best fits their needs and the expectations of their stakeholders.

- Water reuse and recycling is not intended to be a complete replacement for imported or locally available water supply sources. The intent is to: augment traditional water supplies; drought proof local water users; expand the water portfolio; and increase the resilience of water supplies.
- Water reuse and recycling assists in the drought proofing of a local area's water supply. It is intended to provide for a percentage of a local water suppliers total portfolio of available supply. The objective is to increase dependable water supplies.
- Financial costs of water reuse are variable due to the influence of site-specific factors. In general, the cost per acre-foot of *non-potable* reuse and recycled water is comparable to the cost of developing new surface water supplies. The cost per acre-foot for *potable* reuse and recycled water is dependent upon the size of the project — ranging from 20% to 60% more than traditional surface water supplies.
- In general, surface water projects take from five to 20 years for full project build-out and the delivery of wet water to a distribution system. In comparison, Title XVI projects can provide wet water to distribution systems within 12 to 24 months. The value in having access to a dependable water supply in a timely manner is important for many communities.
- Distribution system costs (separate "purple pipe" distribution) can be the most significant component of costs for *nonpotable* reuse systems.
- Recycling and water reuse projects tend to be more expensive than water conservation options and less expensive than developing new surface water supplies and seawater desalination.
- To determine the best economic and socially feasible alternative for local water users, water managers and planners should include assessing non-monetized costs and benefits of reuse projects in comparison to other water supply alternatives.
- Dependable water supplies should include a mix of different water sources in order to create a sustainable local water supply.
- Costs for new water supplies will be more expensive as compared to the traditional federal and state subsidized water.
- Alternative approaches to financing and supporting infrastructure is necessary. Using water pricing to allocate water among municipal, industrial, agricultural, and environmental users of water will become a tool to manage water scarcity and a way to minimize the potential for water shortages.

FOR ADDITIONAL INFORMATION:

DAVE WEGNER, Woolpert Engineering, 970/ 759-0083 or David.L.Wegner@gmail.com

David Wegner is retired from a senior staff position on water, energy, and transportation committees in the US House of Representatives. In that position he worked on legislation that directly affected administration policy and federal agency actions related to the US Army Corps of Engineers, the US Department of the Interior (DOI), the US Environmental Protection Agency, the Bonneville Power Administration, the Tennessee Valley Authority, and the US Department of Energy. Prior to serving in Washington, DC, he worked for over 20 years for DOI managing water and science programs in the Colorado River basin and the Grand Canyon. During his tenure at DOI he was instrumental in formulating the Adaptive Management approach for other river systems impacted by dams and river operations. From 1997 through 2008 he built a private international environmental company that focused on global water and climate issues. Currently he works as a senior scientist for strategic planning for Woolpert Engineering and provides input and strategic counsel to NASA/JPL, academic institutions, members of Congress and staff, and international organizations focused on water, energy, coastal, reservoir management, and climate issues. Mr. Wegner is a frequent lecturer on the use of science in natural resource management and on the history of western water. He is on the boards of the National Academy of Sciences, Glen Canyon Institute, the Sonoran Institute and mentors several post-docs in the US, Europe, and Asia through the International Association of Hydrologic Research.

Title XVI

Literature Cited

- Arroyo, J. and S. Shirazi. 2012. *Cost of Brackish Groundwater Desalination in Texas*. Innovative Water Technologies. Texas Water Development Board. Austin, TX.
- Ault, T.R., J. S. Mankin, B. I. Cook, and J. E. Smerdon. 2016. *Relative Impacts of Mitigation, Temperature, and Precipitation on 21st-Century Megadrought Risk in the American Southwest*. Science Advance 05 Oct 2016. Vol. 2, no. 10, e1600873. DOI: 10.1126/sciadv.1600873.
- Bureau of Reclamation. 2015. *Shasta Lake Water Resources Investigations (SLWRI)* final Feasibility Report and Final Environmental Impact Statement.
- Bureau of Reclamation and County of Los Angeles Department of Public Works. 2016. *Summary Report. Los Angeles Basin Study*. www.usbr.gov/watersmart/bsp/docs/fy2017/LABasinStudySummaryReport.pdf
- Bureau of Reclamation. 2019. Central Valley Project. *Schedule of M&I Cost of Service and Project Use Energy (PUE) Water Rates Per Acre Foot by Contractor*. 2020 M&I Water Rates. M&I 2020 Schedule A-2A. 12/9/2019.
- Bureau of Reclamation. 2020. Central Valley Project (CVP) Fact Sheet. Accessed April 3, 2020. www.usbr.gov/mp/cvp/index.html.
- Bureau of Reclamation. 2020. *WaterSMART: Title XVI-Water Reclamation and Reuse*. www.usbr.gov/watersmart/title/index.html. Accessed April 6, 2020.
- California Department of Water Resources. 2007. *Temperance Flat: Frequently Asked Questions*. Sacramento, CA.
- California Department of Water Resources. 2016. [display=topics&pub=120,125,226,9829](https://www.waterboards.ca.gov/water_issues/topics/pub/120,125,226,9829).
- California Department of Water Resources. 2018. California Water Efficiency Program. <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency>. Accessed April 1, 2020.
- California Department of Water Resources. 2019. Bulletin 132-17. *Management of the California State Water Project*. Sacramento, CA.
- California Legislative Analyst's Office. 2017. *Residential water use trends and implications for conservation policy*. Budget and Policy Post. Sacramento, CA.
- California State Water Board and Department of Water Resources (DWR). 2017. Municipal wastewater recycling survey results. Available at www.waterboards.ca.gov/water_issues/programs/grants_loans/water_recycling/munirec.shtml. Accessed April 5, 2020.
- Congressional Research Service. 2010. *Water reuse and the Title XVI Program: Legislative Issues*. R41487. Washington, DC.
- Congressional Research Service. 2019. *Water Infrastructure Financing: The Water Infrastructure Finance and Innovation Act (WIFIA) Program*. R43315. Washington, DC.
- Conover, B. 2009. Editor. *How the West Was Warmed: Responding to Climate Change in the Rockies*. Fulcrum Press. Golden, CO.
- Cooley, H. and N. Ajami. 2012. *Key issues for seawater desalination in California: Cost and Financing*. Pacific Institute. Oakland, CA.
- Cooley, H. et. al. 2019. *The cost of alternative urban water supply and efficiency options in California*. Environ. Res. Commun. 1-042001.
- Courthouse News Service. 2020. *California Sues to Sink Planned Expansion of Shasta Dam*. www.courthousenews.com/california-sues-to-sink-planned-expansion-of-shasta-dam/. Accessed April 3, 2020.
- Department of the Interior. 1991. News Release: Interior Secretary Lujan announces comprehensive water reuse initiative for southern California. Press Release of August 5, 1991. Washington, DC.
- Diringer, S.E., M. Shimabuku, and H. Cooley. 2020. Economic evaluation of stormwater capture and its multiple benefits in California. PLoS ONE. 15(3):e0230549. <https://doi.org/10.1371/journal.pone.0230549>.
- Environmental Protection Agency. 2002. *Community Water System Survey 2000*. Office of Water. Washington, DC.
- Environmental Protection Agency. 2016. *Drinking Water Action Plan*. Office of Water. Washington, DC.
- Environmental Protection Agency. 2018. *Earthquake Resilience Guide for Water and Wastewater Utilities*. www.epa.gov/sites/production/files/2018-02/documents/180112-earthquakeresiliencguide.pdf. Washington, DC.
- Environmental Protection Agency. 2018. Water Sense. www.epa.gov/watersense/about-watersense. Visited on April 1, 2020.
- Environmental Protection Agency. 2019. *National Water Reuse Action Plan: Draft*. Office of Water. Washington, DC.
- Farm Progress. 2018. *Subsidence Shrinks Friant-Kern Canal Capacity by 60 Percent*. www.farmprogress.com/irrigation-systems/subsidence-shrinks-friant-kern-canal-capacity-60-percent.
- Farm Progress. 2020. *SGMA to Dry Up One-fifth of Irrigated SJ Valley Farmland*. www.farmprogress.com/water/sgma-dry-one-fifth-irrigated-sj-valley-farmland. Accessed March 20, 2020.
- Federal Register. 2020. Docket Number EPA-HQ-OW-2019-0174. Notice of Availability. *National Reuse Action Plan: Collaborative Implementation (Version)*. Washington, DC.
- FOR. 2016. *Proposed Sites Off Stream Storage Reservoir*. Real Facts & Issues. May 26, 2016. Friends of the River. Sacramento, CA.
- GAO [Government Accountability Office]. 2018. Bureau of Reclamation: Water reuse grant program supports diverse projects and is managed consistently with federal regulations. GAO-19-110. Washington, DC.
- Gleick, P. 2020. *Rigged Feasibility Study Shows Desperation for New Surface Reservoirs: Temperance Flat Falls Flat*. SF Gate. <https://blog.sfgate.com/gleick/2009/09/05/rigged-feasibility-study-shows-desperation-for-new-surface-reservoirs-temperance-flats-falls-flat/>. Accessed March 24, 2020.
- Inland Empire Utilities Agency. 2006. Testimony of Richard Atwater at the Senate Water and Power Subcommittee Hearing, February 28, 2006. <http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing>.
- NRC [National Research Council]. 2012. *Water Reuse: Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater*. Washington, DC. National Academies Press.
- Public Law 100-4. Water Quality Act of 1987. Washington, DC.
- Public Law 102-575. 1992. Reclamation Projects Authorization and Adjustment Act of 1992. Washington, DC.
- Public Law 111-5. 2009. American Recovery and Reinvestment Act of 2009. Washington, DC.
- Public Law 113-121. 2014. The Water Resources Reform and Development Act of 2014 (WRRDA 2014). Washington, DC.
- Public Law 114-322. 2016. Section 4009. Water Infrastructure Improvements for the Nation Act. Washington, DC.
- Reisner, M. 1986. *Cadillac Desert: The American West and Its Disappearing Water*. Viking Penguin Books, Inc.
- Reznik A., Feinerman E., Fisher F., Huber-Lee A., Joyce B. and Kan I. 2017. *Economic Implications of Agricultural Reuse of Treated Wastewater in Israel: A Statewide Long-Term Perspective*. Ecol. Econ. 135. 223-33.
- Robbins, J. 2019. *As Water Scarcity Increases, Desalination Plants Are On The Rise*. Yale Environment 360. <https://e360.yale.edu/features/as-water-scarcity-increases-desalination-plants-are-on-the-rise>. United States Congress. 1992.
- Southern California Water Coalition. 2018. *New Report Reveals Cost & Water Supply Benefits of Southern California Stormwater Projects*.
- Stahle, D.W. 2020. *Anthropogenic Megadrought*. Science 17 Apr 2020. Vol. 368, Issue 6488. Pp. 238-239. DOI: 10.1126/Science.abb6902.
- Stanford Woods Institute for the Environment. 2019. *Understanding California's Groundwater*. <http://waterinthewest.stanford.edu/groundwater/recharge>. Accessed March 2020.
- St. Marie, S. and M. Zafar. 2016. *What Will Be the Cost of Future Sources of Water in California?* California Public Utilities Commission. Sacramento, CA.
- Walton, B. 2020. *Remarkable Drop in Colorado River Water Use a Sign of Climate Adaptation*. Water News, Water Education Foundation. June 17, 2020.
- Water Education Foundation. 2014. www.watereducation.org/sites/main/files/file-attachments/groundwatermgthandbook_oct2015.pdf.
- Water Supply Act of 1958, 72 Stat. 320: 43 U.S.C. section 309b.

Washington Water

Groundwater Issues

Three-Legged Program

Water Conflict

Maximized Appropriation

Quantitative Relationship

"Darcy's Law"

Pumping Analysis

WASHINGTON STATE WATER MANAGEMENT

THE PRACTICAL EVOLUTION OF HYDRAULIC CONTINUITY & MITIGATION PRINCIPLES

by Stephen Hirschey (Washington State Department of Ecology, Retired),
Tom Ring (Yakama Nation Hydrogeologist, Retired),
Jason McCormick (McCormick Water Strategies (Yakima Valley, WA)
& Jessica Kuchan (Confluence Law PLLC, Seattle, WA)

Introduction

The 1990s saw a paradigm shift in the way Washington State regulated groundwater with regard to surface water / groundwater interactions. That decade falls within a continuum of: evolving science and technology; growing population and demand for water; recognition of the ecological and aesthetic importance of water; and a century and a half of Treaty making, legislation, and litigation. This article documents this evolution, beginning with a highly permissive era of unmitigated groundwater withdrawals through to the modern era of full recognition of streamflow capture by wells and, in some cases, rigorous requirements of water budget neutrality.

This article parallels the theme of this year's Washington State Chapter of the American Water Resources Association annual conference. The online "virtual" conference, occurring October 6th, is titled: *"The Challenges of Change: How Washington is Responding to Interdisciplinary Changes to Water Resources"* and will be taking a deeper dive into the changes that have transformed water resource management in Washington over the past 50 years with the aid of some of the foremost experts in this field. See: Abbreviated Conference Agenda following this article and the Conference Website: www.waawra.org/event-3828722.

Evolving Statutes and Dwindling Resources

Obtaining a new water right in Washington today is vastly different today than it was even ten years ago, let alone 50 years ago.

In 2017, Washington celebrated 100 years of the Water Code. From the beginning through the early 1970's water resources was, essentially, managed as a three-legged program: 1) water right application processing; 2) water masters to regulate water rights based on priority across the state; and 3) timely adjudications to affirm all water use from a source and the issuance of adjudicated certificate water rights when disputes arose. Adjudication and water right processing functions were based in Olympia, Washington, with water masters distributed across the state.

The program was not without conflict. By the 1970's numerous surface water sources in eastern Washington had been adjudicated — indicating "fully appropriated" basins. Also, in those early years, environmental issues were not addressed in water rights. For example, the Yakima River was diverted dry at Sunnyside Dam, 100 miles upstream of its confluence with the Columbia. In fact, countless tributaries throughout the state were appropriated until dry. The cumulative impact of appropriation reverberated through significant declines in fish populations. As surface waters in much of Washington became fully- or over-appropriated — particularly where irrigated agriculture was prevalent — emphasis shifted to groundwater as a new source for irrigation and other uses. Although groundwater was already understood to be a flowing component of the hydrologic cycle, administratively groundwater was largely treated as a separate source without serious regard for impacts to surface water resources. The following sections document the gradual convergence between groundwater science and management.

Groundwater Management in the Context of Science and Evolving Technology

The quantitative relationship between surface water and groundwater was well established by the time Washington State adopted the groundwater code in 1945. The birth of groundwater hydrology as a quantitative science can be traced to the year 1856 when a French hydraulic engineer named Henry Darcy (1856) published his report on the water supply of the city of Dijon, France (Freeze and Cherry, 1979). Darcy experimentally quantified the relationship between porous media flow, hydraulic properties of porous media, and the gradient of hydraulic head. "Darcy's Law" persists as the basic law of groundwater flow. When Darcy's Law is put together with an equation of continuity that describes the conservation of mass during flow through a porous medium, the result is the equations used in computer models of groundwater flow to this day.

C.V. Theis, a now-revered civil engineer with US Geological Survey, published breakthrough papers providing a quantitative basis for predicting the response of aquifers to pumping. His 1940 paper — *The Source of Water Derived from Wells, Essential Factors Controlling the Response of an Aquifer to Development* — provided the first concise description of the effects of groundwater pumping on surface water components of the hydrologic cycle (see Heath, 1983 for an introductory discussion).

**Washington
Water****Pumping
Impacts****Technological
Advances****“Four Part Test”****Water Right
Records****Prior
Appropriation****Instream Flow
Rules****Permit-Exempt
Uses****Yakima
Adjudication****Limited
Regulation**

A summary of Theis' relevant conclusions includes:

- All water discharged by wells is balanced by a loss of water somewhere.
- After sufficient time has elapsed for the cone of depression areas of aquifer recharge or discharge, further discharge by wells will be made up at least in part by an increase in recharge or a decrease in discharge at the expense of streamflow or, in some cases, transpiration through plants.
- “If this natural discharge fed surface streams, prior rights to the surface water may be injured.”
- In most artesian aquifers, “because the cones of depression spread with great rapidity, each well in a short time has its maximum effect on the whole aquifer and obtains most of its water by increase of recharge or decrease of natural discharge.”

Technological innovations over the past four decades have made it possible for a much broader population to derive quantitative estimates of the effects of groundwater pumping on surface water quantity and quality. For example, recently retired groundwater modelers did their early work on mainframe computers programmed on punch cards. The confluence of a number of factors — including: widely available computers; text books (such as Alan Freeze & John Cherry's *Groundwater*, 1979); development of public domain modeling software such as MODFLOW; the development of graphical user interfaces; and a greatly expanded academic interest in groundwater and river ecology — has contributed to the rigor with which proposed groundwater pumping is evaluated. Starting in the early 1990's, the Washington State Department of Ecology (Ecology), water right applicants, and those opposed to the issuance of a water right all had tools to describe the impacts of groundwater use on other wells and surface water bodies.

Water Right Administration in the Context of Science and Evolving Technology

Washington State's 1917 surface water code (Chapter 90.03 Revised Code of Washington (RCW)) and the 1945 groundwater code (Chapter 90.44 RCW) established that upon the filing a water right application, Ecology shall investigate whether: 1) water is available for appropriation; 2) if the new use will cause impairment of existing rights; 3) is for a beneficial use; and 4) will be detrimental to the public welfare (the so-called “four part test”). From 1917 to arguably the 1990's, interpretation of the four-part test was quite generous with the focus of the test slanted towards enabling out-of-stream uses.

Administratively, from 1917 to the 1980's water rights were recorded by hand in a logbook. Small colored dots were applied to Metzger maps indicating location and point of diversion for the rights. Active files were kept until a certificate issued. During the 1960's a mainframe computer program was implemented to track records: the first electronic database for water rights. Regional staff maintained the paper maps until personal computers became available in regional offices around 1990. In 1970, the Washington State Department of Water Resources was incorporated into the newly created Department of Ecology (Ecology). At this time, water masters were reassigned to the regional offices to process water right applications and this generally resulted in a diminished presence in the field for enforcement of rights.

The drafters of the 1945 groundwater code placed groundwater regulation in the context of prior appropriation and recognized groundwater as part of the same hydrologic cycle as surface water. RCW 90.44.30 states that groundwater appropriation shall not impair surface water rights and adds the following context: “...to the extent that any underground water is part of or tributary to the source of any surface stream or lake, or that the withdrawal of ground water may affect the flow of any spring, water course, lake, or other body of surface water, the right of an appropriator and owner of surface water shall be superior to any subsequent right hereby authorized to be acquired in or to ground water.” The legislation's authors appear to have been familiar with the basic precepts laid out by C.V. Theis — but that doesn't mean that was how it was implemented.

Starting in 1969 with the Minimum Water Flows and Level Act (Chapter 90.22 RCW), followed by the Water Resources Act of 1971 (Chapter 90.54 RCW) and on through 1985, Ecology also promulgated instream flow rules in selected basins across the state. The Water Resources Act of 1971 recognized a shared interest in water resources both instream and out, and an understanding of surface-groundwater interactions. The development of rules by watershed, however, did not follow a consistent definition or technical understanding of these relationships, nor was there consistency in how domestic permit exempt groundwater uses were treated. Some rules treated permit-exempt uses as “de minimis” (i.e., so minor as to merit disregard), and others expressly regulated the use. Such regulatory disparities contributed to the long and tortured history of instream flow development. Suffice to say that instream flows were set in approximately a third of Washington State's Water Resource Inventory Areas (Chapter 173-500 WAC).

The Yakima Adjudication was initiated in 1977 and essentially consumed the next 40 years of adjudication capacity. Ecology continued to process water right applications, although a backlog of applications would soon start mounting, thus creating hardships for water right applications and future political challenges. The “three-legged program” was starting to falter.

Up until the early 1980's Ecology did work to resolve disputes and enforce against unauthorized water use. In 1993, the Court held that Ecology did not have authority to regulate between water users by priority date “without first utilizing a general adjudication pursuant to RCW 90.03 in order to determine the existence, amount, and priorities of the water rights claimed...” *Rettkowski v. Dept of Ecology*, 122 Wn.2d 219, 234, 858 P.2d 232, 240 (1993). Another leg of the three-legged program broke.

Washington Water

Unauthorized Use (Enforcement)

Batch Processing

Basin Assessments

Court Review

Hydraulic Continuity

Withdrawal Restrictions

Yakima River: Pumping Impacts

Ecology Switch

At the same time, processing of new water right applications continued unabated in the 1970's through to the early 1990's — and the backlog of applications grew. Concurrently, the use of personal computer data management programs, and especially mapping with geographic information systems changed rapidly.

The backlog of water right applications and Ecology's inability to address disputes between users and enforce against unauthorized water use — coupled with the political climate of the early 1990's — ultimately flattened the three-legged program. The 1993 Legislature significantly reduced Ecology's budget, causing Ecology to lay off roughly 60% of the staff assigned to water right processing. The Legislature also directed a task force to review the water rights program and provide recommendations for increased efficiencies based on fee revenue. In 1994, the Legislature failed to pass a complex water fee bill based on recommendations from a task force. Therefore, the staffing reductions remained, and Ecology fell farther behind in processing applications. The lay-offs and existing backlog of water right applications necessitated a paradigm shift in the way Washington State processed water right applications.

The impact of the layoffs required a change by Ecology and "batch processing" of water rights was born. There were some earlier examples of batch processing several hundred applications at once, but they were limited to applicants from a lake, a common water source, or single domestic use. Prior to making the water right decisions by batch or common water source, Ecology conducted Initial Basin Assessments. The assessments in the early to middle 1990s were a series of reports done by Ecology's Water Resources Program and consultants using emergency funds provided by the Governor. The assessments evaluated: streamflow conditions; water rights; groundwater conditions; water quality conditions; and fish status in the Water Resource Inventory Areas. For the first-time geographic information systems were employed and coupled with data-bases to summarize all the water rights and claims by source in a visual form. The assessments also collated the information known about streamflow in the basins and how often the instream flows were achieved. The assessments heightened attention on basins that were fully-appropriated and instream flows not being met a significant period of time, especially in low-flow seasons.

Ecology's expanded batch processing approach was reviewed by the courts. In *Hillis v. Department of Ecology*, the Washington State Supreme Court (Supreme Court) held that "...Ecology does have a statutory duty to investigate water rights applications for public water, no time limit is stated in that statute, and we have recognized that a statutory right can be enforced only up to the funding provided by the Legislature." 131 Wn.2d 373, 388, 932 P.2d 139, 147 (1997). In *Hillis*, the Supreme Court further held that: "Ecology will have to engage in rule-making procedures prior to using its decisions on priorities for conducting investigations on applications, its decision to conduct watershed assessments prior to deciding most applications, and its ranking of watersheds for assessment." *Id.* at 400. By the following year, Ecology adopted a rule establishing the framework for the prioritization of its work. Chapter 173-152 Washington Administrative Code (WAC).

Ecology's use of the basin assessments and batch processing lead to issuance of close to 600 water right decisions in 12 watersheds in a short time period of time. In many cases groundwater applications in hydraulic continuity with streams not achieving instream flows were denied (and appealed). A little over half of the decisions were denials and over 130 of the decisions were appealed to Washington State's Pollution Control Hearings Board (the administrative review board for Ecology's water right decisions). Other applications were granted, some with certain restrictions. In *Hubbard v. Department of Ecology*, 86 Wn. App. 119, 126, 936 P.2d 27, 29 (1997), the Court of Appeals held that Ecology may condition groundwater permits to protect senior surface water rights, including instream flow rights. The Court explained that: "If Ecology finds that there is 'significant hydraulic continuity' between surface water and the proposed underground water source, the groundwater permit must be subject to the same conditions, i.e., restrictions on withdrawal, as the affected surface water." Five of the appeals were later consolidated and considered by the Supreme Court in *Postema v. Pollution Control Hearings Board*, 142 Wn.2d 68, 11 P.3d 726 (2000). In *Postema*, the Supreme Court upheld Ecology's authority to restrict groundwater use to protect surface water rights, including minimum flows and lake levels established through rulemaking.

The 1990's – A Decade of Reckoning in the Yakima Basin

In June of 1993, Ecology issued the first 43 of what they had announced would be hundreds of approvals for new irrigation wells in the Yakima Basin. The Yakama Nation appealed those decisions. Even before the decisions were issued, Yakama Nation staff had presented Ecology with a literature review showing that the groundwater being applied for was tributary to the fully appropriated Yakima River and that the proposed pumping would capture surface water within a relatively short period of time. When the Yakama Nation questioned the lack of discussion of hydraulic continuity in the reports of exam, the director of Ecology responded that Ecology staff's technical opinion was that the degree of hydraulic continuity between the target aquifers and the Yakima River was so small that for all practical purposes it need not be mentioned in the water use authorization.

After five years of litigation, and with the *Postema* case working its way through the courts, Ecology saw the issue differently. In 1998, Ecology informed the Pollution Control Hearings Board that new facts, additional science, and new case law had developed since 1993 and that Ecology had altered its position on the impact of hydraulic continuity to the Yakima River. The anticipated hearings never occurred.

Washington Water

Management Agreement

Groundwater Study (USGS)

Hydraulic Continuity

Impacts on Senior Rights

Housing Developments & Permit Exemptions

Clustered Plats

Withdrawal Petition

Treaty Rights

Ecology, the Yakama Nation and the US Bureau of Reclamation (which had filed an amicus brief to protect its interests in Yakima Basin surface water), entered into an agreement that set the stage for future management decisions in the Yakima Basin. Those permittees who wished to be issued a water right were required to pay into a mitigation fund at the market value of the permitted water. Others allowed their permits to be withdrawn. None chose the option to continue with the appeals on their own after Ecology announced its new position.

The federal, state, and tribal governments agreed on the need for consistent, conservative water resource management decisions in the basin and the need to develop a common technical platform for making decisions. This led to the USGS groundwater study of the Yakima basin. This ten-year effort included compiling and collecting stratigraphic data and developing a detailed multi-layer transient computer model of groundwater and surface water in most of the basin. That model found that: 1) streamflow in the Yakima River had been reduced by approximately 200 cubic feet per second; and 2) further groundwater development would further deplete surface water. New permits for consumptive use of groundwater have not been issued in the Yakima basin since the 1990's without mitigation in the form of an equivalent reduction in consumptive use — generally via foregone senior surface water diversion(s).

It was the technological innovations over the 1990s that made it possible for Ecology hydrogeologists and consultants to derive quantitative estimates of the effects of groundwater pumping on surface water quantity and quality. The questions today in the Yakima basin are not if there is hydraulic continuity, but rather how much of a surface-water body's flow will be captured by a proposed well, and where the water will be captured (i.e.: which surface-water bodies will be affected; when will the effect occur; and how long will the effect last).

Permit-Exempt Use and Legal Water Availability - Kittitas County

Following the efforts of the early 1990s to process water right permit applications, Ecology started to address the cumulative impacts of permit-exempt water uses. Kittitas County's development based on permit-exempt water uses became the epicenter of considering permit-exempt water use impacts on senior water rights.

Kittitas County is the furthest upstream county in the Yakima Basin watershed. While the USGS study covered the hydrology of the entire Yakima Basin, the MODFLOW model ended at the western edge of the Columbia River Basalt (a few miles east of the town of Cle Elum) and hence did not model roughly half of Kittitas County in the Yakima Basin. Even so, new water right applications (without mitigation) were not being processed in the Yakima Basin, including Kittitas County, after 1993. In the interim, housing developments met their water needs in this rural area under Washington State's groundwater permit exemption (RCW 90.44.050). The permit exemption provides for: 1) single or group domestic use not exceeding 5,000 gallons per day; 2) irrigation of one-half acre; 3) industrial use not exceeding 5,000 gallons per day; and 4) stock watering. These permit-exempt uses were determined in 1945 as uses of water below the permitting threshold and not subject to the four-part test. However, such uses are subject to regulation under the Prior Appropriation Doctrine.

By the mid-2000's, development in Kittitas County was expanding rapidly with new proposed developments relying largely on the permit exemption. Because obtaining a groundwater permit was off the table since 1993, developers in rural areas outside municipal water systems switched to relying heavily on the domestic use permit exemption (not exceeding 5,000 gallons per day). Using the state's adequate water supply level of 350 gallons per day per home, up to 14 homes could be clustered under a single permit exemption. County and local developers found ways to develop cluster plats of 14 lots. These developments skirted around state environmental review and "daisy-chained" multiple limited liability company ownerships together to create connected 14 lot developments with each component using a permit exemption.

Local conservationists and regional land use advocacy groups took notice of the substantial rural development reliant upon the domestic use permit exemption. In 2006, they filed appeals to the county's comprehensive plan revisions. Then, in April 2007, Ecology received a petition from a local group of landowners and water right holders, formed as "Aqua Permanente." They petitioned for an unconditional withdrawal of all unappropriated groundwater in Kittitas County based on impacts to senior water rights. Hydraulic continuity and impairment of existing rights moved into the groundwater permit exempt well arena with the Aqua Permanente petition for a rule-making that essentially asked Ecology to close roughly half of Kittitas County to exempt wells. Significantly, the Aqua Permanente petitioners based the petition on the effect of exempt wells on their May 10, 1905, priority date of Kittitas Reclamation District water rights, not on an instream flow.

There are no instream flows rules in the Yakima basin. Instream flows in the Yakima Basin are instead based on Yakama Nation Treaty Rights. These tribal water rights have a Time Immemorial priority date and are senior to the rights of all other surface or groundwater users. Moreover, in the Yakima Basin a concept of Total Water Supply Available (TWSA) is applied to instream flow and out of stream water users in the context of managing water in the basin. Impacts to TWSA rise to the level of impairment (to existing rights) under the four-part test in the basin.

<div>Washington Water</div> <div>Kittitas MOA</div> <div>Emergency Rule (Mitigation)</div> <div>"Legal" Availability</div> <div>Mitigation Program</div> <div>Cumulative Impacts</div> <div>"OCPI" Rejected</div> <div>Domestic Use Impacts</div> <div>County Obligations</div> <div>Instream Flows</div> <div>Legislative "Fix"</div>	<p>Ecology responded to the Aqua Permanente petition by rejecting the unconditional withdrawal. Instead, Ecology signed a memorandum of agreement (MOA) with Kittitas County in April 2008 to avert the withdrawal. Between April 2008 and July 2009 Ecology invoked the dispute resolution process under the MOA and then terminated the MOA on July 1, 2009. As a result of terminating the MOA, Ecology adopted the Upper Kittitas Emergency Groundwater Rule (Emergency Rule), Chapter 173-539A WAC on July 16, 2009. The Emergency Rule withdrew unappropriated groundwater in roughly half of Kittitas County. It established a permit-exempt groundwater mitigation process — identified as water budget neutral projects — and acknowledged protection of senior water rights and stream flow. On January 22, 2011, Chapter 173-539A WAC was replaced with the permanent Groundwater Rule in effect today.</p> <p>Concurrently, Kittitas County's comprehensive land use plan revision cases were being heard, then consolidated and ultimately appealed to the Supreme Court. <i>Kittitas County v. Eastern Washington Growth Management Hearings Board</i>, 172 Wash.2d 144, 256 P.3d 1193 (2011)(<i>Kittitas</i>). The arguments heard in <i>Kittitas</i> focused on whether a county is obligated under the State's Growth Management Act (GMA) (Chapter 36.70A RCW) to consider legal water availability in addition to physical availability when making a determination of adequate water supply for any development with potable water needs. The Supreme Court upheld a lower court's ruling that the County's Plan failed to protect rural water resources as required by the GMA, further solidifying the permanent Groundwater Rule.</p> <p>The Yakima basin, with Kittitas County leading the way, was held to implement a strict water budget neutrality mitigation program some time before later Supreme Court cases on the same matter were decided. The <i>Kittitas</i> decision was arguably pivotal in the later Supreme Court case decisions (<i>see below</i>). However, those later case decisions were mostly greeted with a shrug in the Yakima Basin because the mitigation programs were already in place. The reverberation of the GMA cases would soon reach the rest of the state, particularly in the Puget Sound region.</p> <p style="text-align: center;">Permit Exempt Use and Legal Water Availability - Statewide</p> <p>As the impacts of groundwater use on senior surface water rights were considered and addressed in the Yakima River Basin, similar concerns about the individual and cumulative impacts of junior groundwater withdrawals on established instream flow in other watersheds in Washington intensified. For decades, many areas of the State had seen a proliferation of permit-exempt groundwater uses and attempts to establish new water uses without a water right permit.</p> <p>In 2006, Ecology adopted an amendment to the Skagit Basin Instream Flow Rule, establishing reservations of water for permit-exempt uses. Upon appeal, in 2013, the Supreme Court held that Ecology could not authorize the new use of groundwater through reservations under the Water Code's "overriding considerations of public interest" (OCPI) exception because the new groundwater uses would impair the instream flow right. <i>Swinomish Indian Tribal Community v. Ecology</i>, 178 Wn.2d 571, 585-591, 311 P.3d 6 (2013). Two years later, the Court ruled that OCPI cannot be used to authorize a permanent groundwater use that impairs a senior instream flow. <i>Foster v. Department of Ecology</i>, 184 Wn.2d 465 (2015).</p> <p>In 2016, the Supreme Court considered the GMA requirements to protect rural water resources and impacts of new permit-exempt domestic water uses in the Nooksack River watershed. Ecology's Nooksack River Watershed Rule did not close the entire watershed to new permit-exempt domestic water uses even though the instream flow rule standard is frequently unmet. The County relied on Ecology's rule and did not engage in its own consideration of the potential impact of new permit-exempt domestic uses impacts on surface water flows. In <i>Whatcom County v. Hirst</i>, the Supreme Court considered a challenge to Whatcom County's development regulations, which allowed subdivision and building permit applicants to rely on permit-exempt wells except in places where Ecology determine by rule that water was unavailable. 186 Wn.2d 648, 381 P.3d 1 (2016). The Supreme Court held that the GMA imposed obligations on the County that were <i>independent</i> of Ecology's obligations under the Water Code, including the obligation to determine legal and physical availability of water. The Supreme Court found that, even if the instream flow rule does not restrict permit-exempt groundwater uses, impairment of Ecology's minimum stream flows cannot be authorized. The Supreme Court's ruling in <i>Hirst</i> raised questions about many other watersheds in Washington that have instream flow rule standards that are routinely unmet.</p> <p>Following the Supreme Court's ruling in <i>Hirst</i>, the Washington State Legislature considered amendment to the Water Code over two legislative sessions. On January 18, 2018, the Legislature enacted Engrossed Substitute Senate Bill (ESSB) 6091 (<i>see Pitre, TWR #169</i>). ESSB 6091 (later codified in part in Chapter 90.94 RCW):</p> <ul style="list-style-type: none"> • authorized the new use of permit-exempt groundwater uses for domestic purposes in certain watersheds with instream flow rules; • imposed new use restrictions in certain watersheds; • required additional watershed planning actions to offset the impacts of new permit-exempt groundwater uses in certain watersheds; • authorized pilot projects to measure water use of domestic permit uses in two watersheds; • authorized pilot mitigation projects for new water uses in specific watersheds; and • created a taxable bond account to fund watershed restoration projects.
--	--

**Washington
Water****Net Ecological
Benefit****Watershed
Restoration****Water-for-Water
Offsets****Habitat Projects****Non-Water
Offsets****Evolution****Water Budget
Neutral**

RCW 90.94.020 directed local planning units in the Nooksack, Nisqually, Lower and Upper Chehalis, Okanogan, Little Spokane and Colville River Watersheds to “review existing watershed plans to identify the potential impacts of exempt well use, identify evidence-based conservation measures, and identify projects to improve watershed health ...” RCW 90.94.020(2). Under RCW 90.94.020(4)(c), Ecology must evaluate each watershed’s update and “...determine that actions identified in the watershed plan...will result in a net ecological benefit to instream resources within the water resource inventory area.”

The Legislature directed the Nisqually River Watershed and Nooksack River Watershed to complete the update of watershed plans by February 1, 2019. The Legislature required the others to complete the update by February 1, 2021. The Legislature also directed Ecology to establish a watershed restoration and enhancement committee to develop a watershed restoration and enhancement plan in the Snohomish, Cedar-Sammamish, Duwamish-Green, Puyallup-White, Chambers-Clover, Deschutes, Kennedy-Goldsborough, and Kitsap watersheds. Ecology is required to complete the watershed restoration and enhancement plans by June 30, 2021 (*see* RCW 90.94.030(2)(a)).

The Legislature authorized Ecology and planning units to prioritize water-for-water offsets of new permit-exempt water uses, but also allowed the consideration of habitat projects. RCW 90.94.020(4)(b), states, in pertinent part:

The watershed plan may include projects that protect or improve instream resources without replacing the consumptive quantity of water where such projects are in addition to those actions that the planning unit determines to be necessary to offset potential consumptive impacts to instream flows associated with permit-exempt domestic water use.

Furthermore, the Legislature explained that the net ecological benefit should be considered “to instream resources within the water resource inventory area.” RCW 90.94.020(4)(c). The Legislature authorized Ecology and the planning units to consider out-of-kind (non-water) offset projects for new permit-exempt domestic water uses to the watershed scale rather than to address local impacts, as are required in some watersheds — including the Yakima River Basin.

Conclusion

The recent developments in water resource planning for permit-exempt domestic uses highlights Washington’s evolution of understanding and regulating individual and cumulative groundwater use impacts on surface water flows. As described above, the Water Code and the scientific understanding of the hydraulic connectivity of groundwater and surface water had been consistent for decades. The technology to understand potential impacts through modeling has improved since the 1990s and allowed our society to better understand to what extent a new use will impact existing water uses.

In the Yakima River Basin, Washington State has required consumptive water use offset for impacts of new water uses. In other parts of the State, the Legislature has authorized water resources planning to consider habitat projects to offset new permit-exempt groundwater uses. In most of the developed basins in Washington, water right applicants must now, generally, propose water budget neutral projects that are backed up by hydrogeologic studies. If the proposal is not water budget neutral, an applicant is wise to propose mitigation.

Washington water resource management is evolving, and we need to continue to work to find consistent water resource policy to address our future water needs. What is clear is the era of unfettered water development is receding into the past.

The authors of this paper are all on the conference committee for the Washington chapter of the American Water Resources Association 2020 Annual Conference.

FOR ADDITIONAL INFORMATION:

JASON McCORMICK, McCormick Water Strategies, 509/ 949-7297 or Jason@McCormickWater.com
JESSICA KUCHAN, Confluence Law, 206/ 502-4403 or Kuchan@ConfluenceLaw.com

Stephen Hirschey is a retired water policy analyst with over 30 years’ experience working on water issues with the Washington State Department of Ecology and King County.

Tom Ring is a retired hydrogeologist who served the Yakama Nation for many years.

Jason McCormick is a water resources strategist with McCormick Water Strategies in the Yakima Valley.

Jessica Kuchan is a water law attorney with Confluence Law, PLLC, in Seattle.

Washington Water

Ongoing Changes

Expert Responses

2020 AWRA-WA STATE CONFERENCE

American Water Resources Association – Washington Section Event

October 6, 2020 - Virtual / Online

“The Challenges of Change”

How Washington State is Responding to Interdisciplinary Changes to Water Resources

This year's conference will highlight recent and ongoing changes to Washington State's water supply and water quality. Current market, technological, regulatory, and legislative responses to those changes will be examined and explained by experts in the field. Interdisciplinary approaches — including municipal, agricultural, environmental, and energy-related perspectives — will be the focus of in-depth presentations.

Tony Willardson, Executive Director of the Western States Water Council, will present the keynote address, sharing his insights on the role of resiliency in managing water resources. Session 1 will provide an overview of how Washington water quality, regional water use and demand, and hydrology have changed over time, and the changes that are expected to occur in the future. Session 2 will focus on how markets are responding to changes in water resources, supply, and quality, and will identify market solutions that can be used to adapt to those changes. This session will feature speakers from municipal, agricultural, hydropower, and environmental perspectives on market solutions. Session 3 will discuss technological responses and solutions that can be implemented to adapt to changes in water resources, supply, and quality. This session will feature speakers who will discuss technology being implemented in the municipal, agricultural, and fish conservation contexts. Session 4 will provide a panel discussion on the role of policy, regulations, and legislation in preparing for, adapting, and prompting change in water supply, water quality, and water use.

Conference Schedule

Keynote Address: Tony Willardson, Western States Water Council

Session 1: Changes to Water Quality and Water Supply

- Tom Ring
- Mindy Roberts, Washington Water Council
- Gretchen Greene, Greene Economics

Session 2: Market Solutions and Response to Change

- Richael Young, Mammouth Water
- Greg McLaughlin, Washington Water Trust
- Mitch Kunstel, Seattle City Light
- Doug Quinn, Clark Public Utilities

Session 3: Technological Response and Solutions to Change

- Randy Reber, Round Lake Farm
- Dr. Thomas Quinn, University of Washington
- Armin Munévar, Jacobs
- Tracy Tackett, City of Seattle

Session 4: Policy Responses to Change

- Senator Judy Warnick
- Maia Bellon, Cascadia Law Group
- Brady Kent, Yakama Tribe
- Rachael Paschal Osborn, Center for Environmental Law & Policy
- Arden Thomas, Kittitas County

For information: www.waawra.org/event-3828722

2020 AWRA Washington Annual State Conference

The Challenges of Change: *How Washington is Responding to Interdisciplinary Changes to Water Resources*



Manastash Creek 2005 Manastash Creek 2015
Photos by Tom Ring

October 6, 2020

Virtual Webinar



American
Water
Resources
Association
Washington Section

Details and Registration at: www.waawra.org

WATER BRIEFS

CITIES' EXCHANGE AZ
SYSTEM NEARS COMPLETION

Colorado River water is delivered to the Phoenix through Central Arizona Project's (CAP) canal system. Avondale has a contract for a 5,416 acre-feet (AF) allotment of Colorado River water. Avondale does not physically receive their Colorado River water, instead it is sent to the CAP Hieroglyphic Mountain Recharge facility, 21 miles from the city limits. In exchange for storing water in the Hieroglyphics aquifer, state law allows Avondale to pump a similar amount of groundwater from the aquifer beneath the city. While this exchange is legally recovered water, it is not necessarily healthy for Avondale's aquifer. Avondale could request the Salt River Project (SRP) to deliver the Colorado River water through its canal system, but transportation costs are high and much of the water would evaporate along the way.

The agreement with Phoenix, called *Treatment and Delivery*, offers Avondale the opportunity to have its Colorado River water delivered and reduce the amount of groundwater it pumps from its aquifer. The interconnection which completes the system is expected to be complete by December 2020. This new water will help Avondale save water in its aquifer, keeping the aquifer ready to pump during water shortages.

Treatment and Delivery attributes:

- Phoenix water treatment plants sit close to canals and can easily receive Colorado River and the Salt River water, treat it and distribute it to customers.
- One of Phoenix's drinking water distribution pipes runs along Phoenix's border with Avondale.
- Phoenix has agreed to receive Avondale's 5,416 AF of Colorado River water at its Deer Valley Water Treatment Plant.
- Avondale has begun construction on the interconnection to Phoenix's main pipe that runs along its border. The connection will allow Avondale to receive its Colorado River allotment from the Phoenix distribution line on its border and transport the already-treated drinking water into its drinking water system.
- Avondale will add additional treatment to polish the Colorado River water to balance its chemistry so it matches Avondale's delivery system. This prevents corrosion of the system and taste/odor issues common to surface

water being introduced into a system primarily serving groundwater.

In addition to Avondale's CAP allotment, Phoenix receives SRP water each year delivered through SRP's canal system. Avondale's SRP allotment can change year-to-year depending on the watershed, but the average amount of SRP stored water delivered to Avondale is about 7,000 AF. Part of this SRP water is captured in a 72-acre wetlands project within the Crystal Gardens residential development. The remainder is transferred through a pipe that bypasses the wetlands and empties into Avondale's McDowell Recharge Facility near the Agua Fria River; collecting in four basins where it percolates into Avondale's aquifer. The McDowell facility has the capacity to add or "recharge" 20,000 AF of water; currently Avondale uses only about half of that capacity.

Phoenix stores some of its allotment of Colorado River water underground, but the city is running out of storage space. Avondale has agreed to store 5,000 AF of Phoenix's Colorado River water each year in its McDowell Recharge Facility. SRP has agreed to deliver Phoenix's Colorado River water through its canals to Avondale.

During a water shortage an exchange occurs. Avondale would pump Phoenix's stored water and deliver it to its customers. In exchange, Phoenix would receive and treat Avondale's allotted Colorado River water for its customers. This agreement allows each city to quickly respond to future water shortages at a reasonable cost. An aquifer holds a finite amount of water, so the additional water also keeps Avondale's aquifer healthier. Water is recovered in the same general location where it was stored, which is the most sustainable form of underground storage and recovery.

For info: www.arizonawaterfacts.com/, <https://new.azwater.gov/> or www.avondaleaz.gov/

TRANSFER & PROTECT CO
INSTREAM FLOWS

The Colorado Water Trust, with support from the Walton Family Foundation, released a new white paper, *New and Untested Legal Mechanisms for Transferring and Protecting Flow Instream*, on July 20th. "The Instream Flow Act of 1973 provided the Colorado Water Conservation Board (CWCW) with the authority to appropriate

and acquire water to preserve the environment to a reasonable degree on streams and lakes. The CWCW has appropriated 1,684 instream flow and minimum lake level water rights in Colorado, covering 9,720 miles of stream. However, the ability of the CWCW to appropriate water for instream flow outside mountain regions has faced challenges, as there are many streams on which flows are simply too low to support an appropriation, or local entities have opposed instream flow appropriations as a matter of local interest. Due to constraints on the CWCW's ability to appropriate new instream flow water rights across the state, legal mechanisms for transferring senior priority water rights and protecting that water as "instream flow" are now more important than ever." *Introduction*, p. 3. The "white paper examines new and untested legal mechanisms for transferring water rights and protecting them as instream flow in the state of Colorado. The legal mechanisms examined in this white paper are rooted principally in statutory law but include common law mechanisms as well. The tools may also be useful in other western states, at least to the extent that there are commonalities between the prior appropriation principles that guide the states' water law, and to the extent that other state legislatures could replicate Colorado statutes. Several legal tools are already tested and available to Colorado water users for projects that transfer water rights and protect flows instream. Some tools provide for permanent instream flow transfers, while others are temporary." *Id.* at 3-4.

The white paper includes chapters on: Temporary Loan Programs; Substitute Water Supply Plans; Interruptible Water Supply Agreements; Plans for Augmentation; Agricultural Water Protection Water Rights; Water Banking; Efficiency Transfers; and Junior Storage Appropriations and Paper Fill.

For info: CWT website: [>> White Paper 7/20/20](http://coloradowatertrust.org/library/resources)

WATER TOOLS US
INFO ACCESS

On August 10, the Association of Fish & Wildlife Agencies (AFWA) Fisheries & Water Resources Policy Committee (FRWPC) Subcommittee on Water (SOW) hosted a national water

WATER BRIEFS

data webinar that featured presentations on the *Internet of Water* (IoW); Western Association of Fish & Wildlife Agencies (WAFWA) *Crucial Habitat Assessment Tool* (CHAT); Western States Water Council (WSWC) *Water Data Exchange* (WaDE); National Fish Habitat Partnership (NFHP) *Data Assessment*; and the US Geological Survey and Interstate Council on Water Policy (ICWP) water data and decision support related programs.

The webinar recording, agenda, and supplemental information can be accessed via the weblink listed below.
For info: https://drive.google.com/drive/folders/1UCWCgV0vfxizhjQC_hH2BRutEaUHfHL?usp=sharing

RECYCLING & REUSE WEST**RECLAMATION TITLE XVI GRANTS**

The Bureau of Reclamation (Reclamation) announced on June 8 that it is providing \$16.6 million to nine congressionally authorized Title XVI Water Reclamation and Reuse projects. This funding, part of the WaterSMART Program, is for the planning, design, and construction of water recycling and reuse projects in partnership with local government entities. "Title XVI projects develop and supplement urban and irrigation water supplies by reclaiming and reusing water," said Reclamation Commissioner Brenda Burman. "These projects assist communities with new sources of clean water, which increases water management flexibility and makes water supply more reliable."

The projects selected are: City and County of Honolulu, Kalaeloa Seawater Desalination Project (Hawaii) - \$1,026,272; City of Escondido, Membrane Filtration Reverse Osmosis Facility (California) - \$3,069,303; City of San Diego, Pure Water San Diego Program (California) - \$1,160,139; County of Hawaii, Kealahoe Wastewater Treatment Plant R-1 Upgrade Project (Hawaii) - \$1,459,056; Elsinore Valley Municipal Water District, Regional Wastewater Reclamation Facility Expansion Project (California) - \$1,397,974; Long Beach Water Department, Expansion of Recycled Water System and Improved Efficiency in Water Reclamation of the El Dorado Duck Pond (California) - \$1,217,829; Long Beach Water Department, Tanks 19 and 20 Conversion Project (California) - \$692,578; Mojave Water Agency,

Upper Mojave River Groundwater Regional Recharge and Recovery Project Improvements (California) - \$2,659,802; and Padre Dam Municipal Water District, East County Advanced Water Purification Program (California) - \$4,000,000.

For detailed project descriptions and to learn more about the Title XVI Water Reclamation and Reuse Program, visit the website below. Through WaterSMART, Reclamation works cooperatively with states, tribes and local entities as they plan for and implement actions to increase water supply reliability through investments to modernize existing infrastructure and attention to local water conflicts.

On August 5 Reclamation published a funding opportunity for Title XVI Water Reclamation and Reuse Research Projects. It is for research sponsors to submit proposals to cost-share Title XVI Research activities that seek to address water supply challenges by establishing or expanding the use of water reclamation and reuse, improving existing water reuse facilities, and/or streamlining the implementation of state-of-the-art technology for new facilities. Closing date for applications is October 7, 2020.

For info: Reclamation website at: www.usbr.gov/watersmart/; Matthew Reichert, Grants Management Specialist, 303/ 445-3865

TRIBAL WATER SYSTEM NM
ADJUDICATION SETTLEMENT

Reclamation began construction on August 10th on a water system that will bring clean drinking water to approximately 10,000 people and ensure a reliable water supply for residents of the Pueblos of Pojoaque, Nambé, San Ildefonso and Tesuque, as well as some residents of Santa Fe County. The Pojoaque Basin Regional Water System is part of the Aamodt Settlement Agreement and was authorized by Congress under the Aamodt Litigation Settlement Act of 2010 to settle Indian water disputes in the Pojoaque Basin.

The water system will divert water from the Rio Grande in northern New Mexico. The system will include water treatment facilities, storage tanks, and transmission and distribution pipelines with the capability to supply up to 3.57 million gallons per day of drinking water. Phase one of the project includes water intake structures, a control building, 20 miles of water conveyance

pipeline, three water storage tanks and a water treatment plant on San Ildefonso, Pojoaque, and Nambe Pueblos.

For info: Mary Carlson, Reclamation, 505/ 462-3576 or mcarlson@usbr.gov

PENALTY/RESTORATION WA
AQUACULTURE ACCIDENT

Salmon will have better habitat with help from a \$332,000 penalty settlement with Cooke Aquaculture after the collapse of its floating pen near Cypress Island, Washington, in 2017. The settlement required that the fine be split, part going to an environmental project for regional salmon enhancement or habitat restoration and the other part going to the Washington Department of Ecology's (Ecology's) Coastal Protection Fund. Since the net pen collapse, Ecology has strengthened its permits to require additional preventative measures such as more frequent inspections and monitoring, improved maintenance procedures, and notification to tribes.

Ecology determined that the Skagit Fisheries Enhancement Group's Pressentin Park Habitat Restoration Project meets the requirements of the settlement and will receive \$265,000 from the Cooke Aquaculture penalty. This will help with their project to restore critical habitat for Puget Sound Chinook and other salmon in the Skagit River floodplain. Pressentin Park in Skagit County has both active (functional) and previous, no longer functioning, side channels. The restoration project aims to enhance the Pressentin side channel that hasn't been active for a long time. While old, abandoned side channels can happen naturally as a floodplain moves, this channel has also experienced impacts from historic homesteading activities and the construction of dams and the Cascade River Bridge.

This project has been in the works for six years. It's part of an ongoing partnership with Skagit County Parks and has funding from several other sources including the National Fish and Wildlife Foundation's Southern Resident killer whale (orca) research and conservation program. The Skagit Fisheries Enhancement Group will use the money from this settlement to fund the final phase of the project — construction that will restore full function of the side channel.

For info: Ecology Blog at: <https://ecology.wa.gov> >> July 30 Blog

September 16 **WEB**
Pollution Prevention Waste Management Workshop - Virtual Event, Hosted by Texas Commission on Environmental Quality & University of Texas Arlington; 8 am - 5 pm (CDT). For info: P2 Workshop, 512/ 239-0010 or www.P2workshop.com

September 16-22 **WEB**
Riverbank 2020 - Virtual Event, Fundraiser for Colorado Water Trust. For info: <http://coloradowatertrust.org/riverbank-2020>

September 15-16 **MT & WEB**
Buying and Selling Ranches in Montana Seminar - 5th Annual, Billings, Northern Hotel. Available Via Live Webcast. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

September 16 **WEB**
Federal Water Priorities: AWRA-WA Virtual Lunch Meeting, Speaker: Brett Walton of Circle of Blue; 12:00 pm to 1:00 pm PDT. Presented by American Water Resources Association - Washington Chapter. For info: www.waawra.org

September 16 **WEB**
SGMA and Adjudication Session - Western Groundwater Congress, Featured Session. For info: www.grac.org/events/302/

September 16 **WEB**
Virtual EPA Portland Harbor Quarterly Public Forum, 6:00 pm - 8:30 pm PDT. With Support from ODEQ and the Community Advisory Group (CAG); RSVP at: www.eventbrite.com/e/online-epas-september-16-portland-harbor-public-forum-with-deq-cag-tickets-116510322511. For info: Laura Knudsen, 206/ 553-1838, knudsen.laura@epa.gov or www.epa.gov/superfund/portland-harbor

September 16 **WEB**
NACWA Hot Topics in Clean Water Law Webinar, National Association of Clean Water Agencies Event. For info: www.nacwa.org/conferences-events/events-at-a-glance

September 16-22 **WEB**
Riverbank 2020 - Virtual Event, Denver Botanic Gardens. Fundraiser for Colorado Water Trust. For info: <http://coloradowatertrust.org/riverbank-2020>

September 17 **WEB**
Celebrate Water - Center for Environmental Law & Policy Annual Meeting & CLE Workshop, Virtual - View Live on CELP's Facebook Page: CLE 4:00 - 5:00 pm PDT; Celebrate Water Reception 5:30 pm - 8 pm. Honoring Prof. Bob Anderson with the Ralph W. Johnson Award & Celebrating CELP's 25th Anniversary. For info: <https://celp.org/celebrate-water-2020/>

September 17 **WEB**
Financing Options & Strategies for Groundwater Sustainability Plan Development Webinar, 11 am - Noon (PDT). Presented Free by Best Best & Krieger. For info: www.bbklaw.com/news-events/webinars

September 21-22 **Alberta**
Montney & Duvernay Shale Water Management 2020: Water Strategies for Northern Alberta Exhibition & Conference, Grande Prairie. Stonebridge Hotel. For info: <https://alberta.shale-water-management.com/?join=VR>

September 22 **US/WEB**
Troubled Water Webinar, Part I: "What's Wrong With What We Drink, and What Can Be Done", 2:00 pm ET; Parts 2 & 3 on 10/20 & 11/17. Presented by Global Water Works. For info: www.workcast.com/register?cpak=1448147292306883

September 29 **WEB**
Colorado River Basin Climate & Hydrology Webinar Series, Current Understanding of Processes, Patterns, and Variability. Presented by Western Water Assessment (University of Colorado Boulder). For info: <http://www.colorado.edu>

September 30 **CA/WEB**
Water Balance Data: Foundation for Building State's Water Resilience Workshop, Presented by California Dept. of Water Resources. For info: <https://register.gotowebinar.com/register/8363162927003783950>

September 30-Oct. 1 **NV**
13th Annual WaterSmart Innovations Conference and Exposition - CANCELED. 2021 Conference Oct. 6-7, Las Vegas. TBA. For info: <https://watersmartinnovations.com>

October 5-6 **OR/WEB**
Oregon Brownfields & Infrastructure Summit, Presented by NW Environmental Business Council. For info: <https://theoregonsummit.com/registration/>

October 5-9 **WEB**
WEFTEC 2020: The Water Quality Event & Exhibition - VIRTUAL Event, Morial Convention Ctr. Presented by Water Education Foundation. For info: www.weftec.org/future-weftec-schedule/

October 6 **WEB**
2020 AWRA-Washington Annual State Conference - Virtual Webinar, Presented by American Water Resources Association - Washington Chapter. For info: www.waawra.org

October 6 **WEB**
Interstate Council on Water Policy 2020 Virtual Annual Meeting, Start at 9:00 am MDT. Water Planning Focus. For info: Sue Lowry, ICWP, www.icwp.org or 307/ 630-5804

October 8 **WEB**
2020 Environmental Law: Year in Review Webcast, Cosponsored by the Environmental & Natural Resources Section of the Oregon State BAR; 8:30 am - 4:40 pm; Environmental & Natural Resources Topics, Endangered Species Act, CERCLA, Oregon Forest Law & Policy Updates, Clean Water Act, Ocean & Coastal law, Etc. For info: www.osbar.org/cle

October 8 **WEB**
Interstate Council on Water Policy 2020 Virtual Annual Meeting, Start at 9:00 am MDT. Water Data & Science Focus. For info: Sue Lowry, ICWP, www.icwp.org or 307/ 630-5804

October 8 **WEB**
Ensuring Equitable Involvement in Regional Water Planning - Virtual Summit, Day 1: 8:30 am - 1:00 pm PDT. Presented by the Santa Ana Watershed Project & the Local Government Commission; Support by the California Dept. of Water Resources; Engaging Marginalized Communities in Regional Water Management through Local Implementation of Integrated Regional Water Management. For info: www.lgc.org/summit/

October 8-9 **Alberta**
5th Annual Canadian Frac-Sand Exhibition & Conference, Calgary. The Westin Calgary. For info: www.canada.frac-sand-conference.com/?join=VR

October 8-9 **WEB**
PFAS Litigation in the Midwest Conference - VIRTUAL Event, Virtual Via Interactive Zoom Broadcast. For info: Law Seminars International, 206/ 567-4490, registrar@lawseminars.com or www.lawseminars.com

October 13 **WEB**
Interstate Council on Water Policy 2020 Virtual Annual Meeting, Start at 9:00 am MDT. Legislation & Policy Focus. For info: Sue Lowry, ICWP, www.icwp.org or 307/ 630-5804

October 13 **WEB**
Ensuring Equitable Involvement in Regional Water Planning - Virtual Summit, Day 2: 8:30 am - 1:00 pm PDT. Presented by the Santa Ana Watershed Project & the Local Government Commission; Support by the California Dept. of Water Resources; Engaging Marginalized Communities in Regional Water Management through Local Implementation of Integrated Regional Water Management. For info: www.lgc.org/summit/

October 13-15 **WEB**
Western States Water Council Fall 2020 (194th) Meeting, Zoom Webinar - No Charge for Attendance. For info: www.westernstateswater.org/events/wswc-fall-2020-194th-meetings/

October 14 **WEB**
Ensuring Equitable Involvement in Regional Water Planning - Virtual Summit, Day 3: 8:30 am - 1:00 pm PDT. Presented by the Santa Ana Watershed Project & the Local Government Commission; Support by the California Dept. of Water Resources; Engaging Marginalized Communities in Regional Water Management through Local Implementation of Integrated Regional Water Management. For info: www.lgc.org/summit/

October 15 **WEB**
Interstate Council on Water Policy 2020 Virtual Annual Meeting, Start at 9:00 am MDT. Interstate Water Management Focus; Annual Members' Meeting. For info: Sue Lowry, ICWP, www.icwp.org or 307/ 630-5804

October 15 **US/WEB**
Innovation Roadmap for Water Utilities Event, Presented by American Water Works Association. For info: www.awwa.org/Events-Education/Events-Calendar

October 16 **US/WEB**
Legal Issues in EPA's Lead & Copper Rule Roundtable, Presented by American Water Works Association. For info: www.awwa.org/Events-Education/Events-Calendar

October 19-20 **WEB**
Tribal Water in California Seminar - 7th Annual, Virtual Via Interactive Zoom Broadcast. For info: Law Seminars International, 206/ 567-4490, registrar@lawseminars.com or www.lawseminars.com

October 20 **US/WEB**
Troubled Water Webinar, Part 2: "What's Wrong With What We Drink, and What Can Be Done", 2:00 pm ET; Part 3 on 11/17. Presented by Global Water Works. For info: www.workcast.com/register?cpak=1448147292306883

October 24 **WEB**
WaterWatch of Oregon's 18th Annual Celebration of Rivers, Virtual Event: Details TBA. For info: WaterWatch, 503/ 295-4039 or www.waterwatch.org

October 25-27 **FL**
2020 Smart Water Summit, Ponte Vedra. Sawgrass Marriot Resort & Spa. Water Utilities Conference & Exhibition. For info: www.smartwatersummit.com



260 N. Polk Street • Eugene, OR 97402

PRSR STD
US POSTAGE
PAID
EUGENE, OR
PERMIT NO. 921

CALENDAR

(continued from previous page)

October 26-30 **WEB**

2020 Tribal Data - VIRTUAL Conference, Powered by Tribes in the Exchange Network. Environmental Data Sharing, Management & Analysis through Informational Sessions & Interactive Workshops. For info: www.tribalexchangenetwork.org

October 27-28 **WEB**

Central/Western Annual US Power Plant Conference - VIRTUAL Event, Latest Techniques, Research, Processes, Approaches, Case Studies, and Practices in Power Plant Water Management. For info: <https://lmnpower.com/>

October 27-28 **US/WEB**

Annual US Water Treatment Conference, Latest Techniques, Research, Processes, Case Studies & Practices. Presented by LMN Power. For info: www.lmnpower.com/water-treatment-conference

October 28-29 **WEB**

9th Annual Gulf Coast Water Conservation Symposium - Virtual Event, Integrating Water Management on the Texas Gulf Coast: Moving Forward with a One Water Approach. For info: events@harcsearch.org

October 29-30 **WEB**

PFAS Litigation in the Northeast Seminar - VIRTUAL Event, Virtual Via Interactive Zoom Broadcast. For info: Law Seminars International, 206/ 567-4490, registrar@lawseminars.com or www.lawseminars.com

November 3-4 **WA & WEB**

Washington Water Code: Law, Policy & Planning Conference, Seattle. Available Via Live Webcast; PROMO Code SPP50 for \$50 off for TWR Readers. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

November 3-13 **WEB**

2020 Data Academy - Tribal Data, Powered by Tribes in the Exchange Network. Environmental Data Sharing, Management & Analysis through Informational Sessions & Interactive Workshops. For info: www.tribalexchangenetwork.org

November 5-6 **OR & WEB**

29th Annual Oregon Water Law Conference, Portland. Available Via Live Webcast; PROMO Code SPP50 for \$50 off for TWR Readers. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

November 9-11 **US/WEB**

American Water Resources Association Annual Conference, For info: www.awra.org

November 10-11 **US/WEB**

Dam Safety Interactive Course: "What Every Dam Owner Should Know About Dam Safety." Presented by EUCI. For info: www.euci.org

November 17 **US/WEB**

Troubled Water Webinar, Part 3: "What's Wrong With What We Drink, and What Can Be Done", 2:00 pm ET. Presented by Global Water Works. For info: www.workcast.com/register?cpak=1448147292306883

2020 AWRA Washington Annual State Conference

The Challenges of Change: *How Washington is Responding to Interdisciplinary Changes to Water Resources*



Photos by Tom Ring



October 6, 2020
Virtual Webinar



Details and Registration at: www.waawra.org