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All Over the Map: The Diversity of Western Water Plans

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All Over the Map: The Diversity of Western Water Plans

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Abstract

Water presents a complex challenge to western state governments. Water is scarcer in the West than in the East and western states face challenges unknown to eastern ones. The textual analysis of their state water planning summaries produced by the US Army Corps of Engineers between late 2008 and 2009 confirms the differences in their policy priorities. However, there is also a wide variance among western states' policies as the diversity in their water plans show.

Water planning is a challenge not only because of the variability of the resource but also because water basins do not map our local, regional, or state political divisions and many types of users compete for the resource. In addition, states have to conform to certain federal constraints, like the Endangered Species Act, tribal rights, or interstate compacts, which curtail their leeway in deciding how to allocate and manage their water.

Even accounting for these external constraints, the content of western water plans varies substantially. A typical state plan includes from an inventory of water uses, demand projections, and management recommendations. But not all state plans conform to this scheme. Regarding length, topics covered, frequency at which they are updated, and public involvement, they are all over the map. Many reasons might be behind the disparity, but among those, the funding allocated to planning and the relative power of different interest groups are quite salient.

Water planning is a necessary tool to manage water, particularly in a climate change scenario. Planning is a state task but we believe the federal government is in a good position to promote standardized data collection on state water supply and by offering grants to the states. Good information and an informed menu of possible choices is a realistic goal that could in theory achieve bipartisan consensus and move us closer to an integrated and sustainable water resources management.

All Over the Map: The Diversity of Western Water Plans

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1. Introduction

Water presents a complex challenge to western state governments. It is both a private good allocated as a property right to individuals, organizations, and states, and a shared public good for recreational and ecological purposes. Federal laws, projects, and land ownership shape western water policy in critical ways even though water planning and management are primarily subnational responsibilities. On top of these complexities, water is scarcer in the West than in the rest of the country, a situation that has become more problematic with population growth and climate change. Thus, competition among users is rampant.

One potentially important water management tool is the state water plan. While specific content varies widely, state water plans typically include an inventory of current water supply and demand plus recommendations for meeting future demand projections and improving water quality. But translating a state perspective into a plan of action is no simple matter due to jurisdictional complexity. All too often, government boundaries and the geography of natural watersheds do not coincide.

Ideally, water planning would be coordinated within natural watersheds, which rarely map neatly into political jurisdictional boundaries. Given the wide range of water issues across local jurisdictions, effective water planning and management necessarily require both deciding the best level for tackling a given problem (i.e., the “problem-shed”) and overcoming the obstacles of political fragmentation.

State water plans are the main focus of this paper. States have power over water rights (i.e., the quantitative legal allocation of water use). Water rights essentially constitute a legal watershed,¹ creating a transmission chain that links available supply and competing demands. Water impacts economic development and citizens’ quality of life. Considerations of water supply are intertwined with those of water quality. For example, as streamflow decreases or a groundwater basin is depleted, pollutants are concentrated in the remaining water.

¹ Barton H. Thompson, Jr., “A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?” 42 *Env’tl L.* 201, 228 (2012), (suggesting that Integrated Water Resources Management should be undertaken at the state level despite the fact that they do not map watersheds because, among other reasons, states are the units that own the water in their jurisdiction and they have agencies that manage water at the state level).

For states west of the Mississippi River, securing a reliable water supply for settlers has been a challenge since Westward Expansion and Manifest Destiny. Western water plans helped to develop large-scale water projects for agriculture and fostered population growth. Originally, the federal government was the main driving force behind water resource planning, but over the last 50 years water planning has changed from a national to a predominantly state endeavor.

The high-water mark for national water planning was in the sixties and seventies. The 1965 Water Resources Planning Act supports federal and state river and basin planning. Spurred by controversies among states over the Colorado and Columbia rivers, Congress created a National Water Commission (NWC) in 1968 and charged it with developing a “comprehensive review” of national water resource problems.² In 1973, the NWC published *Water Policies for the Future: Final Report to the President and to the Congress of the United States*. The Reagan administration terminated the commission in 1981, and there has been no successful attempt at national water planning legislation since 1965. In 1996, Congress chartered the Western Water Policy Review Advisory Commission to make recommendations regarding the proper role of the federal government in western water management for the next 20 years. In 1998, the commission published *Water in the West: Challenge for the Next Century*.³

Congress, however, continues to shape state water policy by appropriating money for specific projects and providing technical assistance through federal agencies. Federal laws such as the Clean Water Act and the Endangered Species Act are important federal constraints on state water policy. States also have to conform to tribal rights and interstate compacts. Still, there is no federal mandate to undertake state water planning or substantial federal financial incentives to encourage states to engage in water planning.⁴ Consequently, some but not all states have statewide planning efforts.

Of the seven western states that have statewide water plans,⁵ California is at the forefront. It has a long history of water planning with efforts dating from as early as 1873.⁶ It issued its first official statewide plan in 1930.⁷ California’s detailed water plan reflects its commitment to integrated and inclusive water management at multiple jurisdictional levels.⁸

² Betsy A. Cody and Nicole T. Carter, “35 Years of Water Policy: The 1973 National Water Commission and Present Challenges,” Cong. Res. Service, at 5 (2009).

³ For an overview of federal policy on these matters, see Janet Neuman, “Are We There Yet? Weary Travelers on the Long Road to Water Policy Reform,” 50 *Nat. Res. J.* 139 (2010).

⁴ Thompson, *supra* note 1, at 203–04.

⁵ See Tables 1 and 2. Hereinafter, all the facts about water plans described in this article can be found in the abovementioned tables.

⁶ In 1874, a report to the Board of Commissioners to the US Congress could be considered the first California Water Plan; Board of Commissioners, 42nd Cong., Report on the Irrigation of the San Joaquin, Tulare, and Sacramento Valleys of the State of California (1874). For more information about the different historical planning initiatives in California, see Ctr. for Watershed Management at UC Davis, Resources to learn about water in California, <<https://watershed.ucdavis.edu/education/water-primer?destination=node/38>>.

⁷ DWR, California Water Plan (1930), <<http://cee.engr.ucdavis.edu/faculty/lund/fun/CalWaterPlan1930.pdf>>

⁸ Thompson, *supra* note 1, at 213.

But California's approach is not typical. Statewide water plans, where they exist, vary tremendously among western states, despite the states' similarities in having a prior appropriation water rights system,⁹ federal lands with associated water rights, tribal claims, water scarcity, and the Bureau of Reclamation's role in developing western irrigation. These common features have not forged a strong commonality in interests, strategies, and institutional structure.

This paper will identify the differences in western water plans, discuss some of the factors behind the differences, and draw lessons from the states' varied experiences. First, we do a textual analysis of the Army Corps of Engineers' summary¹⁰ of water planning in 2008–2009 to highlight differences between western and nonwestern states. Then, we focus on the six other western states besides California that produce statewide water plans. Our findings are based on case studies, interviews, and careful reading of the water plans.

Our main themes are as follows. Western states are more focused on supply and conservation issues than the rest of the country. Even so, there is much variation among western states in their concerns. This diversity is reflected in the substantive content of the seven statewide water plans. They vary in the amount of information they contain and the specificity of their recommendations. Since none of them have the force of law, water plans serve largely as sources of information and forums for consensus building among stakeholders. To this end, we propose that the federal government fund a grant program that incentivizes states to collect water demand and supply information in a more uniform and accurate manner that could promote water planning in any way the states see fit.¹¹ A step further, beyond the purposes of this paper, would be to offer a water plan framework that states could voluntarily follow since the framework would decrease planning costs.

2. The Distinctiveness of Western Water Issues

Westerners like to think they are distinct from the rest of the US, but is this reflected in their water concerns? Since only a subset of western states produce water plans, we turn to state water planning summaries produced by the US Army Corps of Engineers between late 2008 and 2009 to help answer the question.¹² The goal of the summaries is “to better understand how states are planning and managing water resources and to ultimately determine a more effective role for the Federal government in support of state water planning and management initiatives.”

⁹ Some states, like California, had or have mixed systems where riparian rights exists along with prior appropriation ones. Barton H. Thompson, Jr., Johan D. Leshy, and Robert H. Abrams, *Legal Control of Water Resources* 210 (2013)

¹⁰ US Army Corps of Engineers, *State Water Planning Summaries*, <http://www.building-collaboration-for-water.org/StateWaterPlanningSummaries.asp>.

¹¹ The Bureau of Reclamation has a program called “WaterSMART,” which provides funding to different institutions for the development of new tools that allow better management of water resources, which include projects devoted to improve the assessment of water supply and demand <<http://www.usbr.gov/WaterSMART/cat/prev.html>>. (For example, the Desert Research Institute in Nevada will receive \$126,014 to develop and evaluate regional climate downscaling techniques that will benefit understanding future surface and groundwater supplies).

¹² See *supra* note 10.

The summaries document four elements: (a) the processes by which the states undertake water resources planning, (b) how states manage water resources, (c) state efforts to meet future water needs, and (d) critical issues and obstacles states face in water resources planning and management. The state summaries were developed from reference materials (water plans, basin-wide plans, and other water management documents made publicly available by the states) and interviews conducted by the Army Corps of Engineers. The Corps created 55 summaries that covered 50 states, DC and four interstate water planning commissions.

Our analyses include all 50 states plus DC. We use the 100th meridian as a boundary between “western” and “eastern” states, but we include the six states (North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas) that straddle the 100th meridian as western states. Based on this classification, we have 19 western states and 31 eastern states plus DC.¹³

For each of these 51 summaries prepared by the Corps of Engineers, we converted the pdf file into plain text format, removing the cover page and reference section. We combined the files into a single collection of documents, commonly referred to as a “corpus.” Since we are concerned primarily with the key words in the document, we removed common English stopwords (e.g., the, about, and) and all the state names. To reduce the number of words that have the same meaning, we employed a stemming procedure to retain only the root component of each word (e.g., the root term for “manages,” “manage,” “management” is “manag”). We removed words that have fewer than three characters. After these procedures, our corpus contains 7,256 unique words, or “monograms.”¹⁴

Sometimes key words may appear as a phrase instead of a monogram. For example, “climate change” is given significant consideration in some states. To identify key phrases, we searched for frequent “bigrams.” A bigram is a two-word phrase.¹⁵ Similar to the procedure above, we removed common stopwords and state names, employed stemming procedure, and excluded both infrequent (less than 10 times) and extremely frequent (over 150 times) phrases. Our final corpus included 982 bigrams.

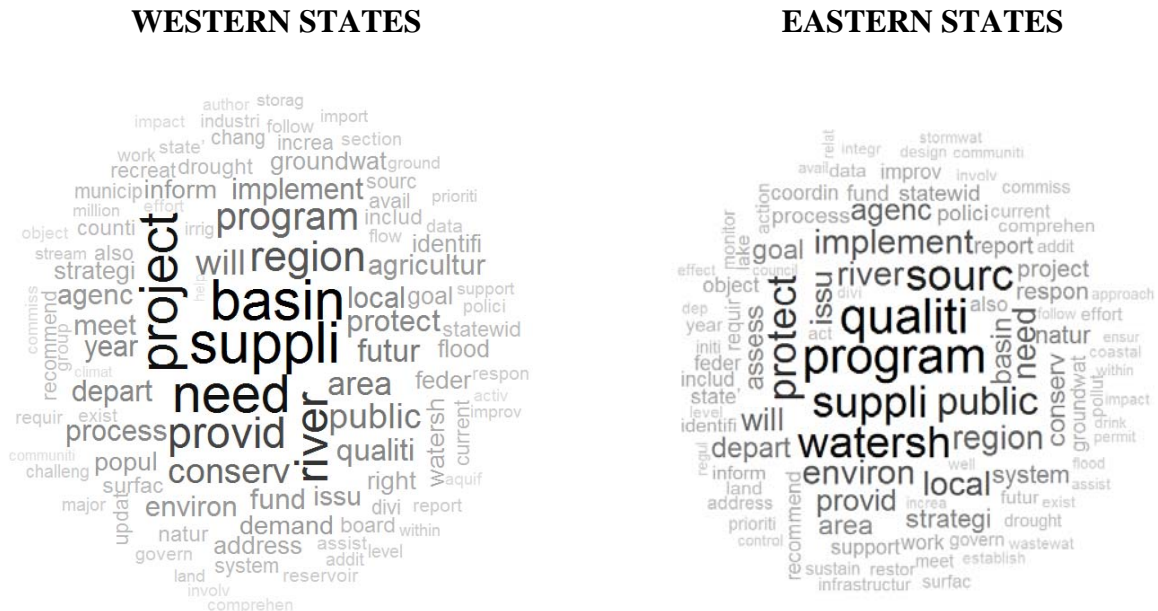
Computing the differences in relative frequency of 1,449 monograms in the western and eastern documents and retaining only those terms that are highly differentiated (where p-values are less than 0.01), Figure 1 displays the terms in two word clouds: the first for western states and the second for eastern ones. Root words such as “project,” “need,” “suppli,” “future,” “popul” appear more frequently in western documents than eastern documents while “discharg,” “drink,” “wastewat,” “pollut,” “stormwat,” “coastal” appear more frequently in eastern documents.

¹³ The 19 western states are: North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Arizona, Washington, Oregon, Nevada, California, Hawaii and Alaska.

¹⁴ A close inspection reveals two extremes: many words appeared infrequently (less than 10 times) and several words appeared with extremely high frequency (over 1,500 times). For example, “water” appeared over 9,000 times in the corpus, “plan” showed up over 4,000 times. We removed both ends as infrequency indicates a lack of importance and extreme frequency suggests a lack of uniqueness. Our final corpus retained 1,449 “monograms.”

¹⁵ We also examined trigrams (three-word phrase) and found very few meaningful trigrams. Hence they are not reported here.

Figure 1. Difference in Western and Eastern State Plan Word Clusters



The bigrams in Figure 2 reveal that the western documents more frequently reflect the different types of water use, conservation, and interactions with the federal government, suggesting that there is far more competition for water in the West. Eastern concerns are more oriented towards water quality, environmental protection, and coastal issues.

We see across state variations within the western states. Figure 3 displays the bigrams with the words along the x-axis and the frequency of mention along the y-axis. We labeled the state that has the most frequent use for each word. For example, California appears to be more preoccupied than other western states with climate change, flood management, public review, and land use. In short, not only are there differences between western and eastern states, there is diversity among western states determined by natural features, politics, and history. This variation is all the more evident upon close inspection of the western water plan documents produced by each state.

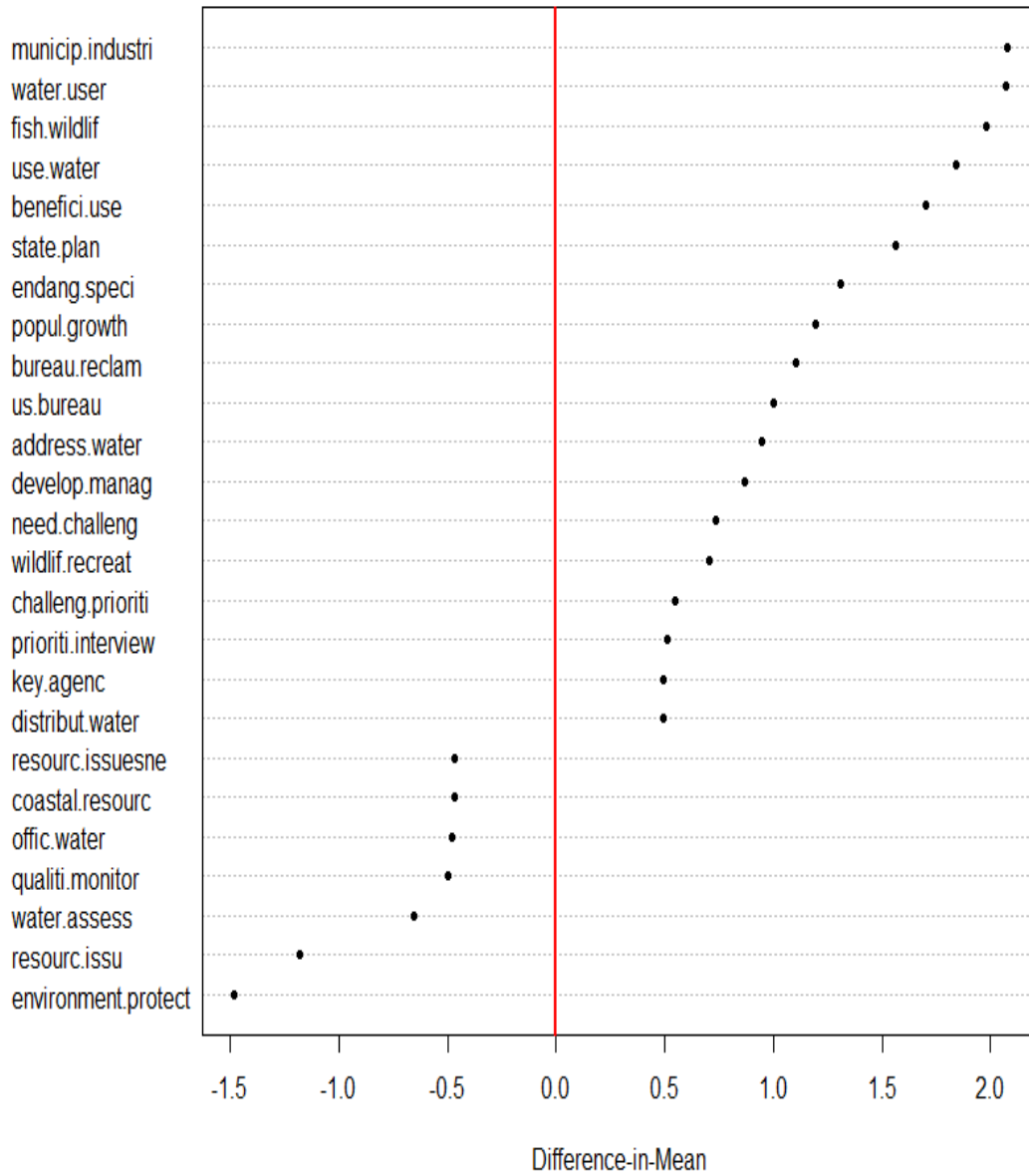
3. The Wide Diversity of Western Water Plans

3.1. Enactment

We turn next to the seven Western state water plans: California, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.¹⁶ They vary in history, form, and content. To begin with, they were enacted in different ways and at various times. Montana initiated its water planning process as part of the 1967 Water Resources Act in the middle of the prime national water-planning period. As a result, Montana’s process has evolved

¹⁶ All the data references in this section are contained in Table 2.

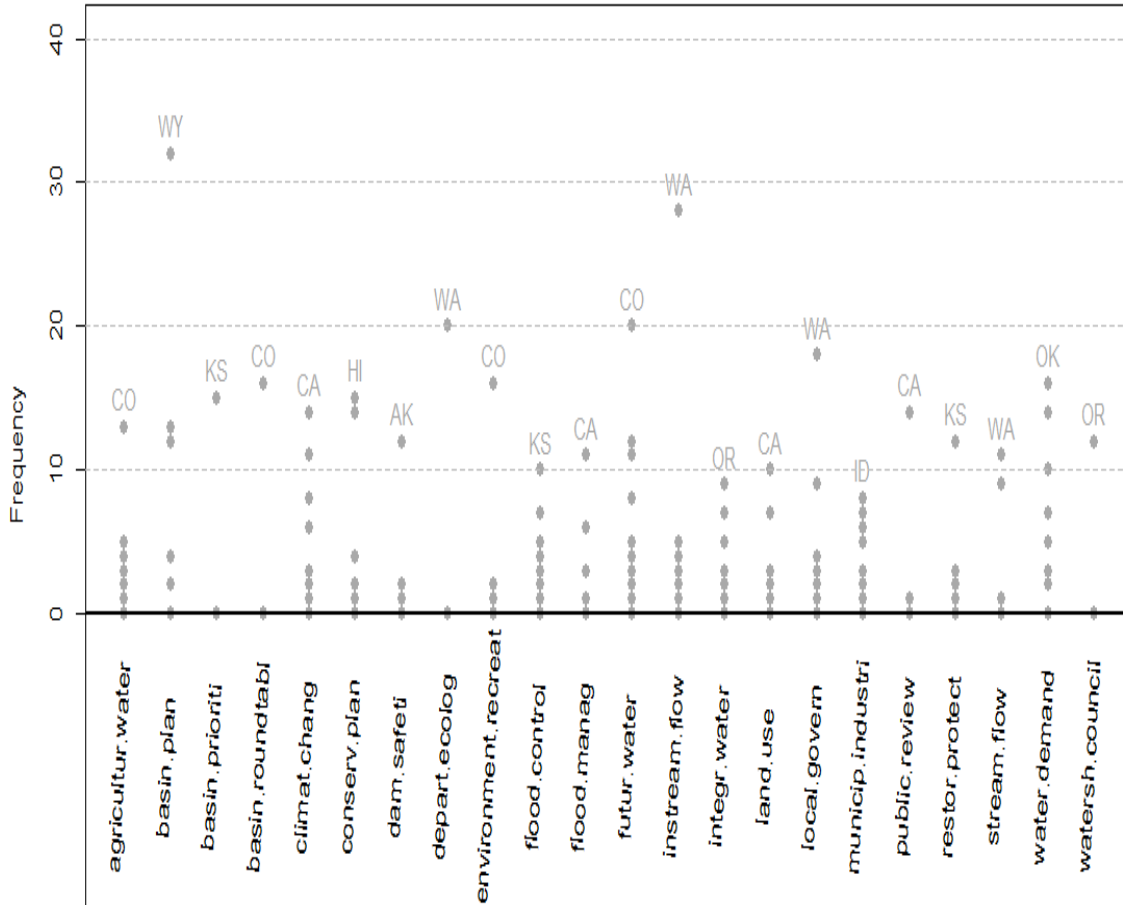
Figure 2. Bigram Differences between East and Western States Water Planning Foci



over time and produced several updates. Conversely, New Mexico passed its enacting legislation relatively recently in 2003, and has to date produced only one version of a state water plan.

The enacting legislation itself varies in length and scope. In some cases, it specifies the topics to be covered, the time allotted to create the water plan, and the budget for these activities. Nevada’s framework provides a list of topics to cover while New Mexico’s lays out how the plan should be structured. Montana and Wyoming’s enacting legislation discusses recommended content for the plans as well.

Figure 3. Differences across Western States



Some enacting legislation explicitly states the planning exercise’s goals, but some do not. Nevada, for instance, envisions state water planning as a way to assist the state, local governments, and citizens in developing effective plans for water use.¹⁷ New Mexico’s plan is intended as a management tool.¹⁸ Utah and Wyoming do not state a purpose in their enacting legislation.¹⁹ The purpose is never to control water management since all water plans are nonbinding but to provide guidelines for the government agencies managing water.

¹⁷ Nev. Rev. Stat. §540–101 and 1967 Montana Water Resources Act, Rev. Code Mont. §89–101.2 (1947)

¹⁸ N.M. Stat. Ann. § 72–14–3.1

¹⁹For Utah the mandate to enact the plan was established in 1967, and it is stated in Utah Code §73–10–15 while for Wyoming it is established on Wyo. Stat. § 41–2–107 (Lexis 2014)

3.2. Planning cycle

Most western states do not have a specific planning cycle. New Mexico stands alone with a designated five-year time frame between updates but has not been able to keep to this schedule.²⁰ Wyoming and California also update their plans periodically. But the other states do not have specified cycles.²¹ Montana, Idaho, and Nevada have only updated their plans when prompted by their respective legislatures. Given the arduous nature of water planning, it is not surprising that it is mostly undertaken sporadically, which has negative consequences for updating information and integrating water management.

3.3. Procedure: Drafting, Public Participation, and Adoption

The process of formulating current water plans usually requires some sort of advisory board or committee that includes stakeholders from every major interest group. The composition of Nevada's advisory board is dictated by the state's enacting legislation. In Idaho and Wyoming the state water planning agency chooses the advisory committee. Utah and New Mexico are the only states that do not directly involve stakeholders in the planning process. Stakeholders generally include irrigators, municipalities, and environmental and conservation groups. Public involvement and input varies widely.

The California Water Code requires the Department of Water Resources to update the water plan at least every five years with the assistance of a public advisory committee. The advisory committee began work on the 2013 update in the fall of 2012. Stakeholders represented different interest and place-based perspectives, and meetings were held across the state and online to encourage widespread public participation. The committee consulted with federal agencies and a tribal advisory committee, and posted hundreds of comments they received online for public inspection. Public involvement in the Nevada plan was also significant with over 50 public forums as a point of pride in their planning process.²² Utah had the fewest public input meetings, conducting only six regional meetings across the state.

In all states except Wyoming, the legislature must adopt the state water plan. Some water plans provoke political controversy. Members of a committee within Idaho's legislature, for instance, objected to any conservation-related language.²³ At the same time, enthusiastic legislative support is no guarantee of a plan's prospects. Nevada's legislature gave its first new water plan in 25 years a standing ovation while passing it easily, only to run into opposition later because it rankled rural farming and ranching interests, some of

²⁰ See Table 1.

²¹ *Id.*

²² Interview with Naomi Duerr, Director, Division of Water Planning, Nevada Division of Water Resources.

²³ Posting of Rocky Baker to Idaho Statesman, "Lawmakers sought to cut climate and endangered species out of state water plan," <<http://blogs.idahostatesman.com/lawmakers-seek-to-cut-climate-endangered-species-out-of-state-water-plan/#storylink=cpy>>.

whom regarded water planning as “communistic”²⁴ even if it was intended only as a guideline not a mandate.

3.4. Supply and Demand Data

There is a large disparity in the form, content, and specificity of the plans. Nevada’s plan is 1,000 pages, making it one of the most comprehensive water plans in the West. Idaho, New Mexico, and Utah’s plans are less than 80 pages and have far less information than Nevada, Wyoming, and Montana’s plans. The longer plans in the data set (Nevada 1,000, Wyoming 524, Montana 242) are divided into several volumes and provide detailed information on the planning process and water issues within the states. California Water Plan update 2013 has three volumes: data and strategies, regional reports, and resource management strategies.²⁵

Accurate information—such as an inventory of current uses and allocations of water, expected variations in water supplies, and current and projected demands—is a critical component of water planning. But here, too, there is enormous variation. Some plans are grounded in numerical data while others are more generically descriptive. Idaho’s plan lacks any statewide numerical data. Montana and New Mexico both have some data, but exclude important figures like water supply and per capita water use. Nevada, Wyoming, and Utah provide more data tables and graphic summaries with commentary. Nevada and Wyoming include socioeconomic data and relevant geographic information.

Adjudication over water rights often incentivizes the quest for more accurate information. Many western states have either not recorded all their water rights or are in the process of doing so. Indeed, the need to allocate water rights is sometimes acknowledged in a state water plan, but inaccurate and incomplete data can undermine the goal.

Water rights and adjudications are especially prominent in the New Mexico and Idaho water plans, and both are still in the process of adjudicating water rights. In New Mexico, 80% of the state’s water is unadjudicated, meaning there has been no legal determination of senior water rights. In a water shortage, the state will be unable to allocate water in the proper order until this is resolved.²⁶ As New Mexico’s state water planner, Angela Bordegray, put it, “You cannot plan until you know who owns what.”²⁷

Idaho, while it has almost finished its adjudication process, still needs to deal with water rights in the Snake River basin, which provides more than 80% of southern Idaho’s water supply. Farmers in central Idaho were using water from the Snake River for irrigation to the point that too little water was flowing through Idaho Power’s hydroelectric power plants and the company was unable to meet electricity demands. The same upstream farmers sued Idaho Power for failing to defend its water rights, which increased

²⁴ Interview with Tom Myers, a researcher and consultant in hydrogeology and water resources. See also Jane Braxton Little, “A Desert State Axes Water Planning,” *High Country News*, Nov. 20, 2000, <<http://www.hcn.org/issues/191/10106>>.

²⁵ DWR, Final California Water Plan Update 2013, <<http://www.waterplan.water.ca.gov/cwpu2013/final/index.cfm>>.

²⁶ Interview with Conci Bocum, former president of the board of directors of the New Mexico Water Dialogue.

²⁷ Interview with Angela Bordegray, water planner at New Mexico Office of the State Engineer.

farmers' electricity rates. The farmers won, and Idaho Power was forced to counter sue. As a result, the attorney general of Idaho and the Idaho Power president came up with the Swan Falls Agreement, which set in motion the Snake River Adjudication, which has been going through state courts since 1987.²⁸

3.5. Goals

The goal of water plans is to protect and secure a state's water resources. Differences in how to achieve that goal are partly determined by the state's natural endowment and economy, but politics play a role as well. To a certain extent, all state water plans cover core issues such as water supply, water use, and water quality. Nevada's plan covers 14 water issues under five major categories: water supply and allocation, water quality, resource conservation, flood management, and water planning.

Not all plans follow this model, and some are structured along issues more relevant for the particular state. For example, Montana has eight specific sections that focus on issues such as agricultural water use, hydropower licensing, and state water rights. Idaho's plan contains seven sections, but emphasizes conservation, optimum use, and management, and its last four sections deal with regional water plans. In sum, all plans cover a baseline of standard issues, but each plan's topical section is slightly different.

As we might expect in the arid West, all plans concentrate on meeting future water demands but adopt different strategies to do so. New Mexico prioritizes drought management and interstate compacts. Utah and Wyoming emphasize water resource development, while Nevada concentrates on interbasin transfers and water quality. Environmental goals are referenced in varying ways. New Mexico addresses global warming and discusses the potential effects in a separate state drought plan.²⁹ Idaho includes a section on climate variability but does not define causes of climate variability as anthropogenic.³⁰ All the states analyzed fall far short of California's lengthy climate change adaptation strategy discussion in its 2009 California State Water Plan³¹ or the full chapter devoted to future water uncertainties in the 2013 update.³²

Western water plans necessarily acknowledge federal laws and mandates like the Endangered Species Act and Wild and Scenic Rivers Act. This includes information about in-stream flows, habitat restoration, and preservation. Montana is the only state water plan without a mention of the status of the Endangered Species Act. Other states include this environmental information as part of an analysis of the states' natural resources.

²⁸ Interview with Shelley Davis, attorney at Barker Rosholt & Simpson, LLP, Idaho.

²⁹ New Mexico Office of the State Engineer/Interstate Stream Commission, *The Impact of Climate Change on New Mexico's Water Supply and Ability to Manage Water Resources* (2006), <<http://www.nmdrought.state.nm.us/ClimateChangeImpact/completeREPORTfinal.pdf>>.

³⁰ Idaho Water Resource Board, *Idaho State Water Plan 40* (2012), <<http://www.idwr.idaho.gov/waterboard/WaterPlanning/Statewaterplanning/PDFs/ADOPTED%20State%20Water%20Plan%202012.pdf>>.

³¹ <<http://www.waterplan.water.ca.gov/cwpu2009/index.cfm>>.

³² California Department of Water Resources, *California Water Plan 2013 Update, Public Review Draft, Chapter 5* (2013), <http://www.waterplan.water.ca.gov/docs/cwpu2013/2013-prd/Vol1_Ch05_ManagingUncertain_PubReviewDraft_wo_JW.pdf>.

3.6. Recommendations

The diversity of water planning extends to recommendations. Some recommendations are intended to guide state, regional, and local water policy development, while others only offer the most basic advice. Water agency officials are a primary audience. Some plans designate which agency is deemed responsible for each action or how they should be funded. This level of specificity increases the chances of implementation.

Wyoming and Utah treat planning very much as a water inventory. Their state plans provide resource and broad management information as education for regional and local water planners. Wyoming devotes one volume of its water plan to background information about the economy, demographics, water uses, water demands, and other relevant state resource information. New Mexico, Nevada and Montana focus heavily on policy recommendations, while others are more deferential to regional measures.

Although it is only 78 pages long, New Mexico's water plan provides the most comprehensive set of policy instructions. It contains 20 areas for policy improvement and gives detailed recommendations and a policy statement for almost every important water issue. Each policy statement is accompanied by implementation strategies and responsibilities for associated state agencies, clearly an attempt to overcome substantive fragmentation among agencies. While there are many topics discussed, the section on drought management gives the most detail by providing policy improvements for land development, data collection, agriculture, drinking water, and the environment.

Montana and Nevada's plans provide similarly detailed recommendations. Montana's plan provides specific policy options, legislative and administrative action items, financial requirements, and funding strategies. Nevada's plan presents over 100 recommendations of varying specificity and detail for 14 water issues. The recommendations allocate responsibility to appropriate state agencies and attempt to prioritize the different recommendations, designating interbasin transfers and water monitoring as the top action items.

Idaho and Utah's recommendations are less detailed. Idaho's plan gives implementation strategies for over 30 water issues but does not identify which agency is responsible for carrying out the improvements. The recommendations highlight a problem and identify possible actions to fix it. Utah's water plan is even less specific; it is the only plan that does not contain a policy recommendations section, but its 2001 water plan lists several possible technology and management strategies.

Wyoming provides recommendations to improve the water planning process but fails to provide recommendations for actual water management. Instead, the plan lists and scores potential projects for each basin, taking into account both monetary and non-monetary factors. A section on potential federal and state funding sources follows the project recommendations.

3.7. Other Aspects of Plan Diversity: Regions, Tribes, and Interstate Compacts

3.7.1. Regional Plans

Many states have regional water plans, which allow states to narrow the planning focus and confront many area-specific water issues. Regional planning may follow the lines of political divisions or the water basins. Utah, Wyoming, and California are the only

states that produce a congruent set of regional plans for all hydrographic basins. Wyoming has the most comprehensive regional plans incorporated into their state plan.

Idaho lies in the middle of the spectrum, with regional sections of the state plan grouped into four major basins. Nevada devotes a subsection to a summary of regional efforts. New Mexico and Utah do not include any regional segments in their state plans, although each of Utah's 11 hydrographic regions provides its own plans with information that mirrors the form of the state plan. Utah has updated the regional plans on an "as-needed" basis from 1993 to 2011. California and Wyoming update theirs with every state plan.

Local water authorities provide Montana, Idaho, and Nevada's regional water planning and do not cover all the state regions. Idaho summarizes their four regional plans in the second half of the state plan. Nevada and Montana reference regional planning but do not include the plans in the state plan. New Mexico produces a comprehensive set of regional plans, but the regions follow political boundaries rather than watershed or hydrographic basins. This results in data collection overlap because the basins are shared between different political divisions. New Mexico's regional plans are not incorporated in state planning, which they acknowledge is a problem.

3.7.2. Pueblo and Tribal Rights

State water plans also have to conform to various external constraints: pueblo/tribal rights, interstate compacts, and federal laws such as the Endangered Species Act. They are external in the sense that they are dictated by federal recognition of tribal sovereignty or water agreements with other states. While long-disputed tribal waters rights continue to be a great source of uncertainty for many western states,³³ current water plans tend to avoid disputes over water with the tribes.³⁴ California, for instance, has a Water Plan Tribal Advisory Committee that ensures input from the tribes on its water plan. Similarly, information in the water plans seems intended to show that states are complying with interstate compacts.

States must respect the water rights of tribes or pueblos, but this can be problematic because the rights are defined according to narrative standards that cannot be easily determined or definitively quantified. Broadly, tribes are entitled to water adequate to fulfill the purposes of their reservation.³⁵ Pueblo rights are based on the Treaty of Guadalupe Hidalgo and grant certain city settlements the right to use water from the stream or aquifers in the city's territory to serve their needs. Such formulations imbue historical water rights with considerable uncertainty.

New Mexico has 22 pueblos and tribes. Tribes generally have senior water rights over all other claims. Similar to interstate compacts, because tribes are technically sovereign nations, the state of New Mexico has to ensure that they comply with water compacts made with the tribes and with pueblo rights or risk expensive and lengthy litigation. Accordingly, there was an extensive section on compliance with pre-existing Indian tribes water rights in the New Mexico plan.

³³ Stephen H. Greetham, "Water Planning: An Opportunity for Managing Uncertainties at the Tribal-State Interface," 64 *Okla. L. Rev.* 593, 610 (2012).

³⁴ *Id.* at 612.

³⁵ The paramount decision on this topic is *Winters v. United States*, 207 U.S. 564 (1908).

Idaho's Snake River Water Rights Act (2004) created a fund for the Nez Perce tribe to acquire land and water rights, in order to restore or improve fish habitat, and for fish production, agricultural development, cultural preservation, water resource development, or fisheries-related projects.³⁶ This tribal agreement affects overall water planning in the state and is discussed at length in the state water plan.

3.7.3. *Interstate compacts*

Interstate compacts are binding for states that sign them and impact the water planning process. The pacts establish how much water is allocated to each state from shared interstate rivers. Proper planning can help ensure that a state meets its compact obligations and can be a preventive strategy if litigation arises, bolstering the evidence that the state is fulfilling its compact obligations. Data on water entering and leaving the state are usually estimated, but can be useful evidence in interstate conflicts.

All of the western states studied except Idaho and Montana are signatories to the Colorado River Compact, which divides water from the Colorado River and apportions it to the seven states that signed the compact in 1922. Utah currently uses only about half of its allotment, in part due to a lack of infrastructure.³⁷ In the most recent planning process, two new water storage projects were initiated that will allow Utah to capture the rest of its allotted water.

Wyoming, Nevada, and New Mexico need to ensure that they are delivering the required allotment of water to states downstream. In the case of New Mexico, they also have to ensure that they are receiving their allotment of the Colorado River.³⁸ In addition to the Colorado River Compact, Wyoming has several interstate compacts,³⁹ and is currently in a legal dispute with Montana over the Powder Tongue River and the Yellowstone River. A former Wyoming planner in an interview suggested that the openness and detail of their state water plan was dictated by their need for evidence in legal disputes between states over shared waters.⁴⁰

A 1987 lawsuit filed by the city of El Paso, Texas against New Mexico where Texas wanted to withdraw water from a New Mexico aquifer triggered regional water planning in New Mexico. The Supreme Court ruled that unless New Mexico could show it needed the water, they had to allow Texas to extract the groundwater. As a result, New Mexico began their regional planning to document their water needs as protection against lawsuits from other states.⁴¹

³⁶ Interview with Clive Strong, Idaho Attorney General's Office.

³⁷ Interview with Zach Frankel, Utah Rivers Council.

³⁸ Interview with New Mexico State Senator John Arthur Smith, New Mexico.

³⁹ To manage the several interstate rivers that flow through Wyoming, this state is a party in seven interstate compacts and three other rivers are allocated according to court decrees. The Compacts are: Colorado River (1922), Upper Colorado River (1948), Amended Bear River, (1978), Belle Fourche River (1943), Snake River (1949), Upper Niobrara River (1962), Yellowstone River Compact (1950). The decrees are: North Platte River (1945), Laramie River, (1911, 1922), and Teton Creek and South Leigh Creek ("Roxanna" Decree) (1941). For more information, see Wyoming State Engineer's Office, Interstate compacts, <<http://seo.wyo.gov/surface-water/interstate-compacts>>.

⁴⁰ Interview with Mike Purcell, former Wyoming Water Development Commission.

⁴¹ Interview with Angela Bordegray, *supra* 27

4. Some Reasons for the Differences

4.1. Budget Constraints and Water Planning Diversity⁴²

Comprehensive planning requires a budget. The size of a state budget reflects the government's resources and, indirectly, its commitment to water planning. The amount of money allocated for a plan can affect its length and detail as well as the frequency with which it is updated.

On the high end, especially on a per capita basis, Wyoming's 2007 framework plan was created with a budget of \$500,000 for each of its seven basins, and an additional \$600,000 to compile a statewide plan. The end result was a 500-page document that gave a comprehensive inventory of Wyoming's water resources, usage, future predictions, and opportunities for infrastructure upgrades and new creations. Wyoming's plan is updated continually. The water development office has an additional budget of \$500,000 a year to work on a new plan due for release in 2018. The funding comes from an oil and gas severance tax. Given that water plays an important role in oil and gas extraction and the oil and gas industry makes up 29% of Wyoming's GDP, there are clearly good reasons to link its water plan funding this way.⁴³

At the other end of the water planning resources spectrum, Idaho spends less than \$150,000, and New Mexico spends a fraction of that, with a budget of \$50,000.⁴⁴ New Mexico has had a water-planning budget of \$55,000 a year since 2007 except for special appropriations from the general fund of \$600,000 in 2008 and more recently \$400,000. This has enabled public outreach meetings but not an update of New Mexico's plan or an inventory of its water resources.⁴⁵ Inadequate funding may also explain why New Mexico's plan has so little data compared to other states in the data set.

4.2. Interest Group Influence

Some of the differences in state water plan content are the result of interest group influence. If water-planning activities were merely technocratic exercises, plan variation could be more completely explained by natural supply and demand variations. In reality, reconciling the different demands on water in a state entails political choices. Engineers dominated the earliest water planning efforts, and focused on increasing supply, mostly through infrastructure.

Today, building massive infrastructure such as new dams and channels is less feasible due to economic and environmental costs. Solutions have shifted toward greater water efficiency and water demands have diversified. Water quality and environmental protection through habitat restoration are more important concerns. Each of these diverse con-

⁴² First, a caveat is necessary: this study focuses on formal water plans. Idaho, Utah, and New Mexico also produce planning documents that deal with specific water issues such as drought, water markets, and conjunctive management. None of these three states have water plans as comprehensive as Nevada or Wyoming, but that can mean that they treat the topics separately.

⁴³ Interview with Phil Ogle, deputy director, River Basin Planning, Wyoming Water Development Commission.

⁴⁴ *Id.*

⁴⁵ Interview with Angela Bordegray, *supra* 27.

cerns has advocates (i.e., stakeholders), and water-planning increasingly involves building consensus among them.

Given changing trends in water planning concerns, the timing of a planning exercise often reflects a state's prevailing interests at the time: drought management, environmental concerns, water pollution crises, and the like. A state's general political culture can matter significantly. In Idaho, where skepticism about climate change is prevalent, the plan's section on a "warming climate" is described as "climate variability."⁴⁶

Another cultural constraint is an aversion to centralized government control. Officials in Utah and Wyoming mentioned that their state plans lack policy recommendations because people in their state do not like being told what to do. Utah's policy recommendations appear only in their regional plans, which are not technically part of the state plan. Wyoming's state plan contains no recommendations. Instead, each of the seven basin groups came up with a list of potential projects.

Water officials in both states alluded to the fact that preference for local planning is due to the "small-government" views of their citizenry. A former director of the Wyoming Water Resources Office said, "We're kind of independent cusses out here."⁴⁷ Resistance to government intervention explains why Wyoming's plan is more "descriptive" rather than "proscriptive," as the president of the Snake River Conservation District explained.⁴⁸ Individual irrigation or conservation districts are free to approach the Water Development Office to ask for assistance in evaluating and constructing water development projects if they choose, but the plans do not prioritize one project over another.

In Utah, this perspective may be reinforced by religion. The Mormon population has historically settled in homogenous, small community settings, and in 1840 Utah was one of the first states to invest in water infrastructure planning separate from the federal government.⁴⁹

As is often true in politics, scarcity sharpens the cleavage between various stakeholders and raises the stakes in negotiated outcomes. The upside of broader participation is the prospect of greater buy-in at the end, but the downside of having a wider spectrum of interests at the table is that it "complicates the decision-making process and places an increased premium on negotiation and compromise."⁵⁰ There are both internal and external conflicts of interest: the internal ones are between various water users and different areas or levels of jurisdictions within a state. External ones concern tribal rights and other states.

One intrastate conflict that recurs regularly in all western states is agriculture versus other economic sectors and urban areas. Agriculture is the primary water user in the West. This is often reflected in the detailed information in water plans about current and projected agricultural water use. Wyoming, California, Nevada, and Utah include extensive agricultural usage figures; New Mexico does not. Agriculture's importance is reflected

⁴⁶ Interview with Kevin Lewis, Idaho Rivers Unite.

⁴⁷ Mike Purcell, *supra* 41.

⁴⁸ Interview with Senator Larry Hicks, Wyoming State Legislature.

⁴⁹ Interview with Zach Frankel, *supra* 37.

⁵⁰ Thompson, *supra* note 1, at 247.

procedurally. Montana, for instance, received a large amount of input from agricultural interests advocating more state water storage projects.⁵¹

Tourism and recreation are important stakeholders in water planning. Unlike agriculture, these industries often align with progressive environmental groups. Conservation can preserve areas where tourism flourishes. In Wyoming, recreational fishing provides a secondary income stream for landowners who allow fishing on their property. The Wyoming water plan states, “While consumption of water is usually not involved, the existence of a sufficient water supply for a quality experience is important. The quality and quantity of good recreational opportunities are highly dependent on water quality and quantity. Recreation, including tourism, is one of Wyoming’s major industries.”

Aside from economic sector tensions, water conflicts arise between regions in a state as well. The tension between northern and southern California is a classic example. Interbasin transfers are always a source of conflict.⁵² Nevada, New Mexico, and Idaho attempted to reconcile concerns between areas experiencing large metropolitan growth and rural areas. A major motivation behind Nevada’s water plan was to help create new water policy in areas that had previously never been thoroughly regulated, such as interbasin water transfers and conjunctive water use.⁵³ The planning department faced opposition from legislators from the northern part of the state who were concerned about southern Nevada appropriating their water and their “right to prosperity” in order to support the rapid metropolitan growth in Las Vegas.

Their concerns were heightened when it became apparent that Las Vegas could not accurately predict its own growth: it claimed in 1990 that the city had enough water to sustain it for 30 years, but by 1999 when the plan was published, the city maintained it only had enough water for five more years.⁵⁴ Las Vegas is an important income generator for the state, but has little water within its own area. The less densely populated northeastern part of the state has most of the water plus agricultural and mining interests. Regional and sectoral interests coincide to form a wide interest group divide.

In New Mexico, the situation is similar. Many agricultural property owners hold senior water rights over cities, but in periods of water scarcity, urban needs have prevailed over seniority.⁵⁵ Much like Nevada, New Mexico’s rural citizens and legislators fear that allowing interbasin water transfers will lead to a regular diversion of their water resources to Albuquerque and Santa Fe, cities that have considerable political and economic clout. They fear their economic interests will be hurt if they do not receive enough water during drought periods. In public stakeholder meetings, many rural citizens voice opposition to interbasin transfers.⁵⁶ As Senator Smith pointed out, the water dispute is lay-

⁵¹ Interview with Rich Moy, former official at Montana Department of Natural Resources and Conservation.

⁵² Christine A. Klein, “Water Transfers: The Case against Transbasin Diversions in the Eastern States,” 25 *UCLA J. Envtl. L. & Pol’y* 249 (2008).

⁵³ Naomi Duerr, *supra* 22.

⁵⁴ *Id.*

⁵⁵ Felicity Barringer, “New Mexico Farmers Seek ‘Priority Call’ as Drought Persists,” *New York Times*, March 27, 2013 at A11.

⁵⁶ Angela Bordegray, *supra* note 27.

ered on a large transition of power.⁵⁷ Prior to 1990, New Mexico had a rurally dominated legislature, but the legislature has become more urban-dominated.

5. Lessons from Water Planning

The two most important features of western state water plans are that they have no force of law and are incredibly diverse with respect to the information they provide and the recommendations they offer. Given the increasing complexity of water demands and water scarcity that is likely to worsen with global warming, the potential value of comprehensive water planning and negotiation is clearer than ever. But what are the options?

A top-down federal government effort is probably neither feasible nor desirable. Aside from a strong western cultural aversion to being told what to do, Congress is too polarized along partisan and ideological lines to take that kind of initiative. Any state plan must be sensitive to the diverse interests and problems at the regional and basin level. What might be gained in terms of uniformity and integration at the central level could easily be offset by insensitivity to specific interests and conditions. The status quo represents the other end of the continuum: little progress in harmonizing the competing uses of water and a system that is ill prepared to handle the conditions of extreme scarcity predicted under climate change models.

There is no magic solution, but an important step forward would be to improve the quality of information about each state's water demands and supplies and to incentivize efforts to reconcile competing water demands with an integrated plan. Good information enables better planning, and sometimes on its own can encourage better behavior by those who do not want to look bad in the public eye. If Congress did nothing more than provide adequate federal funds for collecting and making available more accurate information about water use and supply, it could potentially improve state planning processes. Federal funds have played a role in encouraging better state policy in previous federal environmental statutes, such as the Clean Water Act (CWA),⁵⁸ the Endangered Species Act,⁵⁹ and the Coastal Zones Management Act (CZMA).

Our proposed approach is much less demanding than the one taken for the management of coastal areas. The CZMA passed in 1972 encourages coastal states to develop and implement coastal zone management plans by providing one-to-one matching funds to administer them. In fact, the CZMA has been analyzed as a model for federal action promoting Integrated Water Resources Management (IWRM),⁶⁰ requiring information gathering tasks but going far beyond it. The advantage of our proposal compared to a full-fledged act encouraging IWRM is its narrowness. IWRM is a very broad concept, difficult to pin down and, thus, difficult to monitor how federal funds are spent. Another

⁵⁷ Interview with Senator John Arthur Smith.

⁵⁸ Section 106 of the CWA authorizes EPA to provide federal grants to states to implement water pollution control programs and section 319 (h) to implement nonpoint source pollution management programs.

⁵⁹ According to section 6 of the ESA, Endangered Species Conservation Fund provides grants to states to participate in voluntary conservation projects for candidate, proposed, and listed species. States need to enter into a cooperative agreement with the Secretary of Interior to apply for these funds and to contribute a certain percentage of funds.

⁶⁰ See Thompson, *supra* 1.

example of federal funds, with a goal closer to the proposal put forward here, is the BEACH Act grant program. These grants are awarded to eligible coastal and Great Lakes states to develop and implement beach monitoring and notification programs.

Under our proposal, federal action would take the form of sufficiently large grants that states could apply for to monitor and collect information about their water resources. The type and form of the data would be uniform across the states and be publicly available on state websites. Some states might choose to forego taking the money, but, over time, governors hate to leave money on the table.

If water scarcity becomes a more serious problem, the need to enforce limits on water use will require closer monitoring. In the end, the struggle between agricultural, recreational, environmental, and urban water use will not be easy to resolve and may be too politically challenging to be handled by a water agency and related stakeholders. But good information and a menu of possible choices is a realistic goal that could in theory achieve bipartisan consensus.

Table 1. Water Plans Matrix

	Units	Wyoming	New Mexico	Nevada
Control Variables				
Enacting Legislation		Wyo. Stat. § 41-2-107	State Water Plan Act of 2003	Nevada Revised Statutes- 540.101
Planning Cycle	years	continuous basin planning	5 years	Statewide Planning Disbanded
Current Population	2012 (http://quickfacts.census.gov/qfd/states/32000.html)	576,412	2,085,538	2,758,931
Projected Population	2030 (http://www.census.gov/population/projections/files/stateproj/SummaryTabA1.pdf)	522,979	2,099,708	4,282,102
Budget to Produce Plan	dollars	4,200,000 for basin plans +500,000/yr for ongoing data collection (pg. 7-7, http://uttoncenter.unm.edu/pdfs/Water-Matters-2013/2013_water_matters.pdf)	50,000 (citation in dashboard)	NDWP yearly budget 880,000 (Guinn Article)
Federal Land to Total Land Area	percentage	48.4% (http://www.maineenvironment.org/documents/public_landownership.pdf)	0,294	0,878
Average Rainfall	inches/year	13.07 (http://www.wrds.uwyo.edu/sco/climateatlas/precipitation.html)	13.85 (http://www.nationalatlas.gov/printable/images/pdf/precip/pageprecip_nm3.pdf)	9
Agriculture Portion of GDP	dollars/ percentage	\$279,000,000/ 1.07% in 2007 (http://eadiv.state.wy.us/i&e/Inc_Emp_Report08.pdf)	\$1,488,000/ 1.85% (http://bber.unm.edu/econ/st-gdp1.htm)	\$ 658,863,000/ .5% (http://agri.nv.gov/uploadedFiles/agrinvgov/Content/Home/Features/2013nvagreport.pdf)
Total Water Use	MAF/year (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	5,15	3.950398 in 2005(http://www.ose.state.nm.us/PDF/Publications/Library/TechnicalReports/TechReport-52.pdf)	4,25
Per Capita Water Use	gallons/capita/day	189,2	148,2	315

Domestic Per Capita Use	gallons/capita/day	205	107 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	190 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)
Quantitative				
Last Update	years	2007	2008	1999
Number of Pages		524	78 (2003 plan)	1,000
Basins/ Regions in the state	number	7	16	14
Basin/ Regional Water Plans		7	16	3
Water Supply	MAF/year	16.992100 (average annual supply)	49.56 (http://www.ngwa.org/Documents/States/Use/wy.pdf)	
Groundwater Extraction	MAF			1,6
Total Water Use	MAF			4,25
Groundwater of Total Water Use	percentage			0,4
Surface Water of Total Water Use	percentage			0,6
Total Per Capita Use	Gallons/capita/ day	205		315
Agriculture Water Use	percentage	2,456		0,77
Residential Water Use	percentage	102,200 ac-ft/yr / 1.98% (calculated using total use from 2005, which is not in the plan)		0,085
Industrial Water Use	percentage	0,37062		0,084
Commercial Water Use	percentage			0,036
Water Reuse/ Recycling	MAF			0,026
Irrigated Crop Area	acres	1,947,100		715,439
Major Interstate Water Agreements	list	Bear River Compact, Belle Fourche River Compact, Colorado River Compacts, Upper Niobara River Compact, Snake River Compact, Yellowstone River Compact	Costilla Creek Compact, Animas-La Plata Project Compact, Canadian River Compact, La Plata River Compact, Pecos River Compact, Rio Grande Compact, Colorado River Compact, Upper Colorado River Compact	California-Nevada Interstate Compact, Truckee-Carson-Pyramid Lake Water Rights Settlement Act, Truckee River Agreement, Colorado River Compact
Water Rights System	Riparian or Prior Appropriation	prior appropriation	prior appropriation	Prior Appropriation

Qualitative				
Climate Change/Climate Variability Discussion	extensive/ moderate/ brief/ none	none	yes	none
Environmental Consideration Discussion	extensive/ moderate/ brief/ none	extensive	moderate	extensive
Water Planning for Land Development Mentioned	yes/ no	yes	yes	No
Drought Preparedness Discussion	extensive/ moderate/ brief/ none	extensive	extensive	extensive
Flood Management Discussion	extensive/ moderate/ brief/ none	mentioned briefly	brief	moderate
Water Transfers/ Trading Mentioned	yes/ no	yes	yes	yes
Conjunctive Water Use Discussion	extensive/ moderate/ brief/ none	moderate	brief	moderate
Legislatively Binding	yes/ no	no	no	no
Tribal Contribution to Planning Process Mentioned	yes/ no	yes	yes	yes
Stakeholder Involvement	yes/no	yes	yes	yes
Groundwater/ Surface Water Contamination Discussion	extensive/ moderate/ brief/ none	extensive	brief	extensive
Water Conservation Goals	specific/ general/ brief/ none	general	specific	general
Acknowledges Overdraft	yes/ no	no	no	yes
Stakeholder Acknowledgment	yes/ no	yes	yes	yes
Specificity of Recommendations	specific/ general/ none, defers responsibility	specific	defers responsibility	specific

Table 2. Water Plans Matrix continued

	Units	Utah	Idaho	Montana	California
Control Variables					
Enacting Legislation		Title 73 Chapter 10 Section 5	Idaho Constitution Article XV, section 7	1967 Water Resources Act, Title 85, chapter 1, part 2 MCA	California water code § 10000-10013
Planning Cycle	years	Continuous by Basin Planning	plan is not updated on a regular basis	continuous planning	5 years
Current Population	2012 (http://quickfacts.census.gov/qfd/states/32000.html)	2,855,287	1,567,582	989,415	38,041,430
Projected Population	2030 (http://www.census.gov/population/projections/files/stateproj/SummaryTabA1.pdf)	3,485,367	1,969,624	1,044,898	46,444,861
Budget to Produce Plan	dollars	Annual Planning: \$150,000-200,000, State Plan: \$500,000-1,000,000	140,000 (quote from Helen L. Harrington Manager, Water Planning Section Idaho Department of Water Resources)	none designated	3 million
Federal Land to Total Land Area	percentage	0,752	65,2	31,9	40,12
Average Rainfall	inches/year	13	19.01 (http://maps.redcross.org/website/Maps/Images/Idaho/pageprecip_id3.pdf)	15.34 (http://maps.redcross.org/website/Maps/Images/Montana/pageprecip_mt3.pdf)	22.2 (http://www.currentresults.com/Weather/US/average-annual-state-precipitation.php)
Agriculture Portion of GDP	dollars/ percentage	\$1,000,000,000/ 2.1%	2,900,000,000/ .5 (http://econpost.com/industry/agriculture-sector-top-states-percentage-state-economy)	1,500,000,000/ 4.2 (http://econpost.com/industry/agriculture-sector-top-states-percentage-state-economy)	27,300,000,000 /1.5% (http://econpost.com/industry/agriculture-sector-top-10-states-gdp)

Total Water Use	MAF/year (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	5,333	21.9 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	11,3	43,443
Per Capita Water Use	Gallons/capita/day	321	187 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	223.6 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	209.3 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)
Domestic Per Capita Use	gallons/capita/day	186 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	187 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	112 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)	124 (http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf)
Quantitative					
Last Update	years	2001	2012	2005	2009
Number of Pages		69	90	242	5 volumes
Basins/ Regions in the state	number	11			12
Basin/ Regional Water Plans		11	4	2	12
Water Supply	MAF/year	7,311			82,7
Groundwater Extraction	MAF	0,851		0,243	15,016
Total Water Use	MAF	5,333			40,2
Groundwater of Total Water Use	percentage	0,16			0,35
Surface Water of Total Water Use	percentage	0,84			0,65
Total Per Capita Use	Gallons/capita/day	321			
Agriculture Water Use	percentage	0,8			0,78
Residential Water Use	percentage	0,098			0,15
Industrial Water Use	percentage	0,0064			0,012
Commercial Water Use	percentage	0,0433			0,027
Water Reuse/ Recycling	MAF	.			.45-.58
Irrigated Crop Area	acres	1,377,900			9,200,000
Major Interstate Water Agreements	list	Colorado River Compact, Bear River Compact	Bear River Compact		Colorado River Compact, California-Nevada Interstate Compact, Colorado River Water Delivery Agreement, Truckee River Operating

					Agreement, Truckee-Carson-Pyramid Lake Water Rights Settlement Act
Water Rights System	Riparian or Prior Appropriation	prior appropriation	prior appropriation	prior appropriation	prior appropriation and riparian
Qualitative					
Climate Change/Climate Variability Discussion	extensive/ moderate/ brief/ none	none	brief	none	extensive
Environmental Consideration Discussion	extensive/ moderate/ brief/ none	moderate	moderate	moderate	extensive
Water Planning for Land Development Mentioned	yes/ no	yes	yes	no	yes
Drought Preparedness Discussion	Extensive/ moderate/ brief/ none	moderate	none	extensive	extensive
Flood Management Discussion	extensive/ moderate/ brief/ none	moderate	moderate	none	extensive
Water Transfers/ Trading Mentioned	yes/ no	yes	yes	yes	yes
Conjunctive Water Use Discussion	extensive/ moderate/ brief/ none	moderate	moderate	brief	extensive
Legislatively Binding	yes/ no	no	no	no	no
Tribal Contribution to Planning Process Mentioned	yes/ no	yes	no	no	yes
Stakeholder Involvement	yes/no	yes	yes	yes	yes
Groundwater/ Surface Water Contamination Discussion	extensive/ moderate/ brief/ none	extensive	moderate	moderate	extensive
Water Conservation Goals	specific/ general/ brief/ none	general	general	brief	specific
Acknowledges Overdraft	yes/ no	yes	yes	no	yes

Stakeholder Acknowledgment	yes/ no	yes	no	yes	yes
Specificity of Recommendations	specific/ general/ none, defers responsibility	general	general	specific	specific

Table 2. Components of Enacting Legislation

Components	Wyoming	New Mexico	Nevada
Enacting Legislation	Wyo. Stat. § 41-2-107 House Bill 72 Omnibus water bill-planning (2014)	N.M. Stat. Ann. § 72-14-3.1	Nev. Rev. Stat. §540-101
Date of Legislation	1999	2003	
Planning Cycle	Continuous	5 years	N/A
Agency Designated	Wyoming Water Development Commission; Office of the State Engineer	Interstate Stream Commission; Office of the State Engineer	Nevada Division of Water Planning
Specifies Contents of Plan	yes	yes	Yes
Specifies Planning Process	no		
Purpose/Uses	not stated in enacting legislation	Guiding document for the water plan, which is intended to be a strategic water management tool	The Legislature determines that the purpose of the State's water resource planning is to assist the State, its local governments and its citizens in developing effective plans for the use of water.
Funding	Water Development Account	not stated in enacting legislation	State General Fund
Legislative approval	no		yes

Table 2. Components of Enacting Legislation continued

Components	Utah	Idaho	Montana	California
Enacting Legislation	Utah Code §73-10-15	Idaho Const. art. XV, § 7	1967 Montana Water Resources Act, Rev. Code Mont. §89-101.2 (1947)	Cal. Water Code § 10000-10013
Date of Legislation		Nov 1964	1967	1929 (updated since)
Planning Cycle	N/A	N/A	as needed/ strategic plan updated every six years	5 years
Agency Designated	Division of Water Resources	Idaho Water Resources Board	DNRC Water Resources Division	Department of Water Resources
Specifies Contents of Plan	No	no	yes	yes
Specifies Planning Process	no	no	no	yes
Purpose/Uses	not stated in enacting legislation	“for conservation, development, management and optimum use of all unappropriated water resources and waterways of this state in the public interest”	“set out a progressive program for conservation, development, and utilization of the state's water and propose the most effective means by which the water resources may be used for the benefit of the people, with due consideration of alternative uses and combinations of uses”	“The coordinated plan for the conservation, development, and utilization of the water resources of the State”
Funding	State Revolving Fund	not stated in enacting legislation	not stated in enacting legislation	not stated in enacting legislation
Legislative approval		yes	yes	no