A Review of Water Banking in State Legislation of the Western United States

by
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1. Introduction

Challenges around the world are surfacing due to local water scarcity and limited access to clean, affordable water. Current water issues, which are not limited to political boundaries, include insufficient water quantity or quality, access to water resources in order to meet demand, energy costs effecting water decisions, antiquated water policies, and human resistance to change (EDA, 2010). As a result, new strategies are being considered in order to manage water resources to meet domestic, agricultural, corporate, environmental, and urban demands. One strategy, to be examined here, has received international attention and is rising in prevalence in the Western United States: water banking. Water banks and water banking are presented as tools for water resource management in areas of high water demands or localized water scarcity. Recently, in August of 2016, the Chief Scientist for the Water program of The Nature Conservancy, published an article stating that water banking systems could "provide a more water-secure future for cities, agriculture, industries, and nature" (Richter, 2016).

However, there is no common template for a water bank; the participants, purposes, and rules of a bank are tailored to meet the unique needs of a situation. As a result, the terminology within this field is often overlapping and used interchangeably. Water banks can dually refer to the physical storage of water and/or the financial transactions of water either through credits or monetary exchange, two concepts that are not mutually exclusive. Water banking has been used to refer to water markets, water leasing structures, water sharing systems, or groundwater banks. Table 1 provides examples of the wide breadth of definitions used in the western United States.

Table 1: Examples of Water Banking Definitions

Entity	Water Banking Definition
Arizona Source: State Senate Bill 1356	"Water banking services" means services provided by the authority to persons and Indian communities in this state to facilitate for those persons and Indian communities storage of water and stored water lending arrangements… Water banking services may include: (a) Storage of water. (b) Obtaining water storage permits. (c) Accruing, exchanging and assigning long-term storage credits. (d) Lending and obtaining repayment of long-term storage credits.
Colorado Source: Property and Environment Research Center, 2010	In the most basic sense, a water bank is an institution that uses free-market transactions to facilitate the temporary or permanent transfer of the rights to use water among water users. It does this by acting as an intermediary to bring together those holding legally valid water rights with those in need of additional water supplies. A water bank has a regular, transparent, institutionalized process for transferring water rights, which serves to reduce the confusion and costs associated with trading water. A typical bank also has a public sanction or purpose, for example,

	to alleviate the impacts of water shortage in a basin. In short, the goal of a water bank is to move water to where it is needed most.
Idaho Source: Idaho Department of Water Resources, 2016	The Bank is essentially a water exchange market operated by the Board to assist in marketing the water rights of natural flow and water stored in Idaho reservoirs….The Bank includes two distinctly different categories of exchange markets. The first manages water stored in reservoirs called Rental Pools. The second is called the Board's Water Supply Bank, which manages the exchange of natural flow water rights (surface and ground water) and privately held storage water rights.
Kansas Source: Water Banking Act, 2001	"Waterbank" means a private not-for-profit corporation that: (1) Leases water from water rights that have been deposited in the bank; and (2) provides safe deposit accounts. A water bank may be a groundwater bank or a surface water bank, or both.
Utah Source: Utah State Legislature, House Bill 84	Water banking means a local district's valid holding of one or more water rights for use, lease, sale, or nonuse to meet safe yield requirements.
Washington Source: Washington Department of Ecology, 2004.	An institutional mechanism that facilitates the legal transfer and market exchange of various types of surface, groundwater, and storage entitlements.

In an effort to provide clarity, the Department of Ecology for the State of Washington defines water banking by referencing an interpretation of water banking by Lawrence J. MacDonnell from 1995: "Water banking in its most generalized sense is an institutionalized process specifically designed to facilitate the transfer of developed water to new uses" (MacDonnell, 1995). However, the state of Washington goes on to state that water banking "[has] no single or common definition…refer[s] to a variety of practices, … [shows] significant differences in the way banks operate… [and] can be involved to differing degrees in water exchange" (Washington State Ecology Department, 2016). The programs that have been developed have varying structures, agendas, and management strategies. In addition to state definitions, programs are often run at the local district or county level. With over 3,000 counties in the United States, this provides ample opportunities for varying degrees of discretion in regard to water banking program development and implementation. Figure 1 below shows a geographic spread of programs that self-identify as established water banks in the western United States. Displayed are 94

water banks in 14 western states, with the majority of the clustering in the coastal Pacific states: California, Oregon, and Washington. It has an overlay of the state counties to show where programs lie within counties, implying another level of regulations or program definition in addition to the state legislation discussed in this research. See Appendix A for a list of water banks that have self-identified as water banks in the western United States.

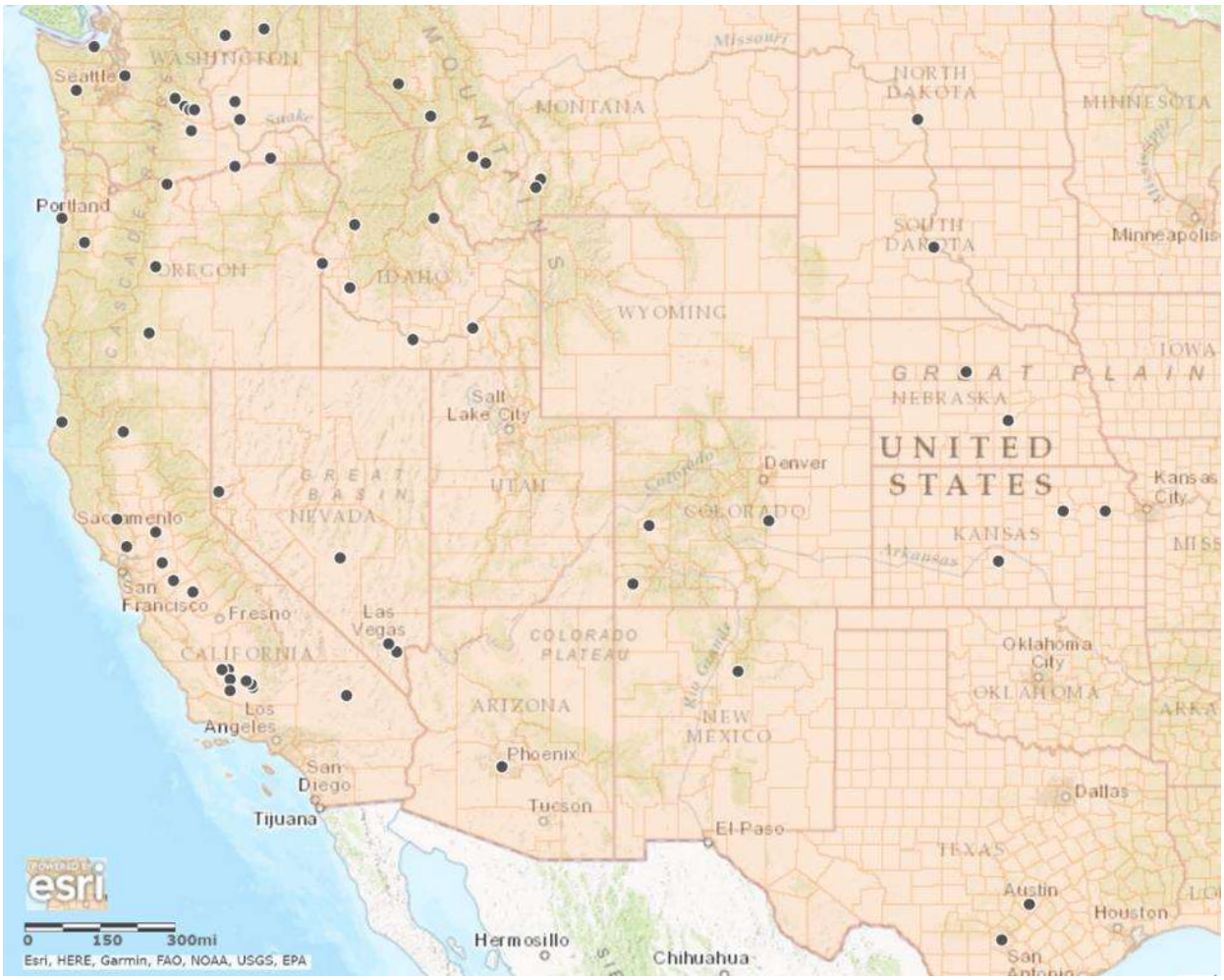


Figure 1: Map of self-identified water banks in the western, continental United States with an overlay of U.S. counties.

The pillars of water banking management have not yet been uniformly developed across states, in part due to the variation in water banking programs and the complexity of the topic. Most laws and policies concerning water markets and water banks have been left ambiguous or non-existent either to allow for future potential of water banking options and growth, or because the state legislature has not yet broached the topic of water baking regulations, albeit the existence of water banking programs within the state.

2. Literature Review

Water banking organizations and entities have varying structures and frameworks proving it difficult to establish a standardized policy framework that creates adequate parameters and monitoring. While each piece of completed research contributes needed information to the field, there remains a few gaps in the industry's information that has not yet been produced. Although policies are often discussed, one such gap is a comprehensive overview of the legislation in the western United States regarding water banks.

Researching water banking policies in the western United States begins with examining water transfer laws, as was done by the 2012 Western Governors' Association report, *Water Transfers in the West*. The report discusses water banking as one option in a suite of alternative transfer methods which identifies water banks as a potential mechanism and reflects on the greater change in western water policy to accommodate water transfers (Western Governors' Association, 2012). Limited research has been conducted on water transfer laws and policies in the American west although, like the Western Governors Association report, some give an overview of the state legal and regulatory frameworks for water transfers (or information on state policies and the programs that impact transfers) without thoroughly examining legislation specific to water banking.

The state of Washington has been proactive in researching and publishing information on water banking trends in the western United States. The initial report conducted in 2004 examined the water policies regarding water banking and walked through key water bank programs in each state (Clifford et al., 2004). Until the recent release of the updated draft (November 2016), the information was outdated quickly by a rapidly evolving field. The 2016 report has been written to provide information to the state as their own water banking activities have grown from two to twenty-four operating banks in the past twelve years (Washington State Department of Ecology, 2016). Within the document, Washington has completed a review of the state's water banking statues, including the comprehensive statewide water banking legislation enacted in 2009 and the five additional bills that have been proposed to the state legislature. While the information within the document is an excellent broad overview of the water banking programs by state, much can be learned by focusing on state legislation that specifically governs water banking activities. The Washington report focuses on the programs and institutions and less on the policies that govern them.

Some research has been conducted that discusses the evolution of water banking policies within each state and highlights the legislation that has affected the practice including the 2014 publication of the article, "Water Banks: Using Managed Aquifer Recharge to Meet Water Policy Objectives". Like many others that provide great insight on a particular state, or uses case studies as the method of research, the article focuses only on a singular example of Arizona to demonstrate the use of water banking to meet western water policy objectives.

Although the Washington State Department of Ecology reports have been the most recent release, they echo the stale focuses of previous water banking research. Reports regarding water banking have mostly focused on the rise of the organizations, the impact on the economy or the environment, or the frequency and trends in trades and transactions. For example, even though the Washington State 2016 report explicitly states that, "there are bills and statutes in the state legislature

to allow for the creation of water banking programs in Utah" (Washington State Department of Ecology, 2016), Utah is barely discussed in these reports since the 2004 and 2016 Washington State articles both identify Utah as having no water banking programs.

Other reports that have a wider breadth by including water banking legislation, such as the 1994 report, "Water Banks in the West," are outdated, while the Megdal et al. (2014) article is exhaustive yet limited in scope (MacDonnell et al., 1994). The literature that does focus on the legislative policy side of water banking shows that the research and analyses completed tend to follow one of two trends, either, (1) discussing water banking and water policies exhaustively in regard to a specific state (or two to three for comparison) or, (2) addressing the development of water banking in the west by using select key case studies as examples. With the quick evolution of the industry, there currently lacks an exhaustive and comprehensive analysis of the legislation regarding water banking in the western United States.

This research focuses on the bills and statutes in the western United States and examines the trends in water banking policies from the states' actions. This research carries significance as noted by a 2012 publication that stated, "State legislation is a powerful tool in changing environments… Studying the course of … legislation allows policy advocates, professionals, legislators, and researchers to pinpoint gaps in policy…Legislation can then provide positive changes to the environment..." (Eyler, 2012). This research begins to address some of the issues within that gap and seeks to provide more information for decision makers and practitioners in the field of water banking by providing a water banking statutory review, identifying prevalent elements of water banking legislation, and comparing states through a scale analysis on their level of water banking comprehensiveness.

3. METHODS

Research Questions and Contributions to the Field

This research will contribute to the field of water resources management and policy by furthering the understanding of policy development in regards to water banking. This will be done by conducting a review and analysis of legislation specifically mentioning water banking in states that use a foundation of the Prior Appropriations Doctrine. The analysis classifies each state's legislation on a qualitative scale of comprehensiveness. The research questions are:

(1) what legislation has been drafted that specifically mentions water banking in the 19 western states that use the Prior Appropriations Doctrine as a foundation; and

(2) how do states compare to each other in regards to the comprehensiveness of water banking legislation?

Understanding the legislative process around water banking provides insight on the development of policies within the overarching framework of western water law. While previous work is limited to specific states, outdated, or use select case studies, this research looks at the current water banking legislation, passed and drafted, in all the western states using the Prior Appropriations Doctrine. This research analyzed the prevalence of explicit water banking legislation in each state and the level of comprehensiveness. The discussion in Chapter 6 will begin to examine the presence of state water banking legislation compared to the actual occurrence of water bank programs and will make recommendations for future research.

Qualitative Methods

This research was completed by using a singular qualitative research method, document analysis. Document analysis is mostly viewed as an information gathering step in mixed methods or

qualitative analysis; however, it can be a valuable method to evaluate information. A document analysis can reveal details about a process or organization that would be lost if not analyzed within the context they were written (Bowen, 2009). By using documents as the data, the details gathered and the associated analysis can be more informative and contextually derived. Qualitative methods provide deeper insight into an issue and go beyond the statistical analysis. In regards to water banking legislation, conducting a qualitative analysis will bring further insight of the context within which water banking is addressed. For example, this qualitative method for water banking will be able to identify when states address water banking within legislation, such as within the framework of meeting irrigation needs or perhaps in reference to water quality standards for fish. Content analysis is a strategy "that generates inferences through objective and systematic identification of core elements of written communication. Content analysis involves the categorization and classification of data to make inferences about the antecedents of a communication, describe and make inferences about characteristics of a communication, and make inferences about the effects of a communication" (Curry et al., 2009). This research used archival data as the primary source of data, which includes information that is stored on public agency websites. In this case, the state legislature websites were the platforms used to examine archival data (Curry et al. 2009).

Setting the Parameters

States to be examined

This research looked solely at the western United States that are based on the Prior Appropriations Doctrine, which governs and controls the use of water in western states that are primarily arid or semi-arid. Water Law in the western United States is vastly different from the eastern

and southern states. While water usage in the east is based on riparian rights, water law in the west is based on the Prior Appropriations Doctrine, a source of law that defines who has the right to use the water and how much they are entitled to use. There are nineteen states that use the Prior Appropriations Doctrine as the foundation of their water law. These states are:

- Alaska
- Arizona
- California
- Colorado
- Hawaii
- Idaho
- Kansas
- Montana
- Nebraska
- Nevada
- New Mexico
- North Dakota
- Oklahoma
- Oregon
- South Dakota
- Texas
- Utah
- Washington
- Wyoming

Some of the states use the Prior Appropriation Doctrine as the sole document from which their water is state regulated while other states employ some elements of both the Riparian Doctrine and the Prior Appropriations Doctrine (Gopalakrishnan, 1973). Confining this research to the states that use elements of the Prior Appropriations Doctrine provides an even platform, given that these states often face similar water challenges and have built a framework for management on the same doctrine.

Pulling Legislation

This research looks at the bills that were both passed and that have been killed or returned to a legislative committee. All bills (drafted, proposed, and accepted) are evidence of water banking discussions within the state legislature. Although not all bills are accepted, the presence and drafting of a proposed bill shows thought and consideration, which provides better insight into the development of water banking legislation.

Limiting the scope to water bank and banking

Water law in the west that is based on the Prior Appropriations Doctrine has produced an "inflexible, but historically stable, institutional structure used to allocate water" (Brookshire and Ganderton, 2004). Alternatively, a more flexible set of structures can be broadly called water markets and water banks. "The literature is casual in the definition of the distinctions of marketing and banking. One may think of banking as being the temporal anchored trade by some allocation mechanism and water marketing as the formal change in perpetual ownership" (Brookshire and Ganderton, 2004). Both "marketing" and "banking" involve some type of exchange process between willing traders. Both markets and banks allow for the transfer of water usage, and reflect the value of the water between uses. It is because of these features that the interest in these allocation mechanisms has grown recently (Brookshire and Ganderton, 2004). However, because of the similar functions of water markets and water banks the terms are often incorrectly interchanged. By focusing solely on water banking (and not including water markets or water sharing in the search protocol) this research further refines the definition of water banking and identifies key elements that characterize a water bank, effectively delineating water banks from similar systems.

Process

Stage 1: Data Collection

A search protocol was developed using two key terms consistently: "water banking" and "water bank". The sources were solely the state legislation websites, tallying a total of twenty-one websites since two states currently have two websites each during their transition stage to new websites. Documents that refer to stream banks or river banks as water banks, were not included in the database. Beginning alphabetically by state, the statutory document collection began by navigating to

the state legislature website then conducting, by key phrases, a search of the relevant statutes, regulations, bills, and amendments. The terms “water bank” and “water banking” were used in quotations as a search engine tool to convey exact phrase results only.

Table 2 below shows the window within which the legislative documents were publicly available online and therefor searched. There was a wide range of availability; while some states had completely transferred their legislative documents to electronic databases, some have only provided access to the documents from the past 15 years. Since the earliest water banking policy is noted as 1964, the statutory review can be considered of “modern” legislation. Documents with reference to water banking were collected and uploaded into Dedoose for a qualitative and quantitative analysis.

Table 2: States reviewed and the window of legislation dates.

	STATE	**Begin Date**	**End Date**		**STATE**	**Begin Date**	**End Date**
1	Alaska	1982	2016	**10**	Nevada	1964	2016
2	Arizona	1989	2016	**11**	New Mexico	1996	2016
3	California	2000	2016	**12**	North Dakota	1957/session law 1997 bills/resolution	2016
4	Colorado	1989	2016	**13**	Oklahoma	Bills to 1993	2016
	Colorado (second website)	1861	1992	**14**	Oregon	Laws: 1999 Bills: 2007	2016
5	Idaho	unknown	2016	**15**	South Dakota	1997	2016
6	Hawaii	1998	2016	**16**	Texas	1989	2017
7	Kansas	1997	2016	**17**	Utah	1896/1997	2016
8	Montana	1999	2016	**18**	Washington	1985	2016
9	Nebraska	2007	2016	**19**	Wyoming	2001	2016

Stage 2: Data Analysis

Stage 2 of this research was an analysis of the collected data in stage one. This was completed in two phases: (1) first by categorizing the states into levels based on the extent to which water banking was addressed within the state's legislation, and (2) secondly, by coding themes in the sections of state legislative documents directed towards water banking.

Categorizing States into Levels:

For the first analysis of this research, states were placed into one of four levels according to the degree of water banking presence in the state legislation documents. The four levels are:

- **Level 1:** The state has no reference to water banking in passed or drafted legislation.
- **Level 2:** The state has legislation that mentions "water banking" or "water bank" but did not deal directly with water banking.
- **Level 3:** The state has legislation that directly discusses or addresses water banking, perhaps within the parameters of another focus.
- **Level 4:** The state has full pieces of legislation written explicitly for water banking.

Documents that categorize states into Levels 2, 3, and 4 were then uploaded into a coding software program, Dedoose, which allows qualitative researchers to examine documents and identify themes by creating codes. The use of computer software programs like Dedoose facilitate qualitative data analysis through computerized coding and organization, in addition to a suite of tools to reliably analyze the data (Curry et al. 2009). Curry et al. (2009) best described the coding process as,

> "A commonly used analytic approach is the constant comparative method. In this form of analysis, data are reviewed line by line in detail. As a concept becomes apparent, a code is assigned to that segment of the document (or an entire document). Codes are tags or labels that help catalogue key concepts while preserving the context in which these concepts occur. To ascertain whether a code is assigned appropriately, the

> analyst compares text segments with segments that have been assigned the same code previously and decides whether they reflect the same concept. Using this constant-comparison method, the researchers refine dimensions of existing codes and identify new codes. Through this process, the code structure evolves inductively, in accordance with analytic principles of grounded theory" (Curry et al. 2009).

The evaluation was then completed by coding the documents for states in Levels 2, 3, and 4.

Codes:

Each piece of legislation was coded for specific key terms and points were given for each subject addressed within the legislation. The topics, all within the context of water banking, are:

1. Authorization, creation, or a request for legislative authorization
    a. Pilot program
2. Purpose or directive of the bank
    a. Definition
3. Management
    a. Implementation
    b. Abandonment or non-use protection
    c. Limitations
    d. Administrator
    e. Tribal Rights and Management
    f. Local districts
4. Financial support/budget allocations
5. Parameters along trading
    a. Purchase/sale
    b. Lease
    c. Interstate agreements
    d. Credits
6. Environment
    a. Wildlife
    b. Fish/fisheries
    c. Quality
    d. Wetland banks
7. Quantity/Water Supply
    a. Domestic use
    b. Agriculture or irrigation
8. Groundwater
9. Room for growth or highlighted future potential for growth, such as potential uses of water banks
10. Specific Water Banking Legislation [THIS IS WEIGHTED 3 POINTS – described in the comparative state analysis below]

Qualitative Information:

Each piece of legislation was read thoroughly and coded with the above codes. Then, the states were compared on a qualitative level, including how many pieces of legislation each state had drafted, and the years that produced the most pieces of water banking legislation. In addition, a series of preliminary analyses were conducted based on the quantitative aspects of the legislation examined, such as the number of pieces of legislation in each state regarding water banking and the temporal distribution for each state's water banking legislation.

Comparative state information:

There was no state to state quantitative comparison of the number of documents due to the disproportionate results that would occur. Many states had posted multiple drafts of the same bill, while other states only publicly displayed the final draft. Had states been compared based solely on the number of pieces of legislation, the results would not have been a good representation of the states' comprehensiveness in regards to water banking legislation. For this reason a sliding scale comparative analysis was conducted which gives each state an overall score (out of 30) based on the presence of key codes, regardless if the code appears once or a hundred times.

Comprehensiveness index and comparative policy analyses between states have been conducted through various policy topics such as youth smoking (US Public Health Service, 1986), human trafficking (Bouche and Wittmer, 2009), school wellness policies (Schwartz et al, 2012), and childhood obesity (Eyler et al., 2012). Coding public documents allows for future analysis of the most common themes that resonate throughout legislation and can thus compare state policy and effectiveness. Coding furthers the analysis of legislation by breaking down each document into its component parts (Bouche and Wittmer, 2009). By creating a list of critical components the legislation can then be scored on a sliding scale awarding points for the inclusion of a specific component. For example, in a study on

the legislation regarding human trafficking, legislation was given points for addressing key issues such as state investment, civil penalties, and criminalization (Bouche and Wittmer, 2009). Furthermore, categories can be weighted to signify greater importance or to show comprehensiveness, as it was done in the US Public Health report regarding access to tobacco. If access to tobacco was discussed, the legislation would have received one point, but received more points if the legislation further discussed how to implement strategies to decrease access to tobacco (US Public Health Service, 1986). For this research, each piece of legislation was evaluated for specific concepts such as groundwater, wildlife habitat, and interstate agreements as shown in the code list (see page 12). In addition, a piece of legislation was only coded for a particular topic once. For example, if a document mentioned the Water Bank Authority multiple times throughout the document, the document was only tagged once for "Arizona Water Bank Authority," but it was also tagged for the surrounding topics such as budgeting, purpose, or authority.

As a result, each piece of legislation has the potential of receiving a top score of 30 for the comparative analysis: 1 point for each category, and a weighted 3 points for having water banking specific legislation. The most exhaustive legislation can reach 30 points by addressing each topic as coded in addition to every subtopic.

4. Results

The Levels

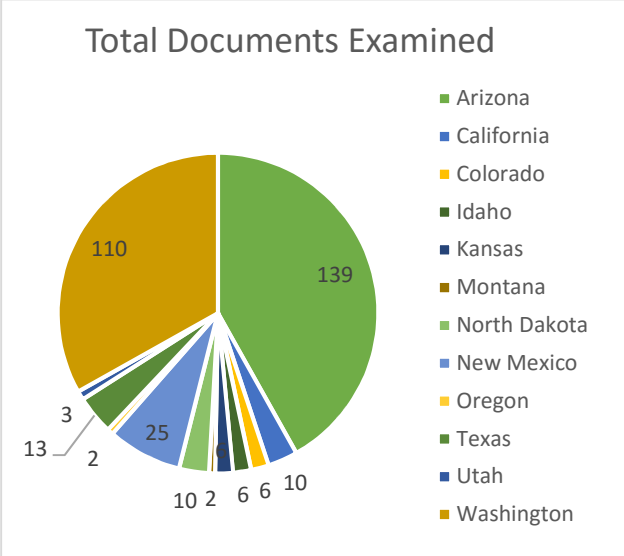
The initial data gathering process revealed 333 documents to be reviewed within 12 states. Based on the pieces of legislation found for each state, the states were then categorized into one of four levels according to the frequency of key terms for the legislation on water banking. A review of the

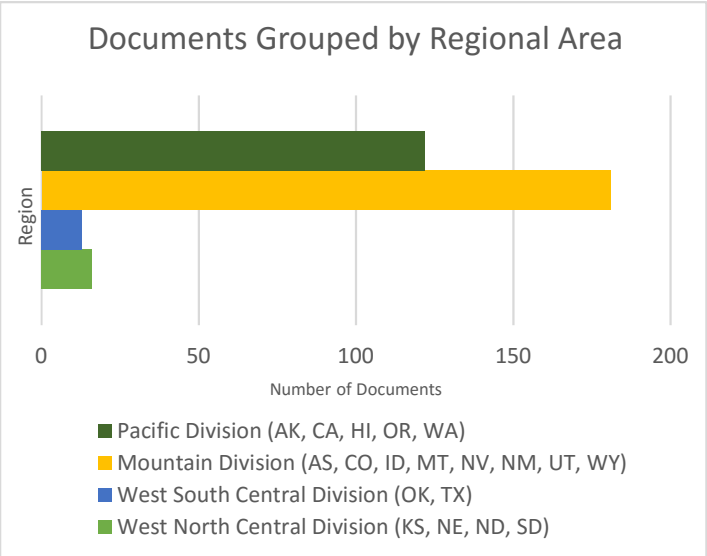
legislation in each state shows that the 19 researched states can be categorized using the parameters below. Table 3 shows the level in which each state qualifies. Although it will be discussed further in the Chapter 6, it is important to note here that had the keyword searches been broadened, the placement of these states would change. For example, California has not drafted legislation directly addressing water banks or water banking; however, it does have multiple pieces of legislation focused on water markets or water transfers, which were not included in this analysis because they do not meet the search protocol criteria.

Table 3: Category Levels

Level	Parameters	States
1	The state has no reference to water banking in the legislation.	Alaska, Hawaii, Nebraska, Nevada, Oklahoma, South Dakota, Wyoming
2	The state has legislation that mentions “water banking” or “water bank” but did not deal directly with water banking.	Montana
3	The state has legislation that directly discusses or addresses water banking, although it is not the main topic of the document, perhaps labeled as a subsection. (This is commonly used as an option within a larger addressed issue such as “water marketing and water reallocation options for the management of water”).	California, Idaho, Utah
4	The state has full pieces of legislation written explicitly for water banking.	Arizona, Colorado, Kansas, New Mexico, North Dakota, Oregon, Texas, Washington

Figures 2 and 3: The number of pieces of state legislation from Level 2, 3 and 4 states that use the keywords water banking or water bank and the geographic grouping by region.





As can be seen in Figure 2 above, the states of Arizona and Washington have significantly higher numbers of pieces of legislation, with 139 and 110 pieces respectively, that use the terms water banking or water bank. New Mexico also has a high occurrence of the key terms in various legislation, 25 pieces. Geographically, there were a total of 181 pieces of legislation regarding water banking in Prior Appropriation states in the mountain division and 122 in the pacific division, with only 16 in the west north central division and 13 in the west south central division (regions defined by the US Census Bureau [US Census Bureau, 2016]). Four of the predetermined Level 4 states are located in the Mountain Division. The 333 legislative documents from the states in Level 2, Level 3, and Level 4 were uploaded to Dedoose and coded for further analysis.

Figure 4 shows that the earliest state legislation that explicitly addresses water banking was from North Dakota in 1969, with House Concurrent Resolution No. 29. The resolution stated,

> "Now, Therefore, Be It Resolved by the House of Representatives of the State of North Dakota, the Senate Concurring Therein: That the Forty-first session of the legislature of the state of

> North Dakota respectfully memorializes the Congress of the United States to adopt legislation which would establish a water bank plan providing for annual payments to farmers and ranchers for nonagricultural use of wetland areas provided that the decision to participate remains with the individual landowner."

The most active year for water banking legislation was in 2009 with drafts from the states of Washington and Arizona and with New Mexico presenting Senate Bill 113, which aimed to establish water banks in New Mexico; however, it was never passed. The late 1990s brought about an explosion of water banking legislation, which continues to maintain a steady production to this day with ten pieces of legislation in 2016.

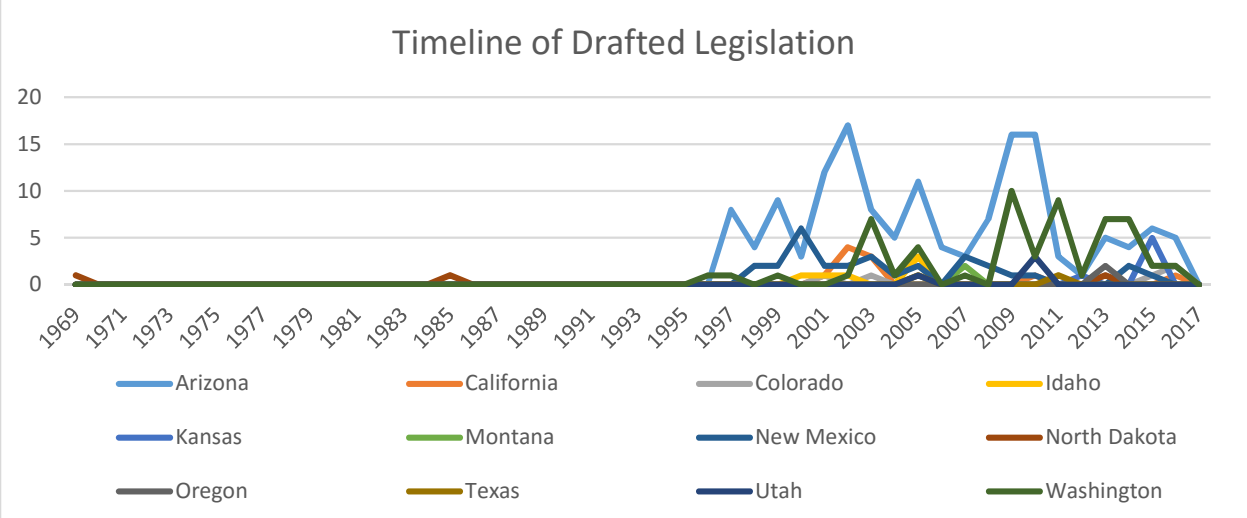


Figure 3: Time distribution of legislative documents.

The Codes to Water Banking

In addition to the above quantitative analysis, Dedoose was also used as a tool for qualitative analysis through coding. The pieces of legislation were only coded for sections that were in reference to water banking. For example, if the document mentioned wildlife habitats but that section was not

affiliated or linked to water banking, then the document was not coded for “wildlife”. However, if a topic was discussed in two different capacities within the same document, then it would have been coded twice in the same document with the same code. Figure 5 below highlights the most prevalent codes used in this research. The larger the word, the more times it was used as a code in the 333 pieces of legislation. See Appendix A for an extensive table that shows how many times a state was tagged with each code and the ratio of codes per document of each state. See Appendix B for the list of codes and example excerpts of each code pulled from the legislative documents.

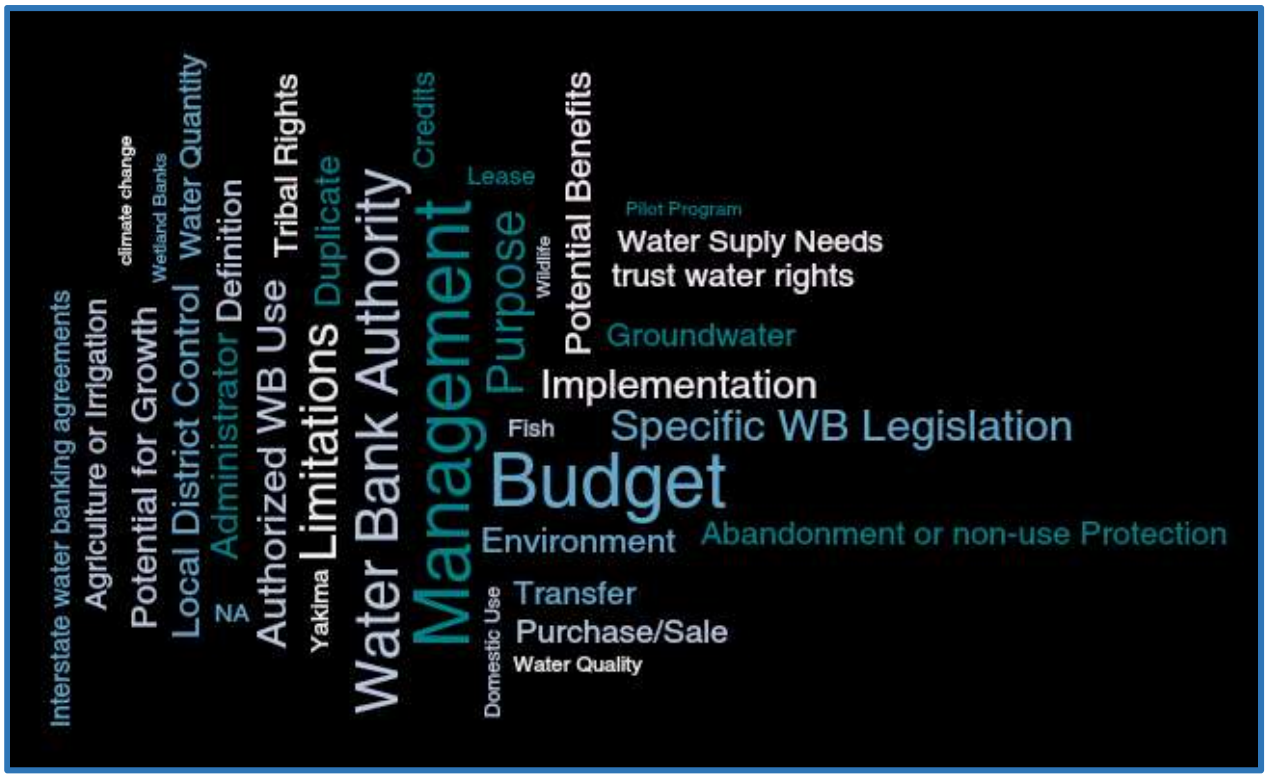


FIGURE 4: Cloud Diagram of most tagged codes.

Once each document was read and coded, the states were subjected to a comprehensiveness analysis based on the information in their state legislative documents, as shown by coding. Points were

awarded for each subject addressed and as a result of this process, a total score was given to each state as described below.

If the state had at least one document that was coded for a key term, the state received a point for that category. Each main topic and sub topic had the potential to earn 1 point, except for the final category “Specific Water Banking Legislation” which had a weight of three points for the significance to the field. Therefor, each state had the potential of receiving 30 points for the comparative analysis, 1 point for each topic and subcategory, and a weighted full 3 points for having water banking specific legislation. The results are shown in Table 4 below, grouped by topic area. For a more detailed table see Appendix A.

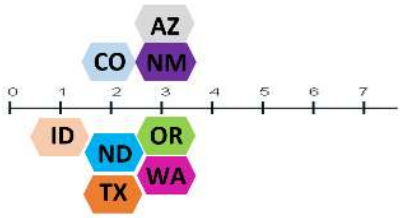
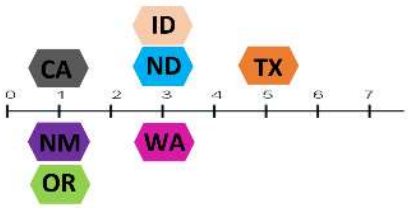
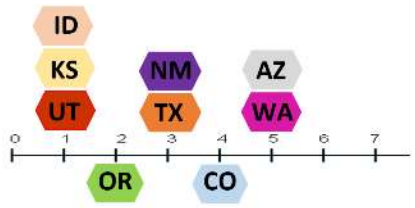
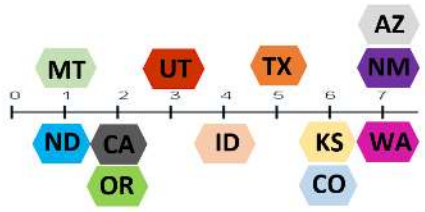
Table 4: Scale analysis of codes within legislation and total sums of coded topics regarding water banks for each state.

	Authorization (2)	Purpose (2)	Management (7)	Budget and Costs (1)	Transfers (5)	Environment (5)	Quantity (3)	Groundwater (1)	Potential for Growth (1)	Specific Water Banking Legislation (3)	**Score of overall state legislation comprehensiveness on water banking**
Arizona	1	2	7	1	5	0	3	1	1	3	**24**
California	0	1	2	1	0	1	0	0	1	0	**6**
Colorado	2	2	6	1	4	0	2	0	1	3	**21**
Idaho	1	1	4	0	1	3	1	0	1	0	**12**
Kansas	1	0	6	0	1	0	0	1	0	3	**12**
Montana	0	1	1	0	0	0	0	0	1	3	**6**
New Mexico	1	2	7	1	3	1	3	1	1	3	**23**
North Dakota	0	1	1	1	0	3	2	0	0	3	**11**
Oregon	1	1	2	0	2	1	3	1	1	3	**15**
Texas	1	2	5	1	3	5	2	0	1	3	**23**
Utah	1	1	3	0	1	0	0	1	0	0	**7**
Washington	2	2	7	1	5	3	3	1	1	3	**28**

Category Comparison

This matrix allows the states to be compared to each other based on the presence of topics within legislation, not on the number of documents. Most categories have sub categories. See Appendix A for the full matrix displaying both primary and sub categories. Using categories that had a wide range of scores, Table 4 shows an example of how the states compare to one another. This table also includes examples of the code. The full list of codes and examples from the legislation is in Appendix B. Each category includes sections of legislation as coded that comprised the category.

Table 4: Category Comparison and Code examples

Category and Code Examples	Comparison of States per Category
Quantity **OR HB 2811:** "Mitigate water resource impacts or future water supply needs" **WA HB 1793** (2015): " The legislature further finds that since the preferred options of offsetting mitigation, water bank use, or extended infrastructure are not always available or practicable, cities and counties should work with local landowners to develop safe and reliable alternatives to the traditional piped water purveyor or private well for supplying potable water. Although not preferred or appropriate in every instance, a local portfolio of legally allowable alternative water systems, such as cisterns, trucked water systems, and rainwater collection and sanitization systems, can provide a suite of options to assist landowners with matching their water needs with the physical location and limitations of their geographic location."	
Environment **ID SB1116** : This measure would authorize the Water Resources Board to utilize water rights secured voluntarily in the Water Supply Bank for minimum stream flows. It is contemplated that aquifer recharge will be an important benefit in certain watersheds, where federal conservation-related incentives and other voluntary water transactions can secure natural flow water rights for the Water Supply Bank to address these purposes. In some watersheds (Big Lost, Little Lost) water rights secured for the Water Supply Bank can help address the loss of fish and wildlife habitat, which has contributed to existing or potential listings of species under the federal Endangered Species Act. **TX SB1**: The Texas Water Trust is established within the water bank to hold water rights dedicated to environmental needs, including instream flows, water quality, fish and wildlife habitat, or bay and estuary inflows.	
Transfers **AZ SB 1478**: "A projection of long-term storage credits that will be stored, loaned, replaced or distributed pursuant to any water banking services agreement into which the authority has entered." **UT HB84:** A local district participating in water banking may do the following, subject to any contractual limitation and applicable law governing the appropriation and use of water, within the local district's territory: (a) lease, purchase, manage, or otherwise administer a valid water right; (b) manage the use of a water right held or administered by the local district; (c) file an application to change a point of diversion, place of use, or purpose of use concerning a valid water right if the local district owns the water right or has the contractual right to file the application.	
Management **CO HB 16-1392:** The board's rules must limit the amount of water a person may deposit into the water bank to depositing all of the water subject to a decree for up to 3 years in any consecutive 10-year period or depositing up to 30% of the water subject to the decree in any consecutive 10-year period. The board's rules must also prohibit a lease, loan, or trade of water from the water bank that would negatively affect an interstate obligation or result in transferring water out of the Rio Grande or Arkansas River basins or across the continental divide. **NM SB 793** (first session 2005): "The district's water bank may make temporary transfers of place of use without formal proceedings before the state engineer, and water rights placed in the district's water bank shall not be subject to loss for nonuse during the period the rights are placed in the water bank."	

Overall State Scores

This comprehensive analysis allows a comparison to the original levels designed to classify each state on their water banking legislation. The top five states (receiving a grade above 20) were classified as Level 4 states in the original categorization. These states, Arizona, Colorado, New Mexico, Texas, and Washington, maintain the highest average grades on this 30-point scale as can be seen in Figures 6 and 7 below.

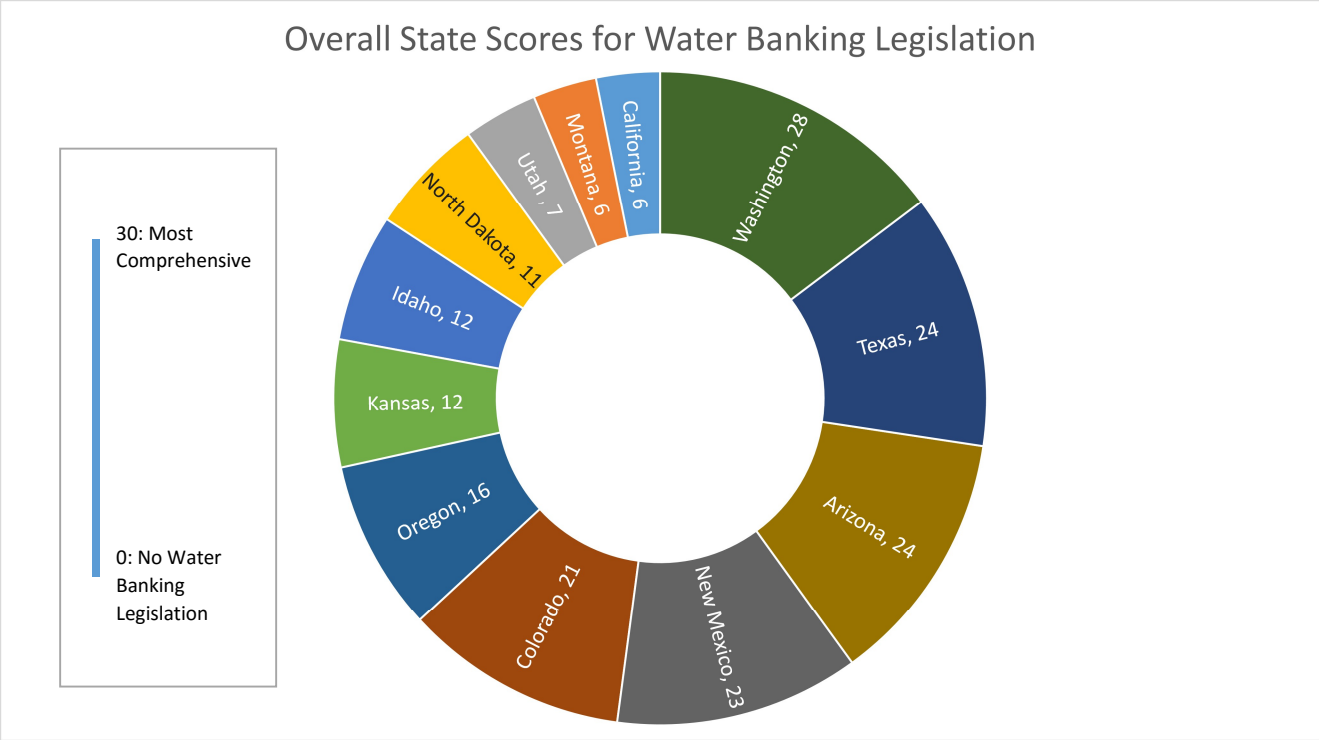
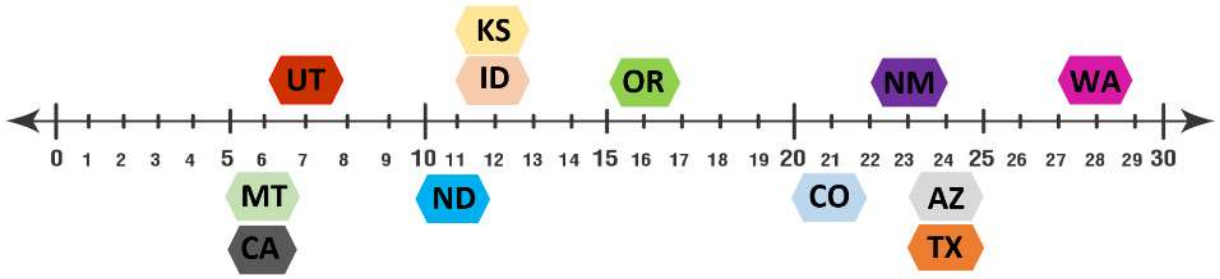


Figure 6 (above): Representation of Overall Scores (on a scale from 0 to 30) for each state based on the level of overall water banking legislation comprehensiveness.

Figure 7 (below): Overall comparison of state assessment scores on legislation comprehensiveness regarding water banking.



In addition, the opportunity was available to simultaneously track keywords for unique phrases in order to identify the relation between water banking and tangential topics. Terms like *Yakima* and *Arizona Water Bank Authority* are unique to specific states but *climate change* transcends all states and was found in three of the twelve coded states. Again, these terms are solely in regards to water resources management, specifically a water banking mechanism. Yakima was present in 76 of the Washington state documents; however, only 19 discuss the Yakima basin in regards to water banking.

5. Discussion

The Results Speak

Conducting this research provided the ability to have prominent water banking legislation in a centralized review. It has enabled the identification of policy elements and objectives most often associated with water banking and has provided a platform for further discussions on how the progression of water banking legislation can be compared to the growth of water banking practices and other water resource management strategies.

In addition to the presence and quantity of legislative pieces for water banking, the two-part strategy for this research showed the comprehensiveness of water banking policies. The results of the

second analysis allowed a comparison to the results of the first analysis, which classified states into various levels based on the presence of water banking legislation. As predicted, the states classified into Level 4 mostly maintain the highest average grades on the 30-point scale analysis. Washington, Arizona, Texas, New Mexico, and Colorado rise to the top of having the most comprehensive legislation concerning water banking. However, this does vary slightly from the original analysis, which was based on the presence of water banking specific legislation. States such as Kansas and Montana, which have legislation written directly for the management of water banking, did not address other topics such as the environment or the budget/funding for such a bank. By conducting this mixed methods approach, the results show that it takes more than just the presence of water banking legislation to have a comprehensive authority. States that did not have specific water banking legislation did not place very high on the scale analysis, such as Idaho.

The coding process and scale analysis shows that even the most basic documents will have elements of the purpose, benefits, and management of water banks, otherwise, legislation varies in need and design. A resounding motivation for water banking was displayed in the occurrence of agriculture and irrigation objectives in reference to water banks. Thirty-seven documents discussed agriculture needs as a priority but it was not the only concern. The research results showed a clear connection between water banking purpose and environmental objectives. Although environmental concerns were not always the motivating factor, 86 documents from seven states referenced environmental categories including, fish and fisheries, wildlife, and water quality. In addition, few states specifically address the domestic and urban use of water banking to meet water supply needs. Although each sector is affected by the other, it was rare when legislation mentioned more than one of these subject areas. Water banking legislation was most often framed to address agriculture needs or environmental concerns, with a rare nod to future domestic supplies. By including the documents that

were drafted and proposed (not only the pieces that passed), it provides evidence that legislative members have interest in water banking and the associated benefits.

Water Banking as a Tool

The data collected showed that water banking is often presented within state legislation as a tool in a suite of options for water resources management. Only 64 out of the 333 documents were dedicated solely to water banking, which implies that the remaining documents reference water banking under a broader umbrella in regards to other programs or initiatives. Programs such as wetland reconstruction and meeting tribal water supply needs have looked to water banking as a mechanism to help meet those goals. When present in documents that are not solely about water banks (coded as Specific Water Banking Legislation), water banking is referenced as one of many tools for the state to best manage and appropriate water resources. The term is often found next to other suggested strategies such as water markets, conservation strategies, and efficiency projects. Water banking is not a panacea for water resource management in water scarce areas, simply another strategy to supplement current ongoing mechanisms. Legislation that has addressed water banking directly has outlined the programs limitations, strategies, and parameters.

Deferment of Policy to an Established Bank

During the coding of legislation, a predominant pattern showed that in cases where there was already a water banking authority, such as in Arizona, the legislation that was written tended to defer to that established program. With the establishment of such an authority, the presence of other legislation written specifically for the function of water banks seemed less likely. These programs were considered in the budget and mentioned within water management plans; however, the growth and development for the water banks, including limitations and management parameters, were not written as fervently as

states that do not have an established authority. In addition, Arizona has a specific program, the Water Banking Fund, which is mentioned in every legislative budget proposal making funding and function more established.

Interstate Water Banking Agreements

An interstate water banking system has been developed by the Arizona Water Bank Authority through agreements with other Colorado River users. “Under an agreement with Southern Nevada Water Authority, when Nevada needs additional supplies it may call on Arizona to reduce its take on the Colorado River. When that occurs, Nevada will use some of Arizona’s Colorado River water and Arizona will use the stored groundwater” (Culp et al, 2014). Arizona Senate Bill 1396, is the prominent piece of legislation that discusses interstate water banking agreements. It clearly stipulates how the agreement is to function and how the Arizona Water Banking Authority is to interact with California and Nevada for the water from the Colorado River. It states, “These water banking agreements may provide that during years when the secretary of the interior has declared a shortage on the Colorado River, no decrease in Arizona diversions shall be required” (Arizona Senate Bill 1396). Arizona is not the only state looking to institute multi-state water banking agreements. Colorado, New Mexico, Utah, and Wyoming are considering the use of a water bank to store water in Lake Powell, a program that may include partnering with individual parties (Culp et al., 2014). Although the water sharing will not be across state lines, Congress appropriated $4 million to fund the Water Bank Program (WBP) through which Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) is establishing water bank programs in Minnesota, North Dakota, and South Dakota (NRCS, 2014).

The Weight of SPECIFIC Water Banking Legislation

Nine states have legislation that is specific to water banking. The analysis shows that the states with the most comprehensive water banking legislation (represented by grades 0-30) are those that have legislation, or at least drafted legislation, that is specific to water banking. Washington was determined to possess the most comprehensive water banking legislation, with an overall score of 28. Since July 2003, the state of Washington has explicit statutory authority to perform water banking through House Bill 1640.

> "[House Bill 1640] gave authority to the Washington Department of Ecology to use the Trust Water Rights Program in the Yakima River Basin for water banking purposes. The authority was broadened in 2009. The Washington Department of Ecology worked closely with stakeholders to produce draft legislation for water banking that was adopted in the 2009 legislative session. The bill clarifies that the Washington Department of Ecology has the authority to use the State Trust Water Program for water banking purposes statewide, including mitigation. During the 2009 legislative session, Chapter 90.42 RCW was amended significantly. It now clearly authorizes the Washington Department of Ecology to conduct water banking activities statewide." (Washington State Ecology Department, 2012).

To better define water banks, legislative members in Washington described "banking as a verb (activity), rather than a noun (institution) to allow flexibility in bank formation and governance" (Washington State Ecology Department, 2012). The state is authorized to use water banking to mitigate for new water uses, hold water for beneficial uses, meet future water supply needs and provide a source of water to third parties on a temporary or permanent basis, for any allowed beneficial use (Washington State Ecology Department, 2012).

Creating water specific legislation does more than just set the foundation for future policy: it acknowledges the need for such legislation and sets a standard for accepting the importance of addressing water banking. Water banking legislation has expedited transactions aimed at meeting in stream flow and out of stream water demands (Cronin and Fowler, 2012). In addition, the legal

acknowledgement of water banks can encourage user participation as most of the states provide protection from water right forfeiture if participating in a water banking program (Schempp, 2009).

Linking Law and Practice

Connecting Legislation to Practice

Water banking institutions have somewhat paralleled the rise in legislation across the western United States as seen by an increase of water banking programs that began in the early 2000s, soon after the increased drafting of water banking legislation as shown by the above timeline of relevant legislation (see Figure 4 above, on page 16). Although there may be a correlation, there has yet to be a proven causation between water banking legislation and water banking programs. The research shows that states such as Arizona and New Mexico have the most pieces of drafted legislation, while states like Washington have high overall scores for legislative comprehensiveness. However, this does not imply or suggest that the states with high assessments will then have the most water banking programs or the most impactful programs. The highest graded, top level (Level 4) states do have water banking specific legislation; however, states with no legislation for water banks still maintain a high number of water banking programs, such as Nevada. In contrast, Utah has developed and passed water banking legislature authorizing water banks within the state (Idaho House Bill 84), yet there are currently no active water bank programs. In contrast, the state of California has been using both physical and financial types of water banks to store and transfer water for groundwater recharge without any written regulations on water banks and there has yet to be an official publication from the state on water bank monitoring (Hanak and Stryjewski, 2012).

The structure and implementation of each water bank in regards to the surrounding circumstances influences the success or failure of a water bank program. For areas in California, drought conditions are what promotes the use of water banks. Water banks can mitigate the economic impacts of a drought by reallocating available water supplies. To effectively serve this purpose, a water bank must be able to arrange the physical transfer of water from sellers to buyers. Miller and Hall (1996) compared water banks in California and Idaho. The study found that the California Emergency Drought Water Banks helped to mitigate the impacts of an extended drought, but water banks in Idaho became increasingly ineffective as drought conditions worsened (Miller and Hall, 1996). Pulido-Velazquez et al. (2004) even examined different models and scenarios in which markets of water transfers could be best implemented to mitigate droughts in California. Using the markets with other conjunctive strategies could have varying beneficial impacts. However, in order to have significant positive impacts on the areas, it would require extensive state policy changes to create a free market (Pulido-Velazquez et al., 2004).

Local Implementation

While this research showed the presence of water banks in state level regulations, practicing banks are often being designed and implemented on the local scale, often through counties or irrigation districts. Water banking is shifting to the local level of water management. The New Mexico Interstate Stream Commission (ISM) recognizes water banks established by an irrigation district, conservancy district, a community ditch, acequia, or water use association (WGA, 2012). In Nebraska, the water bank program that has been developed is in one of the state's Natural Resources Districts (NRD), which is a local branch of government, managed independently where the State of Nebraska has no authority over it (WGA, 2012). The degree to which local districts or counties can exercise discretion varies greatly among states. In Idaho and Texas, the water banks are designed specifically for local districts, but the

state controls the framework and implementation through the established Idaho Rental Pool system and the Texas Water Bank. As long as they adhere to state legislation and policies, local entities can maintain control over the development and management of the water banks. For example, in Oregon, a program was initiated in the Deschutes River Basin, where the Deschutes basin Groundwater Mitigation rules were created, which allowed a water bank to buy and sell mitigation credits. In California, Kern County administers one of the largest water banking programs in the west and is another example of county run water banks such as Kittitas County Water Right Leasing and Water Bank in Washington. However, like most natural resources issues, water does not adhere to political boundaries. As a result, many of the water banking programs reach past county lines and focus on specific water basins, aquifers, and river systems, such as the Columbia Basin Water Transactions Program of Oregon, the Milk River Water Bank of Montana, the Yakima Basin Transfer Program of Washington, and Edward's Aquifer Authority Groundwater Trust in Texas. The Department of Ecology for the state of Washington explicitly displays on its website, "Generally, water banks function better at the regional or watershed level" (Washington Department of Ecology, 2016b). The presence of water banks administered at the county and local levels supports the argument for decentralized water allocation.

Groundwater

Water banking can take the form of groundwater storage. This is reflected more in the practice of water banking programs than the legislation. The occurrence of "groundwater" in state legislation in regards to water banking is sparse. With a total of 35 excerpted sections, only six of the states that were researched explicitly refer to groundwater used in water banking or in some regards to water banking in other capacities. For example, the Utah House Bill 84 refers to the regulations of water banking within local groundwater management plan requirements, stating "requires… a local district participating in

water banking holds sufficient water rights for nonuse to meet the groundwater management plan requirements" (Utah House Bill 8).

A piece of legislation from Arizona made a very important distinction in defining what is groundwater, and very specifically, what it is not: "Groundwater means water under the surface of the earth, regardless of the geologic structure in which it is standing or moving. Groundwater does not include banked water or water flowing in underground streams with ascertainable beds and banks" (Arizona House Bill 2357). However, this definition is specific to Arizona's legislation and may not match another state's parameters.

Washington provides a rare example of the state's legislation on water banking addressing groundwater: "Funds may be provided to lease or purchase water rights to create a reserve water supply for domestic groundwater users that have a groundwater right with a priority date later than May 10, 1905, as well as for all out-of-priority groundwater users. In securing water for such domestic groundwater users, strong preference shall be given to the use of water banking and transfer methods that provide alternatives to permanent purchase and dry-up of agricultural water rights in the basin, including dry-year options, water banking, long-term water supply lease agreements, long-term agricultural land fallowing agreements, and reduced consumptive use through efficiency or alternative cropping arrangements while maintaining historic return flows" (Washington House Bill 5035).

Although groundwater is not often explicitly addressed within legislation, the parameters and management structures of current water banks clearly allow the presence and growth of groundwater storage and, also, aim to protect groundwater resources. Water banks using groundwater can easily be identified in every western state with some notable examples being the Kern County Groundwater Bank in California and The Truckee Meadows Groundwater Bank in Nevada.

Future Research Opportunities

As the results displayed, water banking legislation became more prevalent in the late 1990s. What caused this increase? This is an opportunity for future research to see if there can be a proven causation of increased water banks from external factors such as western droughts, water scarcity, or possibly the boom of development that cause a spike in water demands. Figure 8 below, from a 2005 report, shows the geographic regions most affected by the droughts of 1980, 1988, and 2002 (Cook et al, 2005). From this image it can be seen that the states reviewed in this research were heavily affected by the droughts which could have been an influencing factor in the increased legislation on water banking, a water resource management tool for water scarce areas.

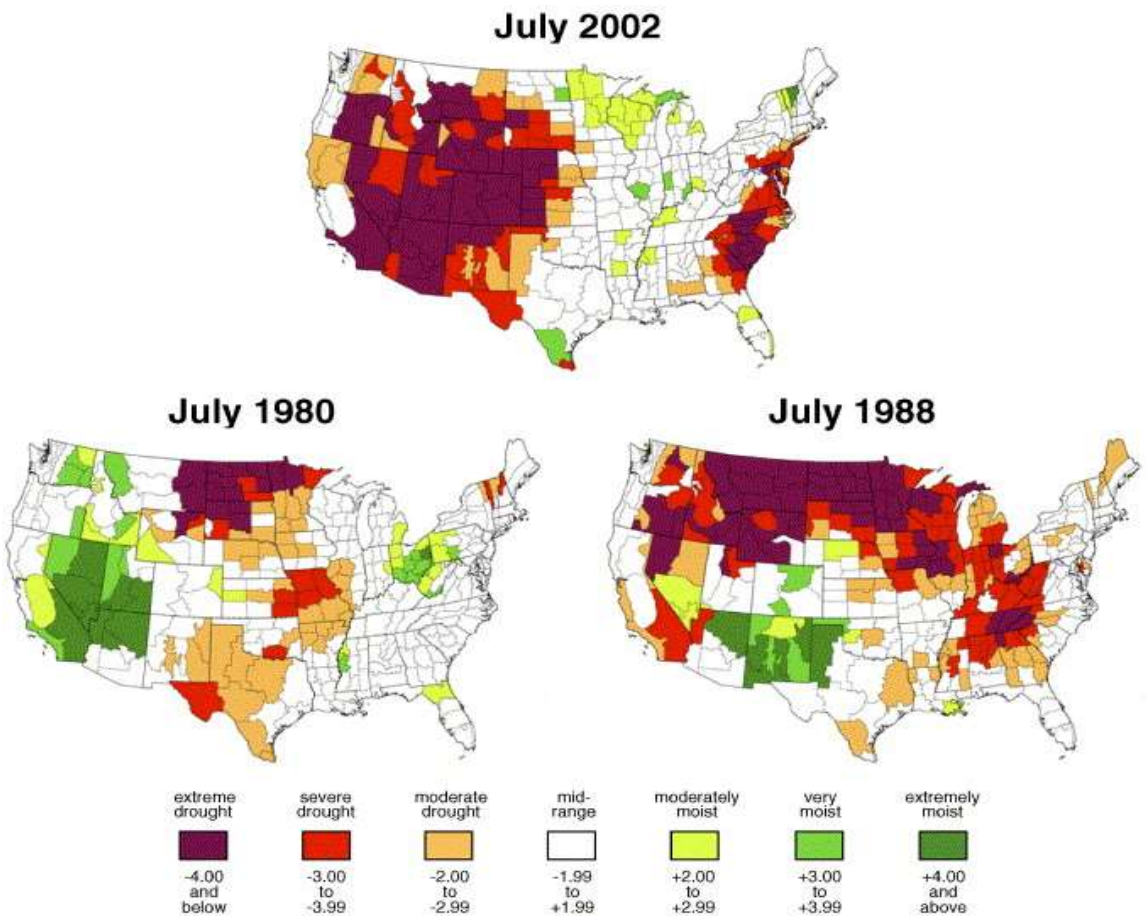


Figure 8: Maps showing the U.S. regions most affected by drought in 1980, 1988, and 2002
Source: Cook et al., 2005

Localized water scarcity due to environmental factors such as drought were also compounded by supply needs by a growing population. The population boom from 1990 to 1995 proceeds the legislative actions in Idaho, Colorado and New Mexico in the late 1990's. New Mexico had zero pieces of legislation referencing water banking until 1998, which was the start of 12 drafted pieces of legislation from 1998 to 2001. Idaho and Colorado also created their first documents referencing water banking in 2000 and 2001, respectively. The growth of water banks in the western United States may be attributed to the rise in environmental protection measures over the past six decades, such as monitoring stream flow levels in addition to water quality for fish and wildlife habitats. From 1990 to 1997, more than $37 million was spent to lease 2 million acre-feet of water and $23.8 million as spent to purchase 132,000 acre-feet of water for environmental protection (Landry, 1998). This research was conducted to create a foundation from which further research can continue to shed light onto the field of water resources management regarding water banking.

6. Conclusions

Limitations, Challenges, and Lessons Learned

In any research the opportunity for reflection on the process and recognition of limitations will rise. While this research provided insight into the history of legislation and the potential benefits to policy makers, there were challenges throughout the process and lessons learned. The first two lessons speak to the range in type of water banking institutions and programs in addition to specific topic vernacular mixing with common (often misused) vocabulary associated with water banking, which was a motivating factor for conducting this research.

A more comprehensive and thorough research of the complete suite of legislation that bears weight on the policies for water banks would include a larger search of associated terms. While working methodically through the state legislation sites it became apparent that some state documents were excluded that were ultimately aimed to address programs very similar to water banks but were not included because the documents did not meet the specifics of the designed search protocol. For example, California often refers to “mitigation banks” which is why California’s legislation is seemingly under-represented in this research. In addition, Hawaii, which has no mention of water banks and water banking, does have legislation on development banks and procedures, which can incorporate water rights. However, since this research protocol did not include such terms, those documents have been left out of the analysis. The literature review showed that water banks are often addressed by states under current legislation that directly addresses water rights and the trading, selling, and leasing of such rights.

In addition, future data collection methods should weed out and exclude program names that include the key search terms. The presence of the Arizona Water Banking Authority heavily influenced the collection of the documents to be analyzed for the state of Arizona. Although the development of such institutions are critical in the analysis of a state’s policy development, it may have unfairly tilted the quantitative analysis. For example, other programs that do not include the term “bank” such as Idaho’s Water Rental Pool programs, did not rise to the meet the search criteria, although it may carry out similar, if not the same, activities of the Arizona Water Banking Authority. As a result, Arizona’s large qualitative presence in the research and analysis is due, in part, to the occurrence of the name, “Water Banking Authority” which was present in many legislative documents even if the rest of the document had no reference to water banking activities. Although this impacted the quantity of documents analyzed, the scale analysis for presence of content was designed to equalize the field for all states.

As an academic and professional reflection, Dedoose may not be the best platform to manage and assess such a large amount of information. Although the analysis tools were efficient and the program was user friendly and fundamentally intuitive, the uploading and examination aspects of documents were not very efficient. For example, PDFs were not converted well and became unsearchable, which forced the primary researcher to manually copy and paste information in as a new document. Finally, the coding process was slow. It took time for every code to be applied and the searching within a document was sluggish and had to be refreshed for each new document. However, the research design and structure was very informative and can be useful for future multi-state policy studies.

How should states proceed?

The legislation not only provides parameters and direction for future growth in some cases, but, more importantly, this research highlights the need for such mechanisms like water banking. Since the appearance of water banks is clearly on the rise, it behooves state water agencies to begin or continue drafting policy parameters for managing and incorporating water bank programs into current state water policies. While water bank programs are being implemented on the county and local scale in addition to the state level, this research highlights the importance of having state legislation in place to allow and support the growth of water banking programs even if being managed by local districts.

States can use this research to see how neighboring states have progressed through their drafting of the legislation and also to note which key topics have been addressed. Policy and decision makers can then see which states had the focused on environmental issues, irrigation needs, or water right trading management, and use the information to fill in the gaps when drafting their own legislation. Furthermore, decision makers must respond to pressing population issues and a changing

environment more quickly than in the past. Hence, it is all the more important for decision makers to act with future growth in mind. The information provided in this research can aid in the preparation and drafting of policies and legislation to incorporate the existence of water banks into state regulations on water resource management.

Conducting this research provided the ability to have prominent water banking legislation in a centralized review. It has enabled the identification of policy elements and objectives most often associated with water banking and has provided a platform for further discussions on how the progression of water banking legislation can compare to the growth of water banking practices and other water resource management strategies.

Appendix A: Water Bank Locations in the Western U.S.

State	Project Name	Location
Alaska	Su-knick Mitigation Bank	Matanuski- Susitna Borough, AK
Arizona	Arizona Water Banking Authority - Central Arizona Project Water Banking Program	Phoenix, AZ
California	Drought Water Banks (Multiple Years) 1991, 92, 94	Central Valley, CA
	Dry-Year Purchasing Program	Sacramento, CA
	Semitropic Groundwater Banking Program	Semitropic, CA
	Butte County	Butte County, CA
	Sacramento North Area Conjunctive Use	Sacramento, CA
	EBMUD/San Joaquin County Conjunctive Use Project	San Juaquin County, CA
	Madera Ranch Groundwater Bank	Madera Basin, CA
	Kern County Groundwater Bank	Kern County, CA
	Tulare Lake Basin Water Storage District	Tulare Lake, CA
	Arvin-Edison Water Storage District Water Management Program	Arvin, CA
	Berrenda Mesa Property Joint Water Banking Project	Lost Hills, CA
	Buena Vista Water Storage District Water Management Program	Buttonwillow, CA
	Cawelo Water District/Dudley Ridge Water District Conjunctive Use Program	Bakersfield, CA
	Cawelo Water District's Modified Famoso Water Banking Project	Bakersfield, CA
	City Of Bakersfield 2800 Acre Groundwater Recharge Facility	Bakersfield, CA
	Kern Delta Water District's Groundwater Banking Program	Bakersfield, CA
	Kern Water Bank	Kern, CA
	North Kern Water District Groundwater Storage Project	Bakersfield, CA
	Thomas N. Clark Recharge And Banking Project	Kern County, CA
	Rosedale-Rio Bravo Water Storage District And Improvement District No. 4 Joint Use Groundwater Recovery Project	Bakersfield, CA
	Rosedale-Rio Bravo Water Storage District's Groundwater Banking Program	Bakersfield, CA
	West Kern Water District's Groundwater Banking Program	Taft, CA
	Napa Co Groundwater Conservation Ordinance	Napa County, CA
	Stanislaus Co Groundwater Ordinance	Stanislaus County, CA
	Merced Co Groundwater Ordinance	Merced County, CA
Colorado	Arkansas River Basin Bank (Pilot)	Colorado Springs, CO
	Dolores Water Conservancy District Water Bank	Dolores, CO

	CO West Slope Bank	Delta County, CO
Idaho	State Water Supply Bank	Boise, ID
	Snake River Rental Pool	Twin Falls, ID
	Shosone Bannock Tribal Water Supply Bank	American Falls, ID
	Boise River Rental Pool	Boise River, ID
	Payette River Rental Pool	Payette River, ID
	Payette Basin On Lake Fork Creek Water Bank	Lake Fork, ID
	Lemhi River Rental Pool	Lemhi River, ID
Kansas	Central Kansas Water Bank Association	Stafford, KS
	State Water Marketing Program	Topeka, KS
	Kansas River Water Assurance District	Junction City, KS
	Marias Des Cygnes River Water Assurance District	Melvern Reservoir, KS
	Cottonwood/Nesho Watr River Assurance	Marion Reservoir, KS
Montana	Grass Valley French Ditch Company Of Missoula	Missoula, MT
	The Private Water Leasing Pilot Project	Bozeman, MT
	Upper Fort Clark River Basin Instream Flow Pilot Program, And	Butte, MT
	The Fish, Wildlife And Parks Water Leasing Pilot Program	Mill Creek, MT
	Montana Water Trust And Trout Unlimited Water Leasing	High Plains, MT
	Milk River Water Bank	Milk River, MT
	Gallatin Valley	Gallatin Valley, MT
Nebraska	Central Platte NRD Water Banking Program	Grand Island, NE
	Lower Loup NRD Irrigated Acres Transfer Program	Lower Loup, NE
	Central Nebraska Public Power And Irrigation District (CNPPID) Delivery Location Transfer Program	Holdredge, NE
Nevada	Interstate Water Bank With Arizona	Las Vegas, NV
	Truckee Meadows Groundwater Bank	Truckee Meadows, NV
	Las Vegas Valley Groundwater Recharge	Las Vegas, NV
New Mexico	Pecos River Basin Water Bank	Pescos River, Nm
	Pecos River Acquisition Program (Water Lease/Purchase Program)	Pescos River, NM
	Esa On Mitigation On Pecos River	Pescos River, NM
North Dakota	Nrcs Water Bank Program	Bismarck, Nd
Oregon	Deschutes Water Exchange - Groundwater Mitigation Bank	Deschutes County, OR
	Klamath Basin Rangeland Trust	Klamath, OR
	Walla Walla Lease Bank	Umatilla, OR
	Benton Co Groundwater Supply And Requirements Ordinance	Benton County, OR

	Deschutes Water Exchange - Annual Water Leasing Program	Deschutes, OR
	USBR Klamath Basin Leasing Program	Klamath, OR
	Columbia Basin Water Transactions Program	The Dalles, OR
	Lincoln City Schooner Creek	Lincoln City, OR
	Klamath Tracking And Accounting Program	Klamath, OR
South Dakota	NRCS Water Bank Program	Pierre, Sd
Texas	Texas Water Bank	Austin, TX
	Texas Water Trust	Austin, TX
	Edwards Aquifer Authority Groundwater Trust	San Anonio, TX
Washington	Yakima Basin Emergency Water Bank	Yakima, WA
	Lake Roosevelt	Cascades Island, WA
	Port Of Walla Walla Leases	Mcnary, WA
	Sullivan Lake	Douglas Ferry County, WA
	Dungeness Water Exchange	Dungeness, WA
	Amerivest	Kittitas County, WA
	Big Creek Water Right	Grisdale, WA
	Bourne Water Bank Llc	Seattle, WA
	Burchak Tillman Creek	Thorp, WA
	Masterson Ranch	Thorp, WA
	New Suncadia	Ellensburg, WA
	Roan	Ellensburg, WA
	SC Aggregate	Ellensburg, WA
	Swiftwater Ranch	Cle Elum, WA
	Western Water Partners	Cle Elum, WA
	Yakima Mitigation Services	Yakima, WA
	Yakima Basin Water Transfer Program	Yakima, WA
	Yakima Basin Pilot Project	Yakima, WA
	Okanagan Salmon Creek Lease Bank	Okanogon, WA
	Kittitas Co Water Right Leasing And Water Bank	Kittitas County, WA
	East Columbia Irrigation District Bank	Othello, WA
	Walla Walla Exempt Well Mitigation Bank	Walla Walla, WA

Appendix B: Full Code Count Chart

	Definition	Budget	Domestic Use	Water Quantity	Agriculture or Irrigation	Environment	Authorized WB Use	Purpose	Purchase/Sale	Lease	Local District Control	Implementation	Specific WB Legislation	Administrator	Management	Wildlife	Pilot Program	Water Quality	Groundwater	Interstate water banking agreements	Transfer	Credits	Potential for Growth	Abandonment or non-use Protection	Limitations	Tribal Rights	Fish	Wetland Banks	TOTALS
ARIZONA																													
#	11	81	1	2	10	0	10	7	8	3	7	17	8	17	38	0	0	0	18	19	2	17	4	1	23	9	0	0	**313**
%	8	58	1	1	7	0	7	5	6	2	5	12	6	12	27	0	0	0	13	14	1	12	3	1	17	6	0	0	
G	1	1	1	1	1	0	1	1	1	1	1	1	3	1	1	0	0	0	1	1	1	1	1	1	1	1	0	0	**24**
CALIFORNIA																													
#	0	8	0	0	0	0	0	1	0	0	0	0	0	0	7	0	0	6	0	0	0	0	1	0	1	0	0	0	**24**
%	0	80	0	0	0	0	0	10	0	0	0	0	0	0	70	0	0	60	0	0	0	0	10	0	10	0	0	0	
G	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	**6**
COLORADO																													
#	1	1	0	1	2	0	1	1	3	2	3	2	2	2	3	0	1	0	0	1	2	0	1	5	6	0	0	0	**40**
%	17	17	0	17	33	0	17	17	50	33	50	33	33	33	50	0	17	0	0	17	33	0	17	83	100	0	0	0	
G	1	1	0	1	1	0	1	1	1	1	1	1	3	1	1	0	1	0	0	1	1	0	1	1	1	0	0	0	**21**
IDAHO																													
#	0	0	0	2	0	4	1	2	0	2	3	1	0	3	9	1	0	0	0	0	0	0	2	0	0	0	3	0	**33**
%	0	0	0	33	0	67	17	33	0	33	50	17	0	50	150	17	0	0	0	0	0	0	33	0	0	0	50	0	
G	0	0	0	1	0	1	1	1	0	1	1	1	0	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	**12**
KANSAS																													
#	0	0	0	0	0	0	1	0	0	1	1	1	1	1	4	0	0	0	2	0	0	0	0	3	3	0	0	0	**18**
%	0	0	0	0	0	0	17	0	0	17	17	17	17	17	67	0	0	0	33	0	0	0	0	50	50	0	0	0	
G	0	0	0	0	0	0	1	0	0	1	1	1	3	1	1	0	0	0	1	0	0	0	0	1	1	0	0	0	**12**

MONTANA																														
#	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	**7**
%	0	0	0	0	0	0	0	50	0	0	0	0	50	0	50	0	0	0	0	0	0	0	200	0	0	0	0	0	
G	0	0	0	0	0	0	0	1	0	0	0	0	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	**6**
NEW MEXICO																														
#	3	7	2	5	7	3	12	14	2	0	4	5	19	4	17	0	0	0	1	1	4	0	5	11	5	9	0	0	**140**
%	12	28	8	20	28	12	48	56	8	0	16	20	76	16	68	0	0	0	4	4	16	0	20	44	20	36	0	0	
G	1	1	1	1	1	1	1	1	1	0	1	1	3	1	1	0	0	0	1	1	1	0	1	1	1	1	0	0	**23**
NORTH DAKOTA																														
#	0	9	0	3	7	2	0	4	0	0	0	0	3	0	11	5	0	0	0	0	0	0	0	0	0	0	4	0	**48**
%	0	90	0	30	70	20	0	40	0	0	0	0	30	0	110	50	0	0	0	0	0	0	0	0	0	0	40	0	
G	0	1	0	1	1	1	0	1	0	0	0	0	3	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	**11**
OREGON																														
#	0	0	0	3	1	1	2	2	1	1	0	1	1	0	2	0	0	0	1	0	0	0	2	0	1	0	0	0	**19**
%	0	0	0	150	50	50	100	100	50	50	0	50	50	0	100	0	0	0	50	0	0	0	100	0	50	0	0	0	**950**
G	0	0	0	1	1	1	1	1	1	1	0	1	3	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	**15**
TEXAS																														
#	6	7	0	5	0	5	5	8	5	1	1	5	4	5	7	3	0	4	0	0	6	0	5	7	3	0	5	4	**101**
%	46	54	0	38	0	38	38	62	38	8	8	38	31	38	54	23	0	31	0	0	46	0	38	54	23	0	38	31	
G	1	1	0	1	0	1	1	1	1	1	1	1	3	1	1	1	0	1	0	0	1	0	1	1	1	0	1	1	**23**
UTAH																														
#	2	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	3	0	1	0	0	2	1	0	0	0	**13**
%	67	0	0	0	0	0	33	0	0	0	100	0	0	0	0	0	0	0	100	0	33	0	0	67	33	0	0	0	
G	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	**7**
WASHINGTON																														
#	14	23	7	36	10	24	24	35	15	6	24	20	25	14	42	0	5	0	10	2	20	11	38	4	29	17	11	1	**467**

%	13	21	6	32	9	22	22	32	14	5	22	18	23	13	38	0	2	29	17	5	0	9	2	2	33	18	10	34	
G	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	**28**

- number of excerpts with this code found in the legislative documents. Note that this number may be higher than total number of documents. As discussed, on rare occasion, the same document might get tagged twice, if the context around the code is very different.

% - percentage: the amount of excerpts for that code compared to the amount of total documents per state

G – Grade or Score. Signified as a 1 if the code was used at all in the state's legislation.

Appendix C: Examples of Excerpts

Authorization of Water Bank Creation or Requesting Authorization

CO HB 16-1392: "Authorizing the Colorado water conservation board (board) to adopt rules establishing a water bank and authorizing the board, after the board has operated the water bank for at least 2 years, to delegate operation of a portion of the water bank to a water conservation district or a water conservancy district that chooses to operate a portion of the water bank and has demonstrated to the board's satisfaction that it can effectively operate a portion of the water bank".

NM HB HJM 77: "Requesting the New Mexico legislative council to establish a task force to conduct consensus planning on water banking legislation."

OR HB2811: "The Water Resources Department shall establish a water banking program to facilitate the transfer of existing water rights or uses between properties accessing the same water source"

TX SB 1030: CREATION OF BANK. The Texas Water Development Board shall establish the Texas Water Bank.

WA 1640- SE: "The department is hereby authorized to use the trust water rights program in the Yakima river basin for water banking purposes."

WA 5333: "It is the intent of this act to enhance the effectiveness of the trust water rights program by improving existing incentives, removing disincentives, clarifying and consolidating procedures for establishing trust water rights, and authorizing the creation of water banks".

Pilot program

CO HB 01-1354: "This article shall be known and may be cited as the 'Arkansas river pilot water banking act'".

WA 1640: "(1) The department shall conduct pilot rule making under RCW 34.05.313 to evaluate the effectiveness of different types of water banks.
(2) In selecting areas for the pilot rule making, the department shall consider the following factors:
(a) The likelihood that water banking could provide temporary or permanent water supply to address drought or future water supply demands;
(b) The existence of plans, programs, or technical resources within the water resource inventory area to assist with implementation and review of the pilot rule making;
(c) Whether the area is located in one of the sixteen salmon critical basins identified in the state salmon recovery strategy; and
(d) The degree of local watershed or regional group support."

Purpose or Directive of the Bank

NM SB113: "…establish a water bank for the purpose of temporarily reallocating water without change of purpose of use or point of diversion to augment the water supplies available for the places of use served by the district.

OR HB 2258: SECTION 5. (1) The Water Resources Department may use purchased water or use a water right acquired under section 4 of this 2013 Act for water banking.

(2) The purposes for which the department may use water banking include, but are not limited to, the following:

(a) Authorizing the use of the purchased water or acquired right to mitigate water resource impacts or future water supply needs.

(b) Authorizing the use of the purchased water or acquired right for other beneficial uses consistent with the terms of a contract or grant or authorized by law.

(c) Making a water source available to third parties on a temporary or permanent basis for any beneficial use.

(d) Providing alternatives to ground water uses for agriculture or industry within an administratively managed groundwater area in this state.

(e) Providing water to holders of water rights that cannot be fully exercised due to the satisfaction of senior water rights.

WA1098: (2) Water banking may be used for one or more of the following purposes:

(a) To authorize the use of trust water rights to mitigate for water resource impacts, future water supply needs, or any beneficial use under chapter 90.03, 90.44, or 90.54 RCW, consistent with any terms and conditions established by the transferor, except that return flows from water rights authorized in whole or in part for any purpose shall remain available as part of the Yakima basin's total water supply available and to satisfy existing rights for other downstream uses and users;

(b) To document transfers of water rights to and from the trust water rights program; and

(c) To provide a source of water rights the department can make available to third parties on a temporary or permanent basis for any beneficial use under chapter 90.03, 90.44, or 90.54 RCW, including the issuance of new water rights that, in combination with water rights held in the trust water rights program for water banking purposes, would not decrease total water supply available in the basin.

WA SB6362: The purposes of state-authorized water banks are to provide local or regional mechanisms by which water and water rights may be transferred and to facilitate the voluntary and beneficial transfer of water and water rights.

Definition

AZ HB2463/AZ HB2885: " 'Water banking services' means services provided by the authority to persons and Indian communities in this state to facilitate for those persons and Indian communities storage of water and stored water lending arrangements. Water banking services include only arrangements by which water will be made available for use in this state. Water banking services do not include interstate water banking undertaken by the authority pursuant to article 4 of this chapter. Water banking services may include:

(a) Storage of water.

(b) Obtaining water storage permits.

(c) Accruing, exchanging and assigning long-term storage credits.

(d) Lending and obtaining repayment of long-term storage credits."

UT HB84: " 'Water banking' means a local district's valid holding of one or more water rights for use, lease, sale, or nonuse to meet safe yield requirements, in accordance with this section."

Management

CA AB 2534: (a) The Integrated Watershed Management Program is hereby established. Upon appropriation by the Legislature, funds allocated to the program may be used by the board, subject to the terms of the memorandum of understanding executed pursuant to Section 30946 to award grants to public agencies and nonprofit organizations for the development of local watershed management plans that meet the requirements of subdivision (c) of Section 79078 of the Water Code, and for the implementation of watershed protection and water management projects that include one or more of the following elements:

ND HB 1369: A BILL for an Act to provide an appropriation for the state waterbank program; and to authorize a transfer of funds.

NM SJM74: Consensus planning on water banking legislation.

WA 2636.SL: (1) The department shall seek input from agricultural organizations, federal agencies, tribal governments, local governments, watershed groups, conservation groups, and developers on water banking, including water banking procedures and identification of areas in Washington state where water banking could assist in providing water supplies for instream and out-of-stream uses.

Implementation

KA HB2516: (8) the charter provides a procedure for resolution of complaints by bank participants and others impacted by the bank policies, practices and operations;
(9) the charter ensures that the determination of the portion of a water right that is bankable shall be subject to the following:
(A) The determination shall be primarily based on a representative period of average water consumption for the hydrologic unit from which water is authorized to be diverted under the water right; and
(B) the method of determination shall not penalize past implementation of water conservation practices;
(10) the charter ensures that the total amount of groundwater leased each year from each hydrologic unit does not exceed 90% of the historic average annual amount collectively diverted pursuant to all deposited water rights or portions of water rights from such unit for a representative past period; and
(11) the charter provides a procedure for the dissolution of the bank, specifically stating how the remaining deposits and safe deposit accounts will be distributed.

TX HB2575: FEES. (a) The board may charge a transaction fee per transfer not to exceed one percent of the value of the water or water right received into or transferred from the water bank [$500] to cover expenses of the board in operating the water bank… The board by rule shall establish fees in an amount necessary to pay for the ongoing administration of the water bank and shall consider the duration, type, and other aspects of the transfer. The transaction fee shall be paid by the depositor on either:

(1) a transfer of rights on deposit in the bank; or
(2) a transfer that occurs within one year of withdrawal of any water right deposited into the bank.

WA 6179-S: (2) The department shall maintain information on its web site regarding water banking, including information on water banks and related programs in various areas of the state. The information maintained on the department's web site under this subsection must include a schedule or table for each water bank that shows: (a) The amount charged for mitigation; (b) the priority date of water made available for mitigation; and (c) the amount of water made available for mitigation. The department shall update the schedule or table on a quarterly basis, using information provided to the department by each water bank. Any person operating a water bank in Washington must provide the information required under this subsection to the department upon request.

Abandonment or non-use protection

NM SB 512: "DEPOSITS--EXEMPT FROM FORFEITURE.--A water right, eligible for deposit as determined by commission rule, may be deposited in the water bank for a term of up to ten years and may be transferred annually during the deposit term, pursuant to the terms of the New Mexico Water Banking Act and rules promulgated pursuant to that act. During the deposit term, a deposited water right is exempt from forfeiture pursuant to Sections 72-5-28, 72-6-3 and 72-12-8 NMSA 1978."

NM SB 793 (first session 2005): "The district's water bank may make temporary transfers of place of use without formal proceedings before the state engineer, and water rights placed in the district's water bank shall not be subject to loss for nonuse during the period the rights are placed in the water bank."

TX HB5: " [Up to 50 percent of a] water right may be deposited in the water bank for an initial term of up to 10 years, during which time the water right is exempt from cancellation by the commission under the terms of Subchapter E of Chapter 11 of this code. A water right is exempt from cancellation under this subsection only once even if it has been transferred or redeposited."

Limitations

AZ HB 2463: The authority shall not enter into water banking services agreements that will provide water for use outside this state. The authority may cancel any water banking services agreement without penalty or further obligation if after entering into a water banking services agreement, the authority finds that the agreement will provide water for use outside of this state. Notice of this subsection shall be included in every water banking services agreement entered into by the authority. The cancellation under this subsection shall be effective when written notice from the authority is received by all other parties to the water banking services agreement.

CO HB 16-1392: The board's rules must limit the amount of water a person may deposit into the water bank to depositing all of the water subject to a decree for up to 3 years in any consecutive 10-year period or depositing up to 30% of the water subject to the decree in any consecutive 10-year period. The board's rules must also prohibit a lease, loan, or trade of water from the water bank that would negatively affect an interstate obligation or result in transferring water out of the Rio Grande or Arkansas River basins or across the continental divide.

WA 5333: "A water bank created outside the department must be constituted as a public entity or a private-public partnership."

WA 6179S: (3) The department shall not use water banking to:

(a) Cause detriment or injury to existing rights;

(b) Issue temporary water rights or portions thereof for new potable uses requiring an adequate and reliable water supply under RCW 19.27.097;

(c) Administer federal project water rights, including federal storage rights; ((or))

(d) Allow carryover of stored water in the Yakima basin from one water year to another water year if it would negatively impact the total water supply available; or

(e) Provide for mitigation of water resource impacts unless an adequate water supply is available for the purpose of providing mitigation.

Administrator

TX SB 1030: "The board shall administer the water bank to facilitate the transfer of water from all sources as necessary to provide sources of adequate water supplies for use within the State of Texas."

WA 6311-S: The county legislative authority may administer a limited purpose local water bank or may contract with a water conservancy board, watershed planning group, or conservation district to administer the local water bank.

Tribal Rights and Management

AZ HB2835: "Water banking services" means services provided by the authority to persons and Indian communities in this state to facilitate for those persons and Indian communities storage of water and stored water lending arrangements. Water banking services include the direct delivery of water to Indian communities in this state in replacement of or supplemental to the accrual of long-term storage credits pursuant to article 5 of this chapter."

NM SJM 17: "WHEREAS, in recent years, the legislature has expressed support for acequias by enacting various laws that strengthen acequia governance, including recognition of regulatory authority over water transfers, establishment of acequia water banking and strengthening of acequia enforcement powers regarding easements"

NM SB82: "…to plan, design and construct a water banking and conservation program for acequias in the lower Rio Chama valley, including planning, designing and mapping, for the Rio Chama acequia association in Rio Arriba county."

Local districts

CO HB16: "the purpose of this article is to create a water bank operated by the board and authorize a district to operate a portion of the bank for irrigation water rights decreed for diversion within its boundaries under strict parameters."

UT HB84: This bill allows the banking of water rights, administered by a local district."

WA 6362: "Local water agencies, cities, counties, other local governmental agencies, and other parties may establish a water bank. Such banks may be established on a temporary or permanent basis."

Financial support/budget allocations

AZ HB2463: "The Arizona water banking fund is established. The state treasurer shall establish subaccounts of the banking fund based on funding sources. The authority shall administer the banking fund in accordance with this chapter. The banking fund consists of all of the following:

1. Monies appropriated from the state general fund by the legislature.
2. Reimbursement for the distribution of long-term storage credits, collected by the authority in accordance with section 45-2457, subsection B, paragraph 2.
3. Monies paid to the authority by the recipients of in lieu water at a groundwater savings facility, in accordance with section 45-2455, subsection C.

ND SB2330: "…is hereby appropriated out of any moneys in the general fund in the state treasury, not otherwise appropriated, the sum of $500,000, or so much of the sum as may be necessary, and $500,000 from special funds derived from federal funds and other public or private sources, to the commissioner of agriculture for the purpose of the state waterbank program for use in the Devils Lake basin, for the biennium beginning July 1, 1997, and ending June 30, 1999."

NM SB 512: "There is created in the state treasury the 'water bank fund' to be used solely for the administration and operation of the water bank by the commission. The water bank fund is to be financed by appropriations from the general fund to the commission, fees assessed and collected by the commission in administering the New Mexico Water Banking Act and such other financing as is permitted by law. Income or interest earned on the investment of the fund shall remain in the fund. Money in the water bank fund is appropriated to the interstate stream commission for the purpose of carrying out the provisions of the New Mexico Water Banking Act. Money shall be expended pursuant to warrant issued by the department of finance and administration pursuant to vouchers signed by the water banking director of the commission. Any unexpended or unencumbered balance of the water bank fund shall not revert to the general fund but shall remain on deposit in the fund for administrative and operating costs of the water bank."

TX SB1: "The board may transfer money in the fund to the water bank account to be used by the board for administration and operation of the Texas Water Bank. "

Parameters along trading – Transfers

TX SB991: The board may take all actions necessary to operate the water bank and to facilitate the transfer of water rights from the water bank for future beneficial use.

WA1098: "Water banking as a function of the trust water rights program and as authorized by this chapter can provide an effective means to facilitate the voluntary transfer of water rights established through conservation, purchase, lease, or donation, to preserve water rights and provide water for presently unmet and future needs; and to achieve a variety of water resource management objectives throughout the state, including drought response, improving streamflows on a voluntary basis, providing water mitigation, or reserving water supply for future uses;

Purchase/sale

UT HB84: A local district participating in water banking may do the following, subject to any contractual limitation and applicable law governing the appropriation and use of water, within the local district's territory:

(a) lease, purchase, manage, or otherwise administer a valid water right;

(b) manage the use of a water right held or administered by the local district; and

(c) file an application to change a point of diversion, place of use, or purpose of use concerning a valid water right if the local district owns the water right or has the contractual right to file the application.

WA 1640: Water banking as a function of the trust water program and as authorized by this chapter can provide an effective means to facilitate the voluntary transfer of water rights established through conservation, purchase, lease, or donation, to preserve water rights and provide water for presently unmet and future needs; and to achieve a variety of water resource management objectives throughout the state, including drought response, improving streamflows on a voluntary basis, providing water mitigation, or reserving water supply for future uses.

WA 5333: (3) Water banks may be created for one or more of the following purposes:

(a) To solicit water rights for the trust water rights program;

(b) To hold trust water rights for mitigation of future activities;

(c) To accept and manage funds to be used to establish trust water rights;

(d) To purchase or lease water rights to be held in trust by the department and to be administered by the water bank;

WA SB6362:

(a) Establish a list of offers to rent or sell and to purchase water and water rights;

(b) Acquire water or water rights for subsequent sale or distribution;

(c) Establish a program for the conjunctive management and use of surface and ground water supplies;

(d) Facilitate transactions between those holding legal rights to use water and those desiring to acquire those rights on a temporary or permanent basis; and

Lease

CO HB16-1392: "…simplify and facilitate the approval of water leases, loans, and trades of water associated with a decreed absolute irrigation water right to other beneficial uses."

KA HB2516: "The chief engineer shall approve the charter of a water bank only if the chief engineer determines that…the charter ensures that the total amount of groundwater leased each year from each hydrologic unit does not exceed 90% of the historic average annual amount collectively diverted pursuant to all deposited water rights or portions of water rights from such unit for a representative past period."

Interstate agreements

AZ 2753: The authority may negotiate and enter into interstate water banking agreements with appropriately authorized agencies in California and Nevada, if all of the following apply:

AZ SB1396: In each interstate water banking agreement, the California or Nevada agency shall agree to pay to the authority all costs that are or will be incurred by the authority in storing and recovering Colorado river water pursuant to the interstate banking agreement. The costs include all of the following:

WA5333: The department is authorized to enter into agreements with neighboring states to establish a joint water bank for a watershed or water body shared between states. Such a joint water bank must operate subject to the applicable legal requirements of each state.

Credits

AZ SB 1478: "A projection of long-term storage credits that will be stored, loaned, replaced or distributed pursuant to any water banking services agreement into which the authority has entered."

WA 5333: "To create a system of credits to track deposits of water rights to, and withdrawals from, the bank; [and] to assign water rights or credits to third parties authorizing the beneficial use of water from the trust program, in a manner consistent with the terms of a trust water right;

WA subSB 6311: Water banks created under this section serve the purpose of providing mitigation credits for existing interruptible or new exempt groundwater withdrawals. The credit must be granted on a one-to-one ratio. The maximum amount of credit may not exceed five thousand 8 gallons per day nor less than three hundred fifty gallons per day. A seasonal water right must be prorated on a basis of the total permitted withdrawal divided by three hundred sixty-five days to arrive at the total expressed gallons per day.

Environment

WA 6444: "…is provided solely for watershed planning implementation grants to continue ongoing efforts to develop and implement water agreements in the Nooksack Basin and the Bertrand watershed. These amounts are intended to support project administration; monitoring; negotiations in the Nooksack watershed between tribes, the department, and affected water users; continued implementation of a flow augmentation project; plan implementation in the Fishtrap watershed; and the development of a

Wildlife

ID SB1116 : This measure would authorize the Water Resources Board to utilize water rights secured voluntarily in the Water Supply Bank for minimum stream flows. It is contemplated that aquifer recharge will be an important benefit in certain watersheds, where federal conservation-related incentives and other voluntary water transactions can secure natural flow water rights for the Water Supply Bank to address these purposes. In some watersheds (Big Lost, Little Lost) water rights secured for the Water Supply Bank can help address the loss of fish and wildlife habitat, which has contributed to existing or potential listings of species under the federal Endangered
Species Act.

ND SB 2019: " The amount of $200,000, or such lesser amount as may be available, for the line item entitled waterbank program in section 1 of this Act, is from the game and fish department operating fund and must be used to increase water storage and enhance wildlife habitat in North Dakota."

Fish/fisheries

IDHB 153: Idaho Code, any storage water released and any natural flow water rights leased or acquired by the bureau within the state of Idaho for listed anadromous fish pursuant to this section must be rented through the water bank operated by the Idaho water resource board."

TX SB1: The Texas Water Trust is established within the water bank to hold water rights dedicated to environmental needs, including instream flows, water quality, fish and wildlife habitat, or bay and estuary inflows.

Quality

CA AB2534: "...water banking, exchange, and reclamation, and improvement of water quality."

TX SB1: "…into the water bank including… accepting and holding donations of water rights to meet instream, water quality, fish and wildlife habitat, or bay and estuary inflow needs"

Wetland banks

ND HCR 29: "A concurrent resolution urging Congress to give favorable consideration to the proposed water bank legislation being considered by the North Dakota Congressional Delegation. WHEREAS, there are hundreds of thousands of wetlands in North Dakota and more throughout the nation; and WHEREAS, these wetlands are valuable wildlife reserves to North Dakota and to the nation; and WHEREAS, it is essential that farmers and ranchers obtain income from these wetlands in order that adequate levels of production and utilization of land be maintained; and WHEREAS, many acres of these wetlands will be drained, resulting in considerable losses of wildlife habitat, in the absence of an incentive to encourage farmers and ranchers to preserve them; and WHEREAS, such an incentive can be supplied through adoption of a plan whereby farmers and ranchers would receive income for the preservation of wetlands areas; Now, Therefore, Be It Resolved by the House of Representatives of the State of North Dakota, the Senate Concurring Therein: That the Forty-first session of the legislature of the state of North Dakota respectfully memorializes the Congress of the United States to adopt legislation which would establish a water bank plan providing for annual payments to farmers and ranchers for nonagricultural use of wetland areas provided that the decision to participate remains with the individual landowner;

Domestic use

WA 5035: Funds may be provided to lease or purchase water rights to create a reserve water supply for domestic groundwater users that have a groundwater right with a priority date later than May 10, 1905, as well as for all out-of-priority groundwater users. In securing water for such domestic groundwater users, strong preference shall be given to the use of water banking and transfer methods that provide alternatives to permanent purchase and dry-up of agricultural water rights in the basin, including dry-year options, water banking, long-term water supply lease agreements, long-term agricultural land fallowing agreements, and reduced consumptive use through efficiency or alternative cropping arrangements while maintaining historic return flows.

Agriculture or irrigation

WA 5035: "Funds may be provided to develop and implement water banking and transfer methods and agreements that are fully protective of senior water rights and that protect domestic groundwater users and improve the profitability of farming operations. The legislature finds such activities to be in the public interest because they can help sustain the viability of the agricultural economy and enhance the certainty of water supplies for domestic groundwater users.

WA 5333: "To develop a schedule of the amount of net water saved as a result of water conservation projects carried out in a watershed, developed annually to reflect the predicted hydrologic and water supply conditions, as well as anticipated water demands, for the upcoming irrigation season, to serve as the basis for the distribution and management of trust water rights each year."

Water Supply Needs

OR HB 2811: "Mitigate water resource impacts or future water supply needs"

WA HB 1793 (2015): " The legislature further finds that since the preferred options of offsetting mitigation, water bank use, or extended infrastructure are not always available or practicable, cities and counties should work with local landowners to develop safe and reliable alternatives to the traditional piped water purveyor or private well for supplying potable water. Although not preferred or appropriate in every instance, a local portfolio of legally allowable alternative water systems, such as cisterns, trucked water systems, and rainwater collection and sanitization systems, can provide a suite of options to assist landowners with matching their water needs with the physical location and limitations of their geographic location."

WA SB6179: "Water banking may be used for one or more of the following purposes:
(a) To authorize the use of trust water rights to mitigate for water resource impacts, future water supply needs, or any beneficial use."

Groundwater

KA HB2516: "…the charter ensures that the operations of the bank will result in a savings of 10% or more in the total amount of groundwater consumed for a representative past period pursuant to water rights deposited in the bank, excluding groundwater located in an intensive groundwater use control area where corrective control provisions have reduced the allocation of groundwater to less than the quantity previously authorized by water rights in the area."

UT HB84: "…requires a different distribution or a local district participating in water banking holds sufficient water rights for nonuse to meet the groundwater management plan requirements."

WA2020: "Funds may be provided to develop and implement water banking and transfer methods and agreements that are fully protective of senior water rights and that protect domestic groundwater users and improve the profitability of farming operations. The legislature finds such activities to be in the public interest because they can help sustain the viability of the agricultural economy and enhance the certainty of water supplies for domestic groundwater users. Funds may be provided to lease or purchase water rights to create a reserve water supply for domestic groundwater users that have a groundwater right with a priority date later than May 10, 1905, as well as for all out-of-priority groundwater users. In securing water for such domestic groundwater users, strong preference shall be given to the use of water banking and transfer methods that provide alternatives to permanent purchase and dry-up of agricultural water rights in the basin, including dry-year options, water banking, long-term water supply lease agreements, long-term agricultural land fallowing agreements, and reduced consumptive use through efficiency or alternative cropping arrangements while maintaining historic return flows."

WA 5536: "The department's consideration shall extend to any increased water supply that results from the impoundment or other resource management technique, including but not limited to any recharge of groundwater that may occur or water banking activity under chapters 90.42 and 90.38 RCW, as a means of making water available or otherwise offsetting the impact of the withdrawal of groundwater proposed in the application for the water right or amendment in the same water resource inventory area."

WA subSB 6311: "Water banks created under this section serve the purpose of providing mitigation credits for existing interruptible or new exempt groundwater withdrawals. The credit must be granted on a one-to-one ratio. The maximum amount of credit may not exceed five thousand 8 gallons per day

nor less than three hundred fifty gallons per day. A seasonal water right must be prorated on a basis of the total permitted withdrawal divided by three hundred sixty-five days to arrive at the total expressed gallons per day."

Room for growth (not just limited to pilot program) potential for growth, multiple banking structures

MT HJR 15:

WA HB2636: "Identify other basins or regions that may benefit from authorization for the department to use the trust water [rights] program for water banking purposes, maintain information on its web site regarding water banking, including information on water banks and related programs in various areas of the state….the department shall seek input from agricultural organizations, federal agencies, tribal governments, local governments, watershed groups, conservation groups, and developers on water banking, including water banking procedures and identification of areas in Washington state where water banking could assist in providing water supplies for instream and out-of-stream uses."

Benefits, Potential, use of WB

AZ HB2835: The legislature further finds that water banking is complimentary and compatible with existing water management efforts. The Arizona water banking authority will compliment and assist the activities of the central Arizona water conservation district in its mission to provide a dependable and cost-effective water supply.

ID SB1116: It is contemplated that aquifer recharge will be an important benefit in certain watersheds, where federal conservation-related incentives and other voluntary water transactions can secure natural flow water rights for the Water Supply Bank to address these purposes. In some watersheds (Big Lost, Little Lost) water rights secured for the Water Supply Bank can help address the loss of fish and wildlife habitat, which has contributed to existing or potential listings of species under the federal Endangered Species Act.

TX SB1: "…water bank for future beneficial use including but not limited to:

(1) negotiating a sale price and terms acceptable to the depositor and purchaser;
(2) maintaining a registry of water bank deposits and those water users in need of additional supplies;
(3) informing water users in need of additional supply of water rights available in the bank;
(4) encouraging water right holders to implement water conservation practices and deposit the right to use the conserved water into the bank;
(5) establishing requirements for deposit of a water right into the water bank including minimum terms for deposit;
(6) purchasing, holding, and selling water rights in its own name;
(7) establishing regional water banks;
(8) acting as a clearinghouse for water marketing information including water availability, pricing of water transactions, environmental considerations, and potential buyers and sellers of water rights;
(9) preparing and publishing a manual on structuring water transactions;

(10) accepting and holding donations of water rights to meet instream, water quality, fish and wildlife habitat, or bay and estuary inflow needs; and other actions to facilitate water transactions

OR HB2258: "It is the role of the Water Resources Department to facilitate the development of water supplies wherever possible to benefit in-stream and out-of-stream uses. Water banking can provide critical tools to:

(A) Make water supplies available when and where needed;
(B) Improve stream flows;
(C) Reduce water transaction costs, time and risk to purchasers;
(D) Facilitate fair and efficient reallocation of water from one beneficial use to another;
(E) Provide mitigation to offset impacts related to future development and the issuance of new water rights"

WAHB1640: "…can provide an effective means to facilitate the voluntary transfer of water rights established through conservation, purchase, lease, or donation, to preserve water rights and provide water for presently unmet and future needs."

Specific Water Banking Legislation

ND HB1369: "A BILL for an Act to provide an appropriation for the state waterbank program; and to authorize a transfer of funds."

NM SB 793: "…to establish water banks for the temporary reallocation of water."

NM SB512: "An act relating to water rights; enacting the New Mexico water banking act and amending sections of the NMSA 1978 to regulate water banking of conserved and surplus water and to establish a fund; making an appropriation.

TXSB991: "AN ACT relating to the operations of the Texas Water Bank."

WA 2193, WA6179: "AN ACT Relating to water banking."

WA 2760: "AN ACT Relating to best practice for water banks."

WA5583: "AN ACT Relating to improving the effectiveness of water bank authorization and exchange provisions; amending RCW 90.42.100, 90.42.040, and 90.42.080; adding new sections to chapter 90.42 RCW; adding a new section to chapter 90.03 RCW; and creating a new section."

ADDITIONAL TERMS:

Yakima

WA 1640-S.PL: "The department is hereby authorized to use the trust water rights program in the Yakima river basin for water banking purposes."

WA 5014.E: " The legislature finds that, unlike other basins in Washington, the Yakima basin is unique in that it has recently undergone a legal adjudication for surface water rights in the basin. In addition, the holders of junior water rights may be subject to water use curtailment. Because of the unique nature of the Yakima basin, there has been the development of an active water market for water reallocation that includes the use of the trust water right program for mitigation purposes and water banking…In adopting this act to establish standards for water banking in the Yakima basin, it is not the intent of the legislature to imply that the types of water mitigation currently used in the Yakima basin can or should be applied to other parts of Washington."

Climate Change

AZ SB 1355: "The director may request the state treasurer to disburse the monies, and the state treasurer shall disburse the monies, for any of the following purposes as determined by the director:..2) in any of the active management areas, for facilitating water planning within the entire active management area or within a subbasin of the active management area. The monies shall be used for this purpose to the extent possible to benefit those persons who have paid the fees. Water planning for this purpose may include long-term water supply and infrastructure planning, regional underground water storage and recovery planning, subsidence management planning, drought and climate change planning and technical investigations."

CA AB 2304: Advance water sustainability, resiliency, and adaptability to drought and climate change by promoting efficient water markets.

WA 1414-S/WA 5366: "Establishment of more efficient water markets and more effective operational and structural changes to manage variability of water supplies and to prepare for the uncertainties of climate change, including but not limited to the facilitation of water banking, water right transfers, dry year options, the voluntary sale and lease of land, water, or water rights from any entity or individual willing to limit or forego water use on a temporary or permanent basis, and any other innovative water allocation tools used to maximize the utility of existing Yakima river basin water supplies, as long as the establishment and use of these tools is consistent with the integrated plan".

WA 1610: "The competition for water will also be intensified by the coming challenges of climate change that will reduce the capacity of the state's natural snowpack and groundwater resources to recharge and sustain stream base flows and lake levels. The legislature therefore intends to promote active water management that protects and restores sustainable water supplies for our communities, farms, and ecosystems…The legislature therefore intends to reform current statutory provisions to promote administrative efficiencies and active water management that will be needed to help the state and its water users prepare for coming water resource challenges due to population growth and climate change."