**Water Transfer Level Dataset**

The Water Transfer Level Dataset is maintained and updated by:

Zack Donohew (primary contact) email: donohew@bren.ucsb.edu

Gary Libecap email: glibecap@bren.ucsb.edu

Acknowledgements: Support for the creation of this dataset was provided by the University of California Center for Water Resources Grant WR1023 and by National Science Foundation Grant 0317275.

**WATER STRATEGIST DATA COLLECTION METHODOLOGY**

This is a dataset of water right transactions in the western United States. The data are drawn from water transactions reported in the monthly trade journal the *Water Strategist* and its predecessor the *Water Intelligence Monthly* from 1987 through February 2010. The *Water Strategist* publishes a section called “Transactions” that lists water transfers by state. From these publications, all or a subset of the following are collected: the year of a water transfer; the acquirer of the water; the supplier; the amount of water transferred; the proposed use of the water; the price of the trade; the terms of the contract; and the issue of the *Water Strategist* where the data was reported.

The dataset contains rows (observations) that represent water transactions. It is important to note that each observation does not necessarily represent a *single* water transaction. Instead, observations may represent a *bundle* of transactions. Often the *Water Strategist* reports transactions that are a summation of two or more water transactions made by a single entity, such as a buyer or seller, or in a single location, such as a state or water basin. Transactions not reported in the *Water Strategist* are not included in this dataset. In total, more than 4400 water transactions are recorded.

**States**

The *Water Strategis*t published water market transactions for the following states: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. However, only a handful of water transfers occurred in Kansas, Nebraska, North Dakota, Oklahoma, and South Dakota. Consequently, the dataset is restricted to the 12 most western states where the bulk of transfers took place: Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Texas, Utah, Washington, and Wyoming.

**Classification**

From the *Water Strategist*’s transaction descriptions, variables were created to describe the transferor’s prior use of a water right and also the transferee’s new use of the water right. For this purpose, three categories of water use were created: agricultural, urban (municipal and industrial), and environmental. These categories provide for nine possible classifications of water transfers: agricultural-to-agricultural, agricultural-to-urban, agricultural-to-environmental, urban-to-agricultural, urban-to-urban, urban-to-environmental, environmental-to-agricultural, environmental-to-urban, and environmental-to-environmental. Three additional categories, combination, recycled, and unknown were added to avoid misrepresenting transactions that did not fall into one of the nine categories. Each transfer was assigned to one, and only one, of these classifications. If the water use before or after a transaction was not explicitly stated in the *Water Strategist*, the category was inferred if possible from the description of the transaction.

*Agricultural*

A water use is classified as agricultural if the name of the lessor, lessee, seller, or buyer is an irrigator, an irrigation district, a water district, a farmer, a rancher, a canal company, a ditch company or an individual. Similarly, a water use is designated as agricultural if the description of the transaction stated that the water was provided by land fallowing, or if the description discussed widespread farming in the district from which the water was supplied.

*Environmental*

A water use is classified as environmental if the lessor, lessee, buyer or seller is a state department of fish and wildlife, a nature conservancy, or if the description of the trade stated that either the prior use or future use of the water is for environmental purposes or to supplement in-stream flow. The U.S. Bureau of Reclamation, generally an agricultural water supplier, was classified as an environmental user when it acted to improve or maintain instream flows to improve aquatic habitat or water quality.

*Urban*

Water transferred to/from cities, townships, municipal water districts, developers, and companies is classified as urban uses. As well as water used in golf course irrigation, landscape irrigation industrial purposes, and mining. Often, industrial uses such as mining do not take place in municipalities but are still categorized as urban.

*Combination*

Some water transaction involved multiple original water uses or multiple destination uses. These transfers are classified as “Combinations.”

*Recycled*

A transfer or sale of recycled water from a water utility. Recently the *Water Strategist* began reporting these sales which do not fit into any of the other categories. The water is typically transferred from a municipal treatment facility to private party for irrigation purposes. Because there are considerable costs in creating infrastructure to transport the treated water, the transaction more resembles a water transfer than water service and so is included in the database.

*Unknown*

Water transfers with unidentifiable origin or destination uses are classified as “Unknown.”

**Contractual Form**

Another set of variables created in this dataset specify the contractual form of each transfer, which take the forms of sales, leases, and exchanges.

*Sales*

Sales are defined as permanent transfers of water rights from one party to another. Water rights are typically defined on an annual basis. Therefore, an entity holds the right to use a specified amount of water each year for perpetuity.

*Leases*

Leases differ from sales in that they do not involve the transfer of a water right and hence they are not permanent transfers of rights. A lease involves the transfer of a specified amount of water annually for a certain time period. Thus, water rights are not exchanged, only the water associated with the right. In rare instances, the *Water Strategist* called some transactions sales that were not permanent water right transfers. Instead, they were one-time transfers, which are equivalent to leases and are therefore categorized as leases.

*Exchanges*

A small percentage of transfers cannot be classified as sales or leases. Most of these types of transfers are called “exchanges” by the *Water Strategist.* An example of the most common type of exchange is a developer who gives a water right to a city in exchange for the city allowing the developer to connect a development to city utilities.

*Lease Duration*

Length of lease, if applicable, in years.

**Water Quantities**

This dataset provides two variables to capture the quantity of water transferred in units of acre-feet: annual flow and committed.

*Annual Flow*

The annual flow amount is the quantity of water that is transferred in the first year of a contract and only in the first year. This is the typical way to quantify a water transaction, by the annual acre-feet assigned to the water right.

Three variables are determined for each transaction, *minimum annual flow, average annual flow,* and *maximum annual flow*. Not all transactions are for set amounts of water. For instance, a transaction might be the purchase of a share in a ditch company, which provides an expected or average flow of water, but whose actual yearly flow depends on the ditch company’s allocation of water. It is often possible to determine from the details of a transaction what type of flow is expected, and what are the maximum and minimum quantities associated with the right.

*Committed*

The committed variable captures the fact that more water is transferred than just in the first year of a lease or sale. The committed variable discounts the flow of water over time into the year the water was first transferred. A 5% discount rate was chosen.

For permanent transfers of water rights, the committed amount of water is determined the same way as finding the present value of a perpetual bond—by dividing the annual flow of water by the discount rate. For leases, the committed amount of water is found the same way as finding the present value of an ordinary annuity. That is to say, the committed amount of water is equal to the expected future annual amounts of water that have been discounted at 5% to a single equivalent value at the year the transaction was made.

The purpose of the committed variable is to capture the fact that long-term leases and sales transfer substantially more water than one-year leases transfer because sales involve the transfer of the right to a certain amount of water annually for perpetuity.

**Prices**

Since this is a time-series dataset from 1987- February 2010, it is necessary to convert all prices into real dollars. Therefore, along with the total price paid for water transfers, this dataset also contains variables for prices that are converted into 1987 dollars by using the Consumer Price Index—All Urban Consumers Average from the Bureau of Labor Statistics. This conversion takes into account inflation and makes cross-year comparison between prices possible.

**WATER TRANSFER LEVEL DATASET VARIABLES**

**Year**

A numeric variable equal to the year in which a transaction occurred.

**State**

A string variable equal to the western state where the transaction occurred.

**Buyer**

Indicates the name or type of water right transferee.

**Sellers**

Indicates the name or type of water right transferor.

**Water Strategist Issue**

Indicates the issue of the Water Strategist, by month and year, that a transaction was recorded.

**Contractual Form**

**Sale**

A dummy variable equal to 1 if the transaction is the permanent transfer of a water right(s) and 0 otherwise.

**Lease**

A dummy variable equal to 1 if a transaction is for the transfer of a specified amount of water annually for a certain amount of time and 0 otherwise.

**Exchange**

A dummy variable equal to 1 if a permanent transaction was made and there was no payment and 0 otherwise.

**Water Quantity**

**Minimum Annual Acre-Feet**

A continuous variable for the minimum amount of water annually transferred in acre-feet.

**Average Annual Acre-Feet**

A continuous variable for the average amount of water annually transferred in acre-feet.

**Maximum Annual Acre-Feat**

A continuous variable for the maximum amount of water annually transferred in acre-feet.

**Committed Minimum Acre-Feet**

A continuous variable for the minimum cumulative amount of water transferred and discounted over time at a rate of 5%.

**Committed Average Acre-Feet**

A continuous variable for the minimum cumulative amount of water transferred and discounted over time at a rate of 5%.

**Committed Maximum Acre-Feet**

A continuous variable for the minimum cumulative amount of water transferred and discounted over time at a rate of 5%.

**Price**

**Total Price**

A continuous variable of the total dollar amount of a transaction.

**Inflation Adjusted Total Price**

A continuous variable of the total price adjusted to 1987 dollars.

**Inflation Adjusted Price per Acre-Foot**

A continuous variable of the inflation adjusted total price divided by the annual flow amount of water transferred.

**Inflation Adjusted Price per Committed Acre-Foot**

A continuous variable of the inflation adjusted total price divided by the committed amount of water transferred.

**Transfers among and between Sectors**

**Ag-to-Ag**

A dummy variable equal to 1 if the transaction is from an agricultural user to an agricultural user and 0 otherwise.

**Ag-to-Urban**

A dummy variable equal to 1 if the transaction is from an agricultural user to an urban user and 0 otherwise.

**Ag-to-Enviro**

A dummy variable equal to 1 if the transaction is from an agricultural user to an environmental user and 0 otherwise.

**Urban-to-Ag**

A dummy variable equal to 1 if the transaction is from an urban user to an agricultural user and 0 otherwise.

**Urban-to-Urban**

A dummy variable equal to 1 if the transaction is from an urban user to an urban user and 0 otherwise.

**Urban-to-Enviro**

A dummy variable equal to 1 if the transaction is from an urban user to an environmental user and 0 otherwise.

**Enviro-to-Ag**

A dummy variable equal to 1 if the transaction is from an environmental user to an agricultural user and 0 otherwise.

**Enviro-to-Urban**

A dummy variable equal to 1 if the transaction is from an environmental user to an urban user and 0 otherwise.

**Enviro-to-Enviro**

A dummy variable equal to 1 if the transaction is from an environmental user to an environmental user and 0 otherwise.

**Combination**

A dummy variable equal to 1 if the transaction involved a combination of origins or a combination of destinations and 0 otherwise.

**Recycled**

A dummy variableequal to 1 if it is stated explicitly that the water transferred has been recycled and resold and 0 otherwise.

**Unknown**

A dummy variableequal to 1 if either the origin or destination use is unknown and 0 otherwise.