Water-Related
Land Use
Inventories

UTAH

Weber River Basin
2015 Inventory

UTAH
DNR
WATER RESOURCES

A WATER-RELATED LAND USE INVENTORY REPORT OF THE WEBER RIVER BASIN

PREPARED BY

UTAH DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WATER RESOURCES

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ACKNOWLEDGMENTS

This report was prepared by Aaron Austin, Senior GIS Analyst. The land use data summarized in this report were gathered under the direction of Todd Adams, Deputy Director, and supervised by John Holman, Section Manager, Technical Services, Utah Division of Water Resources.

The Technical Services Staff was chiefly responsible for the collection, preparation and analyses of the data. The data were summarized by Adam Clark, Senior GIS Analyst. Additionally, select members of the Planning and Development Staffs assisted with the collection of the data.

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Authority

In 1963, the Utah State Legislature charged the Division of Water Resources (DWRe) with the responsibility of developing a State Water Plan. As a part of this objective, the DWRe collects water-related land use data for the entire state. This data includes the types and extent of irrigated crops as well as information concerning dry agriculture, wetlands, open water and urban areas.

The data produced by the program are used for various planning purposes including: determining cropland water use, evaluating irrigated land losses and conversion to urban uses, planning for new water development, estimating irrigated acreages for any area, and developing water budgets.

Previous Methods

The land use inventory methods used by DWRe in conducting water-related land use studies have varied with regard to the procedures used and the precision obtained. During the 1960s and 70s, inventories were prepared using large format aerial photographs supplemented with field surveys to label boundaries, vegetation types, and other water use information.

In the early 1980s, DWRe began updating its methodology to take advantage of the rapidly growing fields of Remote Sensing and Geographic Information Systems (GIS). In 1984, several DWRe staff members visited the California Department of Water Resources to observe its methodology for collecting land use data for water planning purposes.

Based on its review of the California methodology and its own experience, DWRe developed a water-related land use inventory program. This program included the use of 35mm slides, United States Geological Survey (USGS) 7-1/2 minute quad maps, field-mapping and GIS.

Areas for survey were first identified from previous land use studies and any other available information. Aerial photos were taken between 6,000 and 6,500 feet above the ground allowing each slide to cover a little more than one square mile. Water-related land use areas were then transferred from the slide to USGS quad maps using a standard slide projector. Field boundaries were then traced on to the map. Next, a team was sent to use the map in the field to check the boundaries and current year land use. The final step was to digitize and process the field data using ARC/INFO software developed by Environmental Systems Research Institute (ESRI).

In 2000, DWRe further improved its program by using digital data for the purposes of outlining agricultural and other land cover boundaries. The division used satellite data, USGS Digital Orthophoto Quadrangles (DOQs), National Agricultural Imagery Program (NAIP), and other digital images in a heads-up digitizing mode for this process.

Present Methodology

Digitizing is done as Geodatabase feature classes using ArcMap 10.X with NAIP or Google imagery as a background with other layers added for reference. Boundaries of individual agricultural fields, urban areas and more are precisely digitized.

Feature Classes are loaded onto tablet PCs and Field crews are sent to label the crop or land cover type and irrigation method for each field or polygon. Each tablet PC is attached to a GPS unit for real-time tracking to continuously update the field crew's location during the field labeling process. When the time comes to re-inventory a basin, existing boundaries are used and will only be modified in areas where they have actually changed.

Once processed and quality checked, the data is filed in the State Geographic Information Database (SGID) maintained by the State Automated Geographic Reference Center (AGRC). When in the SGID, the data becomes available to the public. At this point, the data is ready for further analysis and use in preparing various planning studies.

DWRe attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Urban, wetlands, open water areas and dry agriculture reported by the division may not represent all such areas in a basin or county since the main focus is irrigated agricultural lands.

DWRe uses 11 hydrologic basins as the basic collection units for the land use inventories. County data is obtained from the basin data. The water-related land use data collected statewide covers more than 4.3 million acres of dry and irrigated agricultural land. This represents about 8 percent of the total land area in the state.

Due to changes in methodology, improvements in imagery, and upgrades in software and hardware, increasingly more refined inventories have been made in each succeeding year of the Water-Related Land Use Inventory. While this improves the data we report, it also makes comparisons to past years difficult. Making comparisons between datasets is still useful; however, increases or decreases in acres reported should not be construed to represent definite trends or total amounts of change up or down. To estimate such trends or change, more analysis is required.

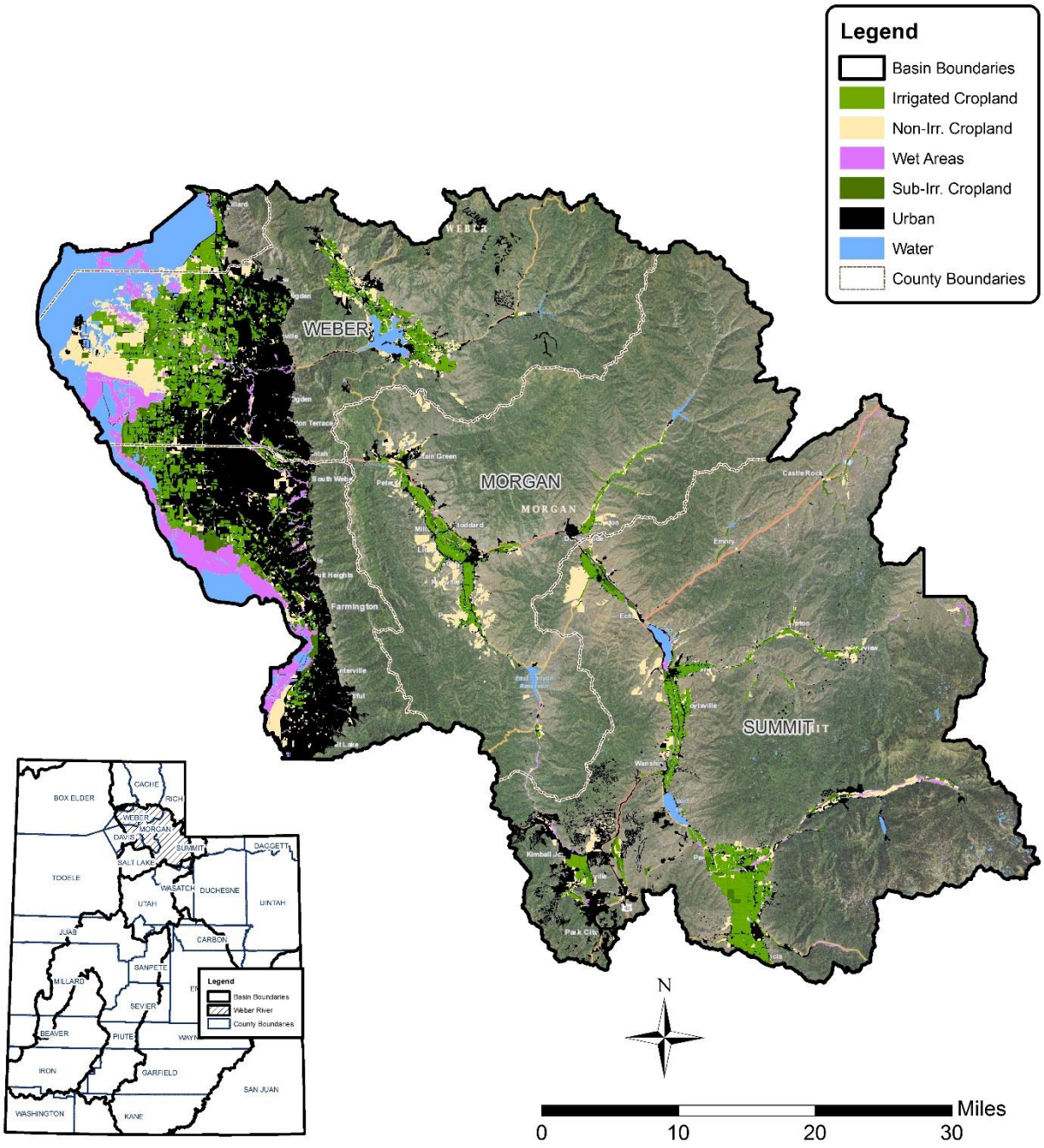
Data Collection

DWRe inventoried water-related land use in the Weber River Basin during the summer of 2015. Previous inventories were done in 1987, 1999, 2003 and 2007.

Summary Table -Total basin acreage for irrigated lands, non-irrigated lands, wet/open water areas, and urban are presented by county. **Note: County numbers are only the basin portion of the county.**

WEBER RIVER BASIN LAND USE 2015 (Acres)										
Category	**Cover**	**BOX ELDER**	**CACHE**	**DAVIS**	**MORGAN**	**SALT LAKE**	**SUMMIT**	**WASATCH**	**WEBER**	**Total**
Surface-Irrigated										
	Alfalfa	860	0	3,299	4,199	0	3,015	0	11,478	**22,852**
	Beans	2	0	107	0	0	0	0	0	**108**
	Berries	2	0	0	0	0	0	0	0	**2**
	Corn	719	0	1,012	449	0	0	0	3,352	**5,532**
	Grain	176	0	1,224	766	0	455	0	2,294	**4,914**
	Grass Hay	526	0	888	843	0	6,947	0	4,086	**13,289**
	Melon/Pumpkin/Squash	11	0	278	0	0	0	0	44	**333**
	Oats	25	0	18	29	0	228	0	272	**573**
	Onions	0	0	197	0	0	0	0	389	**585**
	Orchard	181	0	137	0	0	9	0	64	**391**
	Other Horticulture	0	0	118	0	0	0	0	23	**141**
	Other Vegetables	7	0	91	0	0	0	0	82	**180**
	Pasture	647	0	3,518	1,138	0	10,217	0	9,277	**24,798**
	Potatoes	0	0	52	0	0	0	0	9	**61**
	Sorghum	0	0	27	0	0	0	0	26	**53**
	Tomatoes	0	0	25	0	0	0	0	1	**26**
	Turf Farms	0	0	181	0	0	0	0	29	**210**
	Vineyard	0	0	1	0	0	0	0	2	**3**
	Irrigation Method									
	Drip	110	0	2	0	0	0	0	45	**157**
	Flood	2,817	0	8,599	4,907	0	15,063	0	25,440	**56,826**
	Sprinkle	227	0	2,572	2,518	0	5,809	0	5,942	**17,067**
	Subtotal	3,154	0	11,174	7,425	0	20,872	0	31,427	**74,051**
Sub-Irrigated										
	GrassHay-subirrigated	0	0	165	300	0	467	0	621	**1,552**
	Pasture-subirrigated	227	0	4,400	1,111	0	3,058	0	4,687	**13,483**
	Subtotal	227	0	4,565	1,410	0	3,524	0	5,308	**15,035**
Non-Irrigated										
	Dry Alfalfa	0	0	536	2,315	0	382	0	514	**3,747**
	Dry Grain	0	0	27	1,330	0	950	0	234	**2,541**
	Dry Oats	0	0	0	0	0	0	0	30	**30**
	Dry Safflower	0	0	0	3	0	37	0	113	**152**
	Fallow-Irrigated Ag	8	0	343	10	0	13	0	285	**659**
	Idle-Irrigated Ag	323	0	1,766	187	0	883	0	3,545	**6,703**
	Idle-Irrigated Pasture	215	0	362	163	0	795	0	596	**2,131**
	Subtotal	545	0	3,034	4,008	0	3,060	0	5,316	**15,964**
Other Non-Irrigated										
	Dry Land	552	0	3,441	4,143	0	8,451	0	16,630	**33,217**
Wet/Open Water Areas										
	Riparian	2,123	0	16,247	587	0	3,026	0	10,927	**32,910**
	Sewage Lagoon	9	0	18	21	0	52	0	332	**433**
	Water	16,046	0	3,488	1,760	0	4,459	0	15,886	**41,639**
	Wet Flats	2,680	0	6,185	2	0	144	0	13,444	**22,455**
	Subtotal	20,858	0	25,938	2,370	0	7,680	0	40,590	**97,436**
Residential/Industrial										
	Urban Grass	25	0	3,160	195	0	951	0	2,524	**6,854**
	Urban/Urban Idle	2,741	4	60,890	5,613	1	22,736	2	57,583	**149,570**
	Subtotal	2,766	4	64,049	5,808	1	23,687	2	60,107	**156,424**
Total Land Use/Land Cover		**28,102**	**4**	**112,201**	**25,164**	**1**	**67,275**	**2**	**159,378**	**392,127**

Weber River Basin Water-Related Land Use 2015



Data Access

AGRC – current data

http://gis.utah.gov/data/planning/water-related-land/

Google Drive – Historical and Current Zipped Shapefiles by Basin

https://goo.gl/syoPgQ

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