Water-Related Land Use Inventories

UTAH

Statewide Summary 2005 - 2010

A Water-Related Land Use Inventory Report of the State of Utah

Utah Department of Natural Resources
Division of Water Resources

Report Compiled:
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ACKNOWLEDGMENTS

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TABLE OF CONTENTS

INTRODUCTION…….……1

Authority…….……...1

Previous Methods……..……1

Present Methodology……..……...2

STATEWIDE SUMMARY BY BASIN AND COUNTY....……...….3

Description…….…….……..…….3

Data Collection……....……..3

Data Summary……....……...3

Data Access…….……..3

REFERENCES……4

GLOSSARY……4

Figure 1 Mapped Precipitation ….…….……..…….5

Figure 2 Mapped Water-Related Land Use…….…….....….……..…..6

Table 1 List of Land Use Types…….7

Chart 1 Delineation of Water-Related Land Use Categories……..……..….8

Chart 2 Breakdown of Irrigated Cropland……..……...…….9

Table 2 Statewide Land Use 2005 - 2010 by County……....……..…….10

Table 3 Statewide Land Use 2005 - 2010 by Basin...……..……..…….…….11

Figure 3 Land Use Charts by County 2005—2010……...…….…….12

STATEWIDE SUMMARY
WATER-RELATED LAND USE INVENTORY

INTRODUCTION

Authority

In the 1963 general session, the Utah State Legislature charged the Division of Water Resources with the responsibility of developing a State Water Plan. This plan is to coordinate and direct the activities of state and federal agencies concerned with Utah's water resources. As a part of this objective, the Division of Water Resources 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 phreatophytes[I], wet/open water areas, dry land agriculture and urban areas.

The data produced by the water-related land use program are used for various planning purposes. Some of these include: 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. Additionally, the data are used by many other state and federal agencies.

Previous Methods

The land use inventory methods used by the division 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 vertical-aerial photographs supplemented with field surveys to label boundaries, vegetation types, and other water use information.

After identifying crops and labeling photographs, the information was transferred onto a base map and then planimetered[II] or "dot-counted" to determine the acreage. Tables for individual townships and ranges were prepared showing the amount of land in each land use category within each section. Data were then available for use in preparing water budgets.

In the early 1980s, the division began updating its methodology for collecting water-related land use data to take advantage of the rapidly growing fields of Remote Sensing and computerized Geographic Information Systems (GIS).

For several years during the early 1980's, the division contracted with the University of Utah Research Institute, Center for Remote Sensing and Cartography (CRSC), to prepare water-related land use inventories. During this period, water-related land use data was obtained by using high altitude color infrared photography and laboratory interpretation, with field checking.

In March 1984, several division staff members visited the California Department of Water Resources to observe its methodology for collecting water-related land use data for state water planning purposes.

Based on its review of the California methodology and its own experience, the division 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 quadrangle maps, field-mapping using base maps produced from the 35mm photography and a computerized GIS to process, store and retrieve land use data.

Areas for survey were first identified from previous land use studies and any other available information. The identified areas were then photographed using an aircraft

carrying a high quality 35mm single lens reflex camera mounted to focus along a vertical axis to the earth. Photos were taken between 6,000 and 6,500 feet above the ground using a 24mm lens. This procedure allowed each slide to cover a little more than one square mile with approximately 30 percent overlap on the wide side of the slide and 5 percent on the slide's narrow side.

The slides were then indexed according to a flight-line number, slide number, latitude and longitude. All 35mm slides were stored in files at the division offices and cataloged according to township, range and section, and quadrangle map location.

Water-related land use areas were then transferred from the slide to USGS 7-1/2 minute quadrangle maps using a standard slide projector with a 100-200mm zoom lens. This step allowed the technician to project the slide onto the back of a quadrangle map. The image showing through the map was adjusted to the map scale with the zoom lens. Field boundaries and other water-use boundaries were then traced on the 7-1/2 minute quadrangle map.

Next, a team was sent to use the map in the field to check the boundaries and current year land use field data on the 7-1/2 minute quadrangles.

The final step was to digitize and process the field data using ARC/INFO software developed by Environmental Systems Research Institute (ESRI).

Starting in 2000 with the land use survey of the Uintah Basin, the division further improved its land use 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[iii] mode for this process. This allowed the division to use multiple technicians for the digitizing process.

Digitizing was done as line and polygon files using ArcView 3.2 with a satellite image, DOQ or NAIP image as a background with other layers added for reference. Boundary files were created in logical groups so that the process of edge-matching along quad lines was eliminated and precision increased. Subsequent inventories were digitized in the ArcMap 9.x software versions.

Present Methodology

Using the latest statewide NAIP Imagery and ArcGIS 10, all boundaries of individual agricultural fields, urban areas, and significant riparian areas are precisely digitized.

Once the process of boundary digitizing is done, the polygons are loaded onto tablet PCs. Field crews are then sent to field check the crop and irrigation type for each agricultural polygon and label the shapefiles accordingly. 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. This improved process has saved the division much time and money and even greater savings will be realized as the new statewide field boundaries are completed.

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). Once in the SGID, the data becomes available to the public. At this point, the data is also ready for use in preparing various planning studies.

In conducting water-related land use inventories, the division attempts to inventory all lands or areas that consume or evaporate water other than natural precipitation. Areas not inventoried are mainly desert, rangeland and forested areas.

<u>Wet/open water areas and dry land agriculture areas are mapped if they are with-</u>

in or border irrigated lands. As a result, the numbers of acres of wet/open water areas and dry land agriculture reported by the division may not represent all such areas in a basin or county.

During land use inventories, the division uses 11 hydrologic basins as the basic collection units. County data is obtained from the basin data. The water-related land use data collected statewide covers more than 2.6 million acres of dry and irrigated agricultural land. This represents about 5 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.

STATEWIDE SUMMARY BY BASIN AND COUNTY WATER-RELATED LAND USE DATA

Description

The climate of Utah varies widely with the physiography of the state. Figure 1 shows the historic annual precipitation. Average precipitation ranged from about 4 inches per year at points near the Utah/Nevada border to more than 67 inches in the high mountain areas of the Wasatch Front. Precipitation across the entire state averaged just over 14 inches from 1981 to 2010.[1]

Data Collection

Between 2005 and 2010, the Division categorized a total of over 4.3 million acres of land in the state. This represents roughly 8 percent of the total land area in the entire state. Figure 2 illustrates the water-related land use of the basin and shows where most of the agricultural land use occurs.

Data Summary

Table 1 lists the various land use types used to categorize land. Chart 1 delineates the six categories of land use by percentage for the State. Chart 2 breaks down the types of irrigated crop land by percentage. Table 2 displays the land use by county as calculated from the basin data gathered between 2005 and 2010. Table 3 displays the land use by basin and the year in which it was collected. Figure 3 delineates six categories of water-related land use by percentage for each county and statewide.

Of the agricultural acres inventoried, 1,325,172 acres were irrigated lands (including land that was sub-irrigated), and 1,345,820 acres were non-irrigated (including land that was fallow and idle). Other categories that were inventoried include: 548,216 acres of wet/open water areas (including reservoirs and mountain lakes), and 832,094 acres of residential/industrial areas (including farmsteads and rural housing).

Data Access

GIS data used in this summary may be downloaded from the Utah AGRC. Current land use datasets are available as a statewide layer or by county and are offered in shapefile and geodatabase formats.

To download the most recent dataset, Go to: gis.utah.gov/data/planning/water-related-land/

For past GIS datasets, Please contact Technical Services at the Division of Water Resources www.water.utah.gov/Planning/landuse/index.htm

Past Land Use Reports for this area and a PDF of this report can be found at www.water.utah.gov/planning/landuse/publ.htm

Metadata is available at www.water.utah.gov/planning/landuse/gisdata.htm

REFERENCES

1. Prism Group, Oregon State University, prism.oregonstate.edu/

Maximum, Minimum and Mean precipitation calculated using Zonal Statistics tool with ESRI ArcInfo license.

GLOSSARY

I. Phreatophyte - A deep-rooted plant that obtains water from a permanent ground supply or from the water table.

II. Planimetered or dot-counted - process to determine acreage by assigning an acreage value to a "dot" based on map scale and then counting the number of "dots" within a specific boundary.

III. Heads-up digitizing - Manual digitization by tracing a mouse over features displayed on a computer monitor, used as a method of vectorizing raster data.

Figure 1 - Average Annual Precipitation 1981 to 2010

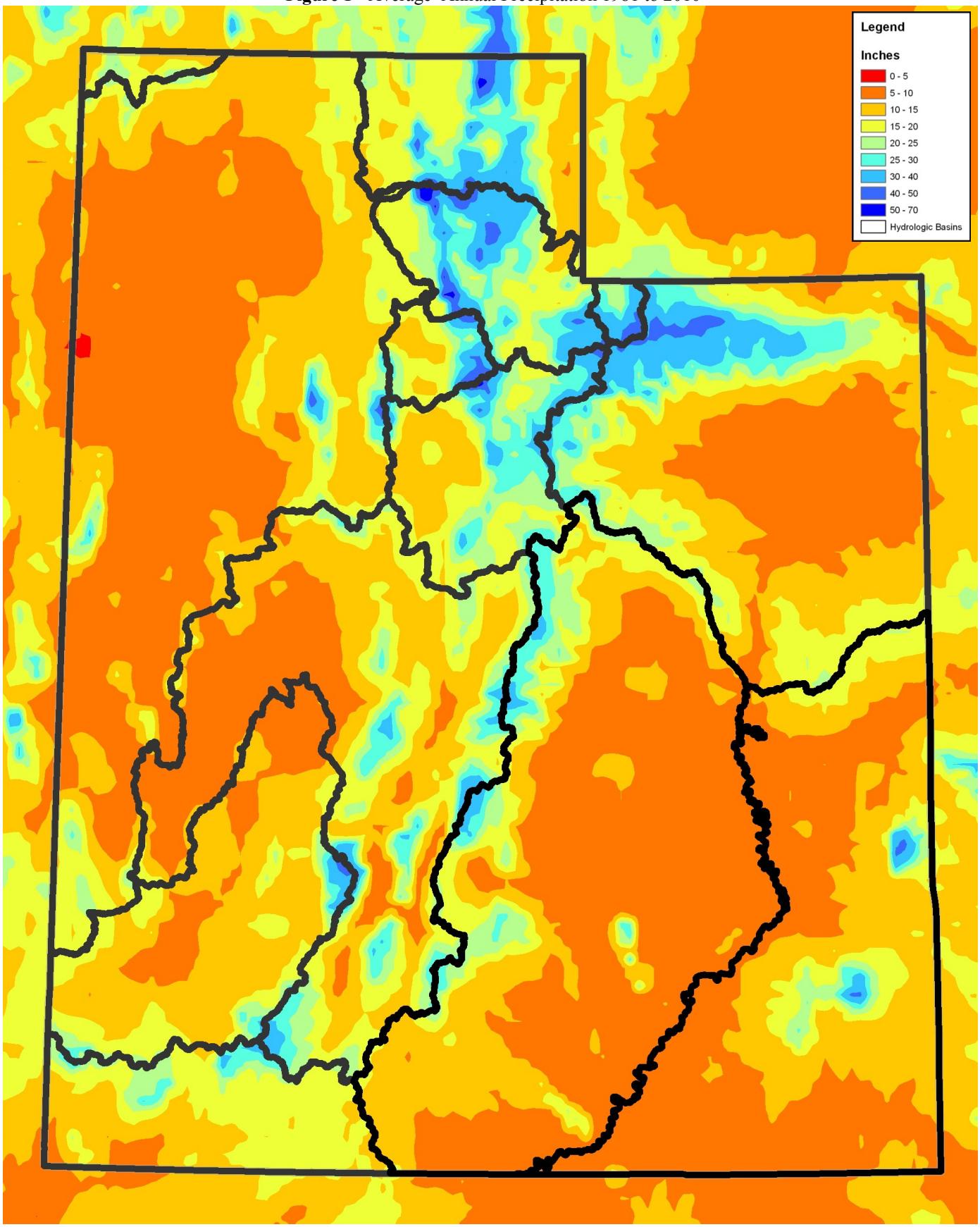

Figure 2 - Mapped Water-Related Land Use Inventoried from 2005 to 2010

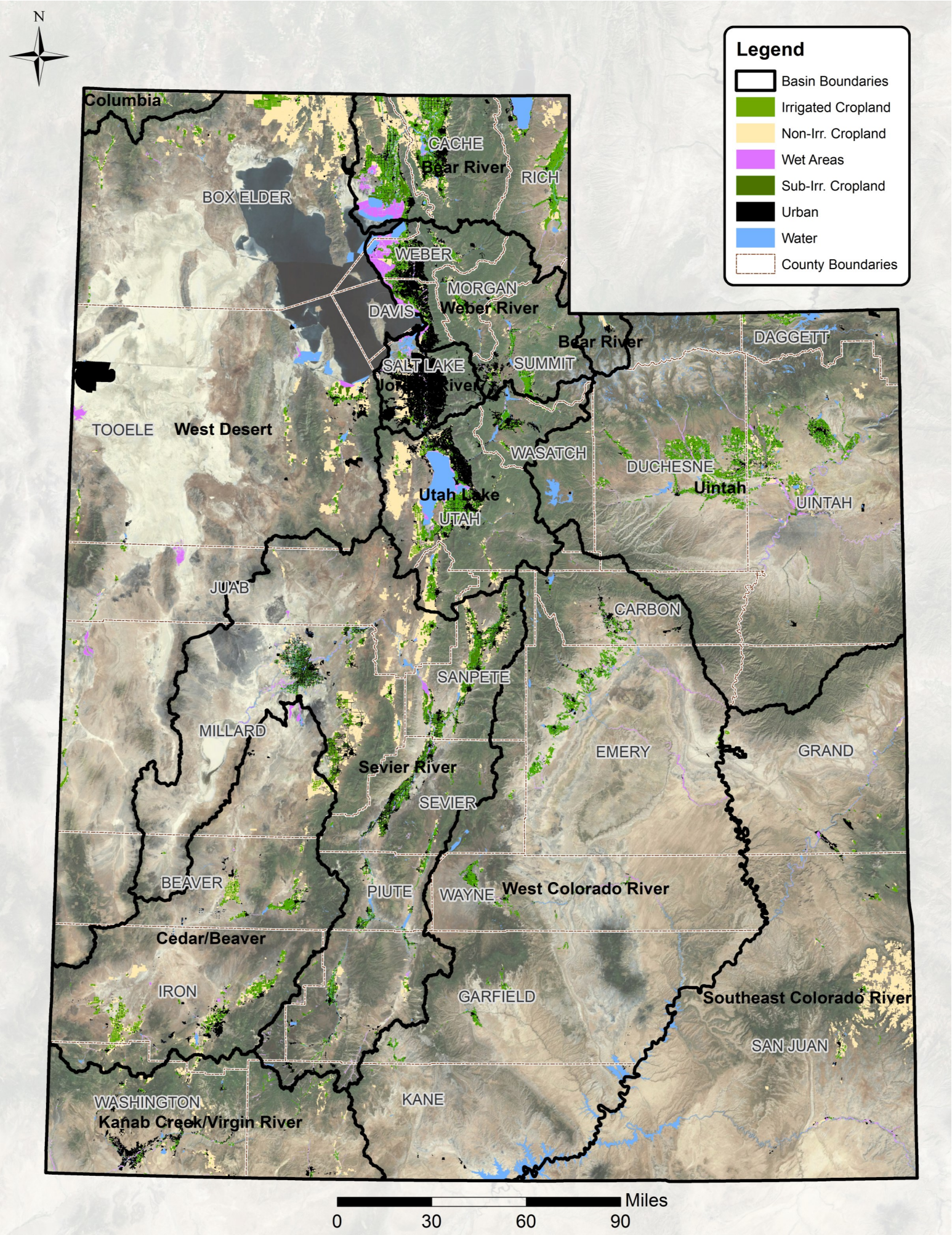

Table 1 List of Land Use Types

DESCRIPTION	IRR TYPE	LABEL	LANDUSE
Alfalfa	F	ALF-F	IR
Alfalfa	S	ALF-S	IR
Idle-Irrigated Land	NA	IDLE	NI
Dry Idle	NA	DRYIDLE	NI
Dry Grain/Seeds	NA	DRYGRN	NI
Pasture	F	PAS-F	IR
Pasture	S	PAS-S	IR
Pasture-subirrigated	SubIR	PAS-W	SubIR
Dry Pasture	NA	DRYPAS	NI
Grass Hay	F	GHAY-F	IR
Grass Hay	S	GHAY-S	IR
GrassHay-subirrigated	SubIR	GHAY-W	SubIR
Grain	F	GRAIN-F	IR
Grain	S	GRAIN-S	IR
Oats	F	OAT-F	IR
Oats	S	OAT-S	IR
Dry Oats	NA	DRYOAT	NI
Corn	F	CORN-F	IR
Corn	S	CORN-S	IR
Fallow-Irrigated Land	NA	FALLOW	NI
Dry Fallow	NA	DRYFAL	NI
Dry Alfalfa	NA	DRYALF	NI
Safflower	F	SAFF-F	IR
Safflower	S	SAFF-S	IR
Dry Safflower	NA	DRYSAF	NI
Dry Beans	NA	DRYBEA	NI
Range Pasture	NA	RPAS	NI
Urban	NA	URBAN	URB
Urban Grass/Parks	NA	UGRASS	URB
Riparian	NA	RIP	RIP
Reservoirs	NA	RESVR	WATER
Lakes & Ponds	NA	LAKE	WATER
Streams	NA	STREAM	WATER
Evaporation Pond	NA	EVAPO	WATER
Sewage Lagoon	NA	SEWLGN	WATER
Orchard	F	ORCH-F	IR
Orchard	S	ORCH-S	IR
Turf Farms	S	TURF-S	IR
Sorghum	F	SRGM-F	IR
Sorghum	S	SRGM-S	IR
Onions	F	ONION-F	IR
Onions	S	ONION-S	IR
Other Vegetables	F	VEG-F	IR
Other Vegetables	S	VEG-S	IR
Other Horticulture	F	HORT-F	IR
Other Horticulture	S	HORT-S	IR
Potatoes	F	PO-F	IR
Potatoes	S	PO-S	IR
Beans	F	BEAN-F	IR
Beans	S	BEAN-S	IR
Berries	F	BERR-F	IR
Berries	S	BERR-S	IR
Tomatoes	F	TOM-F	IR
Tomatoes	S	TOM-S	IR
Melon/Pumpkin/Squash	F	MPS-F	IR
Melon/Pumpkin/Squash	S	MPS-S	IR
Vineyard	F	VINY-F	IR
Vineyard	S	VINY-S	IR
No Land Use	NA	NO-LU	NOLU

Chart 1 - Water-Related Land Use Categories with in the State of Utah

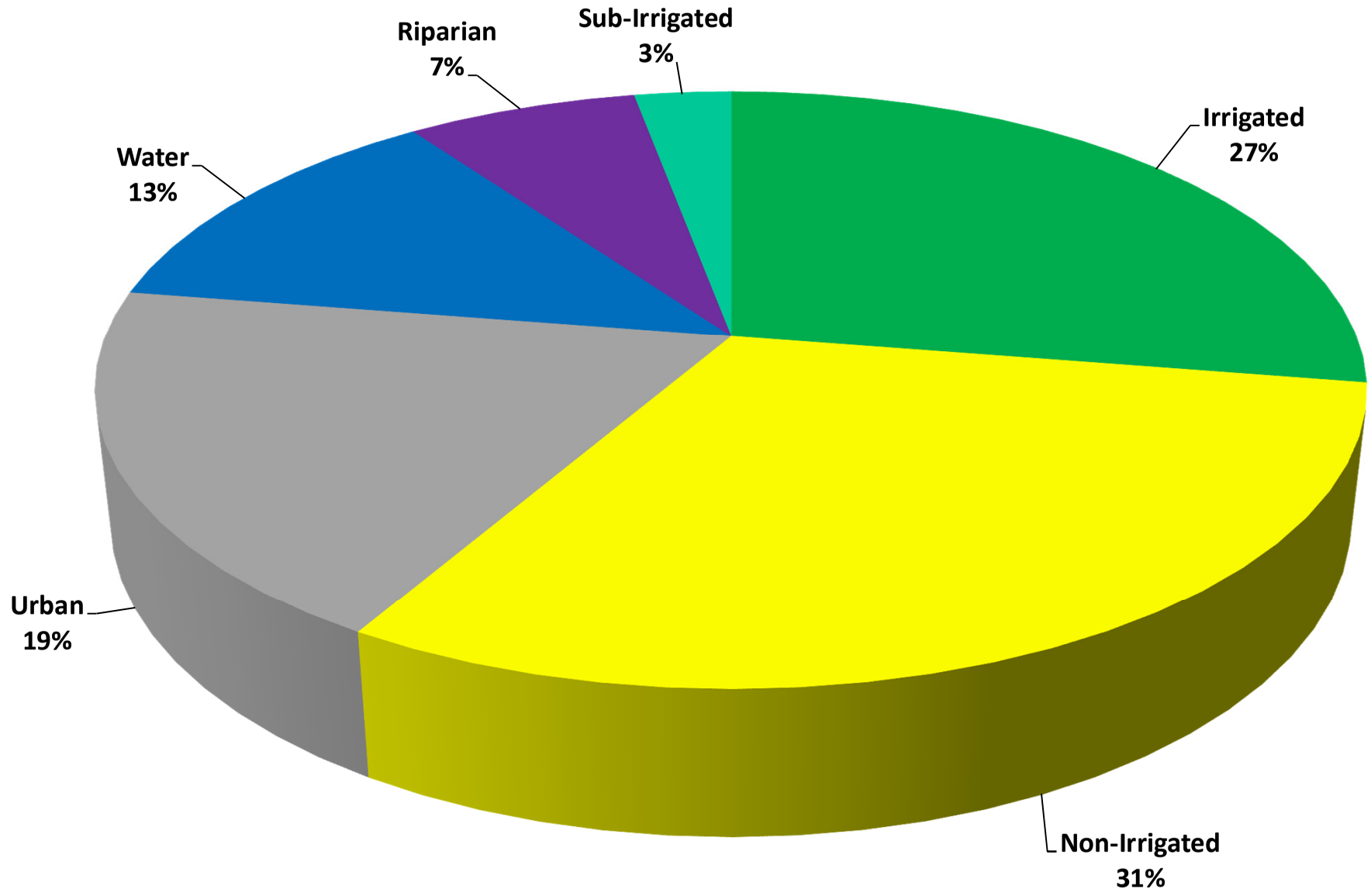

Chart 2 - Breakdown of Irrigated Cropland

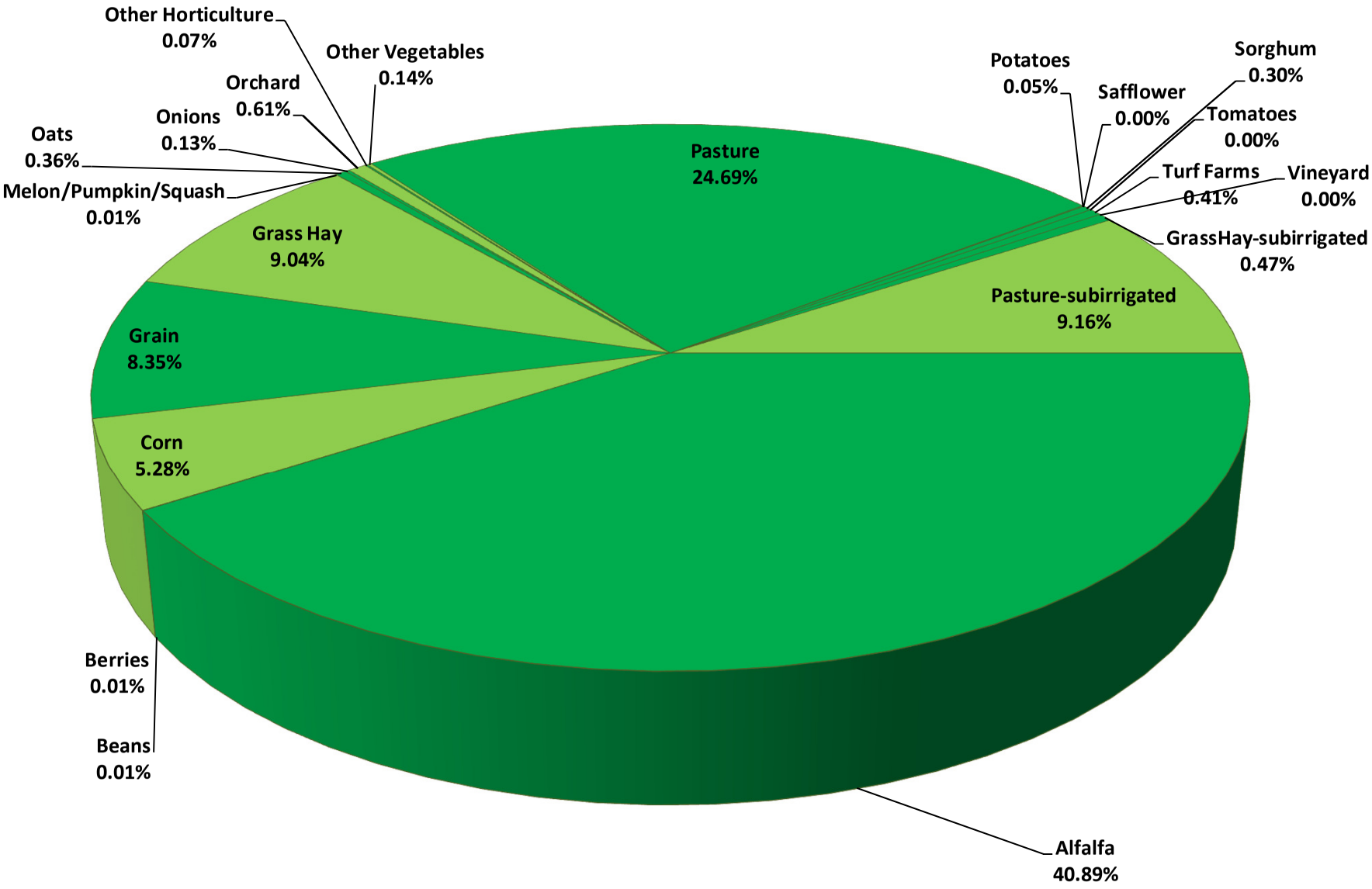

Table 2 - Land Use by County

County Land Use (Acres)																														
	BEAVER	BOX ELDER	CACHE	CARBON	DAGGETT	DAVIS	DUCHESNE	EMERY	GARFIELD	GRAND	IRON	JUAB	KANE	MILLARD	MORGAN	PIUTE	RICH	SALT LAKE	SAN JUAN	SANPETE	SEVIER	SUMMIT	TOOELE	UINTAH	UTAH	WASATCH	WASHINGTON	WAYNE	WEBER	STATE TOTAL
IRRIGATED	**31,689**	**128,192**	**96,965**	**11,356**	**10,770**	**14,787**	**121,193**	**49,448**	**26,905**	**5,257**	**58,519**	**24,100**	**5,604**	**98,494**	**9,223**	**15,547**	**65,989**	**7,904**	**7,334**	**74,645**	**47,902**	**24,459**	**21,955**	**78,494**	**82,034**	**14,965**	**12,458**	**16,391**	**34,891**	**1,197,469**
Alfalfa	20,120	54,950	44,630	5,766	2,047	4,066	40,251	27,004	13,254	3,530	51,133	13,136	897	65,968	4,219	7,030	6,358	2,402	3,088	35,291	23,344	3,738	9,532	38,385	27,994	5,158	4,724	10,593	13,201	**541,808**
Beans			29			148								8											1					**187**
Berries		1	78			15												0							18					**113**
Corn	1,052	13,374	8,624	292		1,939	3,705	1,246		54	952	1,602	2	10,325	577	139		589	190	3,713	4,679		1,143	3,327	8,584	6	219		3,674	**70,008**
Grain	983	32,873	18,219	549	37	1,140	4,697	2,186	536	28	3,251	4,834	240	12,060	946	762	1,750	692	1,850	3,994	1,356	589	877	1,462	9,553	273	475	2,161	2,214	**110,589**
Grass Hay	939	8,763	7,684	655	3,217	573	10,216	2,354	3,048	202	24	646	1,211	1,319	1,643	2,676	37,731	241	199	10,197	1,831	7,105	1,295	3,140	6,319	2,166	1,122		3,258	**119,773**
Melon/Pumpkin/Squash																2				119	2									**122**
Oats									988					1,164		56				2,142	477									**4,826**
Onions		1,132				395															19						3		206	**1,754**
Orchard		866	71	1		210		28	21	14		269	25	16	2			29	22	5	13	11	15	66	5,594		644	40	88	**8,051**
Other Horticulture		227	82			233						211					30	8		56	13				33	18	52		16	**977**
Other Vegetables		321	368	2		199	6	144	1	24	18	3		4		0	1	179		11	3			7	416	1	20		153	**1,881**
Pasture	8,525	14,403	16,336	4,051	5,469	5,637	62,283	16,143	9,006	1,342	2,687	2,393	3,228	7,298	1,787	4,857	20,096	3,546	1,834	19,033	15,801	13,018	7,779	31,873	21,097	7,339	4,734	3,597	11,975	**327,168**
Potatoes			272	1		9			50		142					25	24	5		3	1			83	3		67			**685**
Safflower																				23										**23**
Sorghum	70	484	500	39		8		332		63		706	3	331	48				139	58	50		269	150	508		202		66	**4,026**
Tomatoes																		1							11				8	**20**
Turf Farms		798	71			214	35	9			311	299						207			313		1,047		1,902	3	192		33	**5,436**
Vineyard																		4	12						1		3			**20**
SUB-IRRIGATED	**523**	**24,418**	**8,953**	**702**	**37**	**3,471**	**2,601**	**4,668**	**6,390**	**94**	**1,416**	**4,150**	**1,644**	**1,099**	**576**	**4,210**	**1,907**	**557**	**648**	**22,959**	**4,745**	**6,930**	**5,371**	**2,411**	**8,646**	**941**	**1,232**	**3,836**	**2,566**	**127,703**
GrassHay-subirrigated		815	737				144					156	21	50		468	490	4	19	2,881		155			189	109			14	**6,254**
Pasture-subirrigated	523	23,603	8,216	702	37	3,471	2,457	4,668	6,390	94	1,416	3,994	1,623	1,049	576	3,743	1,417	553	628	20,079	4,745	6,775	5,371	2,411	8,457	831	1,232	3,836	2,552	**121,449**
TOTAL IRRIGATED	**32,212**	**152,610**	**105,918**	**12,058**	**10,807**	**18,258**	**123,794**	**54,116**	**33,295**	**5,351**	**59,935**	**28,249**	**7,248**	**99,593**	**9,799**	**19,757**	**67,896**	**8,461**	**7,981**	**97,604**	**52,648**	**31,390**	**27,326**	**80,904**	**90,681**	**15,906**	**13,690**	**20,227**	**37,458**	**1,325,172**
IRRIGATION TYPE	**BEAVER**	**BOX ELDER**	**CACHE**	**CARBON**	**DAGGETT**	**DAVIS**	**DUCHESNE**	**EMERY**	**GARFIELD**	**GRAND**	**IRON**	**JUAB**	**KANE**	**MILLARD**	**MORGAN**	**PIUTE**	**RICH**	**SALT LAKE**	**SAN JUAN**	**SANPETE**	**SEVIER**	**SUMMIT**	**TOOELE**	**UINTAH**	**UTAH**	**WASATCH**	**WASHINGTON**	**WAYNE**	**WEBER**	**STATE TOTAL**
Flood	8,271	75,008	32,178	7,368	8,244	11,231	51,156	29,579	6,886	2,028	1,297	3,515	2,340	58,747	6,592	9,276	56,671	5,201	2,295	23,546	34,730	19,091	3,444	31,745	47,935	5,335	5,773	2,183	30,159	**581,825**
Sprinkle	23,417	53,183	64,787	3,988	2,526	3,556	70,037	19,869	20,018	3,229	57,222	20,585	3,264	39,747	2,631	6,271	9,318	2,703	5,038	51,099	13,172	5,368	18,511	46,749	34,099	9,630	6,685	14,209	4,732	**615,644**
Subsurface	523	24,418	8,953	702	37	3,471	2,601	4,668	6,390	94	1,416	4,150	1,644	1,099	576	4,210	1,907	557	648	22,959	4,745	6,930	5,371	2,411	8,646	941	1,232	3,836	2,566	**127,703**
NON-IRRIGATED	**11,899**	**279,845**	**73,969**	**2,977**	**3,518**	**6,282**	**22,062**	**9,891**	**18,009**	**3,121**	**48,583**	**84,336**	**12,882**	**146,186**	**7,531**	**7,787**	**31,689**	**30,009**	**171,209**	**63,561**	**14,078**	**14,744**	**77,715**	**40,710**	**109,906**	**4,070**	**35,694**	**1,201**	**12,357**	**1,345,820**
Dry Alfalfa		4,874	11,856	30		396		4		130	30	467		132	1,010		198	104	1,553	834	7	367	1,168	63	129	55			830	**24,238**
Dry Beans												51							5,661	59										**5,771**
Dry Fallow		5,230	4,945	11								2,294		355				472	1,704	76			223		14,929		2,321			**32,558**
Dry Grain/Seeds		100,234	15,933			21		147			657	13,201		1,592	878	15	668	10,015	83,869	1,772		651	2,381		14,830		71		82	**247,016**
Dry Idle	1,038	32,072	15,585	66	31	2,697	434	252	427	11	21,709	11,117	1,026	29,515	3,425	319	3,043	6,821	39,202	4,211	176	1,484	6,176	4,523	29,055	273	3,310		1,162	**219,161**
Dry Oats																				57										**57**
Dry Pasture	832	70,969	6,242	104	708	501	1,236	1,789	3,210	13	6,560	25,446	5,141	36,686	1,972	1,483	22,699	5,966	11,739	17,082	1,366	4,434	41,899	4,364	17,210	1,708	13,130	75	4,506	**309,072**
Dry Safflower		3,328	7,036											40					2,490	16					15					**12,926**
Fallow-Irrigated Land	9	9,018	1,243	182		59	264	513	12	107	145	1,689	9	3,528		384	14	747	398	659	266	18	111	247	1,482	19	326	18	134	**21,602**
Idle-Irrigated Land	9,441	11,553	7,297	2,585	1,940	2,605	12,171	6,041	1,817	2,861	17,019	4,747	1,971	32,569	117	2,354	2,653	5,879	1,468	7,343	8,912	1,746	2,507	17,351	22,692	1,746	5,876	887	5,495	**201,642**
Range Pasture	579	42,567	3,832		838	4	7,957	1,146	12,543		2,462	25,323	4,734	41,769	130	3,232	2,415	3	23,125	31,450	3,350	6,044	23,251	14,162	9,565	268	10,660	221	147	**271,777**
URBAN	**9,065**	**30,044**	**31,639**	**11,752**	**5,483**	**58,098**	**12,619**	**8,542**	**7,644**	**7,480**	**25,560**	**7,183**	**8,694**	**30,868**	**4,929**	**3,124**	**5,728**	**182,081**	**6,674**	**21,105**	**15,878**	**29,029**	**86,488**	**18,498**	**90,241**	**14,447**	**42,285**	**3,458**	**53,456**	**832,094**
Urban	8,800	29,260	29,980	11,529	5,458	55,417	12,202	8,257	7,439	7,160	25,404	6,973	8,555	30,238	4,673	3,083	5,590	172,688	6,468	20,555	15,479	28,107	85,876	17,803	84,893	13,489	40,966	3,371	50,816	**800,530**
Urban Grass/Parks	265	784	1,659	224	25	2,681	417	285	205	321	156	210	139	630	255	41	138	9,393	206	549	400	923	612	695	5,348	958	1,319	87	2,641	**31,565**
WATER	**2,401**	**47,515**	**7,230**	**4,054**	**15,919**	**4,693**	**16,779**	**9,479**	**17,154**	**9,027**	**2,907**	**4,955**	**69,756**	**7,675**	**1,830**	**5,451**	**37,617**	**14,422**	**70,675**	**4,194**	**6,498**	**9,426**	**26,019**	**20,452**	**90,572**	**21,593**	**4,699**	**3,049**	**12,177**	**548,216**
Evaporation Pond		11,906	49	182		15	9			99				254	4	1	44	549	577	130		1	21,438	320	20				7,668	**43,265**
Lakes & Ponds	1,375	21,420	913	2,467	566	4,196	6,516	661	102	15	2,132	116	655	1,472	89	1	34,828	11,589	172	644	304	4,000	20	1,248	88,738	370	977		310	**185,897**
Reservoirs	36	11,810	4,068	259	14,305	270	6,823	3,552	14,916	5,665	265	4,129	68,938	2,976	1,058	4,541	1,628	838	64,366	2,496	4,684	4,083	4,067	6,033	820	20,660	2,514	390	3,228	**259,420**
Sewage Lagoon	839	102	1,011	15	60	30	156	206	86		474	137	123	235	28		34	61	150	216	370	64	349	265	190	114	239		268	**5,821**
Streams	151	2,278	1,189	1,132	988	182	3,275	5,060	2,049	3,247	36	573	40	2,739	651	908	1,084	1,386	5,410	707	1,140	1,278	145	12,585	804	448	968	2,659	703	**53,813**
RIPARIAN	**931**	**53,396**	**8,217**	**2,624**	**796**	**25,808**	**13,725**	**16,853**	**2,942**	**5,076**	**3,792**	**10,514**	**3,187**	**18,365**	**623**	**938**	**4,293**	**7,544**	**7,438**	**7,694**	**4,035**	**3,507**	**13,698**	**26,457**	**10,652**	**2,368**	**3,775**	**4,436**	**40,034**	**303,717**
COUNTY TOTAL	**56,508**	**563,411**	**226,973**	**33,466**	**36,522**	**113,139**	**188,979**	**98,881**	**79,043**	**30,054**	**140,777**	**135,237**	**101,767**	**302,687**	**24,711**	**37,058**	**147,224**	**242,517**	**263,976**	**194,158**	**93,137**	**88,096**	**231,246**	**187,021**	**392,052**	**58,384**	**100,143**	**32,371**	**155,481**	**4,355,018**

Table 3 - Land Use by Basin

Basin Land Use (Acres)													
SURVEY YEAR	2009	2007	2005	2008	2007	2010	2005	2006	2008	2007	2005	2005	2005 - 2010
RIVER BASIN	BEAR RIVER	CEDAR/BEAVER	COLUMBIA RIVER	JORDAN RIVER	KANAB CREEK/VIRGIN RIVER	SEVIER RIVER	SOUTHEAST COLORADO RIVER	UINTAH	UTAH LAKE	WEBER RIVER	WEST COLORADO RIVER	WEST DESERT	STATE TOTAL
IRRIGATED	**244,798**	**95,985**	**5,184**	**7,904**	**16,288**	**245,786**	**14,343**	**212,543**	**114,851**	**83,081**	**87,544**	**69,161**	**1,197,469**
Alfalfa	81,127	76,762	1,296	2,402	4,310	132,995	8,091	80,710	42,689	25,755	49,711	35,960	**541,808**
Beans	29					8			1	148			**187**
Berries	79			0					18	15			**113**
Corn	21,016	2,265	59	589	200	18,714	190	7,032	9,648	6,978	1,592	1,724	**70,008**
Grain	42,420	4,456	215	692	503	19,330	1,860	6,197	12,497	4,957	5,312	12,150	**110,589**
Grass Hay	51,409	1,028	1,794	241	2,148	17,068	741	16,886	9,679	11,751	3,635	3,394	**119,773**
Melon/Pumpkin/Squash						122							**122**
Oats						4,826							**4,826**
Onions	1,132				3	19				601			**1,754**
Orchard	738			29	670	275	36	66	5,617	510	90	22	**8,051**
Other Horticulture	339			8	52	69			262	249			**977**
Other Vegetables	671	26		179	12	19		12	421	371	170		**1,881**
Pasture	43,807	10,858	1,820	3,546	7,990	50,593	3,232	101,371	31,478	31,358	26,633	14,480	**327,168**
Potatoes	295	209		5		79		83	3	9	1		**685**
Safflower						23							**23**
Sorghum	868	70			205	1,033	182	150	621	122	391	384	**4,026**
Tomatoes				1					11	8			**20**
Turf Farms	869	311		207	192	612		35	1,905	248	9	1,047	**5,436**
Vineyard				4	3		12		1				**20**
SUB-IRRIGATED	**33,694**	**1,861**	**267**	**557**	**2,063**	**40,887**	**763**	**7,374**	**12,167**	**11,125**	**9,592**	**7,353**	**127,703**
GrassHay-subirrigated	1,867		160	4	21	3,398	19	144	455	169		16	**6,254**
Pasture-subirrigated	31,827	1,861	107	553	2,042	37,489	743	7,230	11,712	10,956	9,592	7,337	**121,449**
TOTAL IRRIGATED	**278,492**	**97,846**	**5,451**	**8,461**	**18,352**	**286,673**	**15,106**	**219,917**	**127,017**	**94,206**	**97,136**	**76,513**	**1,325,172**
IRRIGATION TYPE	BEAR RIVER	CEDAR/BEAVER	COLUMBIA RIVER	JORDAN RIVER	KANAB CREEK/VIRGIN RIVER	SEVIER RIVER	SOUTHEAST COLORADO RIVER	UINTAH	UTAH LAKE	WEBER RIVER	WEST COLORADO RIVER	WEST DESERT	STATE TOTAL
Flood	158,240	9,423	347	5,201	8,042	129,808	4,025	93,169	57,188	67,023	40,328	9,032	**581,825**
Sprinkle	86,558	86,562	4,837	2,703	8,247	115,978	10,319	119,374	57,663	16,057	47,216	60,129	**615,644**
Subsurface	33,694	1,861	267	557	2,063	40,887	763	7,374	12,167	11,125	9,592	7,353	**127,703**
NON-IRRIGATED	**167,709**	**78,643**	**6,316**	**30,009**	**45,262**	**284,608**	**174,734**	**66,880**	**140,982**	**36,398**	**15,729**	**298,550**	**1,345,820**
Dry Alfalfa	15,243	30	117	104		1,305	1,553	63	296	2,583	164	2,780	**24,238**
Dry Beans						111	5,661						**5,771**
Dry Fallow	8,567			472	2,321	2,263	1,704		15,390		11	1,831	**32,558**
Dry Grain/Seeds	25,246	316	592	10,015	571	14,676	83,869		16,500	1,632	147	93,453	**247,016**
Dry Idle	25,308	24,002	773	6,821	3,361	40,111	39,217	4,988	34,649	8,769	329	30,835	**219,161**
Dry Oats						57							**57**
Dry Pasture	52,349	11,857	2,162	5,966	17,404	69,789	12,202	6,529	27,560	10,797	2,249	90,208	**309,072**
Dry Safflower	8,660					57	2,490		15			1,705	**12,926**
Fallow-Irrigated Land	5,249	187		747	303	6,287	460	511	1,746	220	763	5,128	**21,602**
Idle-Irrigated Land	15,123	31,108	781	5,879	7,307	46,950	3,926	31,798	27,910	10,097	10,574	10,187	**201,642**
Range Pasture	11,964	11,144	1,892	3	13,995	103,003	23,652	22,991	16,917	2,300	1,493	62,422	**271,777**
URBAN	**57,320**	**36,973**	**273**	**182,099**	**44,724**	**80,461**	**15,592**	**36,962**	**110,504**	**144,317**	**25,749**	**97,122**	**832,094**
Urban	54,773	36,496	273	172,705	43,333	78,691	15,023	35,811	104,018	137,819	25,116	96,474	**800,530**
Urban Grass/Parks	2,546	477		9,395	1,391	1,770	568	1,151	6,486	6,498	634	648	**31,565**
WATER	**69,427**	**6,482**	**147**	**14,673**	**4,559**	**24,981**	**100,536**	**73,445**	**99,301**	**34,512**	**81,470**	**38,684**	**548,216**
Evaporation Pond	109			549		385	676	329	20	11,556	182	29,460	**43,265**
Lakes & Ponds	56,842	4,645		11,824	608	1,840	172	11,006	89,021	2,868	3,754	3,317	**185,897**
Reservoirs	6,574	280	147	838	2,649	14,910	96,085	42,765	8,414	17,389	63,967	5,402	**259,420**
Sewage Lagoon	1,137	1,313		61	359	882	150	486	437	400	246	351	**5,821**
Streams	4,765	244		1,402	943	6,965	3,452	18,858	1,409	2,299	13,321	154	**53,813**
RIPARIAN	**59,196**	**8,556**	**133**	**7,034**	**5,459**	**28,353**	**10,073**	**42,068**	**13,688**	**73,247**	**25,992**	**29,919**	**303,717**
BASIN TOTAL	**632,144**	**228,499**	**12,319**	**242,276**	**118,356**	**705,076**	**316,041**	**439,272**	**491,491**	**382,680**	**246,076**	**540,789**	**4,355,018**
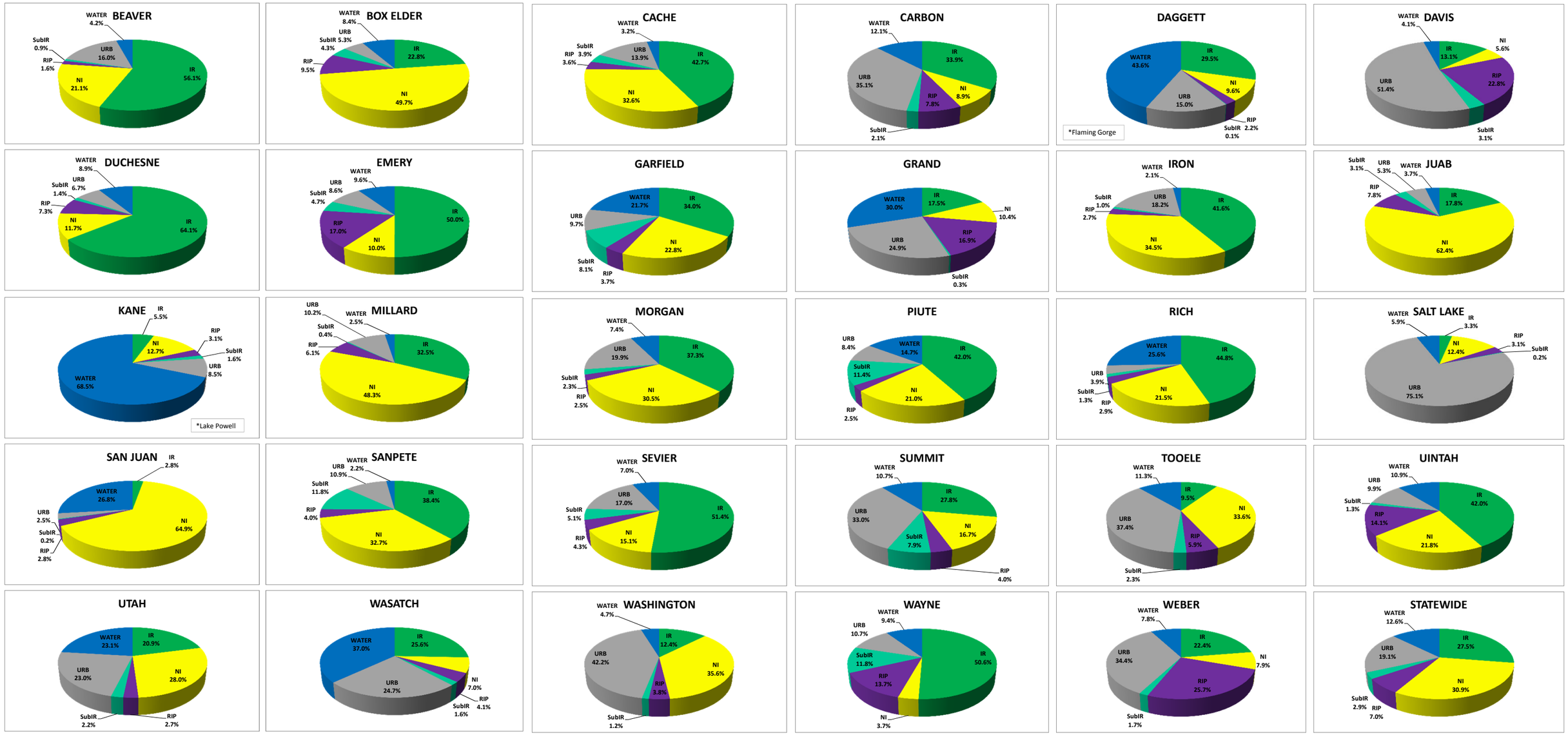
Figure 3 - Water-related Land Use Charts by County