

Evapotranspiration and Precipitation Data for Calculating Irrigation Water Requirements in Utah



Introduction

Reference evapotranspiration (ET_o) and precipitation data are essential for developing water budgets and calculating irrigation water requirements. However, it is crucial that the data used for such purposes are recent and easily accessible to stakeholders. In this fact sheet, we calculated average reference evapotranspiration and precipitation data for multiple locations in Utah, USA. To accomplish this, we collected the data from the [Utah Climate Center](#) and compiled it to show an average of 20 years of data by month in an easily digestible format. We compiled data for 69 locations in Utah, making it easy to find one close to your site. However, it is important to note that the data might not be accurate in every location, as some locations may have distinct microclimate. Nevertheless, stakeholders can use this data to develop a water budget and calculate irrigation water requirements for their area.

Evaporation and Transpiration

Evapotranspiration or **actual evapotranspiration (ET_a)** is made up of two words: evaporation and transpiration. The amount of water lost through soil surface and water bodies is referred to as evaporation, whereas **transpiration** is the loss of water via plants' leaves, stems, and other surfaces. Several factors can influence evapotranspiration rates, including solar radiation, temperature, humidity, wind, soil moisture, topography, atmospheric pressure, and surface

coverings, such as plant type, plant density, and mulch layer.

While ET_a is the amount of water that is actually lost for soil and plant surfaces, **reference evapotranspiration (ET_o)** is a standardized method of estimating the potential water loss from a well-watered, uniform cool-season grass or reference crop under specific meteorological conditions. The cool-season grass or reference crop has a uniform height and is assumed to always have sufficient water supply. ET_o is a theoretical reference value that represents the maximum evapotranspiration that can occur under those idealized conditions. Therefore, ET_o is often used as a standard, baseline, or reference for estimating crop water needs and scheduling irrigation. There are several methods that can be used to calculate ET_o values; however, the Penman-Monteith method is most widely used. It is important to have accurate and reliable meteorological data, as generating precise ET_o values depend on quality meteorological data used in the calculations.

Evapotranspiration Data in Utah

Utah is a climatically diverse state with varying geographical conditions, such as topography, altitude, and vegetation. As ET_o is a function of various climatic and geographical conditions, ET_o varies in different parts of the state. To understand this, let us consider the interaction between two factors: latitude (proximity to equator) and evapotranspiration. St. George, Utah, is closer to the equator than Salt Lake City, Utah; therefore, St. George receives higher solar radiation, and thus, has a higher evapotranspiration rate.

Reference Evapotranspiration and Precipitation Data: Vital Roles in Water Management

Reference evapotranspiration (ET_o) data plays a critical role in agricultural water management, as it provides essential information on crop or landscape water requirements under standardized environmental conditions. Landscapers rely on ET_o data to estimate the amount of water required for crops and landscape, thus helping them manage irrigation systems and avoid over or underwatering. ET_o data can be used in the landscape planning process to determine potential water savings that can be achieved by using low-water-use plants or changing landscape designs. The ET_o values can also be used to:

- Develop water management plans for regions.

- Assist in forecasting areas of drought.
- Manage water resources in agricultural and urban areas.
- Plan landscape by budgeting the available water.

In addition to ETo, including precipitation data in calculations further increases accuracy of water budget estimation. **Precipitation** is any form of water that falls on earth. In Utah, rain and snow are the two most common forms of precipitation. While ETo data provides potential water loss numbers to determine the irrigation water needs, precipitation amount should be accounted and subtracted from irrigation water. In addition, if the laws allow, precipitation water can be stored and used as needed to reduce the reliance on culinary or secondary water.

Use Most Recent Data

However, as important as the ETo and precipitation data are, it is also equally important to have the most recent data because climate and other meteorological conditions change significantly over time. This is especially important as climate change is rapidly changing average temperature, precipitation, and other weather patterns that can impact ETo rates. Using decade old average ETo data may not account for these changes in weather patterns, resulting in inaccurate water budget calculations and poor accuracy in irrigation planning. In addition to climate variations, instruments used to capture those data have also come a long way and are more accurate, powerful, and reliable. Therefore, it is crucial to use the most recent data one can find.

Using Data for Irrigation Scheduling in Landscapes

Estimate irrigation requirements by applying the following formula.

Gross Irrigation Requirement (GIR) (in gallons) = {(ETo – Precipitation) x PF x A } x 0.623

Net Irrigation Requirement (NIR) (in gallons) = GIR/IE

Where, ETo =	Reference evapotranspiration data (in inches) are provided in Table 1.
PF =	The plant factor accounts for the water requirements of specific plant types

	or species within the landscape. Different plants have varying water needs, and the plant factor adjusts the ETo value to reflect these differences. For example, drought-tolerant plants may have a lower PF, while high-water-use plants may have a higher PF. It ranges from 0 to 1, where 1 is high-water-use plants.
A =	Area of the landscape that requires irrigation (in square feet)
IE =	Irrigation efficiency reflects how effectively water is delivered to the landscape. It considers factors such as the irrigation system's design, maintenance, and management. Higher IE indicates a more efficient irrigation system, while a lower IE suggests that more water may be needed to achieve the desired result. It ranges from 0 to 1 where 1 is 100 % efficient.
Precipitation =	Precipitation data (in inches) are provided Table 1.

Data Generation

This fact sheet lists the most recent values for ETo and precipitation at different locations in Utah. To do so, we downloaded the reference evapotranspiration and precipitation data from the Utah Climate Center's [MapServer \(https://climate.usu.edu/mapServer/mapGUI/index.php\)](https://climate.usu.edu/mapServer/mapGUI/index.php) website. We downloaded the data from the years 2000 to 2022, organized it by months, and averaged it for 22 years, aiming to cover all counties of Utah. Figure 1 shows locations included in this fact sheet. However, for some locations, we couldn't find data for all 22 years, and in that case, we just included the data that was available. Some stations also had missing precipitation data and, in that case, we used the precipitation data from a nearby station. Those limitations are also highlighted in Table 1.

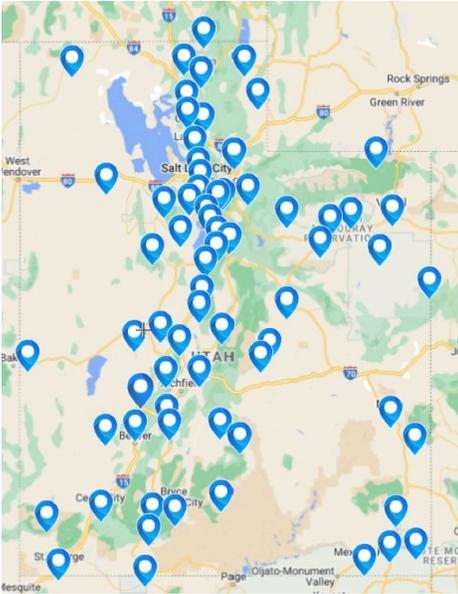


Figure 1. The Spread of Stations Selected to Include ETo and Precipitation Data

Limitations

Although this fact sheet has ETo and precipitation data for multiple Utah locations, and we advise choosing the station closest to your site, we also know it is important to understand that there are limitations to these data. Local weather and meteorological conditions can influence site-specific evapotranspiration rates, which can be challenging to capture accurately due to spatial and temporal variability. As such, it is important to consider the limitations of evapotranspiration data and contextualize it with additional information when making decisions or drawing conclusions.

Table 1. Tables for Average Monthly and Annual Reference Evapotranspiration (ETo) and Precipitation (ppt) Data for Various Utah Locations

Alta, UT																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	0.61	0.71	1.44	2.19	3.40	4.79	5.59	4.65	3.14	1.69	0.85	0.51	29.84							

Total ppt (inches)	1.65	5.53	5.52	4.43	2.91	8.41	5.32	2.24	2.63	3.46	4.24	6.17	47.14							
Alpine, UT																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	1.86	1.27	2.63	3.79	5.56	7.10	7.93	6.73	4.65	2.63	1.31	0.76	45.41							
Total ppt (inches)	2.05	1.90	2.12	4.72	2.21	0.76	6.01	0.71	3.71	8.11	5.32	4.21	19.92							
Altamont, UT *Missing ETo data from 2000-2001																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	1.64	1.02	2.36	3.59	5.17	6.63	7.34	6.18	4.31	2.43	1.20	0.58	41.43							
Total ppt (inches)	1.54	0.48	0.50	0.70	0.90	0.61	0.55	0.99	1.10	0.94	0.44	0.90	8.50							
Alton, UT																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	1.14	1.42	2.74	2.13	3.87	4.27	6.06	5.34	3.81	2.97	1.62	1.00	47.19							
Total ppt (inches)	1.67	1.75	1.42	0.77	0.65	0.25	1.44	2.09	1.63	1.99	1.08	1.81	15.99							

Aragonite, UT * Used nearby station for ppt data, Mining Fork, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.86	1.25	2.51	3.67	5.36	6.90	7.84	6.64	4.92	2.58	1.25	0.75	44.13
Total ppt (inches)	3.85	3.60	3.88	4.05	3.44	4.31	0.21	4.51	8.83	2.33	0.54	2.23	5.10
Assay-Hatch 10 SW, UT *Used nearby station for ppt data, Harris Flat, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.10	1.30	2.38	4.65	6.03	6.84	5.92	4.32	2.67	1.47	0.94	1.86	
Total ppt (inches)	2.13	2.31	1.70	0.89	0.70	0.36	1.87	2.09	1.67	1.99	1.52	0.76	20.05
Beaver Canyon PWR House, UT *2022 data is missing													
Average (2000-2021)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.03	1.28	2.38	4.05	5.16	6.37	6.06	4.13	3.22	2.60	1.39	0.90	42.56
Total ppt (inches)	1.42	1.68	1.86	1.79	1.65	0.62	1.97	1.60	0.89	1.50	0.93	1.51	17.71
Black Rock, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual

Total ETo (inches)	1.07	1.61	3.32	4.79	6.67	8.29	9.00	7.69	5.43	3.23	1.64	0.96	53.47
Total ppt (inches)	1.58	0.72	0.89	0.94	0.74	0.36	0.58	0.74	0.64	0.97	0.51	0.82	8.34
Blanding, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.09	1.50	2.93	4.22	6.07	7.46	7.96	6.24	4.62	2.93	1.56	0.95	47.78
Total ppt (inches)	1.40	1.23	0.96	0.55	0.61	0.32	0.98	1.20	1.31	1.27	0.77	1.35	12.10
Bluff, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.26	1.93	3.67	5.33	7.22	8.76	8.77	5.85	4.46	2.86	1.11	0.56	41.41
Total ppt (inches)	1.75	0.60	0.48	0.26	0.39	0.27	0.60	0.94	0.90	0.78	0.42	0.68	7.20
Bountiful Bench, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.79	1.52	3.73	4.64	6.99	8.27	7.04	5.92	4.04	2.36	1.17	0.70	40.26
Total ppt (inches)	2.42	3.53	1.33	0.58	0.63	1.14	0.60	1.26	1.53	1.82	3.42	2.84	26.16

Brigham City West PLT, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.74	1.16	2.56	3.82	5.57	8.08	25.03	4.75	2.70	1.25	0.67	0.45	72
Total ppt (inches)	1.42	1.18	1.38	1.61	1.76	0.83	1.50	2.36	1.53	1.13	1.37	1.4	37
Brighton, UT *Missing ETo data from 2018-2020													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.73	0.91	1.75	2.56	3.77	4.95	6.84	7.23	2.31	0.83	0.94	0.60	1.70
Total ppt (inches)	4.31	3.60	3.36	3.62	4.41	2.50	0.98	1.80	2.12	3.10	3.45	4.57	35.93
Bryce Canyon AP, UT *Missing ETo data of 2000													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.86	1.12	2.93	5.75	8.26	8.77	29.26	4.51	2.71	1.41	0.76	0.42	2.93
Total ppt (inches)	0.60	0.64	0.70	0.59	0.61	0.32	1.54	1.42	1.49	1.36	0.68	0.71	10.65
Capitol Reef NP, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.05	1.53	2.93	4.29	5.97	7.35	16.46	5.24	2.68	1.80	1.45	0.89	17.06

Total ETo (inches)	1.42	2.50	3.40	5.70	11.24	1.06	0.98	0.95	0.49	0.37	0.72		
Castle Dale, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.21	0.54	1.15	1.55	3.07	3.48	2.28	1.28	0.19	0.62	0.90	0.51	1.00
Total ppt (inches)	1.55	0.58	0.50	0.42	0.54	0.39	0.52	0.82	0.93	1.05	0.31	0.45	0.09
Cedar City MUNI AP, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.16	1.57	3.02	4.30	6.17	7.88	24.11	5.20	3.18	1.71	1.02	0.50	36
Total ppt (inches)	1.71	0.94	1.23	1.02	0.86	0.36	1.19	0.93	0.71	1.15	0.77	0.21	1.12
Chalk Creek #2, UT *Missing ETo data from 2017-2020													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.67	0.88	1.84	2.85	4.21	5.37	14.97	3.24	1.86	0.90	0.56	0.33	37
Total ppt (inches)	2.27	0.32	0.35	0.72	1.30	1.34	0.82	1.58	0.92	0.23	0.20	0.51	12.92

City Creek WTP, UT *Missing ETo data from 2000–2001													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.84	1.20	2.48	3.66	4.76	9.95	9.26	7.84	7.02	6.71	2.90	7.14	44.58
Total ppt (inches)	2.30	2.17	3.07	3.47	2.78	1.13	0.52	0.88	1.60	2.22	2.12	6.52	25.00
Clayton Springs, UT *Missing ETo data of 2000, 2018, and 2019													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.86	1.08	2.02	2.78	4.08	5.41	5.74	4.84	4.52	0.81	1.12	0.72	34.17
Total ppt (inches)	1.98	2.16	2.10	1.90	2.10	3.40	2.49	1.86	2.37	1.56	2.32	4.02	24.02
Cottonwood Weir, UT													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.82	1.24	2.54	3.76	2.66	6.57	3.96	2.74	3.22	5.51	2.30	7.34	42.47
Total ppt (inches)	1.78	1.92	2.60	2.91	2.25	1.18	0.38	0.88	1.55	2.04	1.49	2.10	20.69
Cutler Dam, UT													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual

Total ETo (inches)	1.61	0.97	2.28	3.63	5.22	6.87	9.46	7.54	5.62	5.31	1.40	5.94	2.65
Total ppt (inches)	1.71	1.38	1.37	1.79	1.86	0.76	0.40	0.73	1.25	1.74	1.27	1.61	16.22
Deseret, UT													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.95	1.13	1.84	2.63	3.57	3.23	0.77	1.75	3.40	3.12	1.55	0.84	2.78
Total ppt (inches)	1.65	1.58	1.86	1.88	1.85	3.30	3.20	5.06	6.97	4.80	7.67	8.86	
Duchesne, UT													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.71	1.19	2.74	4.07	5.73	7.19	7.06	4.94	5.42	6.31	3.00	6.44	44.47
Total ppt (inches)	1.47	1.49	1.61	1.70	1.87	0.53	0.70	1.09	1.13	0.94	0.44	0.69	15.00
Echo Dam, UT													
Average (2000–2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.73	1.13	2.52	3.83	5.67	7.31	8.35	7.13	4.92	2.82	1.27	0.65	46.21

Total	1.14	0.89	1.26	1.46	1.66	0.96	0.63	1.01	1.21	1.43	1.13	1.29	1.09
ppt (inches)													
Eden-Liberty, UT *Missing ETo and ppt data from 2000–2010 and missing ETo data from 2014–2016													
Average													
(2011– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total	0.66	0.98	2.25	3.37	4.95	6.79	8.66	8.34	7.22	5.51	2.40	0.63	4.23
ETo (inches)													
Total	2.64	1.81	1.78	1.92	2.03	2.76	4.60	5.31	1.81	1.58	2.07	1.98	1.49
ppt (inches)													
Enterprise Utah, UT *Missing ETo data from 2000–2002; *Used nearby station for ppt data, Little Grassy, UT													
Average													
(2000– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total	1.20	1.59	3.03	4.29	6.09	7.28	8.26	7.35	3.13	2.61	1.74	1.03	5.71
ETo (inches)													
Total	2.47	2.45	1.55	1.14	0.49	1.16	1.40	1.85	1.25	1.80	1.33	0.31	1.58
ppt (inches)													
Ephraim, UT													
Average													
(2000– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total	0.80	1.25	2.75	4.10	5.96	7.08	6.77	3.35	2.03	0.51	1.50	0.77	4.91
ETo (inches)													
Total	1.71	1.80	1.01	0.87	0.87	0.55	0.52	0.72	0.87	1.03	0.68	1.17	0.86
ppt (inches)													

Escalante, UT													
Average													
(2000– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total	1.25	1.73	3.34	4.78	6.69	8.29	8.69	7.51	5.47	3.36	1.80	1.05	3.90
ETo (inches)													
Total	1.89	0.75	0.72	0.36	0.51	0.40	0.27	1.49	1.71	1.43	0.54	0.71	1.26
ppt (inches)													
Eskdale, UT													
Average													
(2000– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total	1.06	1.54	3.15	4.53	6.34	7.90	8.67	7.50	5.31	3.18	1.60	0.95	1.89
ETo (inches)													
Total	1.41	0.38	0.58	0.71	0.62	0.29	0.47	0.57	0.46	0.59	0.36	0.41	0.80
ppt (inches)													
Fairfield, UT *Missing ETo data from 2010–2011													
Average													
(2000– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total	1.85	1.25	2.79	4.13	6.06	7.39	8.37	7.23	4.94	2.96	1.43	0.81	4.08
ETo (inches)													
Total	1.76	0.89	0.81	0.71	0.59	0.43	0.51	0.58	0.55	0.73	0.42	0.87	0.64
ppt (inches)													
Ferron, UT													
Average													
(2000– 2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual

Total	0.92	1.35	2.76	4.14	5.75	7.34	8.56	6.44	7.82	8.91	4.60	8.24	6.99
ETo (inches)													
Total	0.55	0.57	0.56	0.41	0.67	0.43	0.74	0.73	0.90	1.06	0.34	0.52	0.75
ppt (inches)													
Fremont Indian SP, UT													
Average (2000- 2022)													
Total	1.12	1.48	2.94	4.12	6.07	4.68	3.27	1.65	2.13	1.11	6.40	9.74	9.69
ETo (inches)													
Total	0.69	0.91	0.93	1.12	0.97	0.49	1.34	1.35	0.92	1.18	0.77	0.92	1.82
ppt (inches)													
Hanna, UT *Missing ETo data from 2000-2013; *Used nearby station for ppt data, Rock Creek, UT													
Average (2000- 2022)													
Total	0.84	1.08	2.23	2.94	6.21	6.94	6.06	4.09	2.51	1.21	6.53	9.74	
ETo (inches)													
Total	1.67	1.38	1.04	1.23	1.28	0.96	1.49	1.70	2.02	0.81	1.51	0.93	1.37
ppt (inches)													
Hobble Creek, UT *Missing ETo and ppt data from 2000-2011													
Average (2012- 2022)													
Total	0.88	1.12	2.13	1.74	5.65	9.46	8.05	8.93	9.42	2.61	1.90	7.03	8.83
ETo (inches)													
Total	3.14	2.52	1.95	1.65	1.48	0.43	0.81	1.46	1.88	1.38	1.83	3.52	3.21
ppt (inches)													

Horse Hollow-Cove Fort 5W, UT *Used nearby station for ppt data, Kimberly Mine, UT													
Average (2000- 2022)													
Total	0.51	0.35	2.58	3.74	5.46	6.96	7.57	6.53	6.32	7.31	4.10	9.14	4.92
ETo (inches)													
Total	2.57	3.03	2.33	1.31	8.00	7.11	9.11	9.91	9.72	4.82	3.63	2.52	9.49
ppt (inches)													
Kamas, UT													
Average (2000- 2022)													
Total	0.82	1.12	2.37	3.61	5.46	6.88	8.09	6.86	6.02	6.21	2.50	7.04	4.01
ETo (inches)													
Total	1.42	1.12	1.30	1.12	2.50	7.40	8.61	1.71	5.91	5.71	2.20	8.71	4.57
ppt (inches)													
Kanab, UT													
Average (2000- 2022)													
Total	1.49	1.95	3.55	0.36	8.53	4.18	5.77	4.15	5.53	5.62	0.01	2.75	5.66
ETo (inches)													
Total	1.24	1.49	1.08	0.73	4.60	1.81	2.11	1.49	1.61	5.10	9.01	5.81	2.81
ppt (inches)													
La Sal 1SW, UT													

Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.90	1.20	2.51	3.78	5.37	7.10	7.47	6.25	4.23	2.62	1.38	0.81	44.33
Total ppt (inches)	0.73	0.73	0.97	0.88	0.75	0.57	1.26	1.40	1.47	1.29	0.84	0.97	11.82
Laketown, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.59	0.81	1.89	3.22	4.72	6.20	7.08	5.99	4.05	2.41	1.02	0.55	38.44
Total ppt (inches)	1.29	1.20	1.13	1.49	1.96	2.70	4.60	5.95	5.05	2.71	3.01	2.91	41.15
Levan, UT *Missing ETo data from 2008-2009													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.89	1.31	2.75	4.06	5.87	7.36	8.12	7.04	4.91	2.92	1.47	0.80	47.17
Total ppt (inches)	0.93	1.02	1.38	1.33	1.23	0.54	0.63	0.60	0.99	1.24	0.94	1.40	12.65
Little Sahara REC AREA, UT *Missing ETo data from 2008-2009													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.89	1.30	2.74	4.05	5.93	7.58	8.45	7.25	5.04	2.83	1.38	0.75	48.47

Total ppt (inches)	1.30	0.77	0.98	1.07	0.98	0.26	0.47	0.52	0.73	0.88	0.43	0.75	9.75
Logan 5 SW EXP FARM, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.62	0.92	2.73	4.05	5.21	6.80	8.04	6.93	4.60	2.62	1.18	0.64	43.27
Total ppt (inches)	1.63	1.47	1.74	1.89	1.96	0.90	0.32	0.85	1.41	1.64	1.30	1.75	16.37
Manila, UT *Missing ETo data from 2000-2007													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.78	1.02	2.08	3.24	4.65	5.96	7.03	5.89	4.07	2.34	1.21	0.64	40.17
Total ppt (inches)	1.25	1.32	0.65	0.71	1.21	1.84	0.90	0.92	0.91	0.76	0.22	0.29	7.64
Marysvale, UT *Missing ETo data from 2011-2018													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.81	1.52	2.94	4.35	6.20	7.68	8.31	7.19	5.18	3.11	1.62	0.95	50.81
Total ppt (inches)	1.41	0.49	0.42	0.36	0.44	0.25	0.91	0.82	0.57	0.83	0.46	0.16	6.80
McCook Ridge, UT *Used nearby station for ppt data, East Willow Creek, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual

Ogden, UT, Hinkley AP													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.75	1.15	2.49	3.64	5.34	6.90	7.93	6.65	4.49	2.53	1.22	0.69	43.78
Total ppt (inches)	1.35	1.25	1.58	1.85	1.92	0.80	0.30	0.80	1.13	1.59	1.20	1.44	15.21
Ouray 4 NE, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.55	1.16	2.99	4.58	5.78	6.89	7.64	5.28	3.02	1.38	0.59	0.92	50.92
Total ppt (inches)	0.31	0.32	0.61	0.58	0.75	0.38	0.45	0.51	0.60	0.92	0.39	0.36	6.62
Pleasant Grove, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.90	1.36	2.80	4.02	5.87	7.20	8.16	6.99	4.92	2.82	1.35	0.81	46.92
Total ppt (inches)	1.28	1.35	1.47	1.79	1.84	0.60	0.41	0.80	0.85	1.35	0.95	1.24	15.58
Price Carbon CO AP, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual

Total ETo (inches)	1.84	1.24	2.67	4.08	5.84	7.42	8.06	6.77	4.74	2.68	1.34	0.74	46.31
Total ppt (inches)	1.60	0.57	0.62	0.50	0.60	0.58	0.48	0.82	1.08	1.00	0.41	0.72	8.15
Provo BYU, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	0.94	1.44	2.93	3.30	6.13	7.84	8.72	7.35	5.14	2.97	1.45	0.86	50.05
Total ppt (inches)	1.57	1.41	1.45	1.79	1.67	0.63	0.42	0.78	1.20	1.54	1.25	0.11	15.71
Richmond, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.61	0.97	2.31	3.69	5.42	7.07	8.30	7.05	4.72	2.58	1.13	0.64	44.67
Total ppt (inches)	1.83	1.74	1.92	3.62	2.60	0.90	0.40	0.85	1.59	1.82	1.44	1.80	19.30
Rosette, UT													
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total ETo (inches)	1.71	1.03	2.16	3.21	4.75	6.07	7.09	6.13	4.27	2.39	1.09	0.60	39.94

Total ETo (inches)	0.9	1.1	3.3	2.6	3.9	3.6	0.7	0.8	0.4	6.8	7.4	7.1	2.7	0.1	3.3	0.7	9.4	5.9	3	
Total ppt (inches)	1.2	1.4	3.1	4.2	2.6	1.0	0.8	7.0	7.9	9.0	7.6	1.0	2.1	3.9	1.2	1.7	1.1	1.7	1.0	2
Vernal UT																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	0.6	0.1	0.7	2.5	4.0	1.5	5.7	1.5	7.0	6.6	7.4	4.5	2.5	7.1	2.2	0.5	8.4	1.3		
Total ppt (inches)	0.6	2.0	5.2	7.7	7.0	9.9	5.3	0.5	3.0	7.0	1.2	6.1	1.2	0.4	9.0	6.3	8.1			
Vernon-10 N Utah, UT *Used nearby station for ppt data, Vernon Creek, UT																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	1.0	1.1	3.3	2.6	3.8	6.7	8.7	5.3	8.5	7.3	2.0	0.2	8.9	1.4	6.0	8.7	4.8	3.7		
Total ppt (inches)	2.7	8.2	7.9	2.7	3.2	5.1	9.5	7.0	0.6	9.1	0.9	1.2	6.2	3.7	2.0	9.3	2.3	3.9		
Woodruff, UT																				
Average (2000-2022)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual							
Total ETo (inches)	0.5	0.7	6.0	4.3	5.3	2.1	6.6	7.9	6.6	4.5	0.2	4.8	1.0	0.9	4.9	1.7				

Total ppt (inches)	1.4	5.0	4.8	5.8	7.3	1.2	6.0	7.3	3.5	2.9	1.1	1.3	1.0	6.6	2.0	5.3	8.9
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Conclusion

The data on ETo and precipitation in Utah highlights the substantial variation in water requirements for landscapes across the state. ETo can range from as low as 30s to as high as 50s, with a corresponding significant difference in water needs. For instance, a 10,000 square foot landscape would demand approximately 150,000 gallons of water annually with a lower ETo of 30, and 250,000 gallons with a higher ETo of 50. This example assumes consistent plant types and excludes precipitation, thus emphasizing the critical role that location and climate play in determining irrigation needs. Including precipitation data further enhances precision water budgeting. This fact sheet provides valuable insights for Utah residents interested in accurately estimating and budgeting for landscape water requirements to promote responsible and efficient water management practices throughout the state.

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