

WHAT TO KNOW ABOUT GIS IN UTAH

As Utah's map technology coordination office, the Automated Geographic Reference Center (AGRC) provides a wide range of GIS and other geospatial support services, including providing training on Utah GIS. As part of that educational role, AGRC has developed this document to provide links to relevant Utah GIS websites and information.

GENERAL AGRC RESOURCES

- 📍 [AGRC](#): The AGRC website is Utah's GIS data clearinghouse.
- 📍 [Open Data](#): AGRC's Open Data site is the State Geographic Information Database (SGID) (i.e., all Utah vector data) served up through ArcGIS Online.
- 📍 [Open SGID](#): The Open SGID is a cloud hosted, publicly available PostGIS database containing SGID data.
- 📍 [Raster Discovery Application](#): AGRC's Raster Discovery Application allows users to search and download aerial photography, elevation data, and USGS topographic maps for a user-defined area of interest.

AGRC's Discover Imagery and Base Map Server Resources

- 📍 [AGRC's Base Map and Imagery Services](#): Discover provides imagery and base maps services in Open Geospatial Consortium (OGC) standard Web Map Tile Service (WMTS) and Web Map Service (WMS) in the Web Mercator WGS84 projection (wkid: 3857). This page provides general background information on Discover and explains how to sign up for access to Discover.
- 📍 [Discover Server Resources and Information](#): Once users have signed up for Discover, they can check out this page to learn everything there is to know about consuming the services available from Discover.

LOCAL GIS USER GROUPS

- 👥 [Utah Geographic Information Council \(UGIC\)](#)
- 👥 [Salt Lake User Group \(SLUG\)](#)
- 👥 [Utah Valley GIS \(UVGIS\)](#)
- 👥 [Northern Utah GIS \(NUGIS\)](#)
- 👥 [The Spatial Community Slack channel](#)

ANNUAL UTAH GIS EVENTS

- 📅 [UGIC Annual Conference](#) (Typically held in April or May each year)
- 📅 [Maps On The Hill](#) (Held during each Utah General Session at the Utah State Capitol Rotunda)
- 📅 [Esri User Conference](#) (Typically held in July each year)

TRAINING

Online Esri Training

Esri has many online courses that are included in the annual software maintenance cost. They also have several basic free courses that are a good introduction to GIS and ArcMap/ArcGIS Pro.

Free Esri Courses

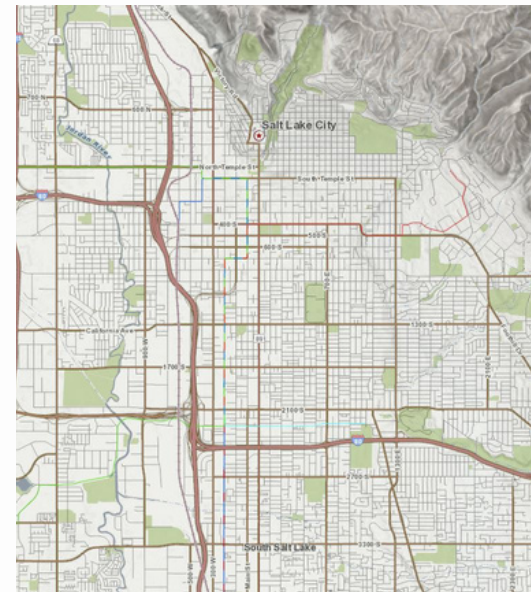
- 📍 Intro to GIS
 - 📍 [GIS Basics \(ArcGIS Pro\)](#)
 - 📍 [Getting Started with GIS \(ArcMap\)](#)
- 📍 [Getting Started with ArcGIS Pro \(Intro ArcGIS Pro\)](#)
- 📍 [Cartography MOOC](#) (This is a great introduction to cartographic design principles and applications.)
- 📍 [AGOL Fundamentals](#) (This includes short intro videos; one intro course; and several advanced, maintenance-required courses.)

AGOL Basics and Essentials

- 📍 Esri's [getting started](#) page
- 📍 [*Credit usage by capability](#)
 - 📍 Credits can be [purchased](#) in blocks of 1,000, usually for \$100 (i.e., 10 cents/credit).
- 📍 [AGOL subscription types and pricing](#).
- 📍 [AGOL user account control: types, roles, and privileges](#)

QGIS Training

- 📍 [A Gentle Introduction to GIS](#)
- 📍 [QGIS Training Manual](#)
- 📍 <https://www.qgistutorials.com/en/>: Step-by-step guides for common QGIS tasks
- 📍 [Baruch College's Introduction to GIS Using Open Source Software](#)



*A Note on Figuring Out AGOL Credits

(This is a quick summary of how AGRC understands AGOL credit accounting. For the official Esri position, check out Esri's [Understand credits](https://doc.arcgis.com/en/arcgis-online/administer/credits.htm) page: <https://doc.arcgis.com/en/arcgis-online/administer/credits.htm>.)

Esri gives credit costs per month and billing is calculated each hour. For example, a 10 MB hosted feature service that was hosted for one month would use 2.4 credits. That same dataset hosted for an hour would be $2.4 / 30 / 24 = 0.00333$ credits and hosted for one year would be 28.8 credits.

Tile layers (and other nonfeature storage categories) are currently significantly cheaper (1/200th) than hosted feature layers—1.2 credits per 1 GB vs 2.4 credits per 10 MB.

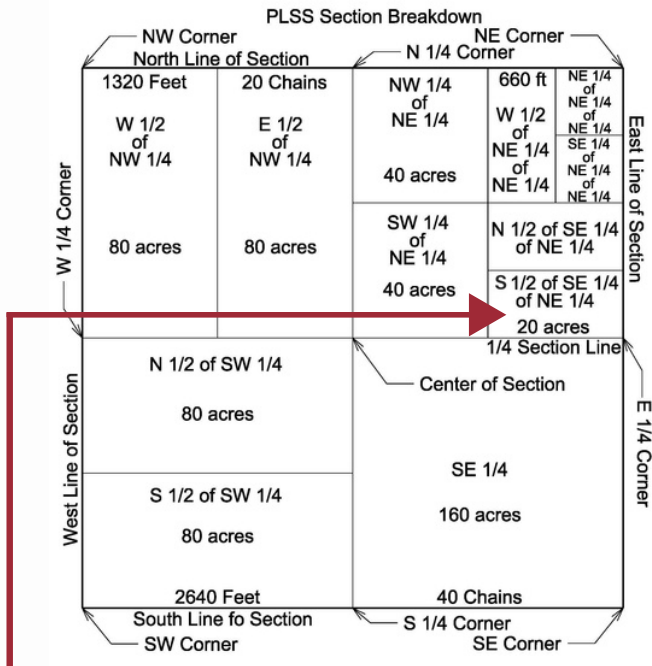
All your credits sit in a common pool regardless of where they come from. You'll get a certain number of credits from different sources—various AGOL subscription levels, Business Analyst, or purchasing them outright. Some of these have different expiration dates, and right now there's no good way in AGOL to tell how many will expire when. Good accounting is your only tool.



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PUBLIC LAND SURVEY SYSTEM AT A GLANCE



Section Numbers in Township with Adjacent Sections

36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6
12	7	8	9	10	11	12	7
13	18	17	16	15	14	13	18
24	19	20	21	22	23	24	19
25	30	29	28	27	26	25	30
36	31	32	33	34	35	36	31
1	6	5	4	3	2	1	6

Township and Range

T2N	T2N	T2N	T2N
R2W	R1W	R1E	R2E
T1N	T1N	T1N	T1N
R2W	R1W	R1E	R2E
T1S	T1S	T1S	T1S
R2W	R1W	R1E	R2E
T2S	T2S	T2S	T2S
R2W	R1W	R1E	R2E

DISTANCE CONVERSIONS

1 Mile

- = 80 chains
- = 320 rods
- = 320 perches
- = 320 poles
- = 5,280 feet
- = 8,000 links
- = 1,609.2655 meters

1 Link

- = 0.66 feet
- = 7.92 inches
- = 0.2017 meters

1 Meter

- = 39.370 inches
- = 3.281 feet

1 Chain

- = 4 rods
- = 4 perches
- = 4 poles
- = 66 feet
- = 100 links
- = 20.1168 meters

1 Rod = 16.5 feet

1 Perch = 25 links

1 Pole = 5.0292 meters

1 Inch

- = 0.0254 meters

1 Foot

- = 0.3048 meters

GEOGRAPHIC COORDINATE DATABASE (GCDB) POINT IDs

XxxYyy, where Xxx = the following range of values

- 711 - 719 Town Sites, City Boundaries
- 720 - 739 County Boundaries
- 740 - 769 State Boundaries
- 770 - 799 Forest Service, Parks Service, Reservations, Grant, Other Boundaries with Mileposts
- 800 - 836 Meanders (right bank even #, left bank odd #)
- 837 - 879 Tracts
- 880 - 899 Right of Ways
- 900 - 999 Mineral Surveys, Homestead Entries, etc.
- Yyy - Numbered sequentially along the survey in increments of 10. The prefix Xxx - may be the same for all points in a similar survey.

Irregularities of Townships for ones places of Xxx and Yyy.

- 1, 2, 8 or 9 -> offset corners along interior section lines and section subdivision lines where +/- 2 is the recommended naming scheme and THE GRAPHICS RULE MUST BE FOLLOWED.
- 3 or 7 -> offset corners along township boundaries, angle points, witness corners, and witness points.
- 4 or 6 -> intersections of rectangular/special surveys and 1/16th corners of elongated sections.
- 0 -> all regular aliquot corners down to 1/16th.
- 5 -> all regular aliquot corners down to 1/256th.

100700	200700	300700	400700	500700	600700	700700
6	5	4	3	2	1	
100600	200600	300600	400600	500600	600600	700600
7	8	9	10	11	12	
100500	200500	300500	400500	500500	600500	700500
18	17	16	15	14	13	
100400	200400	300400	400400	500400	600400	700400
19	20	21	22	23	24	
100300	200300	300300	400300	500300	600300	700300
30	29	28	27	26	25	
100200	200200	300200	400200	500200	600200	700200
31	32	33	34	35	36	
100100	200100	300100	400100	500100	600100	700100
TOWNSHIP						

100200	120200	140200	160200	200200
F	E	B	A	
100160	120160	140160	160160	200160
G	H	C	D	
100140	120140	140140	160140	200140
J	I	N	M	
100120	120120	140120	160120	200120
K	L	O	P	
100100	120100	140100	160100	200100
SECTION 31				

100120	105120	110120	115120	120120
100115	105115	110115	115115	120115
100110	105110	110110	115110	120110
100105	105105	110105	115105	120105
100100	105100	110100	115100	120100
SW 1/4 OF SW 1/4 OF SECTION 31				

Bureau of Land Management (BLM) Point IDs

State Township Range Township duplicate (0, A or B)
UT260060S0020E0_240400
 Principal Meridian GCDB Point ID

AREA CONVERSIONS

1 Square Mile

- = Nominal Section
- = 640 acres
- = 2.590 sq. km.
- = 259 hectares

1 Acre

- = 10 sq. chains
- = 160 sq. rods
- = 160 perches
- = 160 poles
- = 43,560 sq. feet
- = 0.4047 hectare
- = 4,047 sq. meters

1 Hectare = 2.47 acres

1 Sq. Meter = 10.764 sq. ft.



Township and Range (5 characters each)

3 digits for Township or Range number
 1 digit for fraction (0 for no fraction, 1 for 1/4 township, 2 for 1/2 township, 3 for 3/4 township)
 1 letter for direction