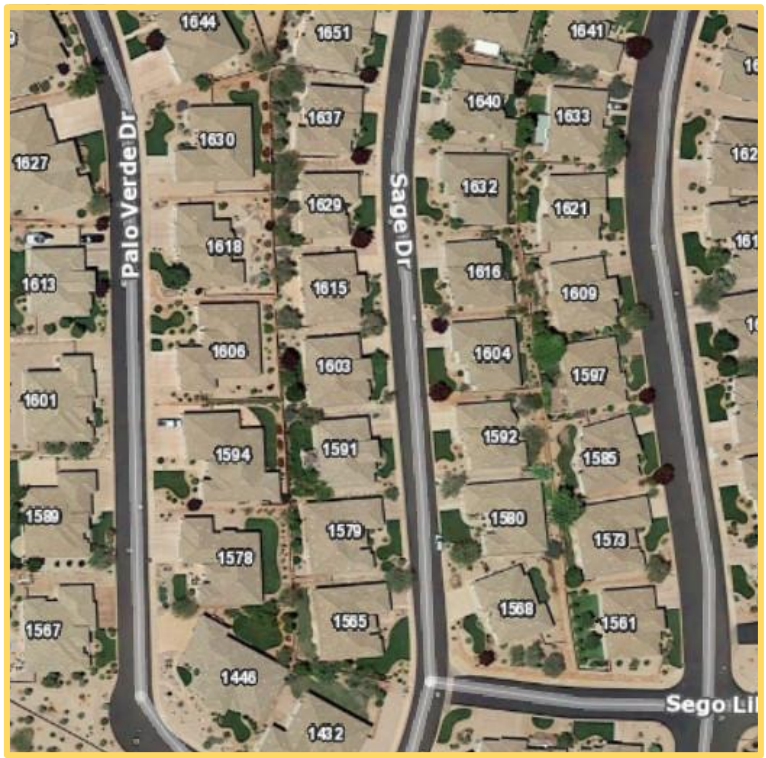
2016 Maps on the Hill



A warm welcome to this year's 5th annual ***Maps on the Hill*** on **Tuesday, March 1st** from **10:00am-1:00pm in the Capitol Rotunda.**

The Maps on the Hill event and this accompanying map book showcase the amazing geographic data, spatial mapping and GIS (Geographic Information Systems) resources available in Utah. Utah has developed a strong national reputation as a leader in geospatial data development and technology. The willingness of organizations to work together towards common data goals and to readily share data sets Utah apart. The resulting extensive spatial data resources allows decision makers at all levels of government, private sector and non-profits to make more informed transparent data based decisions.

Utilizing the spatial data resources, which contain identifying and descriptive information as well as location, GIS provides the tools to produce powerful visualizations and perform a wide variety of spatial analyses to assist decision makers. Today, GIS is used in just about every profession to help visualize, analyze, and interpret data which helps with decision making and increases efficiency by saving both time and money.

To highlight a couple of the Utah's data resources featured in this year's book:

Utah Open Data Portal (opendata.utah.gov) – An open data clearinghouse for Utah-centric data with over 2500 data sets added since January 1st, 2015. Increasingly open accessible data of all kinds is contributing to citizen engagement while better informing and expediting decision making processes.

Utah State Parcels (mapserv.utah.gov/parcels) - A statewide open source application to retrieve parcel information hosted and maintained by the Utah Automated Geographic Reference Center (AGRC). A complete parcel data set is the holy grail of spatial data.

Please look through this book for many more examples of the extensive geospatial resources available in Utah. And, please take a few minutes to join us in the Capitol Rotunda to visit with a variety of professionals that are excited to show you how they use GIS to integrate and manage geographic data to best support the missions of their organizations.

Phoebe McNeally, Chair
Utah Geographic Information Council

UGIC
UTAH GEOGRAPHIC INFORMATION COUNCIL

UTAH GEOGRAPHIC INFORMATION COUNCIL

The Utah Geographic Information Council is the primary professional organization for Geographic Information System (GIS) and Geospatial Information Technology (GIT) professionals, collectively known as geospatial professionals, in Utah. UGIC supports the professional community by:

- Organizing an annual conference for geospatial professionals in Utah and surrounding areas
- Facilitating and supporting geographic data best practices through the UGIC Data Management Committee
- Supporting decision-making during emergency response and mitigation in Utah through UGIC's support of the Utah Emergency Management Technical Team
- Supporting and advocating the use of geospatial tools in K-12 education through the UGIC Education Committee

For more information
or to sign up for our email list, visit:
www.ugic.org
facebook.com/ugic.info
twitter.com/ugicutah
ugic.utah@gmail.com

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Across the State of Utah, mapping data is constantly being created, refined, and updated. Maps contain data on where things are, from roads to hospitals, water resources to sensitive species. Recent advances in GPS, aerial photography, and other technologies have led to an explosion of data that is changing the way we understand and interact with the world.

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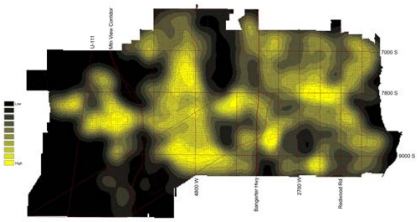
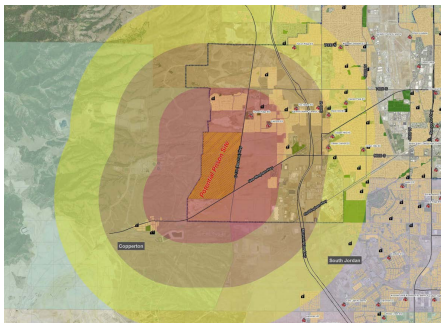
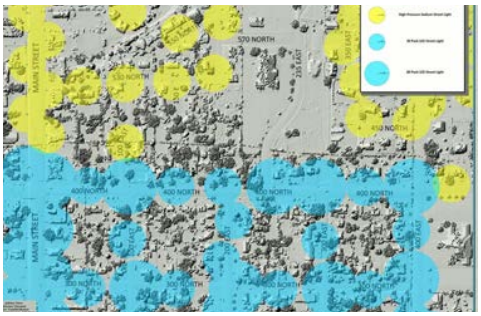


Geospatial professionals assist agencies and organizations by discovering innovative ways to use map data to better inform management and decision making processes.





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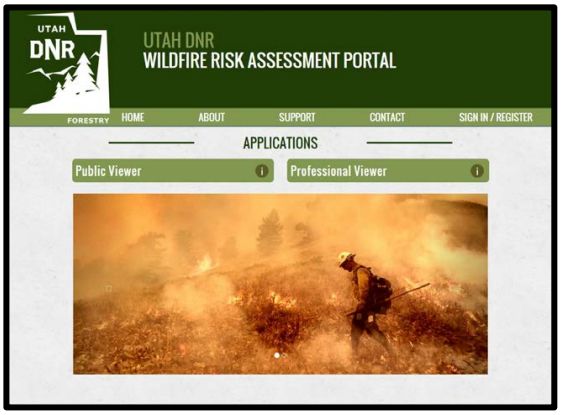
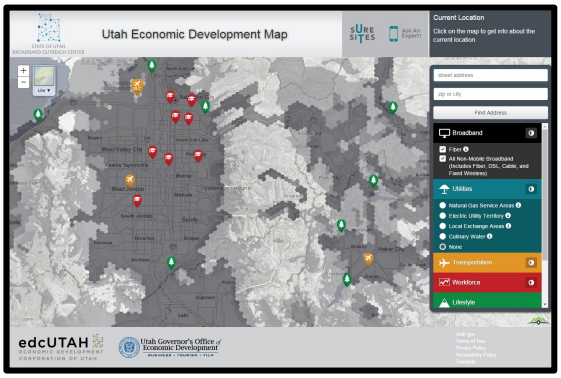
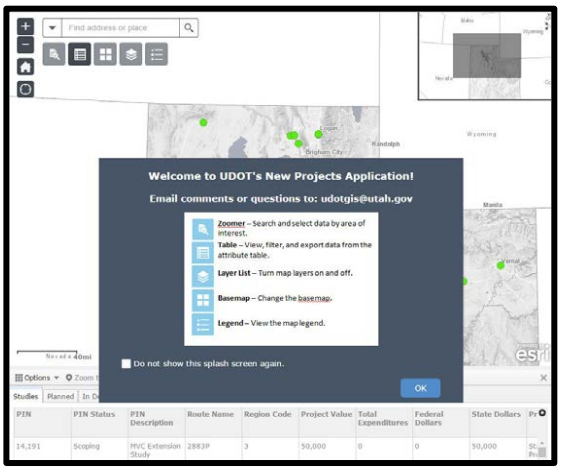
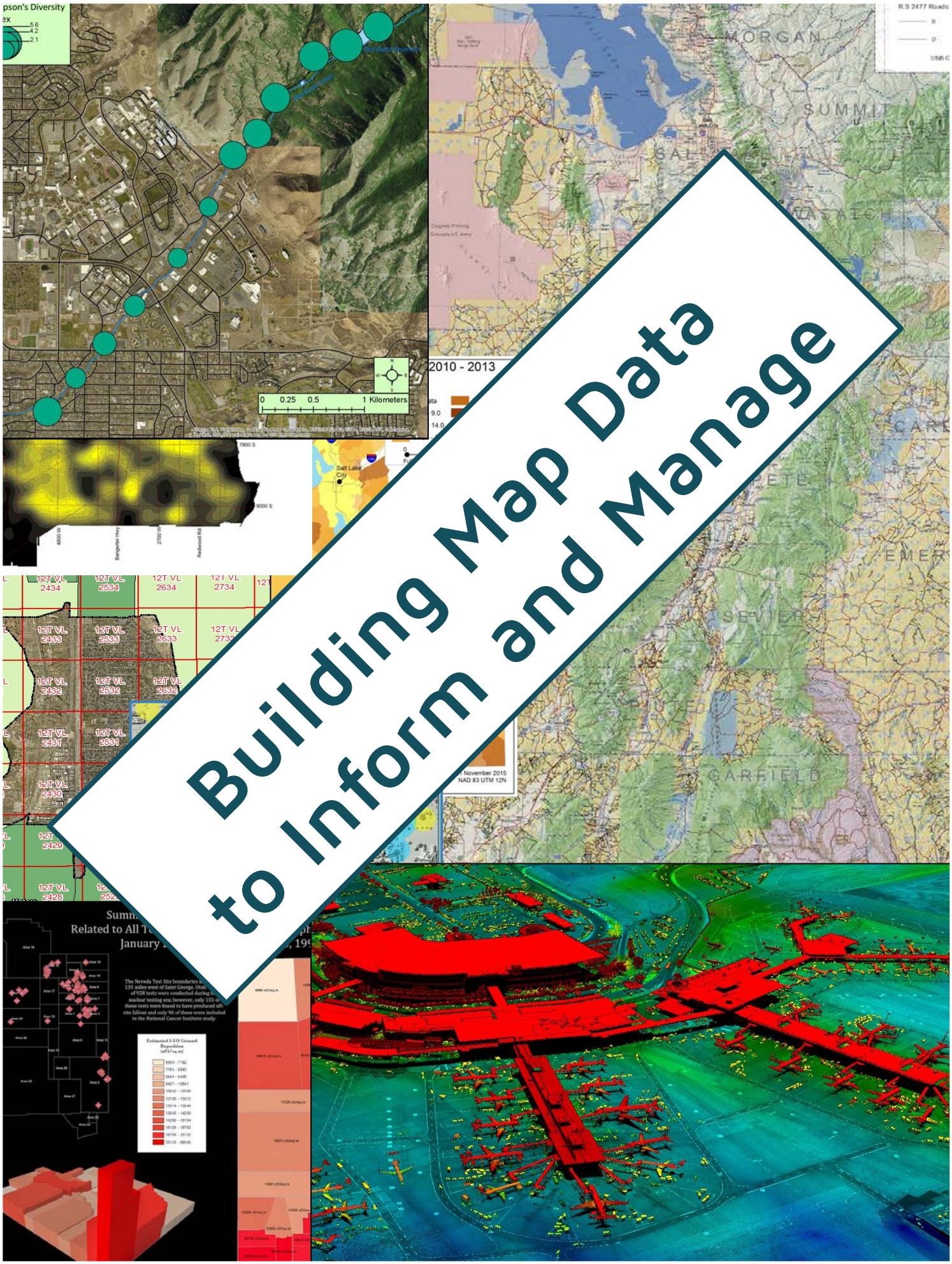
With the rapid growth of online and mobile mapping capabilities, it is easier than ever before for management, workers, and citizens to access a wealth of geospatial data to understand complex issues.





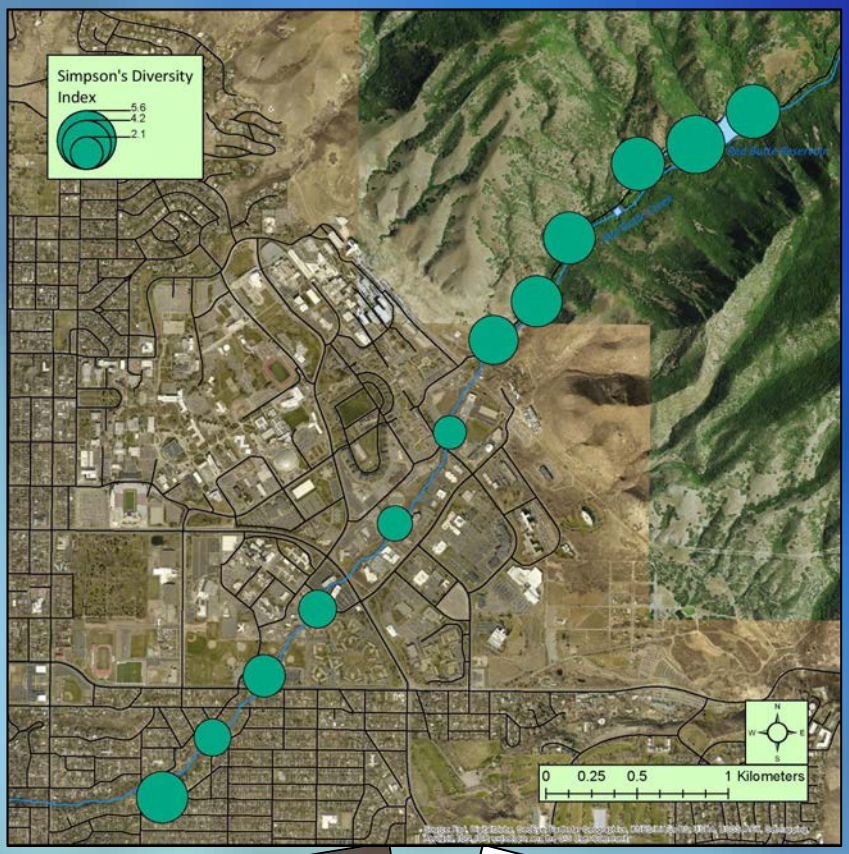


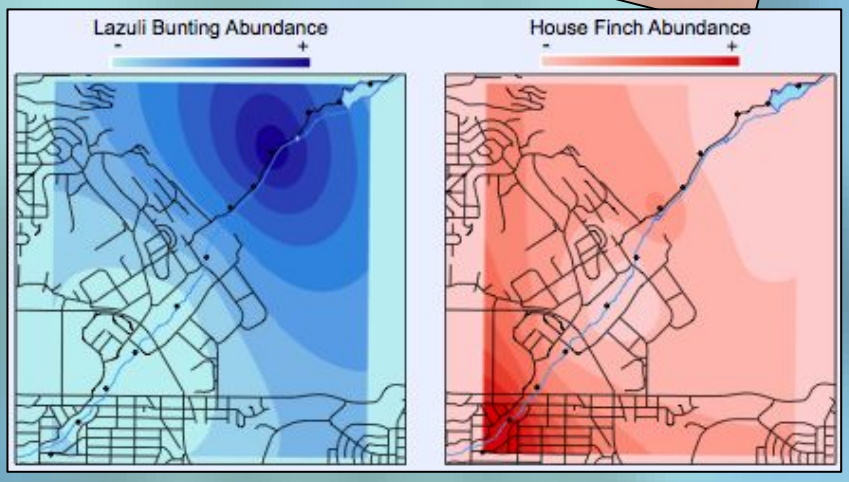
Building Map Data to Inform and Manage



Bird Diversity on Red Butte Creek

Spatial change in diversity along the urban-wild interface of the Red Butte Riparian Corridor





An increasing trend towards urbanization has strong implications for the management of bird communities in human dominated landscapes. Shifts in community composition, diversity, and species abundance should be expected with increasing development; however, the establishment of green spaces in the midst of urban areas can provide valuable habitat for both migrating and breeding birds. Using point counts, a method in which observers record all birds identified within a five minute period at a specific location, we sampled bird diversity on Red Butte Creek. The study area is characterized by relatively undisturbed canyon habitat, commercial and residential development, and urban green space.

Diversity at each point was calculated using the Simpson's Diversity Index, a measure which incorporates the number of species recorded and the number of individuals within each species (higher numbers mean higher relative diversity). Diversity was highest at sample points in the canyon, intermediate at points in urban green space, and lowest in commercial areas. Most species decreased in abundance with higher levels of urbanization, but some species showed an affinity for urban areas. In years to come, we hope to further elucidate the relationship between varying levels of disturbance and bird diversity in riparian communities.

Red Butte Canyon has been a protected area since 1862, offering a unique research area that provides a stark contrast between wildlife communities in undisturbed and highly developed habitats.

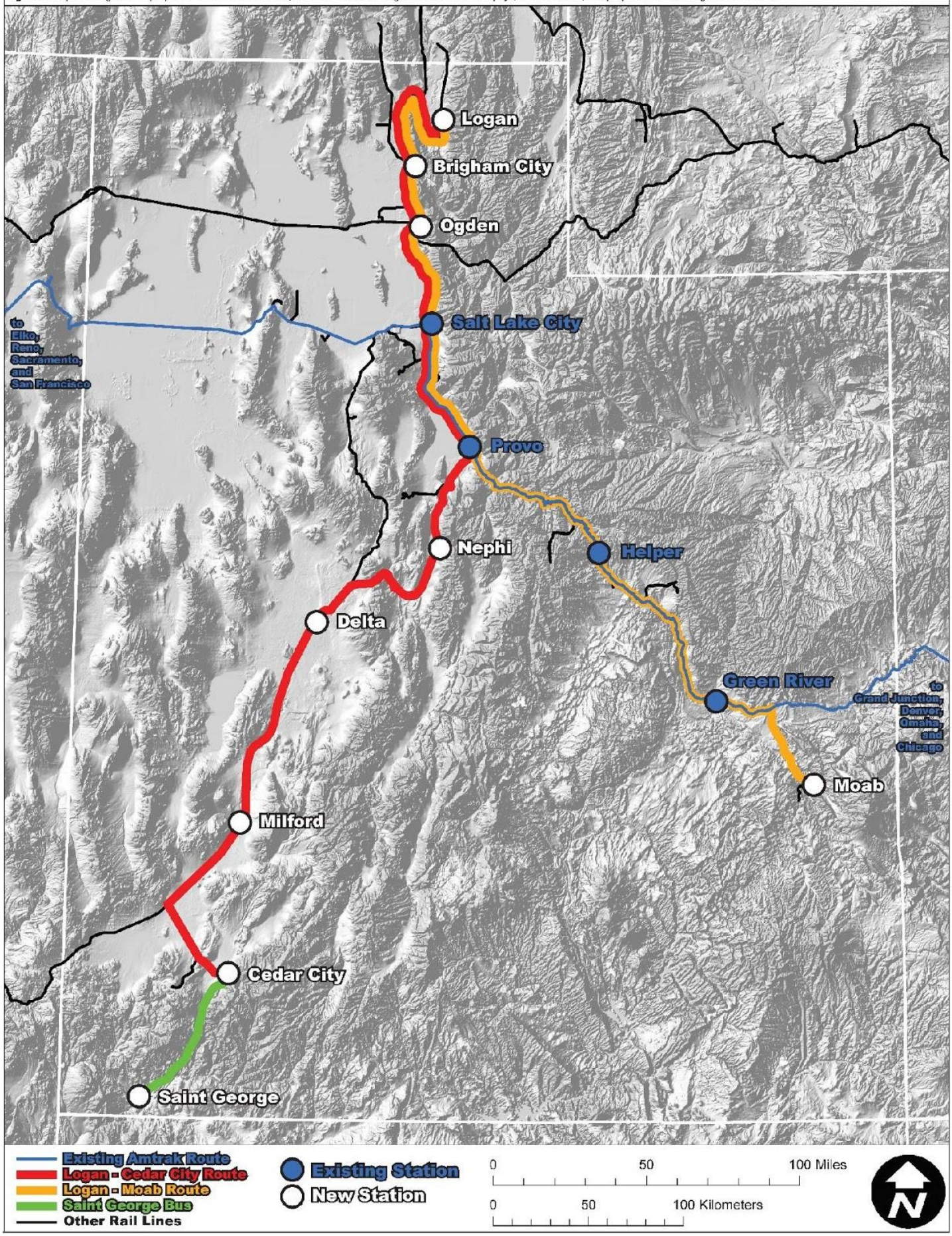
Base map data from Utah AGRC
Diversity data collected by author from 06/2015 - 09/2015

Tyler Gilvarry
University of Utah - Biodiversity and Conservation Lab

The *Beehive State*: An Intrastate Passenger Rail System for Utah Using Existing Union Pacific Tracks

Mike Christensen, Department of City and Metropolitan Planning, University of Utah
Keith Bartholomew, Advisor

Figure 1: Map showing the two proposed *Beehive State* routes, the route of the existing Amtrak *California Zephyr*, other rail lines, and proposed and existing Amtrak stations.



Fort Union Study Area

cottonwoodheights.utah.gov

Existing

Concept

Existing

Concept

The Study Area

Fort Union Boulevard is the primary corridor for both commercial activity and east-west vehicular travel in Cottonwood Heights, and one that should help define the city through uniform development patterns and aesthetic character. In its current state, Fort Union Boulevard does not give the city the identity or aesthetic quality that is desired.

Future redevelopment of Fort Union Boulevard, guided by planning practices focused on form-based land uses and sustainable growth, will help transform Fort Union into a corridor brimming with character and life. Fort Union Boulevard has the potential to become a safer place for vehicles, cyclists, and pedestrians, and can become a destination for residents and visitors alike.

Our Goals

-Develop a Critical Mass of Activity with a Diverse Mixture of Uses
-Foster Economic and Environmental Sustainability
-Define a Framework and Hierarchy of Public Spaces and Linkages

Sarah Rivera & Kevin Sato

gis@ch.utah.gov

Cottonwood Heights GIS

Fort Union Study Area

Planning for the Future

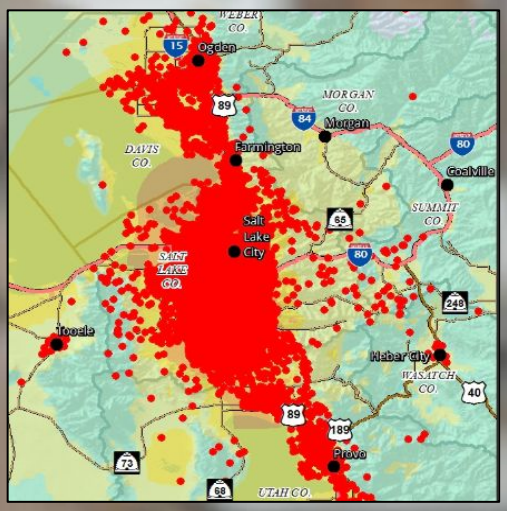
As it Exists Today with Current Zoning

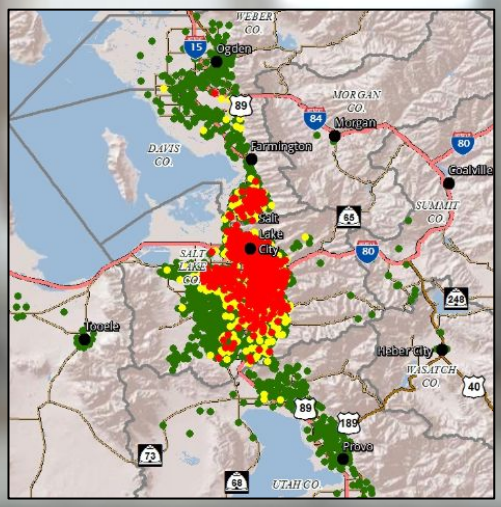
Concept Based on Modified Zoning

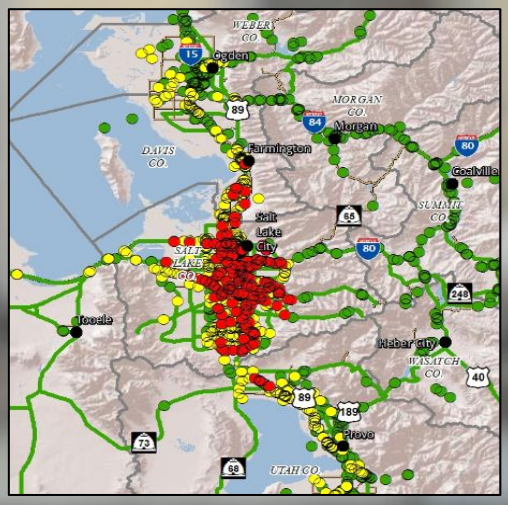
Mapping a Scenario Earthquake

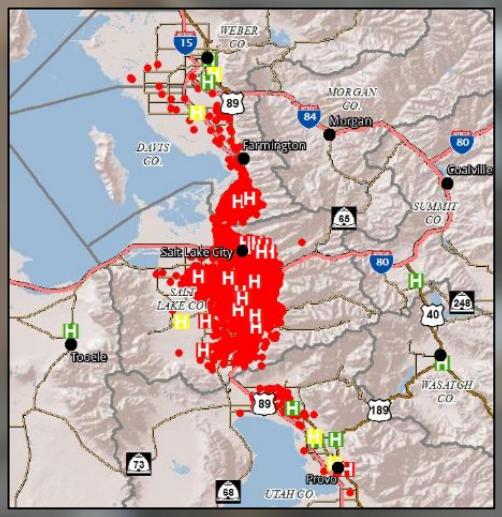
Using HAZUS to Map a Scenario M 7.0 Earthquake on the Wasatch Fault: SLC Segment

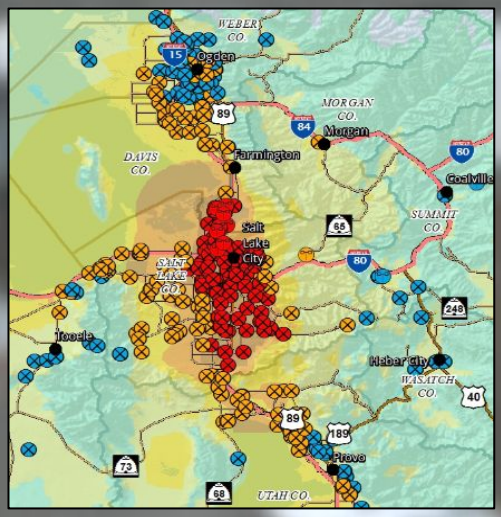
A large earthquake along the Salt Lake City Segment of the Wasatch Fault poses a very real threat to the people of Utah. The maps shown in this document reflect the damage analysis completed in HAZUS, which is a GIS-based loss estimation software developed by FEMA. These maps highlight various potential effects of a large earthquake, such as direct economic loss, sheltering needs, debris generated and impacts to transportation and utility infrastructure. It is evident based on the maps and HAZUS results that an earthquake of this magnitude would have widespread, disastrous effects. While Utah is not prepared to withstand an earthquake of this magnitude, the scenario document includes recommendations that Utahns and those in the seismic safety community can implement to avoid a catastrophe. This project was completed by members of the Utah Chapter of the Earthquake Engineering Research Institute.

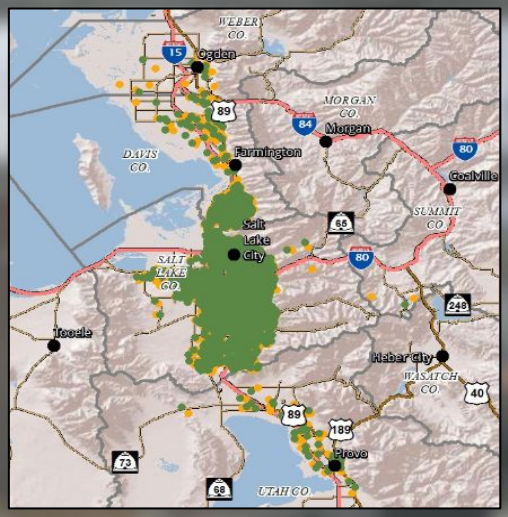












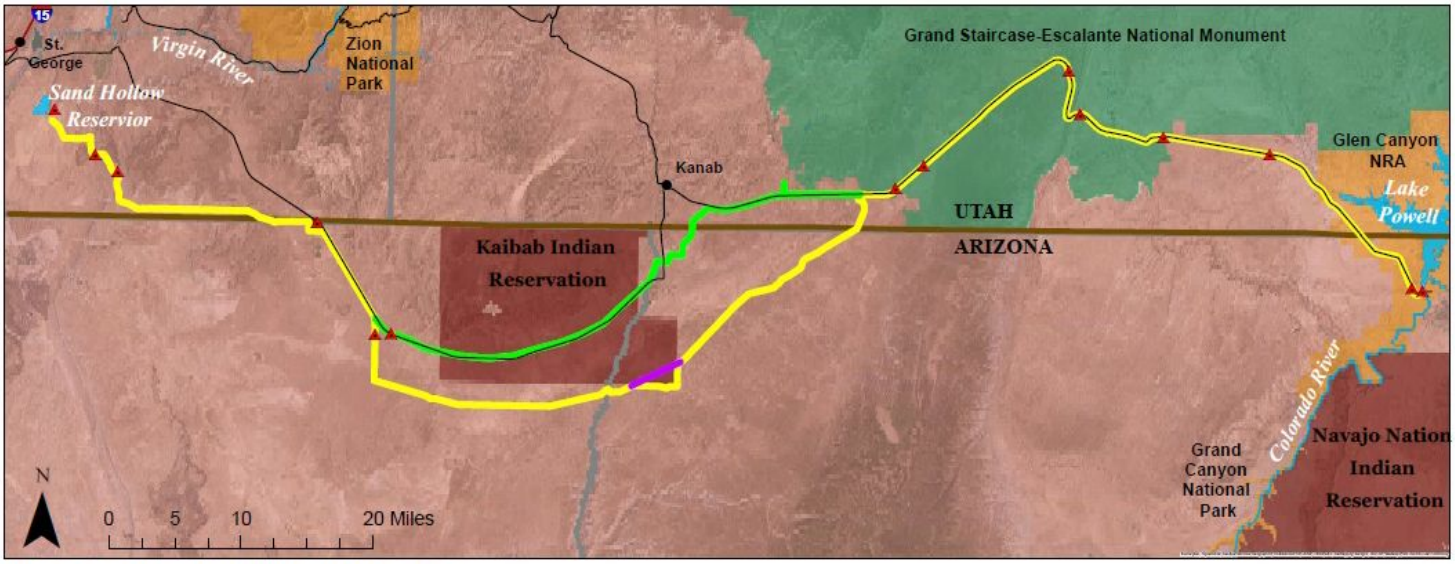
You can download a digital copy of this report at: http://utah.eeri.org/?page_id=322

The maps in this report were created by the Utah Division of Emergency Management using HAZUS 2.1 and ArcGIS 10.0.

A Look at the Proposed Lake Powell Pipeline

The Lake Powell Pipeline is a proposed diversion of the Colorado River to supply water to Washington and Kane counties. The project, estimated to cost several billion dollars, would transport water 139 miles from Lake Powell and would require 2,100 feet of vertical pump station lifting of the water along the way.

The pipeline proposal is a topic of debate in Utah this legislative season. Proponents of the pipeline argue the need to secure water for continued economic development in these arid areas. Opponents cite concerns over who and how project costs would be covered, environmental impacts, and the need to consider water conservation strategies as an alternative.

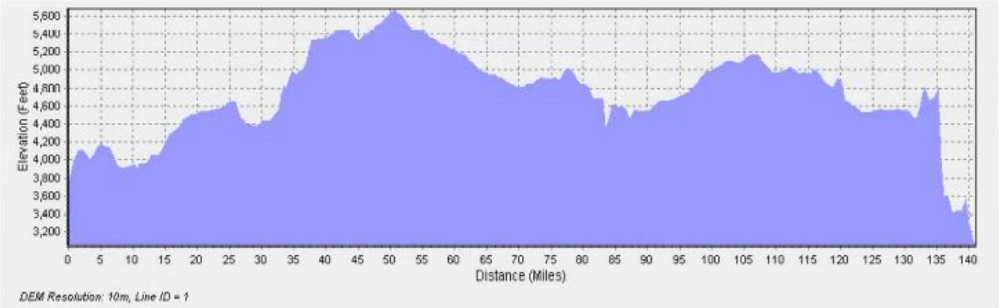


Proposed Lake Powell Pipeline

- Water Pumping Station
- Interstate 15
- Major Road
- Alternative Highway Pipeline Alignment
- Preferred South Pipeline Alignment
- Alternative Alignment 3
- River
- County Border
- Water, Reservoir

Cartographer: Amanda McGarry
Data Source: Utah Division of Water Resources, AGRC, ArcOnline
Created: 11/28/15
Projection: UTM Zone 12

Water Pumping Elevation Profile for South Pipeline Alignment



Amanda McGarry, Salt Lake City, amanda.mcgarry@utah.edu
Map Data provided by Utah Division of Water Resources.

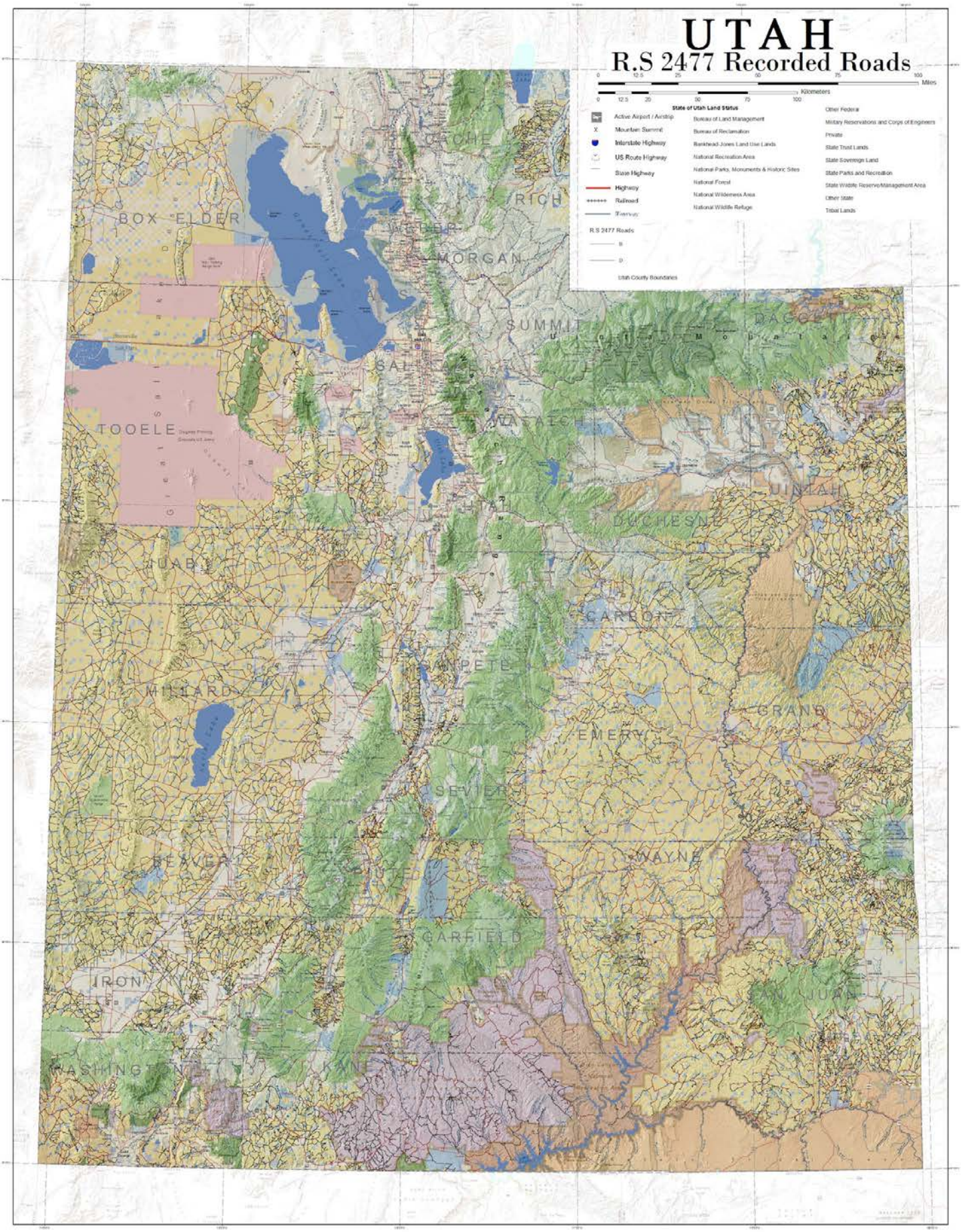
Mapping Utah's Roads

R.S.2477 Recorded Roads - Preserving Public Access

Revised Statute 2477 (Section 8 of the Mining Act of 1866) is a federal law that authorized construction of roads across federal public lands. Residents of Utah, visitors, pioneers, and settlers created and used thousands of roads across public lands for farming, ranching, hunting, recreating, mining, and connecting communities. We continue to use many of these routes daily and some occasionally or seasonally. Utah's Public Lands Policy Coordinating Office is tasked with preserving and defending rights to access, use, and benefit from public lands within the State. GIS analysts are working to ground truth all R.S. 2477 roads across BLM Land. Aerial Imagery and spatially referenced video is being collected to help verify the existence of such roads.

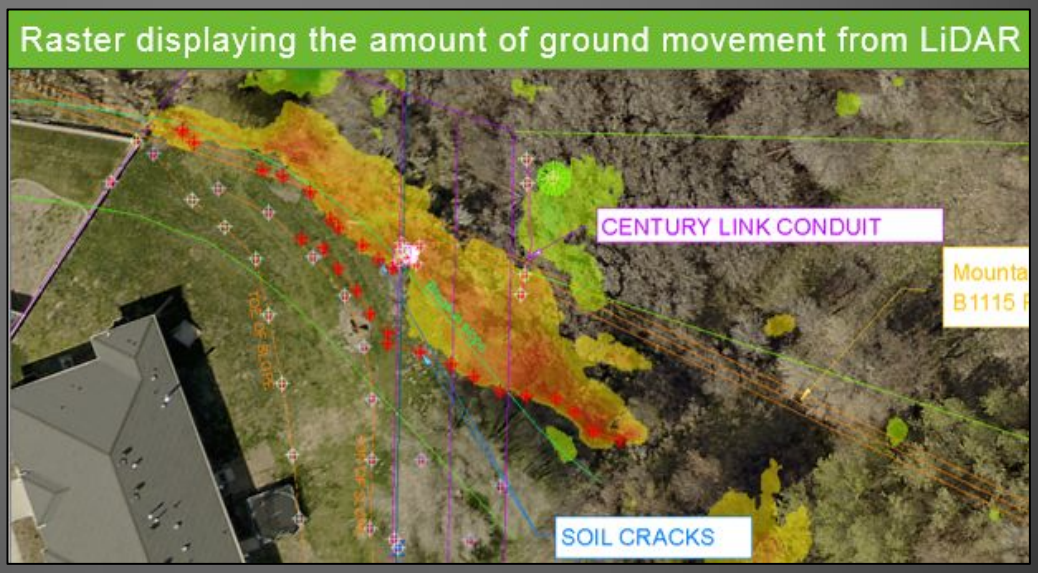
Public Lands Policy Coordinating Office
publiclands.utah.gov

PLPCO
PUBLIC LANDS POLICY COORDINATION OFFICE

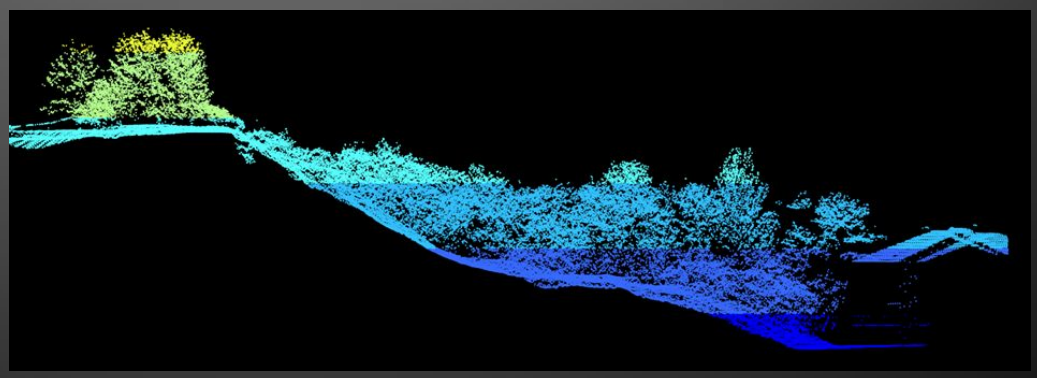

UTAH
R.S 2477 Recorded Roads
Miles
Kilometers
State of Utah Land Status
Active Airport / Airship
Mountain Summit
Interstate Highway
US Route Highway
State Highway
Highway
Railroad
Bureau of Land Management
Bureau of Reclamation
Bankhead-Jones Land Use Lands
National Recreation Area
National Parks, Monuments & Historic Sites
National Forest
National Wilderness Area
National Wildlife Refuge
Other Federal
Military Reservations and Corps of Engineers
Private
State Trust Lands
State Sovereign Land
State Parks and Recreation
State Wildlife Reserve/Management Area
Other State
Tribal Lands
R.S 2477 Roads
Utah County Boundaries
BOX ELDER
CACHE
RICH
WEBER
MORGAN
SUMMIT
DAGGETT
TOOELE
UINTAH
DUCHESNE
UTAH
CARBON
SANPETE
MILLARD
GRAND
EMERY
SEVIER
WAYNE
BEAVER
PIUTE
GARFIELD
IRON
SAN JUAN
WASHINGTON
KANE

Rapid 3D Mapping for Emergencies

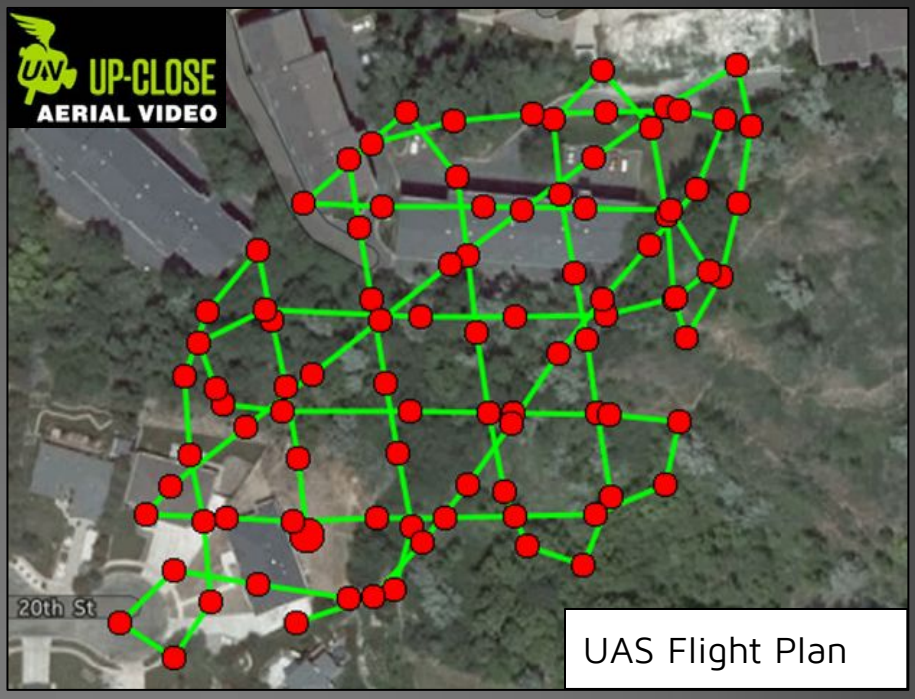
On 02/03/2015 a resident of Ogden City called in reporting a small landslide that had affected water, electrical and communications infrastructure. The slope was steep and conditions unstable, it was wooded and difficult to work. We took the opportunity of this minor disaster to test some technologies and build relationships with local data providers. We were able to test both aerial LiDAR and UAS photogrammetry to estimate the extent of the slide and the volume of earth moved as well as the availability and cost of services.



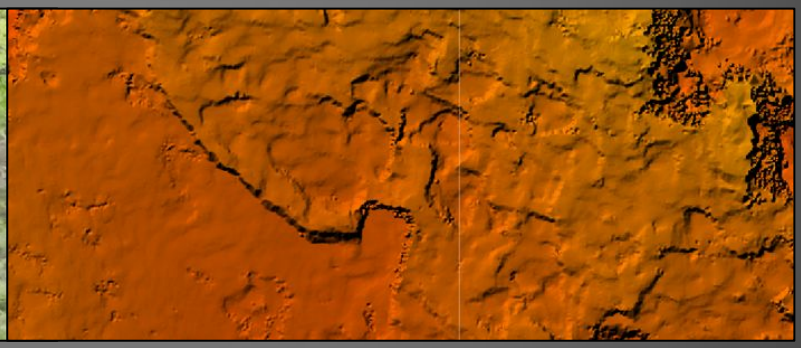
LiDAR Flight Plan



A field survey provided excellent control for us to be able to assess the accuracy of the results. LiDAR returns penetrated the tree canopy allowing us to make excellent calculations and 3D Models from the point cloud while the UAS was unable to do so, it did provided a 3d model, orthophoto and situational awareness within an hour of capture.



UAS Flight Plan



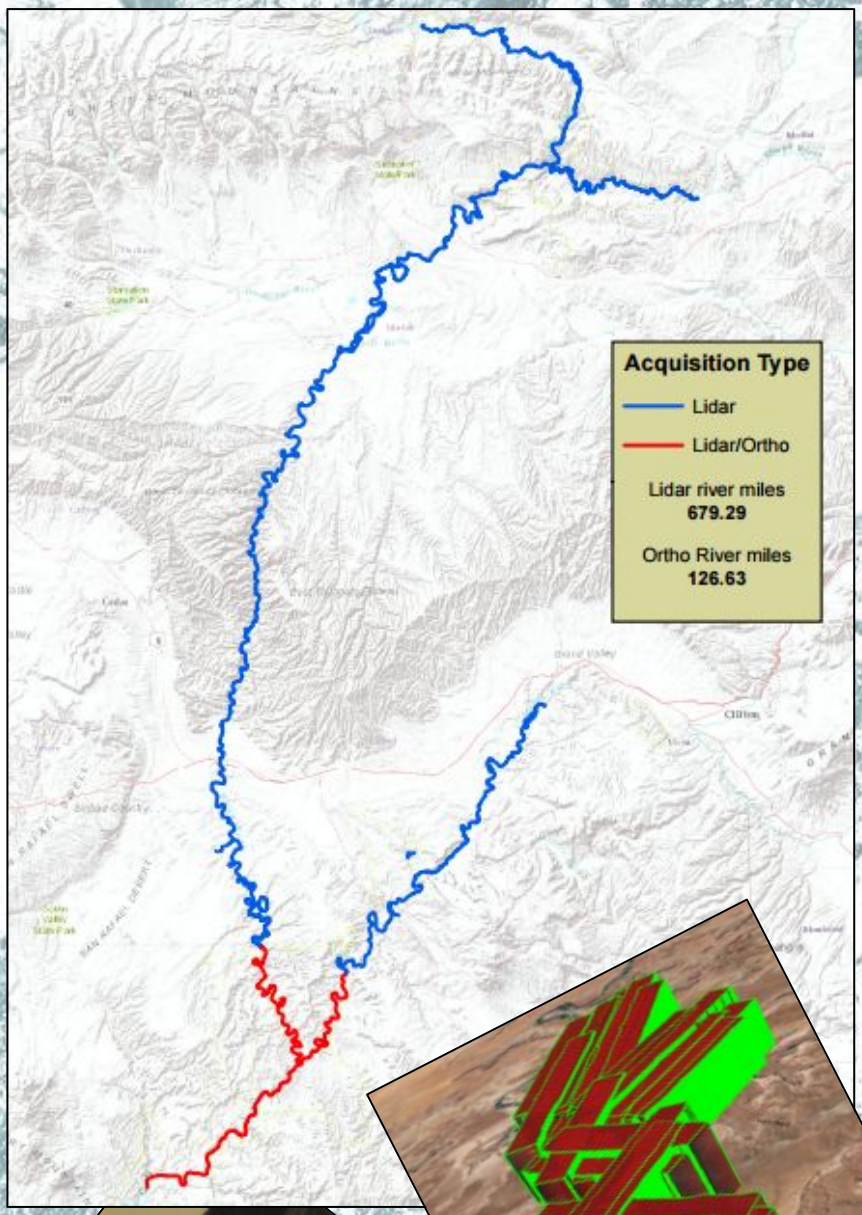
Josh Jones GISP
Senior Project Coordinator GIS
Ogden City

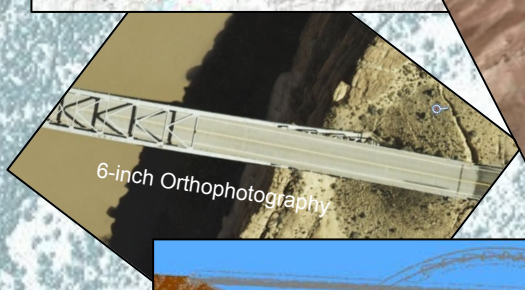
aero-graphics GEOSPATIAL SERVICES

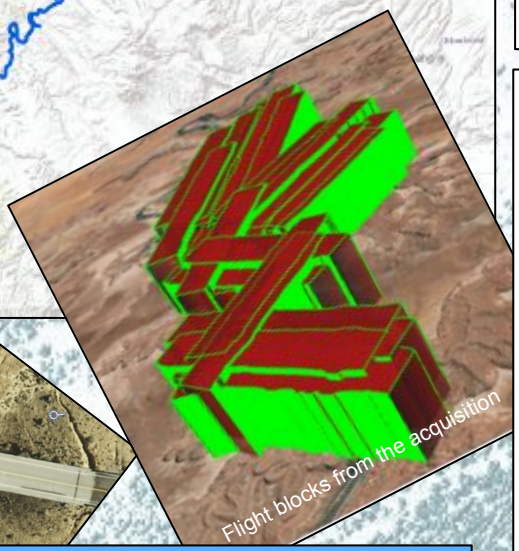
UP-CLOSE AERIAL VIDEO

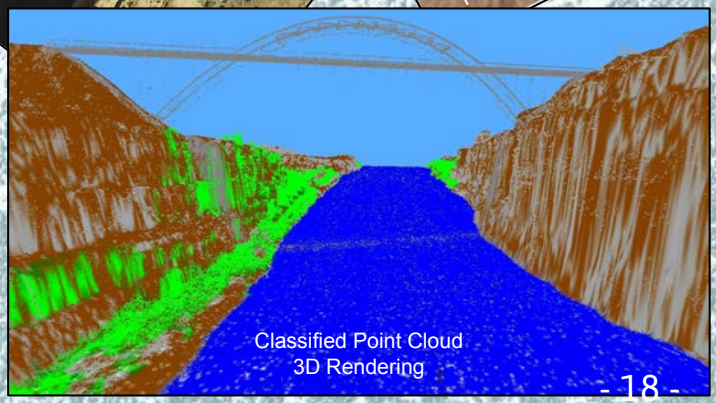
UTAH Ogden geographic information systems

New Lidar and Orthophotography for Utah's Most Scenic River Corridors




6-inch Orthophotography


Flight blocks from the acquisition


Classified Point Cloud
3D Rendering

Through a partnership with the National Park Service, the DNR's Division of Forestry, Fire, and State Lands has contracted with Aerial Surveys International (ASI) to collect, process and deliver lidar and orthophotography data products of the main channel and floodplains of our unique and scenic rivers.

The project area comprises **680 linear river miles, covering 152 sq. miles** of the **Colorado, Green, and Yampa River** corridors in southeast and eastern Utah and northwest Colorado. These river corridors flow through portions of Arches and Canyonlands National Parks, Dinosaur National Monument, and Glen Canyon National Recreation Area.

U.S. Geological Survey **Quality Level 1 lidar data** will be created for the entire project area while **6-inch resolution color orthophotography** will be created within the boundaries of Canyonlands National Park. To date, ASI has completed the orthophotography and lidar collection flights. Data processing and reviews/revisions are ongoing. Delivery of the final data products is expected in fall of 2016 after data processing and QA/QC has been completed.

Opportunities created by this new data include:

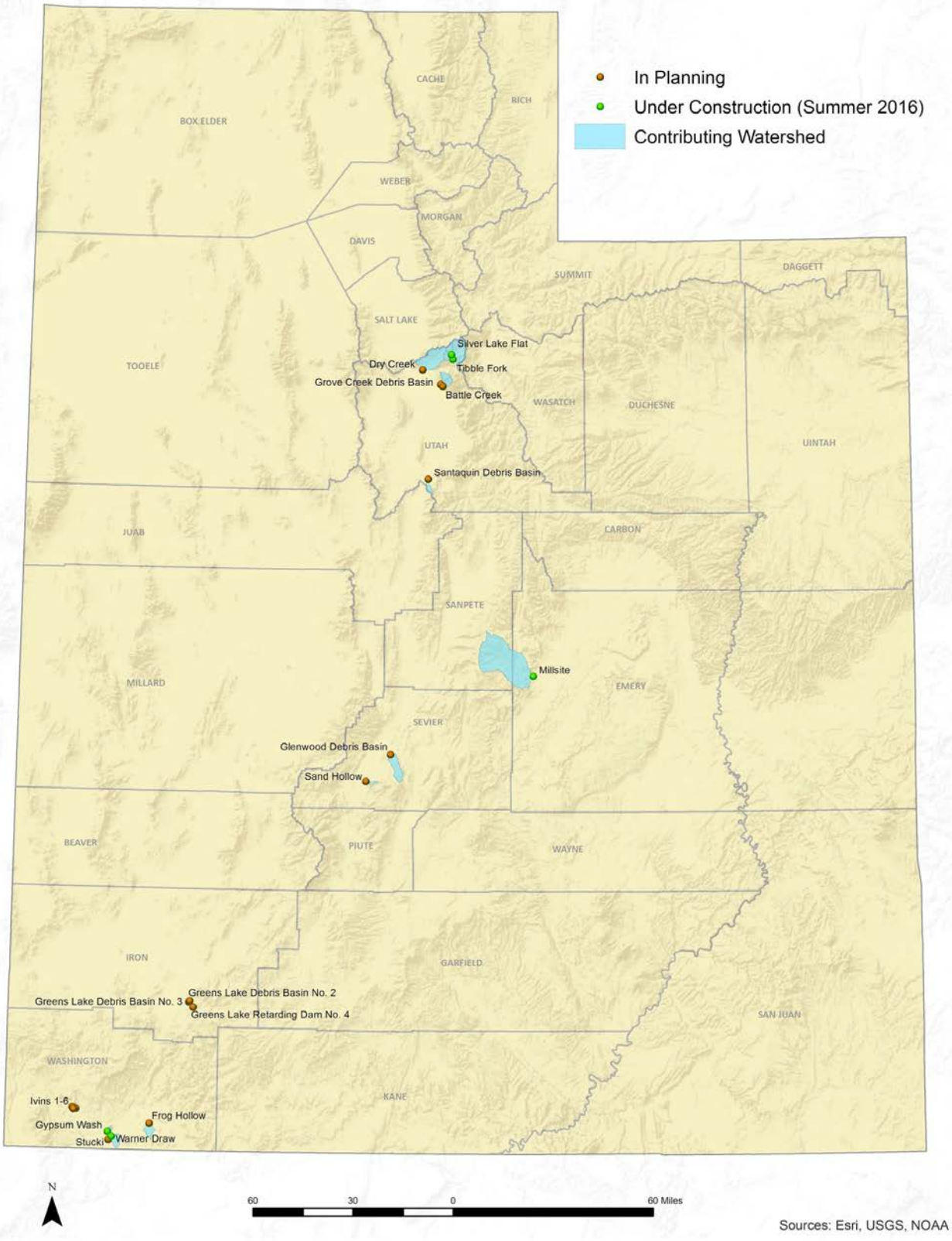
- improving elevation data throughout the river corridors
- better understanding of the low water morphology of the rivers for better management and navigability
- characterizing the structure and composition of riparian vegetation along the river corridors
- providing the greater community, such as recreation and science, with high resolution data
- establishing baseline high-resolution topography for fluvial geomorphic surfaces
- establishing high-resolution topography for the aprons of debris flows associated with rapids and whitewater

Forestry, Fire & State Lands
a division of the
Utah Department of Natural Resources
www.ffsl.utah.gov

NRCS Dam Rehabilitation Projects in Utah

www.nrcs.usda.gov/wps/portal/nrcs/main/ut/programs/planning/wr/

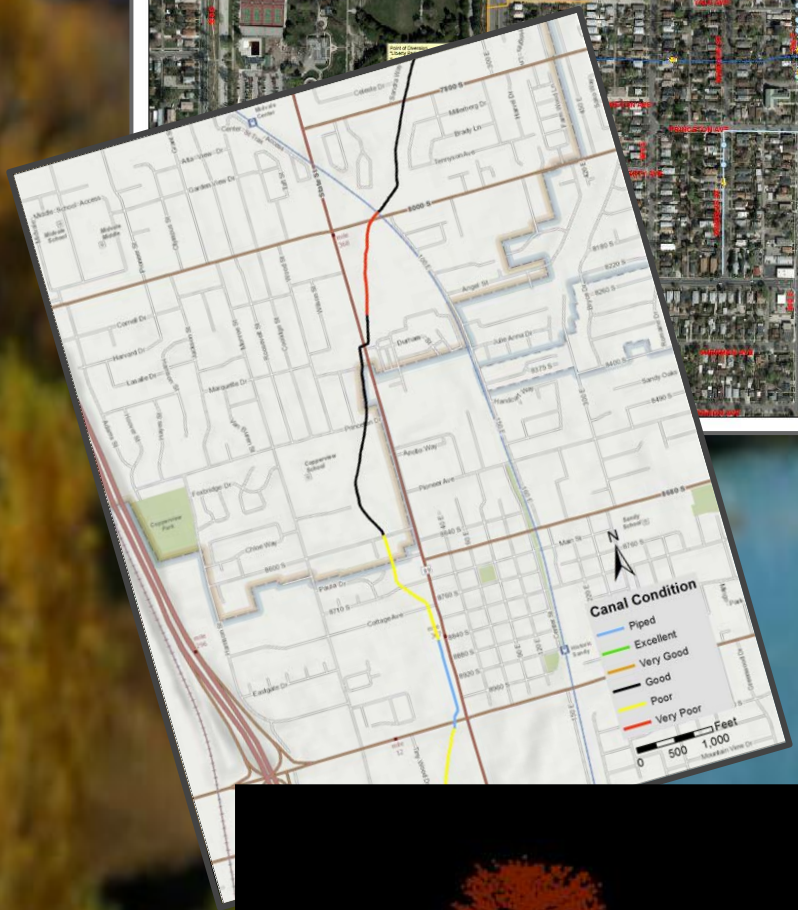
USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

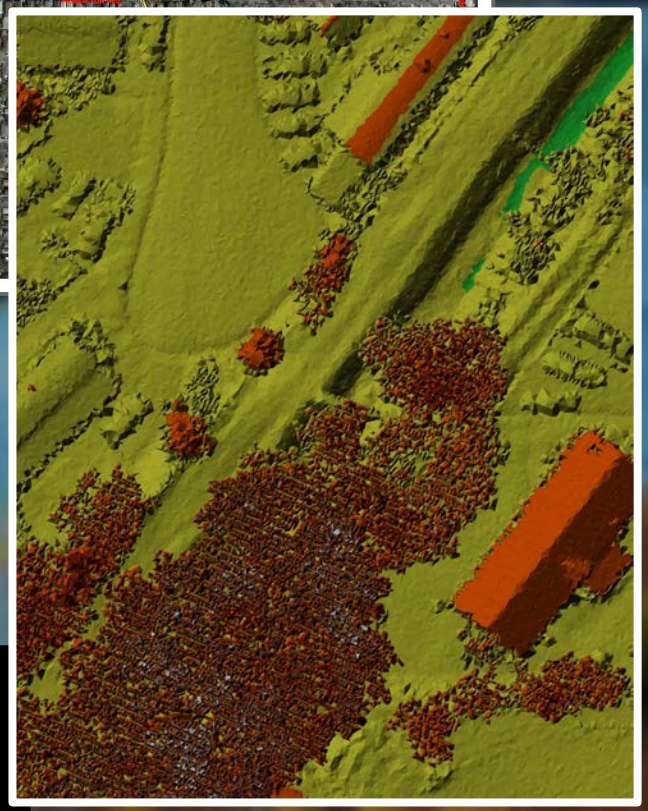


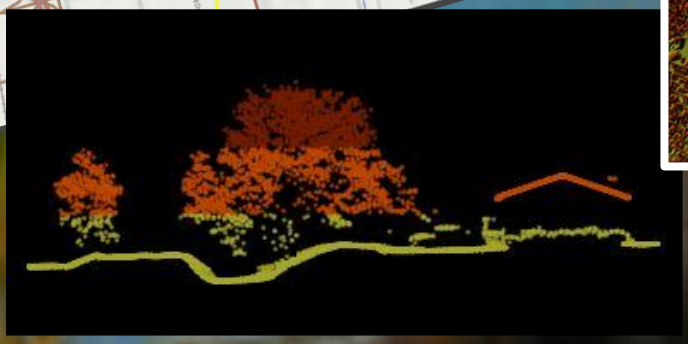
Salt Lake and Jordan Canal

Salt Lake City Department of Public Utilities

Salt Lake City Department of Public Utilities is responsible for inspecting and maintaining the Salt Lake and Jordan canal from approximately 160000 South in Salt Lake County to 900 South in Salt Lake City. The canal feeds the Parleys Water Irrigation System in Salt Lake City. A condition inspection is done twice yearly on the open canal, once in the spring when the canal is filled with water and once in the fall when the canal is dry. Each inspection is tied to an asset on the map. In 2015 the department acquired very high resolution LIDAR for the entire canal to help with mapping, modeling, and assessing the canal.





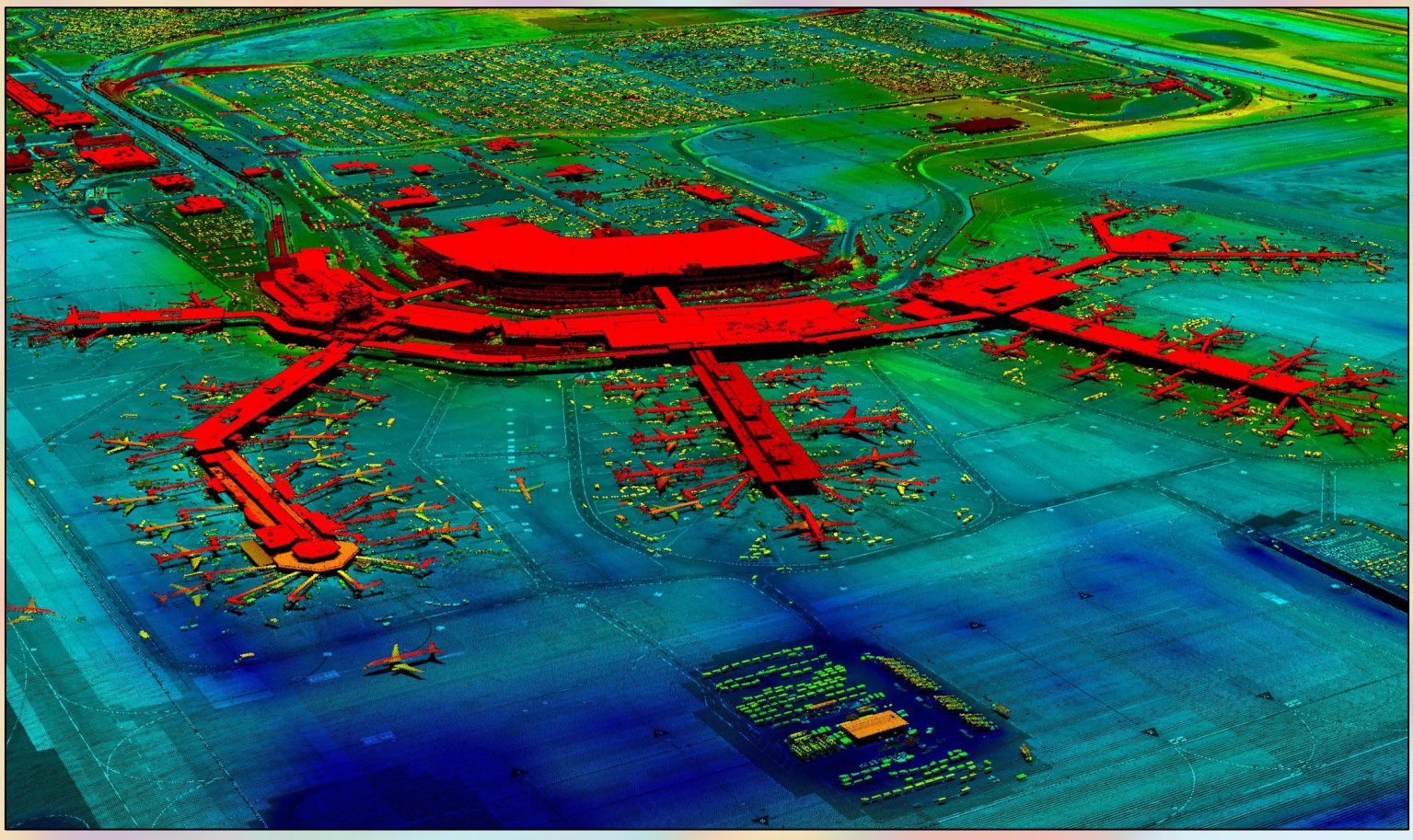


Salt Lake City
Department of Public Utilities
GIS Department

SLCIA Relies on Simultaneous LiDAR and Imagery Collection

The Salt Lake City International Airport is the 24th busiest and 17th fastest-growing airport in the United States. However, due to its original construction in 1960, many of its terminal facilities have succumbed to age. To assist in the design of newer facilities, Aero-Graphics was contacted in 2014 to provide high-precision base mapping for the airport's terminal redevelopment program.

Aero-Graphics' data results were required to satisfy stringent accuracy standards: final lidar data was required to meet a vertical accuracy tolerance of 3cm RMSE, and deliverables were to include a litany of detailed specifications (such as color orthorectified imagery at a 0.2' pixel size, detailed planimetry, and ground-classified lidar data at a density of two points per square meter).

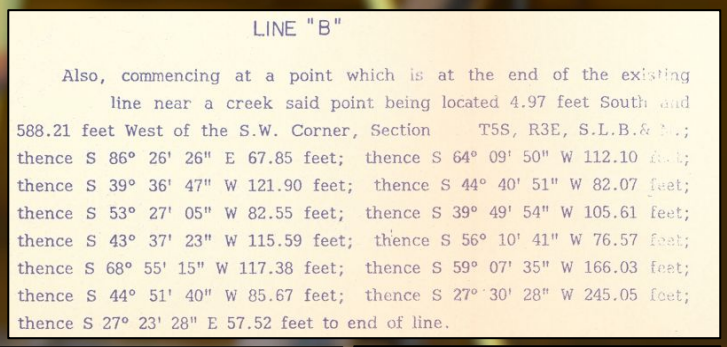


aero-graphics
GEOSPATIAL SERVICES

THE NEW SLC
TERMINAL REDEVELOPMENT PROGRAM

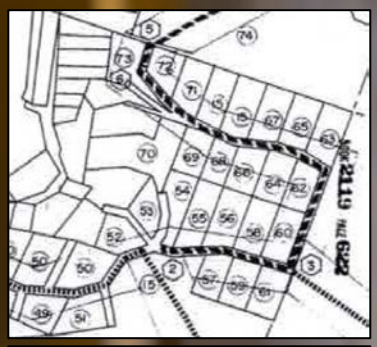
Pipeline Easements and Accuracy

Pipeline Easements can vary significantly on paper compared to actual conditions in the field. This can cause legal concern and headaches when planning infrastructure improvements. Updating easements can prevent project delays and facilitate communication.

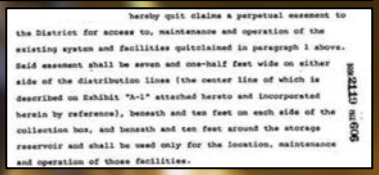


LINE "B"

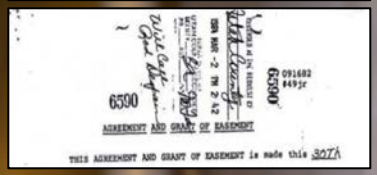
Also, commencing at a point which is at the end of the existing line near a creek said point being located 4.97 feet South and 588.21 feet West of the S.W. Corner, Section T5S, R3E, S.L.B.& M.; thence S 86° 26' 26" E 67.85 feet; thence S 64° 09' 50" W 112.10 feet; thence S 39° 36' 47" W 121.90 feet; thence S 44° 40' 51" W 82.07 feet; thence S 53° 27' 05" W 82.55 feet; thence S 39° 49' 54" W 105.61 feet; thence S 43° 37' 23" W 115.59 feet; thence S 56° 10' 41" W 76.57 feet; thence S 68° 55' 15" W 117.38 feet; thence S 59° 07' 35" W 166.03 feet; thence S 44° 51' 40" W 85.67 feet; thence S 27° 30' 28" W 245.05 feet; thence S 27° 23' 28" E 57.52 feet to end of line.



Kimberly M. Coburn, PE
Epic Engineering, PC
kcoburn@epiceng.net
435-654-6600 | www.epiceng.net



hereby quit claims a perpetual easement to the District for access to, maintenance and operation of the existing system and facilities quitclaimed in paragraph 1 above. Said easement shall be seven and one-half feet wide on either side of the distribution lines (the center line of which is described on Exhibit "A-1" attached hereto and incorporated herein by reference), beneath and ten feet on each side of the collection box, and beneath and ten feet around the storage reservoir and shall be used only for the location, maintenance and operation of those facilities.

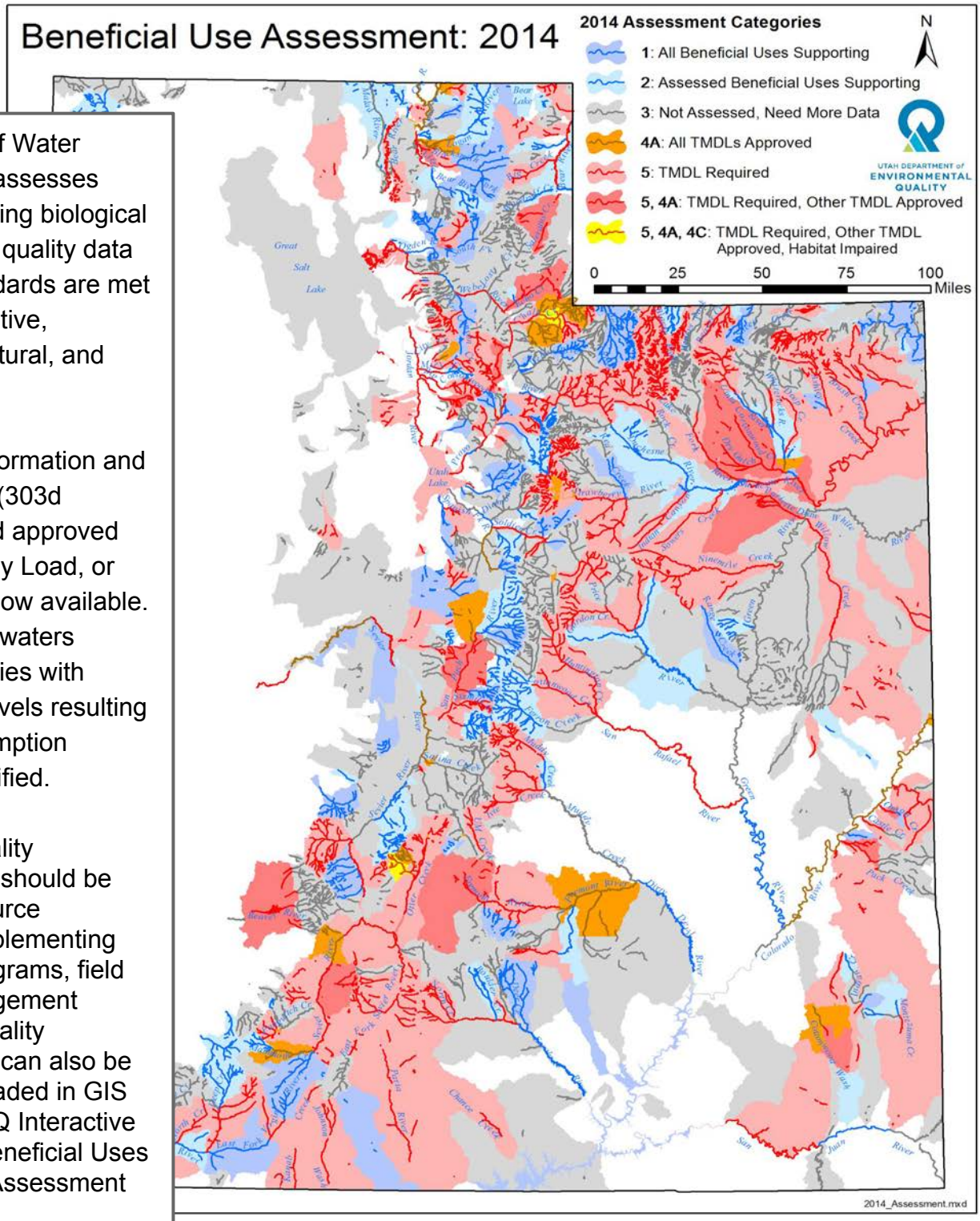


6590

AGREEMENT AND GRANT OF EASEMENT

THIS AGREEMENT AND GRANT OF EASEMENT is made this 30TH

Utah's 2014-16 Water Quality Assessment



The Utah Division of Water Quality bi-annually assesses surface waters utilizing biological and chemical water quality data to determine if standards are met for human consumptive, recreational, agricultural, and aquatic life uses.

Assessment unit information and causes of impaired (303d impaired waters and approved Total Maximum Daily Load, or TMDL) waters are now available. In addition, specific waters containing fish species with elevated mercury levels resulting in fish tissue consumption advisories are identified.

The 2014 water quality assessment results should be considered by resource managers when implementing their respective programs, field projects, and management decisions. Water quality assessment results can also be viewed and downloaded in GIS format from the DEQ Interactive Map or using the Beneficial Uses and Water Quality Assessment Map application.

Mark Stanger, Environmental Scientist / GIS
Utah Departmnet of Environmental Quality, Division of Water Quality
195 North 1950 West
Salt Lake City, UT 84116
801-536-4375

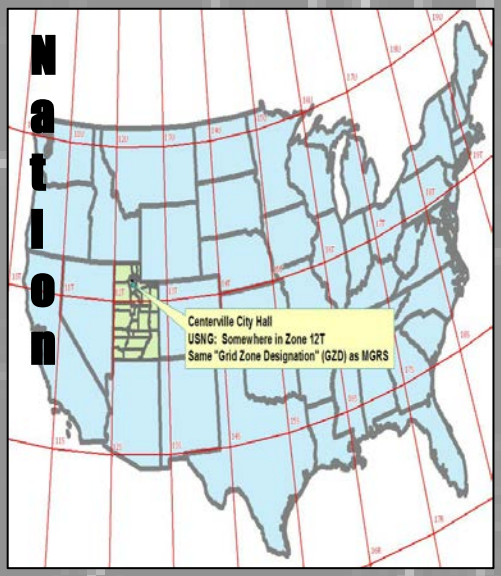
DEQ Interactive Environmental Map: http://enviro.deq.utah.gov/
Water Quality assessment map:http://mapserv.utah.gov/surfacewaterquality/

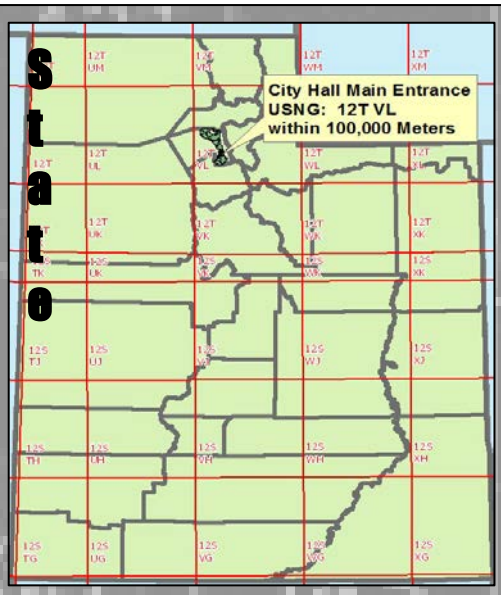
The United States National Grid (USNG)

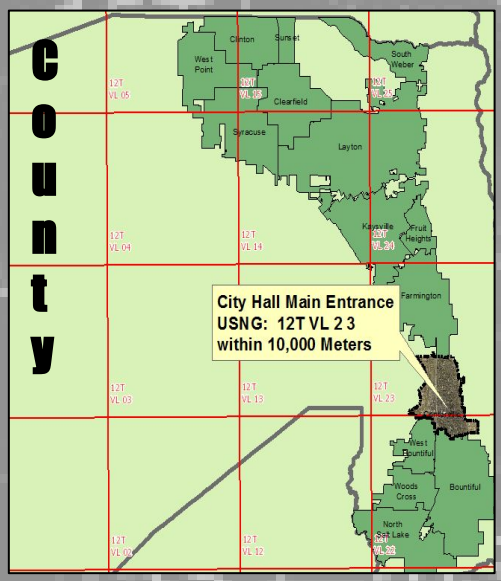
A Coordinate System for the Uncoordinated

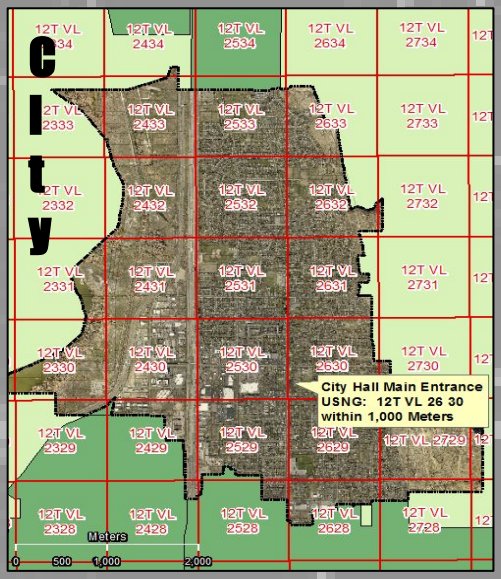
The USNG coordinate system was adopted in 2001 by the Federal Geographic Data Committee (FGDC), it is identical to the Military Grid Reference System (MGRS) with some formatting differences. Since its inception FEMA has been pushing communities to implement the system for all federally assisted disaster relief. The USNG allows any location in the U.S. to be located within 1 Meter. The grid system is easy to learn and apply – FEMA has had great success teaching the USNG to 3rd & 4th graders.

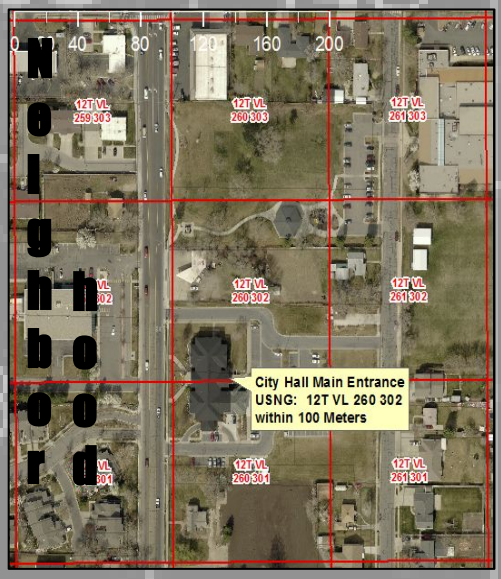
Centerville City has implemented the USNG by training staff on its use and stocking maps with USNG overlays at EOCs and vehicles. These maps will be used to report locations in USNG coordinates when disaster relief is needed. This system becomes powerful when place markers, street signs, and landmarks are wiped out. This will especially help out if FEMA is involved, who as of October 2015, have adopted USNG as the standard for all ground based operations.

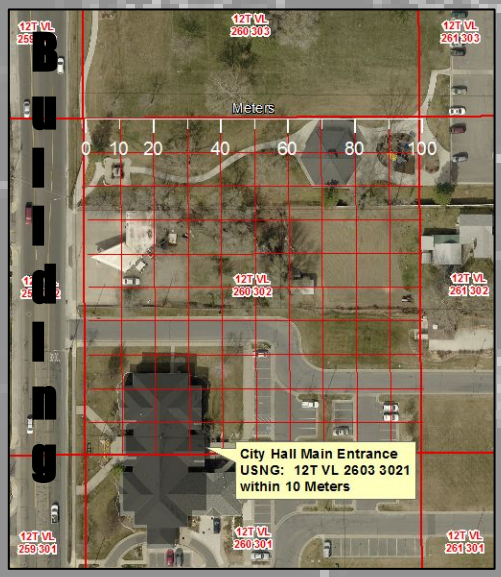












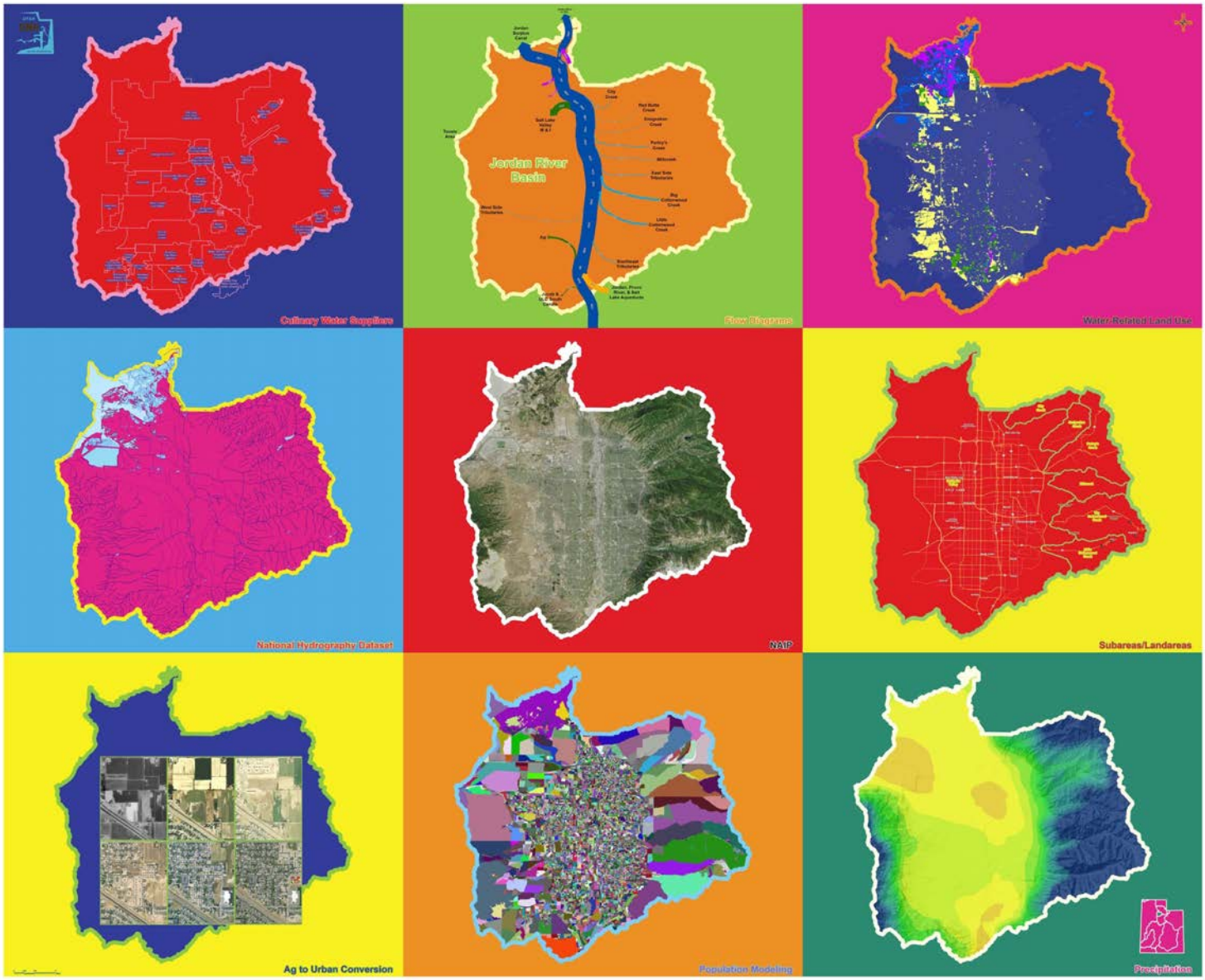
Map Data:
http://maps1.arcgisonline.com/ArcGIS/services
UTAH AGRC

Centerville GIS
msmith@centervilleut.com

www.fgdc.gov/standards/projects/FGDC-standards-projects
www.mappingsupport.com/p/cascadia-rising

Utah Division of Water Resources

Jordan River Basin Mapping Examples in the style of Andy Warhol

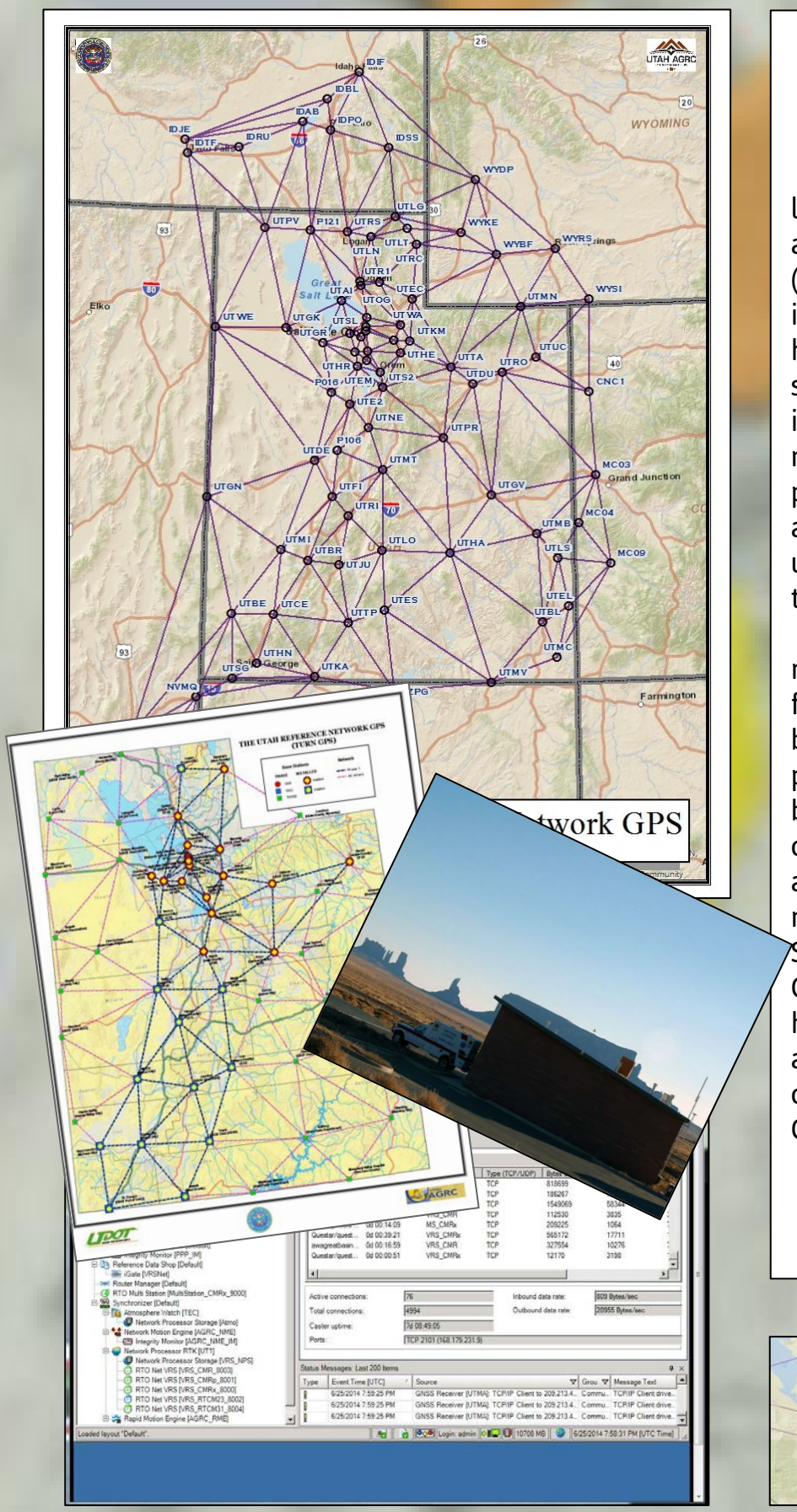


GIS - Where Science and Art Meet

The Utah Division of Water Resources (DWRe) uses GIS for many purposes. This map calls attention to a few uses we would like to highlight. DWRe has recently completed an effort to update the boundaries statewide of Culinary Water Suppliers. This data is now available through AGRC. Other Highlights: Flow Diagrams, Water-Related Land Use, NHD, NAIP, Subarea Boundaries, Ag to Urban Change, Population Distribution, and Precipitation.

TURN GPS: Real-time Precision Surveying

The Utah Reference Network GPS (TURN GPS) ***10 Year Anniversary April 16, 2017***



TURN GPS

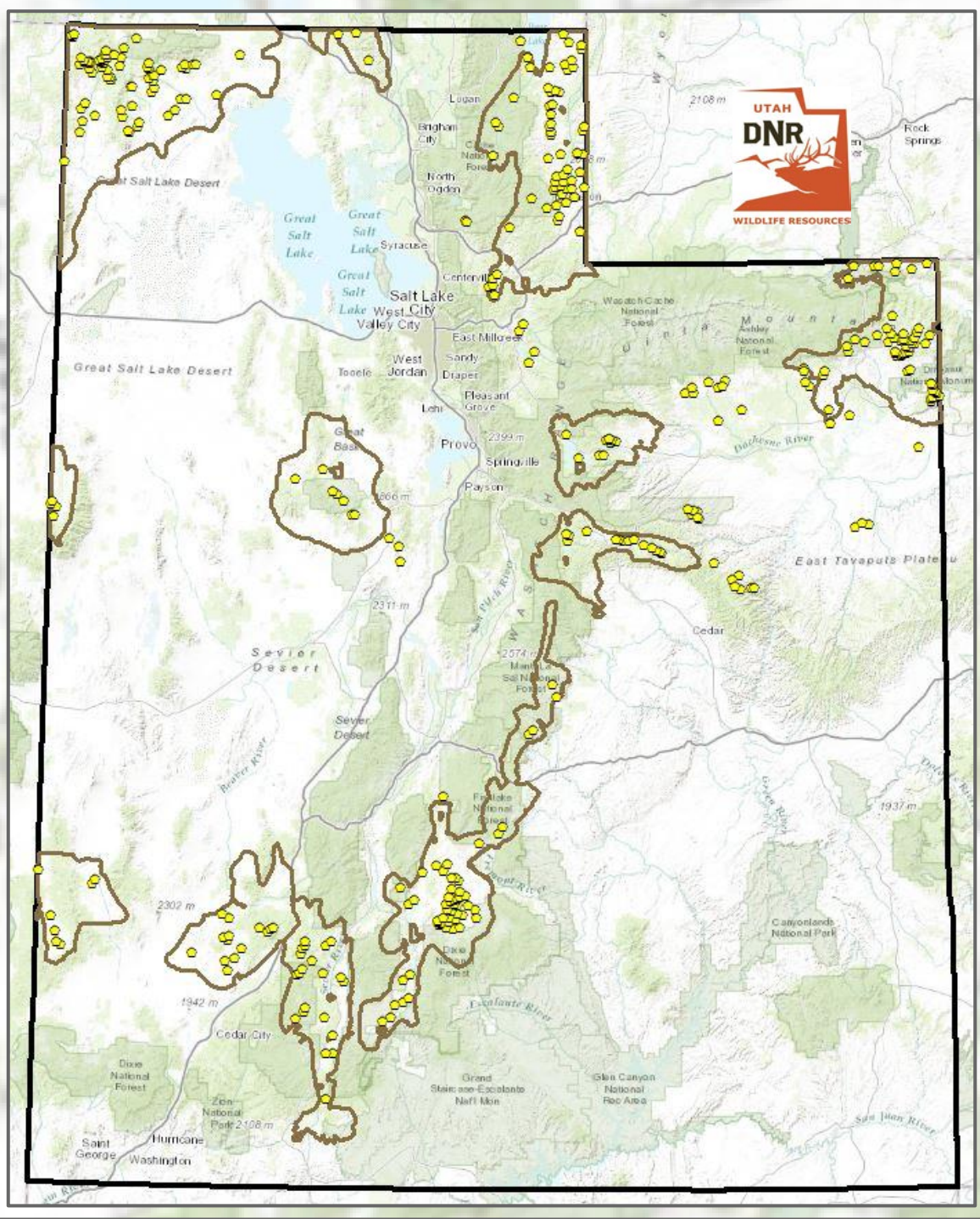
Established April 16, 2007

Utah's AGRC has experienced longstanding success in building out a statewide precision GPS system (VRS). The State of Utah has invested in the necessary reference station hardware; VRS network management software (Trimble Pivot), IT infrastructure, and expertise to maintain a subscription network that provides real-time centimeter level accuracy to surveyors and mappers using compatible GNSS GPS rovers throughout the state.

The network is called TURN GPS. In recent years, Utah's AGRC has formed strategic partnerships to build out the network to include portions of neighboring states that to benefit near-border Utah communities while generating additional revenue to support the network. Clark County, Nevada, Southwest Wyoming, Mesa County, Colorado, and now Southeast Idaho have been joined the TURN GPS VRS and are providing options for low-cost, dual-constellation (GPS AND GLONASS) correction services.

Utah's Conservation Plan For Greater Sage-Grouse

Utah's Sage-Grouse Management Areas (SGMA's) and Leks



The Utah Division of Wildlife Resources recently completed an in-depth statewide study of threats facing greater sage-grouse. The study revealed that 77 percent of Utah's SGMA habitat is unaffected by common landscape threats. The remaining 23 percent of SGMA acreage may be threatened by habitat encroachment, wildfires or other disturbances. Of these threats, only three percent are due to oil and gas development or urbanization. Utah's management plan addresses each of the threats.
wildlife.utah.gov/learn-more/greater-sage-grouse

Where is excavation occurring?

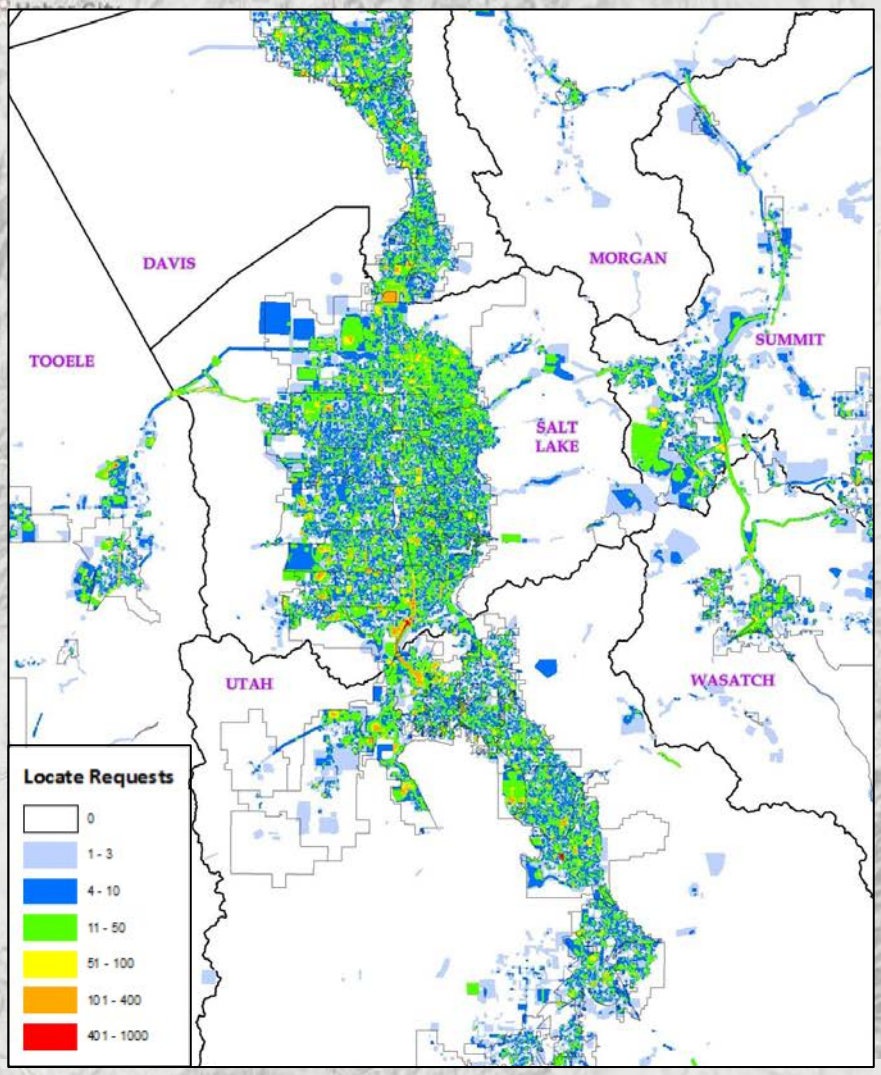
Is excavation activity an indicator of Utah's economic health?

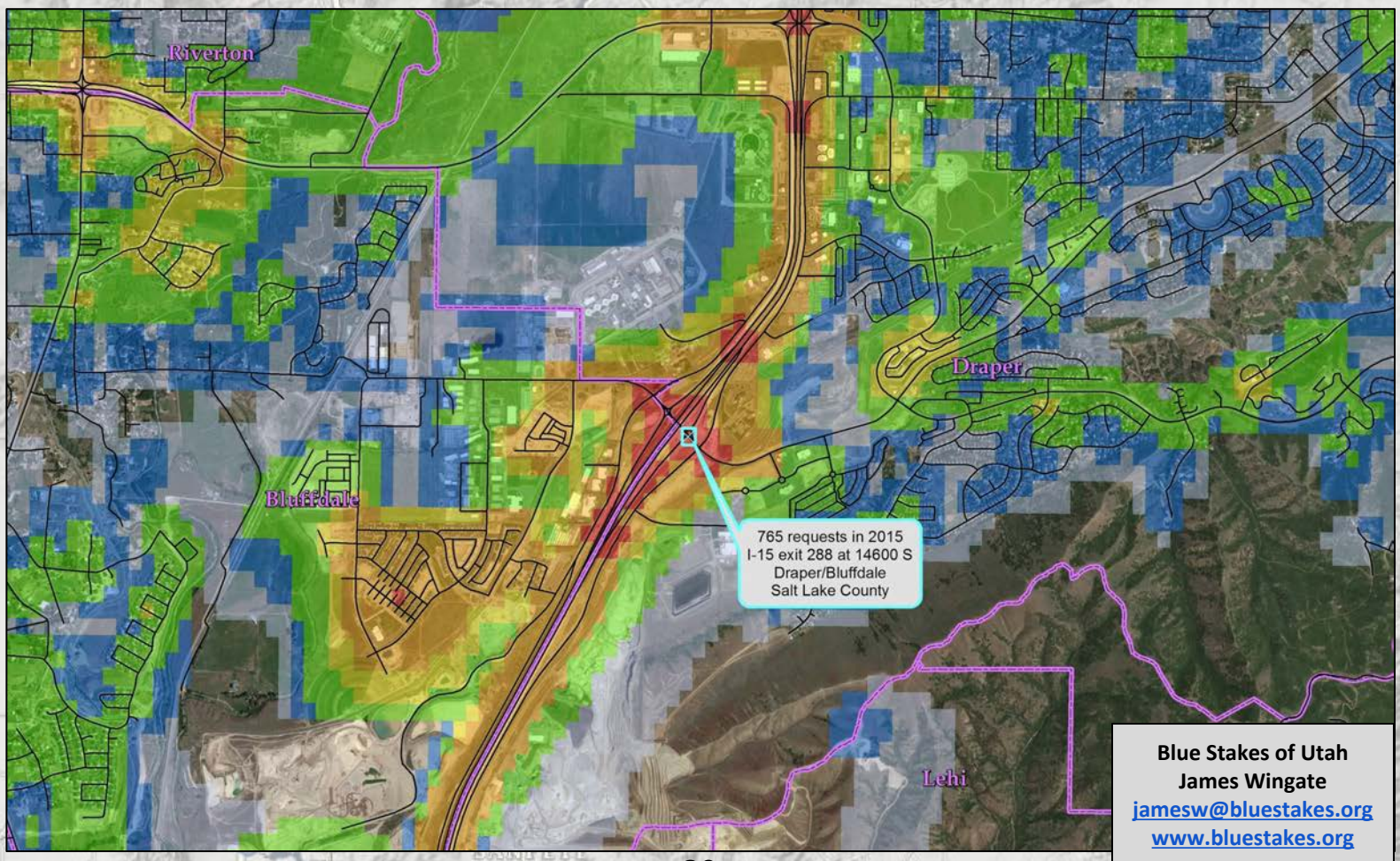
Know what's **below.**
Call 811 before you dig.

Blue Stakes of Utah is the utility notification center for Utah and the organization to "Call 811 Before You Dig." In 2015, Blue Stakes received almost 347,000 requests to have utility lines located and marked throughout the state.

Excavation activity was reported on less than 4% of Utah's land area; the vast majority took place in populated urban areas, with the notable exceptions of the oil & gas fields in Uintah, Duchesne and San Juan Counties.

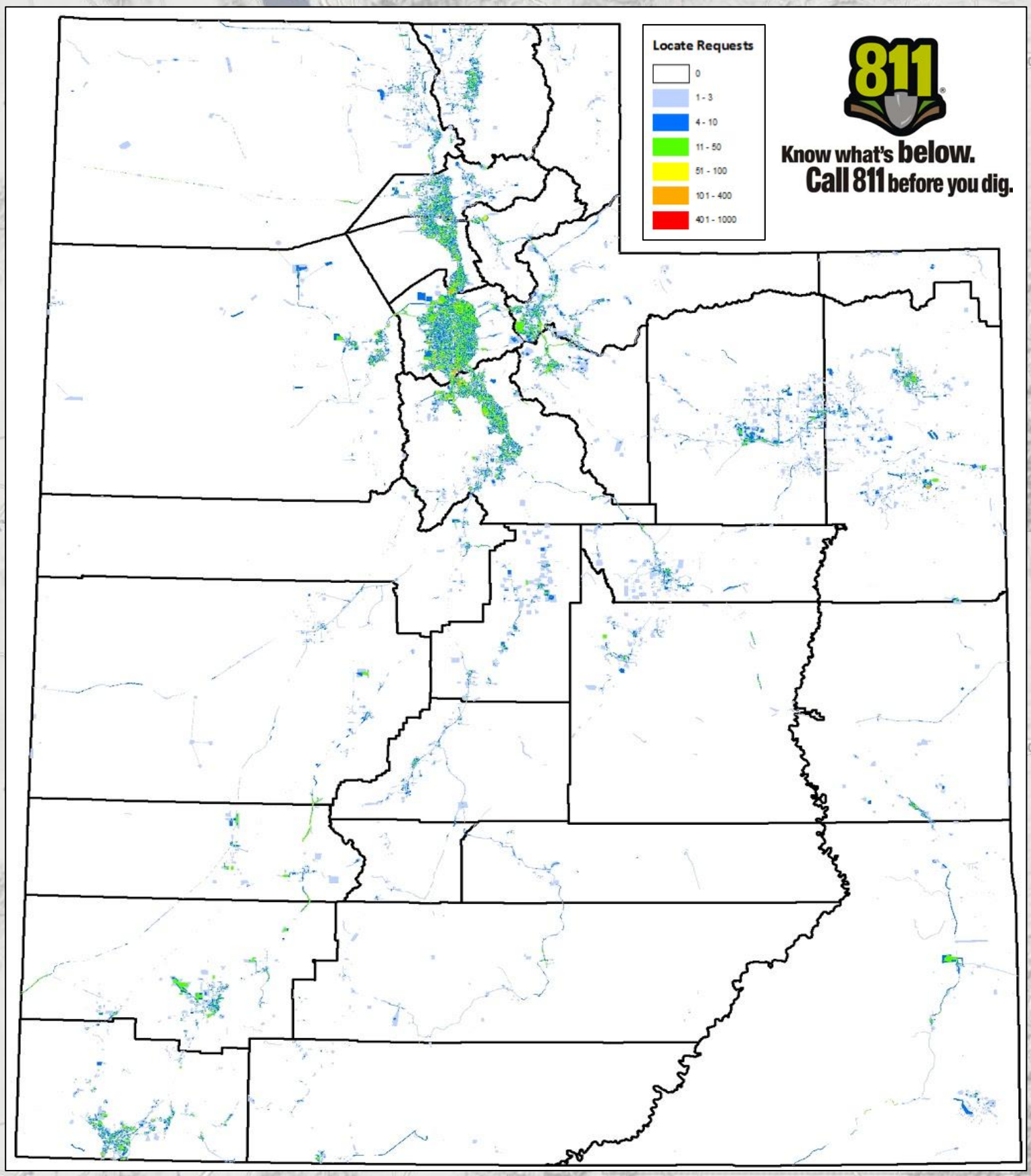
Please visit the Blue Stakes display table to view an interactive density map. See how much excavation took place in your area of interest!





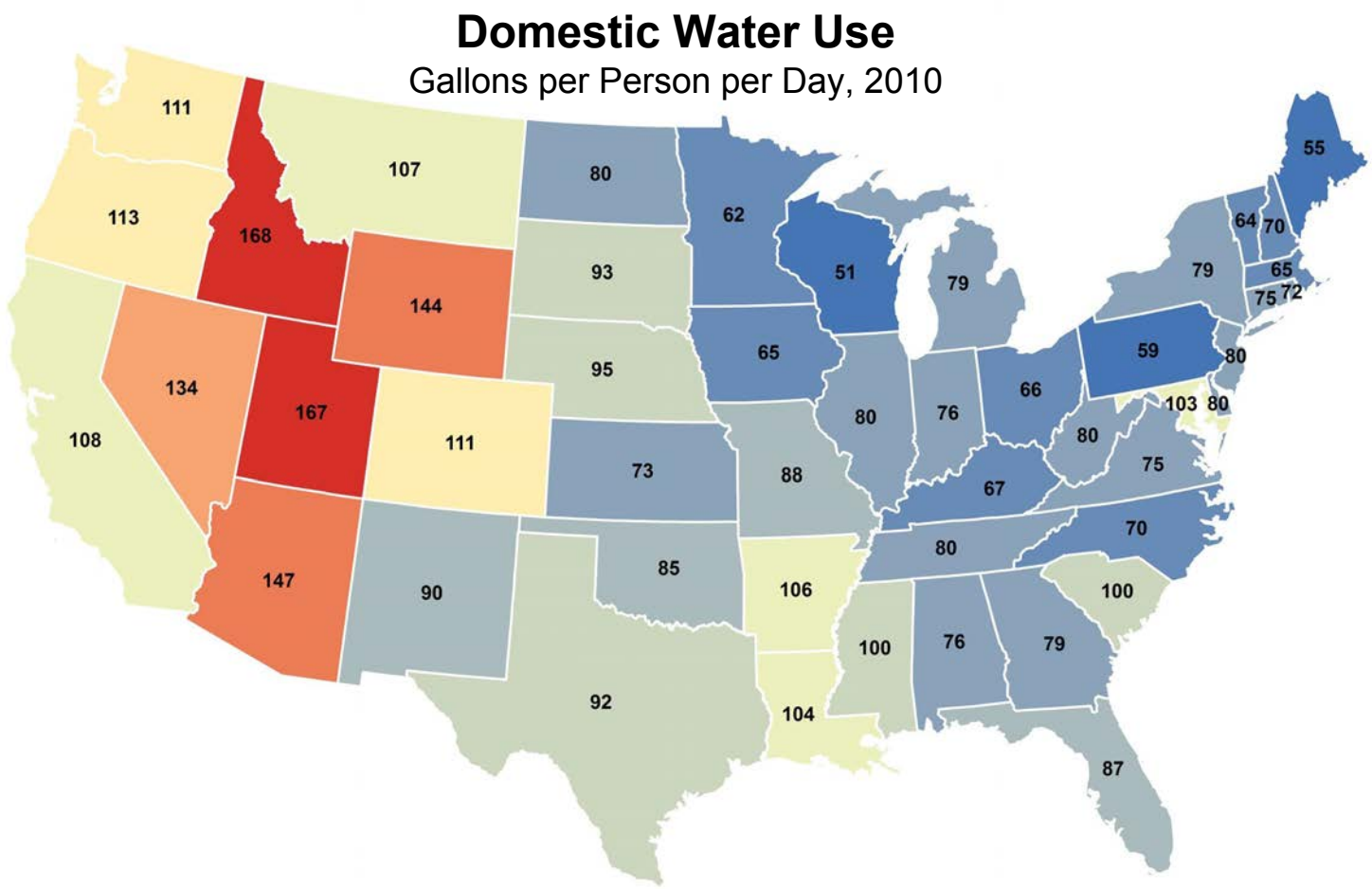
Blue Stakes of Utah
James Wingate
jamesw@bluestakes.org
www.bluestakes.org

Excavation Activity in Utah 2015

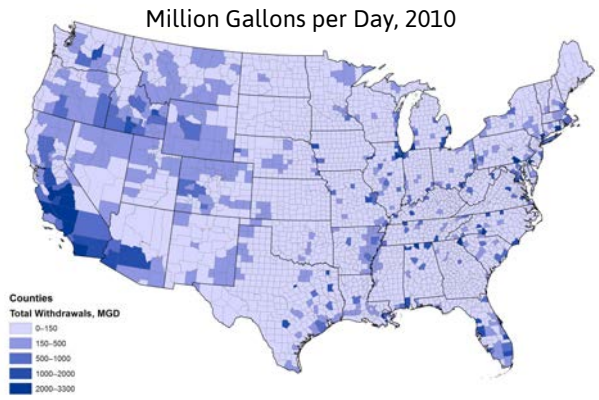


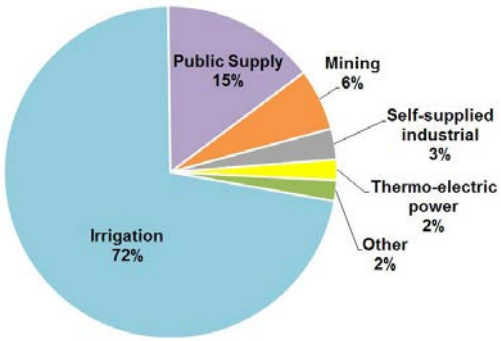
Water Use in the United States and Utah

Public datasets helps us recognize trends, patterns, and behaviors in water use, especially when coupled with geography.



- Utah ranks 2nd in highest domestic use
- Utah's largest use is irrigation
- Utah's goal is to reduce per-capita water use by 25% by 2025





HANSEN ALLEN & LUCE inc
ENGINEERS

Robert B. Sowby
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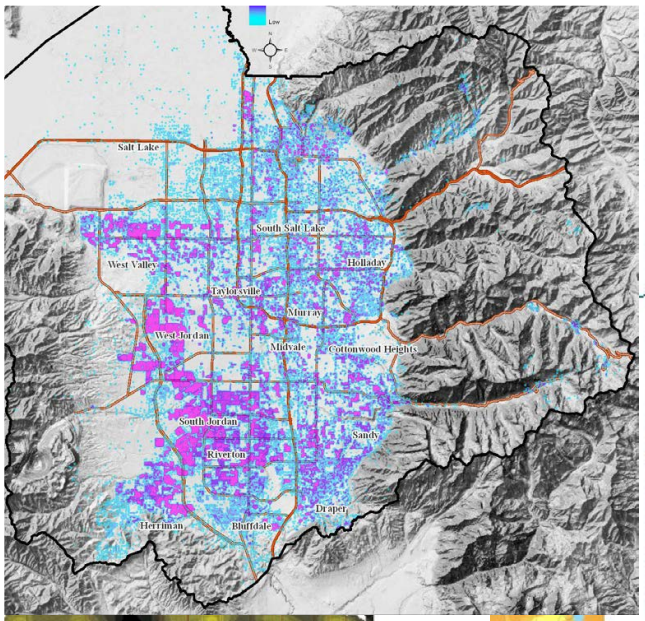
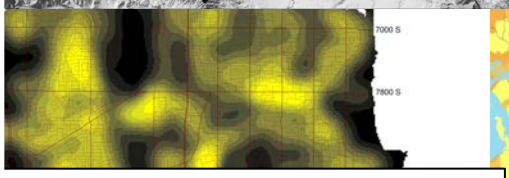
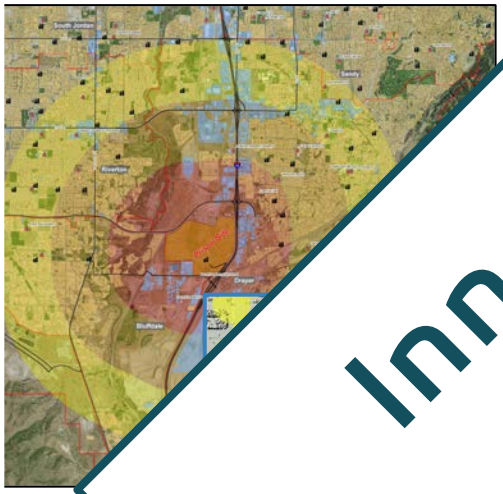
801-566-5599 | www.hansenallenluce.com

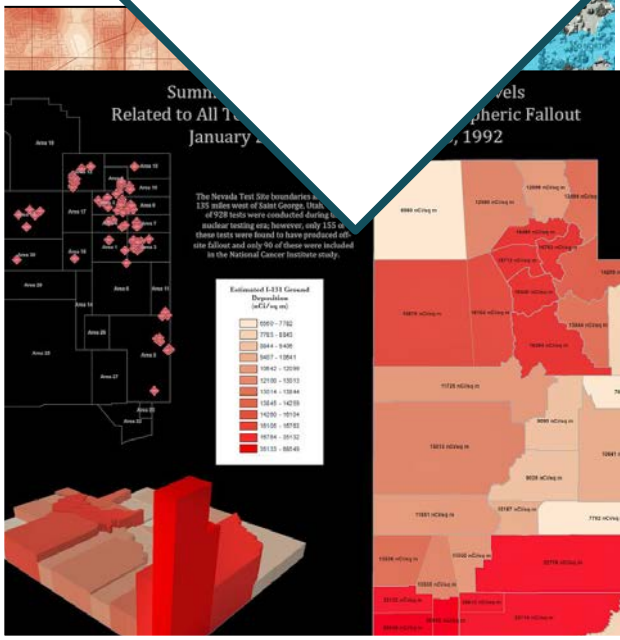
Data: Maupin et al. 2014. *Estimated Use of Water in the United States in 2010*. U.S. Geological Survey Circular 1405. Washington, D.C.: U.S. Department of the Interior, U.S. Geological Survey.

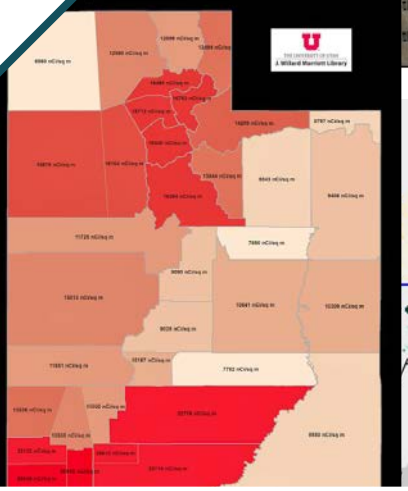
Innovative Uses of Map Data

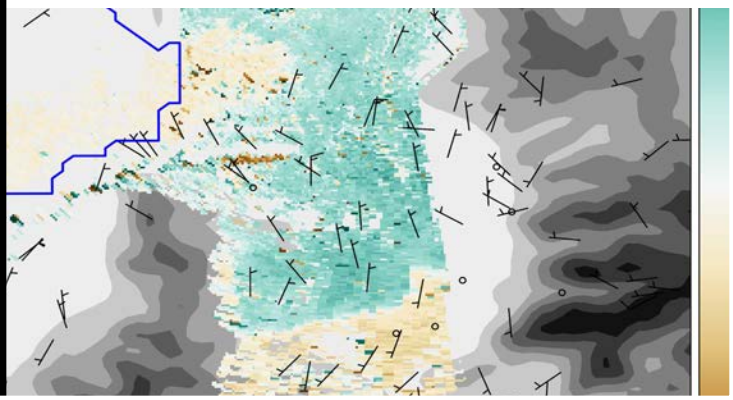








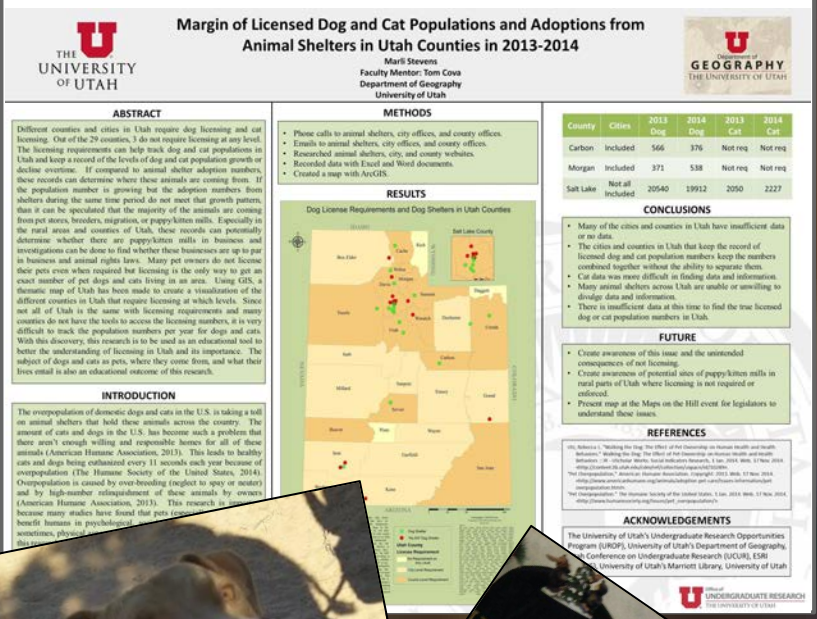




Dog License Requirements and Dog Shelters in Utah Counties in 2014

The Unintended Consequences of Not Licensing your Pet Dog by Marli Stevens

A research poster was presented at UCUR (Utah Conference on Undergraduate Research) with more information, including cat licensing data.



Margin of Licensed Dog and Cat Populations and Adoptions from Animal Shelters in Utah Counties in 2013-2014

Marli Stevens
Faculty Mentor: Tom Cova
Department of Geography
University of Utah

ABSTRACT

Different counties and cities in Utah require dog licensing and cat licensing. Out of the 29 counties, 3 do not require licensing at any level. The licensing requirements can help track dog and cat populations in Utah and keep a record of the levels of dog and cat population growth or decline overtime. If compared to animal shelter adoption numbers, these records can determine where these animals are coming from. If the population number is growing but the adoption numbers from shelters during the same time period do not meet that growth pattern, than it can be speculated that the majority of the animals are coming from pet stores, breeders, migration, or puppy/kitten mills. Especially in the rural areas and counties of Utah, these records can potentially determine whether there are puppy/kitten mills in business and investigations can be done to find whether these businesses are up to par in business and animal rights laws. Many pet owners do not license their pets even when required but licensing is the only way to get an exact number of pet dogs and cats living in an area. Using GIS, a thematic map of Utah has been made to create a visualization of the different counties in Utah that require licensing at which levels. Since not all of Utah is the same with licensing requirements and many counties do not have the tools to access the licensing numbers, it is very difficult to track the population numbers per year for dogs and cats. With this discovery, this research is to be used as an educational tool to better the understanding of licensing in Utah and its importance. The subject of dogs and cats as pets, where they come from, and what their lives entail is also an educational outcome of this research.

INTRODUCTION

The overpopulation of domestic dogs and cats in the U.S. is taking a toll on animal shelters that hold these animals across the country. The amount of cats and dogs in the U.S. has become such a problem that there aren't enough willing and responsible homes for all of these animals (American Humane Association, 2013). This leads to healthy cats and dogs being euthanized every 11 seconds each year because of overpopulation (The Humane Society of the United States, 2014). Overpopulation is caused by over-breeding (neglect to spay or neuter) and by high-number relinquishment of these animals by owners (American Humane Association, 2013). This research is [illegible] because many studies have found that pets [illegible] benefit humans in psychological [illegible] sometimes, physical [illegible]

METHODS

- Phone calls to animal shelters, city offices, and county offices.
- Emails to animal shelters, city offices, and county offices.
- Researched animal shelters, city, and county websites.
- Recorded data with Excel and Word documents.
- Created a map with ArcGIS.

RESULTS

Dog License Requirements and Dog Shelters in Utah Counties

County	Cities	2013 Dog	2014 Dog	2013 Cat	2014 Cat
Carbon	Included	566	376	Not req	Not req
Morgan	Included	371	538	Not req	Not req
Salt Lake	Not all Included	20540	19912	2050	2227

CONCLUSIONS

- Many of the cities and counties in Utah have insufficient data or no data.
- The cities and counties in Utah that keep the record of licensed dog and cat population numbers keep the numbers combined together without the ability to separate them.
- Cat data was more difficult in finding data and information.
- Many animal shelters across Utah are unable or unwilling to divulge data and information.
- There is insufficient data at this time to find the true licensed dog or cat population numbers in Utah.

FUTURE

- Create awareness of this issue and the unintended consequences of not licensing.
- Create awareness of potential sites of puppy/kitten mills in rural parts of Utah where licensing is not required or enforced.
- Present map at the Maps on the Hill event for legislators to understand these issues.

REFERENCES

[illegible]

ACKNOWLEDGEMENTS

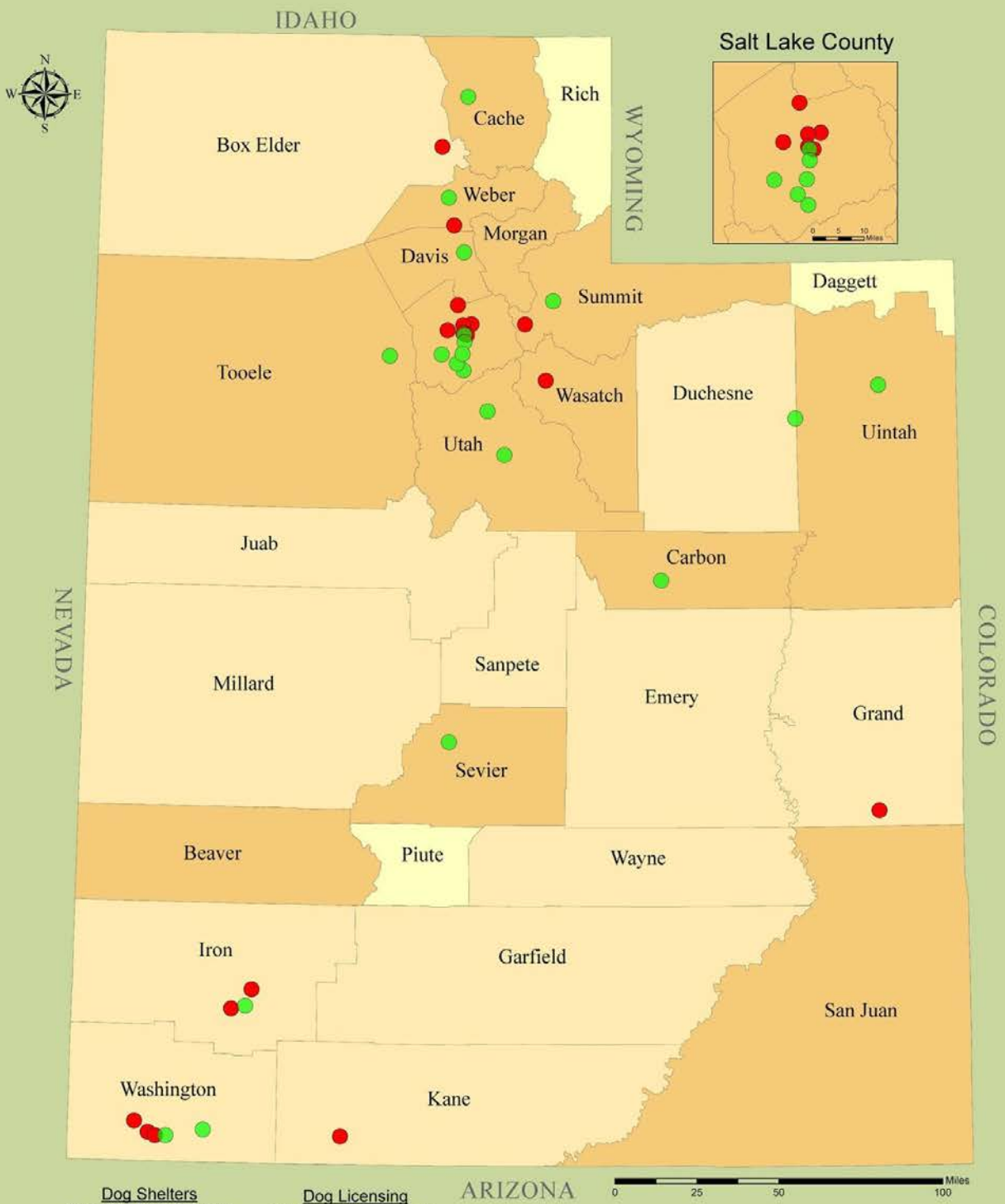
The University of Utah's Undergraduate Research Opportunities Program (UROP), University of Utah's Department of Geography, [illegible] Conference on Undergraduate Research (UCUR), ESRI [illegible] University of Utah's Marriott Library, University of Utah

County	City	2013 # Dog	2014 # Dog
Carbon	Included	566	376
Morgan	Included	371	538
Salt Lake	Not all Included	20540	19912

Many counties in Utah do not require dog licensing on the county-level. Instead, many leave it up to the main cities or towns and do not require licensing in unincorporated areas or other areas outside said cities or towns. Since Utah is mainly rural, there are many areas that puppy mills can exist and operate, and without licensing requirements, there is no way of finding dog population numbers in Utah and finding where these dogs potentially come from. Whether it be from puppy mills, shelters, migration, breeders, or pet stores. Man's best friend is populating our shelters but more research could be done on where they are coming from and whether they are coming from safe and healthy environments. This research could be done with better licensing requirements and enforcement and better record keeping. The data that is collected by counties, cities, and/or towns is sometimes also combined with cat licensing numbers, making it difficult to separate the two populations. The map on the following page was created with ArcGIS (ESRI) after several phone calls to Utah counties and animal shelters.

I am a student at the University of Utah in the Department of Geography and am happy to share my research in this book.

Dog Shelters and Dog License Requirements in Utah Counties



Dog Shelters

This map includes only those animal shelters that have an intake and outtake (adoptions) of dogs. Those dogs in the shelters represented by green dots that are not adopted in time (some shelters have a time limit of as little as 7 days) can be euthanized. Although, just because the green dots represent regular shelters, it actually does not mean they euthanize more than the "no kill" shelters. Some "no kill" shelters are considered "no kill" on the basis of euthanizing less than a certain percentage of animals a year. Others don't euthanize at all. There is no such thing as a "bad" shelter based on whether they are considered "no kill" or not. But keep in mind that unfortunately an overpopulation of dogs has caused many shelters to take in more dogs than can be adopted out. This means that for every dog that is bought from another source (breeders, pet stores, puppy mills, online, parking lots, etc), the more likely it is for a shelter dog to be euthanized.

Dog Licensing

Dog licensing is an important step for many dog owners each year. Licensing your pet dog has many benefits. For example, if a licensed dog is lost, the dog will be able to be returned to its owner quickly; a license ensures a current rabies vaccination (which is federal law to obtain); a license helps determine dog populations; a license helps crack down on animal hoarding and neglect, and many more. In Utah, some counties require dog licensing and many counties do not. Some counties that do not require dog licensing have cities within the county that do require licensing, but unincorporated areas of the county are not required. Native American land does not require dog licensing. Any county that does not require or enforce dog licensing, especially in unincorporated and/or rural areas, may have a higher chance of puppy mills and hoarding. This is a huge problem across the whole nation. This data is collected as of October 31, 2014.

Dog Shelter

"No Kill" Dog Shelter

Utah County License Requirement

No Requirement on Any Level

City-Level Requirement

County-Level Requirement

Cartographer: Marli Stevens
Projection: NAD 1983 UTM Zone 12N
Section: 002
Sources:
Salt Lake County Animal Services, Rich County Clerk's Office, Morgan County Animal Services, Cache County Executive Office, Weber County Animal Services, Box Elder County Clerk's Office, Tooele County Sheriff's Office, Davis County Animal Control, Summit County Animal Control, Wasatch County Clerk's Office, North Utah Valley Animal Shelter, Roosevelt City Dog Shelter, Daggett County Clerk's Office, Uintah Animal Control, Carbon County Clerk's Office, Sanpete County Government Offices, Juab County Clerk's Office, Millard County Government Offices, Sevier County Sheriff's Office, Emery County Auditor's Office, Grand County Clerk's Office, Wayne County Sheriff's Office, Piute County Recorder's Office, Beaver County Animal Control, Iron County Animal Control, Garfield County Clerk's Office, San Juan County Sheriff's Office, Washington County Clerk's Office, Kanab Police Department, South Salt Lake Animal Control Shelter, Best Friends Animal Society, Utah Animal Adoption Center (UAAC), Salt Lake County Animal Services, Humane Society of Utah, Second Chance for Homeless Pets, West Valley Animal Shelter, Murray Animal Shelter, West Jordan Animal Shelter, South Jordan Animal Control Shelter, Sandy Animal Services, Draper Animal Control Shelter, Cache Humane Society, Weber County Animal Services Shelter, Brigham City Animal Control Shelter, Tooele City Animal Shelter, Davis County Animal Control Shelter, South Ogden City Offices, Summit County Animal Control, Friends of Animals Utah/Furbarbia, Heber Animal Shelter, North Utah Valley Animal Shelter, South Utah Valley Animal Shelter, Roosevelt City Animal Shelter, Uintah Animal Shelter, Carbon County Animal Shelter, Sevier County Animal Shelter, Cedar City Animal Shelter, Iron County Dispatch, Washington Animal Shelter, St. George Animal Control Shelter, Hurricane City Animal Shelter, Ivins City Animal Shelter, Google Maps, ESRI, ArcMap

DOWNWINDERS OF UTAH ARCHIVE:

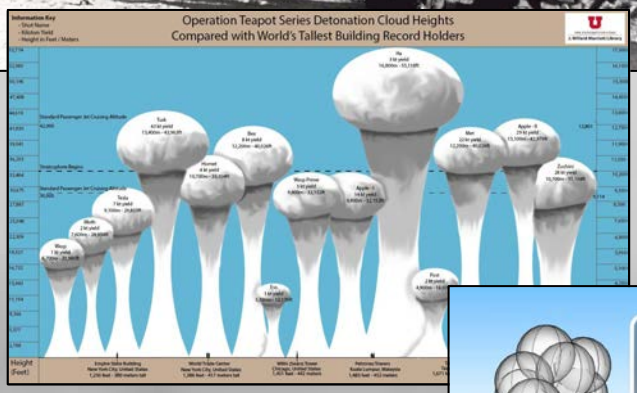
The Downwinders of Utah Archive presents an in-depth study of the nuclear detonations, radioactive fallout and events, which resulted in devastating effects for Utah's "Downwinder" population. Through the creation of an interactive timeline, detailed information on nuclear detonations from the Nevada Test Site and fallout statistics for all Utah counties are presented through cartographic maps, animated reconstruction models, interactive motion charts and a variety of graphics related to testing methods, cloud heights and dispersal patterns. In additional to these components, this archive includes historic photographs and videos of nuclear detonations, archived newspaper articles, and documentation depicting impacts and government deception imparted to residents, as well as oral history interviews from a few of Utah's surviving Downwinders.

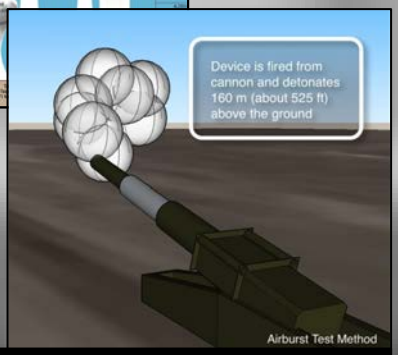
DOWNWINDERSOFUTAH.ORG

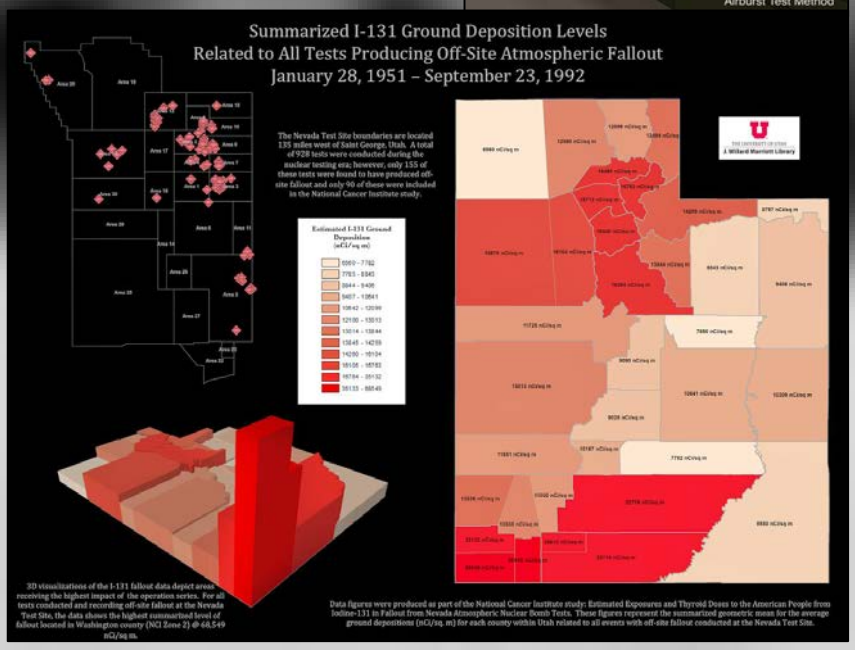
ALL U NEED J. Willard Marriott Library THE UNIVERSITY OF UTAH

Downwinders of Utah Archive

An interactive geospatial timeline depicting the story of Utah nuclear fallout related to atmospheric testing from the Nevada Test Site







Beginning in 1951, the era of nuclear weapons testing was a time of tremendous change at both national and local levels. In the name of national security, a variety of nuclear weapons were tested in a remote area of the Nevada desert known as the Nevada Test Site. Fallout and radiation from these tests have affected communities across the nation, including Utah, resulting in the loss of property, health and life.

<u>Archive Components</u>

- GIS / Cartographic Maps and Visualizations
  Examination of Iodine-131 ground deposition data for all Utah counties presented by individual events and test series summaries for comparative examination

- Interactive Health / Radiation Exposure Statistics
  A new perspective for examining thyroid dosage and Iodine-131 concentrations through the interactive comparison and visualization of raw datasets

- Nuclear Detonation Reconstruction Animations
  A series of animations portraying the set-up, detonation breakdown and aftermath of each type of nuclear test conducted (2D and 3D)

- Historical Articles, Events and Documentation
  Chronological collection of published materials and online resources depicting views, events and deception

- Infographics and Public Domain Multimedia
  Chronologically incorporated images, videos and detonation visualizations complemented by charts and diagrams on a variety of topics

- Oral History Interviews with Downwinder Victims
  A collection of contributed interviews relaying a unique perspective and deeper understanding of events and resulting impacts

Sources: The United States Federal Government, National Nuclear Security Administration, National Cancer Institute and additional resources through the J. Willard Marriott Library.
downwindersofutah.org

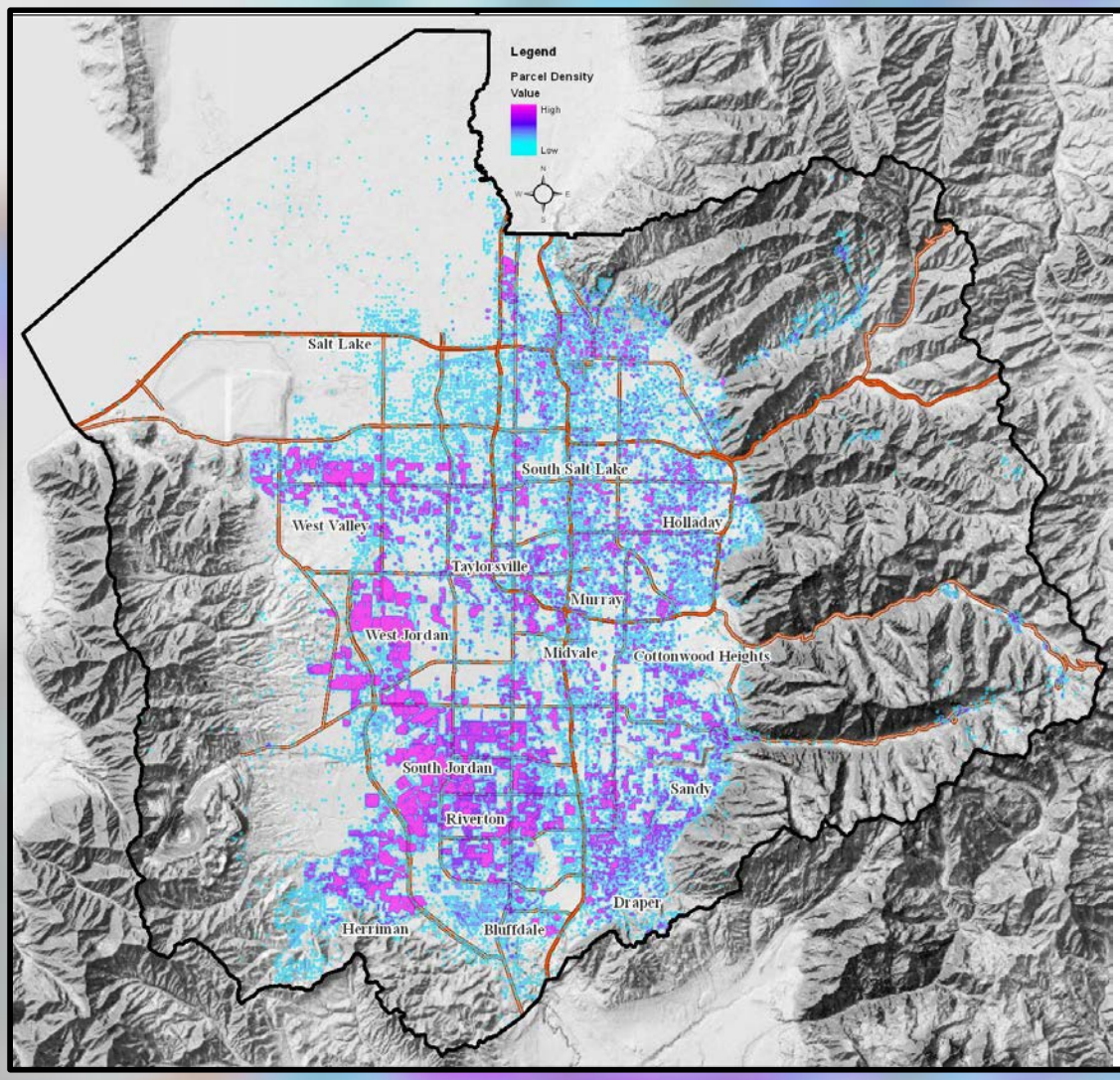
Justin Sorensen
J. Willard Marriott Library
University of Utah
justin.sorensen@utah.edu

J. Willard Marriott Library
THE UNIVERSITY OF UTAH

ALL U NEED

The Changing Face of Salt Lake County

36-year Analysis of Parcel Growth from the Salt Lake County Recorder

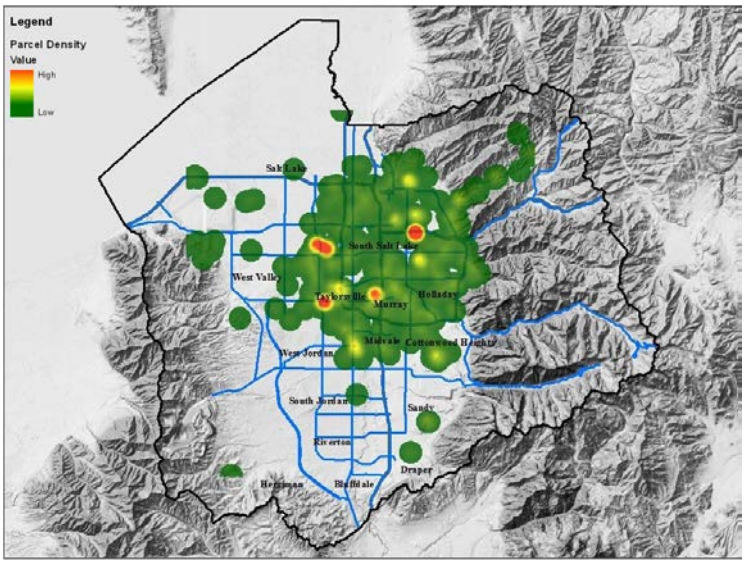


In the beginning of 1980 there were 238,000 parcels in the county. By the end of 2015 there were 373,000 parcels. A difference of 135,000 or 36.2%. Roughly 1.3% growth/year.

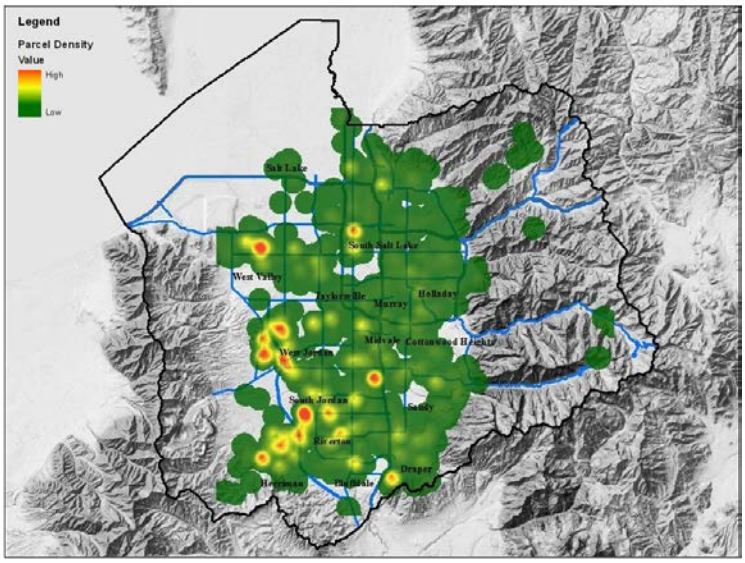
The map to the left shows a kernel density analysis of the entire 36 year span. The highest concentrations of new parcels are west of I-15 and south of I-80. Year-to-year analysis maps like those below contain the variations of kernel densities and will be seen in an app available for the Maps on the Hill event.

How do you think Salt Lake County might use this information to predict growth in the future? Could that help make more informed policy decisions? Tell us your thoughts on the Hill!

Density in 1980



Density in 2003



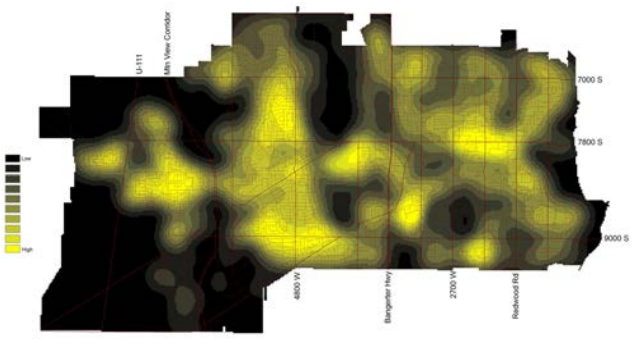
Gary Ott - Salt Lake County Recorder, Julie Dole - Chief Deputy Recorder, created by the staff of the Recorder's Office
Phone: 385.468.8145 Website: recorder.slco.org Address: 2001 South State Street,#N1-600, SLC, UT 84190

Crime & Street Light Analysis

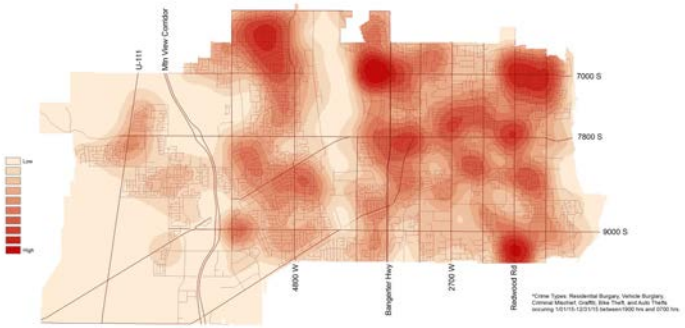
The City of West Jordan, with help from the West Jordan Police Department, created these maps to find areas where street lighting was sparse and where property crime rates occurring at night were high. Using spatial analysis to compare this data, West Jordan wanted to see if there were correlating areas between the two datasets.

West Jordan will now look to use this information to make a more informed choice on where to focus their efforts in placing additional street lights.

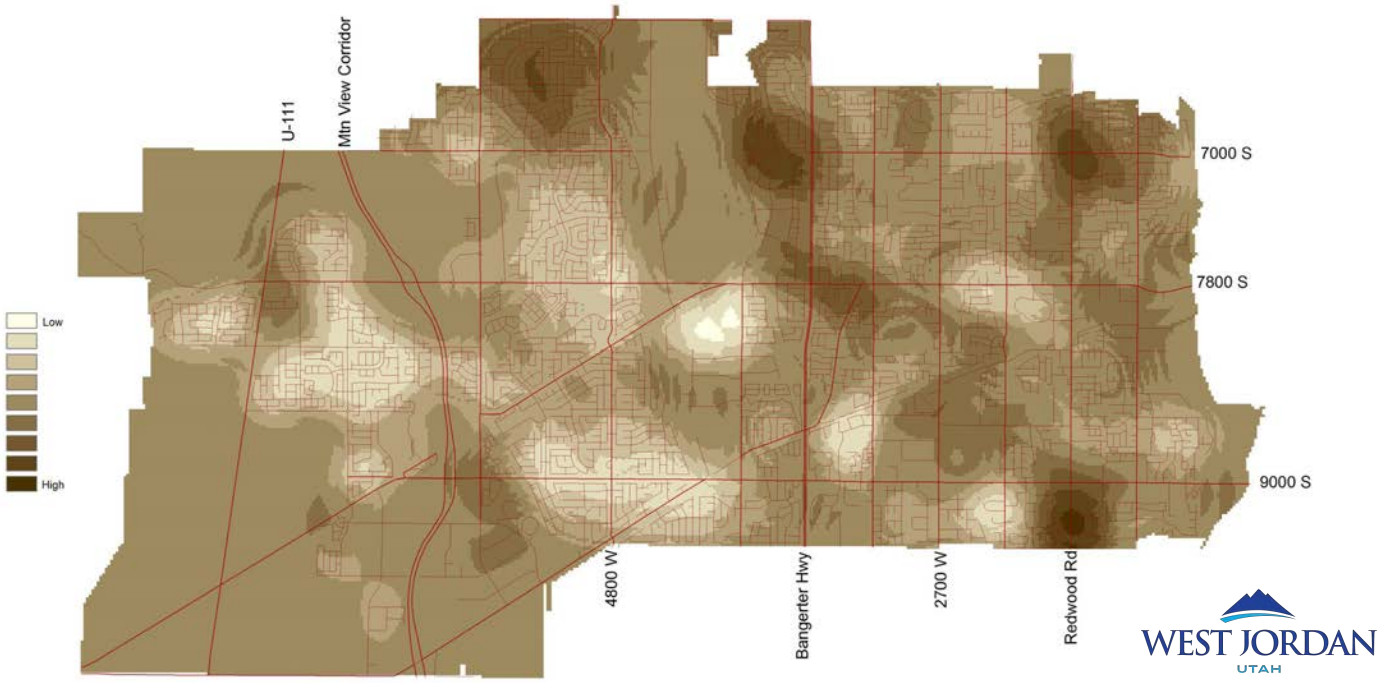
Street Lights



Crime



Correlating Areas



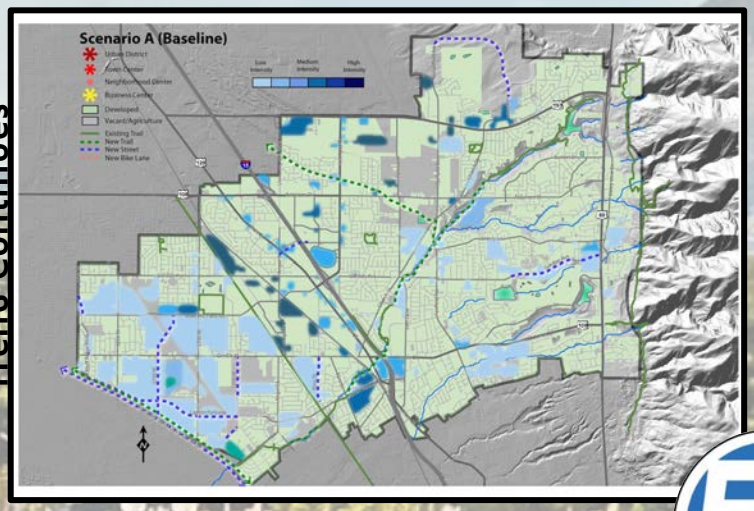
ENVISION LAYTON

What do you Envision...?

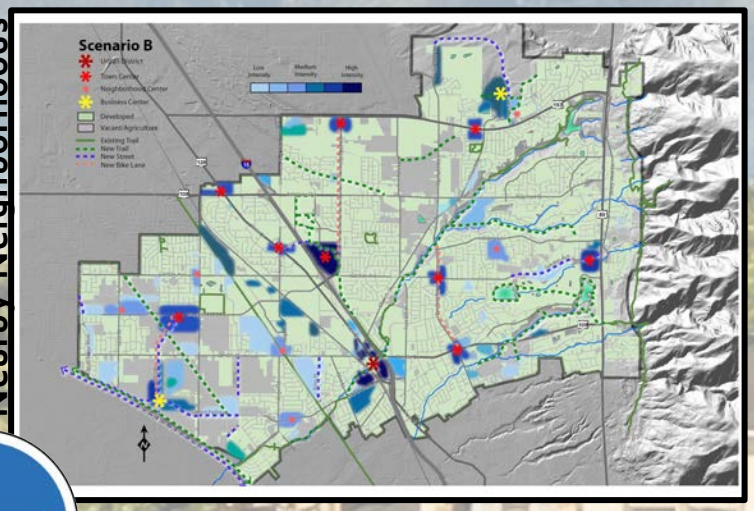
Envision Layton is a city-wide visioning process, enabling us to understand the long term consequences of the choices we make now. Together, let's make sure our kids, grandkids, and others who come after us have a great place to live.

Implementing Wasatch Choice 2040 Locally...

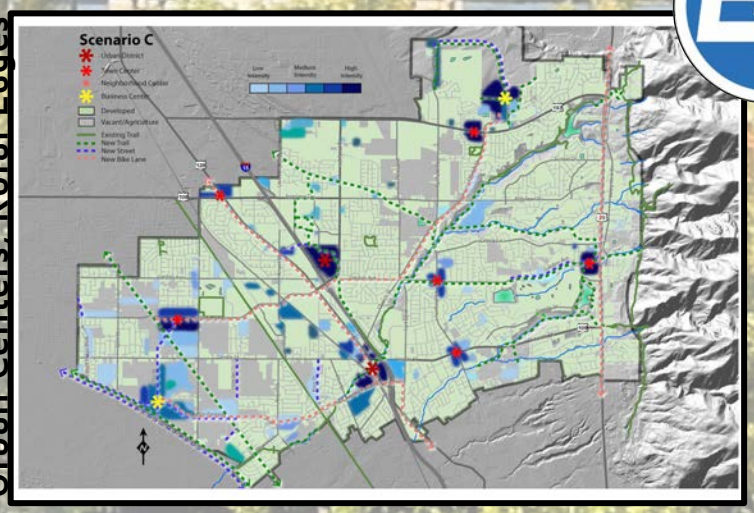
Trend Continues



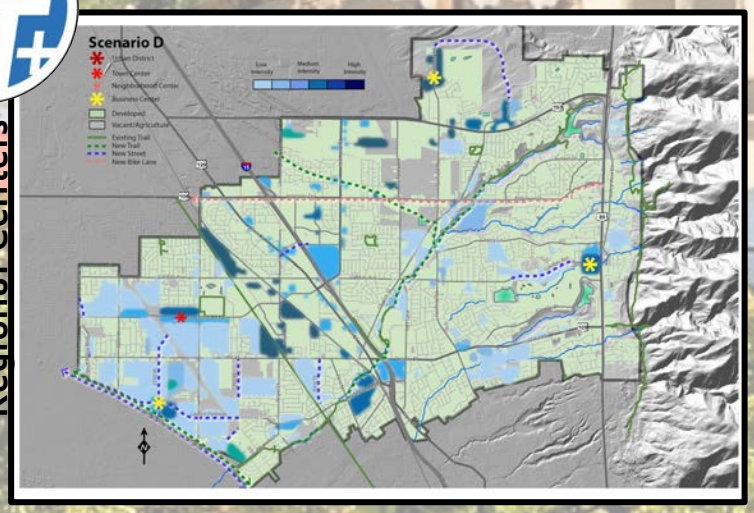
Nearby Neighborhoods



Urban Centers, Rural Edges



Regional Centers



Local Planning Resource Program

Layton City

WASATCH FRONT REGIONAL COUNCIL

Envision Utah How we grow matters.

Envision Tomorrow Plus(ET+)

A Wasatch Choice for 2040 toolbox tool was used to determine the impacts of each growth scenario

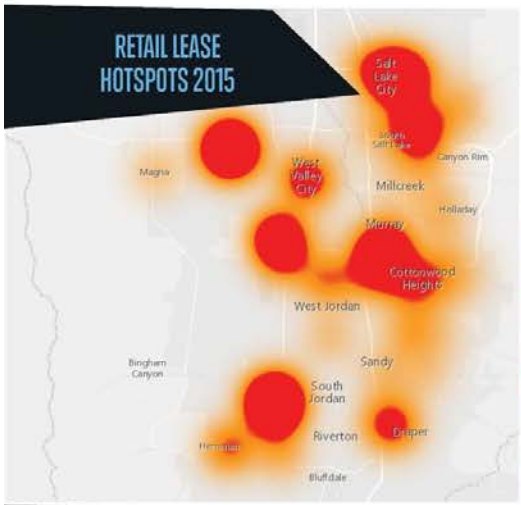
Layton City Community & Economic Development
Peter Matson & Brandon Rypien

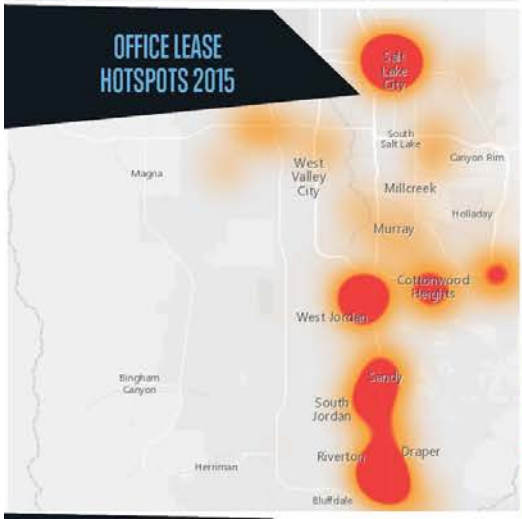
www.envisionlayton.org

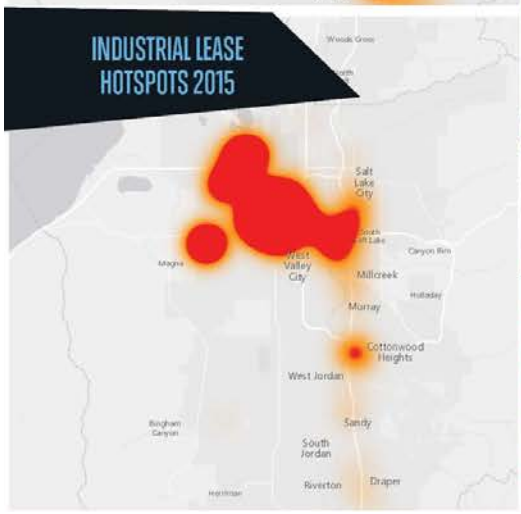
INTERACTIVE COMMERCIAL MAPS FOR REAL ESTATE

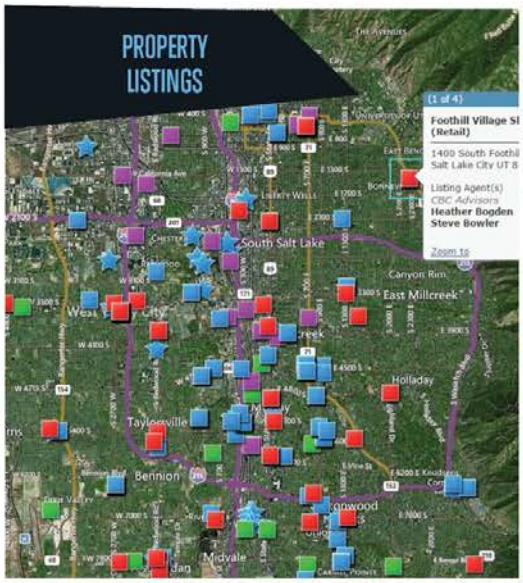
Justin Johnson - GIS/Mapping Manager
justin.johnson@cbcadvisors.com

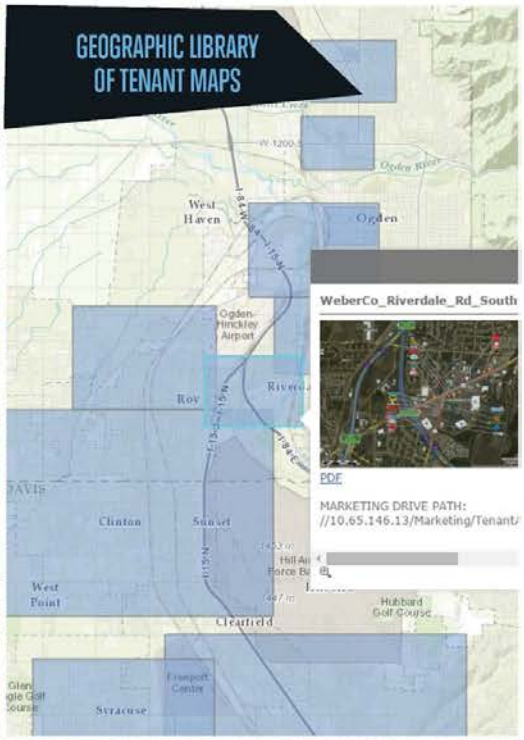
Brandon Dalton - Graphics/GIS Specialist
brandon.dalton@cbcadvisors.com











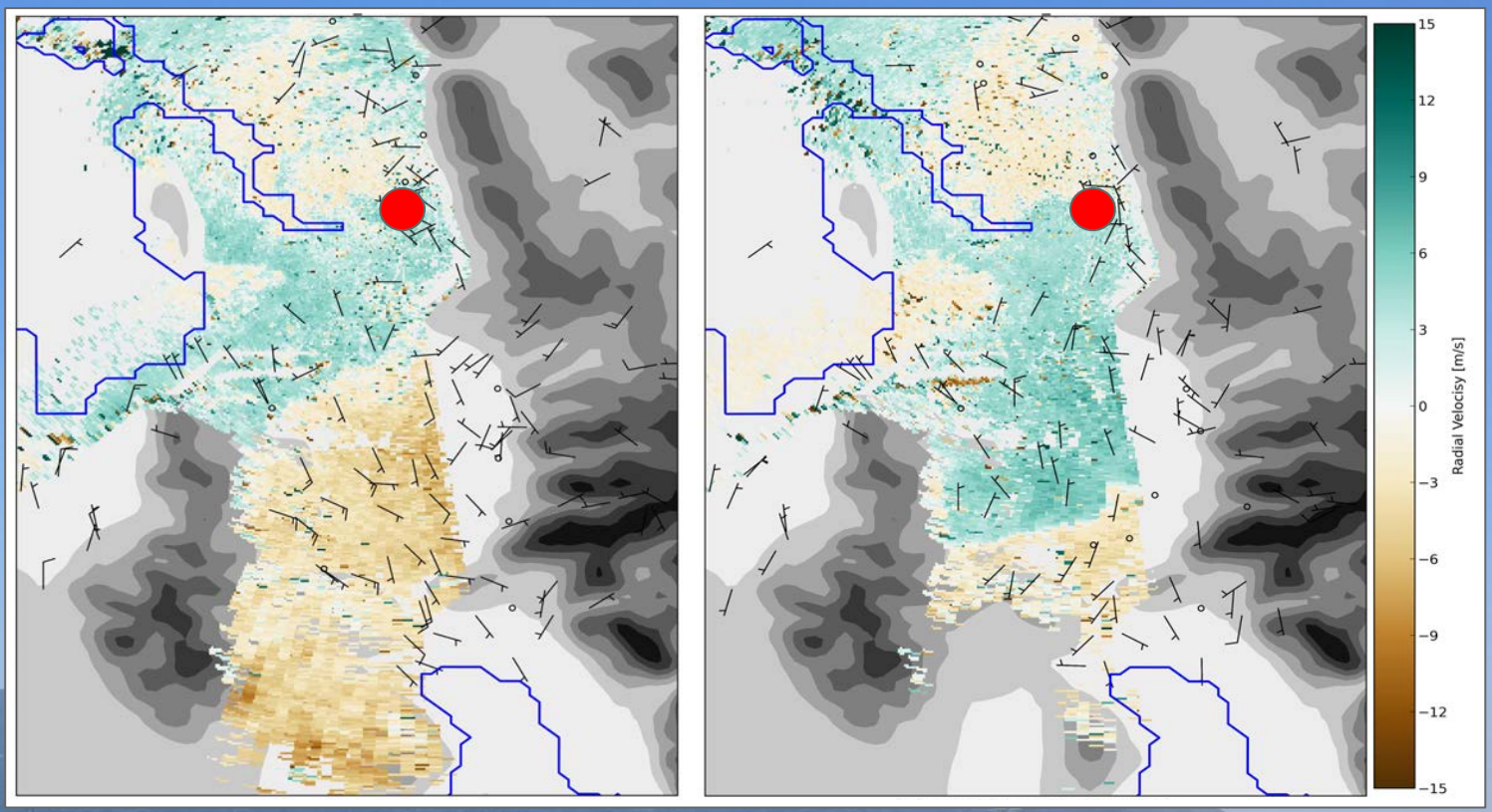
Lake Breeze: Observation

A strong lake breeze in the Salt Lake Valley on 18 June 2015 was observed by surface weather stations available via MesoWest and the Terminal Doppler Weather Radar (TDWR).

The blue outline represents the Great Salt Lake and Utah Lake. Terrain is shaded grey. Location of the TDWR is indicated by the red circle. Color shading represents radial wind velocity with respect to the radar. Green is winds blowing away from radar and orange is winds blowing toward radar. Wind observations at surface weather stations are marked by wind barbs. One full barb represents 5 m/s.

June 18, 2015
3:00 PM

June 18, 2015
7:00 PM



Lake breeze front located at north end of Salt Lake Valley where southerly and northerly winds converge.

Lake breeze front moved south, nearly filling the entire valley.

THE UNIVERSITY OF UTAH

Animated movies available online:
home.chpc.utah.edu/~u0553130/Brian_Blaylock/mapsonthehill.html

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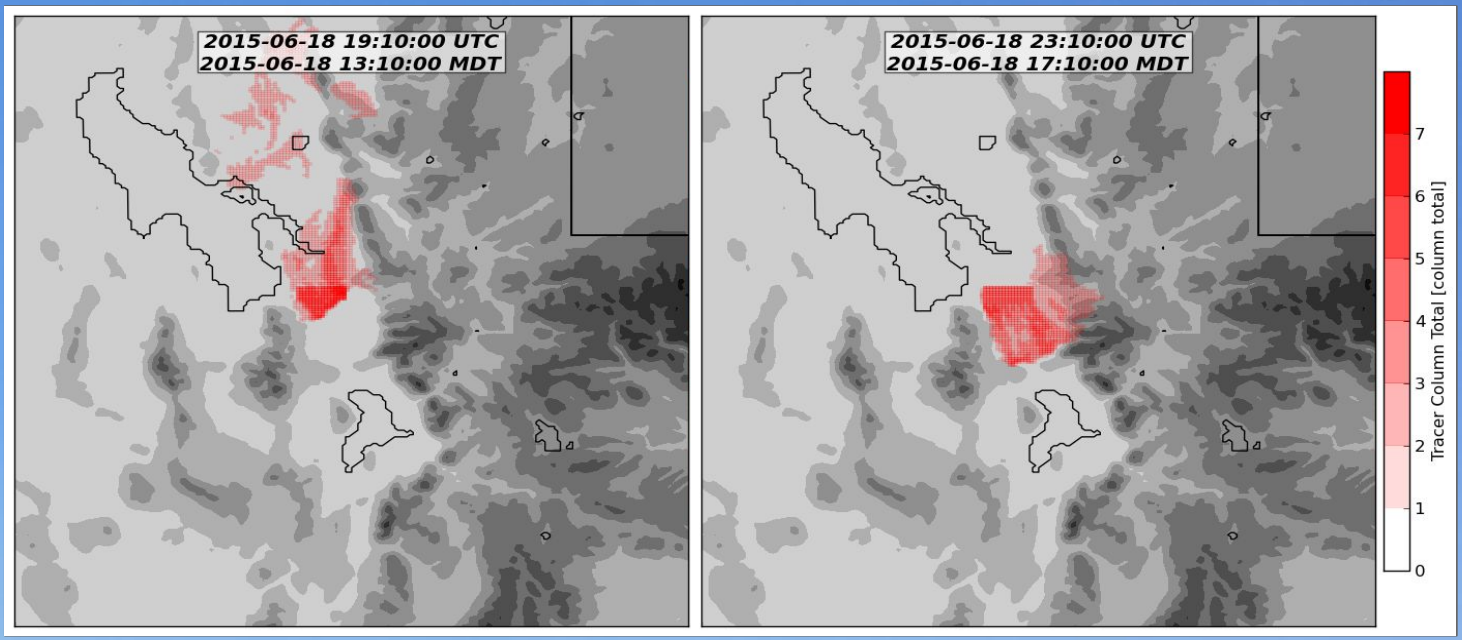
Department of Atmospheric Sciences
University of Utah
brian.blaylock@utah.edu

Lake Breeze: WRF Simulation

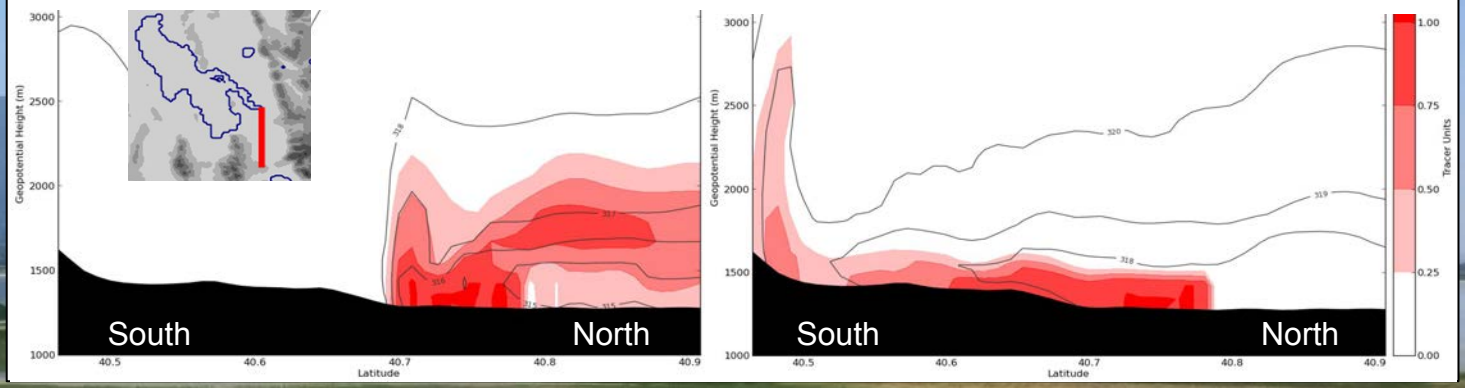
The lake breeze on 18 June 2015 contributed to poor air quality in the Salt Lake Valley with high ozone concentrations brought to the valley from the lake.

This event was simulated using the Weather Research and Forecast (WRF) model. Passive tracers inserted at the northern end of the Salt Lake Valley are used to visualize the transport and dispersion of pollutants. While the modeled lake breeze is three hours earlier than observed, these tracers help visualize how pollution is dispersed during a lake breeze event.

June 18, 2015 1:10 PM	June 18, 2015 5:10 PM



Cross Section



Animated movies available online:
home.chpc.utah.edu/~u0553130/Brian_Blaylock/mapsonthehill.html

Brian K. Blaylock
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University of Utah
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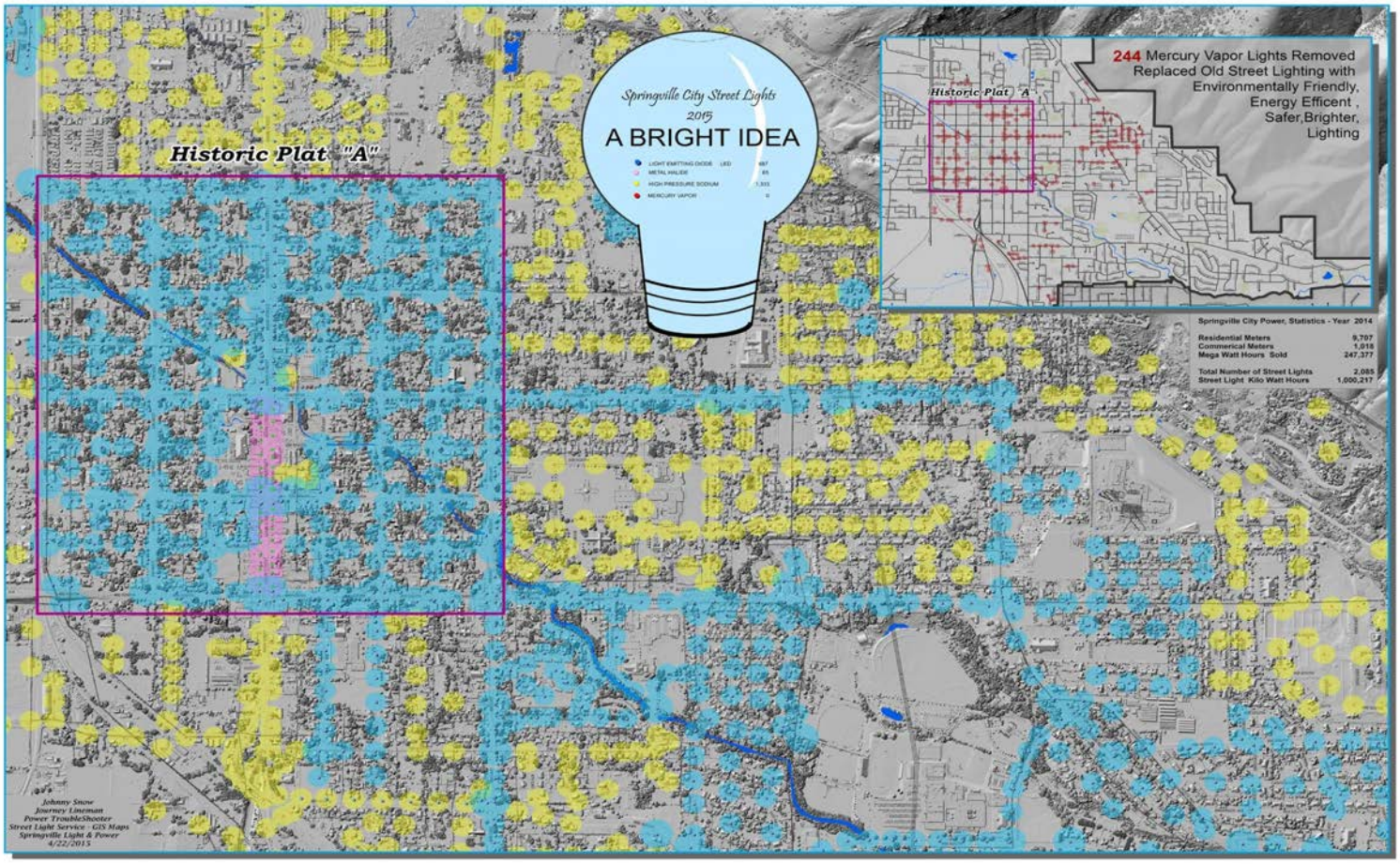
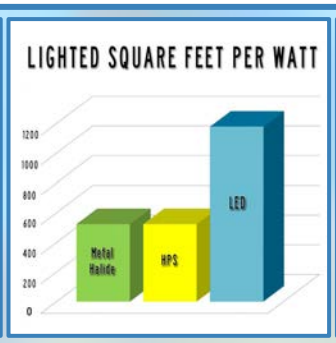
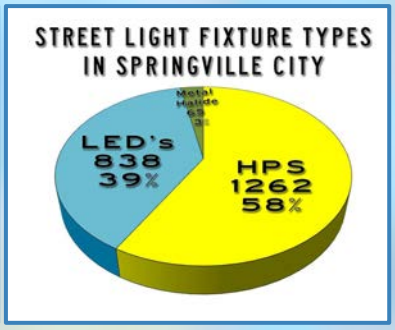
LED Street Lighting in Springville

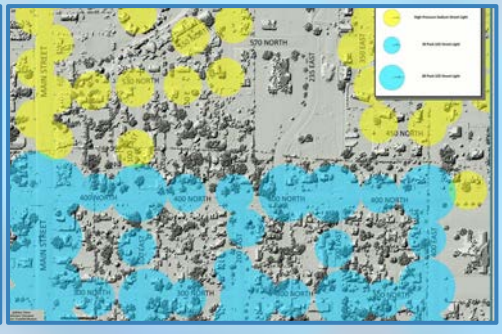
Light Emitting Diode (LED) Street Lights are Illuminating The Art City

Street lighting is a fundamental service that Springville Power and Light provides. It is important to us to take steps to improve our street lighting as well as improve efficiency. LED lighting is an excellent example of how we can provide better service as well as cut costs. Springville Power and Light is migrating to LED light fixtures from older technology lights such as metal halide, high pressure sodium, and mercury vapor lights. LED lights are more efficient than these older technologies. LED's are also better for the environment. In addition, LED lights cast a larger light footprint than older style lights. This map was developed to visualize the street light inventory and the light footprint that can be expected from each type of light. It is also helpful in planning where to direct resources toward installing LED lights. This map clearly shows the number of LED's in operation and the increased light footprint cast by the LED's. Springville Power and Light will continue in its commitment to providing the best street lighting service in an environmentally responsible and cost efficient way. It is our plan to continue to leverage emerging technology like LED lighting to provide better service and cut costs.









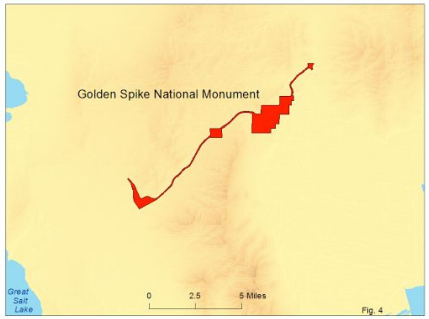
Springville
Community. Service. Reliability.

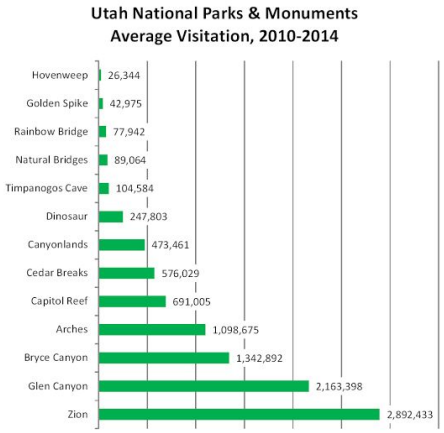
Springville Power and Light: Springville City established its own electric utility in 1904 with the completion of hydroelectric facilities in Hobble Creek Canyon and the installation of poles and wires to deliver the energy to the its citizens. Since that time, the people of Springville have enjoyed the benefits of owning their own electrical system. The primary benefit of local public ownership is the ability of the citizens to have a direct voice in the operation of the utility and the allocation of its derived benefits. The Mayor and City Council are responsible for policy, rates, procedures, and all other matters concerning the operation of the municipal electric utility.

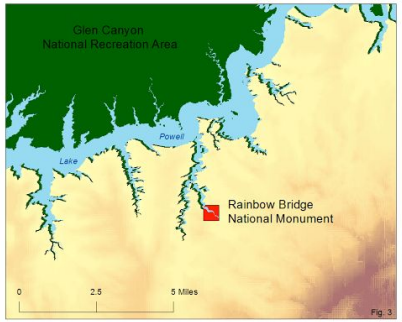
Credits and Sources: Data and resources for this map were provided by Springville City Engineering, Springville City Light and Power, and the Utah Automated Geographic Reference Center. Data is current as of January 2016. Data was collected through the combined efforts of power line crews and technical staff. ESRI ArcGIS Desktop was used to aggregate the data and design the map layout.
Johnny Snow, Power Lineman for Springville Power and Light is the principal contact for this project. Engineering GIS staff provided technical consultation.

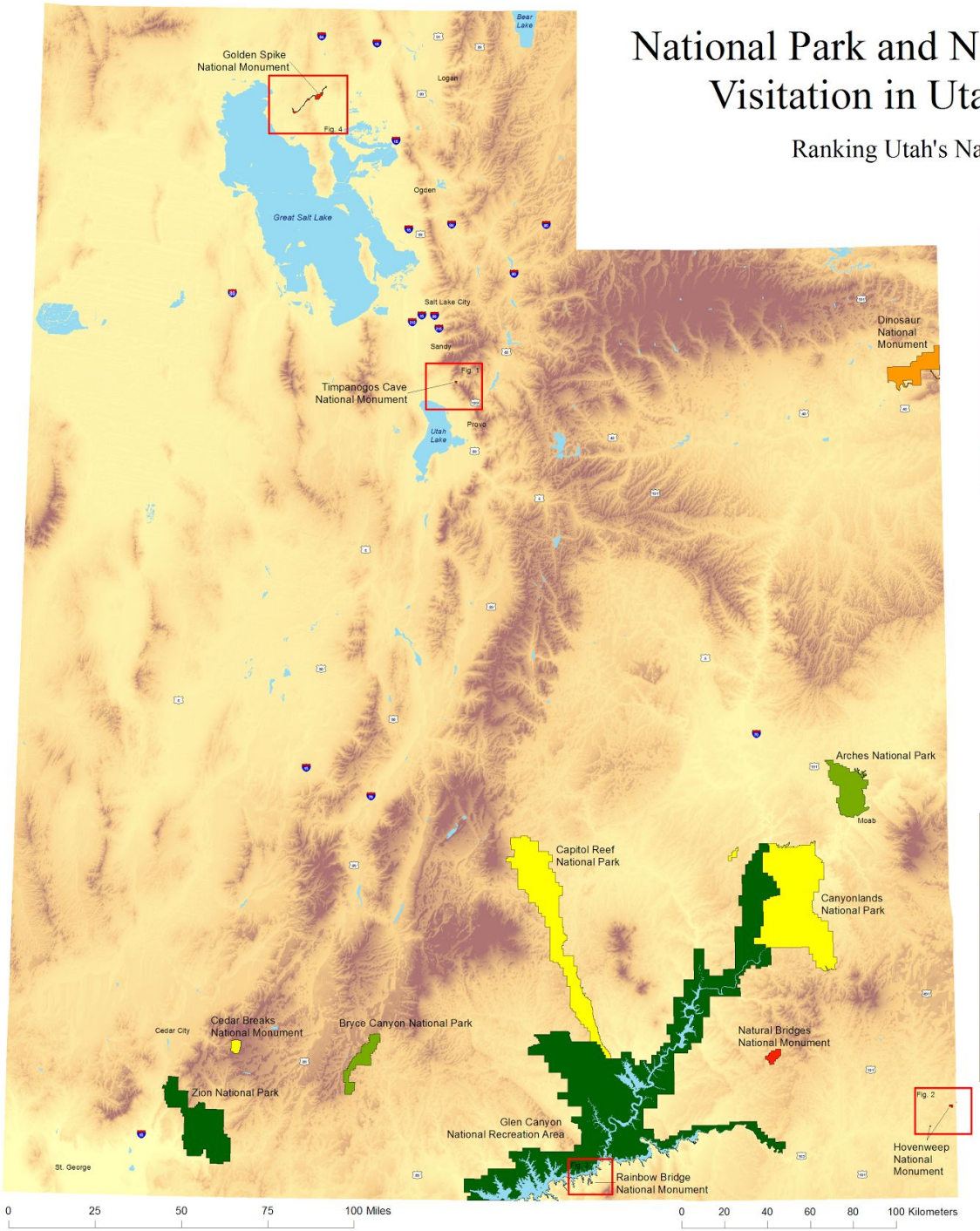
National Park and National Monument Visitation in Utah, 2010-2014

Ranking Utah's Natural Wonders





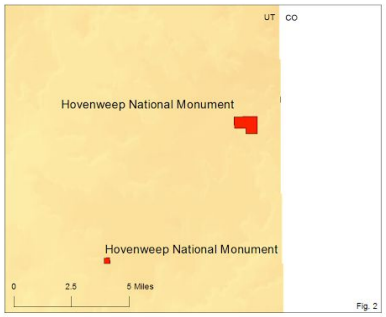




State Highway
Interstate Highway
Lake

Average Annual Visitors (5 yrs)
- 1,400,001 - 2,892,433
- 720,001 - 1,400,000
- 248,001 - 720,000
- 105,001 - 248,000
- 26,344 - 105,000

Elevation Values
- 13,500 feet
- 7,800 feet
- 2,350 feet



December 6, 2015

Cartographer: Chris Fuhriman

Data sources: US Census, Utah AGRC, NPS

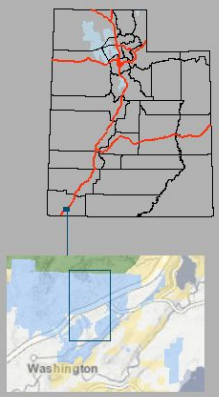
Coordinate system: UTM Zone 12N (NAD 1983)
Projection: Transverse Mercator

Mapping Planned Community Development

State of Utah
School & Institutional
Trust Lands Administration

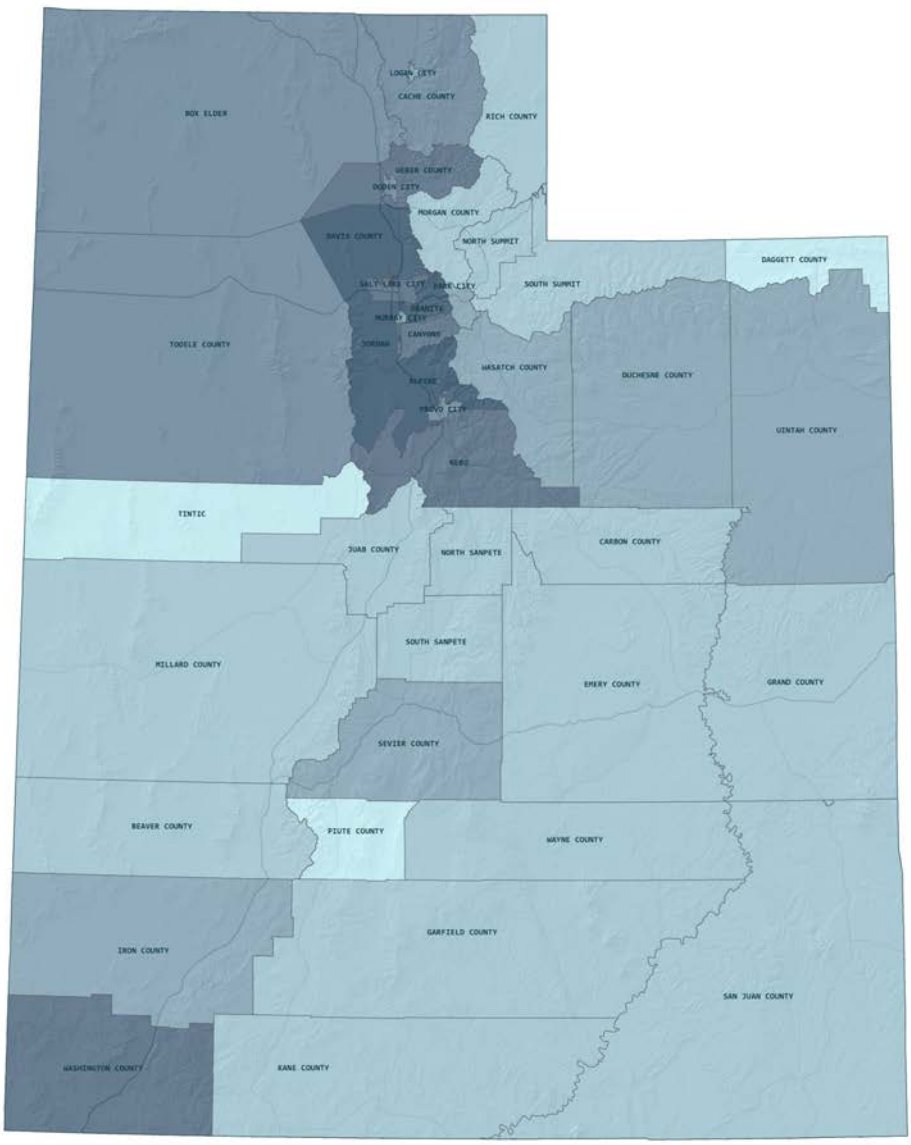
Sienna Hills is +/- 700 acre master planned community located on the north-east side of Washington City. Sienna Hills consists of a variety of planned residential subdivisions, open-space, parkland, trail system, Community Center, school, churches and retail/business areas.

Developing planned communities in southwestern Utah not only helps fund State Trust Lands but provides places to live, work and play while maintaining the beauty and integrity of this natural, fragile landscape.



Steffie Gould, GIS Analyst
State of Utah Trust Lands Administration
801-538-5172

Permanent School Fund Distributions to School Districts



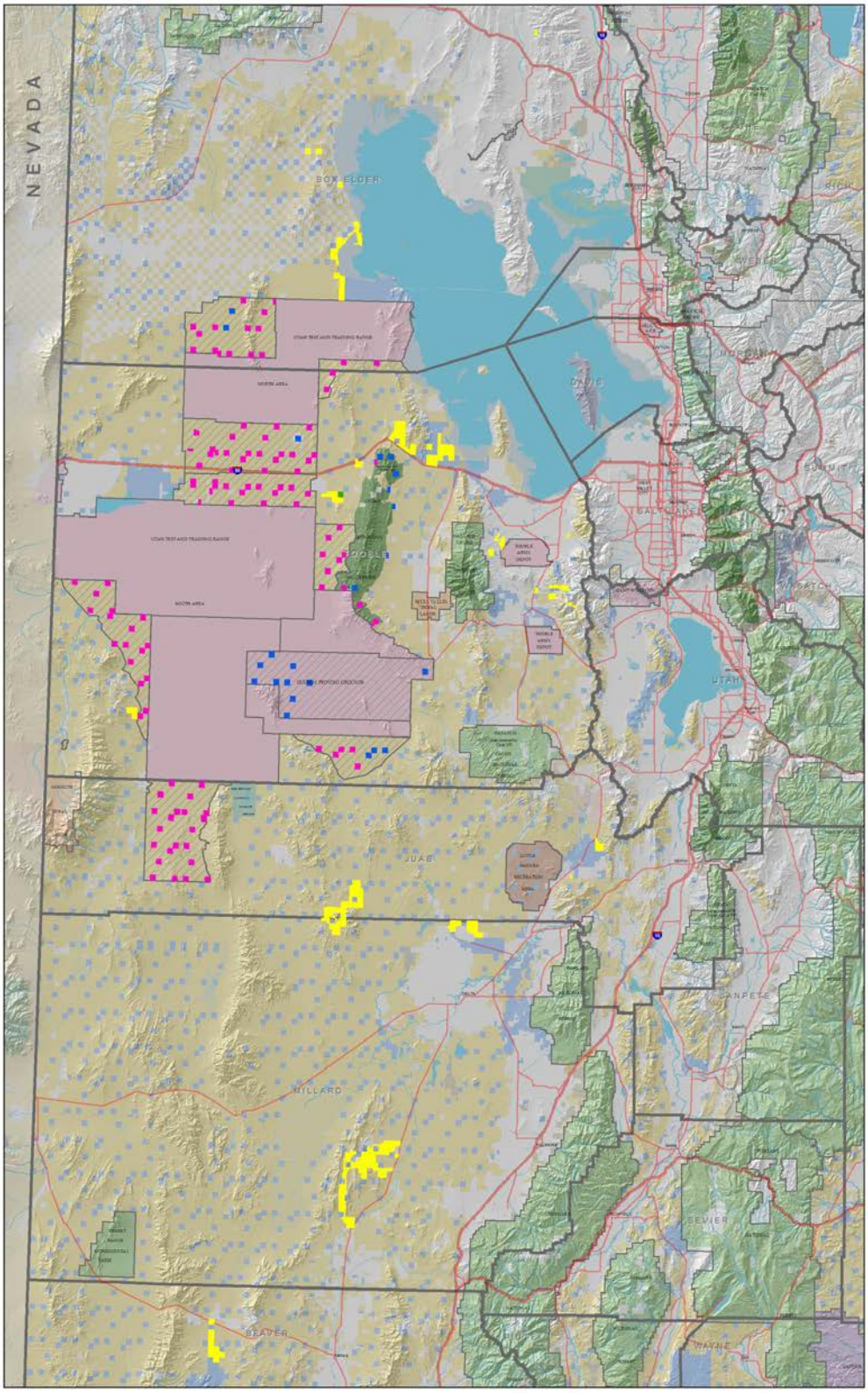
State of Utah
School & Institutional
Trust Lands Administration

Utah's public schools are the beneficiary of 96 percent of all trust lands. Revenue generated from school trust lands is transferred into the Permanent School Fund, growing the endowment for public schools. Income earned from the fund is distributed annually to individual school councils using a per-pupil formula.

This map depicts these distributions for fiscal year 2016 by school district.

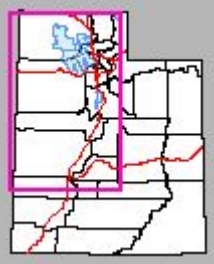
Barry Biediger, GISP GIS Analyst
State of Utah Trust Lands Administration
801-538-5146

Utah Test & Training Range Enhancement



State of Utah
School & Institutional
Trust Lands Administration

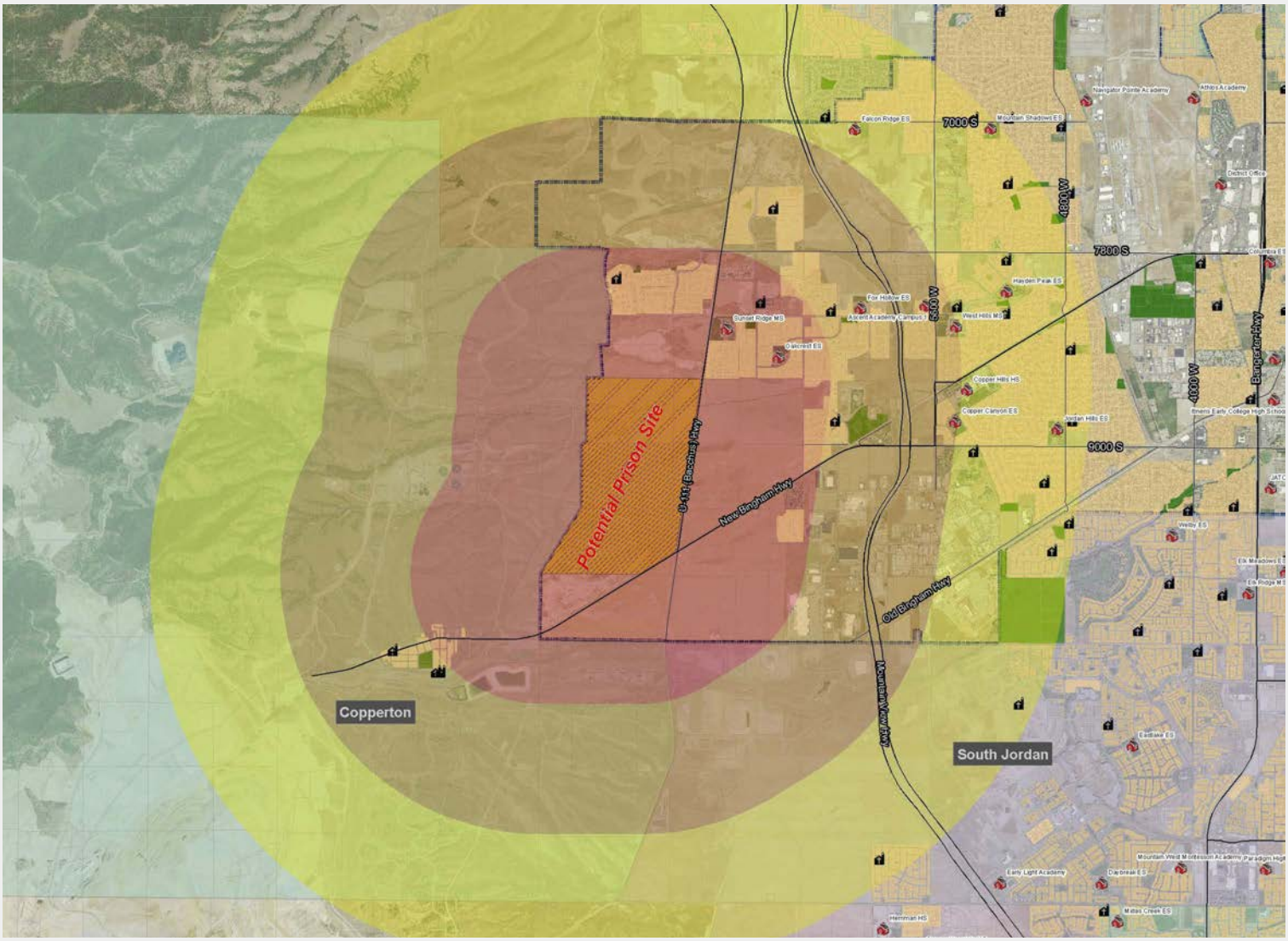
This map depicts the parcels involved in the Utah Test & Training Range Enhancement. Parcels are located in western Utah within the counties of Box Elder, Tooele, Juab, Millard and Beaver.
This exchange involves swapping roughly 84,000 acres of State of Utah School and Institutional Trust Lands Administration (SITLA) parcels (shown in pink & blue) with roughly 97,000 acres of Bureau of Land Management (BLM) parcels (shown in yellow) to expand the Test & Training Range for use by Hill Air Force Base.



Kate Staley, GISP GIS Manager
State of Utah Trust Lands Administration
801-538-5147

Prison Relocation Site Analysis

The City of West Jordan wanted to make a case why it was not the best option in terms of locating the new prison facility. To do so it used GIS to show the proximity of the proposed site within its boundaries to other civil, religious, and educational institutions. Along with this, the current prison site was also mapped to compare the two areas.



Within 1 Mile of Site
Approximate Residential Properties: 1,948
Schools: 2
Parks: 3
Places of Worship: 2

Within 2 Miles of Site
Approximate Residential Properties: 3,803
Schools: 6
Parks: 8
Places of Worship: 8

Within 3 Miles of Site
Approximate Residential Properties: 10,779
Schools: 11
Parks: 23
Places of Worship: 22

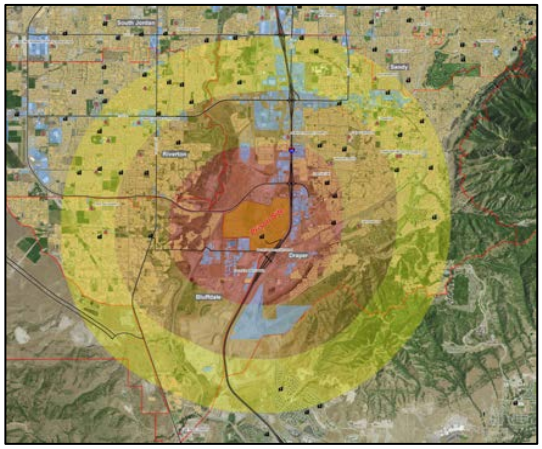
Legend

- Schools
- Places Of Worship
- Major Streets
- Residential Areas
- Parcels
- Parks
- Potential Prison Site
- West Jordan

Buffer Distance

- 1 Mile
- 2 Mile
- 3 Mile

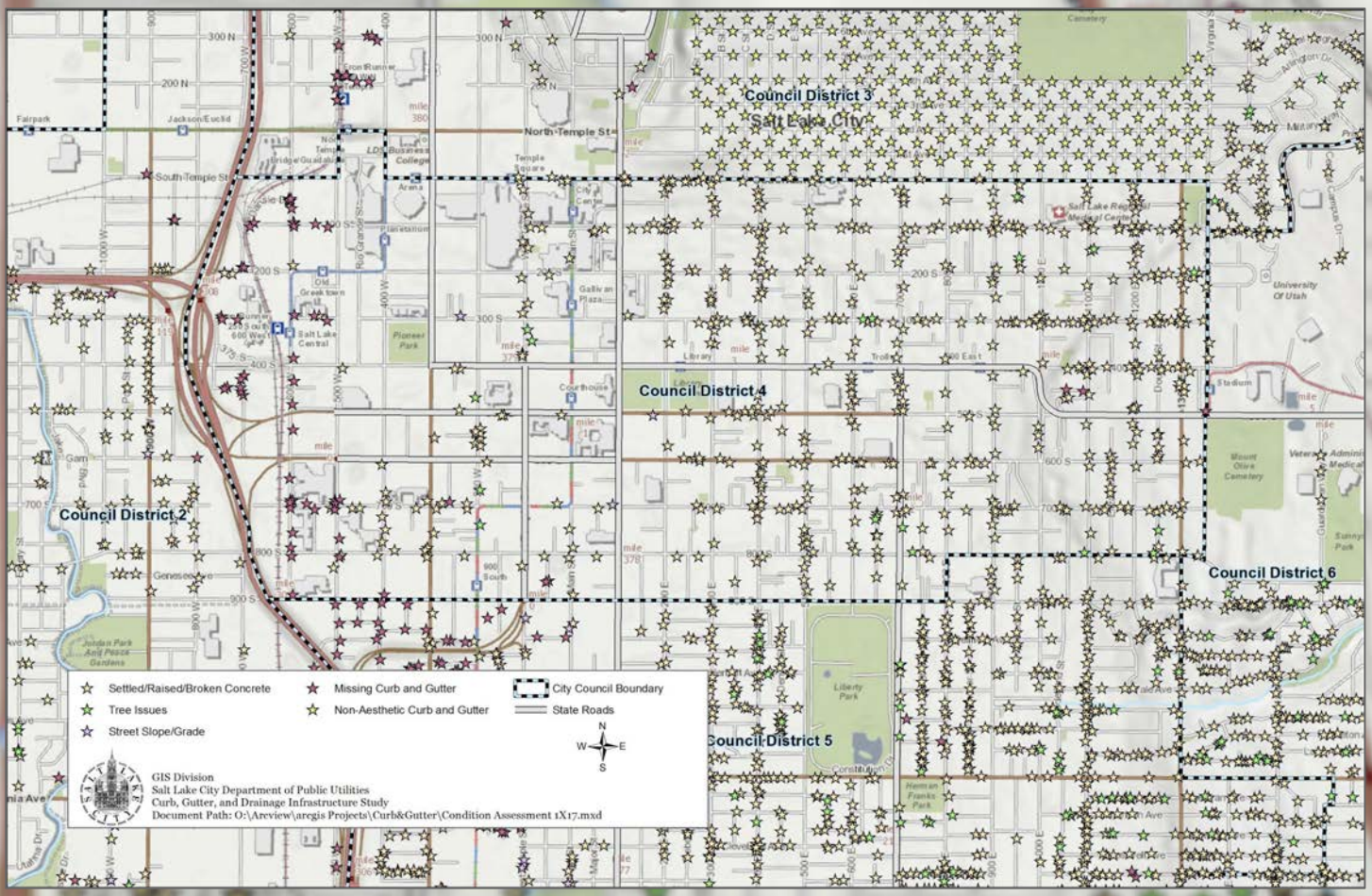
WEST JORDAN
UTAH

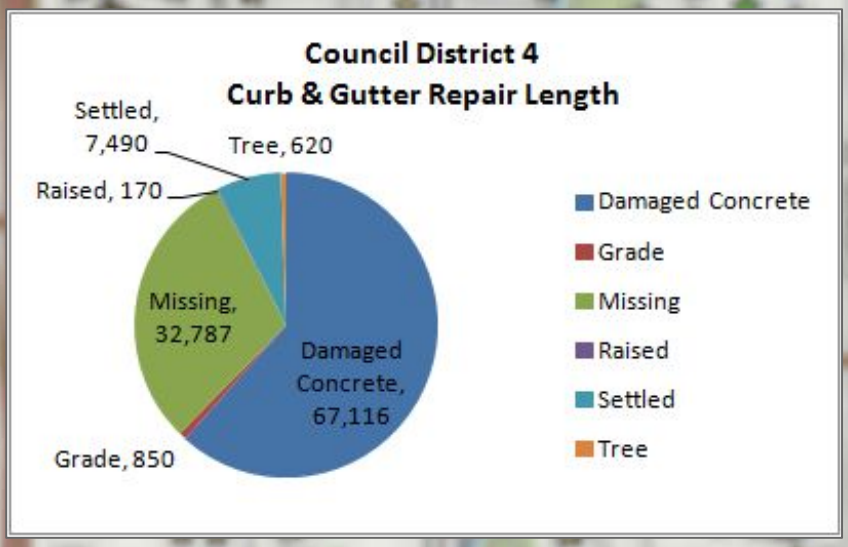


Salt Lake City Curb and Gutter Condition Assessment

Salt Lake City Department of Public Utilities

In 2013, the Salt Lake City Council created a legislative intent to identify areas of the city with drainage deficiencies. City storm drainage crews inspected over 1,000 miles of city streets using a mapping application on iPads to create a map showing locations of curb and gutter deficiencies including missing, raised, settled, tree root caused, or grade issues. Each point on the map shown below is a problem area and has attributes showing the type of defect and the length of repair needed. A cost per foot of repair was calculated for each point and these data were then used to create a report for the council identifying budgetary needs.

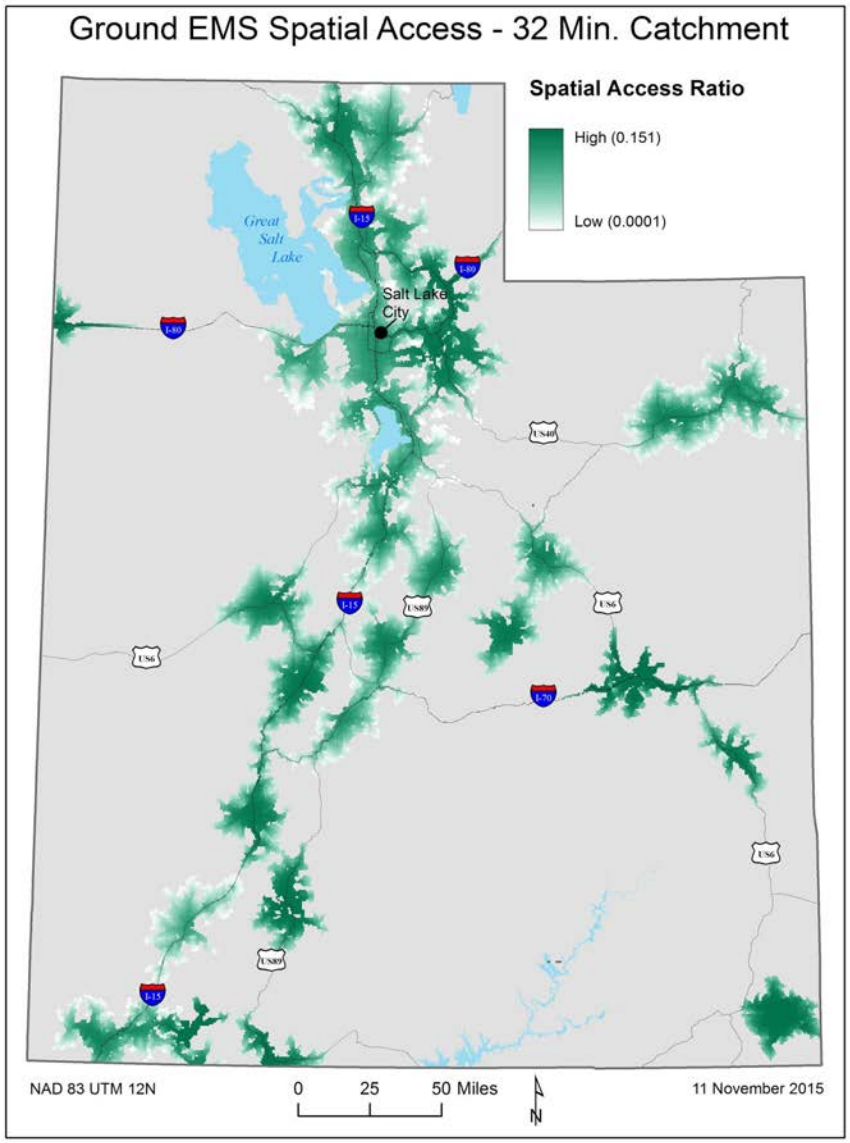


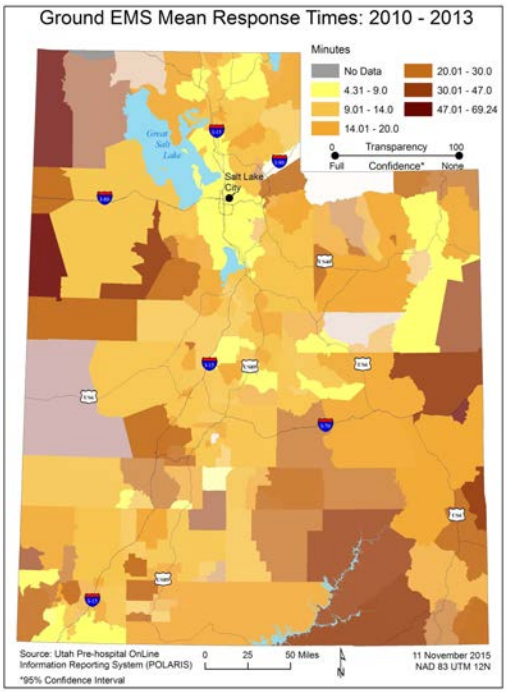


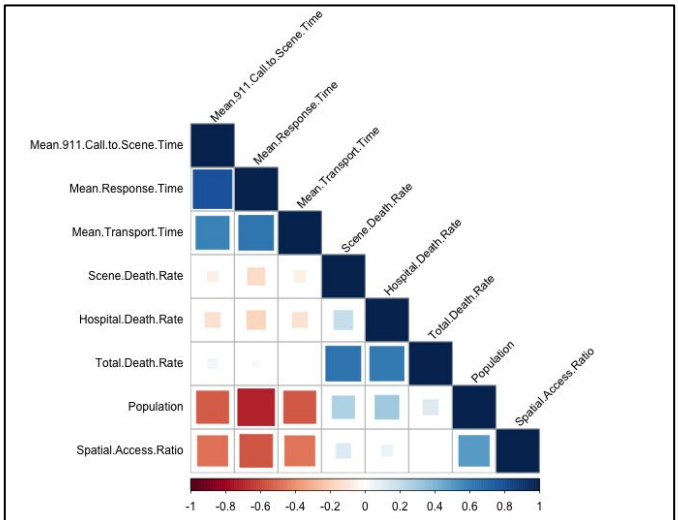
Salt Lake City Department of Public Utilities GIS Department

Spatial Access to Ground EMS in UT

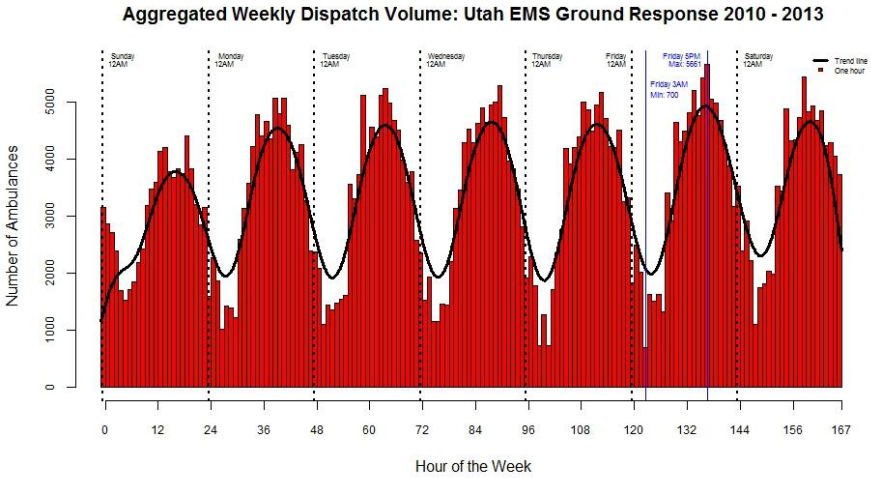
Prompt treatment and transport by EMS provide the greatest chance for reduced morbidity following a sudden illness or accident. One's access to EMS can be a determinant of his or her wellbeing, as well as a measure of community disaster preparedness. Approx. 123 UT-licensed EMS agencies operate nearly 700 transport units. Fewer than 200 of these are staffed and in-service at any one time, however. This study uses the enhanced two-step floating catchment area method to calculate spatial access ratios from drive times and population-to-provider ratios across Utah. Results are generated at 30 arc-second resolution. Further work is needed to examine the dynamic nature of these inputs.







Correlation with zip-code level EMS times and patient death rates.

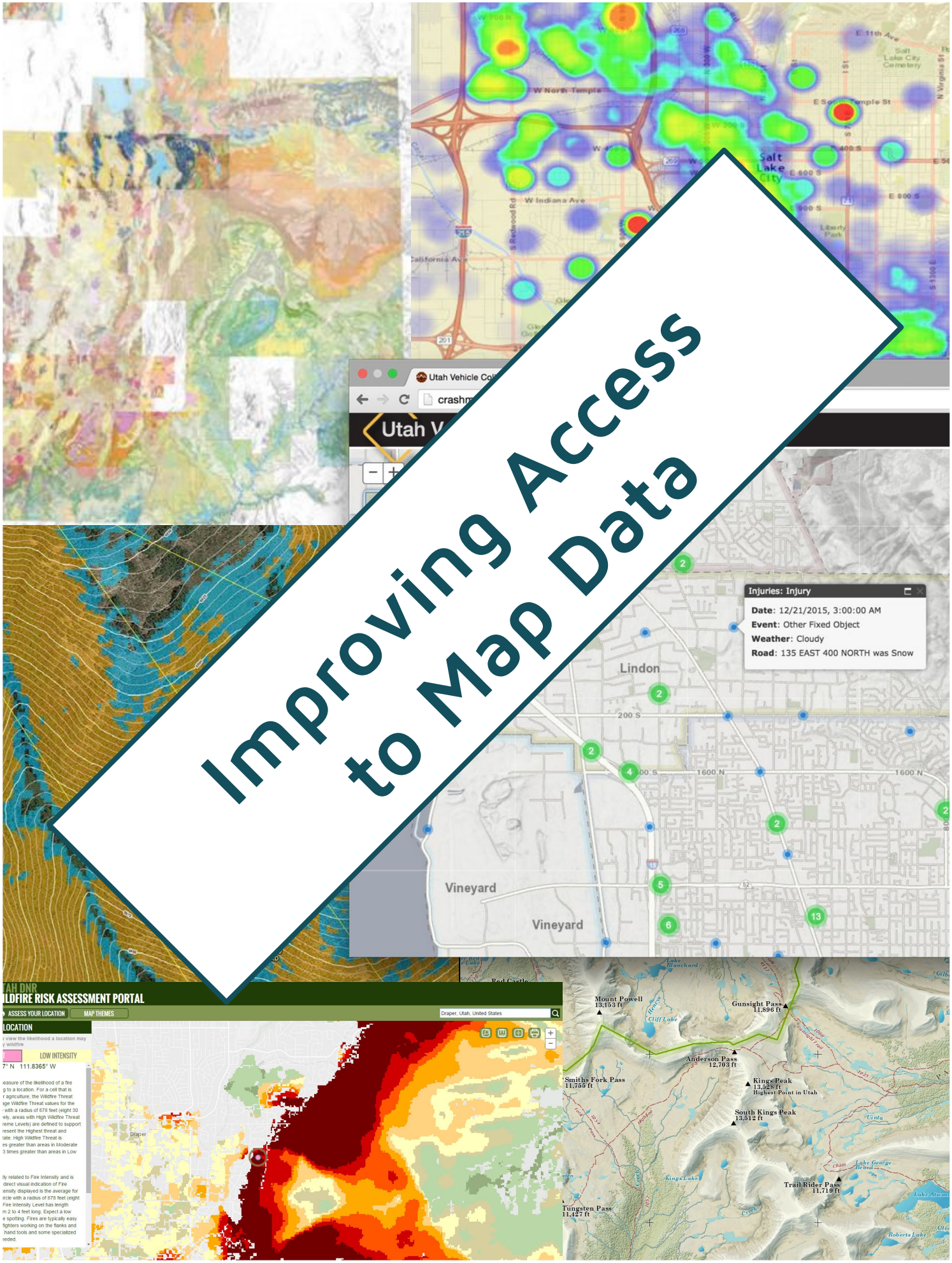


Seth Bishop
Geography Department, University of Utah
Salt Lake City, UT 84112

Data for this study was obtained from the Utah Pre-Hospital OnLine Active Information Reporting System (POLARIS), Utah Bureau of EMS, individual EMS agencies, and the Socioeconomic Data and Applications Center.

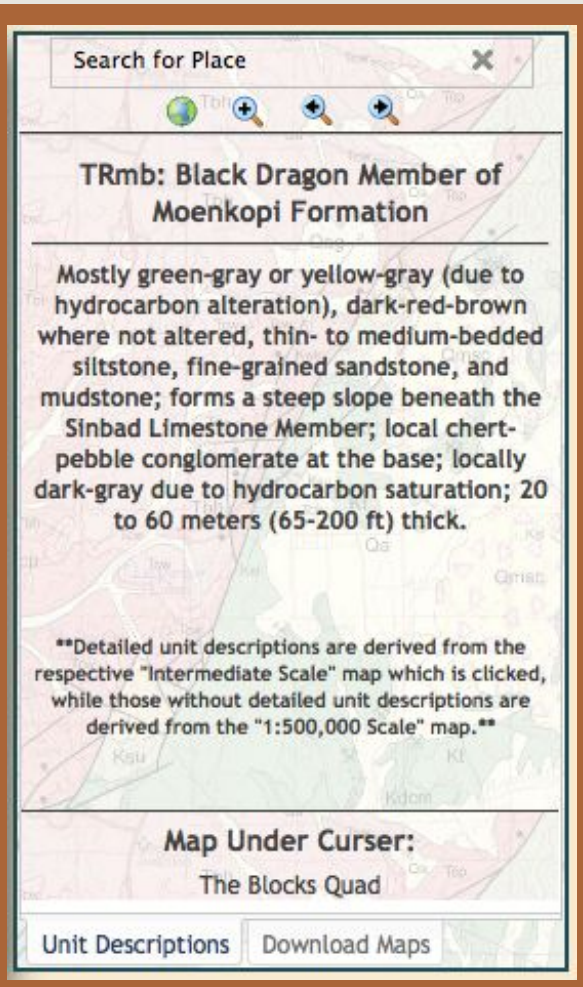
seth.bishop@utah.edu

Improving Access to Map Data



Do you know your geology?

Utah Geological Survey's Geologic Map Portal Database



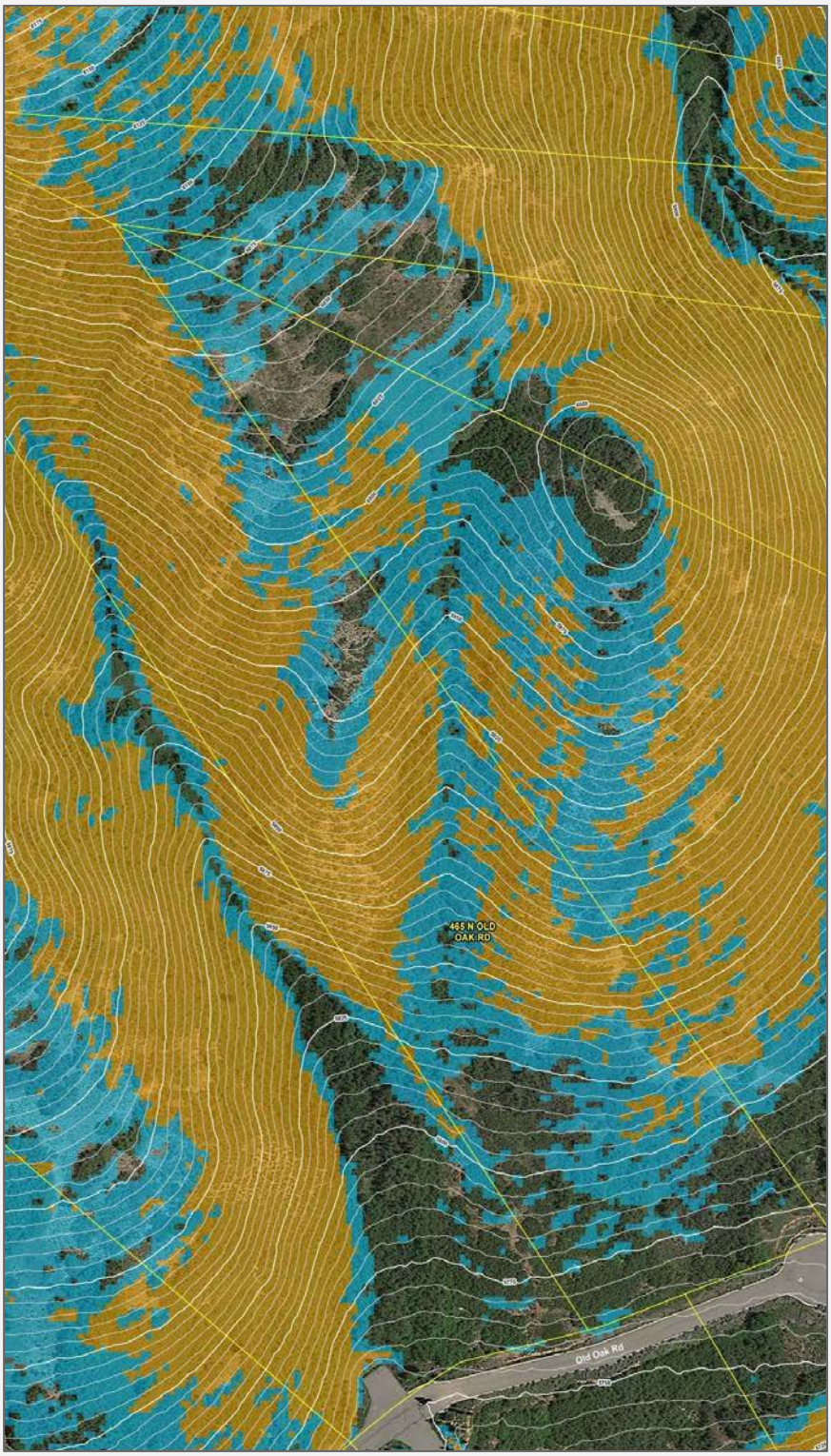
view database here: http://ow.ly/YuNQp

How old are the rocks exposed in the mountain range near my house? What is the geology along my favorite hiking trail? Is there a fault between those two hills? What type of rock is that old mine in? What is the best geologic map of a particular area?

Utah Geological Survey geologists are frequently asked these types of questions. Our interactive geologic map portal, available through the UGS website, can answer many of them. The map portal features about 1,000 geologic maps in the state, ranging from 1:24,000 to 1:500,000 scale, which users can "drill" through to the map that suits their needs. Most of the maps are geopdfs or geotifs, but about 50, which together cover the state, have been produced as well-attributed GIS feature classes, allowing them to be "interactive." Clicking on a polygon pops up a text box with the name, age, and a description of the geologic formation at that site. Several base map and image options allow the user to tie the geology to any location of interest. The descriptions provide basic information for those with minimal geologic knowledge, but also details geared toward the advanced geologist. The map portal also provides download options and information for purchasing printed maps.

Grant Willis, *Mapping Program Manager, Utah Geological Survey*

Foothill and Canyons Overlay Zone

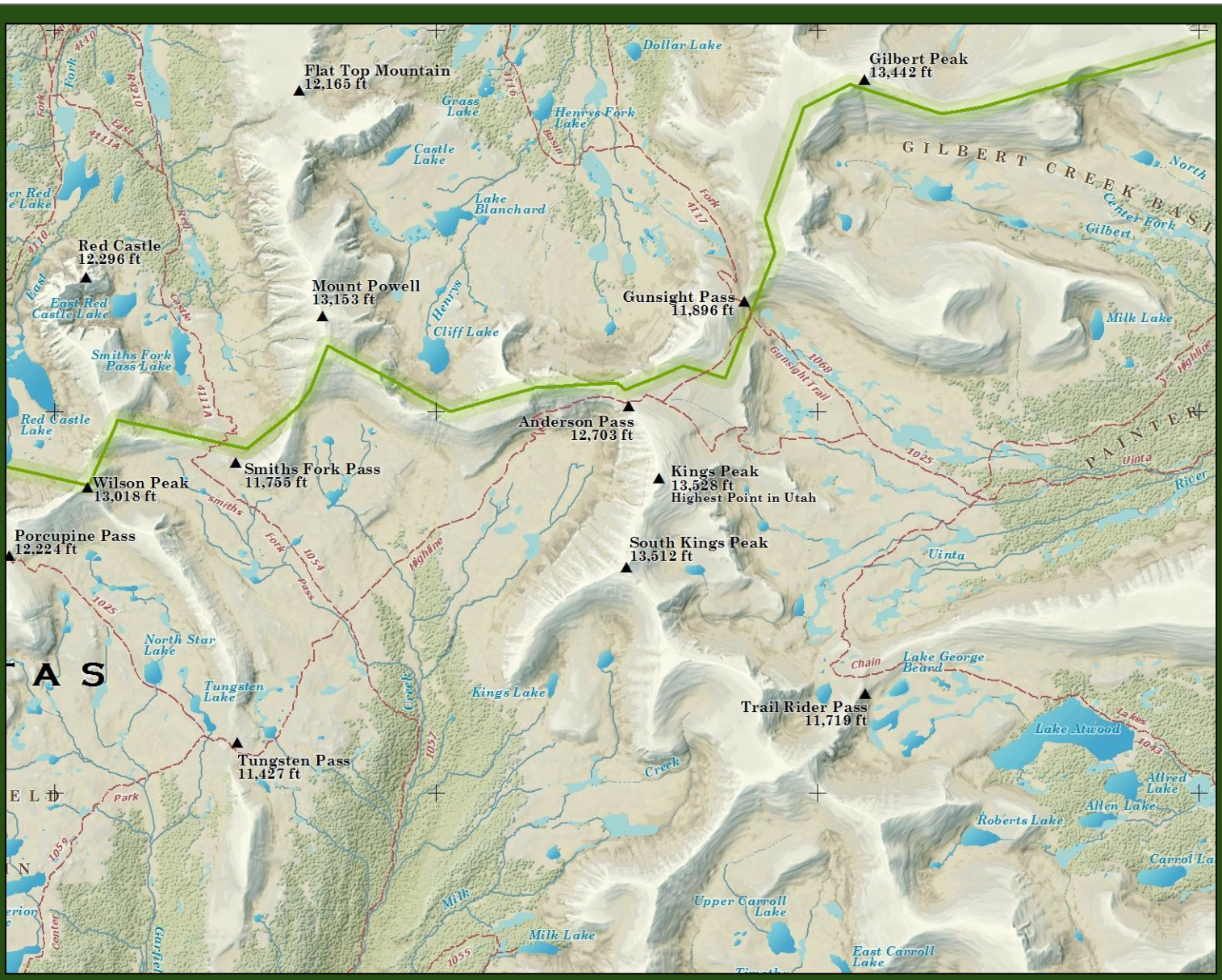


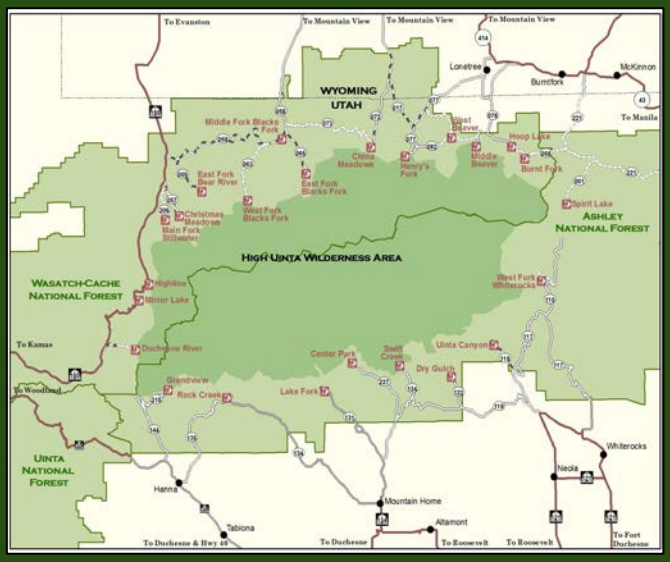
The general purpose of the Foothills and Canyons Overlay Zone (FCOZ) is to promote safe, environmentally sensitive development that strikes a reasonable balance between the rights and long-term interests of property owners and those of the general public. A partnership was formed between the Salt Lake County Surveyor's office and Salt Lake County Planning and Development Services providing customized maps showing the terrain surrounding proposed development in our foothills and canyons. Citizens can request a map of the project site to aid in the permitting process. Since we began the project in 2015 we've completed 192 maps. Prior to this partnership both the citizen and Planner had limited access to this type of information. The maps showing and aerial photo, contours and a slope identifying ranges between 25% and 35% and 35% and greater. The data is generated from LiDAR data collected as a result of a partnership with the State of Utah and the Federal Government.

Salt Lake County Surveyor's Office In Conjunction with the Offices of:
Salt Lake County Assessor
Salt Lake County Clerk
Salt Lake County Mayor
Salt Lake County Recorder

High Uintas Wilderness Area

Uinta-Wasatch-Cache & Ashley National Forest





The United States Congress designated the High Uintas Wilderness in 1984 and it now has a total of 456,705 acres. All of this wilderness is located in Utah and is managed by the Forest Service.

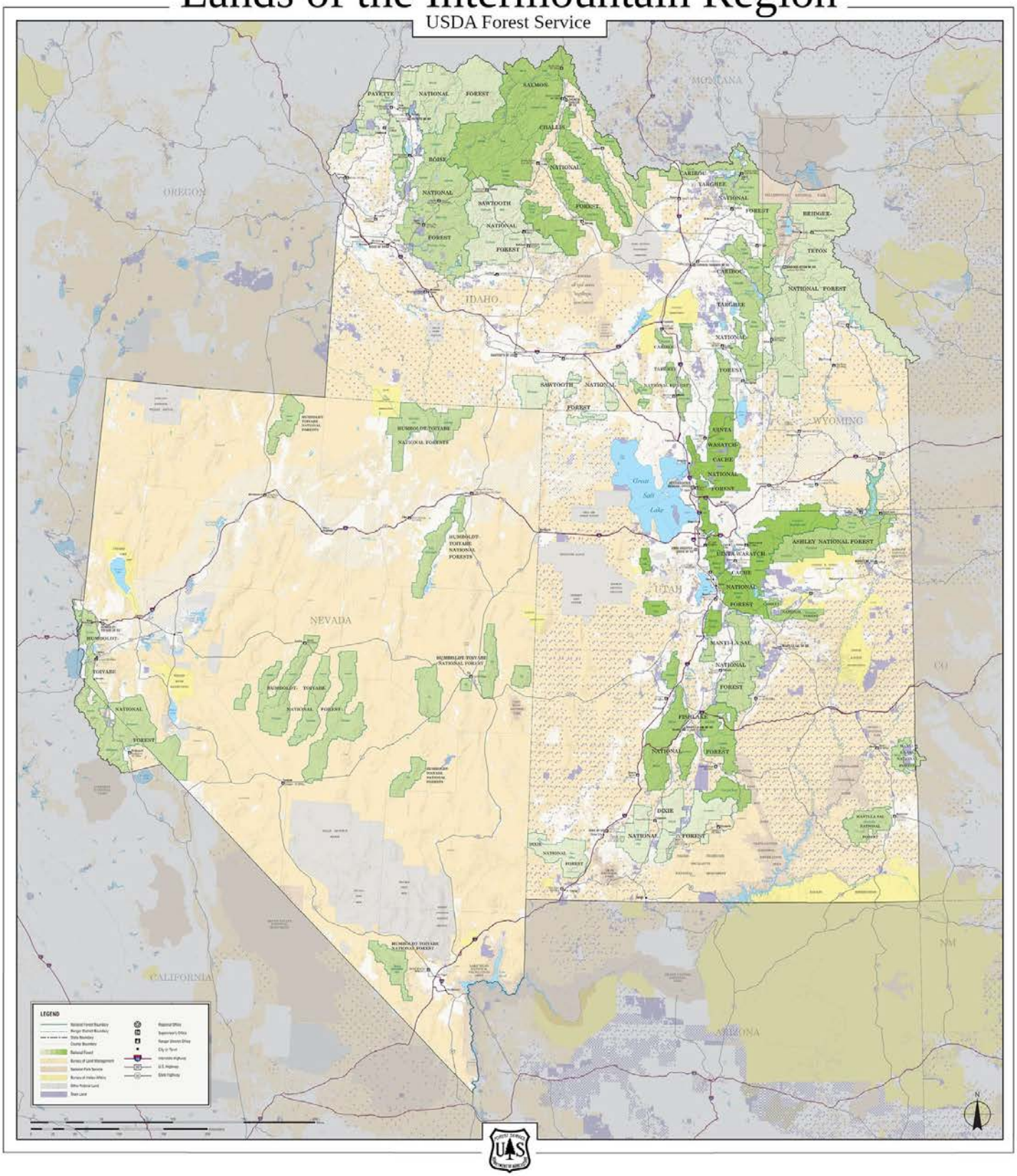
The map was created as a proof of concept for a technique called Cartographic Realism. Cartographic Realism is an attempt to provide a more realistic portrayal to a 2D map, an alternative view that conveys a sense of realistic texture to the surface of the earth.

The map was made at the Geospatial Service and Technology Center (GSTC) in Salt Lake City UT. Data for the map was acquired from the U.S. Forest Service (USFS) and the United States Geological Survey (USGS). The full map is available for download through Avenza PDF Map.

Cartographer: Andrew Keske U.S. Forest Service GIS Specialist

Lands of the Intermountain Region

USDA Forest Service



created by the cartography staff of the
Intermountain Region
USDA Forest Service
Ogden, UT

This map depicts the boundaries of all national forests, ranger districts, and offices in the Intermountain Region. Additionally, the map includes state and federal land ownership.

Mapping the 1983 SLC Flood

Record setting snowfall brought record breaking streamflow throughout the valley.

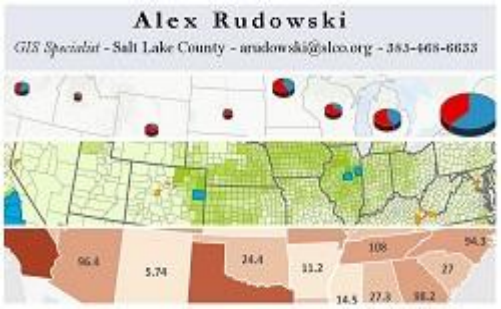
Do you remember the 1983 flood? Maybe you do, and maybe you weren't born yet. Either way, take a tour of a time when canoes were more common than cars on State Street!

Mudslide on Emigration Canyon Road

A rainy Fall in 1982 saturated the soils and set the stage for several landslides in the Canyons. This one, on Emigration Canyond Rd, occurred before the Little Mountain Summit.

SALT LAKE COUNTY FLOOD CONTROL

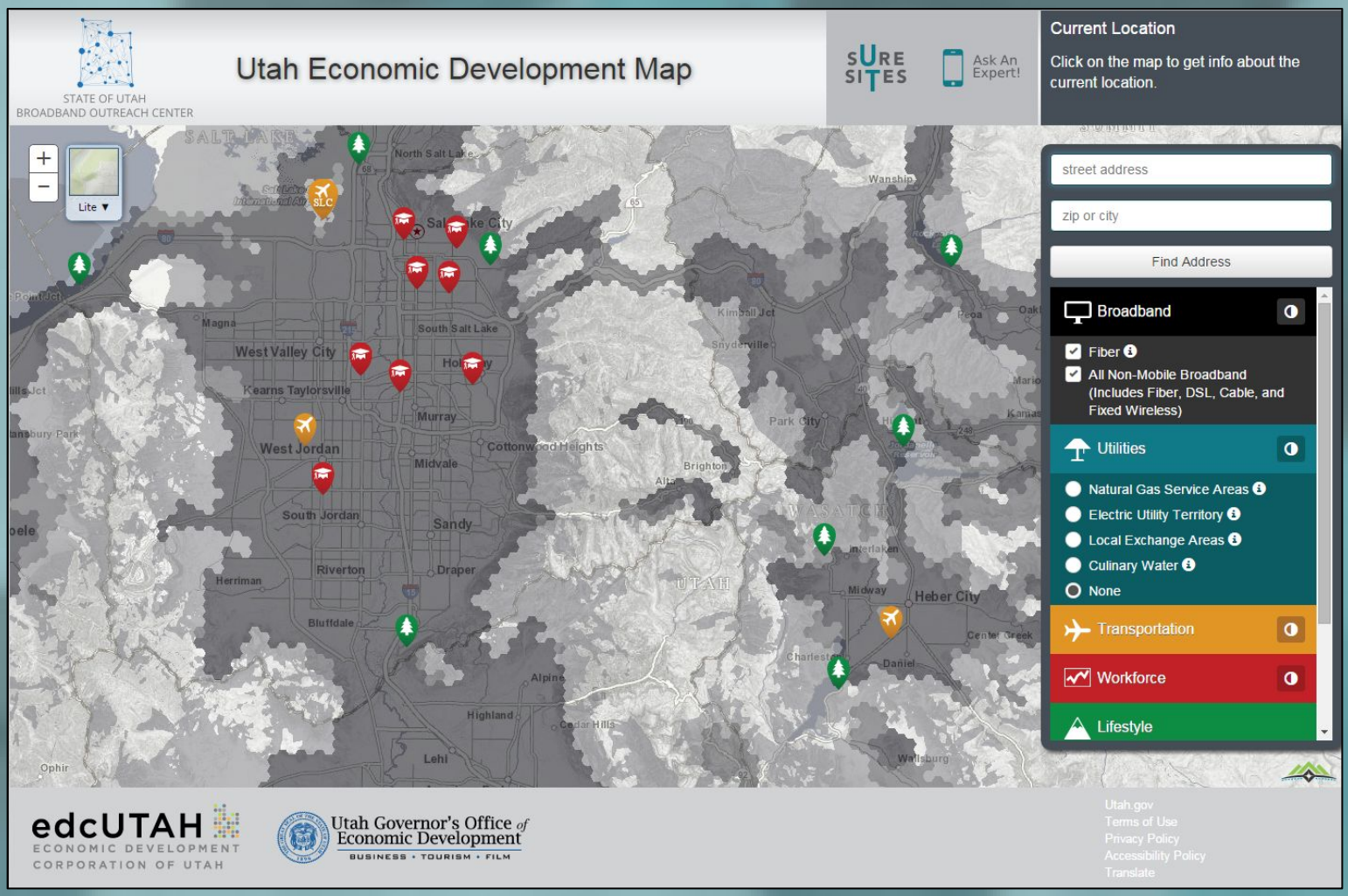
slco.org/flood-control

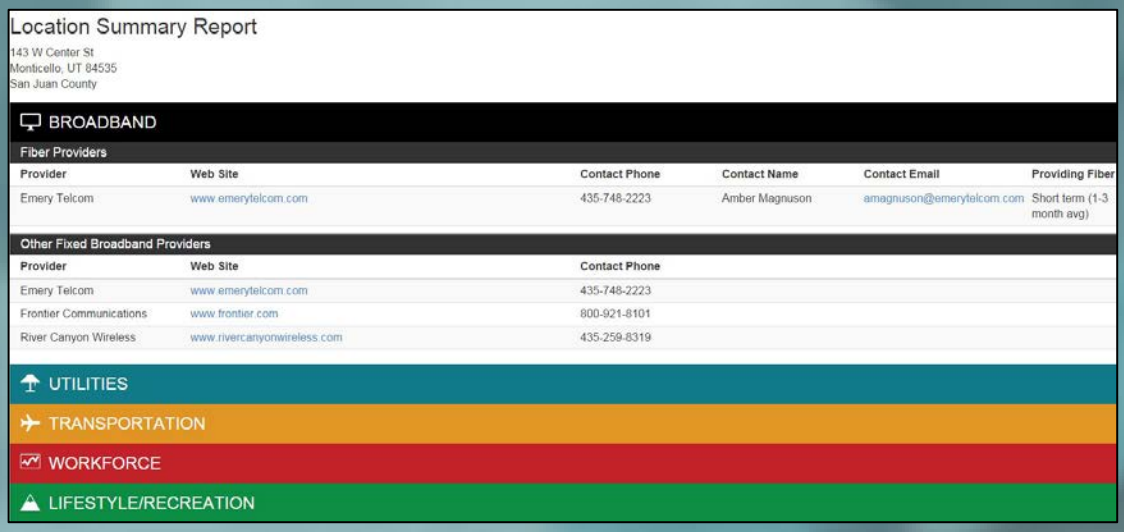


Utah Economic Development Map

The Utah Economic Development Map allows users to explore the state's commercial broadband availability, utility information, transportation, workforce, and lifestyle features. It also allows developers to evaluate potential locations and print customized reports with detailed summaries of available infrastructure.

- **locate.utah.gov**





Location Summary Report

143 W Center St
Monticello, UT 84535
San Juan County

BROADBAND

Fiber Providers

Provider	Web Site	Contact Phone	Contact Name	Contact Email	Providing Fiber
Emery Telcom	www.emerytelcom.com	435-748-2223	Amber Magnuson	amagnuson@emerytelcom.com	Short term (1-3 month avg)

Other Fixed Broadband Providers

Provider	Web Site	Contact Phone
Emery Telcom	www.emerytelcom.com	435-748-2223
Frontier Communications	www.frontier.com	800-921-8101
River Canyon Wireless	www.rivercanyonwireless.com	435-259-8319

UTILITIES
TRANSPORTATION
WORKFORCE
LIFESTYLE/RECREATION

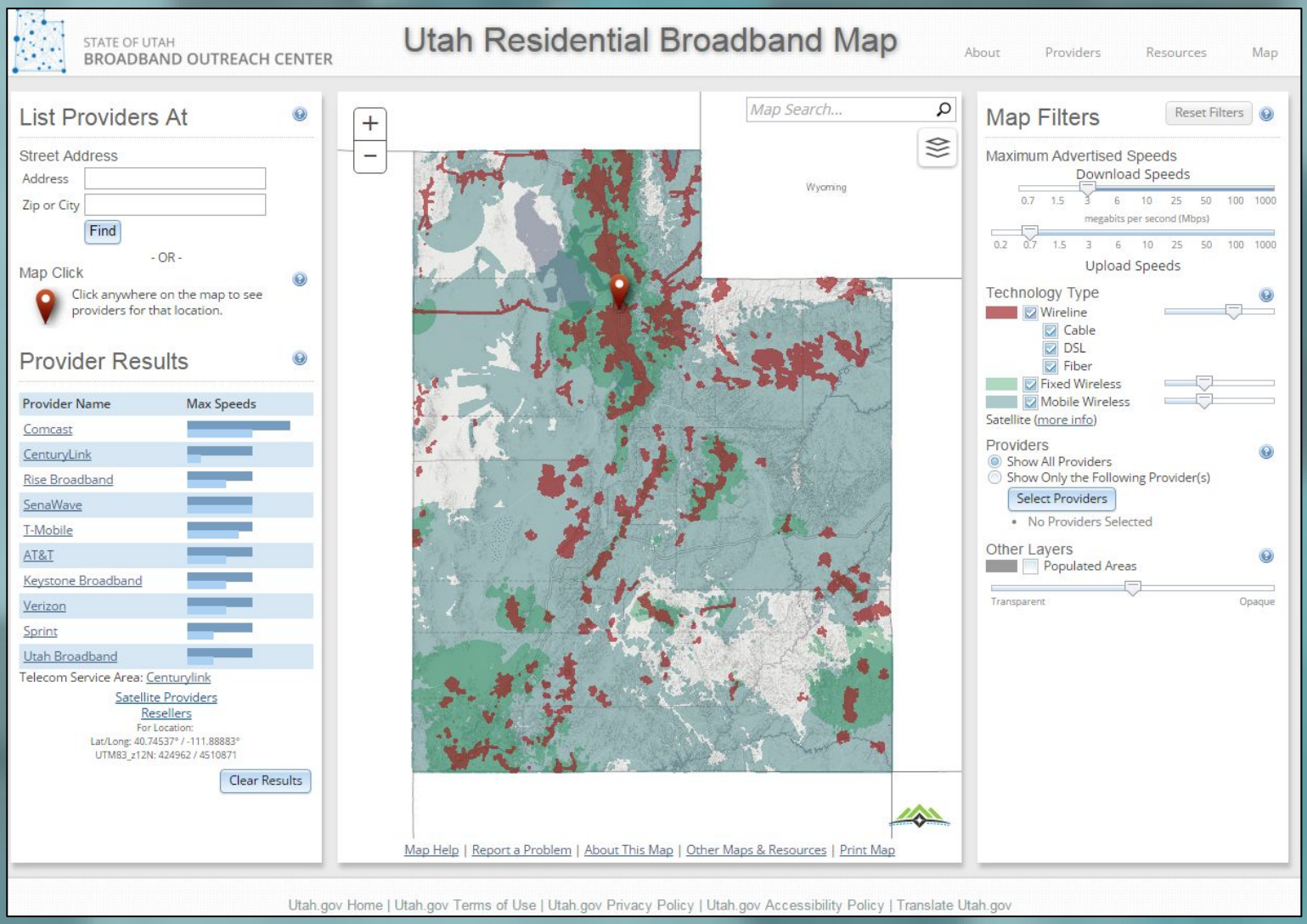
STATE OF UTAH
BROADBAND OUTREACH CENTER
BROADBAND.UTAH.GOV

Locate.utah.gov is hosted by the Broadband Outreach Center, part of the Governor's Office of Economic Development. For more information, contact Kelleigh Cole at kcole@utah.gov.

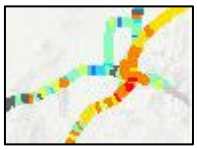
Utah Residential Broadband Map

The Utah Governor's Office of Economic Development Broadband Outreach Center recently released a revamped interactive broadband internet availability map. A consumer can use the map to search broadband services available at a given location, as well as filter coverage by maximum advertised speeds, transmission technology (fixed vs mobile connections), and broadband provider.

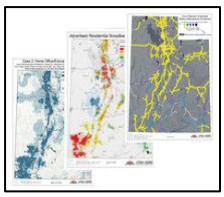
- **broadband.utah.gov/map**



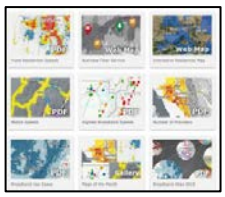
Go to **broadband.utah.gov** for more:



Broadband GIS Data



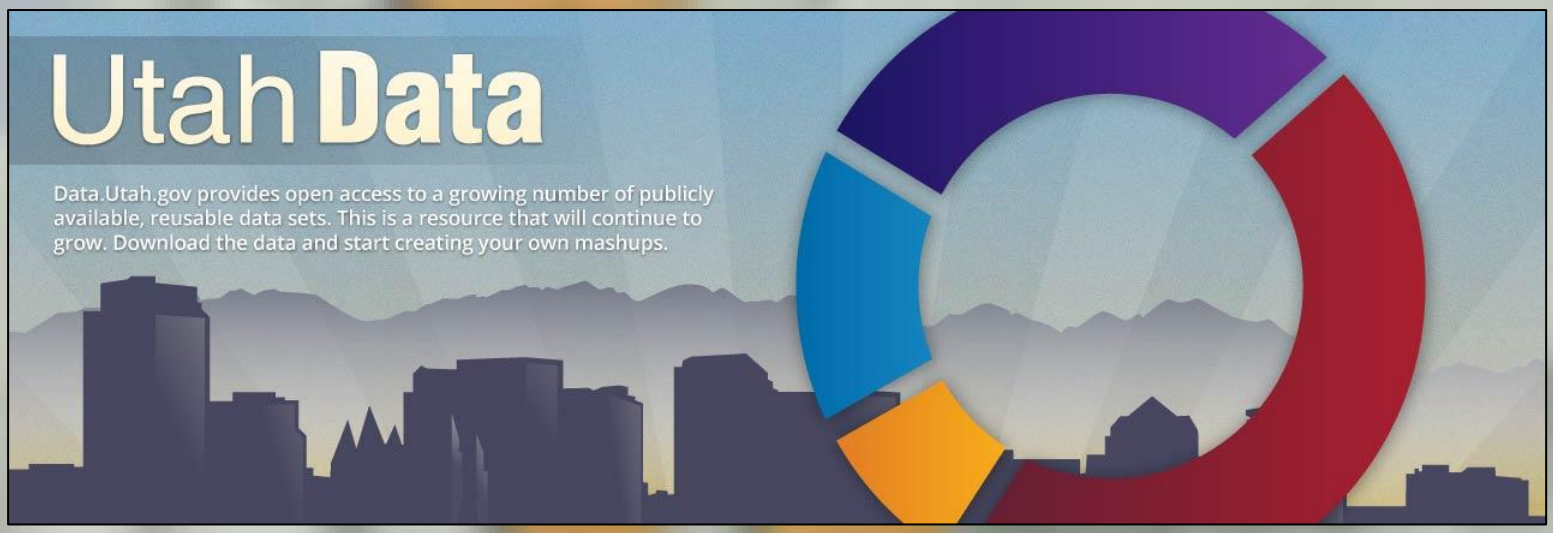
Map of the Month Blog Series

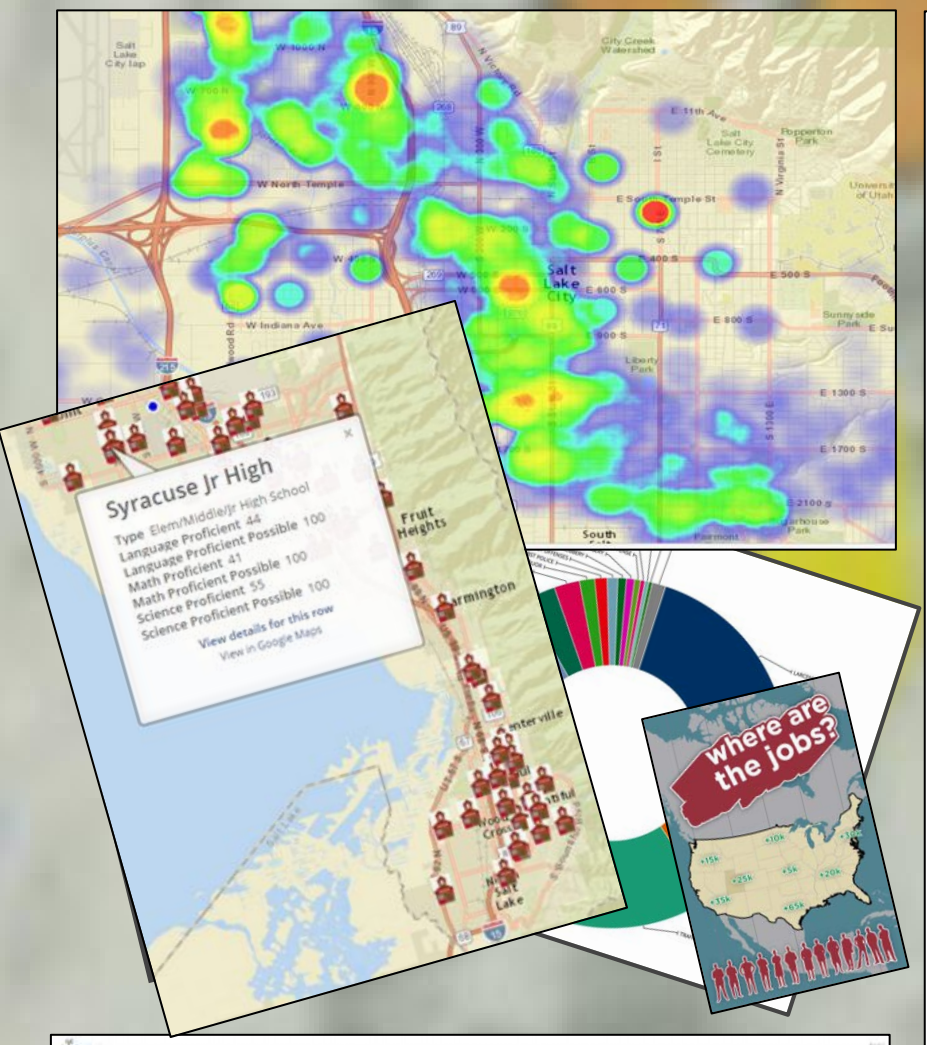


Broadband Map Gallery

STATE OF UTAH
BROADBAND OUTREACH CENTER
BROADBAND.UTAH.GOV

All broadband availability data is reported by broadband providers in Utah. For more information on the Center, contact Kelleigh Cole at kcole@utah.gov.



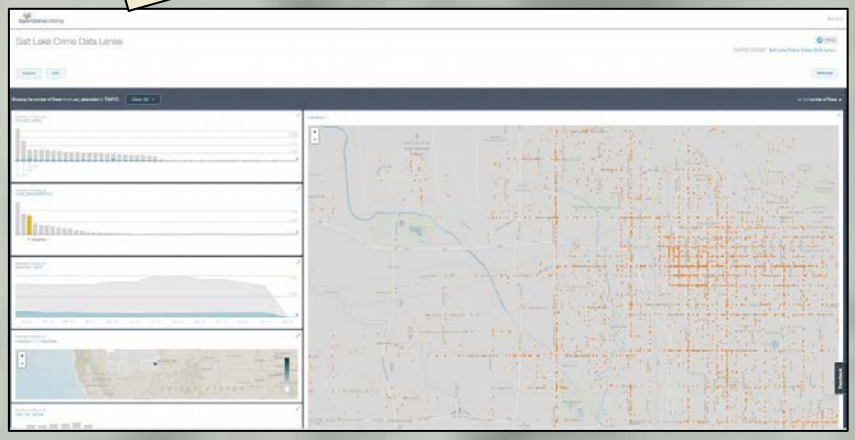


Utah Open Data Portal

The Utah Open Data Portal went live on January 1, 2015 and now has over 2500 datasets, maps and charts on almost every topic and in every geographic area of the state.

The portal is overseen by the Utah Transparency Board and supported by the Utah Department of Technology Services.

In 2015, opendata.utah.gov had over 3 million page views and was used to support hackathons, mobile app development, and student projects and business analytics across the state.

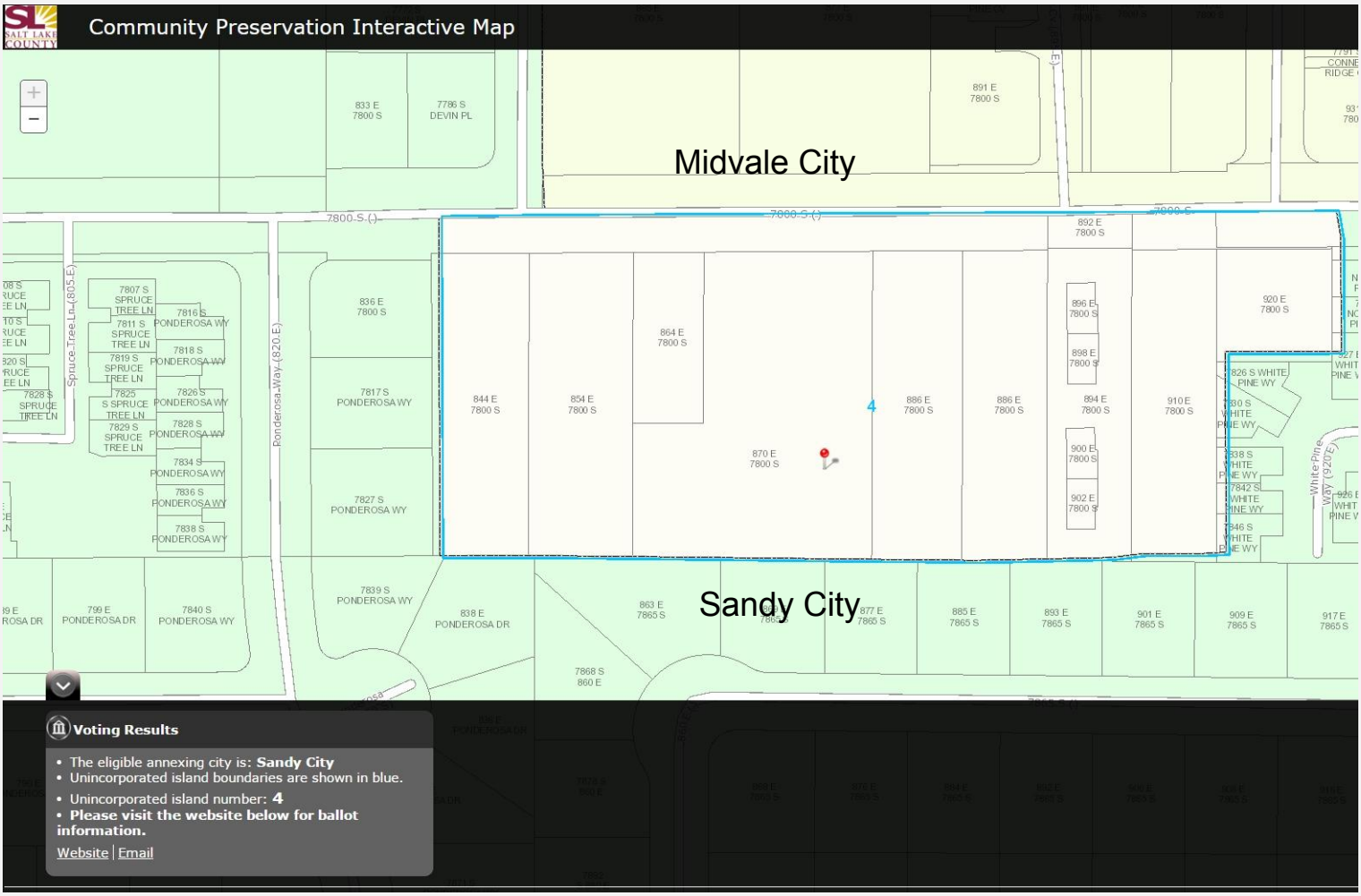


Drew Mingl
State Open Data Coordinator
Utah Open Data Portal
6000 State Office Building
Salt Lake City, UT 84114

This data is provided by: State of Utah
Special Thanks to Senator Deidre Henderson.

opendata.utah.gov dmingl@utah.gov

Utah Senate Bill 199
Community Preservation



SB 199 -Community Preservation The passage of Utah Senate Bill 199 changed the way areas of unincorporated Salt Lake County would be governed. The legislation required a digital mapping component and it was determined that the most efficient media to present the proposed changes would be a web map. The ESRI ArcGIS online Local Government template was adopted to allow the citizens to retrieve valuable information about their communities. Using a pre existing template allowed us to provide the required information within a very stringent timeline. Concerns were raised about the citizenry not being able to retrieve the needed information to vote. The Community Preservation website http://slco.org/community-preservation/ was maintained by a number of County agencies to successfully educate and guide the citizens of Salt Lake County guiding them through the process. The November 2015 election had one of the highest voter turnouts in years. Over the next two years the governing bodies will be elected and municipal services will be determined. Without current GIS technology, the process would have failed.

Salt Lake County Surveyor's Office In Conjunction with the Offices of:
Salt Lake County Assessor
Salt Lake County Clerk
Salt Lake County Mayor
Salt Lake County Recorder

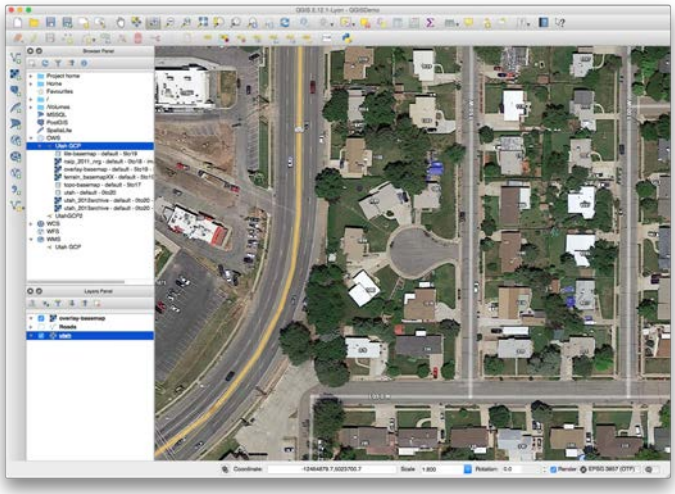
Update:
Utah Mapping & Information Partnership

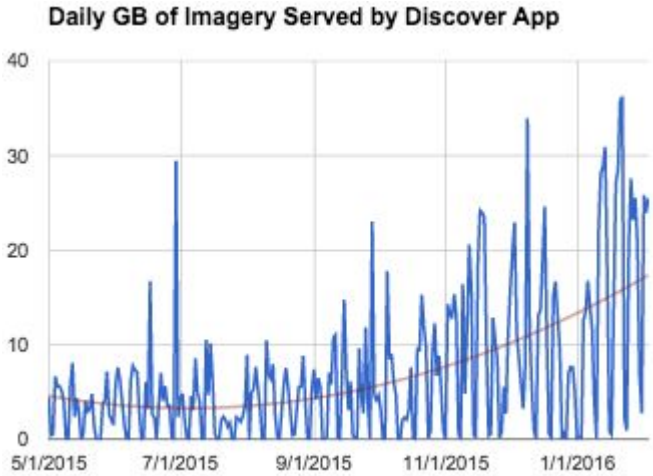
Statewide High Resolution Aerial Photography.

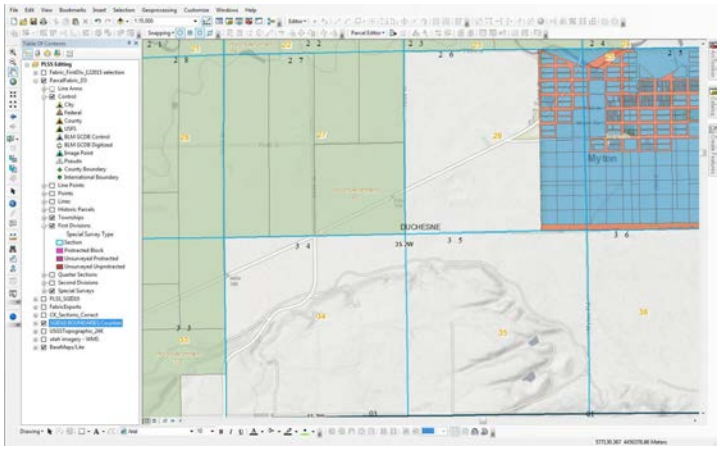
Status: Cloud-hosted statewide aerial photography, licensed from Google, and AGRC base map web services have been operational since March 2015, for all state, local, and tribal government entities and their contractors & partners.

Over 230 organizations have been granted access to the high resolution (6-inch pixel) imagery and other base maps via discover.agrc.utah.gov. 40% of Utah's aerial photo coverage was updated in 2015.

The UMIP partnership plans to develop a funding model to acquire future imagery updates in both 2016 & 2017.







State stewardship of the Public Land Survey System Map database.

Status: AGRC has assumed stewardship of the statewide PLSS section corner database via an MOU with the BLM.

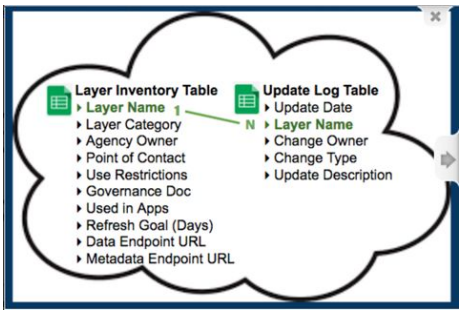
Conversion to the modern, integrated GIS database "parcel facbric" format, and incorporation of field collected GPS data by public & private surveyors, is in process.

Discussions have begun with SITLA and DNR to select the best option for linking public lands boundaries map layers to the new high precision PLSS control database.

Live streaming of map-based agency data.

Status: An inventory of existing live map data web services is in process and is expected to be released this Spring. The inventory is being created with an end goal of having a dashboard view for data layer update frequency goals and status.

Additional priorities for published data services will be identified and implemented by UMIP agencies in calendar year 2016.



Mobile Map Technology Initiative.

Status: Requirements gathering is in process for an initial map-centered Air Quality compliance field data collection app for mobile devices.

Additional funding has been secured through an EPA grant to recommend and operationalize a core platform, which is expected by January 1, 2017.

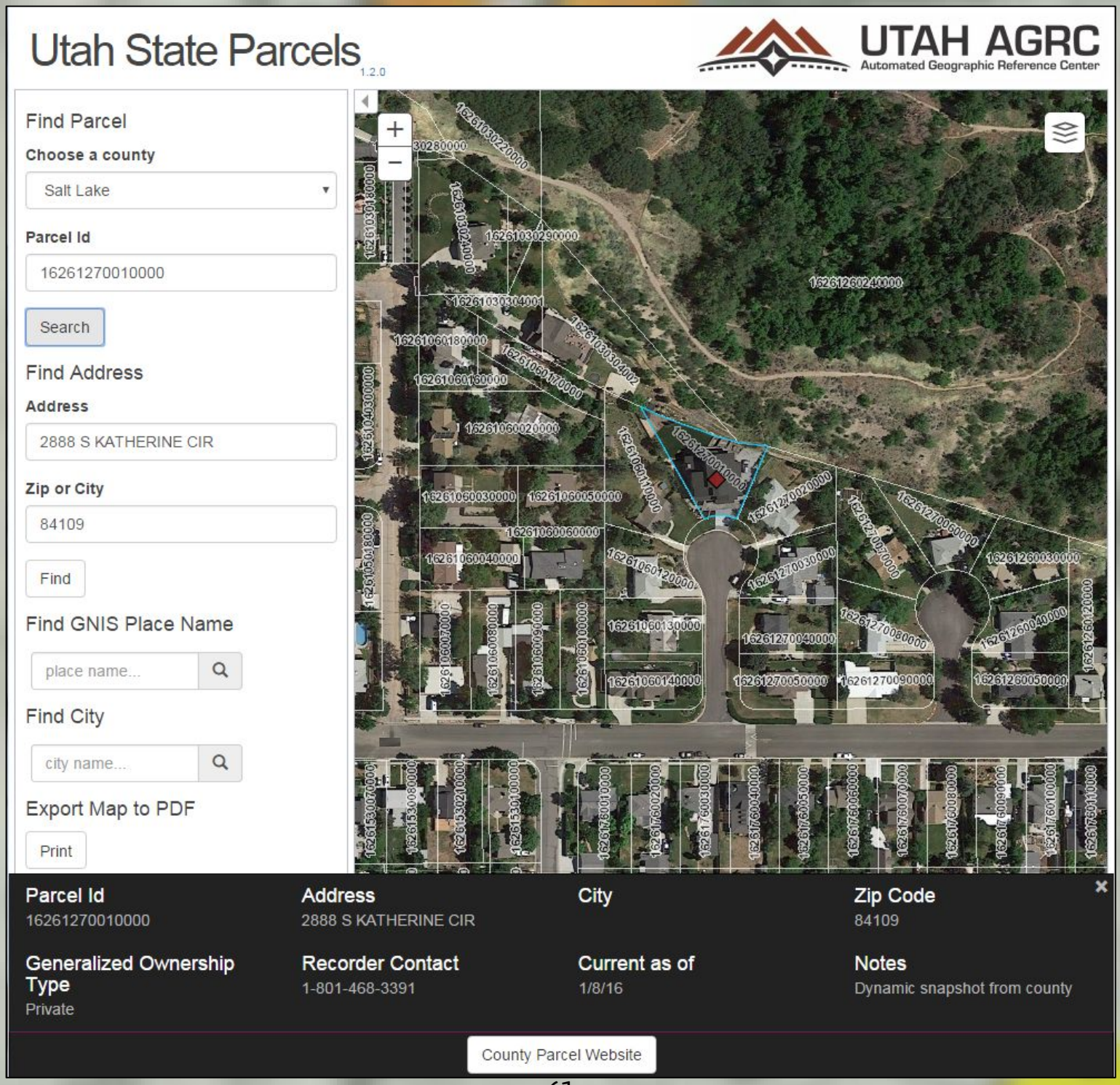
UMIP Partners

AGRC
Community Impact Board
Dept. of Agriculture and Food
Dept. of Environmental Quality
Dept. of Heritage and Arts
Dept. of Natural Resources
Dept. of Public Safety
Dept. of Transportation
Dept. of Technology Service
Duchesne County
Governor's Office of Economic Development
Governor's Office of Energy Development
Mountainland Association of Governments
Public Lands Policy & Coordination Office
Salt Lake County Surveyor's Office
Trust Lands Administration (SITLA)
Uintah County

Utah State Parcels

A public web application was developed and designed by AGRC's Steve Gourley and Rick Kelson to quickly retrieve information about Utah parcels. The basic parcel boundary data is sourced in coordination with Utah's County Recorders (per 63F-1-505), then unified into a common format and served by Utah AGRC. The web app utilizes imagery and base maps from the discover.agrc.utah.gov imagery server and was built with the Dojo JavaScript toolkit. The application is open sourced on GitHub (https://github.com/agrc/parcels).

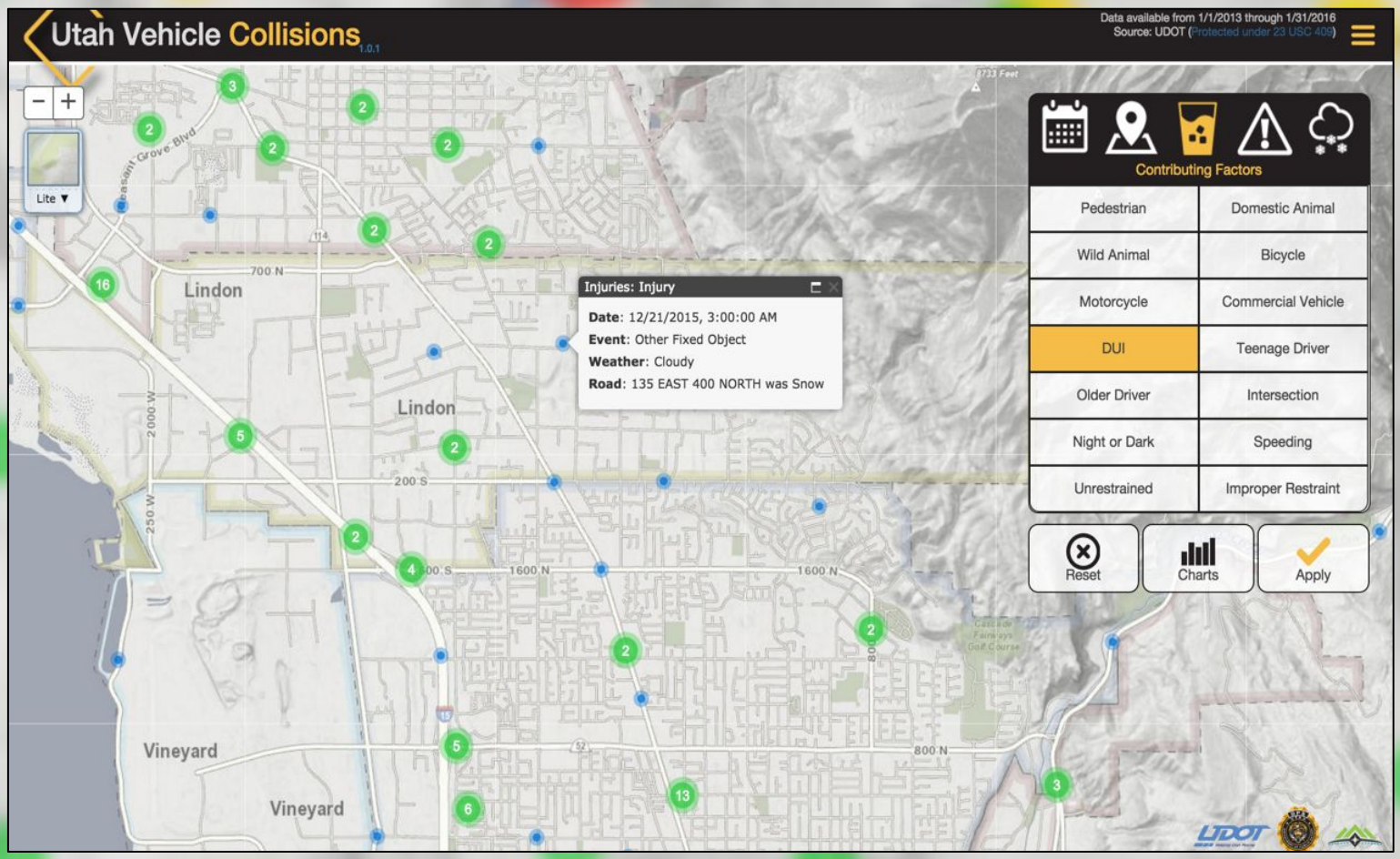
- **mapserv.utah.gov/parcels**

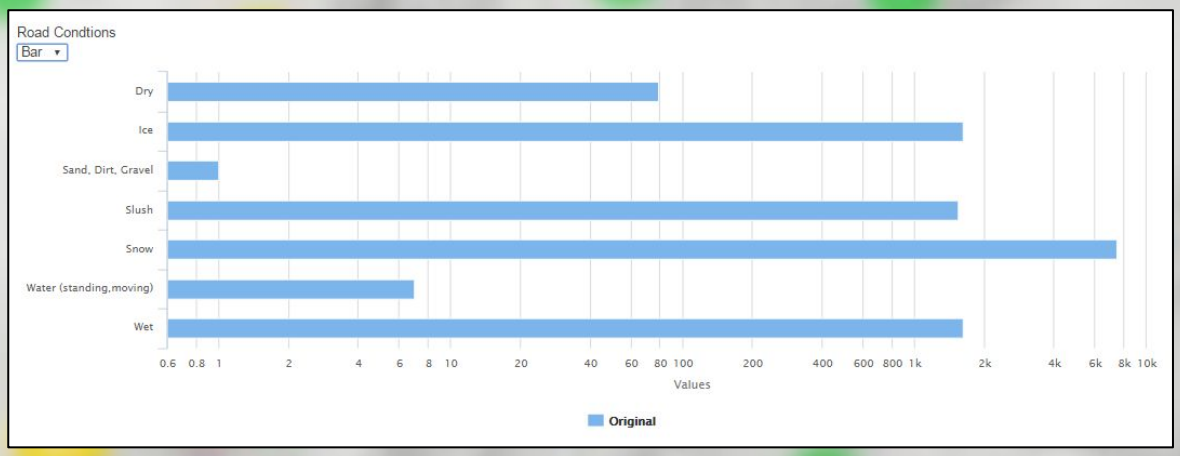


Utah Vehicle Collisions Application

A partnership between the Utah Departments of Public Safety (DPS) and Transportation (UDOT) collects statewide vehicle collision records from across state and local government law enforcement agencies. This information is used by both agencies in their efforts to improve safety through education/outreach, roadway projects, and enforcement activity. The collision data can be viewed and filtered using a new interactive web map built by AGRC's development staff at:

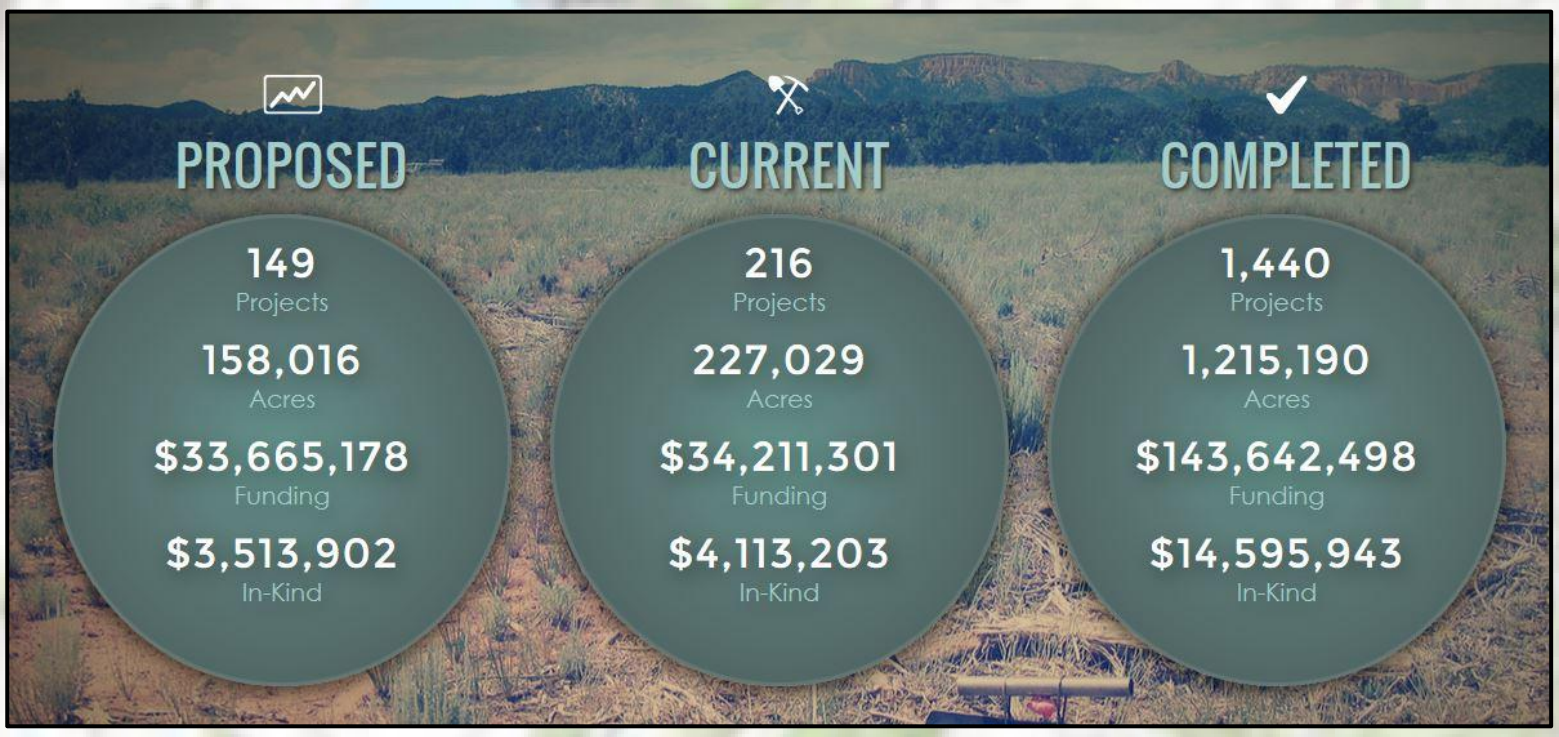
- **crashmapping.utah.gov**

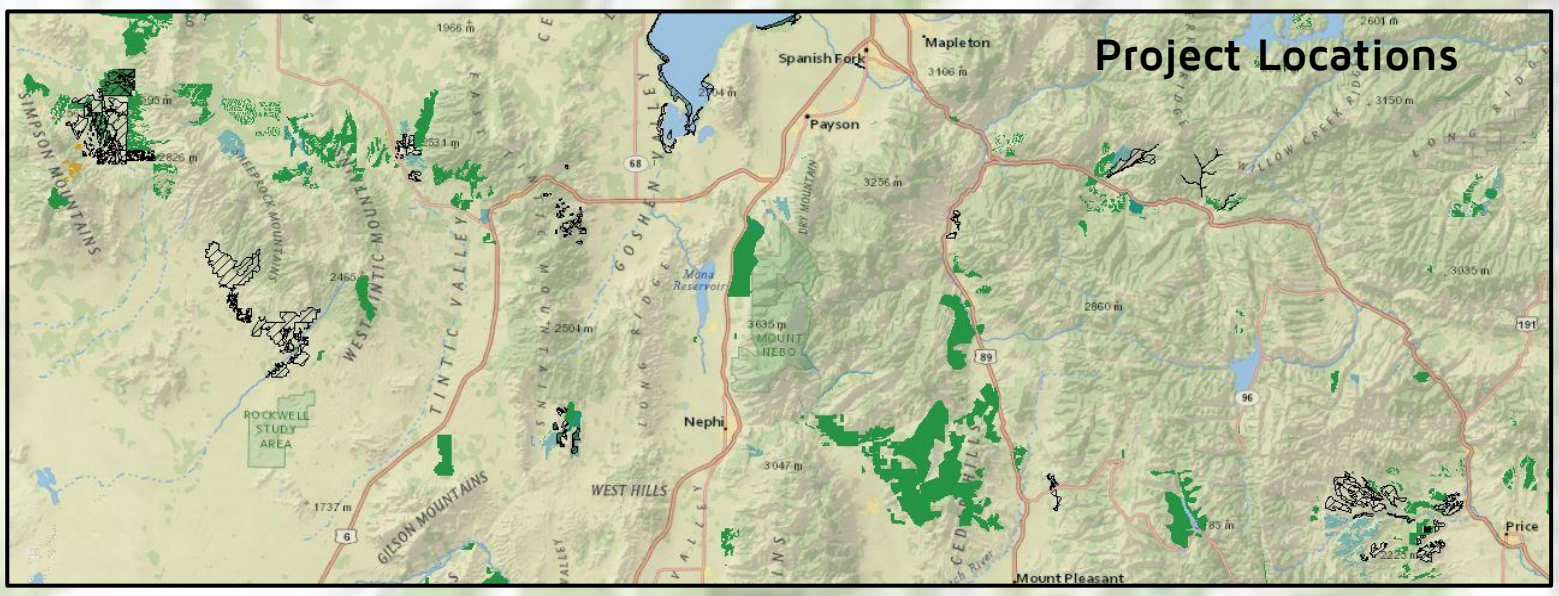




Utah's Watershed Restoration Initiative

Restoring Watersheds Through Partnerships



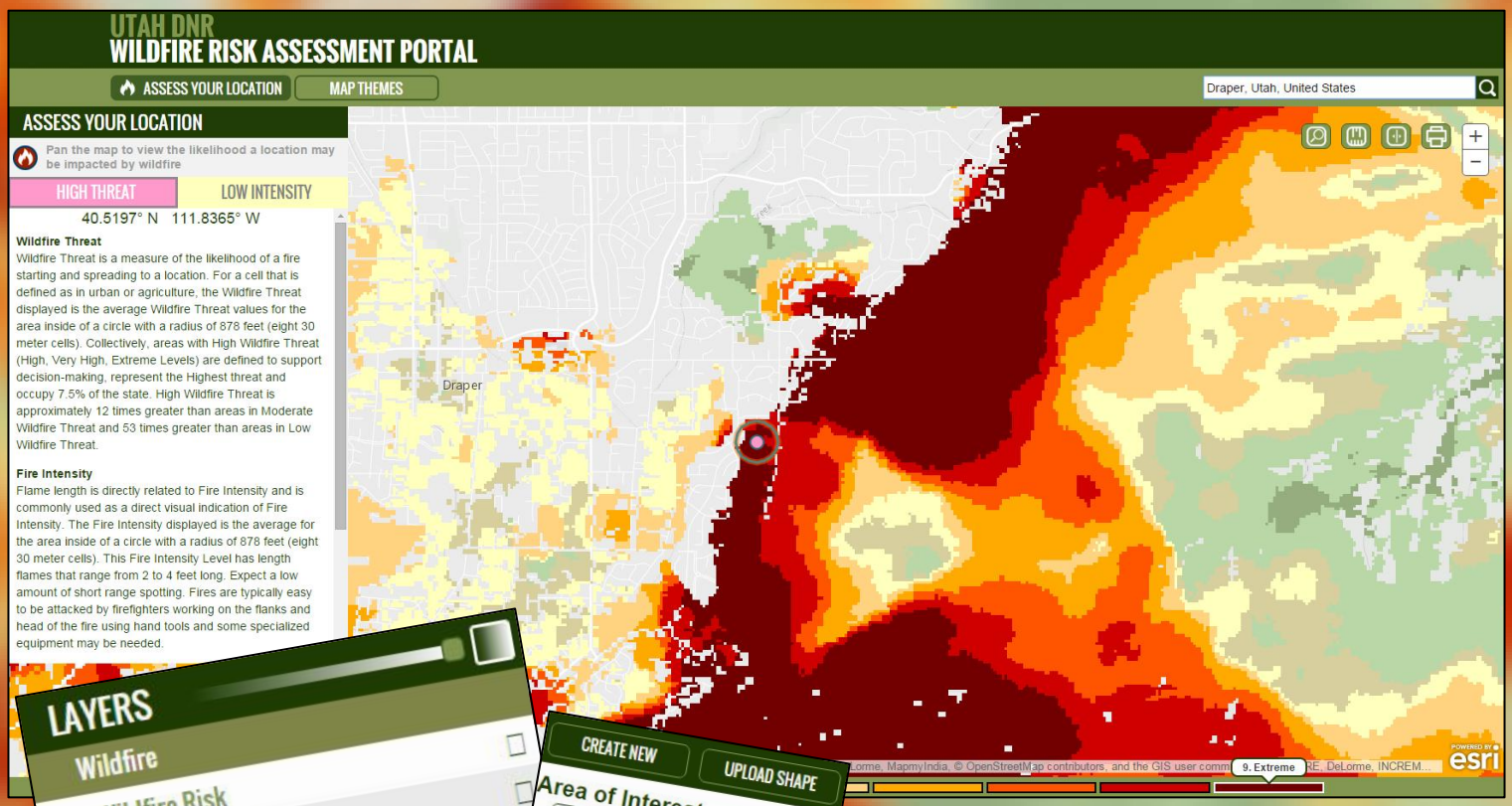


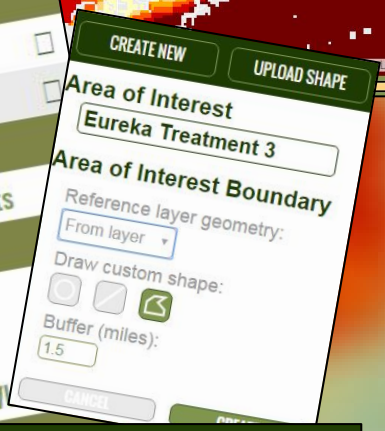
The Watershed Restoration Initiative (WRI) is a partnership program that enables a coordinated effort to improve high-priority watersheds throughout Utah. in FY15, 122 agencies, organizations and individuals participated. The Watershed Program focuses on three primary ecosystem values:
1) wildlife and biological diversity, 2) water quality and yield, and 3) opportunities for sustainable uses of natural resources. WRI is a bottom-up initiative where project planning, review, and ranking occur at a local level.

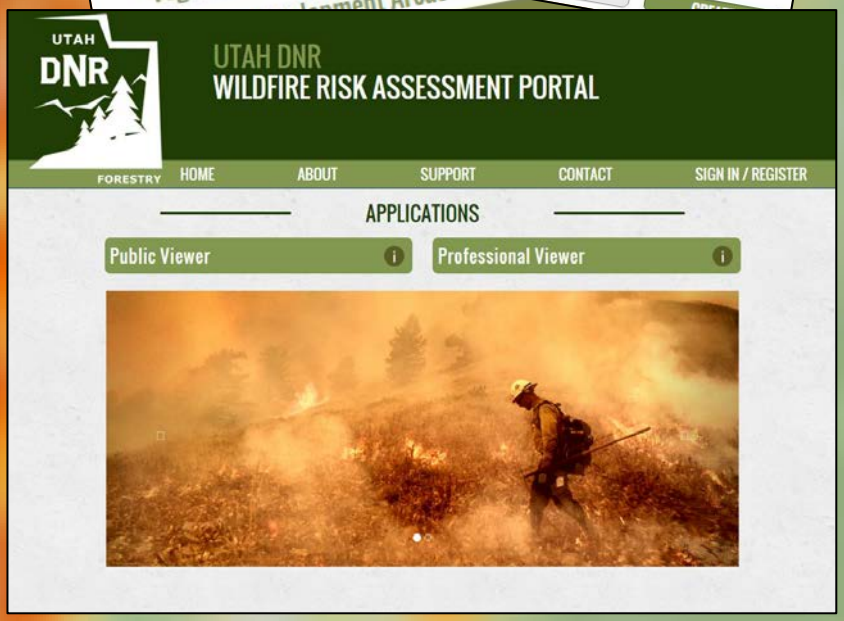
- **wri.utah.gov**

Utah's Wildfire Risk Assessment Portal

Available to the public this upcoming fire season at
www.UtahWildfireRisk.com

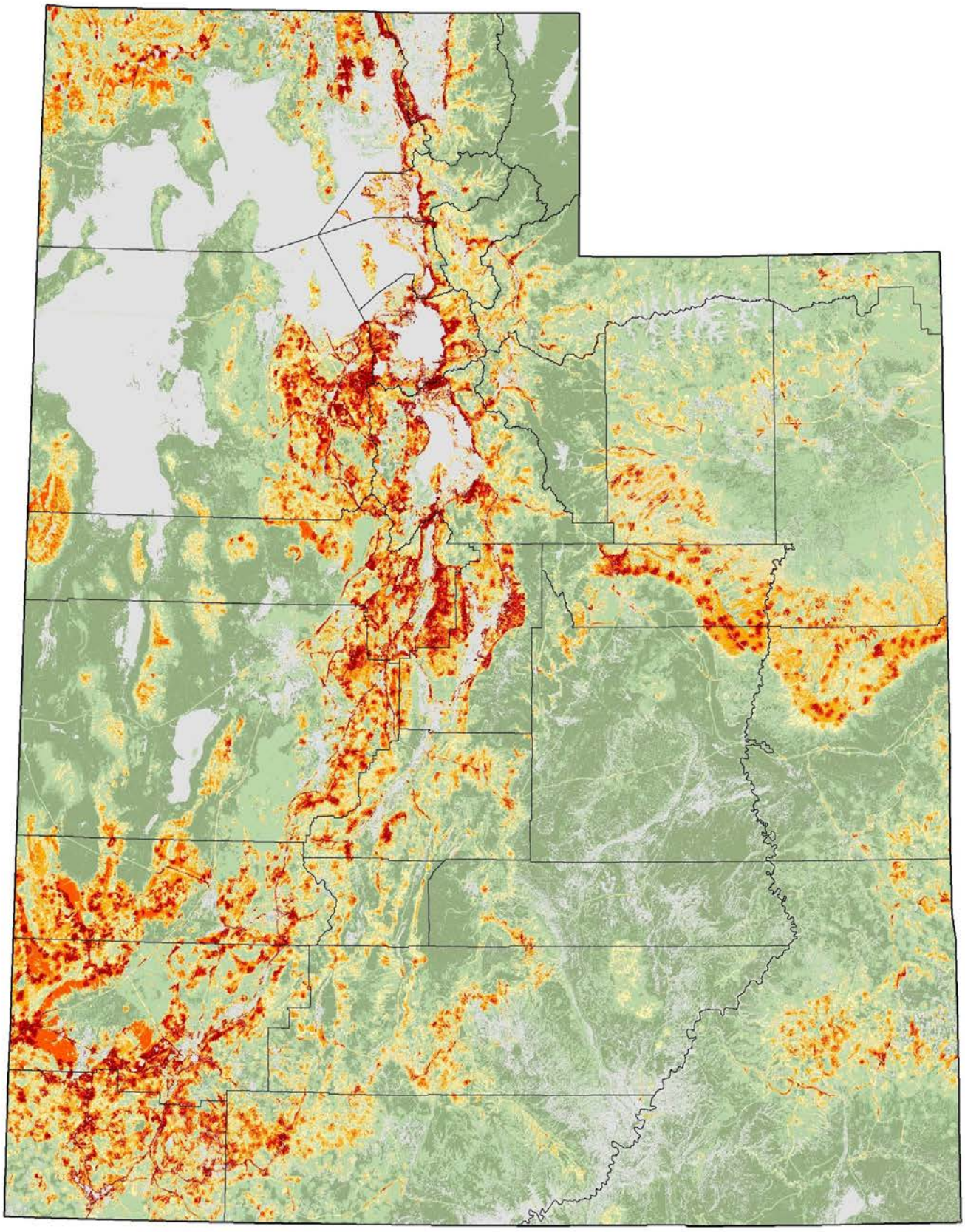






Utah's Wildfire Risk Assessment Portal is designed to let users zoom to an area of interest, explore map themes, and quickly identify areas where fire behavior potential exists in relationship to homes or other valued assets. Signing up is quick and easy and allows all users to use the "Assess Your Location" tool which estimates the threat of wildfire and flame intensity and length for your location or any other area in the map. Enhanced tools are made available for professional wildfire personnel.

Forestry, Fire & State Lands
a division of the
Utah Department of Natural Resources
www.ffsl.utah.gov


Negligible
Low
Medium
High

UDOT Projects Application

udot.utah.gov/projects

Project Description:

UDOT has developed a new **web application** for accessing **project information**. A custom **Zoomer Widget** was developed to assist the public in finding projects related to their area of interest. This widget development represents a time and cost savings when shared with other agencies.

<u>Zoom modes include:</u>

- City
- County
- Legislative Boundary
- UDOT Region
- UDOT Maintenance Shed
- Route

Tabular data is filtered by location and available for download.

Project data is refreshed nightly from UDOT's Electronic Program Management (EPM) database.
This map displays all projects from proposed to completed supporting transparency.

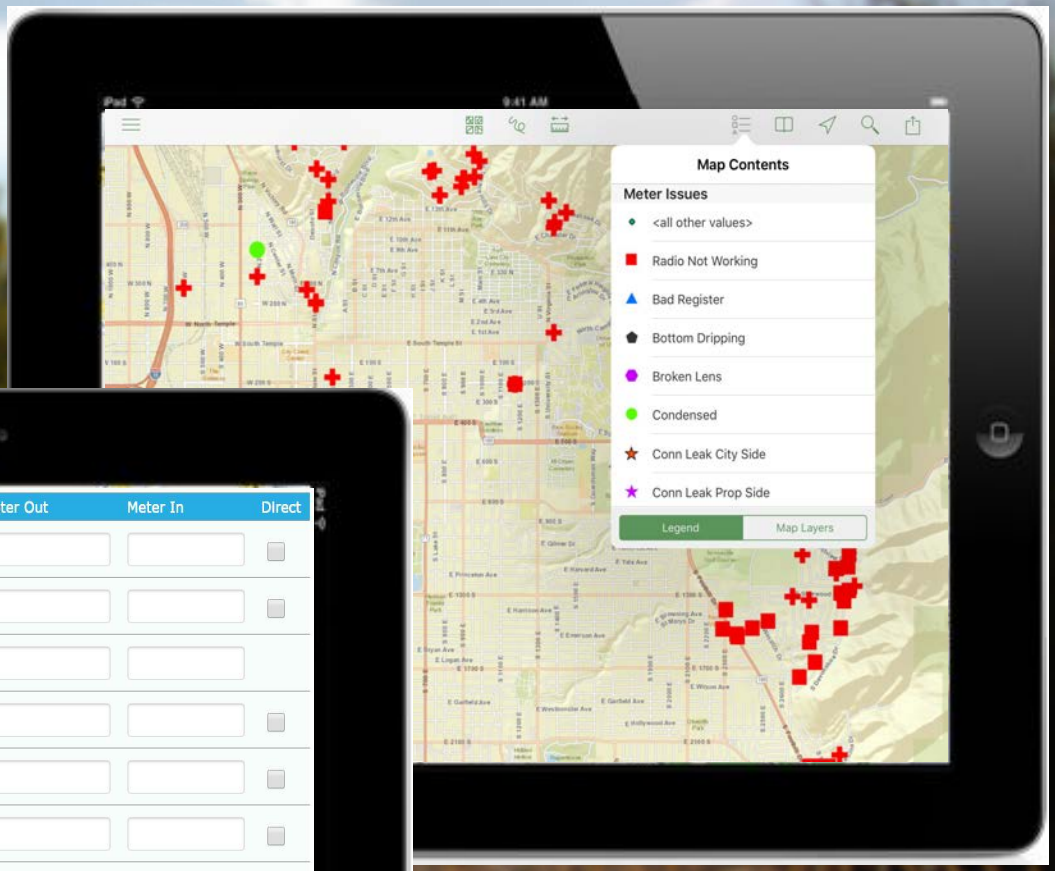
UDOT
Keeping Utah Moving

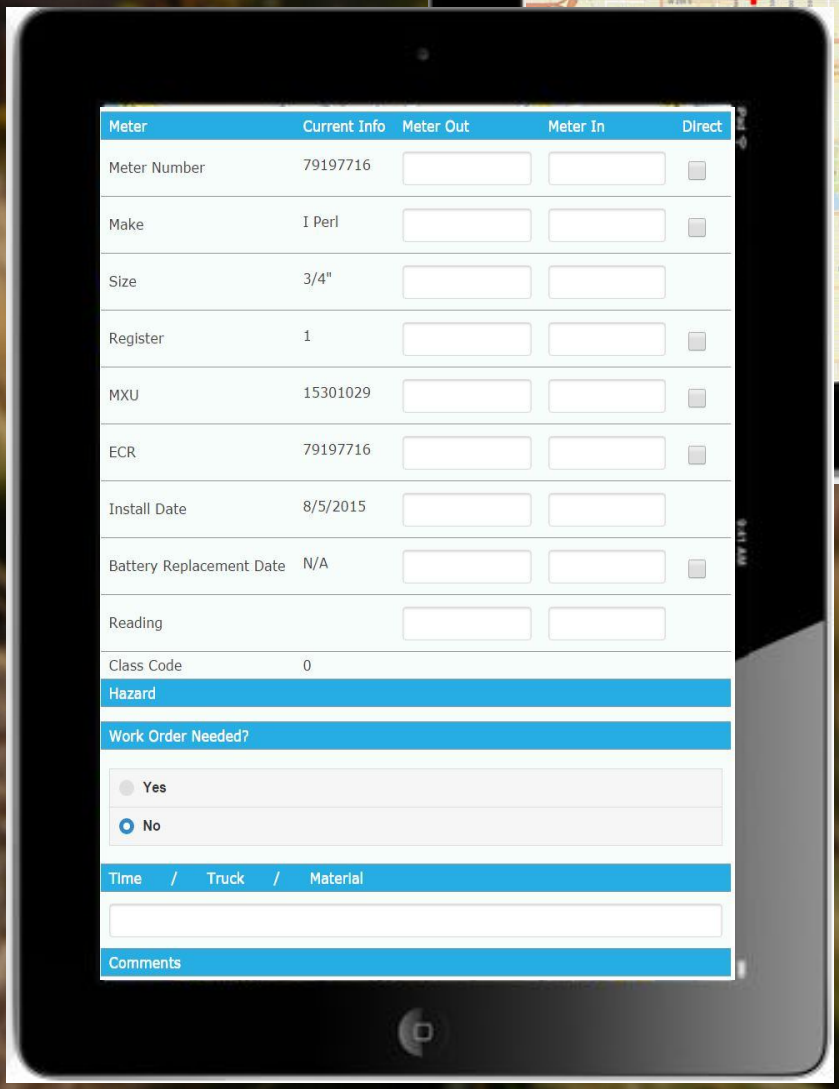
Sarah Rigard
Chris Meredith
udotgis@utah.gov

Water Meter Investigation and Repair Mobile App

Salt Lake City Department of Public Utilities

Salt Lake City Department of Public Utilities has created a mobile mapping application that links our meter billing system to an online mapping application. When meters are not functioning or broken, an employee is sent out to investigate the problem and repair or replace the meter. An electronic form is then filled out by the employee and the new data and comments are automatically sent to the billing and work order management systems. When the investigation/repair is closed the point is automatically removed from the map. This eliminates paper and increases productivity by allowing the employees to visually route themselves efficiently.





Above: Map of meter issues to be investigated.

Left: Form opens by identifying a point on the map and clicking on the link.

Salt Lake City
Department of Public Utilities
GIS Department

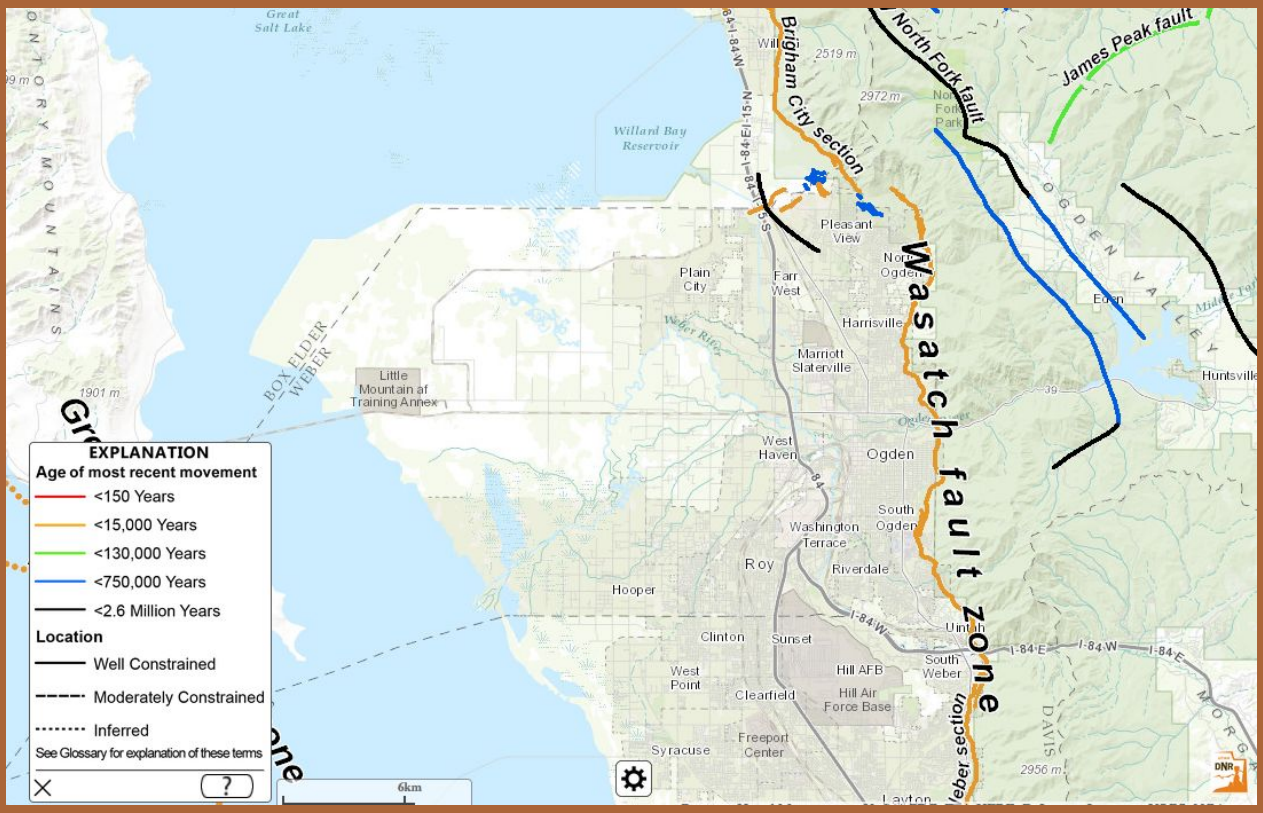
What's at Fault?

Utah Geological Survey's Quaternary Fault Database

The Utah Geological Survey (UGS) has made the Utah Quaternary Fault and Fold Database available through a new interactive web application on the UGS website: **geology.utah.gov/resources/data-databases/qfaults.** This database contains information on faults and fault-related folds considered to be potential earthquake sources. The faults and folds in the database are considered to have been sources of large earthquakes (about magnitude 6.5 or greater) during the Quaternary geologic time period (past 2.6 million years); these geologic structures are the most likely sources of large earthquakes in the future. The Utah Quaternary Fault and Fold Database is the primary source of Utah data for the Quaternary Fault and Fold Database of the United States maintained by the U.S. Geological Survey (USGS).

The interactive map's user interface was built using ESRI's JavaScript API. Several search options allow the user to locate a fault of interest, or specify a location to see if any Quaternary faults are nearby. Pop-up windows provide a brief summary of important information associated with the faults, as well as a link to detailed reports available through the USGS national database. Users can select from a variety of basemaps including topographic, shaded relief, and satellite imagery. A glossary explains terms used in the pop-up windows as well as terms used in the detailed reports that may be unfamiliar to non-geologists.

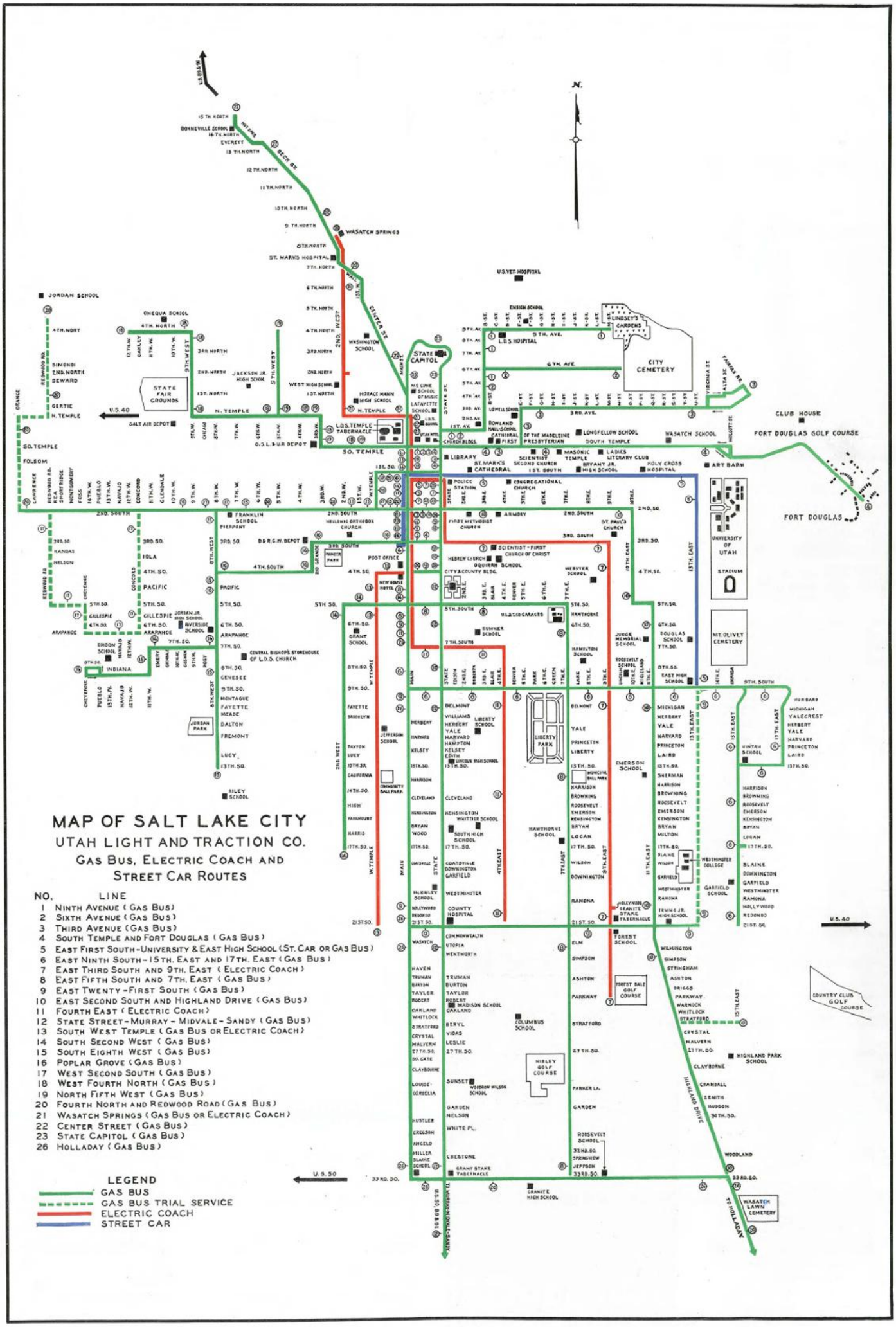
In addition to the UGS interactive map, the Utah Quaternary Fault and Fold Database exists as a fully attributed GIS feature class in the State Geographic Information Database, and can be downloaded from AGRC at **gis.utah.gov/data/geoscience/quaternary-faults**.



Utah Geological Survey

view database here: http://ow.ly/YuNXE

Salt Lake City Bus and Street Car Map, 1940. Source: Utah State Archives



About the cover:

The cover shows four samples of the statewide high resolution aerial photography licensed by the UMIP partnership from Google. The license allows state, tribal, and local government to use this information resource for mapping in GIS, CAD, 811/911/Dispatch, and other systems, as well as in public facing web applications.

The images depict (clockwise from upper left): the Great Salt Lake State Park marina boat storage, an evaporative mining operation for potash outside Canyonlands National Park, the University of Utah's Natural History Museum parking and entrance area, a St. George neighborhood with the statewide address point and street overlay sourced from local government data.

Thanks to all Maps on the Hill 2016 participants!

The 2016 map book was created using the Google Slides distributed editing platform. Each map, description, and layout was contributed directly to the document by the map authors.

Publication of the map book was made possible through the combined efforts of the Utah Geographic Information Council, the Automated Geographic Reference Center, and the Utah Department of Natural Resources.