Ivins

Ivins City is located on the south side of Snow Canyon State Park, overlooked by towering sandstone cliffs, with lava flows throughout the community. Ivins City has ample arts and recreation opportunities through the Tuacahn Center for the Arts, Coyote Gulch Art Village, Snow Canyon State Park, and several resorts that operate in the community.

Ivins City was settled in the early to mid-1920s by families seeking to farm in the area. A small community developed in the following decade and the community incorporated into the Town of Ivins in 1935.

Demographics

As of the 2018 American Community Survey, Ivins has a population of 8,211 people, described in Figure 359. The 2020 census is not yet available to include in this document, so the 2018 ACS estimates the most recent population for the area.

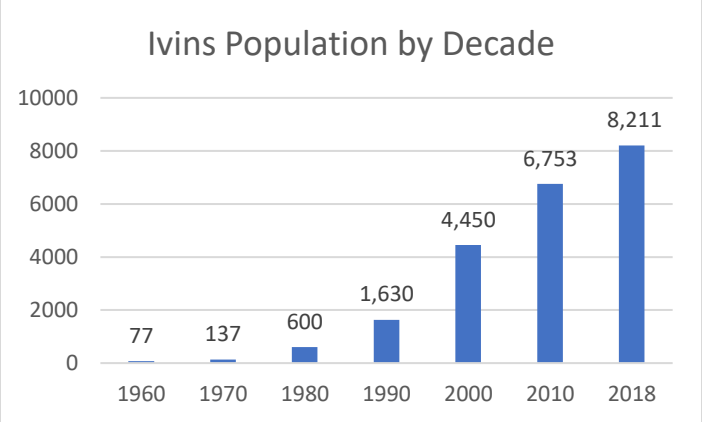


Figure 359: Ivins Population by Decade

Source: US Census Bureau

Ivins population has been increasing with time, with the most rapid changes observed between 1970 and 1980, where growth is recorded at over 300% change. Growth has been slowing since 2000, with the most recent estimated change near 22%, shown in Figure 360.

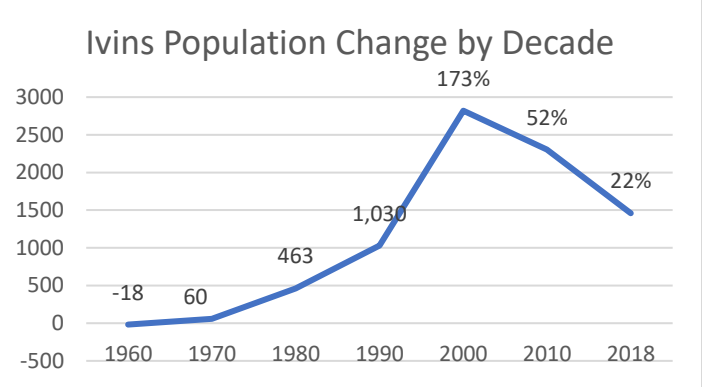


Figure 360: Ivins Population Change

Source: US Census Bureau

Population projections for the county have been completed by the Kem C. Gardner Institute describe that Washington County is expected to see an 229% increase in population between 2015 and 2065. If applied to Ivins, the community could see 24,365 people living in the community in the next 45-years[21].

Economy

Agriculture was a driving force for settlement of much of southwestern Utah, which is reflected in Ivins history. The local economy has grown and developed since the early 1900s. Figure 361 describes an analysis of the share of jobs by industry from the US Census Bureau OnTheMap tool, according to the 2018 American Community Survey estimates. Industries with the largest share of jobs in the community include accommodation and food services, health care and

[21] This estimate is created using the 2015 ACS population estimate for Ivins, which was 7,406, and adding 229% of this population estimate to the population for that year.

social assistance, and construction. Arts, entertainment, and recreation also occupy a large portion of the local economy and is a very visible industry observed through the local theater and arts organizations, recreation amenities, and resorts in the community.

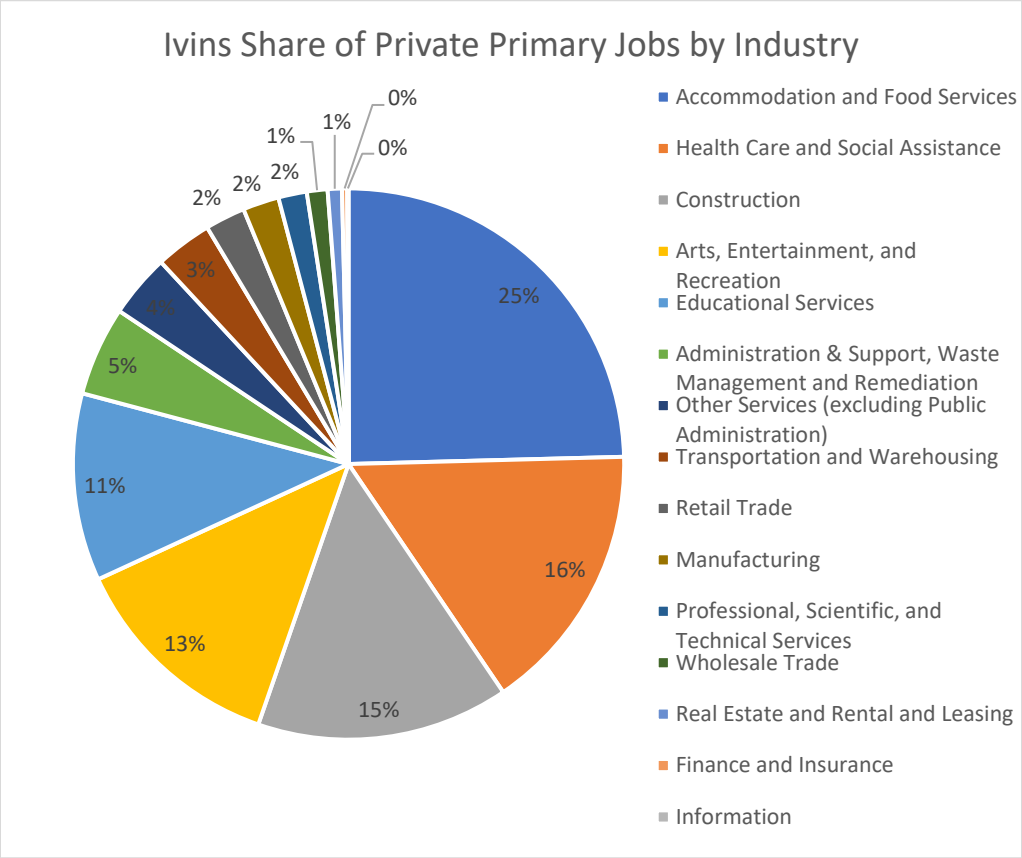


Figure 361: Ivins share of Private Primary Jobs by Industry

Development

The Ivins City General Plan (2015) describes development trends in the community as of 2015. As of the writing of the general plan, 36% of the community was developed and 14.5% is considered permanent open space, leaving 49% in undeveloped space. Some of this undeveloped space may not be developable due to geologic hazard or sensitive lands.

The City continues to develop mostly as a bedroom community to St. George with the majority of the development coming from single family home construction. However, for the past 3 years, the City has seen some multi-family construction occurring on the south side of near Old Highway 91. Commercial development in Ivins City is modest with a handful of small shops, but there are plans for some larger scale resort developments on the east side of the City such as Black Desert Resort and Sentierre Resort that are still in their initial stages of development.

Community Capabilities

Ivins is governed by a mayor and city council, who engage in legislative activities for the community. Several boards and committees advise council on actions and make decisions for the community. Committees include:

- Planning Commission
- Sensitive Lands Committee
- Arts Commission
- Emergency Preparedness Committee

A planning commission reviews new development permit applications, zone change activities, and contribute to the community general plan. The Building and Zoning department assists residents with permit and inspections, plan checks, and other activities which support development which follows city code and the general plan.

The sensitive lands committee provides recommendations to the planning commission and city council about plans and plan elements, ordinances, and applications which may be in sensitive land areas. The body advises the city council on matters relating to sensitive land areas.

The arts commission supports art relating funding and opportunities in the community. Members are appointed by City Council and participate in reviewing an Arts Master Plan, recommending to City Council about plan revisions, arts funding, and appointments to the arts commission.

The Emergency Preparedness Committee has engaged in rapid disaster and resilience training in the community. The committee has implemented disaster boxes in neighborhoods throughout the community, where any resident will be able to access the box during an emergency. Each box includes radio devices and instructions to contact emergency services during a natural disaster or other emergency event. Other activities implemented by this committee include food growing and storage for emergency preparedness and resilience.

City administrative staff oversee the day-to-day operations of the city. Include: city attorney, city manager, treasurer, director of finance, recorder, fleet manager, and business license administrator. Departments provide specific and specialized skills to address city ongoings and needs, per local ordinances. Capacity in departments include, but are not limited to building and code enforcement, engineering, public safety (fire, EMT, and police), building and zoning, and public works, and emergency management.

Public safety is provided by an interlocal agency, the Santa Clara-Ivins Public Safety Department, which provides police, fire, and emergency medical services to residents of the neighboring communities.

Plans and Policies

Ivins has developed plans and policies which set goals, objectives, and laws for the community. Several of these documents describe natural hazards in the goals, objectives, and laws, which have been summarized here. The following section provides an overview of Ivins' plans and policies as they relate to natural hazards. Additional plans may exist which were not made available for review.

Please review the community plans in full to understand current policies and ordinances. The section below is for summary purposes only.

Codes and Ordinances

Ivins City has developed ordinances to address natural hazards. The community includes cod which requires the use of the International Building Code and sets methods by which flooding losses can be reduced.

General Plan

The Ivins General Plan (2015) describes the long-term vision for the community. Elements of the plan describe goals, policies, and actions to meet this long-term vision. Natural hazards including landslide, problem soils, drought, and flooding are addressed in the community general plan. The community included policies which describe preserving the natural state of floodplain, washes, and hillsides to reduce hazard risks on the site. Policies also preface the promotion of water conservation and desert landscaping measures in the city.

Moderate Income and Affordable Housing Plan

The Moderate-Income Housing Plan (2019) challenges elderly residents on a fixed income may face in relation to housing. Housing costs including maintenance and utilities can be a challenge which may make residents more vulnerable to extreme temperatures and weather if these costs are too high. The Ivins general plan describes that weatherization, home rehabilitation programs, and utility assistance can help residents afford maintenance and utilities. In the west, with high heat in the summer and low temperatures in the winter, access to heating and cooling indoors is essential.

Water Conservation Plan

The Water Conservation Plan (2018) reports how Ivins City will conserve water in compliance with the Water Conservation Act of Utah, which requires an overall water use reduction goal and every five years a documented progress report, public comment, and plan update. The plan describes that the Washington County Water Conservancy District has met a 25% conservation goal. The city has also seeking to reduce water usage by 10% between 2017 and 2027 and maintain system water losses to 7%. Review the plan here for detail about the five-year conservation strategies.

Sewer Master Plan

The Sewer Master Plan provides an evaluation of the Ivins City wastewater system and sets objectives for improvements. Some improvements are in response to impacts from natural hazards, including severe storms and flooding, which cause backups or other damage.

Transportation Master Plan

The transportation plan sets the expected needs and growth of transportation infrastructure in the community. The plan describes current development status and exposure to hazard areas including slopes and the floodplain. Two projects in this plan include storm drainage improvements on Old Highway 91.

Risk Assessment

Ivins is at risk to several natural hazards addressed in this Natural Hazard Mitigation Plan. Five County has worked with the Ivins planning team to develop a ranking the highest risk hazards based on probability, and local exposure of the hazard. Table 391 describes the relative risks of hazards in the community.

Table 391: Ivins Hazard Risk

HAZARD	RISK
DROUGHT	1. High
SEVERE WEATHER	2. High
FLOOD	3. High
WILDFIRE	4. Moderate
EARTHQUAKE	5. Moderate
RADON	6. Low
LANDSLIDE	7. Low
PROBLEM SOIL	8. Low

A detailed description and mapping of each of the natural hazards that impact Ivins can be found in this chapter, concluding with a mitigation strategy for the community. The mitigation strategy aims to reduce the risks and vulnerabilities in the community to natural hazards described in this plan and has been developed by the local planning team.

Five County assessments for Ivins include reviewing the exposure that critical facilities, residential parcels, parks, and roads have to the natural hazards that impact the area. Critical facilities include schools, medical facilities, fire stations, and police stations and law enforcement facilities.

Wildfire

Ivins is a city in southern Washington County. The community is bounded by Snow Canyon on the north and east, Santa Clara City to the south, and the Paiute Reservation to the west. Old Highway 91 runs through the southwest portion of the community, parallel to the Santa Clara River. The Ivins reservoir is in the northwest of the community. Wildlands and open space border the community to the north and south.

Figure 362 maps the wildfire risk using data obtained from the Oregon Department of Forestry on the Utah Wildland Risk Assessment Portal. Mapping completed by the Five County AOG describes those areas in and surrounding Ivins that are at moderate to extreme risk to wildfire. The metrics used to determine risk rating can be found in the Hazard Identification section of this plan.

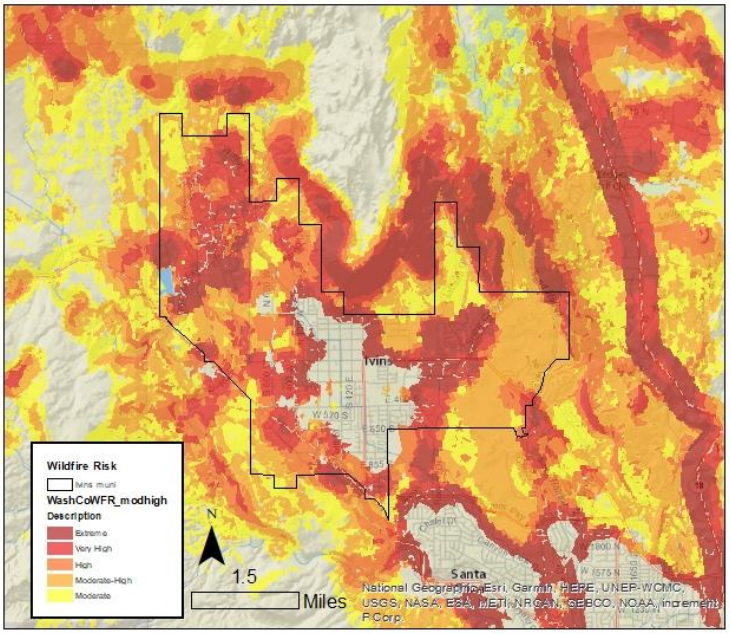


Figure 362: Ivins Wildfire Risk

Source: Oregon Department of Forestry, AGRC.

Table 392 further describes Ivins City's risk by measuring assets that fall in identified wildfire risk areas. Exposure to wildfire risk areas of moderate or greater ranking impacts critical facilities, parcels, and miles of roadway in Ivins, which could damage property, impact public health and safety, or impact local economies. Wildfire risk on roadways can result in challenges to response and recovery and the travel of people and goods. Critical Facilities impacted by wildfire can have challenges providing services during emergencies.

Table 392: Ivins Wildfire Risk

Ivins Exposure to Wildfire Risk						
Critical Facilities	Parcels			Road Miles	Rail Miles	Parks
	Commercial	Residential	Total			
50.0%	61.7%	57.0%	57.0%	60.8%	N/A	63.6%

Source: Oregon Department of Forestry, Washington County Assessor, Utah AGRC.

Hazard History

Several agencies track and manage wildfire data, leading to some differences in the record. This plan references the Utah Wildfire Info database, which records recent, large wildfires from 2017 to present and fires designated under Fire Mitigation Assistance Grant program from FEMA. No fires documented on either source have impacted Ivins as of July 2020. Smaller fires may have occurred that impacted the area that are not recorded on either source.

Wildfire impacts air and water quality and can affect public health through airborne ash and smoke. Individuals with respiratory disease, athletes, or people using outdoor spaces can be impacted by smoke and ash in the air. This ash settles on the ground and riparian areas, affecting water quality for a region. Riparian areas and drinking water assets can be at risk to settling debris from burning.

Wildfire can have economic impacts through damage to infrastructure and structures. In this area of Southern Utah, where public lands are an asset to a local economy, damage in these spaces can impact industries for several seasons, including tourism.

Wildfires can also cause and have heightened risks depending on other ongoing climate, weather, and geologic conditions. Wildfires can cause or exacerbate flash flooding, landslides, debris flows as burned area does not have vegetation to secure the soil, allowing it to wash away in a flood or landslide. Drought hazards can contribute to conditions which lead to heightened wildfire risk, with excessively dry vegetation and low water levels. Changing climate conditions will also contribute to wildfire risk long-term as dry conditions are expected to continue. Drought, flash flooding, and landslides all pose risks to Ivins, and it is essential to be aware of the interrelated nature of these hazards.

Earthquake

Utah has regular seismic activity, reporting several earthquakes annually. Earthquakes in Utah tend to be small and barely felt in communities, but there are several faults in the state that have the potential to produce severe earthquakes. The Southwest has a history of large earthquakes which cause impacts. Figure 363 shows the mapped earthquake epicenters and fault lines in Ivins.

No earthquake epicenters with magnitude greater than 4.0 have been identified in the municipal boundary.

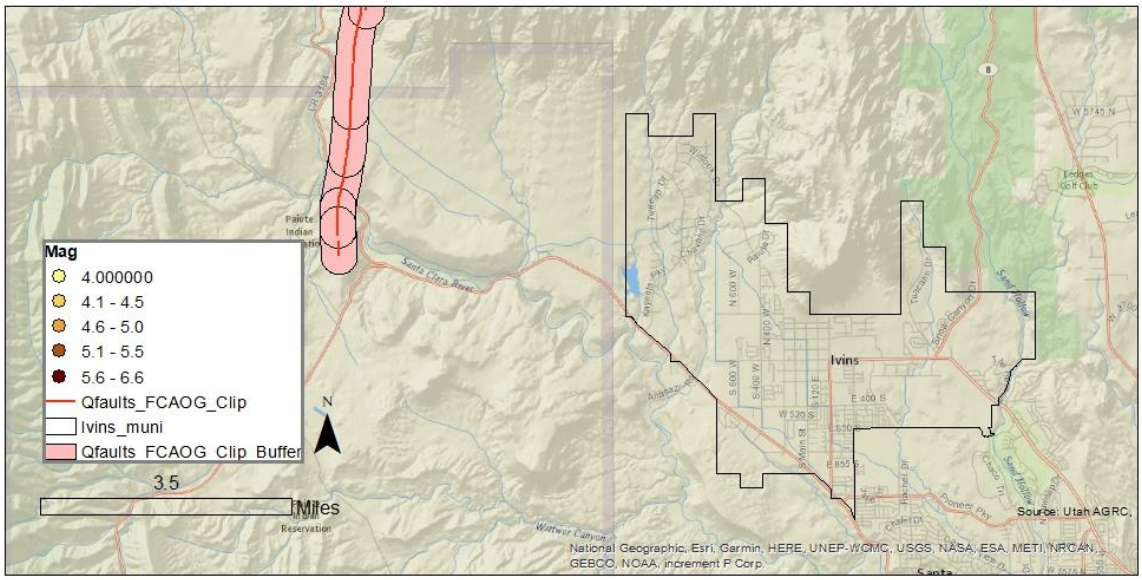


Figure 363: Ivins Earthquake Epicenter and Quaternary Faults

Source: UGS, Washington County Assessor, AGRC

There are no faults in the municipal boundary, with the closest mapped as a segment of the Gunlock Fault approximately four miles northwest of the city boundary.

An identified vulnerability to earthquakes in the region includes structures built before 1975, when seismic code requirements were adopted by the State of Utah. Many of these structures are built using unreinforced masonry construction, which does not have steel reinforcements in the structure to protect it during a shaking event. Structures built in this style can collapse and see increased damages to the structure during a shaking event.

According to Washington County Assessors data, 77 structures were built before the adoption of seismic code requirements, approximately 1.9% of the total structures in the Ivins municipal boundaries. Southern Utah has a pride in their pioneer history, which often includes preservation of historic buildings. Preservation should include retrofitting of structures to ensure the safety of those inside and outside of structures made from unreinforced masonry during a shaking event.

Liquefaction

The Utah Geological Survey has completed mapping of liquefaction susceptibility for the urban portion of Washington County, which includes Ivins City. Liquefaction is a secondary hazard that can occur

following strong shaking, where the soil loses its structure and becomes fluid. Figure 364 indicates that Ivins has low to high susceptibility to liquefaction in the community.

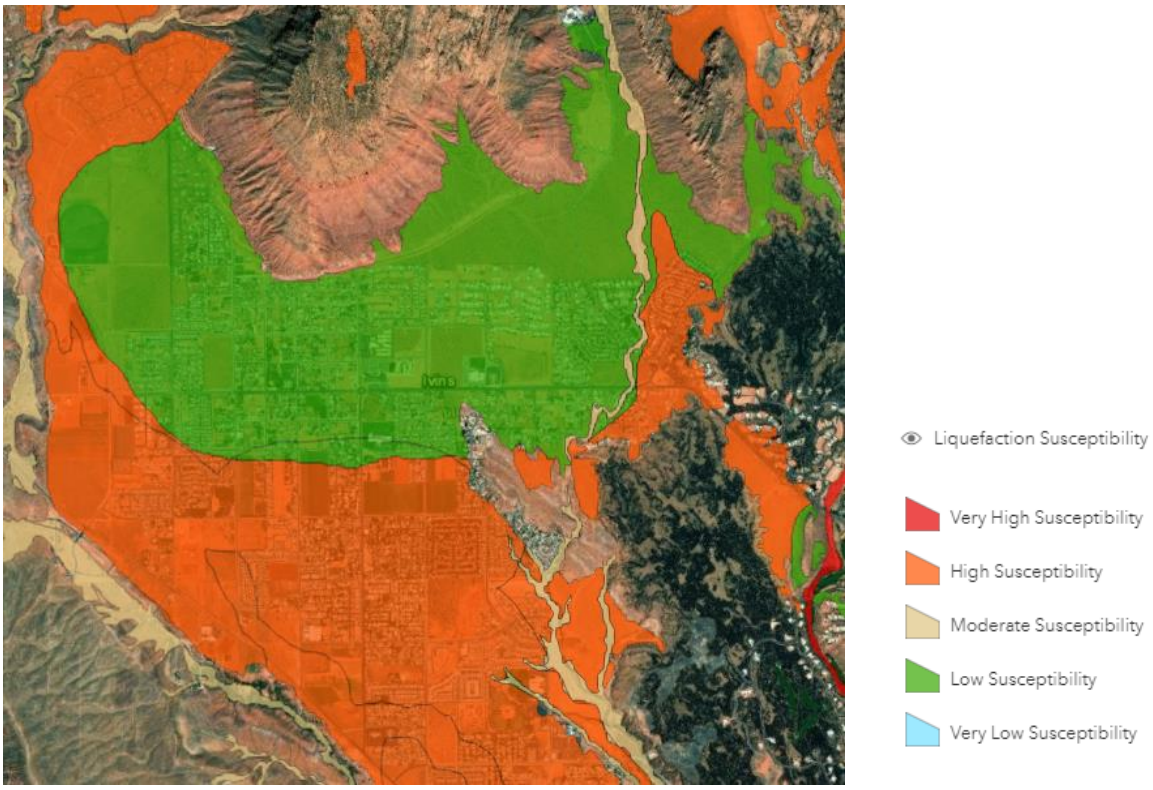


Figure 364: Ivins Liquefaction Susceptibility

Source: Utah Geological Survey

Hazard History

The University of Utah Geology Departments and the US Geological Survey document seismic history, which has been used for this plan. To focus on severe earthquake events, Five County includes earthquakes with magnitudes of 4.0 or greater. The University of Utah and USGS sources documented magnitude differ slightly in their measurement.

No earthquake epicenters of 4.0 magnitude or greater have been reported in Ivins as of 2020. The closest earthquake occurred in St. George approximately 6.5 miles away and was likely felt in Ivins.

Earthquakes are generally not triggered by other natural hazard events prevalent in the Southwest, although they can be caused by human activities like drilling or mining or volcanic eruptions. Several hazards can be caused by earthquakes, including flooding, landslide, and wildfire.

Flood

Flooding events are common in the southwest, especially flash flooding as severe summer thunderstorms produce rapid downfalls of rain. Dams in the region contribute to potential flooding hazard as failure could inundate an area downslope. Figure 365 depicts the flood and dam inundation exposure in Ivins. Dam inundation is mapped to the southwest of the community, along the Santa Clara River, and may interact with the Highway-91 thoroughfare in the community. Floodplains are observed

throughout the community, predominantly running north to south directional channels and washes, which lead to the Santa Clara River.

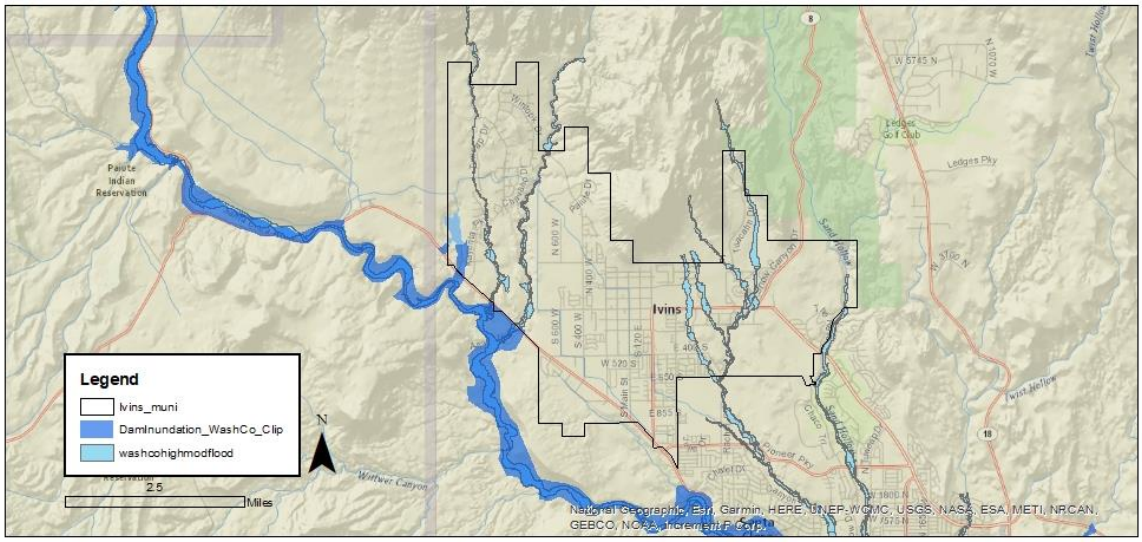


Figure 365: Ivins Floodplain and Dam Inundation Exposure

Source: Flood Insurance Rate Map, AGRC

Table 393 describes the Ivins community assets exposed to dam inundation and the 100-year floodplain zones. Residents, visitors, and personal property may be vulnerable to flooding impacts. Local parks and commercial parcels are most exposed to flood and dam inundation per the map. Parks and open space can provide a buffer for flooding in communities, where flood prone areas do not damage personal property, economic assets, or cause injury to residents or visitors. Commercial properties at risk to flooding may see physical damages to the property, loss of inventory or business during and/or after a flood event, depending on the extent of damages.

Table 393: Ivins Exposure to Flooding and Dam Inundation

Critical Facilities	Parcels			Road Miles	Rail Miles	Local Parks
	Commercial	Residential	Total			
0.0%	11.7%	5.8%	5.9%	3.8%	N/A	27.3%

Source: Floodplain Map, Washington County Assessor, UDOT, AGRC.

National Flood Insurance Program

Ivins property, assets, and homes outside of the mapped zones are not free of flooding risk. Since the inception of the National Flood Insurance Program (NFIP), approximately 25% of all paid claims were not located in a special flood hazard area. (Insurance Information Institute, 2020) The National Flood Insurance Program has provided flood related assistance in rebuilding and repairing structures following flood damages since 1978. Communities must participate in the NFIP for their residents and businesses to purchase insurance. This involvement requires certain policies and practices for the floodplain. Participation in the NFIP can reduce the cost of recovery following flooding.

Table 394: Ivins NFIP Participation and Claims Paid

Total Premium	V-Zone	A-Zone	# Policies	Total Coverage	Claims since 1978	Total Paid since 1978
$16,209	0	0	44	$14,280,000	4	$19,409

Source: FEMA NFIP Insurance Report, Repetitive Loss/BCX Claims, and Community Status Book Report; accessed July 23, 2020.

Ivins participates in the NFIP and had a Flood Insurance Rate Map (FIRM) developed in 2009. Table 394 describes the number of flood insurance policies, and dollar value insured and claimed since participation began. Four claims have been submitted, and there are no repetitive losses recorded for the community. Ivins does not participate in the Community Rating System (CRS). The community received a Community Assistance Visit in 2015 and a Community Assistance Contact in 2019.

Hazard History

The National Oceanic and Atmospheric Administration (NOAA) collects data about reported flooding and severe weather, which is used for this plan. Monsoon rains occur in the late summer and fall, which bring a rapid and heavy rainfall and can lead to flooding events, damaging structures, overwhelming existing infrastructure, and moving debris throughout the town. Table 395 describes the flooding events which have impacted Ivins and the surrounding area. Damages from flash flooding total above $150,000 for the community, from events occurring during monsoon season.

Table 395: Ivins Reported Flood Events

Date	Damage/Injury	Description
8/2/2005	$35,000	During a thunderstorm, a spotter reported 3.88” of rain in Ivins over a few hours. The storm caused seven Ivins homes to flood.
8/27/2007	$120,000	A severe storm dropped 1.77 inches of water, resulting in damage to 12 homes from flash flooding.
8/4/2008	None Reported	Heavy rain produced flash flooding in Snow Creek Canyon.
8/7/2008	None Reported	A severe storm caused flash flooding on streets in Ivins, damaging one home.

Source: NOAA Storm Database

Flood risks can be increased by certain natural hazards, like wildfire or drought, which can burn or kill vegetation, reducing the amount of water absorbed by the ground, which can in turn result in landslides or debris flows. Long-term climate trends indicate that severe weather events are expected to become less frequent but increase in magnitude, which will influence flooding locally.

Landslides

The landscape in Southwestern Utah, marked by mesas, cliffsides, and valleys can see landslides and rockfall over time. Landslide and rockfall activity can be observed on slopes and cliffsides throughout the area and become a risk to humans when events interact with the built environment and recreation opportunities. Figure 368 maps the landslide susceptible areas throughout Washington County, with Ivins Municipal Boundary. Landslide susceptible areas are mapped to the north and southwest portion of the Ivins boundary, where hillsides and steep cliffs mark the terrain.

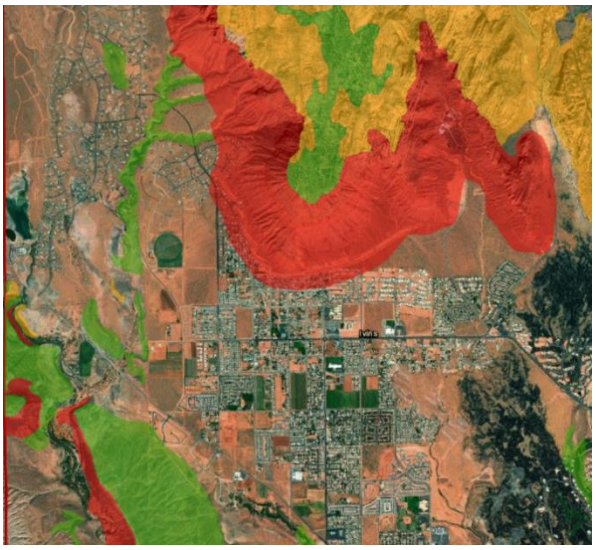


Figure 366: Ivins Rockfall Hazard

Source: Utah Geological Survey

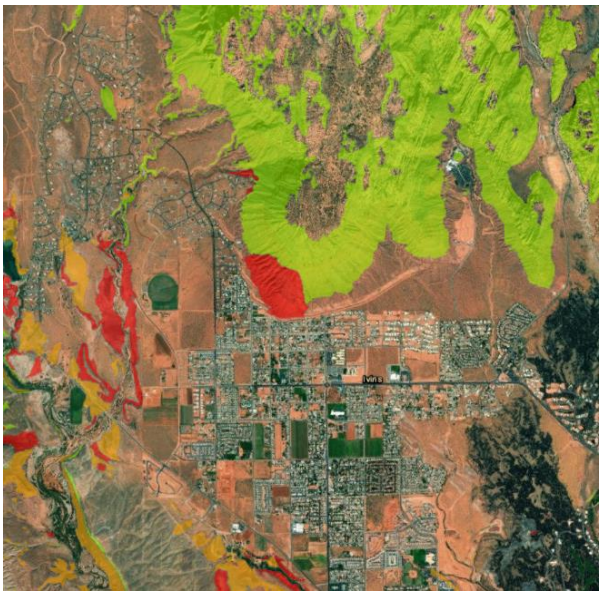


Figure 367: Ivins Landslide Hazard

Source: Utah Geological Survey

Rockfall is a type of landslide which is described as the displacement of rocks or boulders. Rockfall areas may have a long runout where the boulder has built speed and continues to move, even once off the slope, which can impact structures and infrastructure at the bottom of a hill or cliff.

Figure 8 describes the identified rockfall areas in Ivins and areas of high hazard susceptibility are in the northern portion of the community, south of Snow Canyon State Park. Some susceptible areas are in drainages northwest of the community, and in the open space to the south.

Landslides represent a more general term for lands, soils, or rock that move on the ground. Landslides are often attributed to steep slopes. As observed in Figure 9, the northern portion of the community, near Snow Canyon State Park and Tuacahn Theater are exposed to some landslide risk, with the highest risk notably on southwest facing side of Red Mountain.

Figure 10 describes in a summary the exposure for the county, with the City of Ivins outlined, showing a comparison for the rest of the surrounding area.

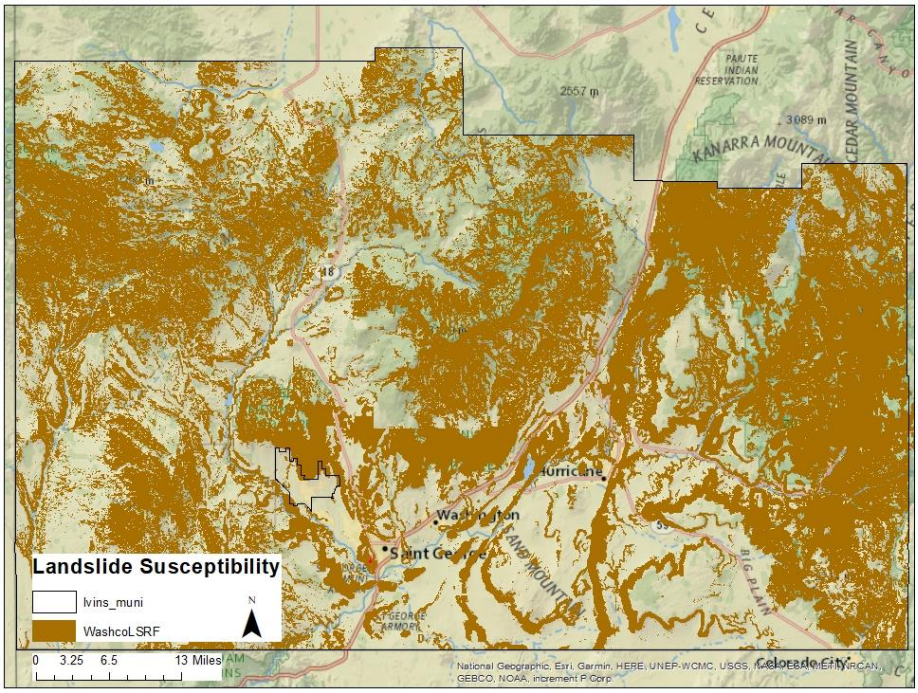


Figure 368: Washington County Landslide and Rockfall Susceptibility

Source: Utah Geological Survey

Ivins is exposed to landslide susceptible areas primarily in the north and southwest portions of the community, where the city is bounded by cliffs and hillsides. Table 396 describes the estimated exposure of community assets to landslide susceptible areas. Exposed assets in the community include critical facilities, commercial and residential parcels, and road miles. People and property are vulnerable to landslides, which can damage homes, vehicles, and cause injury or death. On roadways, landslides can place debris on or cause damage to roadways. Such damages can block traffic and make access to the community a challenge. Future growth in the community could place new construction in susceptible areas without proper planning.

Table 396: Ivins Landslide Susceptibility Exposure

Ivins Exposure to Landslide Susceptible Areas						
Critical Facilities	Parcels			Road Miles	Rail Miles	Parks
	Commercial	Residential	Total			
25.0%	3.3%	7.9%	7.8%	6.6%	N/A	9.1%

Source: Utah Geological Survey, Washington County Assessor, AGRC.

Hazard History

The southwest landscape was developed through landslide events, which are common throughout the region. Landslides that interact with humans and property can have financial, health, life and public safety impacts. To date, there have not been landslides reported impacting the City of Ivins.

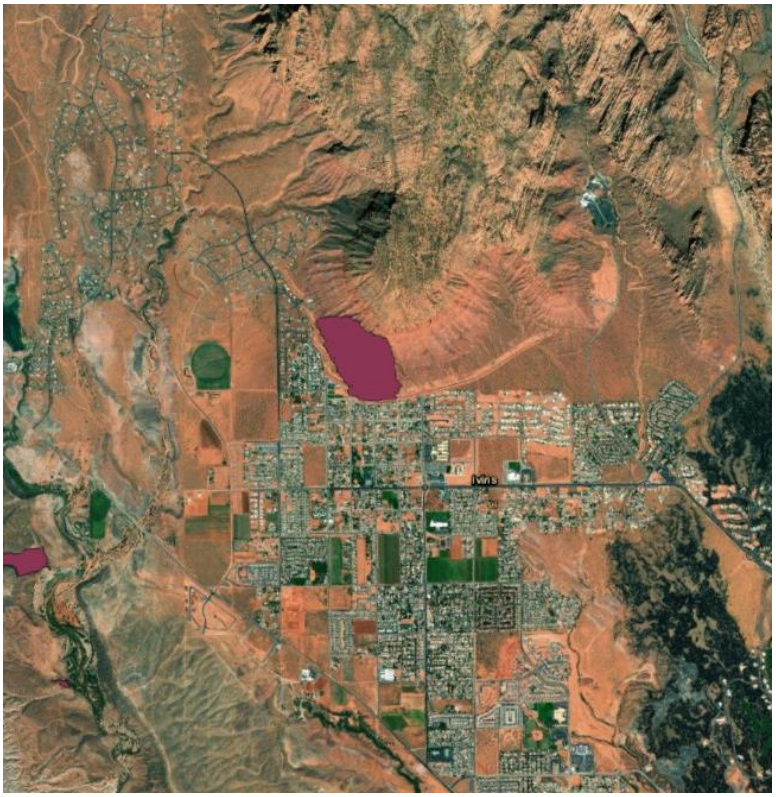


Figure 369: Map of existing landslides

Utah Geological Survey

Maps from the Utah Geological Survey identify landslide boundaries which are on the steep slopes to the north of the city, and in the open space southwest of Ivins. Both areas are presently undeveloped, but future uses may expose structures and infrastructure to landslide risk and damage.

Several factors contribute to the potential or increased risk of landslides. Landslide events can trigger or be triggered by other natural hazard events. Earthquake, drought, flooding, wildfire, and severe weather can cause or worsen landslide events as the soil content and vegetation destroyed during these events. Landslides can likewise lead to flooding as ground materials can block or change flood and drainage areas.

Drought

The Five County region has recorded seven instances of extended drought conditions since 1895 that have impacted the region. The hazard history is described in the Hazard Identification and County section of this plan, as Drought is a regional hazard. The southwest is no stranger to drought, however as the region continues to grow, extended drought can have greater negative impacts. Utah entering an extended period of drought, with 2020 being the driest year on record, there are implications from this natural hazard on the regional economy and people in the area.

Both tourism and agriculture economies would be impacted by a drought event, which can create dry, hot conditions. Drought may also impact the local water supply, for the town includes wells and spring water. Tourism and related industries are portions of the economy in Washington County. A University of Colorado report indicated that perceived risk of hazards from visitors can influence their selection of a destination. Perceptions included low water for river trips or wildfire risk, both of which are influenced by drought.

Drought conditions create visibility and air and water quality concerns as well. Dry soils can blow in the wind, increasing dust in the air which people breathe in. Increased wildfire risks can also lead to more smoke and ash in the air. Dust, smoke, and ash impact water quality.

Drought is connected to other natural hazards, primarily wildfire. Dry fuels can increase the severity of wildfire risk and wildfire events. Changes in the vegetation in an area due to lack of water can lead to invasive species and bare soils which can result in flooding, debris flow, and landslide events when water does flow on drought impacted areas.

Radon

Radon is a leading cause of lung cancer and is the natural hazard that kills more people in the State of Utah. Indoor radon concentrations are common throughout the State of Utah, especially in homes, where people spend most of their time in the day. The Environmental Protection Agency has identified that Southwestern Utah is expected to have an average indoor level between 2.0 and 4.0 Pci/L of air, illustrated by Figure 370. At this level, mitigation is recommended, although mitigated indoor levels below 2.0 are difficult to achieve. There is no known level at which radon concentrations become more or less of a risk, as there is no safe level of radon exposure.

Occurrence and concentrations of radon depend on the soil content, structures foundation, and time spent in a space. Radon is a gas emitted from uranium deposits underground. Radon gas travels through the ground to the surface and can enter homes, become trapped and concentrating. Concentrations of radon gas are unhealthy for humans. Outdoor spaces are not a risk as the airflow dilutes radon.

Radon is not healthy at any level and is annually the natural hazard that kills the most people in Utah. Despite this indicator, few people are aware of radon risks and consequences. Increased public information about radon and reported at home testing results can help to inform the public and residents. Mitigation can be affordable, especially when completed in pre-construction phases.

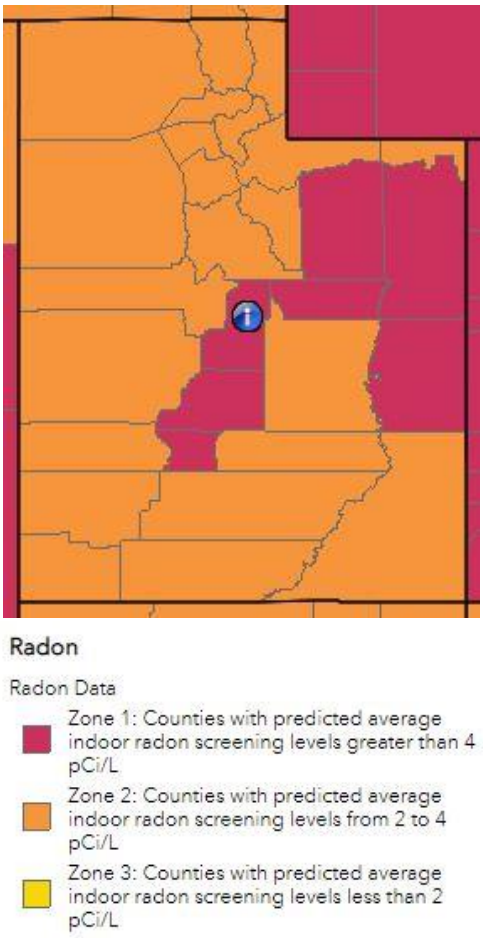


Figure 370: Estimated Indoor Radon Level Zones- Utah

While radon occurrence data can be difficult to acquire for communities, a 2019 report from the Utah Department of Environmental Quality describes short term radon testing by zip code and County. It is important to understand that testing and mitigation are site specific, based in part on the location and geology, but also the age and quality of the structure (Division of Radiation Control, 2019). The data from this report should not be used to determine where testing or mitigation should or should not be applied. Unfortunately data for specific cities and towns is not available.

Table 397 describes the reported findings from short term radon testing across Washington County. The countywide average test result is 2.2 pCi/L of air. While this average is within the radon estimate for the region, radon tests with high levels of radon in the air have been reported which would require mitigation for human occupation of a space. The takeaway from this data is that radon gas has been identified in structures in the County and that testing, and information is necessary to understand and reduce risk.

Table 397: Washington County Short Term Radon Testing Reported

Percent of tests with levels <4 pCi/L	Percent of tests with levels ≥4 pCi/L	Maximum Radon Level Reported	Average Radon Level Reported	Number of Tests
88.3%	11.7%	31.9 pCi/L	2.2 pCi/L	797

Source: Utah Department of Environmental Quality, Division of Radiation Control 2019.

There is not a hazard history for radon beyond the testing record, with even less being available at the town level. Increased testing and reporting would improve the understanding of radon risks and vulnerabilities for home and property owners. While estimates of radon levels in the County can be helpful to describe the problem, individual testing is the only way to understand the potential risk and exposure of radon gasses for a residence or structure. Testing and mitigation of radon should be done with the consultation of a Radon mitigation specialist.

Severe Weather

Severe weather often affects a region or county at large and can be difficult to accurately document, as coverage often relies on local documentation and reporting to NOAA or other weather agencies. There is not GIS data to show where or how severe weather will impact Ivins, however our analysis assumes that severe weather events will impact the whole of the community, residents, facilities, infrastructure, businesses, and property.

Ivins is in a valley at the foot of a canyon, which sees summers marked by heat, dry weather, and rapid downfalls of monsoon rains. A river runs near the community and a major roadway, which can be subject to flooding. Thunderstorms frequently impact Washington County, which can produce hail, high winds, rain, and lightning.

Hazard History

NOAA reports that there have been 451 severe weather events reported for Washington County between 1950 and 2020. Ivins has three reported severe weather events which have impacted the area. Severe winds and thunderstorms are common to Washington County and can damage structures and economic assets, delay traffic, and block roads. Extreme heat is also a challenge throughout the Southwest, two such events are described in Table 398. While the deaths reported during the 2013 events did not occur in Ivins, the area likely saw extreme heat during these events which could cause impacts on residents and visitors. Outdoor recreators, unhoused persons, and outdoor workers are most vulnerable to these extreme temperatures.

Table 398: Ivins Severe Weather Record

Date	Damage/Injury	Description
9/9/1998	$35,000	Wind gusts of 70 MPH were reported in Ivins causing $25,000 in Crop Damage and $10,000 in property damage.
1/5/2003	$100,000	High Winds were observed throughout Washington County with 70 MPH recorded in Ivins.
7/30/2007	None Reported	Thunderstorms caused flash flooding, dropping over an inch of rain in 20-minutes. Dry washes in Ivins were running with water.
7/4/2013	3 deaths	Hot temperatures contributed to the death of three hikers in Garfield and Kane Counties.
7/21/2013	1 death	Hot temperatures contributed to the death of a hiker in Kane County.

Source: NOAA Storm Database

High winds are a frequently observed hazard in Ivins, causing $135,000 in reported damages. Severe weather is frequently occurring throughout the region and can cause damages to structures and infrastructure. Severe weather events have the potential to trigger other natural hazards in the area, which can include flooding or landslide from severe rain, fires from lightning strikes, and blowing sand with high winds, for example.

Problem Soils

Communities throughout the southwest have experienced challenges to construction and development attributed to problem soils, which can impact structures and infrastructure, as soil moisture and other environmental factors cause the soil stability to change. These soil types and their characteristics are further described in the Hazard Identification Section. Figure 371 through Figure 377 illustrate where the Utah Geological Survey has mapped various problem soils for Ivins. According to the planning team, the dominant soils identified to have impacts on structures and construction in the community include collapsible and expansive soils. To address these soil types, the community requires geological testing and mitigation for development.

Caliche



Figure 371: Ivins Caliche Susceptibility

Collapsible Soil

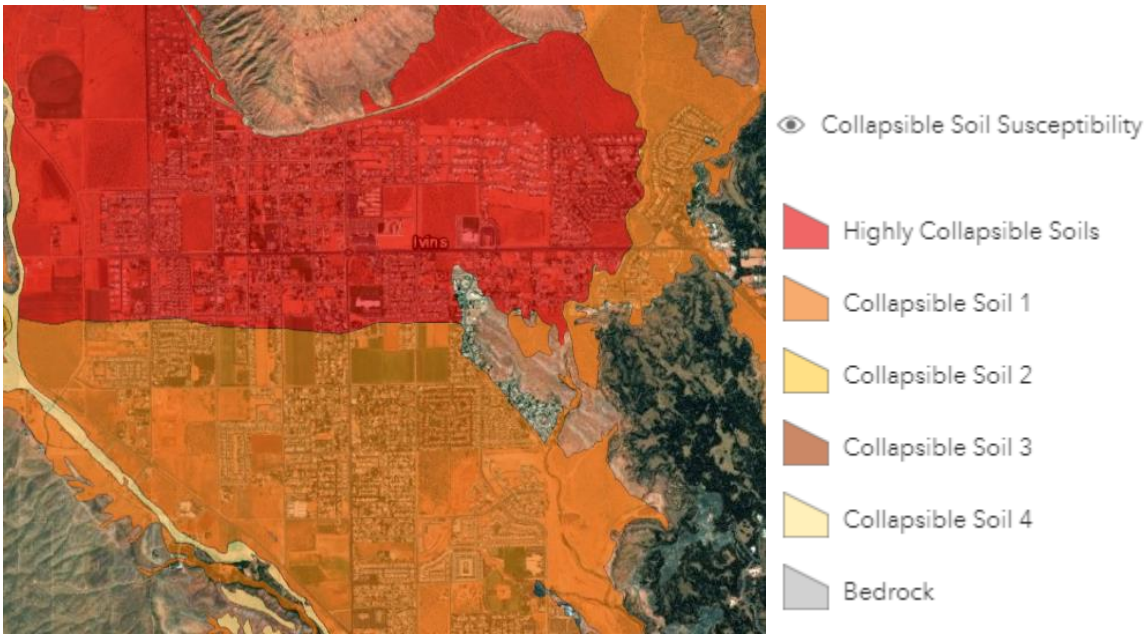


Figure 372: Ivins Collapsible Soil Susceptibility

Expansive Soil

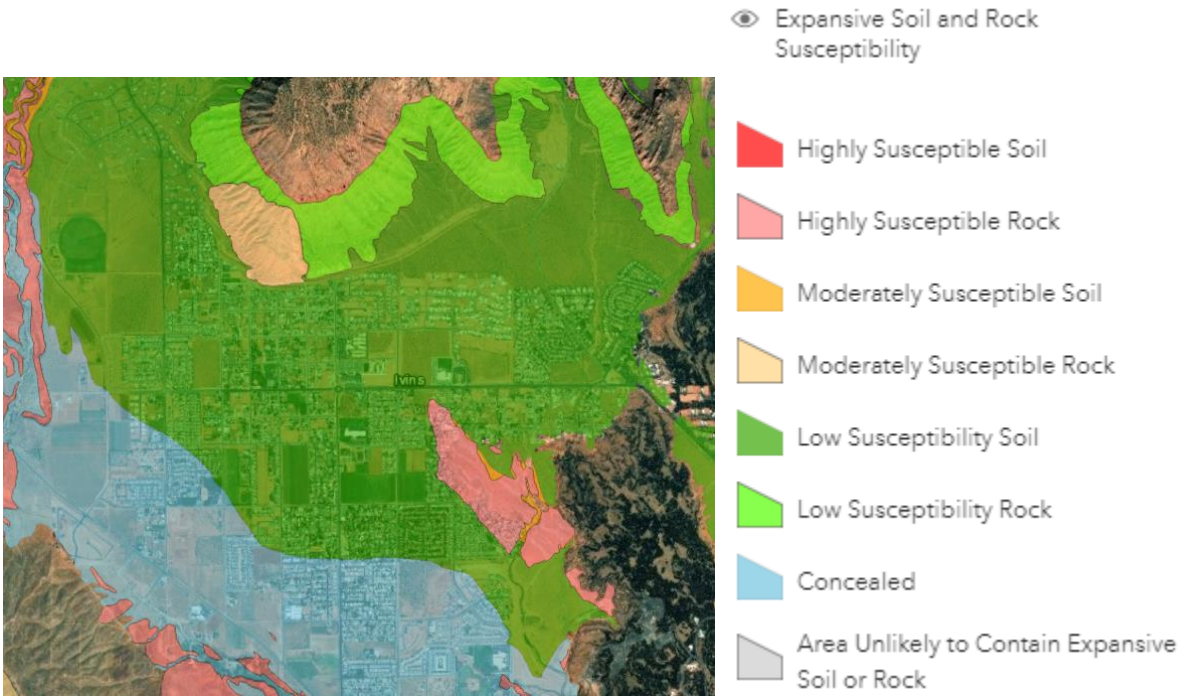


Figure 373: Ivins Expansive Soil and Rock Susceptibility

Piping and Erosion

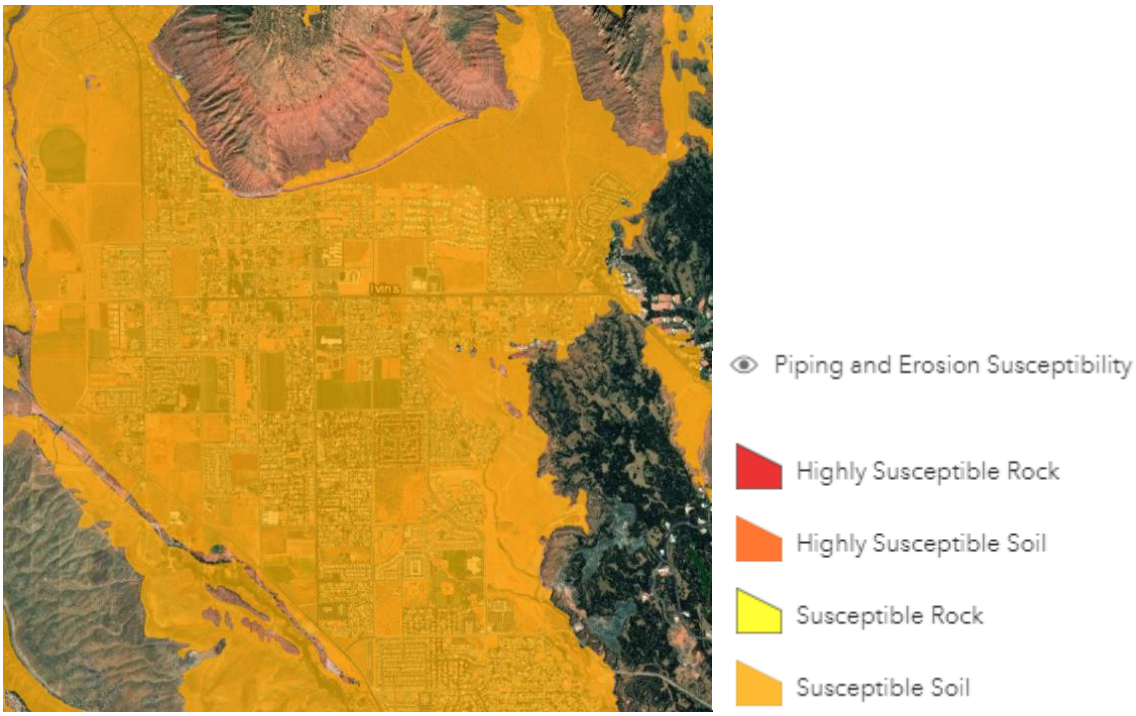


Figure 374: Ivins Piping and Erosion Susceptibility

Shallow Bedrock

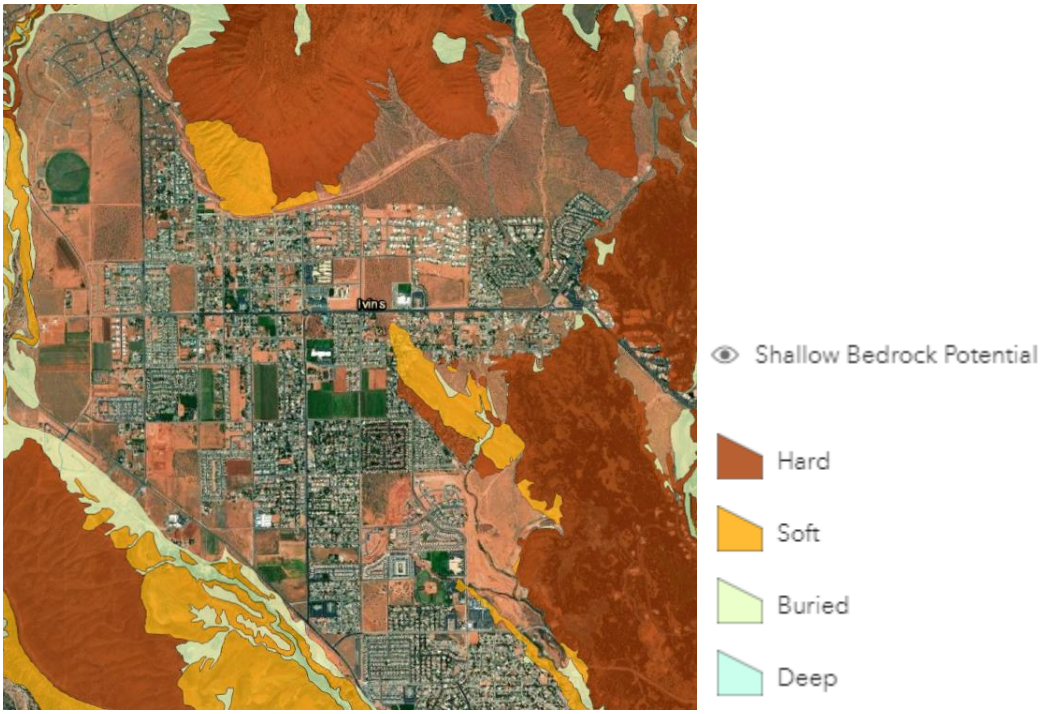


Figure 375: Ivins Shallow Bedrock Potential

Soluble Soil and Rock

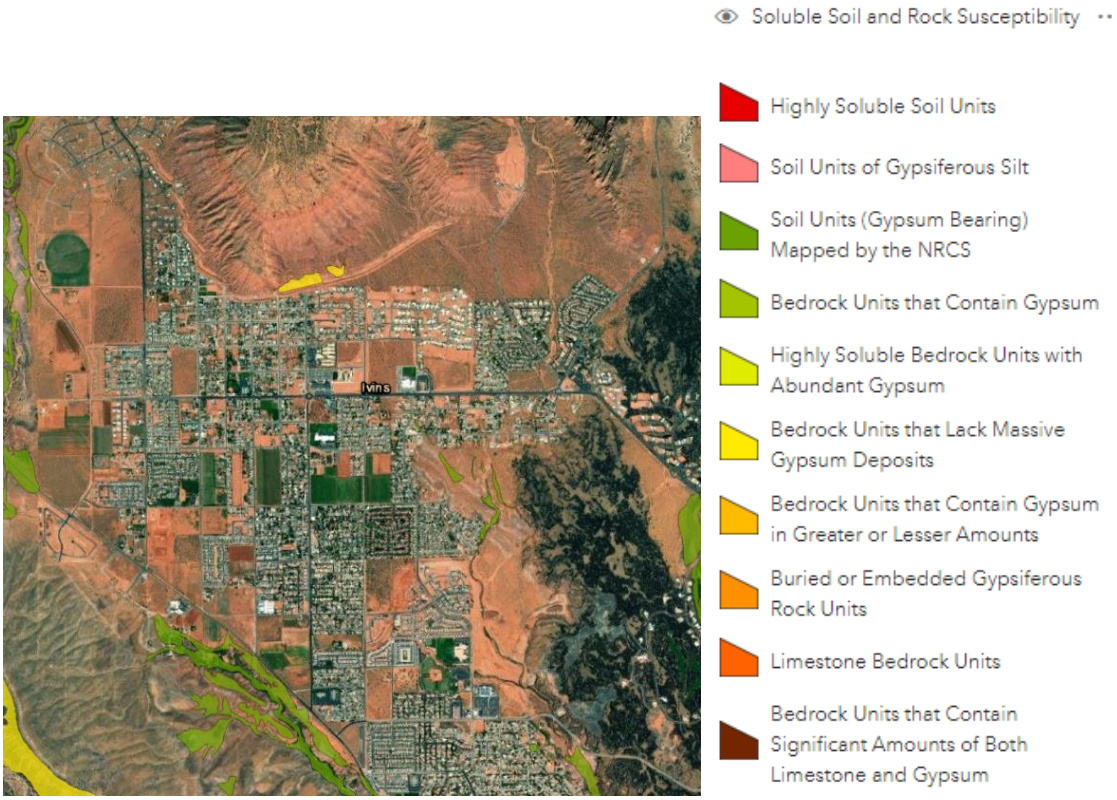


Figure 376: Ivins Soluble Soil and Rock Susceptibility

Wind-Blown Sand

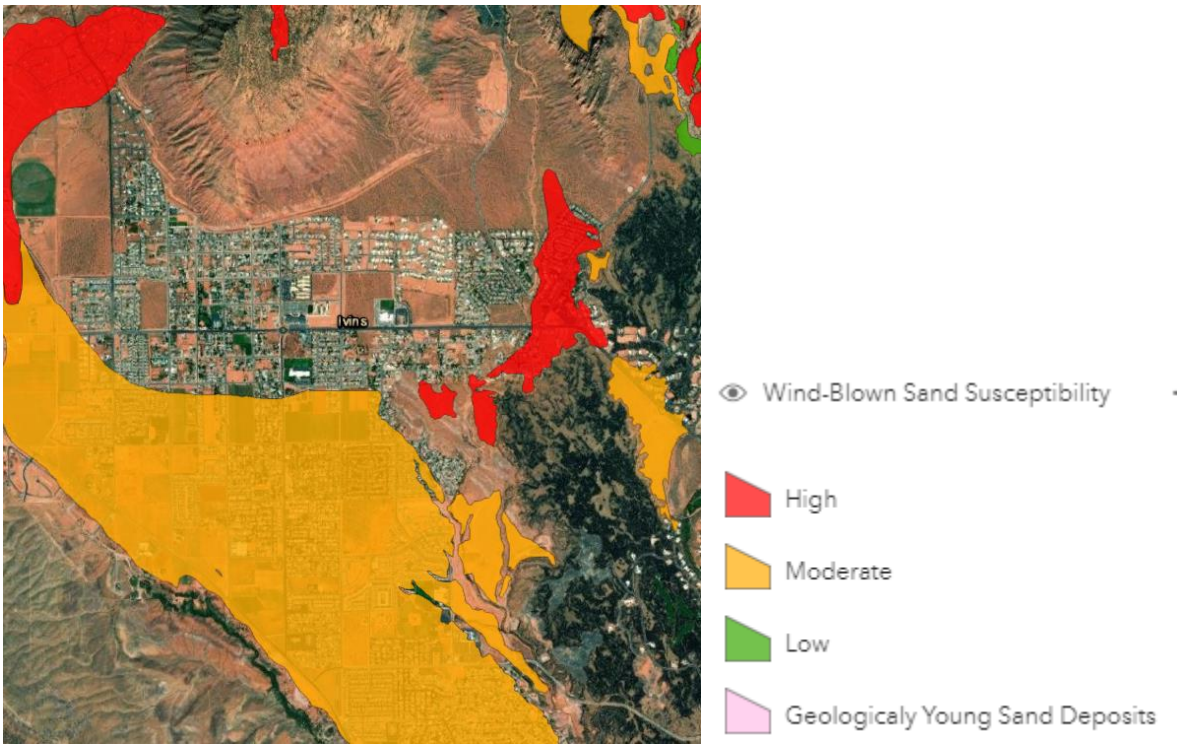


Figure 377: Ivins Wind-Blown Sand Susceptibility

The community and the county do not have a record of problem soil impacts, although building permits should include a description of where studies were required, indicating whether problem soils have been discovered on a site and what types of mitigation were completed.

Summary

Ivins is at risk to wildfire, landslides, earthquake, flooding, drought, severe weather, problem soils, and radon. Vulnerabilities identified potential economic impacts from supply chain delays, access, or traffic impacts on the tourism industry in the area following a natural hazard event. Residents are at risk to injury and property damage from several natural hazards. Critical facilities in Ivins are exposed to several natural hazards, including landslides and wildfire. Visitors to recreational areas have been impacted by severe weather and have the potential to be impacted by flooding, drought, landslides, and wildfires based on the risk assessment.

Mitigation Strategy and Actions

Ivins has participated in previous iterations of the Five County Multi-Jurisdictional Natural Hazard Plan and identified strategies to mitigate natural hazard risks. Table 399 describes progress made on Ivins' mitigation strategy as detailed in the 2016 iteration of the Natural Hazard Mitigation Plan.

Table 399: 2016 Ivins Mitigation Strategy

Hazard	Objective	Action	Timeline	Funding Source	Progress
Problem Soils #1	Lessen the risk to buildings from problem soils.	Address problem soils at the building/construction level by requiring all subdivision proposals to have a geotechnical report.	Ongoing	Private funds/ developer; Local government operating budget; Utah Geologic Survey operating budget.	Ongoing
Problem Soils #2	Lessen the risk to buildings from problem soils.	If jurisdiction does not have trained staff to review the geotechnical report, the jurisdiction can, upon request, have Utah Geological Survey (UGS) perform a review of the report.	Ongoing	Private funds/ developer; Local government operating budget; Utah Geologic Survey operating budget.	Ongoing
Flood #1	Mitigate property damage from high intensity storms	Construct various storm drain projects as identified as priority 2 in the 2016 Ivins Storm Drain Master Plan	Phased over 10 years	Ivins is bonding for $1.5M. Bond will be paid back with impact fees and user rates. A grant from NRCS has delivered another $1M from the Emergency Watershed Protection program.	Unknown

Source: 2017 Five County Association of Governments NHMP

To address the risks and vulnerabilities identified in this chapter, Ivins has assembled several actions, addressing each of the natural hazards that they are at risk to. These actions are detailed in Table 400. Each action includes the following elements:

- Hazard ID- an alpha numeric identifier for the hazard being addressed by the action.
- Goal- the goal section identifies the regional goal that the action meets. Goals set by the region are found in Figure 378.
- Objective- a mid-level description of the purpose for the action.
- Action- Summarizes a specific activity in the community that addresses natural hazard risks.
- Priority- priority description for each action determined through the STAPLEE method indicated by L=low, M=moderate, and H=high.
- Timeline- The estimated amount of time to implement the action.
- Cost- The estimated cost of implementing the action, indicated by L=low, M=moderate, and H=high
- Funding Source- Potential options to pay to implement the action.
- Responsible party- The organization, agency, or entity who will be necessary to implement an action. Potential partnerships are included in this section and are organizations or persons who could support successful implementation of the action.

Plan Goals

Goal 1- Protect life & property

Goal 2- Secure critical infrastructure

Goal 3- Public education and outreach

Goal 4- Partnership and coordination

Goal 5- Emergency response

Goal 6- Protect the natural environment

Figure 378: Regional Plan Goals

Table 400: Ivins 2022 NHMP Mitigation Strategy

Hazard	Goal	Objective	Action	Priority	Timeline	Cost	Funding Source	Responsible Agency
Multi-Hazard #1	3, 5	Provide residents with information	Identify new locations to install and inform residents about disaster boxes in Ivins City neighborhoods.	H	5-years	L	Ivins City	Ivins City Emergency Preparedness Committee, Ivins City.
Problem Soils #1	1, 2, 6	Reduce risk to structures and infrastructure.	Address problem soils at the building/construction level by requiring all subdivision proposals to have a geotechnical report.	H	Ongoing	L	Private funds/ developer; Local government operating budget; Utah Geologic	Ivins City

							Survey operating budget.	
Radon #1	3	Provide residents with information	Provide radon risk, testing, and mitigation information to residents.	H	1-year / ongoing	L	City budget	Ivins City
Radon #2	4	Reduce risk to structures and infrastructure.	Participate in radon testing in local public schools.	M	1-year	L	Ivins City, Washington County, Washington County School District	Ivins City, Washington County, Washington County School District
Drought #1	2	Secure water sources.	Construct a reservoir in Ivins City to support local irrigation needs.	H	10-year	H	Washington County Water Conservancy District	Ivins City, Washington County Water Conservancy District.

Source: Local Planning Team