THE PLAN

Requirement §201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in **the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable** the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

The Five County Natural Hazard Mitigation Plan compiles data for nine natural hazards and establishes mitigation goals and activities that should be revisited annually. Updating the Plan allows for the introduction of new data and technical resources, and maintains strong ties between cooperating agencies, organizations, non-profits, and governments. The continuous integration of new knowledge improves the assessment of each of the hazards in this plan, and improves the region's ability to plan for, and withstand, the impacts of natural hazard events.

Conducting a hazard assessment can provide information on the location of the hazard, the value of existing land and property in the hazard location, and an analysis of risk to life, property and the environment that may result in a natural hazard event. Specifically, the three levels of hazard assessment are:

1. **Hazard Identification** identifies the geographic context of the hazard, the intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display hazard identification data.
2. **Vulnerability Assessment** combines hazard identification with an inventory of the existing property and population exposed to a hazard.
3. **Risk Analysis** involves estimating the damage, injuries, and financial losses likely to be sustained in a geographic area over a given period of time.

Hazard assessments are subject to the availability of hazard specific data. Gathering of data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard specific section of this Plan includes a section on hazard identification using data and information from county or state agency sources.

CHRONIC NATURAL EVENTS

Chronic hazards occur with some degree of frequency and include flooding, landslides, severe weather, wildfires, problem soils, drought, and radon gas. These hazards impact communities with devastating economic consequences. The following is a summarization of natural hazard events occurring in the Five County region.

FLOODING

In the southwest, as elsewhere, flooding, erosion, and sediment discharge are responsible for loss of life, land, and infrastructure, along with damage to reservoirs and natural habitats. Stream flooding is the most prevalent and destructive (annually) of the geologic hazards that affect Utah. This destructive trend is nowhere more evident than in the southwest part of the state.

On January 20, 2011, Governor Gary R. Herbert requested a major disaster declaration due to severe winter storms and flooding during the period of December 20-24, 2010. The Governor requested a declaration for Public Assistance for two counties and Hazard Mitigation statewide. During the period of January 12-14, 2011, joint Federal, State, and local Preliminary Damage Assessments (PDAs) were conducted. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments, and that Federal assistance is necessary. On February 11, 2011, President Obama declared that a major disaster exists in the State of Utah. That declaration authorized assistance for debris removal and emergency protective measures under the Public Assistance program as a result of severe winter storms and flooding in Kane and Washington Counties.

The primary damage from the flooding event was to roads and bridges, but also had significant effect on previous bank armoring installed after the 2005 flooding event.

During the period of April 28, 2005 until June 29, 2005, frequent rainfall events, warm spring temperatures, and abundant snowpack melting at accelerated rates resulted in significant flooding and numerous landslide events in nine Utah Counties and two Indian Reservations. As pertaining to this region, Beaver, Iron and Kane counties experienced damages when large peak discharges, as a result of near record snowpacks, were encountered in the Sevier River basin. This resulted in substantial damage to public and private property. A Presidential Disaster Declaration was declared on August 1, 2005.

A stalled storm system containing abundant moisture caused significant flooding in Washington and Kane Counties between January 8-12, 2005. Higher snowfall and water equivalent totals equaled 70" at Cedar Breaks, and 60" at Kolob-Zion National Park. It is estimated that $300 million dollars in damages was sustained along the Santa Clara and Virgin Rivers. 30 homes were destroyed in the flood and another 20 homes were significantly damaged(NCDC, 2005). One fatality associated with this event resulted when a man and his wife in their vehicle were caught in floodwaters in the Red Cliff Recreation Area near the Quail Creek Reservoir. Six other injuries were reported. A Presidential Disaster Declaration was declared on February 1, 2005.

The Quail Creek Dam, located in Washington County, failed in the early hours of January 1, 1989. In the months prior to the failure, leakage of the dam was the result of the solubility of the gypsum in the soil, which dissolved some of the mechanisms used to transport water. Water released by this dam failure entered the Virgin River and destroyed a bridge on Utah 9 in Hurricane. Failure of the dam resulted in losses to agriculture, livestock, public facilities, roads, bridges, and golf courses. Additionally, 30 homes, 58 apartments and 9 businesses were flooded. Estimates placed the total damage at $11,959,732.

In 1984 statewide flooding occurred which resulted in serious property damage in the Five County region. As a result of greater than average snow pack and above normal precipitation, the Beaver River, near Beaver City, flooded on May 24, 1984. The flooding resulted in property damages estimated at $2,380,952.

LANDSLIDE

Nationwide, estimated losses from damaging landslides equal $3.5 billion annually (USGS, 2005). In Utah, documented losses from damaging landslides in 2001 exceeded $3 million, including the costs to repair and stabilize hillsides along state and federal highway (Ashland, 2003). Total landslide dollar losses are hard to determine from past events because a standard for documenting them do not exist. Several state and local agencies track landslide losses with inconsistent formats often resulting in several different totals for a single event.

During the period of April 28, 2005 until June 29, 2005, frequent rainfall events, warm spring temperatures, and abundant snowpack melting at accelerated rates resulted in significant flooding and numerous landslide events in nine Utah Counties and two Indian Reservations. As pertaining to this region, Beaver, Iron and Kane counties experienced damages when large peak discharges, as a result of near record snowpacks, were encountered in the Sevier River basin. This resulted in substantial damage to public and private property. A Presidential Disaster Declaration was declared on August 1, 2005.

On March 12, 2005 a 100 ft. long by 60 ft. high vertical stream-cut along Kanab Creek failed. This rock fall occurred within the city limits of Kanab, killing one boy and partially burying tow children. This earth-fall type landslide was most likely the result of long-term gravitational effects on over-steepened, unconsolidated material in the arroyo walls (Lund, 2005).

SEVERE WEATHER

The term severe weather, as it pertains to this plan, is used to represent a broad range of weather phenomena which affect southwestern Utah, namely; downburst, lightning, heavy snowstorms, avalanches, and tornados. Severe weather events are the most deadly type of natural hazard in Utah. Interestingly, more people have died in avalanches in Utah than by any other natural hazard. Between 1958 and 2006 avalanches killed 85 people.

Since 1950, lightning has killed 60 people statewide and injured another 144. In southwestern Utah the most common type of severe weather activity is related to lightning. Since 1950 a total of 5 lightning deaths and 10 lightning injuries have been recorded within the region.

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. Most tornados have winds less than 112 miles per hour and zones of damage less than 100 feet wide. According to the National Weather Service, a total of 12 tornados have been observed in southwestern Utah. Of this amount, Iron and Beaver counties contain the highest amounts at 5 and 4 respectively.

A stalled storm system containing abundant moisture caused significant flooding in Washington and Kane Counties between January 8-12, 2005. Higher snowfall and water equivalent totals equaled 70" at Cedar Breaks, and 60" at Kolob-Zion National Park. It is estimated that $300 million dollars in damages was sustained along the Santa Clara and Virgin Rivers. 30 homes were destroyed in the flood and another 20 homes were significantly damaged. One fatality associated with this event resulted when a man and his wife in their vehicle were caught in floodwaters in the Red Cliff Recreation Area near the Quail Creek Reservoir. Six other injuries were reported. A Presidential Disaster Declaration was declared on February 1, 2005.

WILDFIRE

When discussing wildfires it is important to remember that fires are part of a natural process and are needed to maintain a healthy ecosystem. Since its settlement in the mid 1800s, the region and its residents have been subject to the annual threat of wildfire. This is in large part due to the environmental conditions, namely low annual precipitation and high amount of public lands. Lightning is the primary cause of wildfire in the Five County region. However, the potential risk for human caused fires increases as more people move into the wildland urban interface.

Many of Utah's wildland urban interface areas are located in our most fire prone wildland fuels. Generally, these fuels are found on drier, lower elevation sites which are often very desirable for real estate development. To address these issues, a multi-jurisdictional group of agencies, organizations, and individuals collaborated to develop the *Southwest Utah Regional Wildfire Protection Plan* (October 2007). The purpose of this plan is to be a tool in the effort to protect human life and reduce property loss due to catastrophic wildland fires in the communities and surrounding areas located in the southwest Utah counties of Beaver, Garfield, Iron, Kane and Washington. Specific hazard identification, assessment of vulnerability, and mitigation measures will be provided in each respective County specific chapter found within this NHMP.

PROBLEM SOILS

Humans have no influence on the distribution of problem soil and rock, but their activities are often adversely affected by them. As a result, urbanized areas of southwestern Utah are susceptible to damage from these deposits. As development encroaches on less suitable terrain, damage from problem soil and rock has, and will increase. Detailed geotechnical studies are needed in areas of problem soil and rock to identify and mitigate potential problems, and avoid costly corrective measures. Six types of problem soil and rock are present in southwestern Utah.

Expansive soil and rock is the most extensive. Most expansive soil problems are related to bentonitic shales near St. George.

Collapsible soil has caused extensive damage in and around Cedar City. Holocene alluvial fan and debris flow deposits are the sources of collapsible soil in southwestern Utah. Soil and rock containing gypsum are also susceptible to subsidence. Ground water and introduced waters from irrigation dissolve gypsum causing subsidence.

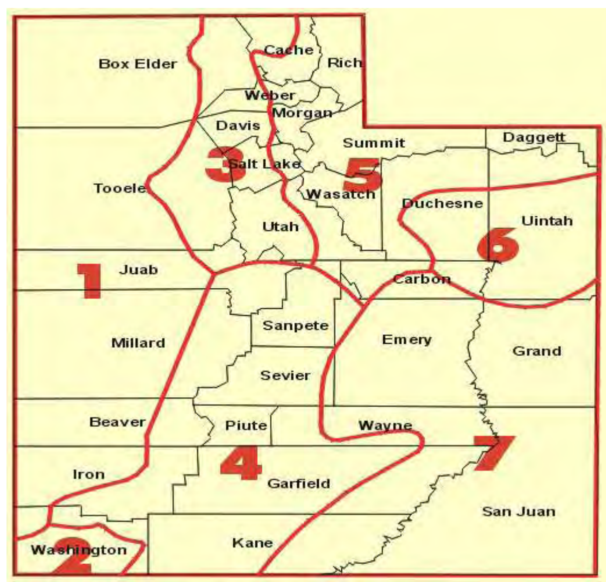
Limestone susceptible to dissolution and subsidence occurs south of St. George. Structures have not been damaged by ground collapse or subsidence related to limestone karst, but because karst ground-water systems have little filtering capacity, contamination of ground water is a major concern. In fine-grained Holocene incised by streams piping is a common problem. Collapse of soil pipes and subsequent erosion has damaged roads and agricultural land. Sand dunes in the Escalante Desert and west of Kanab can migrate across roads and bury structures in areas where active dunes are present. (Excerpted from Lund, UGS unpublished information)

DROUGHT

Drought information in Southwest Utah is based upon the Palmer Drought Severity Index Chart. The Palmer Index was developed by Wayne Palmer in the 1960s and uses temperature and rainfall information in a formula to determine dryness – it has become the semi-official drought index used today. The Palmer Index is most effective in determining long term drought. The advantage of Palmer Index is that it is standardized to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions. The negative is that it is not as good for short term forecasts, and is not particularly useful in calculating supplies of water locked up in snow (NOAA's Drought Information Center).

There are four Climate Divisions in Southwest Utah based: Division 1 – Western, Division 2 – Dixie, Division 4 – South Central, and Division 7 – Southeast.

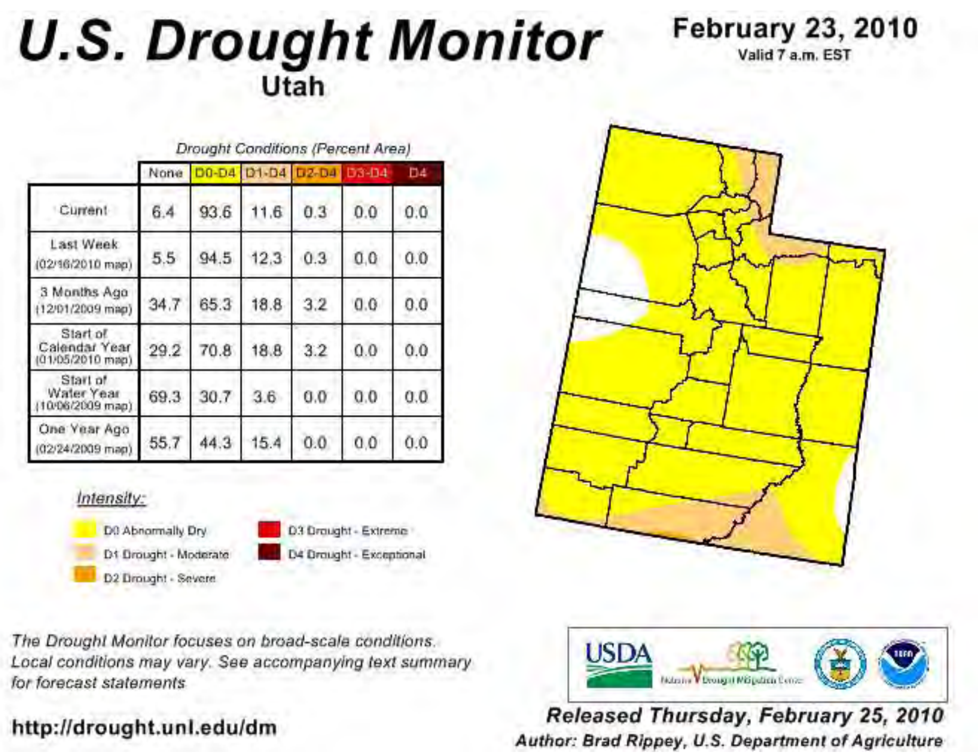
Division 1- The Western Division comprises 4,290 square miles or 24% of the total land area of the Five Counties, and is found in the western parts of Beaver, Iron, and Washington counties. Historically the Western Division has followed a drought pattern of normal to wet for 20 years, then having a severe to extreme drought problem that persist for six or seven years. However, 17 of the last 20 years have been severe to extreme drought.



Division 2- The Dixie Division comprises 1,423 square miles or 8% of the total land area of the Five Counties, the majority is found in Washington County with a small portion found in Kane County. Dixie Division has had three major drought periods since 1895, with the third one currently happening. The last two lasted at least seven years each and were about 50 years apart.

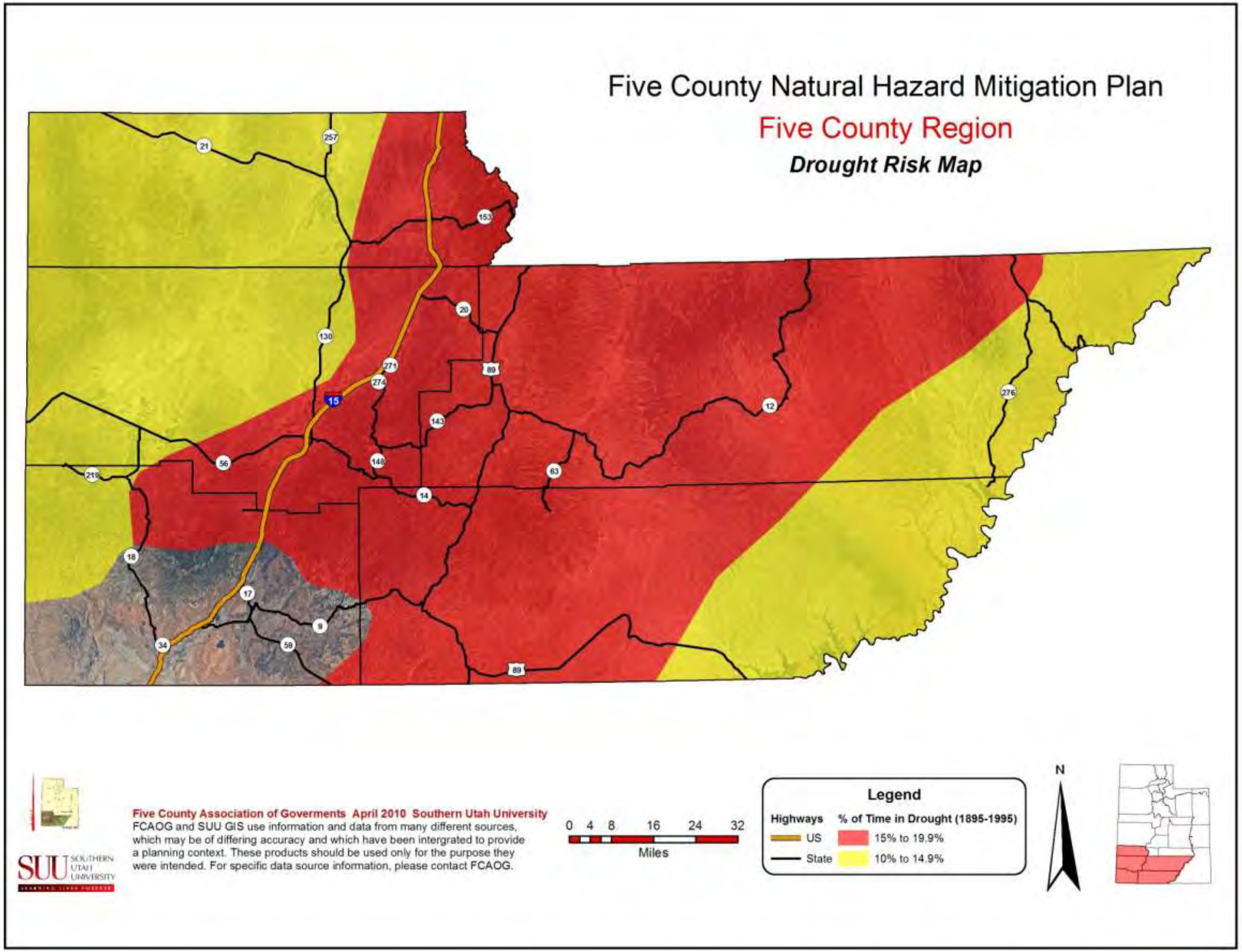
Division 4- The South Central Division comprises 9,097 square miles or 52% of the total land area of the Five Counties. The South Central Division is found in all five counties, mainly found in the central part of the Five Counties. The South Central Division has been pretty consistent throughout the 100+ years of record keeping. Until the mid 60's there has been a period of drought every 20 years on average, after the mid 60's the droughts have been more frequent, primarily every 10 to 15 years.

Division 7- The Southeast Division comprises 2,813 square miles or 16% of the total land area of the Five Counties. The Southeast Division is found in the eastern half of Kane and Garfield counties. The Southeast Division had an eight year drought just as the other divisions did. Between 1896 to 1904 it was in the extreme part of the index. After this long extreme drought there were basically fifty years of normal to wetter than normal years followed by a four year drought in the mid fifties. Since the drought in the mid fifties there has been a two to three year extreme drought every 10 to 13 years.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.4	93.6	11.6	0.3	0.0	0.0
Last Week (02/16/2010 map)	5.5	94.5	12.3	0.3	0.0	0.0
3 Months Ago (12/01/2009 map)	34.7	65.3	18.8	3.2	0.0	0.0
Start of Calendar Year (01/05/2010 map)	29.2	70.8	18.8	3.2	0.0	0.0
Start of Water Year (10/06/2009 map)	69.3	30.7	3.6	0.0	0.0	0.0
One Year Ago (02/24/2009 map)	55.7	44.3	15.4	0.0	0.0	0.0

In summary, the drought history of the four different divisions in the Five County area has been very similar, with the exception of the Southeast division. The Southeast Division is a bit different than the other Divisions, instead of a longer period in-between a drought and then followed with a drought lasting between five to eight years; the Southeast has a shorter period in-between a drought and the droughts are only 2 to 3 years long. As of February 2010, the Five County region as a whole is categorized as "Abnormally Dry" and "Drought-Moderate". In regards to drought intensity, both of these categorizations are at the lower end of the spectrum.



Five County Natural Hazard Mitigation Plan
Five County Region
Drought Risk Map
Five County Association of Goverments April 2010 Southern Utah University
FCAOG and SUU GIS use information and data from many different sources, which may be of differing accuracy and which have been intergrated to provide a planning context. These products should be used only for the purpose they were intended. For specific data source information, please contact FCAOG.
0 4 8 16 24 32
Miles
Legend
Highways
US
State
% of Time in Drought (1895-1995)
15% to 19.9%
10% to 14.9%
N

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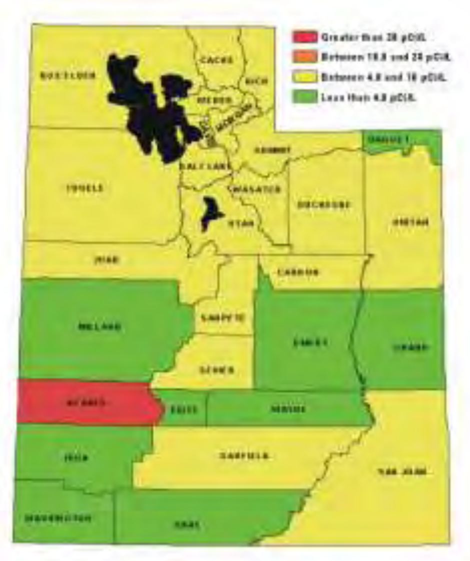
RADON GAS

Radon is a radioactive gas of geologic origin that is found in many buildings in sufficient concentrations to represent a health hazard to building occupants. Radon is an odorless, tasteless, and colorless radioactive gas which forms as a product in three radioactive decay series. Most common of these is the uranium-decay series. In nature, radon is found in small concentrations in nearly all rocks and soils. Potential radon-hazard areas in southwestern Utah are widespread, and are generally underlain by silicic igneous rocks of low-grade metasedimentary deposits.

Surveys conducted by the Utah Department of Environmental Quality/Division of Radiation Control indicate that 20% of homes in Utah are at concentrations above the U.S. Surgeon General's guidance of 4.0 pCi/L. Despite this relative high percentage, radon gas remediation is relatively simple and inexpensive. However, it can become a laborious process because the only way to know if a building is subject to radon hazard is for that building to be tested.



Installing a radon resistant system during the construction of a new home is not difficult, nor is it very expensive if a small amount of planning is done in advance. Furthermore, the skills needed for installing the various parts of these systems are skills already available within existing trades used during construction of a typical new home. Installing radon reduction systems during construction makes good sense and provides a healthy home for years to come; however, if a home is constructed without a radon reduction system there are many cost effective methods which can be implemented to minimize the hazards. The quickest way to test is with short-term tests. Short-term tests remain in the home for two days to 90 days, depending on the device. For example, charcoal canister detectors are most commonly used for short-term testing and provide results quickly. For purposes of this document, citizens in the Five County region should be encouraged by local building officials to evaluate the radon levels associated with their homes.

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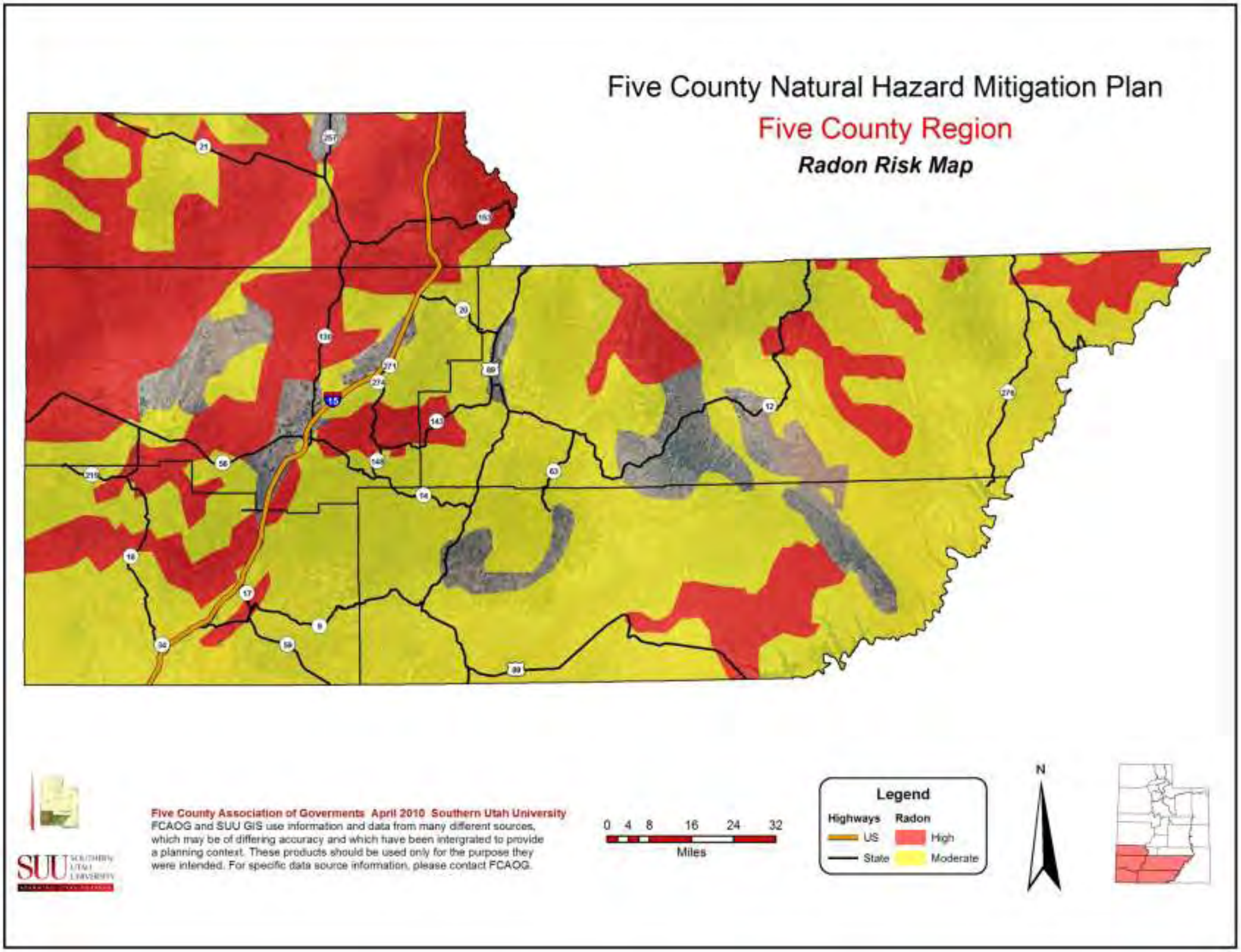
Five County Natural Hazard Mitigation Plan
Five County Region
Radon Risk Map
15
Five County Association of Goverments April 2010 Southern Utah University
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0 4 8 16 24 32
Miles
Legend
Highways
US
State
Radon
High
Moderate
N

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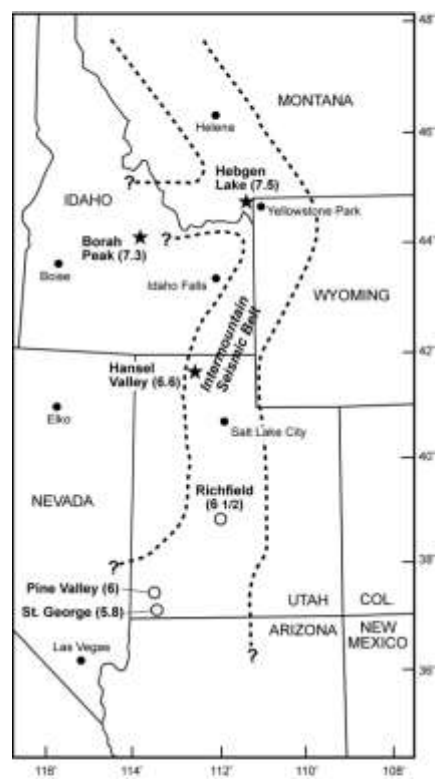
CATASTROPHIC NATURAL HAZARD EVENTS

Catastrophic events do not occur with the same frequency as chronic hazards, but can have devastating consequences. Earthquakes and volcanoes are two types of catastrophic hazards. These types of natural hazards are difficult to predict, affect a wide geographic area, and can severely impact entire regions.

EARTHQUAKE

In Utah most earthquakes are associated with the Intermountain seismic belt (Smith and Sbar, 1974; Smith and Arabasz, 1991), an approximately 160-kilometer-wide (100 miles), north-south trending zone of earthquake activity that extends from northern Montana to northwestern Arizona. Since 1850, there have been at least 16 earthquakes of magnitude 6.0 or greater within this belt (Eldredge and Christenson, 1992). Included among those 16 events are Utah's two largest historical earthquakes, the 1901 Richfield earthquake with an estimated magnitude of 6.5, and the 1934 Hansel Valley magnitude 6.6 earthquake, which produced Utah's only historical surface fault rupture. In an average year Utah experiences more than 700 earthquakes, but most are too small to be felt. Moderate magnitude (5.5 – 6.5) earthquakes happen every several years on average, the most recent being the magnitude 5.8 St. George earthquake on September 2, 1992. Large magnitude earthquakes (6.5 – 7.5) occur much less frequently in Utah, but geologic evidence shows that most areas of the state within the Intermountain seismic belt, including southwestern Utah, have experienced large surface-faulting earthquakes in the recent geologic past.

Fault-related surface rupture has not occurred in southwestern Utah historically, but the area does have a pronounced record of seismicity. At least 20 earthquakes greater than magnitude 4 have occurred in southwestern Utah over the past century (Christenson and Nava, 1992); the largest events were the estimated magnitude 6 Pine Valley earthquake in 1902 (Williams and Trapper, 1953) and the magnitude 5.8 St. George earthquakes in 1992 (Christenson, 1995). The Pine Valley earthquake is pre-instrumental and poorly located, and therefore, is not associated with a recognized fault. However, the epicenter is west of the surface trace of the Hurricane fault, so the event may have occurred on that structure. Pechmann and others (1995) have tentatively assigned the St. George earthquake to the Hurricane fault. The largest historical earthquake in nearby northwestern Arizona is the 1959 Fredonia, Arizona, earthquake (approximate magnitude 5.7; DuBois and others, 1982). Since 1987 the northwest part of Arizona has been quite seismically active (Pearthree and others, 1998), experiencing more than 40 events with magnitudes >2.5.



Despite the lack of an historical surface-faulting earthquake in southern Utah, available geologic data for faults in the region indicate a moderate rate of long-term Quaternary activity. Mid-Quaternary basalt flows are displaced hundreds of meters at several locations and alluvial and colluvial deposits are displaced meters to tens of meters in late Quaternary time.

Because earthquakes result from slippage on faults, from an earthquake-hazard standpoint, faults are commonly classified as active, capable of generating damaging earthquakes, or inactive, not capable of generating earthquakes. The term "active fault" is frequently incorporated into regulations pertaining to earthquake hazards, and over time the term has been defined differently for different regulatory and legal purposes. In fact, faults possess a wide range of activity levels. Some, such as the San Andreas fault in California, produce repeated large earthquakes and associated surface faulting every few hundred years, while others, like Utah's Wasatch fault and many of the faults in the Basin and Range Province, generate large earthquakes and surface faulting every few thousand to tens of thousands of years. Therefore, depending on the area of interest or the intended purpose, the definition of "active fault" may change. The time period over which faulting activity is assessed is critical because it determines which faults are ultimately classified as hazardous and therefore in need of regulatory mitigation (National Research Council, 1986).

VOLCANISM

Southwestern Utah experienced prolonged volcanism during the Cenozoic time. Tumultuous eruptions of calc-alkaline volcanics and deposition of volcaniclastic debris dominated early to mid-Cenozoic volcanism. The active volcanic centers in the southwestern district area include the Escalante Deserts in the Basin and Range Province; the High Plateaus and adjacent areas in the Colorado Plateau Province; and the Pine Valley Mountains-St. George Basin and surrounding areas. The youngest vents and flows in southwestern Utah are less than 1,000 years old. Remote eruptive centers present Utah's most imminent and potentially damaging volcanic hazard.

From late Oligocene to early Miocene, stratovolcanoes and caldera complexes generated lavas and layer upon layer of volcaniclastic debris throughout the Basin and Range Province. Straddling the Utah-Nevada border and circling the southern portion of the Needles Range of Beaver and Iron Counties, the Indian Peak caldera complex served as the source for the calc-alkaline volcanics of the 29.5 million year old Wah Wah Springs Formation.

The Bullion Canyon Volcanics and the Mount Belknap Volcanics originated from calderas of the Tushar Mountains in Beaver and Piute Counties. Flows, pyroclastics, and associated rocks from this caldera complex range in age from 25 to 14 million years. South-Central Utah's mid-Cenozoic stratovolcanoes shed volcanistics onto low lands to the south and east, forming an apron of debris that eventually became the southwestern High Plateaus.
Local, violent eruptions of andesitic and rhyolitic materials are no longer a hazard in Utah. Between 8 and 6 million years ago basaltic and rhyolitic magmas formed domes, plugs, cones, and shield-like volcanic features in the Great Basin and Range of Southwest Utah.

These predominately mafic-composition volcanics have augmented the present-day landforms in the three volcanic regions of southwestern Utah. Geomorphically fresh features and textures, geothermal anomalies, and recent eruptive histories present convincing arguments for the continuation of volcanic events in southwestern Utah.

There has been caldera-type eruptive volcanic activity in southwestern Utah dated as occurring in the early Cenozoic period. As the geologic conditions that created those types of eruptions has long since disappeared there is zero chance of their repetition. The current hazard relating to volcanic activity is strictly limited to localized, small, cinder cone basaltic eruptions. According to geologists, the hazard is real, but extremely infrequent and would be limited to a relatively small area. Because of the remote potential of these volcanic events affecting the built environment, and threatening people, this hazard is not considered in the same vein as many of the other natural hazards that this plan addresses.

Local, violent eruptions are no longer a hazard in Utah. Further, it should be noted that there have been no reports of property damaged or human injuries or deaths attributed to any type of volcanic activity in southwestern Utah, since records have been kept. According to geologists, the hazard is real, but extremely infrequent and would be limited to a relatively small area. As the geologic conditions that created those types of eruptions have long since disappeared there is zero chance of their repetition.

Because of the remote potential of these volcanic events affecting the built environment, and threatening people, this hazard is not considered in the same vein as many of the other natural hazards that this plan addresses.

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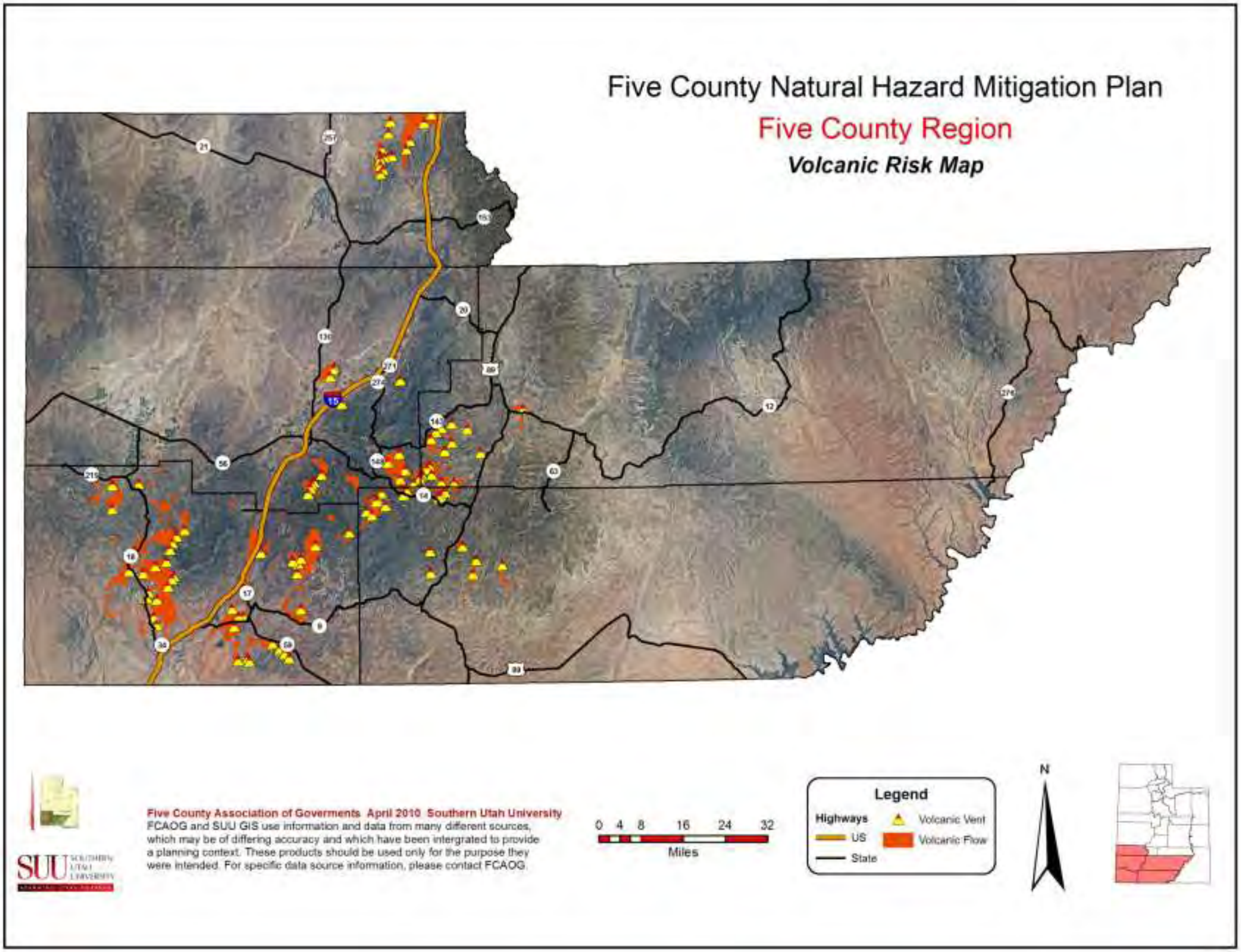

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Five County Region
Volcanic Risk Map
Five County Association of Goverments April 2010 Southern Utah University
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0 4 8 16 24 32
Miles
Legend
Highways
US
State
Volcanic Vent
Volcanic Flow
N

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DROUGHT

Water is a scarce resource in southwest Utah's semi-arid climate. As the population continues to grow, the demand for water and potential strain on the water supply will also increase and likely compound future drought impacts. By employing sound mitigation strategies, the future water demand of the region may be satisfied without increasing the current susceptibility to drought. The impacts of drought can be comprehensively mitigated through cooperative partnerships and efforts of numerous and varied agencies. With this in mind, the following mitigation strategies are generalized in nature with the knowledge that drought is a macro-level risk. Ideally these mitigation strategies will provide the foundation for more specific, locally determined drought mitigation projects.

Drought Mitigation Strategy #1	
Objective:	To provide education to the general public with regard to drought and water conservation.
Action:	1-County-level distribution of water conservation information via newsletter and/or website to affiliated constituents. 2-Water purveyors distribute water conservation information to affiliated constituents.
Timeline:	Ongoing
Estimated Cost:	Minimal
Possible Funding:	State and Federal grants; Local government operating budget; Water purveyors.
Responsible Agencies:	Local (all jurisdictions in southwestern Utah), jurisdictional level.

Drought Mitigation Strategy #2	
Objective:	To conserve water within the agricultural sector.
Action:	Develop/demonstrate water conservation practices for agricultural use.
Timeline:	Ongoing
Estimated Cost:	Minimal
Possible Funding:	State and Federal grants; Water purveyors.
Responsible Agencies:	Local (all jurisdictions in southwestern Utah with agricultural land use), jurisdictional level.

Drought Mitigation Strategy #3	
Objective:	Establish specific county-level water conservation measures.
Action:	County-level implementation of mitigation strategies identified in "*Drought in Utah- Learning from the Past-Preparing for the Future*." http://www.water.utah.gov/
Timeline:	3-5 years
Estimated Cost:	Unknown
Possible Funding:	State and Federal grants; Local government operating budget; Water purveyors.
Responsible Agencies:	Local (Beaver, Garfield, Iron, Kane and Washington counties), jurisdictional level.

RADON GAS

Despite relative high concentrations of radon gas in southwestern Utah, radon gas remediation is relatively simple and inexpensive. The radon gas mitigation strategies provided herein are simplistic in terms of implementation; however, they will enable significant risk reduction which will undoubtedly improve the health, safety, and welfare of citizens in the region.

Radon Gas Mitigation Strategy #1	
Objective:	Promote radon gas reduction measures through non-structural improvements.
Action:	Increase public education related to radon gas hazards by distributing Utah Dept. of Environmental Quality informational brochures to County and City planning and engineering departments.
Timeline:	Ongoing
Estimated Cost:	Very Minimal: request Utah Dept. of Environmental Quality to deliver brochures; and/or download brochures directly from: http://www.radon.utah.gov
Possible Funding:	County and City operating budget; Utah Dept. of Environmental Quality operating budget.
Responsible Agencies:	Local (Beaver, Garfield, Iron, Kane and Washington counties), jurisdictional level.

Radon Gas Mitigation Strategy #2	
Objective:	To reduce radon gas risk as it relates to the built environment.
Action:	Utilize the Radon Risk Map provided in this plan as a tool to assess radon gas risks as it relates to any building/subdivision proposals. If deemed necessary, jurisdiction should require the builder/developer to conduct a site-specific radon hazard identification study and implement applicable control techniques.
Timeline:	Ongoing
Estimated Cost:	$25- $1,200 (per http://www.epa.gov/radon/)

Possible Funding:	Private funds/ developer; County or City government operating budget (where applicable).
Responsible Agencies:	Private property owner; Local (Beaver, Garfield, Iron, Kane and Washington counties), jurisdictional level.

VOLCANISM

Volcanic activity, in terms of hazard assessment and risk analysis, is ranked at the bottom of the list for natural hazards found within the Five County region. This is based solely upon the fact that the probability of volcanic activity is extremely low. Although, the region contains an intensification of volcanic vents and flows, local violent eruptions are no longer a hazard. This being said geologists note: that, 1) the hazard is real, 2) volcanic activity is extremely infrequent and 3) the geologic conditions that precipitated volcanic activity in the region have long since disappeared.

Because of the remote potential of volcanic events affecting the regional built environment, this hazard is not considered in the same vein as many of the other natural hazards that this plan addresses. Therefore, no mitigation measures have been provided herein.