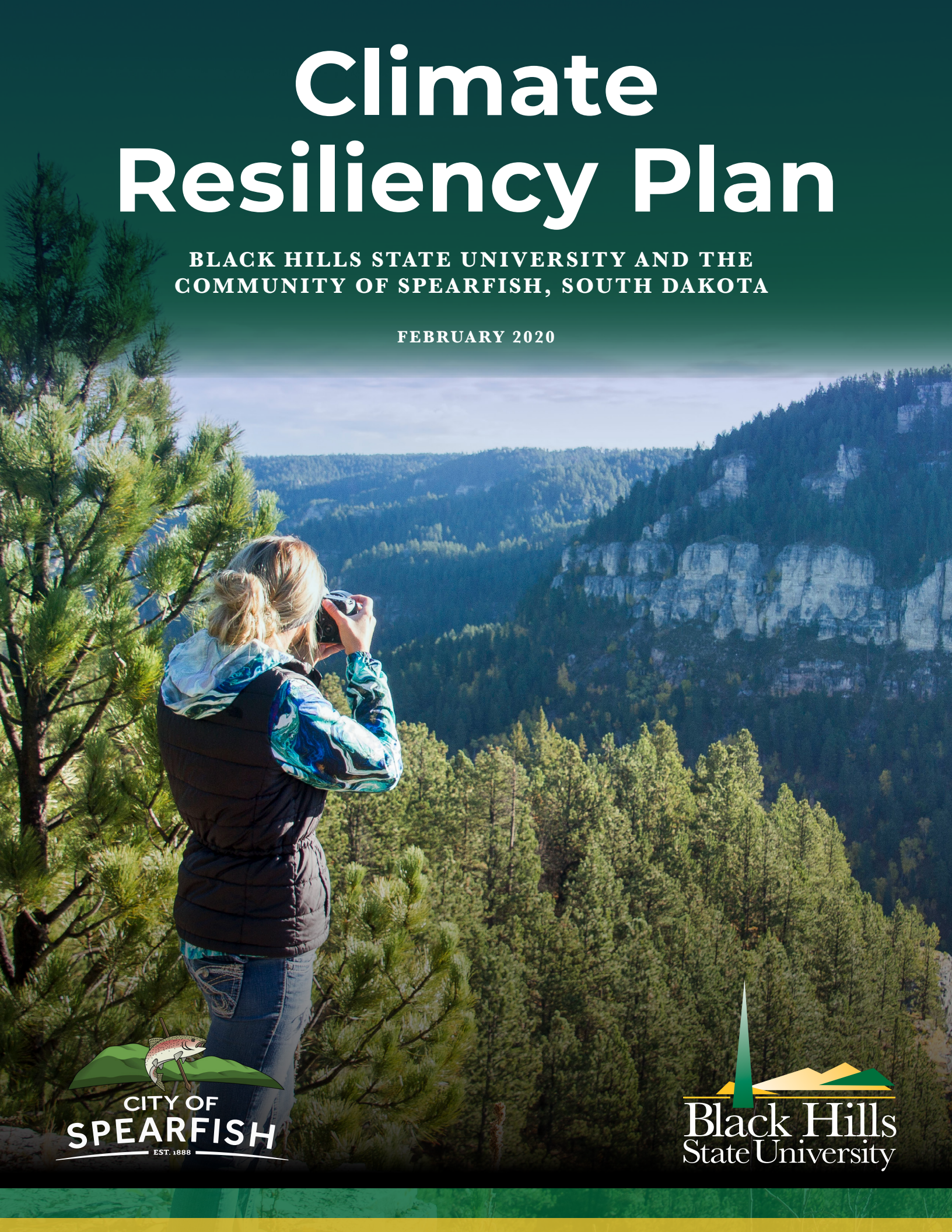
Climate Resiliency Plan

BLACK HILLS STATE UNIVERSITY AND THE COMMUNITY OF SPEARFISH, SOUTH DAKOTA

FEBRUARY 2020



CITY OF SPEARFISH
EST. 1888

Black Hills State University

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Acknowledgements

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Introduction

Spearfish is a close-knit community of approximately 11,000, nestled in a broad valley just to the north of the Black Hills in western South Dakota. Part of the homeland of the Dakota and Lakota nations for centuries, the City of Spearfish was founded by white settlers in 1876. The community prospered due to agriculture, dairy processing, mining, cattle ranching, logging, and irrigated farmland.[1] Today the area is a sought-after haven for retirees and young families alike, with an unemployment rate of just 2.9%,[2] little crime and a relatively affordable cost of living. A spirit of collaboration pervades the community, and civic engagement is high.

The **picturesque town** is surrounded by mountain peaks, hills, and bluffs. With the Black Hills National Forest only minutes away, most residents are outdoor enthusiasts who cherish their beautiful natural surroundings. The downtown area features wide streets and historic building facades, many of which house unique local businesses.

Black Hills State University, the largest University west of the Missouri River in South Dakota, employs around 400 individuals, has an enrollment of 3,858 students, and is an important presence in the city. The **Spearfish School District** serves 2,200 students at five schools and has a 92% high school graduation rate.[3]

The community is politically conservative and racially homogenous: 94% of Spearfish residents are white, with Native Americans making up the largest minority group, at 2.5%. The community is also **young,** due to the presence of college students. Young people aged 15-24 make up 23% of the population.[4]

Tourism is a major driver of the economy, bringing visitors year-round for outdoor recreation opportunities like hiking, fishing, hunting, and camping, as well as to events like bike races, music festivals, art events, run/walks, and more. Just 70 miles from Mount Rushmore and the Crazy Horse Memorial, Spearfish also features the D.C. Booth National Historic Fish Hatchery, the High Plains Western Heritage Center, and beautiful city parks.

[1] "Spearfish - Civic Life & History." Black Hills Knowledge Network. https://www.blackhillsknowledgenetwork.org/community-profiles/cities-of-the-black-hills/spearfish/spearfish-civic-life-history.html#.XKZHr-tKhhE
[2] "South Dakota Economy at a Glance." Bureau of Labor Statistics. https://www.bls.gov/eag/eag.sd.htm
[3] "Spearfish - Education and Training." Black Hills Knowledge Network.
[4] American Fact Finder, https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

Due to its many desirable features, the community has experienced distinct **growth** in recent years, which brings with it both benefits and challenges. The school district is growing, workforce development is a challenge, differences of opinion exist about the best ways to manage development, and wages are not keeping pace with the increased cost of housing. Despite the challenges, Spearfish residents are friendly, generous, and committed to maintaining the quality of life they cherish.

Why Climate Resiliency?

Our climate is changing worldwide, and is predicted to change more significantly in coming decades. Some select statistics show an alarming trend:

- **The number of floods and other hydrological events around the world have quadrupled since 1980 and doubled since 2004.**
- **Climatological events, such as extreme temperatures, droughts, and forest fires, have more than doubled since 1980.**
- **Meteorological events, such as storms, have doubled since 1980.**
- **These extreme weather events carry substantial economic costs. Thunderstorm losses in North America have doubled—from under US$10 billion in 1980 to almost $20 billion in 2015.[5]**
- **Annual average air temperatures across the United States have increased approximately 2 degrees since 1901.[6]**
- **Nearly 80 percent of weather stations across the contiguous 48 states have experienced a decrease in the proportion of precipitation falling as snow.[7]**

In the face of increasing climate hazards, there is a need for proactive planning to ensure that a community will continue to thrive in the midst of change. Forward-looking cities around the world are now engaging in climate resiliency planning. *The purpose of a climate resiliency plan is to engage in dialog with community leaders to assess strengths and vulnerabilities in terms of projected climate change impacts, and to jointly develop multi-faceted strategies to build resilience to those impacts.*

Resilience is defined as the ability of a system or community to survive disruption and to anticipate, adapt, and flourish in the face of change. A more technical definition comes from the Intergovernmental Panel on Climate Change: "*The capacity of social, economic, and environmental systems to cope with a hazardous event, trend, or disturbance, responding or reorganizing in ways that maintain systems' essential function, identity, and structure while also maintaining the capacity for adaptation, learning, and transformation* (IPCC 2014b)."

The important distinction of this definition is its emphasis on the community's ongoing ability to continue to adapt to changing circumstances. Because of the multi-faceted and unpredictable nature of climate impacts and their related effects, the Spearfish community will need to be ready to adapt to circumstances it may not foresee today. That capacity for adaptation and transformation, no matter the circumstances, is the quality that will ensure that Spearfish will continue to thrive.

Climate Risks for Spearfish

Since 1990, South Dakota has averaged 14% more 1-inch rain events compared to the long-term average.[8] Since 1980, observed winter temperatures have been 1.5 - 4 degrees higher than the 20th century average, and from 1995 to 2009, South Dakota experienced the warmest winter temperatures in the historical record. Projections for the Spearfish region show temperature increases of 2 degrees to 16 degrees by the year 2100,[9] a 15% increase in extreme precipitation events,[10] and more frequent droughts and wildfires. Annual precipitation is projected to increase, with the largest increases occurring during spring and winter.[11] These heavy downpours bring with them an increased risk of flooding, particularly in the spring when early snowmelt, ice and heavy precipitation can combine to create dangerous conditions. Since the future climate will be one that fluctuates between extremes, an overly wet period may contrast with a drought not long after.

[5] New data confirm increased frequency of extreme weather events." Science Daily. March 21, 2018. https://www.sciencedaily.com/releases/2018/03/180321130859.htm
[6] "Climate Change Indicators: U.S. and Global Temperature." EPA. https://www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature
[7] "Climate Change Indicators: Snowfall." EPA. https://www.epa.gov/climate-indicators/climate-change-indicators-snowfall
[8] Frankson et al., "South Dakota - State Climate Summary." NOAA. https://statesummaries.ncics.org/chapter/sd/
[9] "Northern Great Plains - Fourth National Climate Assessment." U.S. Global Change Research Program. https://nca2018.globalchange.gov/chapter/22/
[10] Frankson et al., "South Dakota - State Climate Summary." NOAA. https://statesummaries.ncics.org/chapter/sd/
[11] Frankson et al., "South Dakota - State Climate Summary." NOAA. https://statesummaries.ncics.org/chapter/sd/

Resilience is defined as the ability of a system or community to survive disruption and to anticipate, adapt, and flourish in the face of change.

Climate Risks for Spearfish:

- Temperature increases of 2 degrees to 16 degrees by the year 2100
- 15% increase in extreme precipitation events
- Increased risk of wildfire
- More frequent droughts
- Increased risk of flooding
- More extreme storms

Warming temperatures will bring warmer winters and less snow in the fall and spring, but they may bring more snow in the winter, as warmer air holds more water vapor which then becomes precipitation. This warming may have some benefits to the region: a longer growing season may present the opportunity to grow a greater variety of crops, and tourism may increase. At the same time, an increase of seasonal pests and weeds is projected, which may offset benefits to the agriculture sector, and some tourist activities may see a decrease if wildlife, snowpack, and tree health are affected.

The incidence of wildfire has been growing at an alarming rate across the West, and the risk of fire in the Black Hills National Forest is a serious one. Fortunately, most of the town of Spearfish lies away from the forest, but in the case of a wildfire the town may be utilized for evacuation shelters for those who live in the hills. Decreased air quality from fires that may be nearby or hundreds of miles away is another risk factor for the community.

Like all cities, Spearfish faces hazards from the changing climate. Preparing for these risks now will reap exponential benefits in the future, from saving money to saving lives. What's more, the strategies that increase the community's resilience are those that will also lead to a thriving Spearfish far into the future.

Executive Summary

Black Hills State University started to examine the climate resiliency of the University with its 2017 Sustainability Master Plan. This plan included a chapter discussing how the University might engage in a process to assess its climate vulnerabilities and increase resiliency. BHSU is a signatory of a "Carbon Commitment" through the non-profit called Second Nature, which works with universities across the country to reduce emissions and increase resiliency in the higher education sector. The University is considering signing the "Climate Commitment" next, which provides resources and accountability for creating a climate resiliency plan. Using Second Nature's resources as guideposts, Black Hills State University initiated a climate resiliency planning process for the University and community in 2018.

Climate resiliency overlaps with disaster planning, but differs from it in the scope and breadth of its analysis. Climate resiliency planning takes place among separate agencies rather than within one alone, and considers impacts from a holistic perspective, taking into account the issues of economic health, infrastructure stability, ecosystem services, social equity and governance, and health and wellness. For these reasons, any climate resiliency planning that BHSU undertakes necessarily includes the City of Spearfish as well. By its very nature, climate resiliency planning looks at the ways climate disruptions will impact interdependent systems affecting a community. This plan is a climate resiliency plan for the entire community of Spearfish, including the BHSU campus.

Goals

The goals of the project were as follows:

1. To make community leaders aware of extreme weather risk and ramifications to the community, so that they are in a position to make decisions to mitigate those risks.
2. To identify the highest priority strategies that will reduce risk and build multifaceted resiliency in the community.
3. To identify areas where the University and community can help one another in times of disaster.
4. To strengthen ties between the University and community.
5. To create a Climate Resiliency Task Force that successfully works together to build resilience in the region into the future.

Process

In April 2018, BHSU engaged the services of Verdis Group to facilitate the climate resiliency planning process. The project involved the following steps:

1. Verdis Group researched characteristics of the Spearfish community, including a review of the following data and information:
    a. Demographics, including census data, economic, housing, education, health, geographic, and other factors.
    b. City planning, including the Comprehensive Plan (2013), Master Transportation Plan (2011), Fire Ordinance (2012), flood maps, and Old Belle Road Area Study (2010).
    c. Disaster planning, including the Lawrence County Disaster Mitigation Plan (2012), Emergency evacuation and snow routes, Spearfish Snow Information and Advisory Guide, South Dakota Drought Mitigation Plan (2015), South Dakota Office of Emergency Management Severe Weather Preparedness Guide (2013), and Red Cross Winter Storm Safety Checklist (2009).
    d. BHSU plans including the Strategic Plan (2014), Emergency Response Plan (2014), and Emergency Procedures.
    e. Consulted with climatologists in Nebraska, South Dakota, and Colorado on issues such as climate data, climate impacts on agriculture and ranching, and wildfire risk.
    f. Gathered data on past climate norms and trends, past energy demand, growing season length, past environmental disasters, and projected climate impacts for the area into the mid- and late-21st century, including temperature, precipitation, severe storms, and drought.

Process (cont)

2. BHSU invited specific community leaders and University personnel to serve on the Climate Resiliency Task Force. Individuals were selected because of the roles they held and the knowledge they would be able to contribute to the process. Nearly everyone invited accepted the invitation, though some were not able to attend one or more of the workshops due to conflicts. The Task Force had approximately 25 members.
3. In November 2018, individual interviews were held between Verdis Group and the Spearfish City Administrator, the BHSU Public Safety Officer, the BHSU Associate Vice President for Facilities & Sustainability, the U.S. Forest Service Fire Management Officer, and the Director of the Lawrence County Emergency Management Office.
4. On November 15, 2018, the first Climate Resiliency Task Force workshop was held at BHSU. In this workshop, participants were oriented to the project, discussed characteristics of the community, reviewed demographic data, reviewed Storm Atlas and its consequences, reviewed past and projected climate data, established the key climate hazards for Spearfish, and engaged in visioning a thriving Spearfish of the future.
5. On January 16, 2019, the second Climate Resiliency Task Force workshop was held at BHSU. In this workshop, the group assessed strengths and vulnerabilities of Spearfish in relation to key climate hazards and identified priority issues for the group to address.
6. On February 20, 2019, the third Climate Resiliency Task Force workshop was held at BHSU. In this workshop, the group finalized the key vulnerabilities in terms of the community's climate vulnerabilities, brainstormed strategies, and set resiliency goals.
7. Verdis Group did further research on each goal area, worked with Task Force members to clarify and flesh out goals and strategies, created an outline of the plan, solicited feedback on the outline from the Task Force, wrote a draft of the plan, and solicited feedback on the draft from the Task Force.
8. On April 17, 2019, the fourth Climate Resiliency Task Force workshop was held at BHSU. In this workshop, the Task Force reviewed and refined the draft of the plan and decided on next steps for its own work.

Plan Structure and Methodology

The structure of this plan follows the grouping of topics that emerged through the Task Force's work. The top-line goals are termed "Visions," and each is a strategic area to increase the community's resilience to climate hazards and increase its capacity to respond to disruption and ongoing change. Each chapter includes a summary discussion of the issue, followed by a list of key goals, followed by strategies to work toward achieving those goals.

The scope of this project was such that this version of the plan does not assign sub-tasks, designate lead organizations, or discuss funding for strategies. The Task Force will be moving this plan forward to its next iteration which will include these critical elements.

Key Strengths and Vulnerabilities for Spearfish

Strengths and vulnerabilities were identified in three main sectors: Natural, Infrastructure, and Social. In each of these sectors, a grid was created with "planning areas" listed on the vertical axis and climate change impacts listed across the horizontal axis: warming temperatures (including warmer winters, less snow, warmer summers, longer growing season, and more pests), extreme storms (including heavy rains, heavy snows, and floods), wildfire, and drought. The group carefully examined the ways that each of these climate impacts might influence each of the planning areas. From there, a list of the most important vulnerabilities the Spearfish community faces was generated.

Strengths:

1. **Black Hills State University.** The fact that Spearfish is home to one of the state's public universities is a benefit that was continually rediscovered from a multitude of angles over the course of the Task Force's work. The University not only provides needed employment to hundreds of residents, but it also acts as a strategic force in the area which drives economic development, provides jobs training, supports local farms, provides opportunities for at-risk populations, and can even increase the community's recycling rate and improve the quality of public health. Many of the strategies to increase the community's resilience intersect with the University in one way or another, underscoring the need for the state and region to support BHSU, and for the City and University to partner on strategic initiatives.
2. **Low flood damage risk.** Even though occasional flooding from Spearfish Creek is likely in future years, the group felt that the degree of flooding in likely floodplains would be temporary nuisance flooding and not critically harmful to lives or property.
3. **Energy availability.** Representatives from local electric utilities feel that they have ample generating capaCity for the region for the long term, even when factoring in rising temperatures and population growth, which will demand more energy.
4. **Emergency communications.** The City of Spearfish is able to tap into an emergency cellular communications network to send messages to all cellphones within a certain range of a cell tower in case of emergency. This technology could prove extremely useful in case of a natural disaster. The Lawrence County Emergency Management Office also manages a code red system for emergency communications, which at the present time is an opt-in system, meaning that residents are only included if they opt in. It is recommended that the office switch to using an opt-out system, so that all Lawrence County residents are included unless they choose to opt out.
5. **Opportunity for increasing agricultural diversity.** South Dakota's changing climate may provide some benefits to the agricultural sector, as a longer growing season may allow planting of multiple crops in one season, and/or the planting of crops that up to now were only grown at more southern latitudes.
6. **Benefits of wildfire.** Though no one would welcome a wildfire in the area, it was noted by the group that wildfire does provide a host of long-term benefits to biodiversity in a forest. With the risk of increasing droughts and high temperatures, wildfire may be an increased risk for the area, which, if not destructive to life and property, may hold some benefits for the forest.
7. **Community engagement.** Spearfish residents tend to be collaborative, friendly, willing to try new things, active in their community, and proud of their home. This character of the community itself is an important strength that will serve the town well in the case of natural disasters where many volunteer hours may be needed to help the community get back on its feet. The best benefit is that even without a natural disaster, increasing volunteerism and community cohesion will make a healthier and more thriving Spearfish for all residents.

Vulnerabilities:

1. **Enrollment at BHSU.** The health of the University is such a critical component of the region's health that a decline in enrollment would have cascading negative effects on many areas related to the community's resilience, from employment to jobs training to local foods. Maintaining or increasing enrollment should be a priority for all Spearfish residents.
2. **Low-paying jobs.** A concern that was repeatedly noted was the many low-paying jobs in Spearfish, many of which

are in retail or food service, but some of which are institutional as well. These low-paying jobs create economic insecurity and career immobility, as well as impacting access to health care, child care, and other services. Creating higher-paying jobs in the community will reap a wide range of benefits.

3. **Lack of affordable and resilient housing.** Task Force members were in agreement that the cost of living in Spearfish does not align with the wages that are generally offered. This disparity creates vulnerabilities in terms of individual financial resilience, health, transportation, and even safety. Attracting higher-paying jobs and creating affordable housing will be two key strategies for the community's future work.
4. **Increased costs to farmers/ranchers.** Increasing drought, erosion, wildfire and/or severe storms will likely bring increased costs to farmers and ranchers who will have to adapt to disruption. If the agriculture sector sustains significant economic hits, repercussions may be felt in the entire region's economy. The University has an opportunity to play an important role in researching and teaching resilient ranching practices and sustainable uses for agricultural products.
5. **Food supply during an emergency.** Spearfish is completely dependent on I-90 for food supplies to its grocery stores. During the 2013 Storm Atlas, I-90 was closed for three days and food supplies ran dangerously low. Stocking emergency shelters with backup supplies of food will be a critical strategy to ensure the community's resilience in the face of future natural disasters.
6. **Access to health care.** The changing climate will bring increasing public health risks such as vector-borne and insect-borne diseases, increasing allergies and respiratory illnesses, heat stress, and mental illness. Low-income residents may not have adequate access to health care. Spearfish has a 26-bed hospital and a nursing shortage, both of which are areas of concern in terms of meeting the needs of the future. Facilitating greater access to health care for all residents will be an important strategy for the future.
7. **Reduced tree canopy.** The emerald ash borer is a pest that is slowly working its way across the United States and unfortunately decimating ash trees. It is expected to arrive in Spearfish within the next couple of years, and its effect will reduce the overall tree canopy in town. Reduced tree canopy provides less shade and cooling in extreme heat situations, and can increase runoff during heavy downpours. The City is already working on a plan to replace ash trees and diversify its tree species, which will need more attention in coming years.
8. **Training, recruitment, and retainment of emergency volunteers.** Volunteers who are trained in how to respond in an emergency situation will be a critically important component of ensuring the town's resiliency. Training programs are available and need to be implemented in the community. What's more, there is a need for elected officials to take these training programs so that they can understand how best to use communication channels and organize resources in the case of disaster.
9. **Availability of daycare.** Spearfish has a high number of single mothers and a low number of daycare providers. Providing more daycare to these families is an important need that will provide multiple benefits to the community: allowing mothers to finish school or go back to work will reap economic rewards for the community for the long term and increase its resilience.
10. **Reduced tourism revenue.** Tourism is an important driver of the town's economy, and has the potential to become even more important. If, however, a natural disaster such as a wildfire or extreme storm were to strike and leave the area less appealing for tourists, the City's economic health could suffer. At the same time, slow-moving changes to the climate may bring decreases in wildlife population which could impact hunting, and warming temperatures could lead to less snow and availability of winter sports. For these reasons, the community should support the diversification of tourist attractions, ensuring that there are plenty of opportunities to draw visitors that are not reliant on one landscape or weather condition.
11. **Greenhouse gas-emitting energy usage.** Though energy supply is plentiful in the area, it is primarily sourced from facilities such as coal and natural gas plants, which

produce carbon dioxide and methane, two greenhouse gases responsible for much of the planet's warming. Though local energy suppliers also have hydropower, and are steadily increasing the amount of wind energy in their portfolios, the Spearfish community should increase the amount of energy supplied by renewable sources. A new program may provide a near-term opportunity to do this. The City of Spearfish has submitted an application to Black Hills Energy's Renewable Ready program to subscribe to 50% of the electriCity used at seven of the City's top service locations for 15 years beginning in 2020. The wind energy will be produced at BHE's Corriedale Wind Energy Project located near Cheyenne, Wyoming. Increasing energy efficiency in all buildings in Spearfish, from large industrial users to residential homes, will go a long way toward reducing Spearfish's greenhouse gas emissions.

12. **Safety of vulnerable populations.** Vulnerable populations such as the elderly, the special needs population, the ill, and the poor are at special risk in a time of natural disaster. Elderly people who rely on oxygen and live in the hills can be difficult to get to in a rescue operation. Low-income families may not have the ability to stay in a hotel if their homes are damaged. The City should keep these populations at the forefront of their minds in all their resiliency planning.
13. **Reduced water availability in drought conditions.** Increasing droughts will lead to more water scarCity. Enacting water conservation strategies and reducing the amount of leakage in the City water supply will help to mitigate against future droughts.
14. **Emergency energy supply.** In the case of a natural disaster, evacuation shelters will be utilized to shelter people temporarily. Some of these shelters do not have backup generators to provide power for light, heat, and refrigeration. Procuring generators for these locations is an actionable step that will provide many benefits in an emergency.
15. **Air pollution from inversion.** Increasing wildfires across the west will bring increased smoke in the air, which can travel hundreds of miles. Decreasing air quality is a risk to Spearfish residents, particularly those with respiratory illnesses. Installing air quality monitors will establish a way for the community to monitor its air quality and to advise residents accordingly.
16. **Wildfire.** The risk of wildfire in the Black Hills National Forest and surrounding areas is real. Not only is there potential for loss of trees, but subsequent effects on biodiversity, tourism, and ecosystem health. Of course, wildfire is a natural occurrence that can be healthy for forests, but a destructive fire could have far-reaching effects on ecosystems that could take years to recover.

Key Findings

The key findings that emerged from the process are the following:

1. Climate change may hold **rewards as well as risks** for Spearfish. A longer growing season for farmers may boost the region's agricultural productivity, which could have a positive effect on the economy. On the other hand, increasing infestations of pests may offset agricultural increases. Less severe winters may draw more tourists to the area, but a wildfire that leaves a scorched landscape in the Black Hills would likely reduce tourist activity. The community should prepare for both the risks and the rewards of the changing climate, and continue to adapt as time goes on.
2. The strategic benefit of **Black Hills State University** to the Spearfish community cannot be understated. The University not only provides employment and vitality to the community, but it also acts as a strategic instigator of new ideas, connections, and solutions. BHSU has an important role to play in helping to build the community's resilience by offering new programs that will fill critical needs in the area long into the future. Furthermore, partnerships between the University and the City have the potential of helping the City make exponential progress at building resiliency and increasing quality of life for all Spearfish residents.
3. Expanding educational opportunities, growing the local business economy and improving access to basic human needs are **mutually-reinforcing strategies** that will not only improve the community's climate resiliency, they will contribute to a more thriving, fair and dynamic city. Continuing to look for ways to share information, engage in collaborative problem-solving, and learn how organizations can work together will be necessary to make inspiring progress.
4. **Tourism plays an important role** in Spearfish already, and there is potential for it to become an even more important driver of the local economy which will increase the community's resilience to economic shocks. Ensuring that tourism opportunities are diversified will help keep income consistent even if certain activities are impacted by extreme weather events or slow-moving changes to the climate.
5. **Forest health is key to community health.** In many ways, the community of Spearfish revolves around the Black Hills National Forest—no doubt reflecting the way Native people lived in what was to them a sacred home. If the forest were to be decimated by wildfire, pest infestations, or other climate-related disasters, the community would perhaps become unrecognizable. It is important for officials to monitor the health of the forest, for community leaders to keep in mind the protection of the forest in all decisions that are made, and to communicate regularly on these topics to local residents.
6. **The character of the Spearfish community is a great asset.** Spearfish is a special place, with people who cherish their natural surroundings, value community, and are willing to help one another. With these rare qualities, the Spearfish community will be able to increase its resilience to disruptions of the future in ways that will likely be the envy of communities across the nation.

2040 Vision

Our vision for the year 2040 is a thriving and resilient Spearfish that has gracefully and equitably accommodated growth in its economic, education, and housing sectors. There is a strong sense of **community cohesion** and cooperation due to the shared sense of mission by all Spearfish residents to contribute to the health and vitality of their community. Collaborative partnerships have boosted the small business sector, created more affordable housing and increased social services available to vulnerable populations. A commitment to **meeting the basic human needs** of all Spearfish residents has led to improved public health and a strong sense of community pride. A growing diversity of people and ideas has led to creative new ideas and an increased sense of civic leadership.

Black Hills State University has **expanded its educational offerings** to include degree programs in forestry, computer science, and criminal justice that serve previously unmet needs in the region. BHSU has increased the number of Pre-nursing and Applied Health Science graduates to feed into the nursing programs offered west river by SDSU and USD. K-12 education in the area has been strengthened, in part due to an increase in teacher salaries and a career development center at the high school, and both ACT scores and graduation rates are rising. More and more BHSU grads are staying in town to work in local businesses and raise families.

The tourism **economy in Spearfish is growing,** as visitors come year-round to enjoy the hills and outdoor recreation opportunities. Even though the summers and winters are warmer, there are plenty of attractions to draw visitors, including hiking, camping, mountain biking, and competitive racing. Art and music events draw attendees locally and from across the region.

Wildfires are more common, both close to home and across the West. These fires, some even hundreds of miles away, generate unhealthy particulate matter in the air. Sensors in Spearfish alert officials when air quality levels reach unhealthy levels, and when they do, an updated notification system sends residents a warning. **Environmental monitoring** is also used in town, as the tree canopy is regularly evaluated for health. Warmer temperatures have led to more pest infestations, but the integrated pest management program is working to protect trees and provide valuable shade for residents.

In 2040, Spearfish has built a more robust **emergency response** framework that includes a trained volunteer corps available for firefighting, search and rescue, snow removal, floodwater abatement, emergency medicine, and a range of critical care needs. A neighborhood checks system ensures that no vulnerable individuals are left without help in times of need, and a volunteer child care provider pool helps young parents, especially single moms, attend to pressing needs. The local airport has been enlarged to accommodate cargo and firefighting planes, which have been critical in disaster relief. Generators are present at all of the City's evacuation shelters, which are now stocked with backup supplies of food, water, and bedding, and have the ability to accommodate pets.

The climate is changing, and Spearfish now experiences more rain in the fall and spring, and more snow in winter. Flooding, especially in the spring, has become more common, but is manageable thanks to floodplain management. **Community engagement** around the topics of sustainability and resiliency is creating a sense of shared partnership between residents and the city as they face the changing climate. Residents understand the specific risks they face in their neighborhoods, understand who else nearby is vulnerable, and do their part to conserve energy, water, and waste, and reduce pollution. Fifty percent of the electricity Spearfish purchases now comes from renewable sources. Local farmers markets are thriving with music and art.

In 2040, some things are different in Spearfish. But the community has learned how to thrive in the midst of change. They've become stewards of Spearfish success.

Resiliency Visions

Based on the Task Force's careful thought, reflection and discussion, the following Visions emerged as the priority areas for increasing resilience in the community:

Prepare for Extreme Weather Events

Nurture Economic Health

Strategically Invest in Our Educational Resources

Increase Environmental Coordination & Monitoring

Improve Access to Basic Human Needs

Build Community Cohesion

Conserve Our Natural Resources

Prepare for Extreme Weather Events

The era of climate change is expected to bring with it an increased frequency and severity of extreme storms, including heavy rains, heavy snow storms, and floods in South Dakota. At the same time, droughts and wildfires will become more common. Some of these natural disasters will create acute emergency situations for Spearfish. With proper planning for the worst-case scenario, the Spearfish community can engage its residents and build resiliency to the worst effects of climate change.

Spearfish has learned valuable lessons from past natural disasters. In October 2013, Spearfish experienced a blizzard, Winter Storm Atlas, that brought 21.5 inches of snow[12] in the course of a few hours. Winds reached 60 miles per hour; a large number of fallen trees put all three power utilities out of commission and left 25,000 homes without power, some for as long as three weeks. During this time, transportation was nearly impossible. The interstate was closed for three days, leaving the food supply in Spearfish grocery stores dangerously low.

Spearfish responded to this event by improving its emergency preparedness. The city purchased more tracked vehicles to be able to transport emergency personnel in heavy snow. The county implemented a code-red notification program, to notify those in range of cell towers about any emergencies. The local hospital purchased more cots, and the healthcare disaster plan was updated. Though these important measures were taken, the lessons from Storm Atlas show that there are several strategies that can be undertaken to strengthen the community's ability to respond to a natural disaster.

Emergency preparedness and climate resiliency overlap, but they are not synonymous. Being resilient to the challenges of climate change means preparing for both day-to-day changes a community might experience and the worst-case scenario. Creating a culture of preparedness not only unites community members, but it also will lessen the negative effects of extreme storms.

Goal:
Ensure that All Essential Services and Shelters Have Backup Power

Providing shelter to those whose homes are inaccessible during or after an extreme storm is of the utmost importance. Currently, only some emergency shelters are equipped with backup generators to provide light, heat, and refrigeration during a power outage.

3–5 Year Strategies

- Obtain a backup generator for both the Recreation Center and the Young Center, two shelters used in evacuation scenarios.
- Explore the feasibility of allowing pets to accompany their owners in the evacuation shelters.
- Assess the capacity needs for sheltering pets during a disaster.
- Identify one or more schools that can be used as additional evacuation shelters.
- Stock evacuation shelters with a one-week supply of food.
- Ensure that evacuation shelters have emergency bedding.

6–10 Year Strategies

- Equip additional evacuation shelter locations with backup generators.
- Make a plan for sheltering pets during an emergency evacuation.

20 Year Strategies

- Meet a goal of having the capacity to shelter and feed 20% of Spearfish residents in case of an emergency.

Goal:
Ensure that Trained Emergency Volunteer Response Teams Are On Hand to Meet Critical Needs

When a community is in an emergency situation, there is often no shortage of volunteers willing to dedicate their time and resources to helping those in need. What is needed in Spearfish is a planned, dedicated group of volunteers who know how to respond in the case of an emergency, and where their assistance can best be used. Ensuring that Spearfish is well equipped with knowledgeable, annually trained employees will not only bring the community closer together, but it will also ensure Spearfish can withstand and recover from natural disasters.

3–5 Year Strategies

- Develop a Community Emergency Response Team (CERT).
- Recruit and train a full active volunteer fire department (45 active volunteers).
- All emergency response teams will have a supervisor ratio of 1:7.
- Work to schedule annual meetings with leadership in Spearfish to educate them on all possible options for outreach and response in the case of an extreme weather event.

[12]"From the Archives: 5 years since Winter Storm Atlas." Rapid City Journal. October 4th, 2018. https://rapidcityjournal.com/news/local/from-the-archives-years-since-winter-storm-atlas/collection_d2dc4214-b6ae-11e8-8d6b-d7b55eb8ba1b.html

Goal:
Train the Spearfish Community to Engage in Emergency Response Protocol with an Emphasis on Vulnerable Populations

Engaging volunteers is critical, but ensuring that individual residents know how to react and who to call for help in an emergency situation is just as important. An emphasis in these trainings will be placed on vulnerable populations such as those living in remote locations, the elderly, youth, and disabled, who are most at risk in an emergency situation.

3–5 Year Strategies

- Require Climate Resiliency Task Force members complete BHSU's online emergency preparedness training program.
- Conduct annual Spearfish preparedness events to ensure the average citizen understands that preparedness leads to resiliency. Make residents aware of the resources at ready.gov, a federal disaster preparedness website.
- Create an emergency training program for elected and appointed leaders in the community. Conduct personal outreach with each individual to educate them on this plan and on the importance of being prepared.
- Identify vulnerable populations (low-income housing individuals, seniors, and residents in remote locations) and create a contact plan.

Goal:
Create a Neighborhood Checks Program that Invites Neighbors to Check on Neighbors, and Helps Identify Vulnerable Individuals

3–5 Year Strategies

- Create an outline for the program that includes the goals of the project, strategies for implementation, and ownership.
- Educate the community on the need for a Neighborhood Checks program and what it would entail.
- Identify a volunteer coordinator who will not only be responsible for neighborhood checks, but other Spearfish volunteer opportunities outlined in the Community Cohesion section.

Goal:
Create an Emergency Childcare Program

Some community members may want to volunteer, or may need to go to work rebuilding their community after an extreme weather event. Ensuring that children are cared for during these stressful times will help with recovery efforts.

3–5 Year Strategies

- Recruit interested community members to be a part of a database in case of an emergency.
- Find a location in the community that can support an emergency daycare.

Nurture Economic Health

Economic health is key to increasing climate resiliency because a strong economy ensures that individuals and the community will be able to recover quickly following a disruption, such as an extreme weather event. What's more, strengthening existing vulnerabilities can prevent them from becoming acute liabilities in the face of climate disruptions. For example, if a town with a high poverty rate was hit with a natural disaster that destroyed homes, thousands of people without a safety net could suddenly find themselves as refugees without shelter, food, transportation, or water. In the same way, a community with a low rate of new business starts (which may indicate a lack a culture of entrepreneurship) may have a harder time rebounding from a climate-related economic downturn than a more entrepreneurial community, which might find ways to adapt to new conditions more quickly.

For these reasons, one of the main visions of Spearfish's resiliency plan is to nurture economic health. The local economy is already good: the median household income is $44,000 and the unemployment rate is 2.9% —well below the national average.[13] In 2017, 15.6% of the population was below poverty line, but this figure is skewed by the high number of college students in Spearfish: among 18 – 24 year-olds, 57% rate below the poverty level.[14] The community's growth rate has hovered around 1.5% over the last twenty years.[15]

Tourism is an important driver of the local economy. Visitors come from near and far to access the plentiful outdoor recreation opportunities, local attractions, and special events. Visit Spearfish, the local tourism organization, is actively involved in marketing Spearfish as the "Basecamp for Outdoor Adventure," and annually sponsors and/or assists with all types of outdoor events, including running events, year-round biking events, snow-shoeing/cross country skiing/fat tire biking events, triathlons, car shows, rock climbing events, hiking events, outdoor music festivals, and pickleball. They work closely with the South Dakota Game, Fish, and Parks Department, the South Dakota Deptartment of Tourism and Economic Development, and the Black Hills National Forest Service in on-going efforts to educate and inform on accessing and protecting local natural resources for recreational purposes. The tourism sector has the potential to grow even more, creating more jobs for local residents and making the local economy more resilient. Future economic development, however, should be evaluated to ensure it is a good fit for the community and for the environment.

Affordable housing is a serious issue for the Spearfish community to address in order to increase its climate resiliency. Spearfish is not unique in having a community vulnerability of a gap between local wages and the cost of housing. Many retail and tourism employers in the area pay wages that are at or near the minimum wage, while housing costs, partly due to the city's desirability as a scenic mountain retirement location, have risen. Median home costs in Spearfish are 24% higher than the South Dakota average, and 6% higher than the national average.[16] Compared to other cities in South Dakota and cities across the country, the cost of living index in Spearfish is 96 (based on a national average of 100), which is 6% higher than the South Dakota average and 4% lower than that for the entire country.[17] This inequality between jobs and housing is an important, though difficult, issue for the community to address. Strategies that address job training, recruiting companies that employ a higher-educated workforce, and creating more affordable housing options are those that can address this disparity and build economic resiliency for the community.

Goal:
Increase Tourism as an Economic Driver for the Spearfish Community

Supporting efforts to grow tourism in Spearfish will improve the local economy, create more jobs, encourage community collaboration, and increase the community's resilience to possible disruptions. At the same time, these strategies should be undertaken with an understanding of the recreation opportunities that may be at risk of climate hazards. Decreasing snow may have an impact on winter sports, and increasing temperatures may have domino effects on tree health and wildlife behavior, which could influence hiking, camping, and hunting activities. Art tourism is a growing sector that involves people traveling to locations in order to engage with local art and art activities. This sector may hold much potential for development in Spearfish.

3–5 Year Strategies

- Increase tourism activity in Spearfish by 3%.
- Explore avenues to increase marketing funds provided to Visit Spearfish and the Spearfish Economic Development Corporation.
- Continue to market and expand outdoor recreation opportunities.
- Increase the number of retail options for purchasing and renting outdoor recreation equipment.
- Increase availability of biking opportunities.
- Identify another Business Improvement District project.
- Develop a tourist trolley that circulates between hotels, the downtown area, local attractions, and Spearfish Canyon. These trolley rides can be sightseeing trips in and of themselves, and can also provide transportation to tourist destinations.

[13] U.S. Census Bureau, 2013-2015 American Community Survey 5-Year Estimates, https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[14] U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[15] "Population of Spearfish, SD." https://population.us/sd/spearfish/
[16] "Spearfish, South Dakota Cost of Living." BestPlaces. https://www.bestplaces.net/cost_of_living/city/south_dakota/spearfish
[17] "Spearfish, South Dakota Cost of Living." AreaVibes. https://www.areavibes.com/spearfish-sd/cost-of-living/.
The index is comprised of the following criteria: cost of retail goods and services (33%), groceries (13%), health care (5%), housing (30%), cost of public/private transportation (9%) and utilities (10%). Everyday goods and services, along with housing account for 63 percent of the total cost of living index.

- Explore and create a plan to create art installations and events as tourism draws to Spearfish.
- Consider the development of a mountain bike park.

6–10 Year Strategies

- Increase tourism activity in Spearfish by 6%.

20 Year Strategies

- Increase tourism activity in Spearfish by 10%.
- Expand outdoor recreation options.
- Explore revenue options to build venues to attract tourism.
- Increase marketing funds provided to Visit Spearfish and the Spearfish Economic Development Corporation.

Goal:
Foster Robust Local Business Development

One of the best ways to create more jobs is to help local small businesses grow. Most Americans are employed by small businesses—in fact, 89% of workers in 2016 were employed in a business with fewer than 20 employees.[18] Cities that support entrepreneurship by helping people to start new businesses, and that provide mechanisms to help existing businesses grow, are those that see dynamic growth in their local economy.

The Spearfish Economic Development Corporation, aware of the growth potential of outdoor recreation in the area, is actively working on recruiting additional outdoor product manufacturing companies to the community. According to the Outdoor Industry Association, outdoor recreation is an economic powerhouse in the United States, each year generating $887 billion in consumer spending and supporting 7.6 million jobs. Every year, American consumers spend more on outdoor recreation than they do on pharmaceuticals and fuel, combined. In fact, the impact of outdoor recreation on America's economy is almost as big as that of hospital care.[19] Another pillar of a strong local economy is keeping local dollars in the community, which is a focus of the Chamber of Commerce. Currently, though there is a small "shop local" campaign, many residents do their shopping either online or in other communities nearby. A study of this "retail leakage" is currently underway, the results of which should show some clear objectives to address. Current zoning regulations may need to be evaluated in order to foster more local business development.

3–5 Year Strategies

- Complete a market analysis that explores strengths and opportunities of the retail sector.
- Evaluate current zoning districts and identify possible areas for new business development.
- Support the recruitment or expansion of businesses who employ a high-skilled workforce.
- Support the development of a jobs training program to supply workers for high-skilled jobs.
- Evaluate financing mechanisms for local businesses to identify possible opportunities for expansion.
- Identify funding for an expanded "Shop Local" campaign.

6–10 Year Strategies

- Evaluate the need for an additional healthcare facility.
- Re-evaluate market and retail leakage.
- Support the recruitment or expansion of businesses who employ a high-skilled workforce.
- Expand financing mechanisms to support local business growth.
- Implement a marketing campaign to encourage Spearfish residents to shop locally.
- Fulfill a community need for another daycare center.

20 Year Strategies

- Increase the number of local businesses, especially retail and those that serve the outdoor recreation sector.
- Recognize, celebrate, and support local businesses and entrepreneurs.
- Increase the variety of businesses in town.

[18] "Facts and Data on Small Business and Entrepreneurship." SBE Council. https://sbecouncil.org/about-us/facts-and-data/
[19] Kory Menken, Executive Director, Spearfish Economic Development Corp.

Goal:

Foster Workforce/Affordable Housing Development Throughout the Community

Many people who work in Spearfish cannot afford to live there. Many of these employees find less expensive housing in neighboring towns and commute to work. This creates both an economic and safety vulnerability for the community in the face of climate hazards. In a natural disaster, critical personnel may not be able to get to work, which could hamper disaster relief efforts. Even under ordinary circumstances, these employees are stressed and burdened with the high cost of living, and the city of Spearfish is losing dollars that those employees could be spending on rent, groceries, and entertainment in the community where they live. Creating more affordable housing in Spearfish is a critical strategy that will strengthen the community and increase its resilience to climate stressors.

3–5 Year Strategies

- Explore the creation of a workforce housing funding mechanism.
- Propose tax credit policies to incentivize workforce housing development.
- Build or redevelop affordable housing units.
- Re-assess the gap between wages and housing costs.

6–10 Year Strategies

- Create a Workforce Housing Task Force to study the issue and make recommendations.
- Identify locations for affordable housing development/redevelopment.
- Re-assess the gap between wages and housing costs.

20 Year Strategies

- Continue to Reassess the gap between wages and housing costs.
- Build or redevelop affordable housing units based on outcome of housing study and the Spearfish market.

Strategically Invest in Our Educational Resources

The fact that Spearfish is a college town is an immense asset to the community and to its resiliency planning. Black Hills State University has shown itself to be an innovative leader in sustainability and is poised to use its role to bring strategic growth to the community. The University, which has a satellite location in Rapid City, has a full-time equivalent enrollment of 2,520, one-quarter of whom come from other states or countries. The average cost of tuition, room and board is approximately $16,151, and every year, $2 million is awarded in scholarships. The Sanford Underground Research Facility (SURF), built at the location of the former Homestake Mine, supports world-leading research in particle and nuclear physics and other science disciplines. For all of its assets and opportunity, however, BHSU has ranked at the bottom of the South Dakota Board of Regents system for many years in terms of the level of funding it receives from the state. Increasing its funding level will help the University to actualize its plans to better serve its community.

The University sees a strategic opportunity to grow its educational resources in order to meet the changing needs of the community in the future. By adding degree programs in needed fields like forestry, criminal justice and computer technology, the University can graduate trained young people who will contribute to the growth of the local economy. BHSU hopes to partner with other area educational institutions in order to provide even more pathways to education and higher-paying jobs. Currently, 39% of Lawrence County residents have a post-secondary degree,[20] a figure that BHSU would like to see rise in coming decades. One area of concern for the community is the low compensation for secondary school teachers; average teacher salaries in South Dakota are the second-lowest in the country.[21] Raising compensation for teachers will be an investment in the educational quality of the community, as it will help recruit and retain talented individuals.

Climate hazards could impact BHSU in a number of ways that could then have cascading effects on the local community. A serious wildfire or prolonged drought could make the area a less appealing destination for college students. Declining enrollment would affect the University budget, which would then affect staff, faculty and the local economy. Severe storms could damage the campus, hampering operations for a time. The more that BHSU invests in a multi-faceted approach to meeting the educational needs of the future, the more resilience it builds not only for itself as an institution, but for the entire community.

Goal:
Expand Educational Offerings, Increase Enrollment and Increase Scholarship Aid at BHSU

The University has ambitious plans to add degree programs to fill currently unmet workforce needs in the region, and to partner with area institutions to expand the range of educational offerings it can provide. These strategies have a cross-over benefit of supporting the local economy and providing better access to basic human needs.

There is currently a nursing shortage in the area, and although Western Dakota Tech offers a Licensed Practical Nurse (LPN) program and SDSU and USD offer a Bachelor's of Science in Nursing (BSN) in Rapid City, these programs are not at capacity. It is critical for BHSU to increase the number of graduates from their Pre-nursing and Applied Health Science programs to feed the BSN programs and fill them to capacity. This degree is required for critical nursing positions at Spearfish and Rapid City hospitals. Local health officials have serious concerns about the region's ability to continue to provide adequate health care to the population if these critical nursing positions are not filled in the future.

Growing the scholarship fund at BHSU is another strategic goal that will help the University attract and retain talented students. Currently, the University competes for good students with neighboring Wyoming, which offers generous college scholarships for high-performing students. With an increased scholarship fund, BHSU will be able to support a wide range of students, grow enrollment and increase its educational impact.

3–5 Year Strategies

- Create new degree programs in forestry, criminal justice and computer technology.
- Grow the annual scholarship award fund to $4M.
- Increase current enrollment with a goal to maintain BHSU's enrollment average at 90,000 credit hours.
- Increase enrollment by 10% in the Applied Health Science program to feed students into the SDSU and USD BSN programs in Rapid City.

6–10 Year Strategies

- Grow the overall university budget by 10% through a diversified revenue approach.
- Grow the annual scholarship award fund to $10M.

20 Year Strategies

- Create at least five new degree programs or expand current programs to online delivery to serve emerging needs.
- Graduate at least 50 students per year from new degree programs in fields such as forestry, criminal justice and computer technology.
- Disburse $20M annually in scholarship funds.

[20] U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[21] "A look at teacher pay across the United States in 2017." Bureau of Labor Statistics, U.S. Department of Labor. The Economics Daily. May 8th, 2018. https://www.bls.gov/opub/ted/2018/a-look-at-teacher-pay-across-the-united-states-in-2017.htm

20 Year Strategies (CONT)

- Facilitate more affordable access to education.
- Offer 2 + 2 programs and a B.AS degree between BHSU and Western Dakota Tech.

Goal:
Expand Research Opportunities at BHSU

The University has prided itself on being able to offer research opportunities to undergraduates. In coming years, it can expand its contribution to the fields of science, sustainability and resiliency by creating and sustaining innovative research opportunities.

3–5 Year Strategies

- Expand business research into sustainable uses for local natural resources. These could include lumber, sawdust, switchgrass, sustainable agriculture, gold, biomass and many others.

6–10 Year Strategies

- Increase the number of students doing undergraduate and graduate research at BHSU.
- Increase the number of research projects in the underground classroom at SURF by 10%. The baseline in 2019 is 8-10 students per year.

20 Year Strategies

- Contribute new knowledge to the fields of sustainability and resiliency through sustained research into sustainable uses of natural resources.

Goal:
Raise Local Educational Attainment Levels

Increasing education and opportunity for all residents will lead to higher wages, a stronger economy and a more diversified business environment. These factors will increase the city's resiliency to disruptions.

3–5 Year Strategies

- Partner with Spearfish High School to create a Career Development Center. This center would create optional vocational tracks at the high school level that can help raise achievement levels as well as funnel into BHSU. It could be modeled after the Pathways Project in Rapid City.[22]

6–10 Year Strategies

- Increase local teacher pay to 10% above the national average.

20 Year Strategies

- Increase the post-secondary degree attainment level in Lawrence County to 60%.
- Maintain the Spearfish high school graduation rate at over 90%.
- Increase the average Rapid City high school graduation rate to 65%.

Goal:
Educate Key Stakeholders on the Strategic Role the University Plays in the Community's Health

3–5 Year Strategies

- Create and execute a plan to communicate how BHSU can uniquely respond to some of the challenges the community is facing. Determine key messages, key audiences and stakeholders (which may include elected officials, the South Dakota Board of Regents, local businesses, city government, donors, and the public), and communication vehicles. Engage the entire task force in communicating these messages.

[22]James, Meredith, "RCAS looks to implement new pathways approach for high school students." KOTA Territory News. October 25th, 2018. https://www.kotatv.com/content/news/RCAS-looks-to-implement-new-pathways-approach-for-high-school-students-498578761.html

Increase Environmental Coordination & Monitoring

Many residents and visitors associate Spearfish with the wide variety of outdoor activities that comes with its close location to the Black Hills National Forest. The local environment is, in many ways, the crux of Spearfish's tourism economy; Spearfish Canyon, Crow Peak and a variety of hiking and year-round activities keep visitors and residents outside and engaged with the local ecosystem. The Black Hills National Forest is also the number one producer of timber in the country,[23] another essential part of Spearfish's economy. It is clear that caring for local ecosystems is essential to building resilience in Spearfish, not only for the health of local plants and animals, but for human health and the economy as well.

[23]Huntington, Stewart, "Black Hills forest leads nation in timber sales -- for a reason." KOTA Territory News. May 22nd, 2017. https://www.kotatv.com/content/news/Black-Hills-forest-leads-nation-in-timber-sales----for-a-reason-423737633.html

Experts predict that climate change will have a variety of effects on ecosystems in South Dakota. Summers will gradually become warmer and longer, and winters will become milder. South Dakota, like much of the world, should expect a higher frequency of extreme storms, such as heavy rains, snows and floods. Drought is also expected to increase, with extended drought periods causing an increase in forest fires. Optimistically, some experts predict that warmer winters will increase the productivity of livestock due to the potentially longer grazing season. The agricultural industry in South Dakota could see some benefits, with corn and soybeans producing higher yields as the state warms.

With warmer weather and a longer growing season also comes an expected increase in the severity and number of pests, including the nationally known Emerald ash borer. Emerald ash borer (EAB), Agrilus planipennis Fairmaire, is an exotic beetle that was discovered in the United States in 2002 and has since killed hundreds of millions of trees in North America. The adult beetles nibble on ash foliage and cause little damage, but the larvae they lay feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients, eventually killing the tree.[24] Unfortunately, there is no treatment to eradicate the beetle. The beetle was first found in eastern South Dakota in 2018 and is expected to move west. The City of Spearfish is already taking a proactive approach to replacing ash trees that will be lost to the Emerald ash borer. Creating a formal plan for avoiding the negative effects of other pests will be important moving forward. Maintaining a vibrant tree canopy in the city helps keep streets and people cool, increases habitats for a variety of insect and animal species, and has mental health benefits. It is important to prioritize not only the welfare of humans, but also to understand that ecosystems are intrinsically tied to human health.

The Black Hills Forest that surrounds Spearfish is an essential part of the local ecosystem. A staple in recreation, the economy and ecosystem health, the forest is the focus of many organizations that are working to manage and protect it. Engaging the public on the importance of prescribed burns, how to manage their own private properties and how to enjoy the forest will be important as drought, extreme weather events and increasing wildfires threaten to change the forest landscape into the future.

Environmental monitoring is tied to the health and wellbeing of every community's most vulnerable populations. A central component to environmental justice, those who are most marginalized (low income, racially diverse, etc.) carry the majority of environmental burdens. When air quality is at its worst, and when the water is polluted and contaminated, these effects are most dramatically felt by those who can least afford to combat these issues. Caring for local ecosystems is not only essential to maintain a thriving economy and the health of local residents, but it is also fundamentally a justice issue.

Goal:
Increase the Ability to Measure Air Quality in the Spearfish Region

Providing the highest quality data to residents will be essential as the impacts from wildfires to the west and in South Dakota take a toll on the air quality in Spearfish. There are currently no air quality measuring systems in Spearfish; three in Rapid City are currently used to provide data. Adding these systems to the area will help vulnerable populations, such as the elderly and small children, avoid the worst impacts from poor air quality days.

3–5 Year Strategies

- Find funding for and purchase an air quality measuring system; one potential location for a sensor could be Lookout Mountain and another in town.
- Make the air quality measurements publicly available on a website.
- Coordinate with Rapid City and compare air quality results.
- Explore methods of communicating the results with the public.

6–10 Year Strategies

- Use air quality information to empower residents to understand how forest fires in the U.S. affect local issues such as asthma and other health issues.

[24] Emerald Ash Borer Information Network, http://www.emeraldashborer.info/

Goal:
Improve Surface Water Quality

The more that residents can do to help improve surface water quality, the easier and more efficiently clean water can be distributed to residents. Flooding, caused by both heavy rains and misuse of local sewers, can be avoided in part with the help of the local community. Problems can happen when residents and contractors deposit large volumes of debris such as grass clippings or mud in the street. When rain comes, the sewer system can backup and create flooding. Continuous deflection separation units are installed at some major intersections and do help with removing debris. The city cleans these storm sewer drains at regular intervals to prevent backups. Residents can help by not flushing grass clippings, mud, or other debris into the storm sewer system.

3–5 Year Strategies

- Conduct public outreach, targeted at homeowners and contractors, to teach people to avoid flushing of grass clippings, chemicals, mud and other debris into the storm sewer system.
- Explore more environmentally friendly options for ice abatement on city streets.
- Explore possible locations for the creation of bioswales to absorb storm runoff.

6–10 Year Strategies

- Continue to add continuous deflection separation (CDS) units where necessary to the sewer system throughout the city to filter major debris from contaminating water systems.

Goal:
Maintain or Increase the Tree Canopy in Spearfish

Trees are an excellent carbon sink and also serve as habitats for a variety of species. Having a substantial tree canopy and greenspace in a city not only has ecosystem service implications, but also provides shade and may even improve mental health[25] and decrease crime.[26] Ash trees are currently threatened by the emerald ash borer, which has been progressing throughout the United States. Although it has only been found in the eastern parts of South Dakota,[27] a plan is already in place to remove, treat and replace the 750 Ash trees on public Spearfish land.

3–5 Year Strategies

- Implement an integrated pest management (IPM) strategy in city operations to control pests in a targeted and environmentally responsible manner.
- Create a tree inventory of all trees in Spearfish, including city-owned and privately-owned. Start a voluntary program for residents to report the trees on their property. Use BHSU students with tree inventory experience to work on this project.
- Continue to monitor the emerald ash borer, treat, or replace trees on public land and inform private landowners on how they can replace their own Ash Trees.

20 Year Strategies

- Achieve the goal of maintaining or increasing the total number of trees in Spearfish while working toward a target goal of no greater than 5 percent of a single tree species.

Goal:
Support Fire Services in Public Outreach and Educational Campaigns

The Forest Service in Spearfish coordinates a variety of activities each year both to maintain the health and longevity of the Black Hills forest, and educate the community on how they can do their part. In Spearfish, prescribed burns in the northern part of the forest have caused some concern in the past. Prescribed burns are necessary to remove dead trees and allow new life to generate, but do sometimes create smoke billows and reduced air quality. The Resilience Task Force will use their networks to educate the community on the importance of these prescribed burns.

[25] Barton, Jo and Mike Rogerson, "The importance of greenspace for mental health." November 1st, 2017. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5663018/
[26] Wolf, Kathleen, "Crime and Public Safety." University of Washington College of the Environment. June 28th, 2010. https://depts.washington.edu/hhwb/Thm_Crime.html
[27] "Initial county EAB detections in North America." Cooperative Emerald Ash Borer Project, U.S. Department of Agriculture. April 1st, 2019. http://www.emeraldashborer.info/documents/MultiState_EABpos.pdf

3–5 Year Strategies

- Help spread the word about the importance of prescribed burns in the Northern forest in the summertime to the local Spearfish community.
- Increase attendance at Fire service events in the Spearfish community, especially with homeowners and land owners.

Goal:
Monitor Tree Health in the Black Hills National Forest

The Black Hills National Forest is the largest producer of timber in the country. As such, the health and wellness of this vital resource and ecosystem was important to the Climate Resiliency Task Force. The task force can continue to assist those working closely with the forest in spreading the word about any forest updates.

3–5 Year Strategies

- Identify existing Forest Service monitoring tools and reports.
- Designate an individual to regularly report to the Climate Resiliency Task Force on forest health, in order to assist with early identification of wildfire risk, changes to wildlife patterns, dangers to public health and disruptions in recreational opportunities that may affect tourism activities.
- Communicate to the public about forest health and its importance to the Spearfish way of life.

[27] "Initial county EAB detections in North America." Cooperative Emerald Ash Borer Project, U.S. Department of Agriculture. April 1st, 2019. http://www.emeraldashborer.info/documents/MultiState_EABpos.pdf

Improve Access to Basic Human Needs

There are a variety of ways organizations define a basic human need. The UN has a list of sustainable development goals,[28] which includes good health and wellbeing, quality education and affordable clean energy. Psychologist Abraham Maslow created a list of six human needs which includes food, water, shelter and sleep.[29] Several items listed throughout the Climate Resiliency Plan may be considered basic human needs, such as clean air and water, access to education and a variety of other needs. This section captures other items identified as necessary to thrive in Spearfish, such as affordable housing, quality transportation options and healthy food.

[28] "About the Sustainable Development Goals." United Nations. https://www.un.org/sustainabledevelopment/sustainable-development-goals/
[29] McLeod, Saul, "Maslow's Hierarchy of Needs." Simply Psychology. May 21st, 2018. https://www.simplypsychology.org/maslow.html

In Spearfish, 15.2% of the population is considered to be living under the poverty line according to the Census Bureau. Seventy-five percent of single mothers in Spearfish live below the poverty line. Median rent varies, but can be as low as $510.[30] Spearfish has been gradually growing in population since 2000. As Spearfish grows, ensuring there is an adequate number of affordable housing units will be important. Like many cities in the US, Spearfish has been working to implement strategies to provide residents with affordable housing; these are strategies that should continue into the future.

Transportation is a basic need, as it is necessary to use transportation to grocery shop and commute to work. Seventy-five percent of residents in Spearfish drive alone in a car each day to work, while 8.6% walk and 11.4% carpool.[31] Spearfish is fortunate to be serviced by Prairie Hills Transit, a regional non-profit that provides public transportation within city limits on a 24-hour basis for the cost of $2. Biking infrastructure, which may become more popular with shorter, milder winters, could be improved across the city. Transportation freedom, access to a variety of options when getting around Spearfish, is an essential part of any resilient city.

Having access to healthy food options all year round and good medical care should be the standard for all Spearfish residents. Spearfish Regional Hospital provides excellent care, and should continue to monitor the number of staff needed as Spearfish continues to grow. Ability to provide affordable, local, and healthy food in partnership with the local farmers markets and other organizations should continue to increase.

Goal:
Increase the Number of Diverse and Self-Sustaining Alternative Transportation Options in Spearfish and the Local Area

Spearfish has a variety of transportation options available; ensuring that residents know about all options, and can voice their opinions on what is needed to improve transportation in Spearfish will be an important first step. Transportation has an important equity component; AAA estimates that the cost of owning a car is close to $8,500 in the US,[32] a costly expense that may not be reasonable for everyone in Spearfish to afford. The more transportation options available, the higher the likelihood that residents have the freedom to choose how they want to get around their city.

3–5 Year Strategies

- Complete a needs assessment on local transit systems. Do residents know about Prairie Hills Transit bus system? What improvements in alternative transportation options are most needed by residents?
- Given the results of the assessment, survey options of city, county, and federal grants to fund any changes the task force would like to make.
- Increase the connectedness of local bike trails.

Goal:
Decrease the Number of Community Members Experiencing Housing Insecurity

In 2016, a Spearfish Housing Study and Community Profile[33] was completed for the City. Strategies should continue to be pursued in the future, such as increasing the number of affordable housing units in Spearfish, to accommodate all types of residents. This report should be reconducted in five years (2021) to track progress and any changes Spearfish has experienced.

3–5 Year Strategies

- Increase the number of affordable housing units in Spearfish by at least 10-12 units.
- Survey options of city, county, and federal grants for supporting these efforts.
- Conduct an update on the 2016 Spearfish Housing study in 2021 to track progress and reevaluate strategies.

[30] U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[31] U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[32] "AAA Reveals True Cost of Vehicle Ownership." AAA. August 23rd, 2017. https://newsroom.aaa.com/tag/cost-to-own-a-vehicle/
[33] "2016 Spearfish Housing Study." Community Partners Research, Inc. September 2016. https://www.cityofspearfish.com/document_center/ReportsFormsPresentations/2016%20Spearfish%20Housing%20Study%20with%20Community%20Profile%20Full%20Report.pdf

Goal:
Increase the Overall Health of Spearfish Community

Year-round access to healthy food options and adequate health care are two staples of a resilient, thriving community. The existing farmers market is a great example of encouraging health from a community vantage point. Tracking Lawrence County's health statistics and bringing together a diverse group of stakeholders in the community to understand how public health vulnerabilities intersect with climate vulnerabilities will be key. Increasing respiratory illness, vector-borne and insect-borne diseases, and heat stroke are all issues that may become more prevalent in Spearfish as the climate continues to change.

3–5 Year Strategies

- Begin to track some of the basic health statistics of Lawrence County via County Health Rankings.[34]
- Hold an annual meeting to discuss the state of public health in Spearfish with the Resilience Task Force, Regional Hospital, BHSU, and other public health representatives. Identify areas where health risks intersect with climate risks, and which areas may be getting worse due to environmental changes. Identify initiatives to improve public health.
- Expand the farmers market in size and scope of products.
- Facilitate/Lead a public education campaign to encourage active transportation (biking, walking, transit or carpooling) in warm months.
- Educate through workshops the importance of gardening and locally produced food.

6–10 Year Strategies

- Addition of nursing and other healthcare related programs to BHSU.

20 Year Strategies

- Increase the number of healthcare professionals.

[34] County Health Rankings, Lawrence County, University of Wisconsin Population Health Institute, http://www.countyhealthrankings.org/app/south-dakota/2019/rankings/lawrence/county/outcomes/overall/snapshot

Build Community Cohesion

Spearfish is a city with a rich history and a diverse, growing population. The 2017 American Community Survey estimates that Spearfish is home to 11,300 people and has been growing for the past two decades.[35] Creating a strong sense of place and belonging in the Spearfish community will not only make for happier, more invested residents, but also for a more resilient community.

[35] "2016 Spearfish Housing Study." Community Partners Research, Inc. September 2016. https://www.cityofspearfish.com/document_center/ReportsFormsPresentations/2016%20Spearfish%20Housing%20Study%20with%20Community%20Profile%20Full%20Report.pdf

Creating a vibrant volunteer network in the community to help with a range of needs, both emergency and non-emergency, is a visionary strategy that can help the community become more cohesive and more resilient. The task force recommends the creation of a three-part volunteer network. First, a volunteer pool of trained Community Emergency Response Teams (CERT), which will ensure that Spearfish neighborhoods are ready to respond to any natural disaster that arises, with communication networks and emergency procedures already in place. Second, a volunteer pool of child care providers would be essential in emergency recovery efforts as well as day-to-day life. Spearfish has an unusually high percentage of single mothers, and having more resources available to them can help lift them out of poverty, contribute to the economy, and avoid the most acute after-effects of a disaster. Third, a "neighborhood checks" program would consist of a system where neighbors could check on vulnerable members of their own neighborhoods in case of emergency (or non-emergency) to make sure they are okay. In an emergency, it will be essential to locate those residents who depend on oxygen or other needs as priority targets for evacuation. In non-emergency times, having a neighborhood checks system will build community cohesion, life satisfaction, and may even contribute to better health outcomes.

It is essential that the public has an awareness of how climate change will affect the city in the future. Partnering with local organizations is an excellent opportunity to engage current residents in thinking about how they can contribute to a resilient Spearfish. Education, in conjunction with concrete ways for residents to volunteer, will help create a proactive culture in Spearfish.

An important aspect of creating a cohesive community is fostering a sense of place in Spearfish. Spearfish residents describe their community as home to the Black Hills Forest, Crow Peak and Spearfish Canyon, and enjoy the many events that are held year-round. The community could work to increase its sense of place even further with public art installations, community events centered on resilience education and engagement, and a public relations campaign highlighting the community cohesion of Spearfish.

Goal:
Create a Community Norm around Volunteering in Spearfish

Residents of resilient communities support one another. Volunteers can create safety nets for residents in times of emergency and change, and they can strengthen a community simply by creating connections and bringing fulfillment to Spearfish community members.

3–5 Year Strategies

- Identify a volunteer coordinator who can recruit and organize volunteers into one of the three volunteer paths.
- Market and create a brand around a Spearfish volunteer program.

Goal:
Create Partnerships with Local Entities to Educate the Public on Climate Action

Residents of Spearfish will only be able to act in creating a more resilient city if they are educated about the challenges that climate change will pose. Partnering with local organizations can help inspire the community to act together to prepare for the future.

3–5 Year Strategies

- Identify organizations such as schools, health clinics, neighborhood groups, civic clubs, and book clubs with whom to partner to strengthen the volunteer network and increase public dialog about resilience for partnerships.
- Create informative activities, installations, and communication about how Spearfish will be affected by climate change and what the community is doing to thrive despite these changes.

Photo by Fabio Santaniello Bruun on Unsplash

Goal:
Develop a Strong Sense of Place with More Art Installations in Spearfish

Art is a profound way to feature the many voices and stories of Spearfish residents. In the internet era, art often provides visual recognition for visitors and citizens alike and creates vibrant, colorful cities.

3–5 Year Strategies

- BSHU and Spearfish will expand art in public spaces, including on sidewalks, alleyways, buildings, parks, and other creative locations in the area.
- Create a program to recruit local and regional artists for public art installations.
- Identify possible locations for public art installations.
- Design and execute a fundraising strategy to fund art installations.
- Host community-wide events such as an art walk, sculpture day, or plein air painting.

6–10 Year Strategies

- Encourage local businesses to continue public art campaigns in and around the properties they own.

Goal:
Create a Stronger Network of Local Sustainable Food Options

There are already a variety of great options highlighting local food in Spearfish. The Spearfish Farmers Market runs all summer and during the winter. Spearfish's Food Hub has been tremendously successful at providing local vendors with local food options. However, these options may not be successful to all. Residents of all income levels need access to these options to create a healthy and resilient community.

3–5 Year Strategies

- Survey attendees of the farmers market to determine the demographics of shoppers as a baseline.
- Execute changes required to provide more local, healthy options to underrepresented demographics based on the survey of current attendees and selected strategies.

- Expand the farmers market in size and scope of products.
- Expand the scope of the Food Hub each year to include more local organizations that are buying from the hub.

6–10 Year Strategies

- Educate through workshops the importance of gardening and locally produced food.

Conserve Our Natural Resources

Resilient cities rely on sustainable resource use. Natural resources like coal, oil, natural gas, drinking water, and trees are finite. Some estimates predict that at our current usage rate, there are only 115 years of coal reserves left, and only 50 years of natural gas and oil reserves left. What's more, those fossil fuel reserves, if burned, will emit greenhouse gasses that will further destabilize the earth's climate. Researchers believe that 65-80% of current known fossil fuel reserves will have to remain untouched in order to keep average global temperature rise below a two-degree global target.[36] What's more, future climate impacts will place additional stress on water and other natural resources. Because of these factors, resilient cities of the future will be those that monitor and use resources wisely.

[36] Ritchie, Hannah, "How long before we run out of fossil fuels?" Our World in Data. August 8th, 2017. https://ourworldindata.org/how-long-before-we-run-out-of-fossil-fuels

Spearfish is currently served by two utilities, Butte Electric and Black Hills Energy. Both entities use renewable energy-- mostly wind power-- in their generation mix. In 2018, it was reported for the first time that renewables are becoming more economically practical than burning coal, and experts predict that this trend will only continue into the next decade.[37] Ensuring that energy is affordable in Spearfish far into the future means diversifying the mix of energy the city is currently using, and reducing the energy needs of homes and other buildings where possible. A mix of efficiency and sourcing renewables will cary Spearfish into the next decade of energy innovations with electricity providers as partners.

Drought is a potential impact in South Dakota as a result of climate change, so building the most efficient water systems is a priority. Currently, about 25% of water is lost in transmission lines going from water treatment facilities to their end source,[38] with the biggest problem areas being those between the city water mains and the service lines to individual properties, which are the responsibility of homeowners. The city is working on several initiatives to reduce this water loss, including using new technologies to line water mains and offering a low-cost water main insurance program for homeowners. Infrastructure improvements and public education on water conservation will create a more sustainable and resilient water system.

Waste reduction and recycling is another area where the City of Spearfish has an opportunity to make improvements. While the total waste tonnage has been decreasing in recent years, recycling is voluntary and not widely adopted. What's more, the nearest materials recovery facility is located an hour's drive away, in Rapid City, which makes the economics of recycling service difficult. The University and City have a unique opportunity to explore the creation of a local recycling hub right in Spearfish. This program could significantly boost residential recycling rates and create outlets for many types of materials not currently being recycled in the area.

Goal:
Conserve Energy and Increase Renewable Sources

Reducing energy usage has a multitude of benefits for all cities. Reduced reliance on fossil fuels is not only good for air quality and the environment, but will likely have economic impacts in the future as the cost of coal and oil rise. If city buildings use less energy, they will be able to return to standard operations more quickly in the event of an extreme storm or other weather event.

3–5 Year Strategies

- Pilot a low-income support program for energy conservation. Such a program could provide home insulation, water heater insulation, double-paned windows, thermostats, window coverings, fans, and other items to conserve energy in homes.
- Increase the amount of electricity from renewable sources provided to the City of Spearfish by 5% per year to reach a goal of 80% by 2040. The current baseline is 25%.

6–10 Year Strategies

- Educate the public on energy conservation strategies.
- Benchmark, disclose, and reduce energy use in city-owned buildings.
- Encourage local businesses to benchmark, disclose, and reduce energy use in their buildings. Consider creating a city-sponsored recognition program for businesses who conserve energy.

[37] Scott, Mike, "Want the Cheapest Electricity? Build Solar and Wind Farms, Not Coal Power Plants." Forbes. November 21st, 2018. https://www.forbes.com/sites/mikescott/2018/11/21/want-the-cheapest-electricity-build-solar-and-wind-farms-not-coal-power-plants/#2510463566ce
[38] Harmon, Mike, City of Spearfish City Administrator, personal communication, April 2019.

Goal:
Conserve Water

Engagement with the public is key to creating a more efficient water system and conserving resource use. Because infrastructure lines are underground and not remotely monitored, it is difficult to know if a line has failed or is leaking. Leaking residential service lines are often discovered when street work is being done near homes. Many residents are unaware that the maintenance of these service lines is their responsibility. The city offers a low-cost service line insurance program that allows residents to cover the cost of repairs to their service lines, but this program needs to be better promoted. Additionally, water conservation practices can be promoted throughout the city, asking residents to water lawns less frequently and install drought-friendly plants.

3–5 Year Strategies

- Promote the city's water service line insurance program.
- Educate the public on water conservation strategies, including decreased lawn watering and drought-friendly landscaping.

6–10 Year Strategies

- Achieve a goal of no more than 15% water loss in the City water system.

Goal:
Reduce Waste Tonnage and Increase Cardboard Recycling

Diverting waste from landfills is an important strategy for communities around the country. Decreasing the amount of materials sent to the landfill by recycling, composting, and reusing are strategies for both individuals and the City to pursue. For example, given the high market value of cardboard currently, citizens should know that this commodity above all others should be recycled, and the city should make it a priority to both collect and educate the public on the importance of this resource. Plastics, paper, aluminum, steel, and even construction waste are other materials that

can be diverted from the landfill with proper planning and community education.

3–5 Year Strategies

- Set a goal for reducing per capita solid waste disposal by 2040.
- Create a Northern Black Hills Recycling Hub in partnership with the University and City. This will create a student-run recycling processor for the region, which should make it easier and more efficient for businesses, residents and the University to recycle.
- Educate the public on correct recycling procedures.
- Utilize BHSU students and staff to lead community workshops to educate the public.

6–10 Year Strategies

- Evaluate the potential for banning cardboard from the landfill.
- Evaluate options for diverting construction waste from the landfill.
- Evaluate options for diverting organic waste from the landfill.

Implementation and Monitoring

This Climate Resiliency Plan represents a substantial first step in the process of improving the resiliency of the Spearfish community. Through this process, a Climate Resiliency Task Force was created, and this group agreed to continue to carry the work forward in the months and years ahead. The Task Force will continue to meet on a regular basis, and will be charged with implementing the recommendations of this Plan. The Task Force will be jointly chaired by the University and the City.

The Task Force now has a clear set of goals and strategies from which to work. They have assigned a point person for each of the "Resilience Visions" in this plan. The next step of the process will be for the group to delineate the necessary parties they will engage to complete each strategy. Then, they will identify priority areas to begin their work.

Some strategies may be simple to implement, but most will require further coordination, problem-solving, research, and funding. The Task Force will meet regularly and will hold each other accountable to make progress on their goals. While some strategies may be long-term, the length of time it may take to achieve them in no way diminishes their importance. The Task Force has a tracking spreadsheet where they will record their progress over time on each of the strategies noted in this report.

The Task Force will decide in the future how to engage the public in this work, whether to grow the size of the Task Force and whether changes to its structure will be necessary. Over time, the strategies and goals of the plan are sure to shift as more becomes known and refined; the Task Force members will be expected to adjust the strategies in the tracking spreadsheet in order to maintain an overall vision and desired outcome.

All key stakeholders in the Spearfish community are encouraged to keep the Resiliency Task Force accountable to its goals. From homeowners to businesses, single moms to retirees, University personnel to outdoor recreation enthusiasts: all residents of Spearfish should have a vested interest in helping the community become more resilient to the climate changes that lie ahead. When the community pools its resources of trust, good will, and love for their home, there is no doubt that Spearfish will be able to greet the future with boldness, innovation, and creativity.

References

2013-2015 American Community Survey 5-Year Estimates. U.S. Census Bureau. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml.

"2016 Spearfish Housing Study." Community Partners Research, Inc. September 2016. https://www.cityofspearfish.com/document_center/ReportsFormsPresentations/2016%20Spearfish%20Housing%20Study%20with%20Community%20Profile%20Full%20Report.pdf.

"AAA Reveals True Cost of Vehicle Ownership." AAA. August 23rd, 2017. https://newsroom.aaa.com/tag/cost-to-own-a-vehicle/.

"A look at teacher pay across the United States in 2017." Bureau of Labor Statistics, U.S. Department of Labor. The Economics Daily. May 8th, 2018. https://www.bls.gov/opub/ted/2018/a-look-at-teacher-pay-across-the-united-states-in-2017.htm.

"About the Sustainable Development Goals." United Nations. https://www.un.org/sustainabledevelopment/sustainable-development-goals/.

American Fact Finder. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF.

Barton, Jo and Mike Rogerson. "The importance of greenspace for mental health." November 1st, 2017. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5663018/.

"Climate Change Indicators: U.S. and Global Temperature." EPA. https://www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature.

"Climate Change Indicators: Snowfall." EPA. https://www.epa.gov/climate-indicators/climate-change-indicators-snowfall.

Emerald Ash Borer Information Network. http://www.emeraldashborer.info/.

"Facts and Data on Small Business and Entrepreneurship." SBE Council. https://sbecouncil.org/about-us/facts-and-data/.

Kory Menken, Executive Director, Spearfish Economic Development Corp.

Frankson et al. "South Dakota - State Climate Summary." NOAA. https://statesummaries.ncics.org/chapter/sd/.

"From the Archives: 5 years since Winter Storm Atlas." Rapid City Journal. October 4th, 2018. https://rapidcityjournal.com/news/local/from-the-archives-years-since-winter-storm-atlas/collection_d2dc4214-b6ae-11e8-8d6b-d7b55eb8ba1b.html.

Harmon, Mike, City of Spearfish City Administrator, personal communication, April 2019.

Huntington, Stewart. “Black Hills forest leads nation in timber sales -- for a reason.” KOTA Territory News. May 22nd, 2017. https://www.kotatv.com/content/news/Black-Hills-forest-leads-nation-in-timber-sales----for-a-reason-423737633.html.

“Initial county EAB detections in North America.” Cooperative Emerald Ash Borer Project, U.S. Department of Agriculture. April 1st, 2019. http://www.emeraldashborer.info/documents/MultiState_EABpos.pdf.

James, Meredith. “RCAS looks to implement new pathways approach for high school students.” KOTA Territory News. October 25th, 2018. https://www.kotatv.com/content/news/RCAS-looks-to-implement-new-pathways-approach-for-high-school-students-498578761.html.

“L.A. Architect Christophe Cornubert’s carbon-dioxide cube debuts in Copenhagen.” L.A. Times. December 8th, 2009. https://latimesblogs.latimes.com/culturemonster/2009/12/la-architect-christophe-cornuberts-carbondioxide-cube-debuts-in-copenhagen.html.

McLeod, Saul. “Maslow’s Hierarchy of Needs.” Simply Psychology. May 21st, 2018. https://www.simplypsychology.org/maslow.html.

“New data confirm increased frequency of extreme weather events.” Science Daily. March 21, 2018. https://www.sciencedaily.com/releases/2018/03/180321130859.htm.

“Northern Great Plains - Fourth National Climate Assessment.” U.S. Global Change Research Program. https://nca2018.globalchange.gov/chapter/22/.

“Population of Spearfish, SD.” https://population.us/sd/spearfish/.

Ritchie, Hannah. “How long before we run out of fossil fuels?” Our World in Data. August 8th, 2017. https://ourworldindata.org/how-long-before-we-run-out-of-fossil-fuels.

Scott, Mike. “Want the Cheapest Electricity? Build Solar and Wind Farms, Not Coal Power Plants.” Forbes. November 21st, 2018. https://www.forbes.com/sites/mikescott/2018/11/21/want-the-cheapest-electricity-build-solar-and-wind-farms-not-coal-power-plants/#2510463566ce.

“South Dakota Economy at a Glance.” Bureau of Labor Statistics. https://www.bls.gov/eag/eag.sd.htm.

“Spearfish - Civic Life & History.” Black Hills Knowledge Network. https://www.blackhillsknowledgenetwork.org/community-profiles/cities-of-the-black-hills/spearfish/spearfish-civic-life-history.html#.XObMvchKhPZ.

“Spearfish - Education and Training.” Black Hills Knowledge Network.

"Spearfish, South Dakota Cost of Living." AreaVibes. https://www.areavibes.com/spearfish-sd/cost-of-living/.

"Spearfish, South Dakota Cost of Living." BestPlaces. https://www.bestplaces.net/cost_of_living/city/south_dakota/spearfish.

Sullivan, Margaret. " 16 striking murals that show the devastating effects of climate change." Mashable. July 2nd, 2017. https://mashable.com/2017/07/02/climate-change-murals-canada/#BwPDgycFPsqX.

U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

Wolf, Kathleen. "Crime and Public Safety." University of Washington College of the Environment. June 28th, 2010. https://depts.washington.edu/hhwb/Thm_Crime.html.

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