

Activity 2: Using Scenarios to Develop Solutions

Climate Health Adaptation Planning in Michigan

A: EXTREME HEAT SCENARIO

The year is 2050. Average air temperatures in your Michigan community have risen approximately 5 degrees F. It's early August and 30 days have already exceeded 90 degrees this year – 11 of those occurred consecutively, culminating in a county-wide heat emergency. The past two days have climbed above 100 degrees. Nighttime cooling has diminished, with evening lows in the mid-80s, making it very difficult for residents to cool down. A number of residents have been hospitalized due to heatstroke and heat exhaustion.

Warmer temperatures have increased electricity demand for cooling and are causing a significant financial burden on families and businesses. Coupled with the heat, a partial power outage has knocked out air conditioning systems, putting the county's most vulnerable residents, from the elderly to the young, at risk. Unfortunately, many of the most vulnerable populations do not live or work in air-conditioned environments.



B: HEAVY RAIN AND FLOODING SCENARIO

It is the year 2050 and average annual precipitation in your Michigan community has increased by 3 inches, with the majority of the increase concentrated in the spring and fall. Twenty-five year storms now occur on average every other year, exceeding the capacity of storm sewer infrastructure and allowing polluted runoff into nearby rivers and lakes.

This February, an early thaw due to unusually warm weather was compounded by a heavy precipitation event, leading to urban flooding. Ten inches of rain fell, 5 of which came in the first six hours. Runoff resulting from this intense rainfall, compounded by heavy snow-pack melt and frozen soils, has flooded areas of the community that have not been flooded for decades.

So far, your county has incurred \$60 million in road and bridge damage alone and another \$6 million in property damages. Nearly 500 homes and over 20 businesses were damaged by floodwaters. There have also been reports of cars stuck in flooded underpasses and businesses having to pump water out of their stores. Much of your community is without power due to the wind and lightning impacts connected with the severe storm system that passed through the area. The majority of the 80,000 electricity customers lost power.



C: SEVERE DROUGHT AND WILDFIRE SCENARIO

The year is 2050 and recent droughts have been longer and more severe than in the past. This summer's drought has resulted in a decline of water quality in lakes and streams and increases in insect infestations and plant disease, stressing forests and native species. Droughts as well as invasive species have increased the risk and prevalence of wildfires in the region. Over 90 percent of your rural county is forested. With longer wildfire seasons, the existing firefighting capacity is being stressed.

It is April and a large wildfire is ripping through the community. Three weeks in, the wildfire has already burned 25,000 acres, destroying 70 homes and multiple power lines, with total damages estimated at almost \$50 million. All county fire departments have responded, as well as fire departments from neighboring counties and MDNR.

Required evacuation is in effect for portions of several townships. Unfortunately there is only one active siren in the county, but broadcasts have also been made over television and radio. County wide, the particulate matter due to smoke is of particular concern for residents with pre-existing health conditions.



D: WINTER STORM SCENARIO

It's March 2050 and the average number of days below freezing has declined steadily. However, the severity and damage resulting from winter storms has increased. Reduced lake ice coverage and lake warming has resulted in more lake-effect snow, ice and sleet for your Michigan community.

Eight of the past 10 winters have seen severe winter storms, resulting in economic disruptions, power outages, high costs of cleanup, and business disruption. Primary roads, including major arterials, are in poor condition due to an increase in freeze-thaw events. Some local roads are even impassable.

In the past week, an ice storm hit your community, downing tree limbs and power lines, blocking roads, and causing widespread power outages. Approximately 1,000 homes and 40 businesses sustained damage or are without power, with losses estimated at nearly \$1 million. A nearby nursing home has been using backup power now for 18 hours and is without running water.



Note: Scenarios used in this exercise were developed based on GLISA regional climate summaries and historic severe weather events in Michigan.

