Appendix G

Significant Hazard Historical Events
Prior to 2005

Drought Events

Division 2: Alger, Chippewa, Delta, Luce, Mackinac, and Schoolcraft Counties. The most extreme drought was in January 1931, when the Palmer index hit a record low of -7.18.


Extreme Temperatures

December 1993 to May 1994 – Upper Peninsula and Northern Lower Peninsula

This was the deep freeze disaster that was federally declared (#1028). Ten counties (Gogebic, Ontonagon, Houghton, Marquette, Delta, Schoolcraft, Chippewa, Mackinac, Cheboygan, and Charlevoix) were declared disaster areas when record low temperatures caused the freezing and breakage of more than 3,200 water and sewer lines. Service to 18,700 homes was disrupted. Public costs were estimated at more than $12 million.

Rip Currents

According to the National Climatic Data Center, Michigan has experienced at least 17 deaths and 9 injuries caused by rip currents in just the past 10 years. One problem location that was identified includes the waters of Lake Michigan shoreline in Mackinac County. Although Mackinac County Emergency Management has identified a few potential safety initiatives and has offered to place warning signage along swimming beach in these areas, land owners State of Michigan DNR and US Hiawatha Federal Forest Service have final say of what can be done on these sections of beach. Mackinac Co. OEM continues to work with these entities on providing warning and other safety initiatives to users of these areas.

Severe Winter Weather

In January, 1993 snow began across central Lower Michigan late in the evening of the 12th and quickly spread north across northern Lower Michigan during the early morning hours of the Wednesday the 13th. The combination of heavy snow, northeast winds of 15 to 25 mph and temperatures in the lower to mid 20s created near blizzard conditions at times most of Wednesday. The snow tapered to flurries by early evening hours of Wednesday with total snowfall ranging from six to twelve inches.

In March, 1994 a storm system moved northeast across central Lower Michigan during the morning of the 21st, causing a combination of snow, sleet, and freezing rain over the northern third of
Lower Michigan and Eastern Upper Michigan. Over eastern Upper Michigan, about 0.2 to 0.3 inches of ice accumulated on two to three inches of snow. Surprisingly few accidents were reported with this event.

A southwest flow lake effect snow event began during the early morning hours of December 18th, 1996 and continued into the morning of the 19th. A persistent snow band developed across Lake Michigan. The onshore flow produced 18 to 24 inches of snow in a zone between Naubinway and Brevort.

Low pressure moved east across northern Lake Superior, pushing a cold front into and through the northern Great Lakes on the night of the 21st in January, 2004. Out ahead of the front, widespread snow fell, which was enhanced by southwest winds off of Lake Michigan. This contributed to heavy snow over Eastern Upper Michigan during the day on the 21st. Winds gusted up to 40 mph, producing substantial blowing and drifting snow, and at times zero visibility. US-2 was closed west of St Ignace due to the snowy and windy conditions. After the cold front went through, winds turned northwest and ushered in a more classic lake effect snow event.

Heavy snow fell on Eastern Upper Michigan, mainly west of I-75, from the night of the 12th in March, 2004 into the morning of the 13th. Accumulations of eight to ten inches were common from Paradise to Rexton.

**Thunderstorms/High Wind/Lightning/Hail**

On October 21, 1993 a thunderstorm passed through the region spanning several counties including all of the Eastern Upper Peninsula as well as some Northern Lower Michigan Counties. This storm produced sustained winds of 25-40 mph with gusts up to 75 mph around the county, and as a result many trees and power lines went down.

On July 13, 1995 a thunderstorm passed through the county, with measured wind gusts of 67 mph reported by the Curtis area. Numerous trees went down in and around Curtis. Traveling eastward, the storm hit Engadine about 15 minutes later, which also reported numerous tree downs. Twenty minutes later, the storm, still traveling eastward, hit Epoufette which reported gusts of up to 60 mph with big trees down. Brevort Lake was the next hardest hit with reports of over 100 trees in Brevort Lake Campground that fell over tents and campers. As the storm traveled still further east a trailer was blown over on the Mackinac Bridge. This storm caused $55,000 in property damage. The next night, July 14, 1995 wind gusts of 90 mph were measured on the Mackinac Bridge. The sustained winds of 85-88 mph lasted for about 10 minutes. Lightning damaged the main bridge power generator with property damage loss of $1,000.

A strong cold front, associated with a storm system moving across southern Canada, moved across the northern Great Lakes from the evening of the 25th of December, 1999 to the early morning hours on the 26th. Strong winds behind this cold front affected the entire Great Lakes region. The strongest wind speeds were felt in Emmet and Mackinac counties along the Lake Michigan shoreline. Sustained winds during this time period were at 30 to 40 MPH, with occasional gusts to 50 MPH. Wind speeds up to 62 MPH were recorded in the straits of Mackinac.

One of the strongest storms ever recorded in the Great Lakes crossed the region on November 10th and 11th, 1998. The storm originated over the Central Plains and lifted across the western portions
of Lake Superior. South to southeast winds increased steadily during the morning of the 10th and by late
morning, wind gusts of 40 to 50 mph were common over areas away from Lake Huron. Along the Lake
Huron shoreline, winds were gusting to 60 to 70 mph with a peak gust of 95 mph reported on Mackinac
Island. The wind shifted to the southwest during the afternoon, with the strongest winds generally
developing along the Lake Michigan shoreline. During the afternoon and evening of the 10th, wind gusts
of 70 to 80 mph were common along the Lake Michigan shoreline, with 50 to 60 mph gusts across the
rest of the region. Similar winds persisted into the morning of the 11th and then began to diminish
during the afternoon. A large number of trees were uprooted or snapped off, with many branches also
torn off. Many of the trees and branches fell on power lines, resulting in widespread power outages
regionwide. Falling trees also blocked many roads and several accidents were reported as cars collided
with debris on the roadways. Several homes and cars received damage from falling trees and branches.
The strong winds generated 15 to 20 foot waves on Lake Michigan. Most ships took shelter with the
approach of the storm and rode out the storm in protected waters. The strong winds on Mackinac
Island toppled several trees onto a condominium.

A line of thunderstorms moved across eastern Upper and far northern Lower Michigan during
the early afternoon hours of the 8th of August, 2001. These storms produced numerous reports of severe
hail. Winds from these storms also downed numerous trees.

Four waves of severe thunderstorms impacted northern Michigan during the morning,
afternoon, and evening hours on the 1st of August, 2002. The first wave of severe thunderstorms struck
the area during the early morning hours, initially knocking trees down in Tahquamenon Falls State Park.
The last of the storms exited northern Michigan into Lake Huron during the evening hours. Three
tornadoes were associated with the severe thunderstorms, but none of these crossed county
boundaries. Damage to patrol car was reported in Moran.

Tornadoes

According to the National Weather Service, during the time frame of 1950-2004 Mackinac County has
experienced three tornadoes. Of these three, two tornadoes were rated an F1 and one reached an F2
level. On July 14, 1984 a F2 tornado touched down causing $25,000 in property damage. With the
other tornadoes, one occurring August 16, 1988 and one on July 13, 1995 there was no damage reported.

Wildfires

May 1999 - Champion (Marquette County), Epoufette (Mackinac County), Oscoda County
In Mackinac County, an 850-acre fire burned for several days near Epoufette, while another 850-acre fire burned in the Huron-Manistee
National Forest in Oscoda County. In the Northern Lower Peninsula alone during that first week of May, MDNR forces fought nearly 40
wildfires. All of the wildfires were fueled by the same dry conditions that set the stage for the Tower Lake fire.

<table>
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<th>County</th>
<th>Number of Wildfires</th>
<th>Number of Wildfires/Year* (over 30 year period)</th>
<th>Number of Acres Burned</th>
<th>Number of Acres Burned/Year* (over 30 year period)</th>
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<td>Mackinac</td>
<td>197</td>
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Number of Wildfires and Acres Burned, by County: 1981-2010 (MDNR jurisdiction only)
Infrastructure Failures

Beginning on July 22, 2000 Mackinac Island began to experience intermittent power outages that escalated two days later into a complete power blackout. The outage continued until July 28 when several large generators were brought to the island by Edison Sault Electric Company to provide temporary power until the island’s electrical infrastructure could be repaired. The cause of the outage was later determined to be overheating damage to five of the seven underwater cables that provide power to the island from the mainland. The damaged cables were subsequently replaced in hopes of eliminating any future problems.

The outage came at the worst possible time for the residents, visitors, and businesses on Mackinac Island – at the height of the tourist season (with more than 35,000 tourists on the island) and during the week of the popular Chicago to Mackinac yacht race. Somehow, the island’s businesses and visitors managed to cope, but not without significant inconvenience, additional operating costs, and some loss of revenues.

Bois Blanc Island Township also experiences frequent power outages and needs updated equipment and technology to reduce failures.

Each winter, the City of St. Ignace Department of Public Works experiences pipes freezing and breaking. A number of residents need to let their water run, which may or may not prevent the water mains from breaking. In one instance, the end of a sewer pipe that was capped off broke and, once thawed, flowed into the nearby snow bank concealing the leakage. Until it was discovered, melting snow and discharge flowed into Lake Huron causing some environmental contamination.