GLAA-C
Great Lakes Adaptation Assessment for Cities

Climate Change in Ann Arbor
Summary of Projected Changes in Climate and Associated Impacts

Changes in Temperature

- Average temperatures increased by 2.3°F from 1968 to 2002 in the Great Lakes region[i]
- By 2050 an average air temperature increase of 1.8° to 5.4° is projected[1]
- By 2100, temperatures are projected to rise 6-10°F in winter and 7-13°F in summer in Michigan[2]

These changes in temperature would mean that:

- By 2030 Michigan summers may resemble Ohio's current summer
- By 2100, Michigan summers may resemble those of northern Arkansas[2]
- The number of hot days in Detroit is projected to double or triple with 30-50 days exceeding 90°F each year and two heat waves each summer by the end of the century[3]
- There is a projected 5 –10 fold increase in extreme heat days (currently averaging less than 5 per year) by 2080[2]
- Air quality in the Ann Arbor-Detroit region which already experiences ozone levels higher than the EPA's health-based ozone standard will further diminish [3]

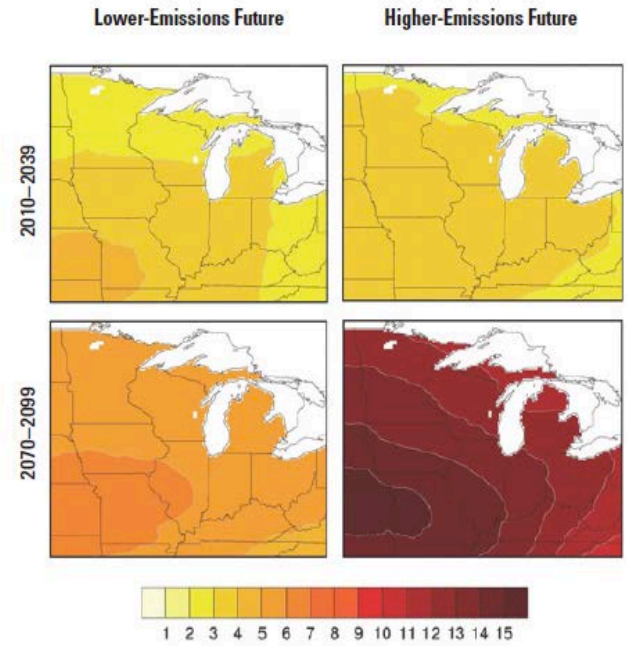

Figure 1: Degrees Fahrenheit above the average of 1961-1990 summer temperatures

Changes in Precipitation in Michigan

- Heavy rains are occurring about twice as frequently as a century ago[2]
- Heavy rainstorms (24-hour and multi-day) will continue to increase[2]
- Seasonal precipitation will increase in winter by 10-25% and change in summer from between +20% to -5%[2]
- Since 1975, the number of days with land snow cover has decreased by 5 days per decade and average snow depth decreased by 1.7 cm per decade[ii]

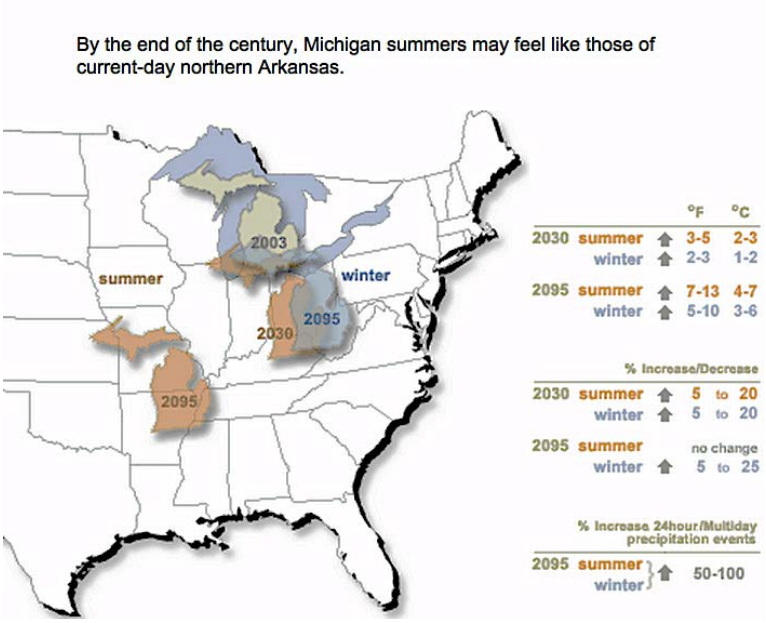

Figure 2: Union of Concerned Scientists - Migrating Climates

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The changes in precipitation may lead to

- Increased summer droughts[2]
- Reduced summer rainfall will diminish recharge of groundwater[2]
- The Great Lakes region could see a 30% decrease in soil moisture in the next century[4]
- Winter and spring will be 25% wetter, but summer will about 10% drier at the end of the century[3]
- Flooding events will occur more often[5]
- Higher precipitation can lead to greater rates of erosion and runoff by up to 310% in southeastern Michigan[5]

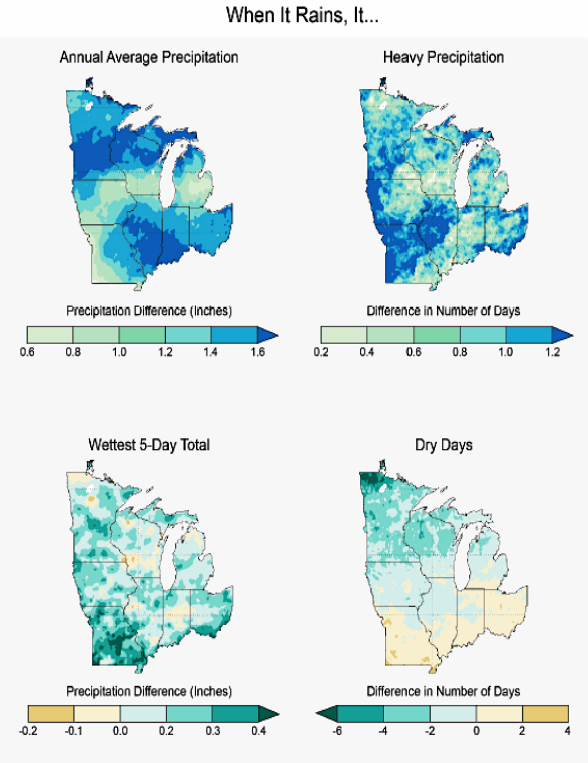

Figure 2: Projected changes in precipitation per the draft 2013 Midwest Chapter of the U.S. National Climate Assessment

Cross Cutting Impacts

- Flooding and erosion damage transportation infrastructure, interfere with traffic, cause economic disruption and pose health risks
- Air quality deterioration can cause more severe smog problems having serious consequences for public health, including a greater incidence of asthma attacks and respiratory conditions
- Climate variability will likely pose risk for smaller farmers and affect farming communities, posing a special threat to Michigan's fruit trees and vineyards.[2]
- Waterborne infectious diseases as well as diseases carried by insects like ticks or mosquitoes may become more frequent and widespread following more rainfall and rising temperatures [2]
- In Michigan's lakes and rivers cold-water fish species will decline dramatically, while invasive species and warm-water fish move into the rivers. Longer summers also contribute to formation of deep-water dead zones in lakes.[2]

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1 GLISA , "Climate Change in the Great Lakes Region"
http://www.glisa.msu.edu/docs/fact_sheets/GLISA_climate_change_summary.pdf
2 Union of Concerned Scientists, "Confronting Climate Change in the Great Lakes Region: Michigan"
http://ucsusa.org/assets/documents/global_warming/ucssummarymi-updated-final.pdf
3 Union of Concerned Scientists, "Confronting Climate Change in the U.S. Midwest: Michigan",
http://www.ucsusa.org/assets/documents/global_warming/climate-change-michigan.pdf
4 National Conference of State Legislatures and University of Maryland Center for Integrative Environmental Research, "Michigan: Assessing the Costs of Climate Change"
http://www.cier.umd.edu/climateadaptation/Climate%20change--MICH.pdf
5 GLISA, Impacts of Climate Change on Infrastructure,
http://glisaclimate.org/sites/default/files/HRWC%20Infrastructure.pdf