

# Our Climate is Changing

## Climate Change Vulnerabilities in Milwaukee and Beyond



Andrey Smirnov/AFP via Getty Images



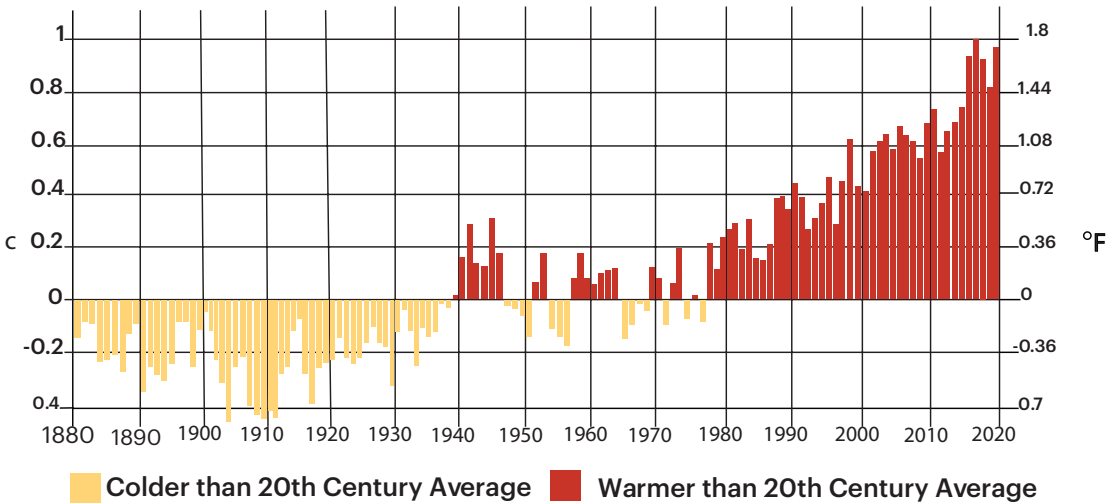
James Nielsen/AFP via Getty Images



Joe Giddens/PA Images via Getty Images

Our world is warming and our climate is changing rapidly, impacting the world and Milwaukee, with extreme temperatures, storms, and flooding. Climate change is caused by a rise in global temperatures due primarily to the burning of fossil fuels, such as coal, oil, and gas, which spill excessive amounts of carbon dioxide and other greenhouse gases (GHGs) into our atmosphere. Without dramatic action to fight climate change, many more parts of our world could become unlivable within a few generations.

Global Temperature from 1880-2019<sup>i</sup>



### Health



Climate change is expected to **cause an additional 5 million deaths worldwide between 2030 and 2050** due to heat stress, malaria, hunger, and other illnesses. This problem will disproportionately impact those with existing health conditions, lack of access to affordable health care, as well as Black, Indigenous, and other communities of color.<sup>ii</sup>

### Displacement



In 2017, **over 22 million people were displaced from their homes** due to extreme weather events, such as wildfires and hurricanes, and that number is estimated to rise **above 1.2 billion people by 2050**.<sup>iii</sup>

### Too Hot to Live



By 2070, **3.5 billion people could be exposed to a mean average temperature above 84 degrees**, currently experienced on 0.8% of Earth mostly in the Sahara Desert, but that **will cover 19% of the Earth** without dramatic action to fight climate change.<sup>iv</sup>

### Political Conflict



Studies on climate and conflict have found that humanmade climate change could substantially **increase global violent crime, civil conflict, and political instability**, mostly due to higher temperatures and extremes in rainfall (either too little or too much), which in turn lead to resource scarcity and economic depletion.<sup>v</sup>

# CLIMATE CHANGE IMPACTS IN MILWAUKEE



Erich Schlegel/Getty Images

## Extreme Weather and Flooding

- Catastrophic flooding in July 2010 in the Milwaukee area caused over **\$30 million in damage** to homes and businesses and caused hundreds of job losses.<sup>vi</sup> Flooding across Wisconsin in August 2018 caused more than **\$208 million in damage.**<sup>vii</sup>
- Currently, **19,413 properties in Milwaukee County are at risk of flooding** and that risk will increase in the future.<sup>viii</sup>
- In Wisconsin, what was considered a **100-year flooding** event in 1961 now occurs about every **40 years.**<sup>ix</sup>

## Heat Waves

- **Extreme heat is more deadly** to Wisconsinites **than all other weather disasters combined**, as heat can lead to heat stroke, dehydration and worsen chronic diseases.<sup>x</sup>
- Milwaukee County reported **91 heat-related deaths during a heatwave in 1995.**<sup>xi</sup> The greatest health risks occur with **extended heat events or excessive nighttime temperatures.**<sup>xii</sup>
- By 2050, experts predict that Milwaukee will see **3 times as many days with a heat index above 105 degrees.**<sup>xiii</sup>
- Higher temperatures **also increase violent crime.**<sup>xiv</sup>



## Hunger

- Climate change will likely **worsen existing food insecurity** due to limited local food availability, price increases, interrupted transportation, and diminished food safety.<sup>xv</sup>
- Many people **in Milwaukee already experience hunger and food insecurity. In 2020, 15% of Milwaukee County residents were food insecure**, compared to a national average of 13%.<sup>xvi</sup>
- **Nearly 42% of children in Milwaukee County received FoodShare (food stamps)**, while 82% were determined to be economically disadvantaged.<sup>xvii</sup>



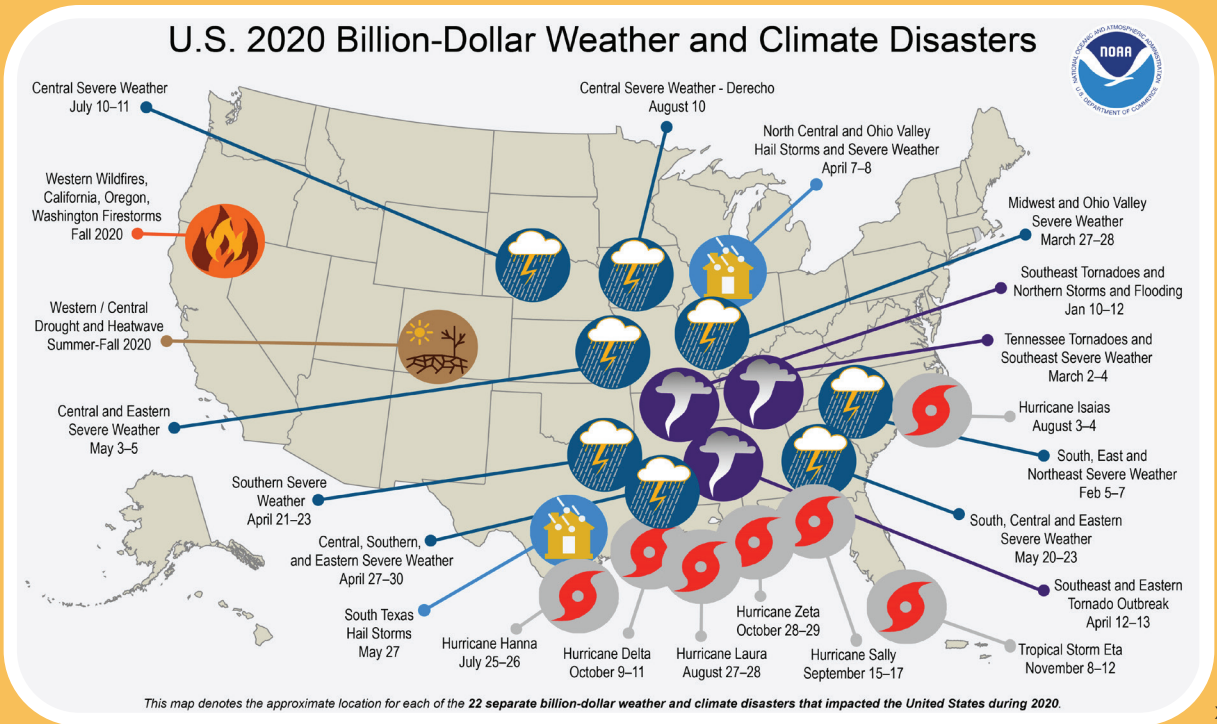
## Health Impacts

- Flooding can lead to future health issues, such as **mold growth that exacerbates asthma symptoms.**<sup>xviii</sup>
- Warmer, wetter weather means that ticks and mosquitoes are becoming more widely distributed in Wisconsin. **Tick bites can cause the debilitating Lyme disease, and mosquito bites can cause potentially deadly neuroinvasive disease from West Nile virus and La Crosse encephalitis.**<sup>xix</sup>
- The U.S. Centers for Disease Control already reported a **25% increase** in neuroinvasive disease from West Nile virus in 2018.<sup>xx</sup>





# CLIMATE CHANGE IMPACTS AROUND THE WORLD



Scientists warn of an **economic recession caused by major economic impacts of climate change by 2100**. Two causes include more frequent crop failures and disturbances to major trade routes. Without decisive federal and local climate action, the report warns, climate-related isasters **will cost taxpayers hundreds of billions of dollars**.<sup>xxi</sup>



Jonas Gratzer/LightRocket via Getty Images

## Sea-Level Rise

- In the U.S., an estimated **13 million people will be displaced by sea-level rise alone by the year 2100**.<sup>xxiii</sup> With only moderate cuts in GHGs, many of the world's largest cities could face **over 6 feet of flooding by 2050**:
  - Miami** - 6.2 million people
  - New York City** - 8.4 million people
  - San Francisco Bay Area** – 7.75 million people
  - Shanghai, China** – 27 million people
  - Mumbai, India** – 20.6 million people.<sup>xxiv</sup>
- Higher sea levels also lead to **dangerous storm surges**. When a storm surge arrives at the same time as high tide, as it did with **Superstorm Sandy in 2012**, it can raise water levels **20 feet above mean sea level**.<sup>xxv</sup>

## Extreme Heat

**Heat Waves** are one of the weather phenomena most clearly caused by humanmade global climate change, and **are the most deadly**.<sup>xxvi</sup> For example, it is estimated that over **70,000 people died** in the 2003 European heat wave.<sup>xxvii</sup> If the **world warms by 2°C** – warming which scientists project may be reached in **20 to 30 years** – there will be widespread **food shortages, fatal heat waves, and crop failures** throughout the Global South.<sup>xxviii</sup>



P. Ravikumar/Reuters via NYTimes

# Mobilizing to Fight Climate Change Can Help Milwaukee

The good news is that fighting climate change can also create significant economic and environmental benefits.

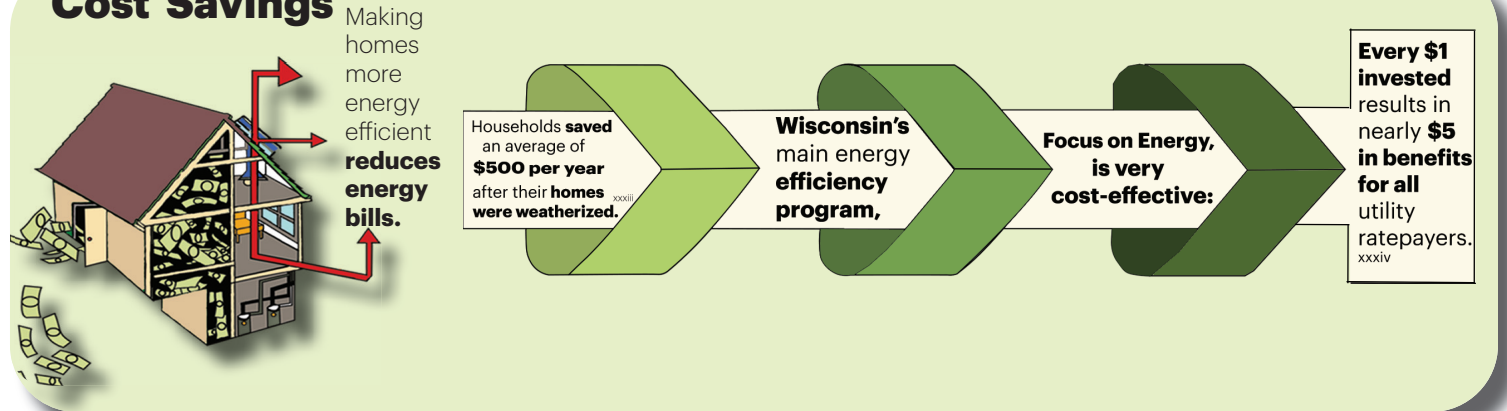
## Jobs and Economic Development

- Before the COVID-19 pandemic hit, there were **76,600 clean energy jobs in Wisconsin**, with **23,748 in the greater Milwaukee area.**<sup>xxix</sup>
- In-state production of **100% clean energy** would create **162,000 good, high-paying jobs in Wisconsin.**<sup>xxx</sup>
  - The median income **for a Solar Installer in Wisconsin is \$73,393 per year.**<sup>xxxi</sup>
  - The median income **for an Energy Efficiency Specialist is \$55,537 per year.**<sup>xxxii</sup>



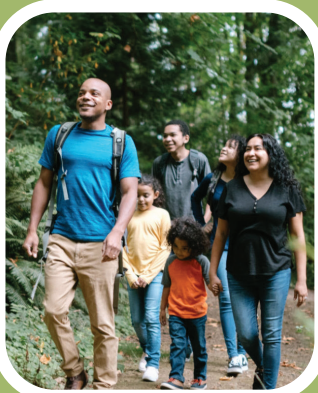
Robert Nickelsberg/Getty Images

## Cost Savings



## Improved Health and Quality of Life of Life

- Producing **100% clean energy in Wisconsin** would reduce air pollution, saving **\$21 billion every year** due to avoided health damages.<sup>xxxv</sup>
- A decline in the use of gasoline-powered vehicles, through increased use of transit, biking and walking, and electric vehicles, will **reduce local air pollution.**
- Planting more trees is a key climate change strategy, as **trees absorb GHGs and cool the environment** through evapotranspiration.
- Increased tree cover has been found to **decrease nearby air temperatures by up to 9° Fahrenheit.**<sup>xxxvi</sup>
- Studies also show a **strong relationship between more tree canopy and lower levels of crime.**<sup>xxxvii</sup>



RyanJLane via Getty Images

[bit.ly/MKEClimateSources](https://bit.ly/MKEClimateSources)

## How to get involved

Join the fight against climate change! **Visit [city.milwaukee.gov/climate/Climate-Plan](https://city.milwaukee.gov/climate/Climate-Plan)** to learn about and provide feedback on **Milwaukee's Climate and Equity Action Plan.**

The City of Milwaukee Environmental Collaboration Office also runs many programs to help you save money and reduce pollution through cleaner, more efficient energy use.



- i. NOAA National Centers for Environmental information, Climate at a Glance: National Time Series. Plot produced by the Wisconsin Initiative on Climate Change Impacts.
- ii. World Health Organization. (2018, February 1). Climate Change and Health. <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health..>
- iii. Podesta, J. (2019, July 25). *The climate crisis, migration, and refugees*. <https://www.brookings.edu/research/the-climate-crisis-migration-and-refugees/#:~:text=In%202017%2C%2068.5%20million%20people,after%20droughts%2C%20and%20intensified%20storms> and Institute for Economics & Peace. (2020). *Ecological Threat Register 2020: Understanding Ecological Threats, Resilience and Peace*. [https://reliefweb.int/sites/reliefweb.int/files/resources/ETR\\_2020\\_web-1.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/ETR_2020_web-1.pdf).
- iv. Fountain, H. (2020, May 4). Billions Could Live in Extreme Heat Zones Within Decades, Study Finds. *The New York Times*. <https://www.nytimes.com/2020/05/04/climate/heat-temperatures-climate-change.html>
- v. Burke, M; Hsiang, SM; and Miguel, E. (2015). Climate and Conflict in *Annual Review of Economics* 7: 577-617.
- vi. <http://www.impactlab.org/research/climate-and-conflict/>
- vii. US Department of Commerce and NOAA. (2015, April 5). 2010, July 22, Flash Flooding & Tornado Outbreak. *National Weather Service*. [https://www.weather.gov/mkx/072210\\_flashflooding-tornadoes](https://www.weather.gov/mkx/072210_flashflooding-tornadoes)
- viii. Thomson, P. (2019, August 27). From Tribune files: Photos show damage caused by August 18 flooding in La Crosse area. *La Crosse Tribune*. [https://lacrossetribune.com/news/local/from-tribune-files-photos-show-damage-caused-by-august-2018-flooding-in-la-crosse-area/collection\\_2c25194e-178e-5ee3-bd91-0c616f98ba72.html#4](https://lacrossetribune.com/news/local/from-tribune-files-photos-show-damage-caused-by-august-2018-flooding-in-la-crosse-area/collection_2c25194e-178e-5ee3-bd91-0c616f98ba72.html#4).
- ix. Retrieved from [https://floodfactor.com/property/2910-n-1st-st-milwaukee-wisconsin/550299976\\_fsid#local\\_risk\\_overview](https://floodfactor.com/property/2910-n-1st-st-milwaukee-wisconsin/550299976_fsid#local_risk_overview) on April 12<sup>th</sup>, 2021.
- x. Patz, J., Lois, A., Clifford, S., Brossard, D. and Maibach, E. (2020, October 20). Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 15. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>
- xi. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 8. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xii. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 9. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xiii. U.S. Global Change Research Program. (2021). *About Heat Waves*. Retrieved from <https://www.globalchange.gov/browse/indicators/us-heat-waves> on May 10<sup>th</sup>, 2021.
- xiv. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 8. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xv. Heilman, K. and Kahn, M. (June 2019). The Urban Crime and Heat Gradient in High and Low Poverty Areas. *National Bureau of Economic Research*, Working Paper 25961. <https://www.nber.org/papers/w25961>

- xvi. Truth, C. (2021, February 27). Acute Food Shortages are Disproportionately Pushing More Black and Latinx Families to the Brink of Starvation. *Milwaukee Independent*. <http://www.milwaukeeindependent.com/syndicated/acute-food-shortages-disproportionately-pushing-black-latinx-families-brink-starvation/>
- xvii. Kiefer, O. (2020, February 24). Opinion: ‘Food insecurity’ doesn’t affect just “them,” it affects us all. *Milwaukee Neighborhood News Service*. <https://milwaukeeenns.org/2020/02/24/opinion-food-insecurity-doesnt-affect-just-them-it-affects-us-all/>.
- xviii. Hunger Task Force. Retrieved from <https://www.hungertaskforce.org/about-hunger/hunger-in-milwaukee/?sfw=pass1617734015> on April 12<sup>th</sup>, 2021.
- xix. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 14. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xx. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 19. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xxi. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 20. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xxii. NOAA NCEI. (2020, January 8). 2010-2019: A landmark decade of U.S. billion-dollar weather and climate disasters [Infographic]. *NOAA Climate*. <https://www.climate.gov/news-features/blogs/beyond-data/2010-2019-landmark-decade-us-billion-dollar-weather-and-climate>.
- xxiii. Solly, M. (2018, November 26). Climate Change Will Cost Taxpayers Billions In Near Future, Federal Report Shows. *Smithsonian.com*. <https://www.smithsonianmag.com/smart-news/new-report-offers-stark-assessment-climate-changes-impact-us-180970885/>.
- xxiv. Goodell, J. (2018, February 25). Welcome to the Age of Climate Migration. *Rolling Stone*. <https://www.rollingstone.com/politics/politics-news/welcome-to-the-age-of-climate-migration-202221/>.
- xxv. Retrieved from <https://www.loveexploring.com/gallerylist/91927/incredible-places-that-will-be-underwater-by-2050-on-March-16> 2021 and Coastal Risk Screening Tool, [coastal.climatecentral.org](http://coastal.climatecentral.org)
- xxvi. U.S. Climate Resilience Toolkit. Storm Surge. Retrieved from <https://toolkit.climate.gov/topics/coastal/storm-surge#:~:text=Additional%20impacts%20of%20storm%20surge,threat%20of%20death%20by%20drowning> on May 6<sup>th</sup>, 2021.
- xxvii. U.S. Global Change Research Program. (2021). *About Heat Waves*. Retrieved from <https://www.globalchange.gov/browse/indicators/us-heat-waves> on May 10<sup>th</sup>, 2021.
- xxviii. Robine, J.M., Cheung, S.L.K., Le Roy, S., Van Oyen, H., Michel, J.P. and Herrmann, F.R. (2007, August 22). Death toll exceeded 70,000 in Europe during the summer of 2003. *Comptes Rendus Biologies*, Vol. 331, Issue 2:171-178. <https://www.sciencedirect.com/science/article/pii/S1631069107003770?via%3Dihub>

- xxix. The World Bank. (2013, June 19). *Warmer World Will Keep Millions of People Trapped in Poverty, Says New Report*. Retrieved from <https://www.worldbank.org/en/news/press-release/2013/06/19/warmer-world-will-keep-millions-of-people-trapped-in-poverty-says-new-report> on May 10th, 2021.
- xxx. Clean Jobs Midwest. Wisconsin Fact Sheet. Retrieved from <https://www.cleanjobsmidwest.com/more-jobs-data?f=wi> on April 4<sup>th</sup>, 2021.
- xxxi. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 6. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xxxii. Retrieved from <https://www.salary.com/research/salary/posting/solar-installer-salary/wi> on March 16th, 2021.
- xxxiii. Retrieved from [https://www.payscale.com/research/US/Job=Energy\\_Efficiency\\_Specialist/Salary](https://www.payscale.com/research/US/Job=Energy_Efficiency_Specialist/Salary) on March 16th, 2021.
- xxxiv. Keene, A., Lick, A., Pigg, S. and Parkhurst, R. (2018). Assessment of Energy and Cost Savings for Homes Treated under Wisconsin's Home Energy Plus Weatherization Program 2018. P.13. Retrieved from <http://homeenergyplus.wi.gov/docview.asp?docid=28720&locid=25>, on March 16<sup>th</sup>, 2021.
- xxxv. Clean Wisconsin. (February 2021). Strategies for Climate Action in Wisconsin. P. 3. Retrieved from [https://www.cleanwisconsin.org/wp-content/uploads/2021/02/Final CCTF 1.pdf](https://www.cleanwisconsin.org/wp-content/uploads/2021/02/Final_CCTF_1.pdf).
- xxxvi. Patz et. al. Medical Alert! Climate Change is Harming Our Health in Wisconsin. P. 6. <https://ghi.wisc.edu/wp-content/uploads/sites/168/2020/10/Medical-Alert-Climate-Change-is-Harming-Our-Health-in-Wisconsin.pdf>.
- xxxvii. Centers for Disease Control and Prevention. Extreme heat can impact our health in many ways. Retrieved from [https://www.cdc.gov/climateandhealth/pubs/extreme-heat-final\\_508.pdf](https://www.cdc.gov/climateandhealth/pubs/extreme-heat-final_508.pdf). On April 14<sup>th</sup>, 2021.
- xxxviii. Witthun, O. (2018, October 11). Reduce crime and violence with trees in your neighborhood. *Wisconsin DNR Forestry News*. <https://forestrynews.blogs.govdelivery.com/2018/10/11/reduce-crime-and-violence-with-trees-in-your-neighborhood/>