WHY A MORE VARIABLE CLIMATE MATTERS TO YOUR COMMUNITY

What Does a More Variable Climate Mean for Great Lakes Communities?

No matter where you live, changing weather patterns can have an impact on your community. From changes in rain and snow with stronger storms and increased flooding to longer droughts, these impacts will need to be addressed in our communities. If your community is working to address issues such as how to handle and treat stormwater, minimize flooding, prepare for droughts and heat waves, all while meeting your budget restrictions now and in the future, taking climate change impacts into account in your planning and decision-making could protect your community's infrastructure and natural resources and may even save you money in the future.

Challenges

RISING AIR TEMPERATURES

- During the summer, public health and quality of life, especially in cities, will be negatively affected by more frequent and severe heat waves, reduced air quality, and insect and waterborne diseases.
- In the winter, heating costs and traffic safety may improve overall, but these effects will be partially offset by the increased likelihood of severe winter storms.
- Increased demand for air conditioning during heat waves will increase the likelihood of unplanned blackouts or rolling power outages.

MORE DROUGHTS AND FLOODS

- Increased precipitation in winter and spring and more frequent, heavy downpours year-round will lead to more flooding, as well as more water quality problems caused by runoff and sewage overflow events.
- The combination of more inconsistent rainfall and higher temperatures will make drought conditions more common.

CHANGES IN GREAT LAKES WATER LEVELS

- Significant reductions in Great Lakes water levels partially caused by increased evaporation correlating with warmer air temperatures will affect shipping, fishing, tourism, water quality, beaches, public health and ecosystems.

LONGER GROWING SEASONS BUT CHALLENGES TO CROPS

- While longer growing seasons can potentially boost crop yields, increased heat waves, floods, droughts, and insect outbreaks will present increasing challenges to crops, livestock and forests.

EFFECTS ON PLANTS AND ANIMAL SPECIES

- Warmer water holds less oxygen and speeds algae blooms and decomposition, which increases the risk of low-oxygen 'dead zones.'
- Climate change will re-mobilize mercury, PCBs, and other pollutants from soil and sediments into air and water, increasing the uptake by a host of animals, and the health risk to people who eat them.

DECREASE IN ICE AND SNOW COVER AND EARLY SPRING SNOWMELT

- Decrease in outdoor winter recreational activities such as skiing, snowmobiling, ice skating and ice fishing.
- Thinner or absent lake ice leaves coasts more vulnerable to erosion during winter storms.

Solutions to Reduce Impacts of a Variable Climate

Action: KEEP IT COOL

- Plant shade trees near houses to help keep summer heat waves under control.
- Interplant trees with crops to help limit drought severity in dry years, and help limit erosion in wet years.
- Good insulation doesn't just keep you warm in the winter—it keeps heat out in summer.

Example: The Cayuga Lake Watershed Network is addressing the impacts warming temperatures will have on promoting the invasion of the Hemlock Woolly Adelgid and the potential devastation on the Hemlock Forest in the southern Finger Lakes region. Lacking Hemlocks for shade, creek waters will warm, causing increased evaporation, reduced water levels, and loss of habitat for cold water species such as trout. This project is training residents to develop a community-based Hemlock Guardian team that identifies and inventories the insects and works with the public and agencies to mitigate the threat.

Action: LIMIT RUNOFF

- Reduce paved surfaces to allow more water to soak into the ground, limiting flooding.
- Install raingardens, bioswales, and other low-impact landscaping options that can act as sponges, taking up water when there's too much and slowly releasing it over time.
- Provide education and support to farmers to encourage adoption of lower-impact farming practices.

Photos L to R: West Grand Boulevard Collaborative; Detroit Library's Duffield Branch; Volunteers worked hard and had fun installing the beautiful vegetation and art work that made up the rain gardens.

Example: The Albert H. Mallory Reading Garden was built by the West Grand Boulevard Collaborative in Detroit, Michigan. It demonstrates how rain gardens collect and treat rain water, creating an awareness of, and a conversation with visitors about, the benefits that Low Impact Developments (LID) can provide for the community and our environment. It is projected that climate change will impact the Detroit area through increased temperature in the summer and winter. Toxins and warm water from the hot pavement enter the lake through the sewer system, especially during an extreme storm and flooding event.

Action: THE RIGHT PLANTS IN THE RIGHT PLACES

- For landscaping and tree-planting projects, use a mix of species that can handle warmer weather, both increased floods and droughts, and species suited to both current and likely future conditions.
- Farmers considering future crop investments should make choices that maintain flexibility in the face of an uncertain future.

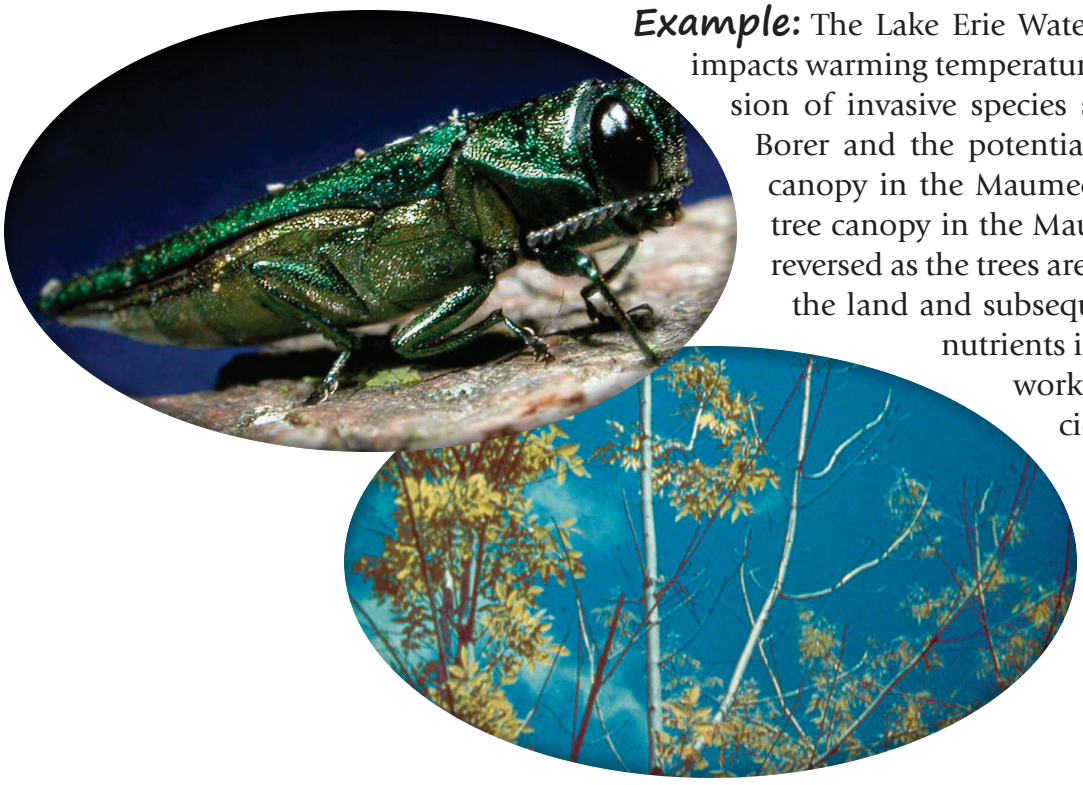
Harvesting wild rice.

Photos: Great Lakes Lifeways Institute

Example: Great Lakes Lifeways Institute is working in partnership with the Lac Vieux Desert Band of Lake Superior Chippewa to ensure continuity of the ricing tradition in Michigan's western Upper Peninsula by identifying and advocating for adaptation measures to reduce the vulnerability of wild rice beds to climate change.

Action: EARLY DETECTION, RAPID RESPONSE

- Identify areas at particular risk of invasion by non-native species and set up citizen monitoring and response programs.



Example: The Lake Erie Waterkeeper is addressing the impacts warming temperatures will have on the expansion of invasive species such as the Emerald Ash Borer and the potential devastation on the tree canopy in the Maumee River Basin. The loss of tree canopy in the Maumee River Basin must be reversed as the trees are critical to keeping soil on the land and subsequently, the sediments and nutrients in the soil. The project will work with the public and agencies to identify the climate impacts on the tree canopy and work to develop plans that will mitigate the climate threats.

Action: PLAN FOR THE FUTURE, NOT THE PAST

- Make sure that land use plans, floodplain designation, and infrastructure design all reflect conditions over the expected life of the plans or project.
- Where feasible, expand protected areas to include expected future as well as current ranges for the species or habitats being protected.
- Design restoration projects to succeed across a range of future conditions, including changes in lake levels, flood and drought severity, and species ranges.

Example: Ecolibrium3 is establishing a coordinated planning effort to train citizens to take on an advocacy role for community resiliency in the face of climate change impacts in Duluth-Superior, Minnesota. The project is initiating a community engagement process and will support recruit, train, and provide ongoing support for a steering group for a community resiliency planning process.

Jodi Slick, Ecolibrium3

Action: ASSESS THE REAL ENVIRONMENTAL IMPACTS

- Make sure that environmental regulations account for the fact that increasing temperatures will affect pollutants in the air and water, and may lead to greater toxicity and other impacts on plants and animals.
- Adjust water clean-up plans and other regulations to reflect changing runoff quantity and timing.

Example: Climate changes were not considered in the design of the sulfide mine being constructed in the Yellow Dog watershed. Potential problems with rising water levels or increased precipitation could affect the ability to deal with wastewater and unexpected runoff. The Yellow Dog Watershed Preserve is identifying how current mine plans handle increased precipitation and compare that with predicted changes due to climate changes.

Yellow Dog Watershed Preserve Staff and the Salmon Trout River.

Photos: Cheryl Nenn