Climate Change: What Lies Ahead for Evanston

Evanston's climate is already changing. Average temperatures in the Chicago area have risen by 2.6ºF over the last 30 years. Ice on Lake Michigan has decreased, and the growing season has lengthened. Extreme heat events are occurring more frequently, and heavy downpours are becoming much more common as well.

These trends are expected to continue, although the extent of the changes that do occur will depend on whether emissions of heat-trapping gases are cut substantially or continue to rise at close to their current pace. The following specific changes are among those projected for this area.

Hotter summers and more heat waves
The number of very hot days (over 90ºF) is very likely to increase, from about 15 days/year today to 36 days/year by 2100 under a lower emissions scenario--and 72 days/year under a higher emissions scenario.* The number of extremely hot days (over 100ºF) could increase from the current 2 days/year to more than 30 such days/year under a higher emissions scenario.

Evanstonians can also expect more frequent, longer, and hotter heat waves than in the past. Extreme heat events such as the seven-day 1995 Chicago heat wave, which claimed almost 700 lives, will become much more common. By the end of the century, there is likely to be one such severe heat wave every other year under a lower emissions scenario--and several such heat waves *each summer* under a higher emissions scenario.

The projected increase in the frequency of extremely hot summers poses a significant risk to human health. More cases of heat-related illness and mortality can be expected, particularly among the elderly, children, and those with pre-existing health conditions.

Higher temperatures are also likely to be accompanied by an increase in ground-level ozone, exacerbating asthma and other respiratory diseases. Pollen seasons could lengthen or become more intense as well, causing further suffering for asthmatics. In addition, warmer conditions will allow disease-carrying insects such as mosquitoes to proliferate, increasing the risk of diseases such as West Nile virus.

More heavy downpours and flooding
Annual precipitation is expected to increase by about 20 percent over this century, with most of that increase occurring in winter and spring. The frequency and intensity of heavy rain events are expected to increase as well. Heavy downpours can overwhelm drainage systems and water treatment facilities, leading to the discharge of contaminants into nearby waterways.

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* ***Higher emissions scenario***: Continued global dependence on fossil fuels as the primary energy source; carbon dioxide (CO_2) levels--currently 385 parts per million (ppm)--reach 940 ppm by 2100. ***Lower emissions scenario***: Shift to less fossil fuel-intensive industries and introduction of clean-energy technologies; CO_2 levels reach 550 ppm by 2100. (Many climate scientists believe that concentrations of CO_2 must stabilize at--or below--450 ppm to avoid dangerous interference with the climate system.)

Heavy rains are a particularly serious problem for older cities--like Evanston and Chicago--that have combined sewer systems. A rainfall of 2.5 inches or more in 24 hours is the threshold for a combined sewer overflow into Lake Michigan. The frequency of such heavy rain events is projected to increase--under the higher emissions scenario--from about once every four years to once every other year by the end of the century.

More intense heavy rain events, warmer lake temperatures, and lower lake water levels--all of which are projected for this area--are likely to lead to more beach closures.

Lower lake levels
Warmer air and water temperatures and reduced ice cover will mean more evaporation and a likely decline in lake water levels. Under the higher emissions scenario, the average level of Lake Michigan could drop as much as 1.5 feet by the end of the century.

More insect pests and weeds
A longer growing season and higher levels of carbon dioxide will stimulate plant growth. But warmer and shorter winters will allow insect pests to expand their range northward, and a longer growing season will allow some pests to produce more generations per year. Warmer temperatures will also benefit weed growth and will allow the northward spread of invasive plants that now cause major damage in more southern states.

Threats to native species
Plant hardiness zones are projected to shift northwards--by one full zone by the end of the century under the lower emissions scenario--and by one and a half zones under the higher emissions scenario. Habitats of many plant and tree species will move northward, while more heat- and drought-tolerant species become more abundant. Corresponding changes in animal and insect communities can also be expected as the timing and quality of their food resources change.

Information in this article comes from *Climate Change and Chicago: Projections and Potential Impacts*, research findings that underpin the Chicago Climate Action Plan. (www.chicagoclimateaction.org/pages/research___reports/48.php)