LUC Adaptation Survey

In a 2012 survey of activities that Loyola should undertake to advance sustainability across our campuses, curriculum and community, 33% of respondents voted that we should ‘Prepare (Loyola’s) campuses for climate change’. This was just behind the options to ‘Set a goal for greenhouse gas reductions’ and ‘Advance a climate action plan’. Of the 415 comments we received, over 60 suggested adaptation actions ranging from 'have a plan to adapt' to 'prepare our buildings for future climates'. With this guidance the Office of Sustainability created this survey of existing resources, forecasts, efforts underway and areas of vulnerability to inform a climate adaptation plan for the University. It is important to note that, similar to the survey responses, in responding to climate change, Loyola is prioritizing greenhouse gas emissions with a 50% reduction goal by 2015 from a 2008 baseline. This is the most important step in reducing future climate change. For more on what Loyola is doing to address climate change visit luc.edu/SustainLoyola.

Please note: This document does not include the international campuses as their climate impacts will vary from those forecasted for northeastern Illinois.

Top Six Climate Change Impacts for Chicago

• **Temperature increase:** As compared to a 1961-1990 avg. and under high & low emissions, 2070 winters could be 3-5° Celsius (C) warmer and 2070 summers could be 3.5-7.5° C warmer. Under high emissions, the Midwest could experience ~45-85 days over 35° C by century’s end.

• **Changed precipitation patterns:** As compared to the 1961-1990 avg., spring and winter in 2070, could have 20-35% more precipitation events. Summers could have 10-15% less.

• **“Migrating” seasons:** By century’s end, Chicago winter could feel like Pittsburgh and summers could feel like Knoxville or, under high emissions, Baton Rouge.

• **Heat-related morbidity:** By 2085, there could be 450-1,200 heat-related Chicago metro-area deaths per year, (per 6M people in the Chicago-metro area).

• **Great Lake impacts:** Long-term trends discern, under high emissions, that the avg. Lake Michigan level could decrease by up to 1.5’ by century’s end. The Great Lakes will experience an increased likelihood of extreme storms, e.g., seiches.

• **Plant Hardiness Zone shift:** The Midwest’s Zones have shifted and will continue to shift ½ to 1 zone every 30 years. From 1990-2006, Northern Illinois’ shifted, representing a 10° F range change in the lowest temperature of the year.

**Source:** Chicago Climate Action Plan (2008)
Sustainability survey responses:

18. Climate Change (please choose two)

<table>
<thead>
<tr>
<th>#</th>
<th>Answer</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Set a goal for greenhouse gas reduction</td>
<td>893</td>
</tr>
<tr>
<td>2</td>
<td>Prepare our campuses for climate change (often referred to as 'adaptation')</td>
<td>677</td>
</tr>
<tr>
<td>3</td>
<td>Use our campus landscapes to trap and sequester greenhouse gas emissions</td>
<td>672</td>
</tr>
<tr>
<td>4</td>
<td>Promote climate change science more</td>
<td>482</td>
</tr>
<tr>
<td>5</td>
<td>Promote personal action on climate change</td>
<td>653</td>
</tr>
<tr>
<td>6</td>
<td>Advance a climate action plan for the University</td>
<td>715</td>
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<tr>
<td>7</td>
<td></td>
<td>4092</td>
</tr>
</tbody>
</table>

Total Responses: 2,024
Potentially Vulnerable Elements

**Built Infrastructure**

- Buildings (all campuses)
- Paved surfaces (all campuses)
- Water treatment system (all campuses)
- Transportation systems (all campuses)
- Lakefront seawall (Lakeshore campus)
- Energy infrastructure (all campuses)

**Natural Infrastructure**

- Traditional landscapes (all campuses)
- Natural landscapes (Lakeshore and LUREC)
- Aquatic landscape (Lakeshore and LUREC)
- GreenRoofs (Lakeshore, Maywood and Water Tower)
- Agriculture systems (Lakeshore and LUREC)
- Trees (all campuses)

**Community**

- Students (all campuses)
- Staff/Faculty (all campuses)
- Neighboring Communities
Potential Strategies:

- Design all new buildings and retrofit existing buildings for energy efficiency: As energy supply and demand become less certain, Loyola can reduce exposure to risk and increasing costs by reducing total energy use. This is also the primary action to mitigate climate change as building energy use contributes 70% of the City’s greenhouse gas emissions (61% for the Chicagoland region). Source: CCAP and CMAP

- Explore systems that protect energy infrastructure: This could include renewable energy infrastructure that provides decentralized energy production, smart grid technology that addresses outages and routes around issues directly, and energy storage systems that remove the need for redundant/back up systems such as generators.

- Create a building policy to set guidelines/targets for resilient infrastructure: This could include sizing for stormwater systems, resilience thresholds for masonry, sealants, paving, anchoring and other elements that may fail due to freeze/thaw cycles or extreme heat, and heating/cooling infrastructure planned for future climates.

- Confirm that all trees on grounds and in future planting plans are hardy to future climates (Zone 5b-7a) and considering potential future pests. The best way to assure that a planting is resilient is through diversity and adequate planting soil volumes.

- Confirm that the Emergency Response Plan for the university has been reviewed with future climate impacts included. Considering the schedule of use of the university (academic year for residential students), special attention should be paid to increased snow fall, freezing rain/ice, flooding conditions.

- Consider a stand-alone extreme heat plan for campus operations specifically focusing on athletics, summer residents, infrastructure and special events during times of the year where modified operations may be underway. Consider alternative communications pathways, transient populations and other summertime exceptions not usually covered under the existing emergency response plan.

- Prioritize expanding natural areas and other green space to provide stormwater capture, cooling and additional refuge for regionally appropriate species. LUREC, Lake Shore and Maywood campuses.

- Prioritize stormwater infrastructure strategies that are sized for future precipitation events to reduce water pollution and hazards caused by combined sewer overflows, basement and low land flooding. Communicate the hazards caused by flooding in enclosed locations including basements and transportation routes.

- Consider how Loyola may serve as an adaptation for our neighboring communities including but not limited to; hosting community planning events, serving as a refuge during extreme events, programs that mitigate emissions or prepare communities for climate change. Communicate the role Loyola’s campuses play for neighboring communities such as; transportation hubs, cooling landscapes, stormwater capture, other.

- Consider alternative work arrangements, taking advantage of tele-commuting and transportation demand management infrastructure, during extreme weather, including Air Quality Action days, extreme precipitation (snow, ice or rain) and Heat Advisory days

- Consider alternative class arrangements during extreme weather, including Air Quality Action days, extreme precipitation (snow, ice or rain) and Heat Advisory days
-Consider alternative operational arrangements, utilizing demand response, building automation and other systems during extreme weather, including Air Quality Action days, extreme precipitation (snow, ice or rain) and Heat Advisory days

Current adaptation strategies underway:

-Research on emerging diseases and climate-sensitive hazards in Biology and Health Sciences

-Stormwater management on Lake Shore, LUREC and Maywood campuses

-Energy efficiency initiatives and participation in demand-response program at all campuses reduces our contribution to peak energy use times.

-Natural landscaping at LUREC, Maywood and Lake Shore campuses provides refuge and buffer areas to address stormwater and biodiversity resources under stress.

-Built and natural infrastructure reduce demand on energy and stormwater infrastructure. Landscapes provide cooling and refuge for people and biodiversity.

Resources:

[Chicago Climate Action Plan](#)

[Chicago Metropolitan Agency for Planning Adaptation Toolkit](#)

[Advancing Adaptation in the City of Chicago: Climate Considerations for Management of Natural Areas](#)

[Chicago Wilderness Climate Action Plan for Nature](#)

[National Climate Assessment](#)

[Intergovernmental Panel on Climate Change](#)