Aurora and Climate Adaptation
Using the ND-GAIN Urban Adaptation Assessment

Presented by Jack Diederich
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Climate Change Today

• Temperatures are likely to rise 1.5 °C above preindustrial levels by 2030-2052 (IPCC)
• High vs. Low emission scenarios (RCPs)
• Growing, consequences in concentrated, interconnected urban environments
• Need for Adaptation
Aurora, Sustainability, and Adaptability

- City of Aurora Sustainability Plan
- Discussions on Global Covenant of Mayors for Climate and Energy
- Gardening and Bio-diversity
- Tree Board
- Recycling Initiatives
- RiverEdge Park as a catalyst
ND-GAIN Urban Adaptation Assessment (UAA)

- **Online, data-rich tool** for visually connecting city’s vulnerabilities to climate disasters, adaptive capacities, and how these are distributed within a city
- Led by the Notre Dame Global Adaptation Initiative (ND-GAIN), funded by the Kresge Foundation
- Data from over 270 U.S cities in all 50 states and Puerto Rico
What is Adaptation?

• The adjustment to current and future climate conditions that minimizes negative effects on human lives and communities

• Includes changing policy, operations and physical assets to modify supply chains, capital projects, community engagements and regulations
What is Risk?

- A city’s vulnerability to climate change. Risk incorporates:
  - Exposure
  - Sensitivity
  - Adaptive Capacity
What is Readiness?

- The capacity of a community to mobilize adaptation investments from private sectors, and to target investments more effectively.
  - Economic Readiness
  - Governance Readiness
  - Social Readiness
### UAA Profile

<table>
<thead>
<tr>
<th></th>
<th>FLOOD</th>
<th>HEAT</th>
<th>COLD</th>
<th>DROUGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical average cost</td>
<td>$689,967</td>
<td>0 CASUALTIES</td>
<td>0 CASUALTIES</td>
<td>$0</td>
</tr>
<tr>
<td>(2011-2015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probability of hazard</td>
<td>MEDIUM</td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>event in 2040</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected cost</td>
<td>$353,607</td>
<td>N/A</td>
<td>N/A</td>
<td>$77,397</td>
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</tbody>
</table>
City Matrix

Aurora
- Risk: 41.88
- Readiness: 33.3

Comparable City:
McAllen, TX

Risk Comparable to Local Cities on Rivers

Slightly Lower Readiness Compared to Area cities
## City Readiness

<table>
<thead>
<tr>
<th>Social score</th>
<th>Economic score</th>
<th>Governmental score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>30.7 (Higher is Better)</strong></td>
<td><strong>30.6 (Higher is Better)</strong></td>
<td><strong>38.7 (Higher is Better)</strong></td>
</tr>
</tbody>
</table>
| • Civic engagement  
• General innovation capabilities | • Bond worthiness  
• City debt per resident  
• Tax incentives for renewable energy | • Estimated % adults who think global warming is already harming people in the US or will within 10 years%  
• Total no. of federal public corruption convictions by district |
# Drought Risk

<table>
<thead>
<tr>
<th>Historical average cost (2011-2015)</th>
<th>Probability of drought event in 2040</th>
<th>Projected cost of drought event</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>MEDIUM</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exposure score</th>
<th>Adaptive capacity</th>
<th>Sensitivity score</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.3 (lower is better)</td>
<td>50.0 (higher is better)</td>
<td>44.9 (lower is better)</td>
</tr>
</tbody>
</table>

- Population density
- Existence of drought management plans
- Existence of water management plan
- Baseline water stress
- % of GDP based on water intensive industries
- % of workforce in farming, fishing and forestry
Response to Drought

Actions Aurora can and has taken:

Reduce risk:
• Reduction of industrial and residential water consumption

Increase readiness:
• Promote water conservation education and practices
• Encourage water conservation with community businesses
• Improve water treatment
# Heat Risk

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>0 Casualties</td>
<td>HIGH</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Exposure score</th>
<th>Adaptive capacity</th>
<th>Sensitivity score</th>
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</thead>
<tbody>
<tr>
<td><strong>46.3</strong> (lower is better)</td>
<td><strong>27.2</strong> (higher is better)</td>
<td><strong>41.3</strong> (lower is better)</td>
</tr>
<tr>
<td>• Population density</td>
<td>• No. of acute care hospital beds available per 1000 residents</td>
<td>• % of buildings built before 1979</td>
</tr>
<tr>
<td></td>
<td>• % of land covered by tree canopy</td>
<td>• % of employed population that works outdoors</td>
</tr>
<tr>
<td></td>
<td>• % of population with health insurance</td>
<td>• % of households receiving public assistance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• % of population spending over 50% income on rent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• % of population that is 65 years or older living alone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• % of population that is under 5 years old</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• % of population with a disability</td>
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</table>
Response to Heat

Actions Aurora can and has taken:

Reduce risk:
• Provide cooling stations throughout the city
• Increase tree cover
• Reduce the size of paved areas when allowable
• Limit social isolation

Increase readiness:
• Promote construction of new housing (those that provide adequate insulation and A/C)
• Promote use of alternate materials that do not absorb as much heat
## Cold Risk

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<th>Probability of cold event in 2040</th>
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### Exposure score

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<tr>
<td></td>
<td>% of households with heating fuel</td>
<td>% of employed population that works outdoors</td>
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<td></td>
<td>% of population with health insurance</td>
<td>% of households receiving public assistance</td>
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Response to Cold

Actions Aurora can and has taken to:

Reduce risk:
• Provide warming stations throughout the city

Increase readiness:
• Promote construction of new housing (those that provide adequate insulation and heating)
• Prepare to provide and repair services in extreme cold
# Flood Risk

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## Exposure score

- **7.4 (lower is better)**
  - % of buildings in high risk flood zone
  - % of cars in high risk flood zone
  - % of population living in high risk flood zone

## Adaptive capacity

- **54.3 (lower is better)**
  - No. of acute care hospital beds available per 1000 residents
  - % of population with health insurance
  - Water quality enforcement

## Sensitivity score

- **35.5 (lower is better)**
  - % of area that is impervious surface
  - % of buildings built before 1999
  - % of households without access to a vehicle
  - % of population spending over 50 percent of income on rent
  - % of population that is 65 years or older living alone
  - % of population that is under 5 years old
  - % of total housing units that are mobile homes
Responses to Flooding

Actions Aurora can and has taken:

Reduce risk:
• Move more structures out of floodplain
• Install wetlands and parks near the Fox River

Increase readiness:
• Promote public knowledge about flood zones and insurance
• Education resources on protecting basements and values
Future Concerns

- Continued occupancy in at-risk lots and buildings
- Relief Inequalities by Wealth
- Long-term costs and inconveniences
- Vulnerabilities of downtown businesses
- Uncertainty of Conditions
Recent Successes

Aurora:
• Sustainable goals
• Green Spaces along waterfront
• Adult and Youth outreach and Involvement

Nationally:
• Mayoral Alliances
• Buyout Programs
• Infrastructure Investments
Conclusion

Priority hazards: Heat, Cold, and Flooding

Areas of Concern:
- Downtown
- Along the Fox River
- Near East & West Side

Resources to leverage:
- Community education, awareness, and involvement
- Local business initiatives
- Tax incentives for sustainable practices

UAA Help Center Always Available