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# Climate Justice: Towards a Proactive Response to Social Inequities

By Vivek Shandas

Discussions about climate change have taken center stage. Claims of 'carbon neutral', and strategies for calculating and mitigating green house gas emissions (GHGs) have become common place from Beaverton to Bali. The discourse on climate change, however, remains largely an environmental one, with increasingly precise definitions of parts per million, downscaling climate models, and regional assessments for reducing carbon dioxide (CO<sub>2</sub>) emissions. These discussions are essential for understanding connections between local sources of GHGs and global consequences of our actions. But health and equity are equally critical dimensions of climate change, although these dimensions have had only limited investigation.

Although federal action on climate change is beginning to take shape, policy, planning and implementation will occur at local levels, and information will need to be increasingly precise, so that regional responses can be appropriately applied. Decision makers at city, county, region, and state levels are responding to calls for local information by developing carbon calculators for transportation projects, carbon 'footprints' for existing buildings, and carbon taxes which penalize specific behaviors. Many existing efforts focus on mitigation, although as we learn more about the causes of and limits to CO<sub>2</sub> emissions, attention will also need to emphasize proactive measures that respond to potential threats from climate-related events. We are only now becoming aware of the local consequences, and how each of us may be affected.

For example, Hurricanes Katrina and Rita made abundantly clear that local impacts of global changes are catastrophic, and that those with fewest resources are often the hardest hit. While many of the serious consequences of an altered climate will take decades to understand, the coming years will likely be filled with clues about the types of regional responses that are essential to 'climate-proof' communities from adverse climatic events.

## Global warming and urban heat

If past climate-related events, like hurricanes and decade-long droughts provide an indication about what is to come, then adaptation is already needed on a massive scale. While hurricanes, tornadoes, and floods are dramatic and often make the front page, a far more insidious and silent result of climate change is urban heat.

Given the attention that we pay to spectacular climate related events, Americans are often surprised to learn that in the US more people die of heat waves than from all other extreme meteorological events combined. For example, during the week of July 14, 1995, in Chicago over 800 people died of heat-related illness, which includes heat stroke, heat exhaustion, and problematic pulmonary and circulatory conditions. More recently in 2003, over 35,000 people died throughout Europe from similar heat related illnesses. This tragedy bares monetary costs of 13 billion Euros, as well as the social costs associated with this overwhelming loss of life. These numbers are staggering, suggesting that urban heat is an issue to which decision makers will need to respond.

Regional studies by Climate Impacts Group at the University of Washington state that compared to the historical record, Seattle and Portland will witness considerably more challenges associated to extreme climate events. Specifically, in terms of human health, "...under medium warming scenarios, more people are projected to die because of heat waves..." and "...poorer air quality in the summers will also contribute to more deaths by mid-century." What can past heat-related events teach us about adapting to future consequences of climate change? Which populations are disproportionately affected by urban heat? We explore these questions here by examining the relationship between urban heat and demographics in the Portland metro region.<sup>1</sup>

## Where's the heat?

Numerous studies in climate science have documented the fact that urban areas are generally warmer than the surrounding rural areas. While scientists have linked these temperature differentials to several phenomena, including earlier blooming dates for flowering plants and trees, and circulation of air currents, only now are we learning the extent of the differences within our particular urban area. Over the past several years, researchers from Portland State University have traversed the metropolitan region to describe differences in temperature, and

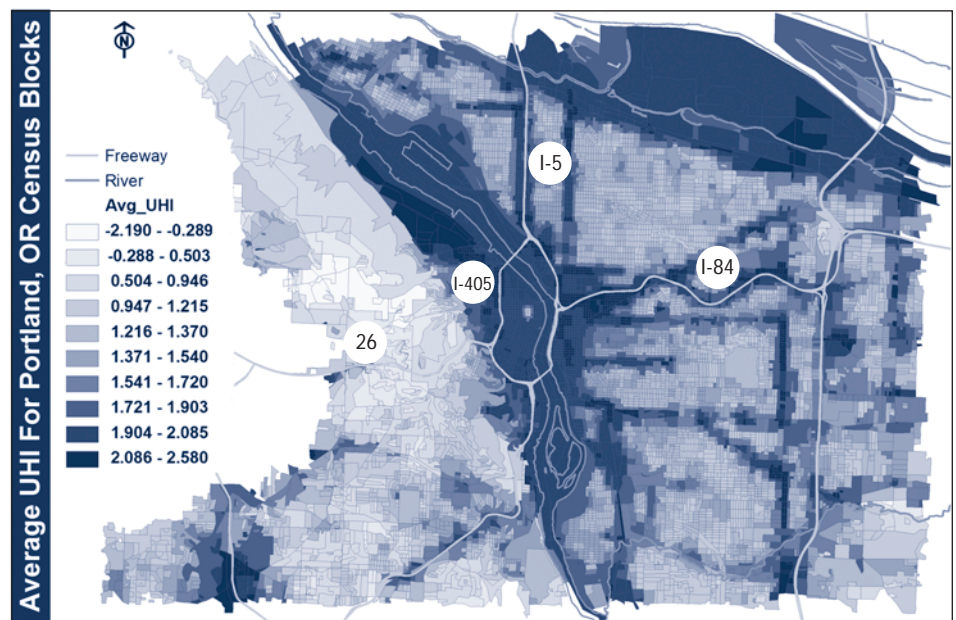


Figure 1: Map of urban heat islands (UHI) in the Portland region based on US Census boundaries (blocks). Darker areas contain higher relative temperatures.

to identify urban heat islands. Findings recently published in *Theoretical and Applied Climatology* describe a temperature gradient of 6 degrees in the Portland region from the coolest to hottest areas.<sup>2</sup> The resulting urban heat island (UHI) maps present a land-based “mosaic” of average air temperatures for each Census block in the Portland region (2008 estimates). The maps describe neighborhood-scale variation in temperature as it relates to the groups of people living in different areas of the region (Figure 1).

Evident from the UHI map is the fact that roadways are generally hotter than other areas. In fact, as expected, the results indicate a strong association between paved surfaces (e.g., roads, rooftops, and driveways), and higher levels of heat. Since air pollution is also highly concentrated around roadways, we examined the demographics of the people living alongside roads, and those who might be at increased risk in

living in or near UHIs. This is not to say that other populations are not at risk from heat waves, rather that those with lower income, who are younger, living alone, and renting are *disproportionately* living in the hottest areas of the region. In terms of air quality, we found that populations living in *smaller homes, living alone, older adults, and Hispanic populations* are most commonly in areas filled with harmful air pollutants. Again, other populations are also affected, but some population groups, more so than others, are living in areas with bad air. We recognize how some of these factors could be linked (e.g., low income communities and renters), and we are currently conducting a complementary case study that examines the conditions residents where higher levels of urban heat and air pollution coexist.

While findings that identify the poorest and oldest members of the region as those most likely to be affected by bad

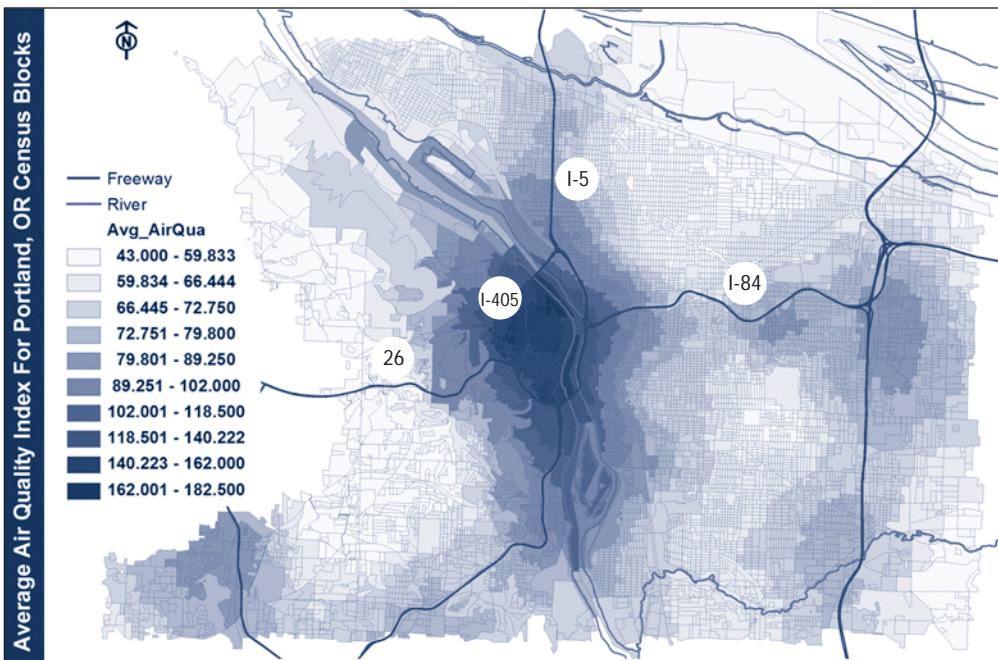


Figure 2: Map of air toxins in the Portland region based on US Census boundaries (blocks). Darker areas contain higher relative levels of air toxins (source: George and Shandas, forthcoming)

terms of exposure to heat and poorer air quality. To assess air quality, we used regionally modeled air quality data (provided by the Oregon State Department of Environmental Quality) to further analyze the places and people who are disproportionately affected (Figure 2). By combining the results of the UHI analysis and air quality, we were able to assess which populations in the Portland region are at greatest risk from degraded environmental conditions.

For specific demographic populations, the results were strong and statistically significant for both UHI and air quality. Thus, we identify some groups that were more likely to be impacted by urban heat, while others might be exposed to poor air quality. In terms of urban heat, our results suggest that *lower income, younger individuals, living alone, and renting* were populations

environmental conditions is not a radical departure from earlier studies of urban inequity, these results do help frame an approach for engaging specific populations most at risk from climate-related events. In addition, the results provide further evidence that the Portland region shares many similar challenges to other urban areas in terms of climate-proofing for adverse events. In fact, should a Chicago or European-type heat event occur here, we can expect disparate impacts. Given these results, the policy relevant questions are: What can be done? By whom? And will preventative actions create an equitable distribution of benefits?

## Building out a Full Response

Developing mitigation strategies that solely focus on technological approaches, while laudable, are only

part of the solution. Few studies examine the social dimensions of climate related events. Our results shift this trend. For example, our results indicate that those living alone and renting are exposed to the hottest and most polluted areas of the region. While living in these areas does not, in and of itself, suggest that all members of these groups are at risk from heat stress or respiratory illness, it does suggest that the combination of potentially dangerous environmental conditions and limited awareness of remedial measures could lead to health disparities in some populations more than others. This is supported by another body of research which suggests that the people who suffer from adverse health conditions do so because of a combination of environmental and social conditions that limit their ability to improve their environment<sup>3</sup>.

➤ Climate, continued on p. 10.

<sup>1</sup> A more detailed description of the literature, methods, and findings are available through a forthcoming peer-reviewed journal article.

<sup>2</sup> Hart, M and DJ Sailor, 2009. Quantifying the influence of land-use and surface characteristics on spatial variability in the urban heat island. *Journal of Theoretical and Applied Climatology*, 95:397-406.

<sup>3</sup> (a) Patz, J. A., Campbell-Lendrum, Holloway, T and Foley, JA. (2005). Impact of regional climate change on human health. *Nature*, 438: 310-317.

(b) Kalkstein, L. S., & Green, J. (1997). An evaluation of climate mortality relationships in large US cities and the possible impact of a climate change. *Environmental Health Perspectives*, 105(1): 84-93.

In terms of what to do, we might begin by challenging assumptions which describe all urban residents as *active consumers* of social services, whether those services are needed during daily life (e.g., public transit, police) or during catastrophes (e.g., heat waves, floods). A consumer-oriented approach to social service places the responsibility on the individual, often leaving out the role of the larger system within which each person is living. Indeed, the colossal public health and financial consequences from recent extreme climate events indicate those communities with the weakest capabilities and greatest need were least likely to get them. We might rather begin by developing proactive social and political programs for addressing inequities from a systematic perspective. In his seminal work *Heat Wave* (2002), Klinenberg, makes such an argument by stating that, “...the health risks of future heat waves will continue to grow so long as there are no strong public policies to address the social, ecological, and physiological conditions that make everyday life so precarious, and extreme events so treacherous, for the rising population of vulnerable city dwellers.”<sup>4</sup> Accordingly, we must seek to develop strong policies that reduce the distances between those advantaged and disadvantaged; strong policies that provide the most vulnerable populations better access to public services; and strong policies that raise the awareness about the shared social and financial costs associated with poor planning and design. It is in this spirit that we offer these findings, which we hope will assist urban planning and public health organizations in combating social isolation and to expand involvement of marginalized communities in the political and planning process. ✨

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<sup>4</sup> Klinenberg, E, 2002. *Heat Wave: A social autopsy of disaster in Chicago*. The University of Chicago Press.

## Meeting the Needs of Our Region

Can the needs of our growing population be met without taking over farm and forest land? Metro’s conclusion: Yes, we can!

Metro is legally required to provide sufficient land to accommodate future population growth. However, before expanding the urban growth boundary, it must demonstrate that the need cannot reasonably be accommodated on land already inside the boundary.<sup>7</sup>

The analysis shows that expansion of the UGB is not necessary to meet anticipated housing needs. Despite a growing population,<sup>8</sup> these needs can be met with land that is already zoned for housing—if we better utilize more of that land.<sup>9</sup>

How do we use land more efficiently? We adopt public policies, create programs, and incentivize projects that will lead to better use of the land within the UGB. We invest in transportation alternatives—enhanced light rail, bus service, sidewalks, bike lanes, etc.—that support higher density and mixed uses in existing neighborhood centers. Other tools include cleaning up brownfields and supporting infill of developable land.

If we were truly business-minded, we would avoid the conditions that encourage inefficient growth patterns and the counterproductive spending that undermines efficient public investment in the long run. Infill development creates the conditions where the local, home-grown “Mom and Pop” enterprises can succeed. Small business take advantage of the urban density that creates a solid customer base, fostering creativity and experimentation (aka research and development), reducing shipping costs, and providing an increasingly rich infrastructure to

<sup>7</sup> Oregon Statewide Planning Goal 14: Urbanization (emphasis added).

<sup>8</sup> Metro estimates that the regional population will grow from about 2.2 million today to between 3.6 and 4.4 million in 2060. The region is much larger than the area inside the Urban Growth Boundary; it includes the seven counties of Washington, Multnomah, Clackamas, and Yamhill Counties in Oregon, and Columbia, Clark, and Skamania County in Washington. Metro Population and Employment Forecast, Executive Summary, March 2009, p. 5.

<sup>9</sup> UGR Executive Summary, p. 9.

<sup>10</sup> Metro website, Urban revitalization: Centers and corridors.



UGB 185th near W. Union. Photo by Marcia Sinclair.

support both businesses and their customers, who may possibly be neighbors.

## Making the Right Choices

The region’s long-range plan, the 2040 Growth Concept, focuses on developing in regional and town centers, on main streets, and along transit corridors in order to foster the livable communities and natural beauty that make our region special.<sup>10</sup> Focusing investment in these areas uses urban land most efficiently, and it is becoming clear that they also make for more equitable communities.

Government funds are tight, which leads to difficult choices about where to invest. But the data show that investing inside the UGB rather than on the edge would protect farm and forest land while also cleaning up blighted brownfields in our cities and towns. It would lead both to a better life for lower income populations, and to better use of public dollars, leading to a better life for everyone.

**To learn about what you can do about Regional Reserves, go to Action Alerts at [www.clfuture.org](http://www.clfuture.org).** ✨

Mara Gross is CLF’s Policy Director and Dianne Riley is CLF’s Equity Agenda Coordinator.