

Climate change will have region-specific impacts on human health, economy

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Gregory Wellenius (right), an associate professor of epidemiology, collaborates with associate professor Joseph Braun and doctoral candidate Geetika Kalloo (center) to study the complex connections between our environment and health in Brown University's School of Public Health. Credit: David DelPoio

The Earth has already warmed approximately 1.7 degrees since 1901,

the Fourth National Climate Assessment (NCA) reports, and projected warming between 2.7 degrees and 3.6 degrees by 2100 will bring even more record-breaking storms, rising sea levels and spread of disease-carrying insects.

Gregory Wellenius, an associate professor of epidemiology in Brown University's School of Public Health, researches how the places people live impact their health, particularly the impact of air pollution, and how changing climate and rising temperatures will influence health and well-being. He is also studying how to create communities and cities that are healthier, more sustainable and more resilient.

In late November, the [federal government](#) released the second volume of the NCA, a congressionally mandated report by the U.S. Global Change Research Program. Wellenius was a contributing author for a chapter focusing on how climate change would affect residents of the Northeast.

Wellenius and Dr. Perry Sheffield, an assistant professor at the Icahn School of Medicine at Mount Sinai who contributed to the same chapter of the report, also wrote a commentary about the significance of the report for the journal *Epidemiology*. The commentary was published on Tuesday, Nov. 27.

Wellenius shared his insights in the wake of both the report and the commentary.

Q: What does the fourth installment of the NCA add to the conversation about climate change? What would you say is the main conclusion?

This assessment is published every four years, and what the fourth NCA adds is a focus on what matters most to people. It's not about how the

changing climate is affecting the environment—it's how the changing climate is threatening the things that we as people that live in these regions care about most. This report included 10 regional chapters to highlight how continued climate change threatens those aspects of our lives and livelihoods that people value most in each region of the country, as well as examples of steps being taken to minimize those risks across the country. An additional 16 chapters integrate the major themes across the country.

Although all Americans care about their health and economic livelihoods, the threats from continued climate change are specific to each location. For example, the Northeast has a lot of seasonal tourism—from fall foliage to winter skiing and summer beach vacations—as well as fishing and agriculture, all of which are under threat from continued climate change. The report focuses on how climate change is threatening our families, our communities, our kids. This document provides a very comprehensive description of how continued climate change threatens our way of life, which differs from community to community.

Q: The title of your *Epidemiology* commentary is "The U.S. Government just published a new report detailing the impacts of climate change on Americans: Does it matter?" So, does it?

There have been several reports in the last few months about the threat of climate change. For example, the Intergovernmental Panel on Climate Change just released the 1.5 degree Celsius report and the Lancet just posted the Lancet Countdown. The NCA report is 1,500 pages, involved more than 300 experts and cites more than 6,000 references, so it would be easy to think of it as just another big, government report. But it is important because it highlights how continued climate change threatens the way we live, work and play, today and into the future. The report also gives us a few reasons for optimism. For example, despite the fact

that the current administration is hostile to climate change science, there are hundreds if not thousands of federal employees—including the hundreds who worked on this [report](#)—actively working to reduce the risks of climate change and its impacts on our communities.

Q: What is your opinion on the current administration's stance on human-caused climate change? Can we do anything besides work at a more local level?

The current administration is short-sighted, preferring short-term economic gain and political ideology over policies that would protect the health, well-being and [economic opportunities](#) of current and future generations. State and local governments and large corporations have begun to fill the void left at the federal level. Federal policies would definitely help, but there's so much to be gained from climate action at local level. And you see it being done: States, cities and communities are taking very active roles in reducing their greenhouse gas emissions—mitigating future climate change—as well as better preparing their residents for the future climate risk, including extreme temperatures, severe storms, air pollution episodes, sea level rise, spread of infectious diseases, lower crop yields and so on from continued climate change—adaptation. I think that there is hope, the pace of change is always too slow, but we are moving in the right direction.

Q: As far as climate change mitigation and adaptation are concerned, what steps could Rhode Island legislators take to improve the resilience of the state?

Rhode Island had the first commercial offshore wind farm in the

country, which was very exciting. Now that is a technology and approach that is really taking off in our neighboring states, so Rhode Island has set an example. On the other hand, there's always more we can do. There's going to be some hard choices to make in terms of the cost of reducing future greenhouse gas emissions as well as infrastructure development. How are we going to continue to develop our cities and towns in Rhode Island to make those communities more resilient to the severe weather and other climate changes that are already here?

Q: In your Epidemiology commentary, you mention the importance of a pipeline for climate researchers. Can you provide any insight for Brown students considering a career in climate research?

I think that students today have an incredibly exciting opportunity. There are critical moments in history when being in the right place at the right time will give you opportunities to be new leaders in a field. Climate science has a long history, but science at the intersection of climate and health is a really new concept. There are relatively few people in the world working specifically in this area so there are tremendous opportunities for young people with new ideas, bringing combinations of technical skills to bear on this great challenge. Every great challenge comes with great opportunities to make a huge impact and a huge difference.

I encourage students who are interested in pursuing careers in climate research—specifically climate and health—to excel in a discipline, but we really need people who can bring together multiple disciplines to tackle problems in new ways. And for students who are thinking about disciplines that haven't traditionally been a part of this conversation, I think that's where the biggest opportunities are available. For example, there's so much potential in the use of big data and artificial intelligence,

new computational techniques to bring together data sources that we haven't fully leveraged in the past.

Students at premier institutions such as Brown also have an opportunity, really a responsibility, to advocate for [climate](#) action by encouraging their institution to reduce their carbon pollution and their government representatives to enact policies to better protect us and our communities from the threat of [climate change](#).

More information: Gregory A. Wellenius et al. The US Government just published a new report detailing the impacts of climate change on Americans, *Epidemiology* (2018). [DOI: 10.1097/EDE.0000000000000952](#)

Provided by Brown University

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