Money to burn: As the wealthy get wealthier, carbon emissions grow in US states

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Across the U.S., state-level carbon emissions are higher in states where income is more highly concentrated among the wealthiest residents, according to a new study by two Boston College researchers.

On a global level, the connection between national wealth and carbon emissions has been well documented. The study, by sociologists Andrew Jorgenson and Juliet Schor, is the first to link income inequality and

carbon emissions within and across the individual U.S. states.

The study found that state-level carbon emissions between 1997 and 2012 were positively associated with the income share of the top 10 percent of a state's population, according to the findings, published online and in the April edition of the journal *Ecological Economics*.

Using the 2012 state data for carbon emissions, and based on the statistical analysis reported in the research article, a one percent increase in the income share of the top 10 percent of a state's population results in tons of additional carbon emissions, led by:

- 1. Texas - 812,325 to 934,174 metric tons
- 2. California - 437,035 to 502,590 metric tons
- 3. Pennsylvania - 284,980 to 327,728 metric tons
- 4. Florida - 269,030 to 309,395 metric tons
- 5. Illinois - 261,170 to 300,966 metric tons
- 6. Ohio - 260,622 to 299,716 metric tons
- 7. Louisiana - 246,618 to 283,611 metric tons
- 8. Indiana - 232,886 to 237,819 metric tons
- 9. New York - 196,234 to 225,670 metric tons
- 10. Michigan - 184,835 to 212,560 metric tons

South Carolina was the median in the analysis, with income share growth adding 89,175 to 102,551 metric tons of carbon emissions in 2012. The District of Columbia saw the lowest growth in carbon emissions at an increase of 3,251 to 3,738 metric tons for each 1 percent increase in wealth.

The findings come as states are increasingly taking the lead in their own environmental protection. California Gov. Jerry Brown recently pledged the state would maintain its broad environmental regulations, regardless of any federal shift toward deregulation.

"We think it is safe to say, in terms of environmental policy and action, it is going to be much more active at the state level than the federal level," said Jorgenson, a professor of sociology and environmental studies. "Given the uncertainty of the regulatory environment at the federal level, states like California are saying they will not move away from their policies even if the federal agenda on climate change makes a 180-degree turn from the prior administration."

Spending power drives carbon-intensive consumerism. But so do the political clout and economic power of the wealthiest individuals, according to Jorgenson and Schor, whose analysis with co-author and BC graduate student Xiaorui Huang employed established economic models that assess the political and economic influence of individual wealth on society.

"First, income concentration leads to concentrated political power and the ability to prevent regulations on carbon emissions," said Schor, a professor of sociology. "Second, high income consumers are disproportionate carbon polluters."

The researchers tested the influence of a well-established statistical measure of income inequality, known as the Gini coefficient. That analytical tool reports inequality in a general sense, but doesn't show where inequality exists, said Jorgenson. So the researchers turned to a measure that captures the top 10 percent of a state's population.

"What we find here in the context of income inequality and carbon emissions is that it's about the concentration of income at the top of the distribution," said Jorgenson. "In our statistical models, where the Gini coefficient is non-significant, across the board the wealth of the top 10 percent is. That tells us that it really is about income concentration at the top end of the distribution."

In addition to income, the analysis weighed additional factors - some already well-established as contributors to carbon emissions - such as population size, per capita gross domestic product, urbanization, manufacturing as a percentage of state GDP, fossil fuels production, and the level of state's commitments to environmental regulation.

The researchers drew from a broad array of sources, including statistics from the U.S. Environmental Protection Agency, U.S. Census Bureau, the U.S. Department of Commerce, the U.S. Energy Information Administration, the League of Conservation Voters, and databases including the U.S. State-Level Income Inequality Database at Sam Houston State University and the internationally supported World Wealth and Income Database.

In addition to advancing the understanding of the factors that force changes in the climate, Jorgenson said the findings contribute to a more expansive view of the harmful effects of income inequality, which has been shown to foster poor outcomes in measures such as health and well being.

"Equalizing incomes has all kinds of potential benefits," Jorgenson said. "This suggests a holistic view of sustainability, equalizing income distribution within the U.S. can have social and environmental benefits. And they can have a global benefit too, since the U.S. is such a significant contributor to climate change."

More information: Andrew Jorgenson et al, Income Inequality and Carbon Emissions in the United States: A State-level Analysis, 1997–2012, *Ecological Economics* (2017). DOI: 10.1016/j.ecolecon.2016.12.016