

Ohio Environment Report

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Does Climate Change Threaten Ohio?

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It is interesting to listen to the increasingly shrill voices on climate change. On the one hand, I agree with the conclusion offered by many that society should take the threat to our climate seriously, and that we should all engage in modest policy. On the other hand, many groups are making such alarmist statements, it is hard for me to take them seriously.

Consider the recent report by Environment Ohio titled "What's at Stake: How Global Warming Threatens the Buckeye State." The report can be obtained at <http://www.environmentohio.org/>. This report claims that global warming imminently threatens Ohio's forests and agriculture in particular, and this should motivate Ohioans to support climate legislation. The report links some statistics on current industry with a bunch of assertions about ecological changes. The report does not actually assess the potential economic impacts.

Having spent my entire career developing methods to measure the economic impacts of climate change on timber and forestry, and having carefully reviewed the literature on agriculture, I am astonished at the claims in this report.

Consider their estimates of the size of the forest products and agricultural industries. The report claims that forest industries are worth \$15 billion and the agricultural industries are worth \$93 billion in annual output. This amounts to \$108 billion. If these numbers were true, then the forest and agricultural industries would account for 24% of our state level gross domestic product of \$452 billion per year. If we really obtained this much income from agriculture and forestry, that would be astounding. But the Bureau of Economic Analysis (<http://www.bea.gov/regional/gsp/>), who actually calculates these kinds of statistics, suggests this is not the case.

For example, the forest industry, which includes harvesting wood products and producing pulp, paper, furniture and other wood products, is worth \$5 billion per year according to the Bureau of Economic Analysis, not \$15 billion. Pulp and paper is the largest component at \$2.1 billion per year, with furniture manufacturing being worth \$1.5 billion and other wood products about \$1.1 billion per year. Harvesting of timber is worth less than \$0.3 billion per year (and this number actually includes fishing).

Now consider how much of this income is actually susceptible to changes in climate? The biggest impact will be on the trees themselves and the people who harvest them. Downstream participants, such as the pulp and paper industry and other wood product

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manufacturers already import and export raw wood products and thus will be insulated to a large degree. This does not mean that they are out of harm's way entirely, but they are more affected by their ability to manage their supply chain (which includes sourcing material from throughout the world) than they are by climate change.

Based on my own analysis published in a variety of places, by 2060, the range of effects on landowners and the foresters who harvest the trees in Ohio would be a 3% loss to a 255% gain in annual output. Thus, the \$0.3 billion per year could decline to \$0.291 or it could increase to \$0.8 billion per year. The results of most studies examining climate change impacts on timber markets in the US suggest that timber industries in places like Ohio likely would benefit from climate change, not be harmed. In fact, nearly all economic studies conducted to date looking at potential climate impacts suggest that prices for timber products will fall over time as a result of increasing worldwide supply of timber resulting directly from climate change (Easterling et al., 2007).

This is not to say that climate change does not present challenges. Of course, rising temperatures and changes in precipitation will affect us here in Ohio. But there is currently scant evidence that the economic implications of these changes will be dramatic for the Ohio economy. Most evidence actually suggests that the largest negative impacts will occur outside the United States, particularly in the tropics, where temperatures are higher to begin with and people are less able to adapt.

The real issue for Ohioans actually relates to the cost of climate policy, not the damages from climate change. The report by Environment Ohio suggests that Ohio should reduce its greenhouse gas emissions by 20% by 2020 and 80% by 2050. The report does not talk about the costs. There have been lots of studies conducted on the costs, though, and these studies suggest that real costs are unavoidable. To achieve these kinds of reductions, Ohioans could end up paying around \$40 per ton CO₂ (see Clarke et al., 2007). Ohio currently emits around 270 million tons of CO₂ per year, or 24 tons CO₂ per person. This means that Ohioans would need to pay about \$10.8 billion per year in new taxes on carbon, or around \$960 per person per year to reduce emissions by 20% by 2020.

I don't want to belabor these high cost estimates because my reading of the evidence suggests that we should undertake some new policies in the US to alleviate climate change. The Intergovernmental Panel on Climate Change, for instance, suggests that the economic damages from climate change range from \$3-\$14 per ton CO₂ (Yohe et al., 2007). If we instituted policies at the upper end of this range, \$14 per ton CO₂, that would cost Ohioans around \$3.8 billion per year, or \$336 per person per year. This rate of taxation is substantially less than the \$40 per ton CO₂ recommended by Environment Ohio, but it is roughly in-line with the proposals debated by Congress last year.

There is plenty of evidence from ecology to economics to support undertaking modest climate policy along these lines. The evidence does not include the likelihood of exorbitant damages to Ohio's forests or crops. It does include things like sea-level rise, abandonment of some species, increasing extent of disease vectors, reductions in

agricultural production in tropical countries, and other factors. As a society we should shoulder some responsibility for the future impacts of climate change. However, we should do so after reasoned discussion about costs and benefits rather than after being scared by the latest alarmist view of potential impacts.

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