

## Iowa Climate Statement 2015: Time for Action

Over the past four years, researchers and educators at nearly every college and university in Iowa have produced annual statements to communicate in plain language the state of climate science and the impacts of climate change on Iowans. This process has been open to all of our state's academic climate experts to ensure that our statements are factual. Climate change has been measured, and the integrity of the measurements has been accepted through review by thousands of scientists worldwide.

The upcoming Iowa caucuses provide Iowans with a unique opportunity to bring their questions into the national conversation about climate change. As presidential candidates come to our state to ask Iowans for their votes, we feel it is important to know how candidates use science to inform decisions. Therefore, we hope that all candidates will be asked and will answer at least the following question:

***Iowa farmers and communities are already adapting to climate change, and 188 researchers and scientists at 39 Iowa colleges and universities have signed a statement warning that its effects are expected to get worse. What policies do you support to address this critical issue?***

In support of this question, we share the following information:

- Humans are adding heat-trapping gases to the atmosphere. These gases are a major contributor to climate change. (ICS 2011-2014; IPCC 2013, Chapter 10; Santer, et al., 2009; Stott, et al., 2010)
- Climate change is already having significant effects on Iowans economically, socially, and psychologically, and these impacts are expected to intensify (ICS 2011-2014; IPCC, 2013, Chapters 11 and 12; Mearns, et al., 2013, Doherty and Clayton, 2011).
- As the climate warms, evaporation increases (IPCC, 2013, Chapter 2). During dry periods with little rain, increased evaporation makes dry soils even drier, while during wet periods it adds even more moisture to the atmosphere. In these ways, climate change may strengthen both droughts and floods (Kundzewiczab, 2014; Seneviratne, 2010; Strzpek, 2010). The recent sequence of extreme rainfall years—flood events in 2008, 2010, and 2014 interrupted by the drought of 2012—illustrates the Iowa impacts from enhanced evaporation. The emergence of years with both drought and flood, as in 2011 and 2013, is concerning (ICS 2011-2013).
- There is clear evidence that the frequency of intense rain has increased in Iowa over the past 50 years (ICS 2012; Min et al. 2011).
- Natural systems are responding to the increase in the global average temperature (Bradley et al. 1999; Gordo, 2007). The northward expansion of species formerly restricted by a colder climate could disrupt natural ecosystems (IPCC 2014, Chapter 4; Cleland et al., 2006; Bellard et al., 2012) and introduce new agricultural pests and diseases (IPCC 2014, Chapter 7; Parmesan et al. 2003; Diffenbaugh, 2008).
- The changes are also expected to lead to negative health effects for Iowans, including the direct impacts of flooding (Pinkerton et al. 2012), stresses on the heart and lungs (Caizzo et al. 2013), allergens that are more abundant and have a longer season (Ziska et al. 2003), and the spread of diseases carried by organisms like mosquitoes and ticks (Patz et al. 2014).
- If greenhouse gas emissions continue to increase, agriculture, human health, and economic stability will be affected in new and dramatic ways (ICS 2011-2014; IPCC, 2013, Chapters 11 and 12; Mearns, et al., 2013).
- There are policies and practices that, if implemented, would help Iowans adapt to climate change in the short term and avoid unmanageable consequences in the long term (ICS 2012-2014)

We recognize the important responsibility Iowans have in the process of vetting presidential candidates, and we encourage all Iowans to demand that political leaders ground their decisions in sound, peer-reviewed science and ask them what specific policies they will advocate to address climate change in Iowa.

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