GLOBAL INSTITUTE of SUSTAINABILITY
ARIZONA STATE UNIVERSITY

DECIDING TO DEAL WITH CLIMATE

by Anthony Brazel for the *Arizona Republic*
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This article is one in a series of articles contributed by Arizona State University's Global Institute of Sustainability, which catalyzes and advances inter-disciplinary research and education on environmental, economic and social sustainability.

During the 1960s, I had the good fortune of spending several summers on some ice- and snowfields in Alaska, at a time when it was commonly thought that global cooling was a climate trend and that we were returning to an ice age. A few decades later, I returned to Alaska to map and analyze glaciers, and found many dramatically retreated up their valleys by one-quarter of a mile or more.

Now, with satellite systems, we can see the dimensions of these glaciers in 2007, which further reveal a retreat. The latest data from the Intergovernmental Panel on Climate Change (IPCC) show that many glaciers worldwide, including many in Alaska, experienced similar retreats and melting in the second half of the 20th century. This all is coincident now in what we call a global-warming period.

Through many scientific reports, educational outlets and media sources, we are increasingly becoming aware of global warming and possible solutions through mitigation and adaptation. Global warming is the increase in the average temperature of the Earth's near-surface air and oceans during this past century. Air temperature has risen a little over 1.0 degree Fahrenheit over the last 100 years. We know there are extremes in warming, and even in cooling, from place to place, but this increase represents an overall warming of the globe.

Changes in the atmospheric abundance of greenhouse gases and aerosols, in solar radiation, and in land- and ocean-surface conditions alter the energy balance of the climate system and can sway overall Earth temperatures. Significant environmental alterations may occur when the Earth's overall temperature moves in an upward or downward trajectory by over 1 degree over decades to a century. Over the last decade, the scientific community accumulated evidence that indicates continued greenhouse-gas emissions from industrialization and human activity are probably tied to the globe's temperature increase.

It's been said that a consensus exists among a large number of scientists studying this issue that greenhouse gases may be a major cause of global warming. But scientists still need to dig deeper into causes of climate change (and glacier changes) to make this connection between human activity and global warming, and to produce models that refine current predictions of our future, which suggest a further 3- to 4-degree rise by the middle of the 21st century.

Research conducted by colleagues at ASU's Global Institute of Sustainability, Decision Center for a Desert City and School of Geographical Sciences shows that in the mountains of Arizona, there may be significant reductions in future decades in the snow cover that is essential to sustain water resources.

We might best respond to changes like global warming not with neglect, but with setting policies that could curtail or cope with change, and that must be based upon more sound scientific information and informed judgment on what to do in the future.

Balancing energy resources and demands, finding ways to cope with risks of environmental change and developing sustainable technologies are three areas in which decisions made now will shape the lives of future generations.

Although fact-finding and theory development and testing are always important in science, decision-making on environmental issues, including global warming, must become a better science in and of itself, given facts as we know them from the science community.

The recent Focus on the Nation event and other educational activities will help us be more aware of possible environmental changes on the horizon, so we can make our own reasoned judgments.

Anthony Brazel is a professor in the School of Geographical Sciences and is affiliated with the Global Institute of Sustainability. He received Fellow status in the American Association for the Advancement of Science through his previous contributions to understanding high-mountain, cold-environment climates and impacts on snow and ice.