Statement of Purpose

I look at differences between expectations and reality. The expectations are from computer models of the climate system. Computer models can tell us about historical changes in climate – the changes we should have seen in response to things like human-caused increases in greenhouse gases. My job is to compare these expected changes in climate with actual observations.

In my scientific life, expectations and reality match up most of the time. There are also times when they don't match up. I try to understand both the "matching up", and the "not matching up". The bottom-line message from this work is that there's very good agreement between most model expectations and reality – but we only find this agreement if models include human influences on the climate system. Natural factors alone don't give us "matching up" between expected and observed changes in climate.

I've also learned that when model expectations and reality don't match up, the differences between the two are revealing. They tell us something useful about uncertainties in real-world climate measurements, about factors missing from the model simulations, and about the effects of natural climate variability.

That's the way science works. When expectations and reality do not align, we learn. We try to understand. We try to improve the models. We try to reduce uncertainties in the observations. We keep on iterating. We keep on confronting expectations with reality, until what once was mysterious is no longer puzzling. Advances in scientific understanding are unstoppable, even when magnitude 8.0 seismic shifts occur in our political system.

In life, too, there are differences between expectations and reality. After the last Presidential election in the United States, over half of the voting population

encountered differences between what they wanted and what they got. They expected a United States in which racism, religious intolerance, and misogyny do not have a place. They expected a United States government determined to find solutions to the existential problem of human-caused climate change. They expected a country eager to find cheap and efficient ways of producing low-carbon energy – a country ready to become a clean energy leader rather than a follower of others. They expected a country in which rational and respectful discourse is possible, in which ignorance is not glorified, and in which fear is not used as a motivational tool.

As yet, we do not know whether reality will match these expectations. Perhaps the harsh rhetoric of the campaign trail will give way to more thoughtful speech. Perhaps solutions will replace slogans, and divisiveness will give way to inclusiveness. Perhaps the job will change the job-holder. Perhaps pragmatism will win out over ideology. Perhaps there will be a few moments of clarity, when a signal of understanding – understanding of the President's responsibility for our country's future, and for our planet's climate future – emerges from the continuous background noise of special interests, lobbyists, ideologues, and forces of unreason.

Some of my colleagues, younger and older, have concerns about this new post-election reality. They wonder whether there is still a place for kindness, tolerance, and rationality, and for curiosity about this strange and beautiful world in which we live. They are unsure whether "climate scientist" is still a viable career option. They are concerned about the climate risk their children and grandchildren are already being exposed to. They know how that risk will grow if we do nothing to reduce emissions of greenhouse gases.

I do not have good answers for their questions and concerns. All I can tell them is that we need to understand and learn from these "expectation-versus-reality" differences, just as we do in climate science. I tell them that we can find clever ways of using and

amplifying our scientific voices, and of declaring who we are and what we stand for. I tell them that we have the amazing privilege of being in a position to advance scientific understanding, to work on problems that are truly important. I tell them that this is not the time for despair – it's time for leaving the sidelines and entering the public arena. And finally, I give them my post-election statement of purpose, and tell them that this is how I have chosen to spend my time. That's something we all have control over – how we choose to spend our time.

Personal statement of purpose:

1. To continue working to improve scientific understanding of the nature and causes of climate change;

2. To continue to inform the public and policymakers about all aspects of climate science;

3. To continue to seek constructive engagement and respectful dialogue;

4. To continue to be in the public arena, to be a voice of reason, and to be accountable for the research I do.

Ben Santer, San Ramon, November 22, 2016