



How Woody Guthrie can help us fight for science

After the election of Donald Trump, Jacqueline M. Vadjunec offers a message of resistance and hope from deep within the US Bible Belt.

When I moved from Massachusetts almost a decade ago to teach at Oklahoma State University, many colleagues were afraid for my career. I work on the human dimensions of global environmental change, and Oklahoma has a long and complex history with science, including climate change.

Oklahoma was the first state to ratify 'anti-Darwin' legislation in 1923 and today is home to key sceptics in the war on climate change, including Republican Senator James Inhofe and Scott Pruitt, the state's attorney-general, who earlier this month was nominated to run the US Environmental Protection Agency. These politicized debates trickle down, and both evolution and human-induced climate change remain contested topics, especially in schools.

However, Oklahoma is also the home of protest singer Woody Guthrie, a visible example of resistance in the 1930s class and culture wars between rural and urban values. If Woody could use his voice to speak up, so can scientists.

In truth, my career is fine, and my colleagues are supportive. I not only manage, but also thrive. And if I can, then so can other scientists who find themselves concerned about the tidal wave of climate scepticism that comes with last month's election of Donald Trump and his associates. The election might have powerful effects on science, policy and funding. But I want to stress the power and promise of human agency.

In my case, adjustments are minor, but might seem substantial elsewhere. I realize that in my day-to-day actions in the classroom and in my research with family farmers and ranchers, I probably hold a minority viewpoint on human-induced climate change. In the classroom, I am sensitive to the fact that many of my students have family ties to the oil and gas industry. I regularly see them struggle with the local contradictions. I try to create a place of mutual respect to embrace this struggle on their own terms, while also trying to focus on our role as global citizens facing global challenges. It is not always an easy balancing act; these experiences have taught me that most students care about global environmental change, but often have little previous exposure to such issues — in part because of the decisions of local politicians and school boards. In our debriefing at the end of the semester, students often express frustration that they weren't exposed to many of the issues surrounding climate change at a younger age.

I also learned that actively listening to (instead of talking at) farmers and ranchers who care about sustaining their land and livelihoods is a good way to open dialogue. We can then find common ground on pressing environmental issues, such as the depletion of the Ogallala Aquifer, encroachment of invasive and nuisance woody-plant species on pasture lands, and the compounding impacts of long-term cyclical

drought. People in Oklahoma care about the long-term sustainability of their natural resources, but they often use language that is different from that of climate scientists and elected officials.

We should remember the power of the small. In *Weapons of the Weak* (Yale Univ. Press, 1985), James C. Scott illustrates the power of "everyday forms of resistance". It is through these small acts (both intentional and unintentional) that power can be contested, destabilized and renegotiated. There may be increased climate scepticism, but there will also be more scientists, teachers and citizens banding together to respond.

Despite official policies that limit climate-change education, a recent survey of 115 science teachers in Oklahoma showed that more than 80% teach climate change in state schools, either formally or informally (N. M. Colston and T. A. Ivey *J. Educ. Policy* **30**, 773–795; 2015). Faced

with few locally available teaching resources, most teachers write their own lesson plans. They also take advantage of 'teach the controversy' campaigns — intended by some to undermine the scientific consensus — to introduce students to locally controversial topics such as human-induced climate change, which otherwise might be seen as off limits. Consequently, more than two-thirds of these teachers say that they experience no pushback from students, parents or administrators (N. M. Colston and J. M. Vadjunec *Geoforum* **65**, 255–265; 2015).

In resisting the mood of anti-science, researchers need to reach out to a diverse public in more accessible ways. We also need to accept different ways of knowing or even talking about climate change: ways that open doors to start a conversation;

ways that are more context specific, culturally sensitive and nuanced than science in general might be comfortable with.

For example, state politics in Oklahoma are shaped in part by continuous interactions with Oklahoma's 39 Tribal Nations. These Native Americans, in conjunction with researchers and media artists, are speaking up to provide their own unique perspectives on climate change (see go.nature.com/2grktji). Such projects show that indigenous people care deeply about climate-change issues, but that when it comes to adaptation and mitigation, they would like their traditional knowledge to be valued along with that produced by Western science.

Where there is climate war, there is also climate resistance, in large and small ways. I urge scientists not to lose heart, but to develop tools and projects that are useful to citizens, as well as to our peers and funding agencies. In practising such open-minded science, we might find that we have more allies than are visible at first glance. ■

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