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A critical political ecology of consensus: On "Teaching Both Sides" of climate change controversies

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ABSTRACT

In the United States, contemporary anti-science education coalitions are increasingly linking climate change and evolution using "teach the controversy" campaigns. Awareness of this political phenomena raises questions about the extent to which portrayals of global warming predictions as mere knowledge claims undermine efforts to increase public understanding of scientific consensus about global warming. This paper uses a critical political ecology framework to explore the problematization of climate change consensus located and performed across discourses of secondary science teaching and learning. Theories of resistance are used to analyze teachers' everyday experiences with classroom pushback about climate change. Data collection included key informant interviews with state science education stakeholders and on-line survey of 5th–12th grade science teachers in Oklahoma, USA. The article synthesizes the situated discourses of Oklahoma science teachers' and their attitudes about teaching climate change in the face of public controversy. Our analysis demonstrates teachers marginalized by anti-science controversies but engaged in everyday acts of resistance to political, ideological, and religious norms. Most notably, science teachers re-purpose "teach the controversy" frames as a way to introduce climate change where it might not otherwise be included. We argue that, contextualized within a history of contestation over the teaching of evolution, the practice of teaching 'both sides' is an important boundary ordering device that bridges convinced and skeptical discourses in the classroom. This research informs new roles and possibilities for science education on global environmental change by reminding climate scientists, educators, and policy advocates that all climate change knowledge is coproduced.

1. Introduction

Perhaps the most vocal and recognized climate change denier in contemporary United States politics, Oklahoma Republican Senator James Inhofe was infamously quoted as calling human-induced climate change the "greatest hoax ever perpetrated against the American public" (Inhofe, 2003, S10022). Formerly chair of the Senate Committee on Environment and Public Works, Inhofe publicly questions the scientific evidence and motivations of scientists supporting global warming theories (Inhofe, 2012). The emergence of the term "sound science" is synonymous with conservative pushback and, arguably, frames public discussions about climate change around normative questions about the relationship between science and policy (Demeritt, 2006, 457).

In light of scientific consensus about anthropogenic climate change, this tactic can be described as a form of manufactured scientific controversy deployed by self-interested parties to stifle policy-making discussions (McCright and Dunlap, 2010). As Demeritt (2006, 474) explains, the resulting "veil of technical objections to climate change science" invokes a logical positivism that problematizes scientific consensus norms and sustains public controversies about climate change. Indeed, the success of similar climate denial campaigns aimed at engendering doubt about scientific consensus, e.g. Climategate (Mann, 2013) and the Oregon Petition (Washington, 2013), have scientists, educators, and policy advocates alike questioning whether or not portrayals of global warming predictions as mere knowledge claims undermine efforts to increase public understanding of scientific consensus about global climate change (Shackley and Wynne, 1996; Buttel, 2000; Hulme, 2010).

Researchers across diverse disciplines trace the socio-political and rhetorical contestations that sustain public perceptions about a lack of scientific consensus about climate change (Schneider, 1993; McCright and Dunlap, 2000; Demeritt, 2009; Hulme, 2010; Moser, 2010; Oreskes and Conway, 2010; Weart, 2011; Ceccarelli, 2011; Powell, 2011; Washington, 2013). Geographic work on the

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boundaries between science and society contributes a better understanding to the way "climate change knowledge and meaning travels uncomfortably across scales and needs constant reinterpretation as it is applied to different spatial contexts" (Hulme, 2008, 6). For example, Antilla's (2010) comparative analysis of global news sources theorizes the influence of media systems on public perceptions of science. The study findings highlight significant differences between US and global news coverage about climate change tipping points driven by regional framing of climate change as a controversial topic. Other notable work in U.S. climate change denial campaigns (Dunlap and McCright, 2011) and mass media coverage (Boykoff and Boykoff, 2007; McComas and Shanahan, 1999) similarly highlights the polarizing influence of public debate focused on questions of scientific consensus about human-caused climate change.

While there is widespread concern about the deliberate use of the scientific uncertainty frame to delegitimize climate science and to stifle global environmental governance, more research is needed to understand how manufactured scientific controversy is translated across other socio-political contexts and scales of influence. Perhaps considered indicative of the symbolic power of such campaigns on public attitudes, classroom science teachers across the United States now report increasing protests from parents and school administrators who challenge the scientific consensus behind climate change (Wise, 2010; Petrinjak, 2011; Reardon, 2011; Johnson, 2011). While research suggests worldview and political orientation may influence public attitudes about climate change consensus (McCright and Dunlap, 2011; Leiserowitz et al., 2011), it is less clear how climate change denial campaigns might shape teacher's attitudes, the intensity of classroom pushback experienced, and the nature of climate change education in science classrooms (NCSE, 2012).

This article draws on lessons from critical political ecology to explore the situated experiences of Oklahoma secondary science teachers in the face of classroom pushback about climate change. First, we provide background information on the politics influencing science education in Oklahoma, including historical ideological and religious contestations associated with "teach the controversy" campaigns. Blending critical political ecology and resistance theory, we outline a theoretical framework for examining the situated role of science teachers in the coproduction of climate change consensus. Our results show that the repurposing of "teach the controversy" frames allows science teachers to include climate change education where it might otherwise be excluded or contested. As a boundary ordering device, these frames acknowledge, in part, the social construction of science and, in practice, offer opportunities to delineate between the realms of science and religion. In the conclusion, we argue for more research on spaces of resistance, as well as highlight the implications for consensus-based politics on global climate change advocacy.

2. Study area and background

In addition to prominent fossil fuel and agricultural industries, the prevalence of conservative religious political values defines Oklahoma as a unique socio-cultural landscape for studying controversies about climate change in public school settings. For example, as a public icon of conservative climate denial politics, Oklahoma Senator Inhofe's (2012) most recent book on the topic outlines a global warming conspiracy theory that implicates scientists and environmental regulatory agencies in attempts to control the American public and demonize the fossil fuel industry. However, complementary to his scientific skepticism, Inhofe often appeals to Christian religious dogma by suggesting that humans are arrogant to believe they can change God's will or control Earth's changing systems (Voice of Christian Youth America, 2012).

Indeed, according to Author (Sheehan and Vadjunec, 2012, 929) "Oklahoma has the second highest rate in the country of religious adherents belonging to evangelical protestant religions (42 percent)". While mainstream definitions of the Bible Belt emphasize the literal interpretation of the Bible, Brunn et al. (2011, 517) argue that the term "generally pertains to a region associated with fundamentalist Protestantism, [and] puritanical mores." Beyond religion, Bauer (2011, 525) claims that evangelical Protestants of the region have "a conservative ideology in most political and social matters." In Oklahoma, there are instances of town ordinances that support multi-story outdoor crosses as the tallest allowable structures in some small towns. A contemporary example illustrating the entrenchment of religion in Oklahoma politics is a monument of the 10 Commandments at the State Capitol that remains standing in an act of defiance by the Governor, even though the Oklahoma Supreme Court recently declared it unconstitutional (Phillip, 2015). In Oklahoma, politics and religion are highly intertwined when it comes to climate change as well.

2.1. "Teach the controversy" campaigns

Notably, efforts to link climate change with other contested topics like evolution can be found in the legislative efforts of conservative states across the U.S. (Scott and Branch, 2003; Scott, 2013). For example, in 2013, legislative bills proposed in Colorado, Kansas, Montana, and Oklahoma coupled climate change and evolution in attacks against consensus-based science education (Harris, 2013). These "teach the controversy" campaigns often capitalize on the rhetorical strength of public debate about these topics as justification for regulating the balanced teaching of science in public schools. Legislation in Oklahoma aimed at regulating evolution in science education is not new, but the addition of climate change to the list of contested topics is relatively new. Similarly, adaptations of the new nationally developed Next Generation Science Standards (NGSS), which include both detailed evolution and climate change content, were met with resistance from state legislators in Oklahoma during recent standards revisions processes (Colston and Ivey, 2015; NGSS Lead States, 2013).

The coupling of climate change with existing anti-evolution pushback engenders questions about the best ways to advance climate change education in science classrooms (McBean and Hengeveld, 2000; Taber and Taylor, 2009; Wise, 2010; Inman, 2012). In fact, "teach the controversy" campaigns are strongly contested by the scientific community within the United States (Nisbet and Mooney, 2007; Ceccarelli, 2011). Within the context of science education, they are often considered "scientifically inappropriate and pedagogically irresponsible" (Scott and Branch, 2003, 499). "Teach the controversy" frames capitalize on the scientific uncertainty appeals associated with widespread public debate about human-caused global warming. When applied to climate change, the "teach the controversy" slogan also invokes appeals to fairness, openness, and independent decision-making that neatly align with already popularized anti-evolution campaigns (Scott and Branch, 2003). While some research shows that "teach the controversy" frames in the news media are often associated with common sources and geographical areas (Grimm, 2009), this research paper meets the need to contextualize the influence on specific groups, in this case science educators, within these situated political landscapes.

3. A critical political ecology of climate change onsensus

Political ecology (PE) is generally understood as the empirical investigation of the struggle of knowledge, power, and practice that inextricably accompany the politics of environmental conflicts (Watts, 2000; Robbins, 2012). By conceptually focusing on the