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Understanding stakeholder perspectives on agricultural best management practices and environmental change in the Chesapeake Bay: A Q methodology study

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ABSTRACT

This paper examines differences in environmental attitudes and awareness among stakeholders involved in implementing and promoting agricultural best management practices (BMPs) in the Chesapeake Bay. BMP adoption studies have often considered variables such as environmental attitudes and BMP awareness in examining why farmers do or do not adopt BMPs. Such studies, however, rarely consider the range of viewpoints on these issues across diverse stakeholders such as environmental professionals, scientists, regulators, and agriculturalists. Thus, there is little understanding of how and why knowledge about the environment and BMPs might be deeply contested and a source of political friction between multiple types of actors. In this paper, we take up this issue by examining the relationship between one's subjective understanding of environmental changes and one's attitude towards agricultural best management practices. Doing so, the paper examines the ways in which these two domains align within actors, and maps the variance of these views across a diverse set of stakeholders associated with BMPs. We find a close alignment between one's view of environmental change and the value of BMPs as well as deep divisions between farmers and other non-farming stakeholders with regard to these views.

1. Introduction

We live in an age of increased contestation over environmental knowledge (Druckman et al., 2013). Researchers have documented partisan polarization around the basic facts concerning environmental issues such as climate change (McCright and Dunlap, 2011), genetically modified foods (Druckman and Bolsen, 2011), and endangered species reintroduction (Wilson, 1997). While few researchers would doubt the existence of polarized views around various environmental narratives, there is less understanding about the kinds of factors that drive these contestations, with scholars debating whether one's ideas about the causes of, and solutions to, environmental problems are grounded in one's structural position—whether one is a farmer, fisherperson, bureaucrat, businessperson, or activist—or if it is based on values that are idiosyncratically held (Hajer and Wagenaar, 2003; Robbins, 2006). Understanding this distinction is critical because if one's view of the environment is closely welded to identity, then polarization makes it difficult to find common ground among many different actors. If, however, people's values are more variable and less tied to one's structural position, then the opportunity for diverse political coalitions can emerge.

This paper takes up these broad issues of environmental polarization, values, and identity in order to understand how a diverse group of actors view the importance of agricultural best management practices. Best Management Practices (BMPs) are a suite of agricultural practices that are meant to reduce nutrient runoff from farms. These can include maintaining riparian buffers between a farmer's field and a nearby stream, developing nutrient management plans, installing field drainage, using winter cover crops, and practicing no-till agriculture. Because of the declines in ecological and human health that are associated with increased fertilizer and pesticide use, BMPs are promoted in many states, and have also been the focus of a number of voluntary,

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pay-for-performance plans as well as regulations. The success of such efforts, however, has been mixed at best: BMP adoption rates by land users are uneven (Gillespie et al., 2007), and water quality across a number of critical estuaries and watersheds continue to decline (Donner et al., 2004; Leisnham, 2011).

Research on BMP adoption itself has tended to look for various relationships between farmers and BMP adoption. To date, no consistent predictor of BMP adoption has been found (Prokopy et al., 2008). In this paper we contend that this is due partly to the failure of such studies to interrogate the ways in which the identities and values of land users have come to shape their attitudes toward environmental regulation. This paper seeks to examine this relationship with regards to the wide range of actors involved in BMPs, and to understand the relationship between one's knowledge about environmental change and their attitude toward BMPs. In short, we examine the relationship between one's views on a widely promoted yet unevenly adopted environmental policy (BMPs), and one's view of the environment, and track the intersection of these views across many different types of actors. Doing so, this analysis contributes to broader debates over the causes of one's stance toward environmental problems and the extent to which one's view of an environmental problem lines up with their daily engagement with that issue.

Our analysis employs Q methodology, which is a statistically supported method for examining different subjective perspectives around an identified field of inquiry. It uses statistical factor analysis to identify a range of factors that underlie a set of statements that are ordered by participants according to their level of agreement. The researcher interprets the resulting factors as types of discourses (Brown, 1993). Rather than ask predefined questions across a population, Q methodology allows the research subject to define the key ideas for analysis and his or her relationship to them. For example, rather than engaging research subjects with predefined notions of what constitutes agricultural best management, participants are free to express, through interviews, what they believe “best management practice” of land is. The range of responses across actors around this topic is then incorporated into a set of statements that comprise the “Q sort”, where subjects are asked to rank their level of agreement with statements, in relation to all of the other statements. This approach allows for the emergence of different subjective perspectives between actors. It also is able to highlight points of multiple perspectives and allow contradiction within individual subjects to emerge.

We use this method (described in more detail below) to ask two sets of empirical questions. First, is contestation or agreement around BMPs due to the structural position of a person – whether they are farmer, regulator, extension agent, or environmental professional? Or, is one's view of BMPs more idiosyncratic, and not necessarily determined by one's profession? Second, what is the relationship between one's understanding of land use change and their attitude toward the adoption of best management practices?

To answer these questions, the paper examines the following two hypotheses. First, there is a clear divide between land users and non-land users concerning their attitudes toward BMPs and land use issues. In short, one's position as a farmer is congruent with an attitude toward land use issues that are distinct and separate from regulators, environmentalists, NGOs, and non-farming residents. Second, a respondent's understanding of land use change and attitudes toward BMPs are closely aligned. We propose that if one has an understanding of land use change from a synoptic and measurable point of view then it is likely paired with a positive opinion of BMPs. In contrast, more personal and experiential views of land use change are paired with skepticism toward conventional assessments of BMPs.

This paper proceeds as follows. The next section will describe the paper's study site and methods. This is followed by a summary of the significant factors to come out of the Q study. We conclude by assessing the two hypotheses, and discussing how they help explain each other.

2. Literature review

With an eye toward understanding how BMP adoption can be improved, a number of scholars have investigated the adoption of agricultural BMPs by examining social, behavioral, economic, and ecological variables that affect the adoption of these practices (Baumgart-Getz et al., 2012; Belknap and Saupe, 1988; Napier and Bridges, 2002; Greiner et al., 2009; Prokopy et al., 2008; Reimer et al., 2012). Collectively, these studies have been unable to find clear drivers of BMP adoption, with many different positive and negative determinants of adoption emerging, but with few consistent predictors. For example, Knowler and Bradshaw's (2007) metaanalysis of global conservation tillage adoption was unable to find consistent variables that explain adoption. Other studies found positive determinants of BMP adoption, but their effect on adoption was often statistically weak (Rubas, 2004; Prokopy et al., 2008). For example, none of the variables positively associated with BMP adoption in Prokopy et al.'s (2008) metastudy emerged as consistent significant predictors.

Across these studies, BMP adoption is often related to various forms of farmer attitudes toward, and knowledge of, the environment (Gillespie et al., 2007; Knowler and Bradshaw, 2007). A number of studies have more closely examined this relationship by developing various psychological frameworks—such as Ajzen's Theory of Planned Behavior (Ajzen, 1985) or the Reasoned Action Approach (Fishbein et al. 2007)—for understanding the relationship between farmer attitudes and their action (eg. Kaiser et al., 1999; Ahnström et al., 2009). While there are subtle differences between various theoretical approaches, most of them point to attitudes toward the environment as something that is conditioned by many other contextually mediating factors. Such mediating factors can include attitudes toward the behavior itself (Ajzen, 1985), perceived control (Lynne et al., 1995), as well as on-farm environmental, economic, and social constraints (Ahnström et al., 2009). The on-farm constraints mean that place-based contextual factors can shape the degree to which a person's environmental attitudes plays a role in their decision to adopt a particular conservation practice. For example, Reimer et al. (2012) found that farmers with attitudes toward the environment that extended beyond the farm's business itself and into off-farm stewardship benefits were more likely to adopt conservation practices, while farmers more focused on the farm's business were less likely to adopt.

Environmental psychology is not the only field that has informed scholars studying land user approaches toward conservation. A number of researchers across varied disciplines have honed in on the politicized nature of conservation itself, where both policy, and knowledge about the environment, can become a source of political contestation (Forsyth, 2004; Lave, 2012). Thus, seemingly neutral conservation tools, and ostensibly objective facts about the environment, can become highly contested, and even result in purposeful non-compliance with environmental laws and regulations by land users (McCarthy, 2002). Political friction concerning regulations, the science that informs such regulations, and attitudes toward what constitutes proper conservation have been shown in such varied contexts ranging from exurban land use planning (Walker and Fortmann, 2003), Elk hunting regulations in Yellowstone (Robbins, 2006), and the planting of Bt corn in Iowa (Kaup, 2008).

One theme to emerge from this research is that these politicized understandings of the environment are not grounded in ignorance. Instead, they reflect a sophisticated understanding of environmental change, but one that is mediated through a land users’ lived experience. The result is the emergence of conflicting attitudes that are grounded in fundamentally different approaches toward issues of uncertainty, complexity, and the resilience of nature (eg. Berkes, 2012). For example, Paolisso and Maloney (2000) study of farmer environmental knowledge in the Chesapeake Bay used interviews and ethnographic observation to conduct a triadic comparison method, where stakeholders are presented relevant terms in sets of three, and asked to pick