



The role of remote engagement in supporting boundary chain networks across Alaska



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ABSTRACT

Boundary organizations serve multiple roles in linking science and decision making, including brokering knowledge, supporting local- and cross-level networks, facilitating the co-production of knowledge, and negotiating conflict. Yet they face several challenges in providing services for an ever-increasing number of actors and institutions interested in climate information and adaptation. This study evaluates how the Alaska Center for Climate Assessment and Policy (ACCAP) innovated its boundary spanning role to improve outcomes by partnering with other boundary organizations through its ongoing climate webinar series. We utilize the concept of boundary chains to investigate outcomes associated with different extended network connections. Our evaluation is based on the analysis three datasets, including interviews (2013) and two web-based questionnaires (2010 and 2013–2015). Findings from the evaluation reveal several ways that remote engagement via the ACCAP webinar series facilitates learning, decision application, and cross-level network building, and overcomes barriers associated with large geographic distances between communities. In an organic evolution and innovation of the climate webinar series, ACCAP partnered with other boundary organizations to establish satellite hub sites to facilitate in-person gatherings at remote locations, thereby increasing the number and diversity of participants served and supporting local networking within organizations, agencies, and communities. Leveraging complementary resources through the satellite hub sites provided mutual benefits for ACCAP and partnering boundary organizations. These findings advance our understanding of the value of remote engagement in supporting boundary spanning processes and how boundary organizations innovate their roles to build capacity and increase the usability of climate information.

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Introduction

Boundary organizations are emerging as an important feature of the science–policy interface given their ability to foster communication between researchers and decision makers, facilitate the two-way transfer and translation of information, support local networking and cross-level linkages, and mediate conflict (Cash, 2001; Buizer et al., 2010; Hoppe et al., 2013). In the climate arena alone, several processes and approaches are utilized by boundary organizations to increase

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the usability of information and build adaptive capacities (McNie, 2013). These processes vary greatly in terms of their institutional arrangements and commitment of human and financial resources, and evaluations consistently highlight the importance of understanding specific decision making contexts, sustained interaction, trust building, and innovation and adaptability (Dilling and Lemos, 2011; Lemos et al., 2012; Knapp and Trainor, 2013).

Empirical studies reveal several challenges facing boundary organizations in providing and sustaining climate services among a growing number of individuals involved in climate-sensitive decisions, including time and resource constraints and willingness to sustain partnerships (Kirchhoff, 2013). Social networks serve several important roles in overcoming these challenges and supporting climate adaptation through the dissemination of information, leveraging and pooling of resources, negotiation of conflict, and co-production of knowledge to meet the ever increasing and dynamic needs along the science-policy divide (Pahl-Wostl, 2009; Juhola and Westeroff, 2011; Dow et al., 2013; Kalafatis et al., 2015). Extended networks between two or more boundary organizations, known as boundary chains, are theorized to further improve the provision and use of climate information as well as increase the efficiency and effectiveness that services are provided (Bidwell et al., 2013; Lemos et al., 2014).

Information and communication technologies, including teleconferencing and web-based seminars, offer great potential in supporting boundary organizations and boundary chains, especially for organizations separated by large geographic distances (Trainor et al., *accepted*). These remote forms of engagement have demonstrated their ability to overcome distance and cost barriers in the delivery of information and the development of social networks (Sheppard and Mackintosh, 1998; Porter and Donthu, 2008; Johnstone and Boyd, 2014). Although different approaches have been used by boundary organizations to create and adapt their boundary spanning activities to local contexts (Feldman and Ingram, 2009; Rice et al., 2009; Lemos et al., 2014), there remains a limited understanding of the role of remote engagement in supporting boundary spanning processes and enabling boundary chains.

This paper explores the role of remote engagement in supporting traditional boundary spanning processes and boundary chains in Alaska, with a case study of an ongoing climate webinar series (CWS) hosted by the Alaska Center for Climate Assessment and Policy (ACCAP). We begin by discussing the role of boundary organizations, social networks, and information and communication technologies in supporting climate adaptation. We then provide background information about ACCAP and the CWS, situating the CWS as a boundary object in facilitating the transfer of information and knowledge between science and society and developing network connections among participants and speakers. We discuss two innovations of CWS, whereby ACCAP partnered with other boundary organizations, to promote networking and information exchange, fitting the boundary chain model. We highlight how the organic evolution of webinar series increases the capacity of ACCAP and participating boundary organizations to reach a larger and more diverse audience, foster local network connections, and reach key organizational missions. We situate these findings in how boundary organizations innovate their boundary spanning roles to build capacity and increase the usability of climate science for decision making.

Literature review

Boundary organizations

The conceptual and theoretical foundation of a boundary organization stems back to social studies of science in the 1960s when philosophers and scholars theorized on the demarcation of science, a long standing analytical problem. These early efforts focused on the institutionalization of scientific norms and specification of criteria that separated science from other intellectual activities (Popper et al., 1965; Merton, 1973); however, scholars struggled to demarcate science as many of the proposed characteristics also existed in other intellectual activities (Elkana, 1981). Gieryn (1983) later argued that demarcation was a practical problem and ideological effort by scientists to distinguish their work from non-scientific intellectual activities, as the construction of a social boundary provided protection against 'pseudo-science' and political interference in scientific research. Gieryn (1983) labeled these efforts of scientists as "boundary work." The concept of boundary work was soon extended into science-policy applications and the separation of scientific and political activities (Jasanoff, 1990).

Boundary organizations are generally considered to have three defining characteristics (Guston, 1999). First, they involve individuals engaged in the production of science, use of information, and mediation of interests. Second, they provide a space for the creation of boundary objects and other products that facilitate communication among actors across both sides of the boundary. These objects allow "members of different communities to work together around them, and yet maintain their disparate identities" (Guston, 1999, 89). Boundary objects can take many different forms including, climate models, decision support tools, workshops, scenarios, and web-based seminars (Girod et al., 2009; Buizer et al., 2010; White et al., 2010; Trainor et al., *accepted*). Third, they function at the frontier of science and decision making and maintain distinct lines of accountability for the producers and users of information (Guston, 1999). This third characteristic is built on principal-agent theory (Jensen and Meckling, 1976; Eisenhardt, 1989), a political-economic approach, which when applied to science-policy contexts, suggests that organizational relationships are based on contracts between 'principals' (users) that seek information from the scientific community and 'agents' (producers) seeking incentives from the policy community. Principal-agent theory helps structure boundary organizations as a mechanism to address conflict of interest between principals and agents.

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