Short Take

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A Community-Partnered Approach to Social Network Data Collection for a Large and Partial Network

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Abstract

In the small town of Sitka, Alaska, frequent and often catastrophic landslides threaten residents. One challenge associated with disaster preparedness is access to timely and reliable risk information. As with many small but diverse towns, *who* or *what* is a trustworthy source of information is often contested. To help improve landslide communication in Sitka, we used a community-partnered approach to social network analysis to identify (1) potential key actors for landslide risk communication and (2) structural holes that may inhibit efficient and equitable communication. This short take describes how we built trust and developed adaptive data collection methods to build an approach that was acceptable and actionable for Sitka, Alaska. This approach could be useful to other researchers for conducting social network analysis to improve risk communication, particularly in rural and remote contexts.

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Background

Sitka lies on a 14-mile stretch of road that houses approximately 8,500 people in southeastern Alaska (U.S. Census Bureau 2019). Nestled against the Tongass National Forest with heavy rainfall and steep slopes, many homes in Sitka are exposed to potentially catastrophic landslide risk. In 2015, one landslide killed three Sitkans and significantly heightened fear of landslides in the Sitka community (Waldholz and Woolsey 2015). As part of an interdisciplinary disaster risk reduction effort, we partnered with several community organizations and institutions to support the development of a landslide warning system and ensure that warnings are disseminated throughout the community: (1) efficiently and (2) equitably through (3) reliable and redundant channels and sources (Woolsey 2018). In a small and diverse town such as Sitka, achieving these three risk communications criteria can be particular challenging. To help establish landslide preparedness equity and efficiency, we needed a way to help Sitkans leverage and build on their existing interpersonal relationships to help disseminate information on landslide risk and preparedness (Renn and Levine 1991).

Ethnographic and sociometric approaches to social network research are commonplace, and their methodologies have been documented, formalized, and packaged to improve ease of use (Ready et al. 2020). In this case, our challenge was to build such an approach for a small, remote, and relatively isolated community with significant distrust of outsiders as well as strong existing community resilience.

Step 0: Who Is Being Served by This (and All) Community-partnered Research

In 2015, Sitka established a Geo Task Force to focus on landslide risk (SSSC 2016). Their initial focus was on understanding the geological determinants of landslides. However, as it became clear that the type of landslides most affecting Sitka were hard to predict, conversations shifted to community resilience. As part of this shift to focusing on resilience, the Sitka community decided that it wanted to ensure that landslide-related warnings and general information could be quickly, reliably, and equitably disseminated throughout Sitka. Consequently, the research questions in this report have been formulated by, for, and with Sitkans through continued conversations with our community research partners, in-person workshops held in Sitka, and town halls where all Sitkans were invited. Our aim was to develop a process that included community members throughout the entire research process so that the research remained acceptable, practical, and useful for Sitka and other remote communities.

Step 1: Assessing Appropriateness and Feasibility of a Social Network Approach

While Sitkans drove the focus of our research questions, our research team helped provide the community with a proposed methodology for improving the efficiency, equity, and reliability of landslide risk communications. We reviewed published community-based approaches for communications research (Scherer and Juanillo 2003; Schiavo et al. 2016), which often aim to converge a lay and expert risk model. In the case of Sitka, the community had already mobilized a science-centric approach to studying landslide risk, and the community expressed most concern about getting the word out to citizens in time for them to prepare for and potentially evacuate from impending landslides.

Every methodology brings challenges; for Sitka, privacy was an acute concern. On learning that we would hold personally identifiable information and that Sitkans would be required to name their social contacts for whole network mapping, our social network methods were initially received with suspicion. However, after presenting the potential benefits of increased network connectivity for natural hazard warning and describing our measures for data protection, many Sitkans decided that it was worth the trade-off (relative to other methods).

Trust in authorities was also an issue. Many residents in Sitka share justified legacies of skepticism around formal recruitment for federally funded studies, as well as suspicion about the potential utility of academic research. By emphasizing the role of existing community organizations, listening to community members' needs and concerns, demonstrating our ability to adapt the research to benefit community members, and leveraging trusted channels to convey the research objectives, we were better able to engender community trust.

Step 2: Ethnographic Mapping of Communities

Based on formative ethnographic interviews, we identified potential groups or cliques in Sitka, as well as types of individuals more likely to face difficulties accessing landslide risk information. For example, one clique we identified was commercial fishermen, who spend significant time during the rainy season on their boats and outside the range of Internet or cellular connections. Another type of isolated group was of those who camped for extended periods in remote areas to hunt, fish, or simply to get away from larger population centers. To tailor our approach to groups more likely to be vulnerable to landslides and to information gaps, we identified which groups were most likely to be at risk of landslides (based on their geographic location), as well as

groups that might be resistant to being engaged in research or risk communication.

Step 3: Leverage Available Data to Estimate the Size of Communities

After identifying types of landslide risk and communication groups via formative ethnographic research, we estimated the relative size of each community (while acknowledging that people can be members of multiple communities). To gauge each community's size and the extent of overlapping communities, we first consulted with community leaders. We then used these approximations alongside U.S. Census data and publicly available voter registration records provided by the Alaska Department of Records (to assess, for example, registered voters over 60 years old AND with a primary address in the hillside). We used these estimates to inform our sampling approach and treated these as a general guide (rather than strictly prescriptive) to help ensure equitable representation. More details on our sampling approach can be found in Rahmattalabi et al. (2020). We then programmed the survey into EgoWeb 2.0 (2020) and imported all names from publicly available voter lists in the name generator to facilitate ease of developing a whole community network map.

Step 4: Adaptive Sampling and Recruitment

To continue to address community concerns with social network research, we sought out credible research "champions" and engaged with community leaders to facilitate survey recruitment. These included radio interviews and presentations to local community groups (e.g., the Sitka Tribe and Rotary Club), public library talks, newspaper articles, blogs, and Facebook groups. As responses became available on Egoweb, we tracked ego- and alter-level responses based on the a priori defined community groups and monitored response rates based on the assumption-based quotas. Figure 1 is an example of how we monitored the difference between our a priori simulated sample and the empirical sample size. As the network was starting to be revealed, we quickly learned that groups did not coalesce in the way we expected from our a priori definitions; consequently, we did not use the a priori sample as a framework to make inferences from our data.

Step 5: Applying a Networked Approach to Landslide Risk Communication

Our sample of 300 participants revealed 802 unique nodes in the network—nearly 15% of Sitka. We then performed descriptive statistics to better

understand the network structure and degree centrality of various nodes. As displayed in Figure 2, Sitka's landslide risk communication network largely followed a core–periphery structure, with what is likely a technocratic core surrounded by more disparate groups and individuals leveraging potentially

	#	Target (n=300)	%
Age 18-30			
Newly arrived within last 8 years	36	25	144%
Grew up in/near Sitka	22	38	58%
Age 30-65			
If children in Sitka schools:			
Someone in household (HH) employed in commercial or charter fishing	11	70	16%
Other/No occupation	64	64	97%
If no children in Sitka schools:			
Someone in HH employed in commercial or charter fishing	12	17	71%
Other/No occupation	100	16	625%
Age 65+			
Has relocated to Sitka in the last 10 years	3	14	21%
Has lived in Sitka > 10 years	52	57	91%
Total	**300**	**300**	**100%**

Figure 1. Ethnography-informed sample and quotas reached.

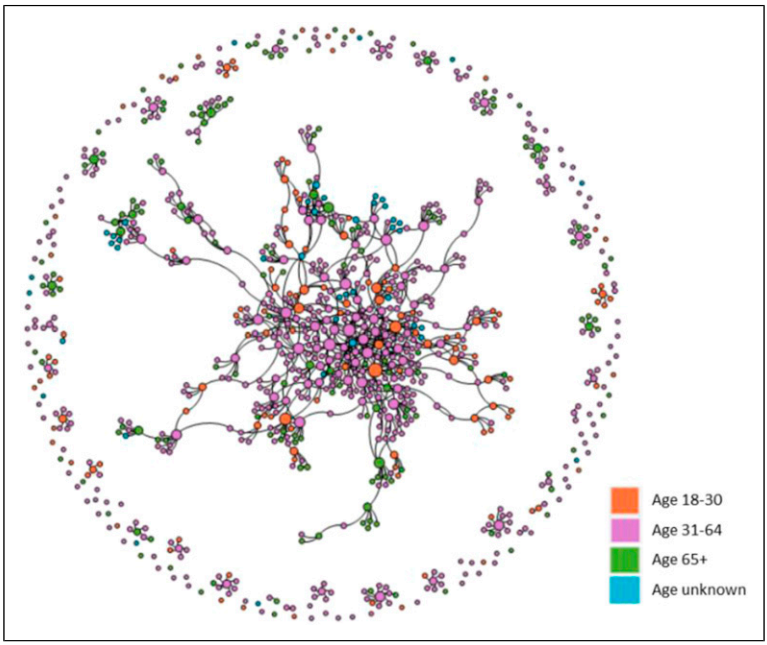

Figure 2. Sitka's informal landslide risk communication network.[1]

alternative knowledge sources for informing their landslide preparedness decisions.

In September and October 2021, we presented these findings in various town halls, radio interviews, workshops, and meet and greet events in local venues. These reflection sessions focused on obtaining community reactions to our findings and gauging potential options for interventions to close the "structural holes" in the Sitka landslide information network. Informed by risk communication theory (Aarstad 2014; Barbour et al. 2020), these "network-building" options were intended to be redundant and credible for diverse audiences. Provisional ideas included identifying community leaders to broker relations with technocrats for distributing landslide risk information (e.g., via a phone chain), having both elected and other community leaders promote the landslide warning system, dissemination in trusted media outlets, and recruiting landslide warning and preparedness "ambassadors" from the network data.

Conclusion

Community-partnered approaches to social networks help facilitate community detection, ensure representation of diverse groups, identify shared group affiliations, and enable flexible and adaptive sampling approaches. These approaches require researchers and community partners to reflect on community boundaries, group formation and identities, and social cohesion. Importantly, the community-partnered approach is not solely a means to an end. Although improved network data will inform risk communication and disaster preparedness, the process itself of eliciting network information contributes to improved awareness of structural holes and increases awareness of the need for a holistic disaster risk communication strategy. Future community-partnered approaches may experience similar benefits that not only improve the quality and sampling of network data but also help lay the groundwork for increasing community resilience.

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Note

1. Nodes are sized by degree centrality.

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