Journal of Extension
www.joe.org

December 2018
Volume 56
Number 7
Article # 7FEA1
Feature

# Improving Climate Literacy within Extension by Understanding Diverse Climate-Related Informational Needs

**Abstract**

Increasing literacy among Extension professionals in every sector regarding potential regional impacts and adaptation strategies related to climate change is key to producing high-quality relevant programs addressing climate-related risks. Professionals in the forestry, agriculture, livestock, and coastal resources sectors attended the Southeast Region Extension Climate Academy in fall 2014. Participant surveys and interviews suggested that some of the agents most confused about climate change gained the most from the workshop. Further, focusing on region- and sector-specific information made climate change relevant to participants who were initially uninterested in addressing the topic.

**Keywords:** climate change, professional development, reasonable person model

**Maggie Clifford**
Master's Student
mclifford@ufl.edu
@maggiehclifford

**Martha Monroe**
Professor
mcmonroe@ufl.edu

School of Forest Resources and Conservation
University of Florida
Gainesville, Florida

## Introduction

Given the need to address climate-related issues with science-based solutions, climate literacy among Extension professionals is of national concern (Becerra, Middendorf, Campbell, & Tomlinson, 2016). As trusted members of the communities they serve, Extension professionals are well positioned to share mitigation and adaptation strategies with their clients (Prokopy et al., 2015). Agents in the southeastern United States, according to a 2011 survey, hold a range of beliefs about anthropogenic climate change (ACC) that correlate to their relative willingness to develop and implement climate-related programming (Monroe, Plate, Adams, & Wojcik, 2015). Roughly mirroring the views of the general public (Monroe et al., 2015), many Extension professionals agree with a scientific consensus that human activity is a primary driver of ACC (Cook et al., 2013; Oreskes, 2004), and some do not (Tyson, 2014). In response to this circumstance, Extension directors in the Southeast sought to improve climate literacy among Extension professionals by providing a regional training program. State Extension specialists and faculty worked together for nearly a year to coordinate the Southeast Region Extension Climate Academy (SRECA). We were involved in planning and evaluating the workshop, with author Martha Monroe being a lead coordinator of it.

Because climate literacy in Extension is of national concern, our experiences in the southeastern United States could provide useful insights for professionals in other regions. Herein we present outcomes, analysis, and evaluation of the 2014 training and suggestions on how to apply our findings to work toward greater climate literacy within Extension.

# Literature Review

## Climate Change and Extension Professional Development

Climate science communication scholars urge communicators to better understand how their audiences perceive climate change and to employ culturally salient methods of information transfer rather than rely primarily on facts and graphs to convey climate-related risk (Kahan et al., 2012; Moser, 2010; Prokopy et al., 2015; Shome et al., 2009). Humans are not passive receptors of information; rather, new information is filtered through mental models and put into the context of our lived experiences, values, and social norms (World Bank Group, 2015). Culturally conditioned responses to information on climate change can be strong. Thus, communicators must be aware of audiences' perceptions of the messenger, worldviews, and other characteristics that affect willingness to engage (Monroe et al., 2015; Rabinovich, Morton, & Birney, 2012). A scholar in cultural cognition, Kahan (2010) noted, "People feel that it is safe to consider evidence with an open mind when they know that a knowledgeable member of their cultural community accepts it" (p. 297). This cultural link is one reason Extension agents historically have been able to reach their clients with science-based innovation—agents are active members of the communities they serve. Like others in these communities, an Extension agent is a culturally situated citizen with predispositions that inhibit or encourage the acceptance of science-based information. For example, an Extension agent may be more willing to meaningfully engage with a colleague in his or her sector about climate change than with someone who does not share a common professional identity.

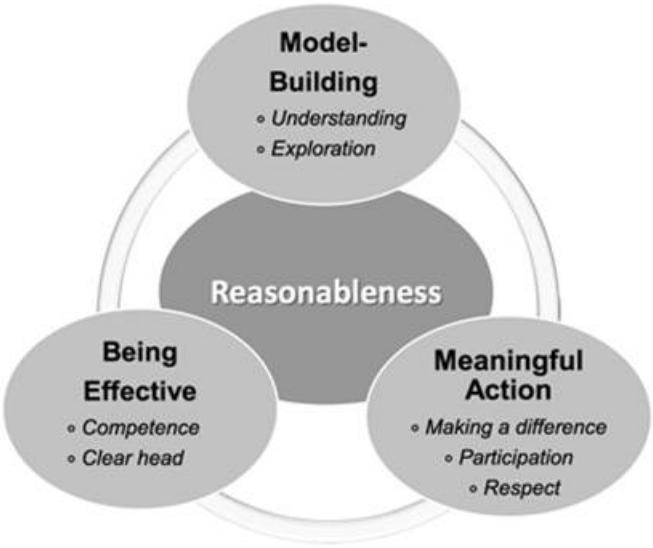
Extension agents in the southeastern United States work with a variety of audiences, including forest landowners, agricultural producers, and coastal residents, some of whom are both skeptical of ACC and uniquely placed to mitigate and adapt to it (Prokopy et al., 2015). Consequently, an opportunity exists for relevant education. That said, in 2011, around 25% of a regionally representative sample of Extension professionals were dismissive or doubtful of ACC, and such agents were significantly less willing to develop and use climate-related materials in their programs (Monroe et al., 2015). Additionally, results from a study involving interviews with 23 agents dismissive of ACC indicated that they were unlikely to support ACC program development (Sommer, 2014). Sommer (2014) explained that this population was concerned with remaining neutral on the topic of ACC, prone to believing that the science of ACC is unsettled, and unlikely to share climate-related information unless "both sides" (i.e., claims that support and refute scientific consensus on ACC) are presented.

## Reasonable Person Model and Supportive Learning Environments

In seeking a theoretical model with which to frame the workshop design, workshop organizers chose not to employ those that aim to change behavior of participants (Ajzen, 1991) or persuade participants (McKenzie-Mohr, 2011). Instead, the reasonable person model (RPM) was chosen because it is concerned primarily with developing an environment that supports a learner's capacity to integrate and use information (Kaplan & Kaplan, 2009). Because climate change can be a polarizing topic, developing a productive learning environment for people who hold a range of views on the topic presents a challenge. The RPM involves three interrelated elements that create an environment supportive of learning: model building, being effective, and meaningful action (Figure 1). Maximizing all three elements of the RPM can increase the likelihood that a program will foster reasonable responses. In the context of improving climate literacy, dedicated focus on these elements may augment efforts to broach this scientifically complex and culturally salient topic.

**Figure 1.**

Reasonable Person Model




Note: Copyright 2011 by Rachel Kaplan. Reprinted with permission.

The workshop organizers designed the SRECA program to include plenary sessions with climate scientists, social scientists, and Extension professionals working in climate-related programming. Additionally, approximately 5 hr were dedicated to sector-specific breakout sessions. Participants met in one of four sector groups—forestry, agriculture, livestock, and coastal resources—to examine how climate change relates to their specific areas and to discover and discuss tools for communicating climate-related issues with their clients. During the planning process, workshop organizers integrated elements of the RPM framework and informational needs of participants (see Table 1).

**Table 1.**

Incorporating the Reasonable Person Model (RPM) in the 2014 Southeast Region Extension Climate Academy

| RPM element | Element objective | Programming to meet objective |
|---|---|---|
| Model Building | To foster understanding and ability to integrate new information | • Plenary sessions for building a shared foundation of climate-related science<br>• Sector-relevant information and conversations in breakout sessions—time dedicated to identifying at-risk areas and possible adaptation strategies |
| Being Effective | To facilitate clear-headedness and | • Simplified models, graphs, and explanations |

| | | |
|---|---|---|
| | competency without causing participants to feel overwhelmed | • Pleasant learning environment; indoor/outdoor space; physical movement<br>• Shared meals for informal interaction, social cohesion |
| Meaningful Action | To engender the belief that participation makes a difference and earns respect | • Use of preworkshop surveys in workshop development, indicating that contributions matter<br>• Participatory learning activities used to ensure that voices are heard and integrated |

## Research Questions

To understand how, if at all, the climate perspectives of SRECA participants influenced their climate-related knowledge and skills before and after the workshop and to develop useful insights for future trainings, we based our research on the following questions:

1. What are the climate perspectives of participants at the workshop?
2. What are some significant differences in climate-related knowledge/skill outcomes across climate-perspective groups?
3. How can climate-related trainings for Extension personnel better meet the needs of participants with diverse perspectives on climate change?

## Methods

### Workshop Participants

Workshop organizers asked state Extension directors in 13 southeastern states to nominate for SRECA inclusion up to 16 Extension faculty participants from their respective states regardless of those faculty members' perspectives on ACC. More than 100 agents and specialists accepted invitations to attend the workshop.

### Surveys

We asked participants to complete an online preworkshop survey (available for viewing at https://www.joe.org/joe/2018december/docs/SRECA-Preworkshop-Survey.pdf), which we had tested with nonattending Extension agents and then revised for clarity and length. We used Qualtrics to disseminate the survey and analyze the resulting data. Our main objectives for the survey were (a) to gather data on participants'

climate-related perceptions, (b) to inform program development for the SRECA, and (c) to establish a baseline from which to evaluate the workshop. Survey items ranged from word association items (i.e., What 3–4 words come to mind when you hear the phrase "climate change"?) to scaled opinion and self-rated knowledge and skill items to items addressing demographic and job information.

During the last session of the workshop, we administered a postworkshop survey (available for viewing at https://www.joe.org/joe/2018december/docs/SRECA-Postworkshop-Survey.pdf) to gather data on participants' perceptions of the workshop, changes in knowledge and attitudes from the preworkshop surveys, and suggestions for improving future programs. We analyzed the data using SPSS, and a statistician at the University of Florida verified the reliability of our analyses.

## Interviews

Nine months after the SRECA, we invited a purposeful sample of participants ($N$ = 39) via email to participate in phone interviews and reflect on their experiences during and after the SRECA. We selected individuals for the sample with the purpose of including participants who were from each sector and held a range of climate perspectives. Objectives of these interviews centered on identifying (a) participants' lasting impressions of the SRECA; (b) what, if anything, had changed since their participation in the SRECA with regard to their understanding of how climate change relates to their Extension programs; (c) what they would like to learn about climate change; and (d) what they thought their clients would want to know about ACC.

We developed interview questions with input from two Extension specialists and two land-grant faculty members. After transcribing each interview, our lead researcher identified themes through multiple readings of the transcripts. If three or more agents mentioned a similar impression, it was determined to be a theme. A second reviewer read all transcripts and confirmed the reliability of these themes.

# Results

Over 100 Extension professionals attended the 3-day SRECA in the fall of 2014. Participants represented the forestry, agriculture, livestock, and coastal resources sectors. The results we present here are intended to show (a) the process we used to determine the climate perspectives of participants who attended the workshop, (b) similarities and differences among these groups regarding their self-reported climate-related knowledge and skill before and after the workshop, and (c) how participants with different climate perspectives responded to the workshop.

## Categorization of Respondents by Climate-Related Perspective

Preworkshop survey results gave workshop organizers an opportunity to plan for how many participants would be in each sector and to consider the content and flow of sector-specific programming with participants' climate-related perceptions, knowledge, and skills in mind. Respondents to the preworkshop survey ($n$ = 69) represented the four previously identified sectors (Table 2).

**Table 2.**
Sectors Represented by Respondents to Southeast Region

Extension Climate Academy Preworkshop Survey

| Sector | *n* |
|---|---|
| Forestry | 10 |
| Agriculture | 25 |
| Livestock | 16 |
| Coastal resources | 14 |
| Unknown | 4 |
| Total | 69 |

To identify climate-perspective groups, we modified and aggregated robustly tested items from the preworkshop survey (Leiserowitz, Maibach, Roser-Renouf, Cutler, & Rosenthal, 2009) to ascertain participants' (a) belief in scientific consensus on ACC, (b) confusion about ACC, and (c) concern over ACC and beliefs regarding attribution of "current climate change," where current climate change is defined as the observed climatic changes over the past 150 years and projected changes for the next 100 years. Using these criteria, we identified three groups, which we named Natural Changes, Human Causes, and In Between. Table 3 shows data characterizing the three groups. The Natural Changes group was less sure that there is scientific consensus on climate change, more confused about climate change, and less concerned about climate change than the Human Causes group. The In Between group closely aligned with the Natural Changes group regarding confusion about climate change but aligned with the Human Causes group in their climate-related concern.

**Table 3.**

Climate-Perspective Groups Based on Relative Beliefs About Climate Change Causes and Levels of Confusion and Concern

| | | | Group | | |
|---|---|---|---|---|---|
| **Item** | **No. of respondents** | **Statistic** | **Natural Changes** | **In Between** | **Human Causes** |
| The scientific community has not reached a consensus on current climate change and I don't believe it's worth further consideration. | 66 | *M*<br>*SD*<br>*n* | 2.7ac<br>1.011<br>26 | 1.8c<br>.699<br>14 | 1.3a<br>.533<br>26 |
| There is so much confusing information out there about current climate change that it is hard for me to know what | 65 | *M*<br>*SD*<br>*n* | 3.7a<br>1.263<br>26 | 3.4c<br>1.151<br>14 | 2.0ac<br>1.060<br>25 |

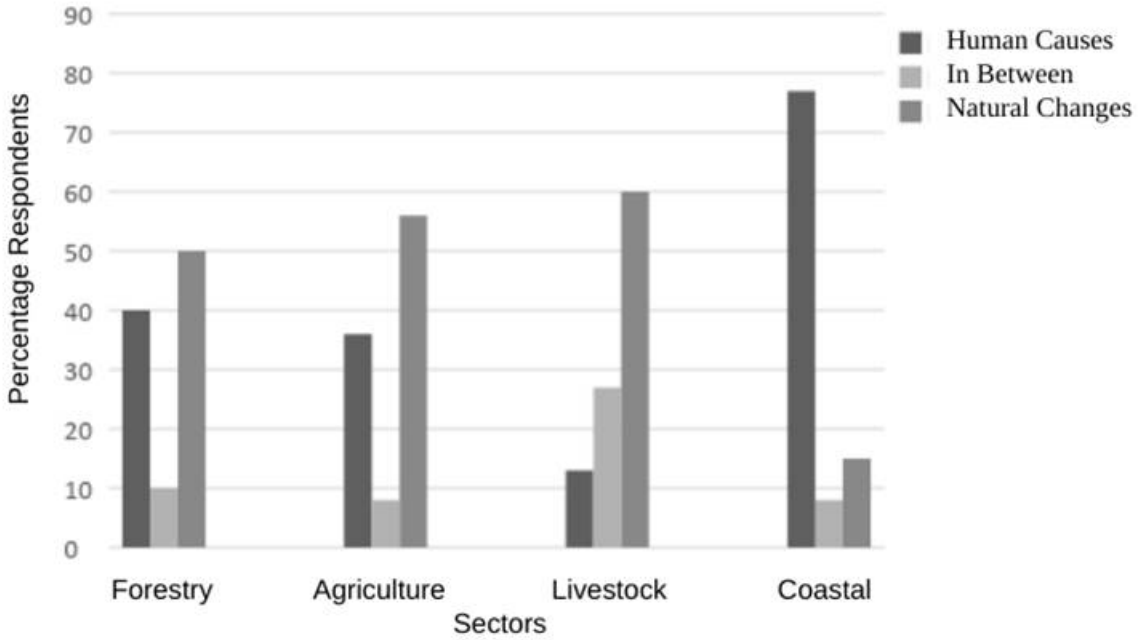
| | | | | | |
|---|---|---|---|---|---|
| to believe. | | | | | |
| I am very concerned about current climate change and fear that it may negatively impact the global ecosystem and current and future generations. | 66 | *M*<br>*SD*<br>*n* | 2.5ab<br>.706<br>26 | 3.7b<br>.825<br>14 | 4.4a<br>.983<br>26 |

*Note.* A 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*) was used for each item. Significant differences between groups are annotated with letters in superscript, where a indicates $p \leq .001$, b indicates $p \leq .001$, and c indicates $p \leq .01$. Shaded areas show where there is no statistically significant difference, highlighting similarities between groups.

Figure 2 shows the percentage of respondents in each climate-perspective group for each sector. Whereas the agriculture sector had the highest number of Natural Changes respondents ($n$ = 14), the livestock sector had the largest percentage of this group (60%). The coastal resources sector had both the highest number ($n$ = 10) and the largest percentage (78%) of Human Causes respondents. This distribution is roughly similar to findings from Monroe et al. (2015), who determined that the agriculture sector had significantly more Extension professionals dismissive and doubtful of climate change than other natural resources sectors did.

**Figure 2.**

Climate Perspectives of Southeast Region Extension Climate Academy Respondents by Sector



## Climate-Perspective Groups' Pre- and Postworkshop Self-Reported Knowledge and Skills

In analyzing responses to knowledge and skills items on the preworkshop survey, we found statistically significant differences between the Natural Changes and Human Causes groups on three knowledge-related items. Specifically, the Natural Changes group scored significantly lower than the Human Causes group with regard to their self-reported knowledge of climate science, causes of climate change, and climate-related resources they could access to better understand climate change ($p \leq .01$).

Using one-way analysis of variance tests, we compared pre- and postworkshop scores for the three climate-perspective groups; results are presented in Table 4. The tests showed increases in self-reported knowledge of ACC topics for both the Natural Changes and In Between groups. We found no significant knowledge-related changes for the Human Causes group. However, with regard to self-reported ability to address climate-related challenges, our analysis revealed statistically significant increases for this group as well as the In Between group. The Natural Changes group showed no significant changes regarding ability to address climate-related challenges.

**Table 4.**

Pre- and Postworkshop Mean Scores for Select Self-Rated Knowledge and Skill Items by Climate-Perspective Group

| | Natural Changes | | In Between | | Human Causes | |
|---|---|---|---|---|---|---|
| **Item** | **Pre** | **Post** | **Pre** | **Post** | **Pre** | **Post** |
| Knowledge of the potential future impacts of climate change in the Southeast | 2.5 | 3.1** | 2.7 | 3.6* | 3.0 | 3.4 |
| Knowledge of the climate-related resources I can access to better understand climate change | 2.4 | 3.3*** | 2.3 | 3.7*** | 3.2 | 3.5 |
| Knowledge of climate-related decision support tools I can access | 2.1 | 3.0*** | 2.2 | 3.5*** | 2.8 | 3.2 |
| Ability to use climate-related decision support tools to guide improvements in production strategies or natural resources management | 2.3 | 2.7 | 2.1 | 3.2* | 2.5 | 2.8 |
| Ability to talk to Extension audiences about current climate change | 2.8 | 3.0 | 2.7 | 3.4 | 2.8 | 3.4* |
| Ability to design a program that addresses current climate change | 2.3 | 2.8 | 2.4 | 3.4* | 2.7 | 3.2 |

*Note.* Scales ranged from 1 = *no knowledge*/*no ability* to 5 = *outstanding knowledge*/*outstanding ability*. One-way ANOVA was used to test significance.

*$p < .05$. **$p < .01$. ***$p < .001$.

## Responses to Workshop

Of the 39 agents contacted to participate in the 9-month-postworkshop follow-up interviews, 15 agreed to be interviewed (response rate, 38%). The lowest response rate (29%) applied to those in the Natural Changes group, and the highest (80%) applied to those in the Human Causes group. SRECA participants from each of the four sectors and each of the three climate-perspective groups participated as interviewees. Two themes regarding perceptions of the workshop emerged: (a) Interviewees noticed and responded positively to region- or sector-specific climate-related information, and (b) interviewees from both the Natural Changes group and In Between group expressed interest in learning more about data collection methods for determining climate change attribution and trends.

### *Appreciation of Context for Climate-Related Information*

ACC is a subject that spans multiple fields and has widespread implications across every sector in Extension. To help narrow the focus to Extension and make ACC relevant to participants, workshop organizers presented sector-specific information on possible impacts of ACC. In response to this effort, one agriculture agent from the Natural Changes group noted, "I greatly appreciated the speakers that looked at climate-related issues from a pragmatic standpoint, and those that addressed on-the-farm issues. It was the first time any climate-related issues had been presented that way."

Other agents, especially those in the livestock and agriculture sectors, similarly appreciated the opportunity to look at climate change and its potential effects on the industries affiliated with their sectors. An agent who was in the In Between group and from the livestock sector commented that she had seen for the first time how climate change and increasing temperatures could affect the livestock industry (by influencing hay production and gain-to-feed ratios). Other interviewees also indicated that the workshop was the first time projected effects of ACC had been made relevant to their regions and sectors.

### *Desire for More Information on Climate Science*

The workshop organizers intentionally did not dedicate time at the workshop to discuss and analyze the causes of ACC. Although this topic is fundamental to a holistic understanding of the scientific consensus on ACC, it also is an area of serious political debate and could have consumed a large portion of the workshop's schedule. Organizers believed that some participants might have wished to engage in debate over what most climatologists consider to be facts and that this situation might have detracted from developing and sharing climate projections and adaptation strategies. Interviewees in the Natural Changes and In Between groups commented on this missing link, with some indicating that to a greater or lesser degree, they did not trust that the science was settled on ACC and, therefore, felt uncomfortable sharing some climate-related information with their clients—especially information related to attribution. One agriculture agent from the In Between group said, "I was a little disappointed at the workshop on climate change [a plenary session led by a climatologist]. We just kind of glazed over the science . . . I wanted to understand how we come up with those samples. Where are we coming up with this data?"

A coastal resources agent from the Natural Changes group went into great detail about his skepticism concerning

the reliability of temperature-related data. He, like the participant identified in the preceding paragraph, wanted to better understand data collection and analysis methods for determining attribution: "There are graphs that show the temperature of the earth, you know, year by year, ok, but how was that average temperature in 1950, in 1900, 1850, in 1800 determined? You have dots on that graph, but just *what* went into that dot in 1850 or 1900, and how does the accuracy of that dot compare to 2015?" This agent said he did not ask these questions at the workshop because there was no session dedicated to explaining how data are derived. (As noted, the workshop was not designed to investigate the causes of climate change; it was designed to share information and develop skills needed to address adaptation and communication. To attend to agents' need to better understand relevant aspects of climate science, SRECA organizers held a climate science webinar after the workshop focused on evidence of changes.)

## Discussion and Recommendations

Our analysis of pre- and postworkshop surveys suggests that individuals in three climate-perspective groups sought and gained different knowledge and skills from the SRECA. Increases in self-reported knowledge of climate-related resources and decision support tools were achieved by all three groups, but only the Natural Changes and In Between groups had statistically significant changes from before to after the workshop on all three knowledge-related survey items. Participants in the Natural Changes and In Between groups entered the workshop considering themselves less knowledgeable about ACC than those in the Human Causes group did; this circumstance may help explain why the former two groups had increases with statistical significance on knowledge-related items and the Human Causes group did not. Meanwhile, the Human Causes group was the only group to achieve a statistically significant increase in the ability to talk to Extension audiences about ACC. This finding suggests that participants in this climate-perspective group were uniquely ready to gain this skill. Overall, the differences in reported knowledge and skills across the three groups suggest that people with different perspectives on climate change benefit from different kinds of information. Furthermore, people who are the most confused about ACC may need knowledge about and trust in climate science before they are willing to develop climate-related programming. Although findings from our research do not clarify whether increased knowledge leads to increased willingness to develop climate-related programming, the data do suggest that people who are both confused and concerned may be the most likely to benefit from training.

Considering that some members of the Natural Changes and In Between groups did not trust that there is scientific consensus on ACC, future climate trainings could be improved by providing participants with similar climate-related perspectives more time to examine and discuss climate science in ways that are relevant to them. A session could focus on data collection methods and climate change attribution, for example. Enlisting the help of trusted and trained facilitators who are well versed in both climate science and culturally salient viewpoints on ACC would further augment a productive learning environment in which Extension professionals could improve their climate literacy.

## Conclusion

As trusted members of their communities, Extension agents are poised to facilitate greater understanding of ACC and climate-related risk management options with their clients. Not all Extension professionals in the Southeast, however, are ready and willing to do so. Results from our study show that agents with different perspectives on climate change have different knowledge and skills that influence their ability to create and implement climate-related programming for their clients. Some agents are ready to learn how to talk about ACC-related risks with their clients. Others want to better understand how climate change is measured and the potential impacts to their

clients before investing time and energy into developing climate-related programming. Agents across a climate-perspective spectrum report that they want more information on ACC.

Given the urgency of addressing climate-related issues and the range of climate-related perspectives among Extension professionals, thoughtfully designing programs to build climate literacy across and within climate-perspective groups is a critical path forward. Learning within their sectors helped make ACC more relevant to some SRECA participants, and such relevance is fundamental for model building and engaging in meaningful action. Responses to our interview questions indicated that presenting regionally relevant and sector-specific information (e.g., effects of increasing drought events) can increase engagement with ACC among Extension personnel. By actively working to understand perceptions and addressing stated informational needs of participants, program planners can cultivate supportive learning environments to improve climate literacy among Extension professionals.

**Acknowledgments**

We would like to acknowledge the contributions of Elizabeth Clifford, who assisted us with transcribing the interviews, and Wendy-Lin Bartels and Damian Adams for commenting on earlier versions of our manuscript. We also would like to thank the anonymous reviewers for their helpful feedback and the tireless efforts and oversight of *Journal of Extension* editor Debbie Allen.

## References

Ajzen, I. (1991). The theory of planned bahavior. *Organizational behavior and human decision processes*, *50*, 179–211.

Becerra, T. A., Middendorf, G., Campbell, A., & Tomlinson, P. (2016). Climate change challenges for Extension educators: Technical capacity and cultural attitudes. *Journal of Extension*, *54*(6), Article 6FEA2. Available at: https://joe.org/joe/2016december/a2.php

Cook, J., Nuccitelli, D., Green, S., Richardson, M., Winkler, B., Painting, R., . . . Skuce, A. (2013). Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters*, *8*(3). doi:10.1088/1748-9326/8/2/024024

Kahan, D. (2010). Fixing the communications failure. *Nature*, *463*(7279), 296–297. doi:10.1038/463296a

Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Ouellette, L. L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nature Climate Change*, *2*(10), 732–735. doi:10.1038/nclimate1547

Kaplan, S., & Kaplan, R. (2009). Creating a larger role for environmental psychology: The reasonable person model as an integrative framework. *Journal of Environmental Psychology*, *29*(3), 329–339. doi:10.1016/j.jenvp.2008.10.005

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Cutler, M., & Rosenthal, S. (2009). Global warming's Six America's 2009: An audience segmentation analysis. New Haven, CT: Yale Program on Climate Change Communication.

McKenzie-Mohr, D. (2011). Fostering sustainable behavior: An introduction to community-based social marketing. Gabriola Island, Canada: New Society Publishers.

Monroe, M. C., Plate, R. R., Adams, D. C., & Wojcik, D. J. (2015). Harnessing homophily to improve climate change education. *Environmental Education Research*, *21*(2), 221–238. doi:10.1080/13504622.2014.910497

Moser, S. C. (2010). Communicating climate change: History, challenges, process and future directions. *Wiley Interdisciplinary Reviews—Climate Change*, *1*(1), 31–53. doi:10.1002/wcc.011

Oreskes, N. (2004). Beyond the ivory tower—The scientific consensus on climate change. *Science*, *306*(5702), 1686–1686. doi:10.1126/science.1103618

Prokopy, L. S., Carlton, J. S., Arbuckle, J. G., Haigh, T., Lemos, M. C., Mase, A. S., & Power, R. (2015). Extension's role in disseminating information about climate change to agricultural stakeholders in the United States. *Climatic Change*, *130*(2), 261–272. doi:10.1007/s10584-015-1339-9

Rabinovich, A., Morton, T. A., & Birney, M. E. (2012). Communicating climate science: The role of perceived communicator's motives. *Journal of Environmental Psychology*, *32*(1), 11–18. doi:10.1016/j.jenvp.2011.09.002

Shome, D., Marx, S., Appelt, K., Arora, P., Balstad, R., Broad, K., . . . Weber, E. (2009). *The psychology of climate change communication: A guide for scientists, journalists, educators, political aides, and the interested public.* New York, NY: Center for Research on Environmental Decisions.

Sommer, E. K. (2014). *Agriculture and climate change: Perceptions of Extension agents in the southeast U.S.A.* (Unpublished master's thesis). University of Florida, Gainesville, Florida.

Tyson, R. (2014). The merits of separating global warming from Extension education sustainability programs. *Journal of Extension*, *52*(1), Article 1COM3. Available at: https://joe.org/joe/2014february/comm3.php

World Bank Group (2015). *World development report 2015: Mind, society, and behavior* (Overview). Washington, DC: Author. Retrieved from https://openknowledge.worldbank.org/handle/10986/20597