Creating Extension Programs for Change: Forest Landowners and Climate Change Communication

Shelby Krantz, Martha Monroe, and Wendy-Lin Bartels, School of Forest Resources and Conservation, University of Florida, Gainesville, Florida, USA

The Cooperative Extension Service in the United States can play an important role in educating forest landowners to improve forest resilience in the face of climatic uncertainty. Two focus groups in Florida informed the development of a program that was conducted in Leon County; presurveys and postsurveys and observation provided evaluation data. The Reasonable Person Model (RPM) was a helpful framework for developing the program and explaining results. Landowners desired more information in order to manage their forests in light of climate change after the program than before.

INTRODUCTION

Climate variability and change have the potential to alter ecosystem health and productivity in Florida. While farmers have been greatly assisted by the Southeastern Climate Consortium (SECC) and Florida Climate Institute in their exploration of adaptations to climate change, forest landowners have had fewer resources. It is essential that forest landowners receive useful information about climate change for two reasons: (a) they manage a crop that will grow for 20 years through whatever climate changes might occur, and (b) trees can sequester carbon in considerable quantities, reducing atmospheric carbon. Effective climate programs for forest landowners should reflect this dual purpose—adaptation and mitigation.

The Cooperative Extension Service is a national educational program in the United States that connects citizens to land grant universities in every state through agents in each county. Because landowners trust their county extension agents, this network could provide an effective tool for climate change communication because it allows researchers and professionals to reach landowners through a trusted avenue. This article describes a program to explore the potential that Extension has for reaching forest landowners.

The mere mention of climate change drives people away for a number of reasons. Research has shown that the public’s perceptions of climate change are highly varied and in most cases, inaccurate and influenced highly by politics and emotion. For example, a quarter of respondents to the Yale Project on Climate Change Communication (YPCCC) survey said that the issue of global warming made them feel “depressed” or “guilty” (Leiserowitz, Maibach, Rosner-Renouf, & Smith, 2010). The issue is compounded by the fact that most of
the climate science communication is coming from scientists who are not trained to communicate with the general public. Somerville and Hassol (2011) state that, “It is urgent that climate scientists improve the ways they convey their findings to a poorly informed and often indifferent public” (p. 48). The issue of climate change is also rife with misconceptions. According to Leiserowitz et al. (2010), there is widespread confusion about weather and climate, especially with regard to record snowstorms in recent years. On top of these and many other barriers to understanding, there are also barriers to behavior and attitude change. For groups such as forest landowners, barriers to behavior change can include the fact that options for change are limited. As farmers of a crop that grows for two to three decades, there is little flexibility in when and how the trees can be planted, grown, and harvested.

Because of these barriers and the relevance of the topic to landowners, communication is a challenge. Extension could fulfill a role that other avenues of communication cannot because of the trust that exists between landowners and county Extension agents. The Southeast Climate Consortium has been successful in engaging row crop farmers and communicating adaptation strategies for climate change issues (Bartels et al., 2012). However, row crops are very different from trees in that they are planted and harvested by season, while trees are planted and harvested much less often. Designing a meaningful program requires an audience assessment and feedback on a pilot project.

This project was conducted in conjunction with a large, regional program, PINEMAP, and the University of Florida Extension faculty. PINEMAP is an integrated research/education/extension project focused on planted pine forests in the Atlantic and Gulf coastal states from Virginia to Texas to promote forest management techniques to increase forest resilience, carbon sequestration, water use, and nitrogen efficiency. Industrial and nonindustrial private landowners will be targeted in a multipronged Extension program (see http://www.pinemap.org). A better understanding of the perceptions, needs, and reactions to Extension programs will help agents conduct more meaningful and successful programs.

Three questions were explored throughout this project:

1. What are forest landowners interested in learning about regarding climate change and their land?
2. Can an Extension programs engage landowners in a meaningful way that fosters an atmosphere for discussion and questioning?
3. Do Extension programs focused on engagement with participants help to create “reasonable people” by the standards of the Reasonable Person Model (RPM; Kaplan & Kaplan, 2009)?

LITERATURE REVIEW

A review of typical Extension programs suggests they successfully lead to specific outcomes because they are heavily focused on providing science-based information and demonstrating the behaviors that people should adopt (UF, 2012). They do not focus primarily on awareness or questions from participants; they are designed with one-way communication and information dissemination from the agent to the audience. This model works for many topics that Extension covers, such as growing vegetables, reducing insect pests on crops, or losing weight. However, because of the barriers to communication that arise with climate change, this model may not work changing forest landowner behavior to adapt to an uncertain climate. We therefore intended for this pilot program to deviate from the traditional model; it was based on the tenets of social learning and used the RPM as a framework. Social learning is defined by Schusler, Decker, and
Pfeffer (2003, p. 311) as “learning that occurs when people engage one another, sharing diverse perspectives and experience to develop a common framework for understanding as basis for joint action.”

RPM offers insight into peoples’ informational needs with regard to the environment from a psychological perspective. Developed by Kaplan and Kaplan (2009), RPM is a framework of three essential and interconnected components of human informational needs: model building, being effective, and meaningful action. Essentially, unreasonable behavior stems from lack of understanding, feelings of helplessness, and inability to participate in solutions. Mental models are simplified versions of reality that one stores in one’s head and uses to make sense of things, to plan, and to evaluate possibilities. Meaningful action encompasses participatory actions and also the response to these actions (e.g., respect, listening, and being heard). Effectiveness has to do with how we manage information. Individuals can be effective when they are able to achieve clearheadedness and their feelings of competence and confidence are enhanced. In this case of this project, model building involves participants understanding climate change as it relates to their forests as well as how it relates to their previously held conceptions of the environment and climate change. Effectiveness encompasses participants being able to consider solutions for forest health in the face of climate change. Lastly, meaningful action will ultimately be the changes they make to forest management, but may be preceded by a desire to gain more information. The goal of the program is to have participants act reasonably with regards to climate change.

Engagement in learning is particularly useful with issues like climate change because of strongly held opinions among conservative audiences. YPCCC identified six distinct perspectives of Americans’ views of climate change. The categories are: dismissive, doubtful, disengaged, cautious, concerned, and alarmed, in ascending order of belief in global warming, concern, and motivation. In June 2010, 35% of Americans fell into the three categories of disengaged, doubtful, and dismissive. People in these three categories are far less likely to want to be engaged in climate-related programming because they have no personal connection to the issue. These respondents view global warming as a problem of the distant future, if at all (Leiserowitz, 2006). Dilling and Moser (2007) point out that there is a disparity between a person’s level of awareness of the issues and their level of personal concern. Therefore, creating urgency is not simply a matter of understanding the facts, but caring about them. They provide several reasons why climate change is not perceived as urgent, including the lack of immediacy (carbon dioxide and other greenhouse gases are invisible and have no direct health impacts on humans currently) and the remoteness of the impacts at the moment to most of the world’s population.

Issues must be framed in order to be relevant to landowners. Leiserowitz stated that, “most Americans lack vivid, concrete, and personally relevant affective images of climate change, which helps explain why climate change remains a relatively low priority national or environmental issue” (2006, p. 55). The issue must be framed in a local, current manner in order to properly engage participants (CRED, 2009).

The most common themes reported from focus groups done with forest landowners in the Pacific Northwest were uncertainty, complexity, and skepticism about climate change. Most landowners were confused by the “debate” and the science behind climate change, perhaps because of the use of complex models that are difficult for the general public to understand. This made it hard for landowners to assess the validity of climate science (Creighton, Schnepf, Grotta, Kantor, & Miner, 2011).

Using insights gleaned from the literature and the SECC row crop experience, we embarked on a program development and evaluation process that began with understanding forest landowners’ perceptions.
FOCUS GROUPS

Methods

An audience analysis, or needs assessment (Ernst, Monroe, & Simmons, 2009) took the form of focus groups in this project (Krueger, 1998). Two focus groups were held in Leon and Madison Counties, Florida with a total of 10 participants. Extension agents in both counties were asked to invite participants and a meal was provided. After opening questions about forest land and management goals, we explored questions involving climate change (Creighton et al., 2011). A sample of the questioning route used for this project is provided in Appendix A. Themes were derived from the transcriptions and categorized by their importance to participants.

Results

The focus groups attracted two different types of landowners. In Madison County, the majority of participants were large forest landowners, either working solely in timber and pulp production, or doing this in conjunction with an off-farm job. In contrast, the participants in Leon County were mostly small forest landowners; some were fairly uninvolved in the management of their land. This led to very different discussions in each focus group.

Larger landowners seemed to be most concerned with the economic aspect of their forested land, such that understanding climate change was not important. As one Madison County landowner stated, “If you’re worried about writing a check and balancing your checkbook for this year, it’s kind of hard to prepare for something that might happen 10 or 20 years down the road.”

The following is a summary of what the researchers came to understand that these larger landowners were interested in learning about climate change:

- Economics and increasing income from pine plantations, including biomass markets and conservation easements;
- Insect management;
- Climate forecasts, especially wet and/or drought periods, and management techniques during drought; and
- Species and varieties of pine to plant for future climate.

Smaller landowners did not manage their land for income, considering aesthetic, legacy, and conservation to be the priority. From their comments, researchers understood a few key issues about climate change that smaller landowners were interested in understanding:

- What is climate change and what are major causes?
- Are weird weather phenomena a result of climate change?
- How does population affect climate change?
- What is the role of fossil fuels in climate change?
- How does carbon cycle through Earth?

PROGRAM

Methods

The main topics that participants of the focus groups wanted to understand were extracted from the transcripts and notes, and using these, specialists from the University of Florida and Florida State University were chosen as speakers for the program—“Climate and Forests, What’s Changing?” The state climatologist provided basic information about climate science and change, while UF foresters covered practical forest management strategies for accommodating drought and insect pests. The program was designed to engage participants by creating an atmosphere conducive to discussion; this was done using a small-group facilitator, allowing all participants and presenters
to introduce themselves, limiting presentations to a very short introduction, and highlighting questions from the audience.

To understand whether our objectives were met and whether the program helped meet the goals of the RPM, we collected opinions and beliefs through a written survey before and after the program. The survey was based on questions from the YPCCC (Leiserowitz et al., 2010). A draft was pilot tested with three forest landowners. Using their feedback, the survey was revised and reformatted.

The data were analyzed using small sample-size statistics. Questions that were repeated in both surveys were analyzed using a \( t \)-test for two samples assuming unequal variances. All other questions were analyzed by finding either mean and median, totals, or ratios for all answers. Along with the survey answers, questions that were asked by participants during the question and answer sessions were written down, along with observational data that was gathered in notes.

**Results**

Fourteen participants attended the program, only one of whom had attended a focus group. Most were large landowners with more than 100 acres of land though one had a small yard in an urban area. The preprogram survey revealed that a few of the participants did not believe the climate is changing, but the majority of participants answered, “I believe it is changing and I am very concerned.” This was a good indication that the program attracted those who were concerned and wanted to learn more about climate change. There was no correlation between the size of the landowner’s parcel and their amount of concern, nor between concern and interest in further workshops. Although there was no significant difference between the prequestions and postquestions, more landowners desired more information to manage their forests in light of climate change after the program than before. Over half of the participants believe that the climate change is caused more or less equally by natural changes in the environment and human activities. Ten of the participants listed changes they had seen in weather or climate patterns during the time they had lived in Florida.

Evaluation feedback was generally positive. The participants found each part of the program to be fairly or very useful. The most helpful information was on insect and disease, best management practices for burning, resilience practices, and the explanation of El Niño and La Niña cycles. By the end of the program, the participants still had many questions, which suggests the program helped engage participants in thinking and established a comfortable atmosphere for considering this contentious issue. It also suggests that there is a need for additional programming. There was a positive response on the survey to continuing climate-related workshops, with researchers providing information to landowners. Almost all participants were in favor of receiving additional information in the form of a fact sheet or a tour of a forest and most preferred a presentation or workshop. Very few participants were interested in a Web-based program.

There were two additional opportunities for the researchers to collect questions from the participants: verbally, during the question and answer sessions, and in writing, on a page in between the presurveys and postsurveys that served as an area to note questions during the presentations. Although it did not come up in public discussion, the private questions revealed some doubt about the climate change data. One participant thought that claims are statistically insignificant because a “sample set of 100 years is insufficient.” Given the presentation, we believe the participant confounded the concepts of climate change and the El Niño and La Niña cycles.

The remaining written and verbal questions suggest topics the landowners still want to know concerning climate change and management of forests. The participants had basic climate questions, such as how greenhouse gases affect climate, and asked about:
• Forest water management
• Invasive and endangered species
• Forest resilience for insects and disease; uneven-aged management
• Tree genetics
• Weather and climate outlooks, El Niño and La Niña cycles
• Pastoral silviculture
• Market impact on management choices

The survey also provided insights into the degree to which the program affected participants’ mental models of climate change, sense of effectiveness, and ideas about actions (the three components of RPM). Questions about participants’ level of concern and beliefs about climate change showed that most respondents believe that climate change is occurring, is caused by human activities along with natural changes, and is of concern. This perspective closely matches the message of the program and enables participants to comfortably ask questions and learn more. However, some respondents revealed they do not believe the climate is changing; an effective Extension program must be able to reach and engage these participants, too.

Effectiveness was measured by asking respondents to rate each portion of the program for usefulness; each part of the program was rated as fairly useful (average of 3 on a scale from 0 to 4), and several topics were listed as being “helpful” in a separate free-response question. Program effectiveness was measured with a self-reported knowledge score. A slight but insignificant decline in the participants’ assessment of their own knowledge could be the result of the program offering new information which led them to realize how much they need to learn. Because participants’ questions primarily drove the program, information was not overwhelming.

The last component of RPM is the importance of meaningful action and participation, in this case, in the form of continuing to attend climate-related programs or changing their own forest management practices. Only four participants explained what changes they might consider making, but nine mentioned that they needed more scientific knowledge, hands-on learning, money, time, and energy to make management changes.

DISCUSSION

The purpose of this project was to discover if we could engage forest landowners in the topic of climate change. The landowners’ interests and questions at the focus groups framed the key elements of the program. Focus group participants said an economic frame would be effective for large landowners. The program utilized the most important themes from the focus groups: economics and increasing income from pine plantations and diversification of markets (biomass, conservation easements); insect management; climate forecasts, especially wet and/or drought periods; and tree genetics (what is best to plant now and in the future).

Program participants were generally receptive of information and wanted to learn more. The program was offered in a way that was sensitive to the political and emotional aspects of climate change information; it was framed to address what participants already know (weather, El Niño cycles) and what they expressed interest in learning. The format of the program was designed to encourage questions and discussion, with a small group facilitator and short presentations from the researchers and climatologist.

The data from observations and surveys indicate that the information about insects, diseases, best management practices for burning, resilience practices, and the explanation of El Niño and La Niña cycles was most useful. Since respondents want more scientific knowledge and hands-on learning, and responded positively to attending further workshops, it appears that the goal of inspiring meaningful action that will build relevant and helpful mental models was achieved. Comments helped reveal confusion about El Nino cycles and
longer-term climate changes, which point to an important addition for a future program. If the basis of this confusion is a scientific misconception, it can be addressed by acknowledging the validity of the experience or observation, presenting an example of a conflicting observation, and offering a theory that better accommodates all the data (Monroe, 2005).

One key aspect of this program appears to be the encouragement of participant questions. This enabled people to learn what they wanted to know rather than be overwhelmed with what an expert wanted to say. People thought the program was helpful and were willing to seek additional information. RPM provides a useful framework for designing a program that respected what people want to learn and can understand, as it focuses organizers on providing information that is meaningful and relevant, in a manner that is coherent yet not overwhelming. RPM also encourages program designers to concentrate on what participants can do with this information to help solve problems. Given that any audience is likely to have people who vary in their perceptions of climate change, encouraging people to share their ideas, experiences, and ask questions is a useful strategy to enhance individualized learning—social learning could be an important tool to changing the tone and expectations of a program on climate from confrontational to exploratory. Extension programs designed to encourage reasonableness, should begin to overcome many challenges to climate change communication (Dilling & Moser, 2007; Somerville & Hassol, 2011).

Based on the results of the survey and observations made at the program, this project successfully addressed all three research questions: (a) What are forest landowners interested in learning about regarding climate change and their land? (b) Can an Extension program engage landowners in a meaningful way that fosters an atmosphere for discussion and questioning? and (c) Do Extension programs focused on engagement with participants help to support reasonableness by the standards of the RPM?

We now have a better idea of what landowners still need and want to understand about forest health and climate change. The information from this project will help create additional programs for forest landowners in North Florida and will be shared for use across the southeastern region. Misconceptions and lack of belief in climate change continue to be barriers to communication, but relying upon social learning strategies and using RPM as a framework for program design could help Extension agents overcome these barriers.

REFERENCES


**APPENDIX A**

1. Tell us about your forest . . .
   a. How many acres?
   b. How many acres are planted, how much is natural (old growth or natural regeneration)?
2. People have been talking about and reporting on odd weather, unusual droughts, rain-storms, and so forth, and attributing this to “climate variability.” What have you observed on your land?
   a. What kind of questions do you have about climate variability?
3. How do you think climate variability may or may not impact your forest?
   a. What would you like to know about this?
4. Are you aware of management changes that you might implement to protect you/your forest from potential future climate variability?
   a. Would you like to know more?
5. There’s a lot of information out there—how do you decide what to believe about climate?
6. Where do you get most of your information about climate change?
7. Extension plans to develop information for forest landowners on climate change. In what form would you like to get this information?
8. Do you have any further questions?