Information Transfer and Public Awareness Sector Report

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INTRODUCTION

Information Transfer was the title of our breakout group, however, those of us sharing a concern for increasing the public awareness of global change issues know that we cannot simply transfer information from the heads of scientists into the minds of the public. People incorporate new knowledge based upon their prior knowledge, the way they experienced the new incoming knowledge (e.g., media, hands-on), and how relevant the new knowledge is to the them. Therefore, information transfer of global change issues to individuals incorporates *how* people may learn information and *what they do* with the information once they have it.

With this broad ranging concept in mind, increasing the understanding and awareness of the public about global change issues encompasses many audiences: people differing in age, ethnic background, religion, gender, interest, and capabilities. It also incorporates a variety of venues for facilitating information transfer such as television, newspapers, radio, workshops, community groups, informal education (Cooperative Extension), K-12 education, and higher education.

Because of the difficulties in communicating complex scientific information to so many constituencies in so many forms, the group reached a consensus acknowledging there is no one way to educate the public, but many methods and procedures. In order to avoid duplication of effort, those who engage in information transfer need to communicate and educate the public in a coordinated effort.

The Information Transfer and Public Awareness group included a broad representation of individuals from education (high school and university), adult outreach and education (Cooperative Extension and Union of Concerned Scientists), climate change researchers from the scientific community interested in how information is transferred and incorporated into decision-making, state (Maine DEP) and federal (New England EPA) government representatives, and two media liaisons (one local and one federal).

The members of the Information Transfer group identified a series of problems and opportunities related to informing and educating the wide range of populations important to reach with global environmental change information. Many of these significant findings are not only specific to global environmental change issues, but are important to a public capable of coping with evolving environmental concerns.

The group identified concerns/problems which were summarized into four strands:

- the advancement of scientific literacy of the public,
- the need to identify key concepts,
- the lack of information availability, and
- the increasing necessity for communication between the various stakeholders.

Our group recognized the need for a long-term educational strategy to improve the scientific literacy of the public. Therefore, it is critical that key concepts, which comprise the most important facets of the global environmental change issues, be identified. From these concepts, we need to develop local, regional, and global examples that will help people to define global change issues in a manner relevant to their lives. A personal connection to global environmental change issues is a crucial step leading to the ownership of the problem and resulting behavior changes.

A variety of outreach and teaching mechanisms need to be employed in order to reach the diversity of audiences impacted by global change. We need to create new, and utilize existing, informational systems. An example of existing informational systems is the Environmental Protection Agency's world wide web pages on climate change. There are many such governmental agencies, non-profit organizations, and universities that already have existing information; however, accessibility is crucial. Reputable and knowledgeable clearinghouses are needed to find and organize all the diverse sources of information.

* See Appendix V for authors' affiliations and addresses.

Scientists, especially those who are educated to facilitate communication, need to interact more with teachers, the public, and the media. Educators must turn their energies to developing and implementing more authentic learning experiences for students. Outreach specialists need to inform small businesses, farms, and other public sectors of the local and regional impact of global climate change. Finally, the media need to increase their coverage of climate change issues and develop stories that accurately describe the complexity of this topic.

In preparing an information and education effort to address climate change and other global environmental issues, it is crucial to recognize that these issues are long-term, interdisciplinary, and must be understood by a wide range of audiences. As a result, there are no quick, simple, or easy options that can be implemented. The solution requires a long-term investment for the development of a public capable of recognizing and dealing with the complex issues of global environmental change.

SIGNIFICANT FINDINGS

The Information Transfer group recognized certain information dissemination issues that relate to global environmental issues in general and global climate change specifically. The group members also developed a number of recommendations thought of as "actions and opportunities" which are listed at the end of this report.

- Scientists are professionally discouraged from communicating with the general public. This creates an individual hesitancy with regards to sharing data and interpretative information outside of accepted professional channels if one's credibility in the scientific community is to be maintained. We need to create changes in the reward structure for researchers, academics, and scientists.
- People with good information are not always good communicators. Communication training may be a very helpful option. Professionals with a background in science trained in communication and/or educational techniques could bridge the gap between the scientists, the general public and businesses. Examples could include extension educators and specialists, as well as other outreach specialists in governmental and non-governmental organizations.
- The lack of understanding among the public may also be related to the levels of uncertainty reflected in the data on climate change compared to the levels of risk change involves.
- The media needs to be encouraged to report on climate change issues with care, foregoing the sensational and simplistic for proven scientific fact and complexity. Topics of global change, being long-term, are often not a good match with the media requirements for new/late-breaking news, personal interest stories, or dramatic photo opportunities. By the time the drama of a forest die-back occurs, it is too late.
- Doom and gloom sells media stories, however, it is crucially important to provide hopeful, good-news stories that demonstrate appropriate actions to avoid feelings despair and promoting lack of action by the public.
- The classroom educator is already overwhelmed with the amount of material that must be learned by students during the school year. To learn and teach global change issues may not be a priority as a separate subject. However, there are many opportunities in several subject areas such as science and social studies to integrate global change concepts and activities.
- Interest groups and businesses affected by pollution controls frequently implement misinformation campaigns through media editorial campaigns and advertising that further muddy the facts with innuendo and create major obstacles to changing the status quo.
- In many of our discussions we assumed the public *wants* to learn about these global environmental issues; however, it is unclear what percentage of the public is truly interested in learning about these issues. How can we encourage additional interest? How can we support reaching those interested individuals and groups?

THE FOUR QUESTIONS ADDRESSED

The questions given to the various breakout sectors to focus the discussion during the breakout sessions were changed by our group to better address issues of information transfer. Our job is to be able to assimilate information about global change issues and to help others understand this information in a way that informs and empowers them as decision-makers. Information transfer professionals need to know the concerns, problems, and current knowledge held by various stakeholders because of the frequent role that they play as intermediaries between the groups. Therefore, the four guiding questions were transformed.

The Four Original Questions and Transformed Questions

- What are the current concerns and stresses facing regional stakeholders in the Information Transfer sector?

  What are the stresses that impact the information transfer of global change issues?

- How will climate variability and climate change modify the current concerns and stresses of this sector in the region?

  Who is the public we are trying to reach?

- What information and data are needed by information transfer experts to fully understand and address climate-related issues?

  What are some ways to support outreach to the public?

- What types of strategies and approaches are available for coping with, or mitigating, climate change stresses for this sector?

  Where are the information gaps? What do we need to do better?

From the breakout session notes, themes emerged from the overlap in our rich discussions. Specific suggestions were organized under the description of the four strands, as detailed below.

Four Strands to Global Climate Change Education and Information Transfer

1. Science Literacy

Any long-term education strategy undertaken must include improving science literacy. Science literacy is defined as being made up of at least five components:

1) a vocabulary that includes some basic scientific and technical terms and concepts;
2) an understanding of the scientific method including, for example: the possibilities and limits of scientific investigation;
3) developing an understanding of how scientific consensus is reached;
4) an understanding of the role of uncertainty in science, and options for responding to new scientific claims;
5) the impacts of science and technology on society (what does it mean for me?).

The lack of science literacy in the general public contributes to dismissing the seriousness of global environmental issues, such as global climate change and the likely impacts, for a number of reasons. Scientific literacy can include the need to:

- understand that global change science is a developing science and that the present state of knowledge is changing;
- clarify apparent past scientific non-consensus about global climate change and the confusion that period subsequently engendered;
- understand the reasons for the apparent imprecision in the range of climate model projections or likely impacts for specific regions;
- encourage scientists, who usually do not, and often will not, to make policy even though they are often considered more credible than policy makers;
- understand risk assessment and resulting policy choices.

2. Key Concepts

The confusion experienced by many members of the public when confronted with information related to global environmental issues is common. Part of the confusion relates to the lack of scientific literacy, while another part can be understood due to the complexity of the issue.

The *key concepts,* topics which explain the most important facets of global environmental change issues, need to be developed by experts and disseminated to the many audiences impacted by climate change. Those key concepts need to include brief descriptions, examples, and a glossary including a definition of terms that would clarify the variety of phrases currently in use. For example, global warming, climate change, and climate or natural variability are different concepts that are often (and incorrectly) used interchangeably. All those terms have different meanings, but the public is not aware of the nuances of each term. An effort to cross those language barriers would assist useful interactions related to global environmental issues and the policy options and personal actions undertaken.

Another level of key concept development would be applied to regional and local issues and examples. Personal connections to global environmental change issues are crucial to creating a sense of ownership of the problem and a willingness to undertake the personal responsibility for change.

Some examples of the key concepts in action include:

- Develop a multidisciplinary approach to science learning that addresses the complexity of the interconnections and global nature of the issues under consideration.
- Assist teachers with programs that link required curricula and standards to key concepts about global change issues.
- Connect global change issues to standardized, statewide learning requirements and assessments such as state science assessments (i.e., New Hampshire).
- Encourage the local media to provide information related to the key concepts in several different forms: short television "Did you know" spots, radio announcements, articles in sectorial journals, and inserts in newspapers.

3. Information Availability

The distributed and fragmented nature of the global environmental change information and the resources available, make it extremely difficult for individuals to find pertinent information. One centralized, regional information source would help to solve that problem. Other actions to facilitate information transfer include:

- Address the lack of resources providing information and education to a wide range of audiences.
- Cull, distribute, show how and when to use the fragmented information and resources available to make them available for a variety of user/interest groups.
- Research region-specific examples to explain and encourage adoption of a sense of responsibility. Without local and regional examples it is difficult for people to see the relevance of the issue to themselves.
- Develop an empirical mechanism to see if the information and resources that are being distributed are being used.
- Provide workshop and educational outreach opportunities for the media on climate change issues. A goal of countering incorrect information and de-emphasizing the often-used sensational highlights should be reached. We need to clarify tested observations and understandings to the media by reducing the complexity of climate change science for them.
- Develop relationships with media professionals on local, regional, and national levels to provide the latest emerging data and maintain the media interest for global change issues, which by nature require a long-term focus. Find ways to personalize and localized science stories for media coverage.
- Focus on human actions that positively affect the environment. Doom and gloom sells in the media, however, it is crucially important to provide hope, good-news stories, and appropriate actions to avoid feelings of despair and therefore lack of action by the public.

4. Increased Communications

There are any number of important considerations related to communication efforts. One is the issue of knowledge, accuracy, and credibility. In environmental issues, scientists often have first-hand information and are perceived as more knowledgeable and credible sources than industry, government, or media representatives. Most scientists, however, do not consider direct interaction with the various publics as part of their profession. The Information Transfer working group recognizes this dilemma and suggests the need to widen the job of scientists to include communication. Because of their perceived credibility they might also suggest appropriate actions for individuals and groups to implement. Specific suggestions include:

- Reward scientists for communicating and educating the public.
- Train people with good information to be better communicators and educators to bridge the gap between scientists and the public.
- The transfer of information requires meeting person-to-person with researchers and others outreach specialists.
- Try to find strategies to get non-interested teachers and community members involved.
- Suggest appropriate actions from credible sources for the public to implement to assist in the global change situation.
- Consider using famous personalities as a way to reach various audiences. Suggestions for well-known spokesperson could include: C. Everett Koop, Patrick Stewart, Bill Nye and astronauts such as Sally Ride.

- Combat the misinformation campaigns that are being waged by the potentially affected sectors with well-time, interesting press releases that illustrate the refuting facts.

Recommended Actions and Opportunities

The issues surrounding global environmental change provide windows of opportunity for a variety of actions. Those suggested by the group are listed below, along with a series of crucially important recommended actions needed to support information transfer and education efforts.

- Define "key concepts" that define the most important aspects of significant global environmental change issues to be communicated.
- Develop local, regional, and global examples for use in information transfer activities.
- Recognize science literacy as a major component of a long-term education strategy for global environment issues.
- Encourage an understanding of linkages between global environmental change issues and other stressors on the environment and on the social systems in our communities.
- Recognize that a personal connection to global environmental change issues is crucial to ownership of the problem and resulting behavior changes.
- Understand that these issues are long-term and require a long-term investment to develop a capable public interested in addressing these issues.
- Recognize the variety of audiences that need to be reached and the variety of information sharing mechanisms that need to be employed.
- Utilize existing, and create new and needed, information systems.
- Incorporate media relations as a crucial part of the information transfer process.
- Encourage scientists to interact more with the teachers, the public, and the media.
- Provide opportunities for experiential learning for students and families through programs such as GAIA and GLOBE that encourage people to become scientists in the realm of global change, and students to become involved in the science.
- Train facilitators in communication skills and utilize governmental outreach agents to work with the general public and businesses.
- Reorganize the way science is taught in teacher education programs and undergraduate higher education to be built around an experiential-experimental model instead of lecture-didactic method.
- Create specific learning modules or individual educational activities that teachers can incorporate into existing curriculum.