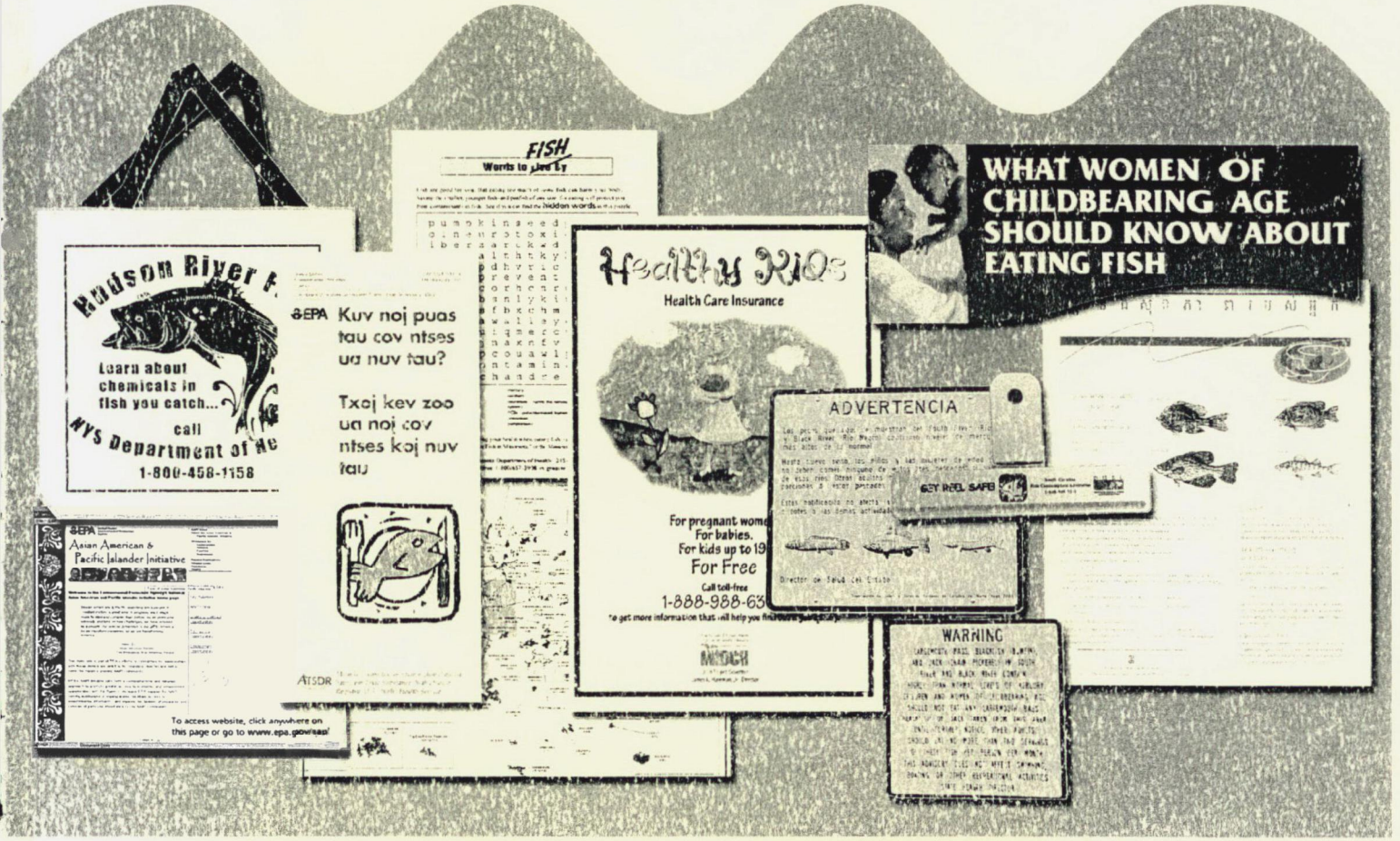
National Risk Communication Conference

Held in Conjunction with Annual National Forum on Contaminants in Fish

Proceedings Document

Sponsored by
U.S. Environmental Protection Agency
(under Cooperative Agreement No. X-82825101-0)
Minnesota Department of Health
Society for Risk Analysis

Chicago, Illinois
May 6-8, 2001



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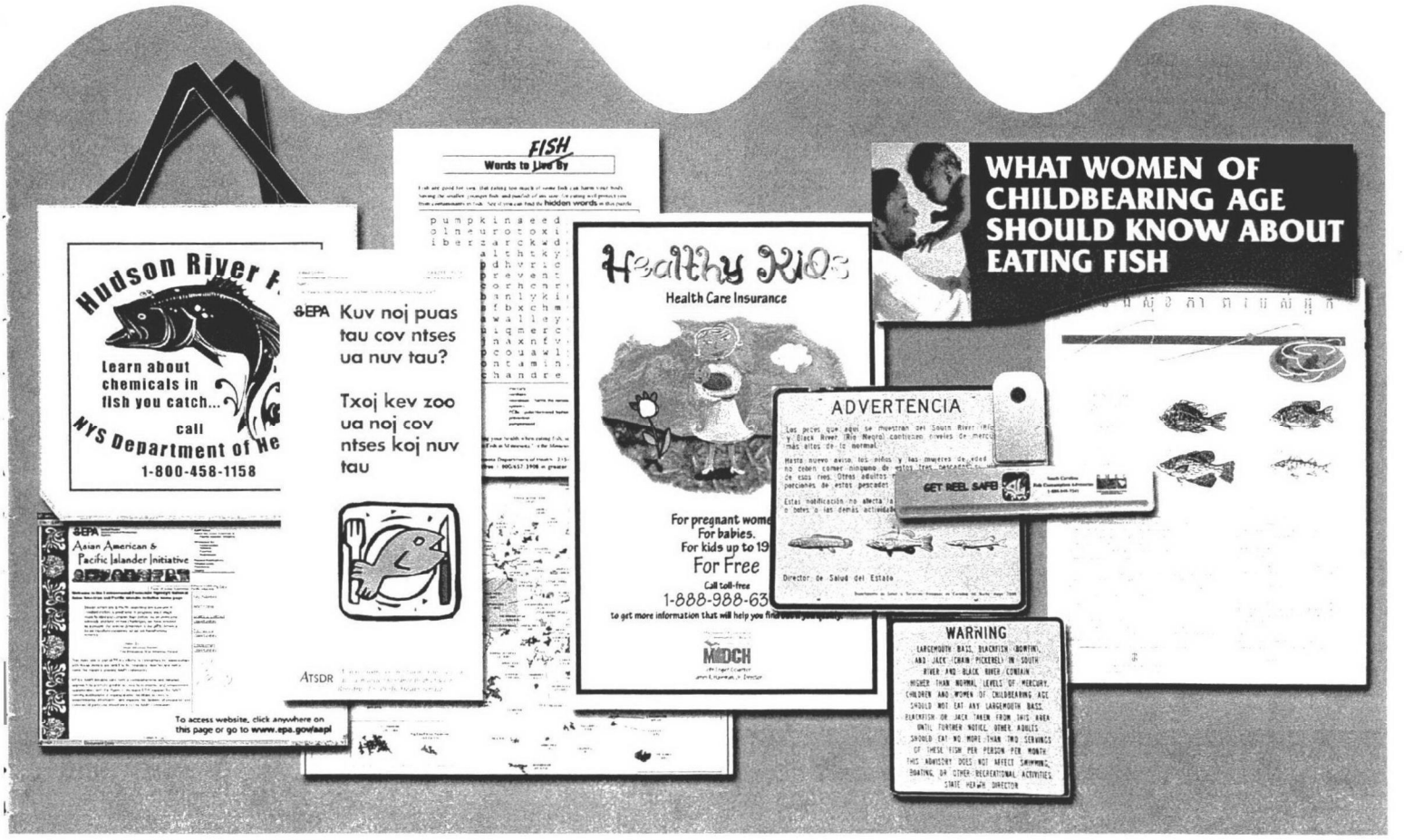

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Prepared by

Research Triangle Institute
P.O. Box 12194
Research Triangle Park, NC 27709

August 2001

Foreword

A conference was held in May 2001 to bring together representatives of state, tribal, and community programs involved in communicating health risks of eating chemically contaminated fish. The focus of the conference was communicating risks to fish-eating populations who are hard-to-reach because they may not hear, understand, or be receptive of health risk messages about contaminated fish.

A technical advisory committee made up of stakeholders and experts in the field helped plan the content of the conference and designed presentations, panels, and a classroom lecture series on the steps of risk communication. Interactive discussion sessions among conference participants were intended to elicit best practices in risk communication and identify priorities for research needs.

The planning committee identified speakers from around the country who had expertise in the various steps in risk communication and had past experience in communicating with hard-to-reach communities. Speakers from academia, federal and state government, tribes, and community-based organizations were asked to present at the conference.

Funding from the U.S. Environmental Protection Agency made it possible for the planners to pay the travel costs of a large number of participants. Each state was asked to nominate one representative from their fish consumption advisory program and a community partner. Tribal governments with past involvement in water quality standards or fish consumption advisories or those identified by EPA Regional offices were invited to attend. In addition, water quality planners from each state and a large number of community-based or nonprofit organizations were also invited. A total of 356 people attended the conference.

This document contains the details of the presentations and discussions that took place over the two days of the conference. The recommendations and research needs identified by the conference participants are described in the record of the breakout discussion sessions. These recommendations will be shared with each conference participant, each state fish consumption advisory program, and EPA's National Fish and Wildlife Contamination Program.

Pamela Shubat
Co-Chair
Conference Technical Advisory Committee

Acknowledgments

This proceedings document was prepared under Assistance Agreement X-82825101-0 between the U.S. Environmental Protection Agency (EPA) and the Minnesota Department of Health. We would like to acknowledge the following individuals who served on the Technical Advisory Committee for their help in planning and organizing this National Conference on Risk Communication:

- Dr. Henry Anderson, Wisconsin Division of Public Health
- Henry Folmar, Mississippi Department of Environmental Quality
- Kristin Ryan, Alaska Department of Environmental Conservation
- Mike Haars, Alaska Department of Environmental Conservation
- Edward Horn, New York State Department of Health
- Faith Schottenfeld, New York State Department of Health
- Andrew Smith, Maine Bureau of Health
- Patricia Cochran, Alaska Native Science Commission
- Moses D. Squeochs, 14 Confederated Bands of the Yakama Nation
- James Thomas, 14 Confederated Bands of the Yakama Nation
- Amy Kyle, University of California, Berkeley
- Brian Merkel, University of Wisconsin-Green Bay
- Steve Blackwell, Agency for Toxic Substances and Disease Registry
- Jeffrey Bigler, National Fish and Wildlife Contamination Program, U.S. EPA
- Elizabeth Blackburn, Community Affairs and Outreach of the Office of Children's Health Protection, U.S. EPA
- Kathryn R. Mahaffey, Office of Science Policy and Coordination (Office of Prevention, Pesticides, and Toxic Substances), U.S. EPA.

In addition, the committee relied on Milton Clark, U.S. EPA Region 5 Health and Science Advisor, and Edward Ohanian, U.S. EPA Health and Ecological Criteria Division, for assistance.

Subcontractors Patricia A. Cunningham, Research Triangle Institute, and Barbara Knuth, Cornell University, played an integral role in the planning committee, including development of the conference agenda, identification of speakers, and development of technical materials. Carolyn Walker and Tanya Bethel, ICES, Ltd., provided logistical support for securing conference facilities and services and travel arrangements for the invited speakers and attendees.

Although the information in this document has been funded wholly or in part by the U.S. Environmental Protection Agency, it may not necessarily reflect the views of the Agency and no official endorsement should be inferred.

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Part I

Conference Summary

National Risk Communication Conference

May 6-8, 2001

Background

The first national conference on risk communication to address the risks of consuming chemically contaminated fish was held in Chicago, Illinois, May 6-8, 2001. The conference was convened by the Minnesota Department of Health and the U.S. Environmental Protection Agency's (EPA) Fish and Wildlife Contamination Program and cosponsored by The Society for Risk Analysis. Participants from across the United States were invited to share information on risk communication methods that are effective for populations exposed to and susceptible to chemical contaminants in fish, especially those who may have difficulty receiving, understanding, or accepting risk information. The purpose of the conference was to develop recommendations on risk communication techniques that are effective in reaching specific audiences and informing them of the risks from eating contaminated fish. A complete description of the conference goals and objectives is provided in Part VI, Appendix A, of this proceedings document.

EPA helped identify the agencies and organizations that have produced fish consumption advisories and the nongovernment organizations that have used fish advisories in education and outreach to communities. Representatives of these groups made up the primary audience for the conference and included state and tribal fish advisory contacts, riverkeepers and other community-based organizations, as well as university, private contractors, and representatives from various federal programs.

A geographically and institutionally diverse planning committee (see Acknowledgments), co-chaired by Patricia McCann and Pamela Shubat of the Minnesota Department of Health, identified topics to be addressed and speakers for the sessions. The planning committee included individuals with experience in state fish consumption advisory programs; individuals knowledgeable of Native American tribal concerns regarding fish consumption and advisories; academicians experienced in issues of fish consumption, indigenous communities' concerns, and environmental justice; and representatives of EPA and the Agency for Toxic Substances and Disease Registry.

The conference officially opened on Sunday, May 6th, with a Risk Communication Display Session (see Part VI, Appendix A). Various state, federal, and tribal programs displayed examples of their fish advisory communication materials and were available to discuss the programs they represented. All display materials were made available to conference participants on a CD-ROM and will be included in a fish advisory information clearinghouse to be

established on the EPA fish advisory website www.epa.gov/ost/fish. Copies of the CD-ROM are available from EPA.

This proceedings document is organized in six parts. Part I offers a summary of the conference proceedings and recommendations. Part II contains the text of the presentations made by invited speakers and panel participants. Part III summarizes the breakout session discussions and recommendations. Part IV provides an overview of the Risk Communication Basics course that was offered concurrently with the Breakout Sessions. Part V contains the transcribed questions and comments submitted by participants throughout the conference. And conference background and presentation materials are provided in Part VI.

Conference Organization

The conference was organized around the six primary steps of risk communication:

- Identify and get to know the audiences
- Determine what the audiences need and want to know
- Choose and develop the message content
- Choose the medium for the message
- Implement the communication program
- Evaluate the risk communication program.

These components were explored through a variety of session formats. Presentations, breakout discussion groups, and lectures allowed conference participants the opportunity to learn more from experts in the field as well as from one another through active participation in discussions. The contents of these sessions are presented in Parts II and III of this document. In addition, participants were encouraged to submit questions and comments in writing. These questions and comments were intended to allow participants to comment on the record when time or session format did not allow discussion. The written comments have been transcribed and are presented in Part V, Written Comments.

Conference Summary

Welcome and Introduction

Kathy Svanda, Minnesota Department of Health, followed by James Hanlon, U.S. EPA, welcomed conference participants and explained the purpose of the conference. The number of fish advisories has been steadily increasing nationally over the last decade, with 48 states currently having fish consumption advisories in effect for some state waters. Advisories now cover 71 percent of U.S. coastal waters including all waters of the Gulf of Mexico, and all of the waters of the Great Lakes. Health effects are not abstract or theoretical and exposure to contaminated fish can lead to a range of health problems. States and EPA have made improvements in communication, but traditional communication mechanisms may not be effective in reaching at-risk groups, including the rural and urban poor, women, and those who eat large amounts of fish. EPA's role has been to provide guidance to the states for their fish advisory programs through the document series, *Guidance for Assessing Chemical Contaminant*

Data for Use in Fish Advisories. The most recent risk communication endeavor undertaken by federal agencies was the National Mercury Consumption Advisory issued by EPA for locally caught freshwater fish and issued by the Food and Drug Administration for commercial marine fish. The conference objectives are to better understand how different at-risk populations receive risk communication messages and what the barriers are to communicating effectively with these hard-to-reach populations.

Identifying and Getting to Know the Audiences

Barbara Knuth, Cornell University, began the morning plenary session with the keynote address, "Risk Communication Challenges: Are Audiences Hard to Reach? Or Are the Messages Hard to Send?" Dr. Knuth introduced the process of risk communication as it pertains to fish consumption advisories: Risk communication is a process of sharing information about perceived and potential dangers and benefits associated with fish consumption. Audiences can be hard to reach for a variety of reasons; they may not speak English or have only a limited command of the language, they may be geographically isolated, or they may be suspicious of the agencies delivering the advisory information. Some audiences choose not to follow the consumption advice because they feel the benefits of eating fish outweigh the risks. To communicate risk information with these audiences requires understanding the elements of culture and communication and how they affect the communication process as well as the response process.

Session 1: Perceptions of Fish Safety: Voices from the Community addressed the first step in risk communication with a panel of five diverse community representatives. Josee Cung, Minnesota Department of Health, spoke of the concerns of Minnesota's Southeast Asian immigrant community regarding cultural traditions, chemical contamination, and consumption patterns. Maria Maybee, Great Lakes United, discussed the objectives of her project and related a few of her successes in risk communication. She spoke specifically of the challenges in reaching Native Americans and women. Jose Cuevas, Commissioner for Human Rights, Elizabeth, New Jersey, described the efforts of the New Jersey Department of Environmental Protection to perform a fish consumption study in his Spanish-speaking neighborhood. He also discussed his recommendations on how to make this study more successful. Ora Rawls, Mississippi Rural Development Council, voiced the concerns of the rural poor and, specifically, African-Americans. She stressed that the amount of fish consumed is underestimated and that advisories are not yet communicated effectively to the rural community. Patricia Cochran, Alaska Native Science Commission, described the goals and objectives of the Traditional Knowledge and Contaminants Project. She also related the concerns of the Alaska Native Communities about the overall cultural and environmental health of their communities and the changes observed in fish and wildlife species in Alaska.

Session 2: Risk Communicator Presentation examined the process of getting to know the audience from the risk communicator's point of view. Ed Horn, Bureau of Toxic Substance Assessment, New York State Department of Health, discussed the different aspects of at-risk populations and hard-to-reach audiences. He described some of the major challenges facing New York State (lack of funding and staff) and the nontraditional communication strategies that have been used to address these challenges, such as partnering with other agencies or groups. Stephanie Allen, Sagamok Anishnawbek First Nation, described a case study of the Effects on Aboriginals from the Great Lakes Environment (E.A.G.L.E.) project and discussed key points for

working in partnership with First Nations and Tribes. Henry Anderson, Wisconsin Division of Public Health, examined how to realistically promote and establish fish consumption advisories with limited resources. He stressed the importance of developing a common message to avoid confusing the audience.

In Session 3: How to Gather Information on Target Audiences, Sharon Dunwoody, University of Wisconsin-Madison, discussed the need to determine who your target audience is and what information they need to know. Dr. Dunwoody discussed the advantages and disadvantages of various information-gathering techniques, such as focus groups, purposive sampling, and mail, telephone, and in-person surveys and presented a case study to further illustrate the point.

Determining What Your Audiences Need and Want to Know

Following lunch, conference participants chose to attend either the Risk Communication Basics Course, Session 1: Overview of Risk Communication Process, Problem Identification, and Target Audience Identification (see Part IV), or one of the five topic sessions within Breakout Session 1: Determining What Your Audience Wants to Know. Randy Manning, Georgia Department of Natural Resources, led the first session of Risk Communication Basics Course. A facilitator and notetaker (is this one word or two words???] led the discussion within each breakout topic session. The groups condensed their discussions in the five breakout sessions into recommendations for best practices and information needs, which were presented in the plenary session following the breakout sessions.

For Breakout Session 1, recurring themes included involving the target audience (community) at all steps of the risk communication process and investigating potential alternatives that would make sense to the target audience to reduce exposure to consumption of contaminated fish (e.g., fishing at different sites, eating a variety of fish species, and using various trimming and cooking practices to reduce exposure). Recommendations of the five topic sessions include the following:

- **Women's Health Issues—Pregnant, Nursing, Childbearing Age.** Go to community organizations and leaders as well as health care providers to better understand the information needs of women and how to best reach women. Include women in the communication process and test messages and evaluate success throughout.

- **Cultural/Traditional or Geographically Isolated Subsistence Fishers, Including Native Americans.** Communicators must spend time with tribal communities; government-to-government relationships must be developed with tribes; and the social, cultural, spiritual, as well as nutritional benefits of fish and native diets and the need for replacement protein must be addressed in communicating fish advisory information. Messages that emphasize options and choices are better received than the "do not eat" message. In addition, fish advisories are not a substitute for reducing toxic discharges or removing existing contaminants from the environment.

- **Fish Eaters Whose Native Language Is Not English.** Involve and use community-based organizations to build trust, understand the community, and carry out a communication plan. Each ethnic group may learn and communicate differently. An important research effort is to understand each community's risk perception, customs, traditions, and practices.

- **Economically Dependent Fish Eaters—Urban and Rural Poor.** Involve and use leaders within the community targeted for a communication project. Use positive messages that emphasize options and choices rather than the "do not eat" message.

- **General Population Sport Anglers.** Provide anglers with core information on advisories, but also let them know where to find in-depth information. Focus messages on family members and friends as well as the angler. Include a range of healthy choices to reduce exposure, and research the health benefits of eating fish and the safety of alternatives to eating fish.

In Case Studies of Fish Advisory Scenarios, Kerry Kirk Pflugh, New Jersey Department of Environmental Protection, discussed a community outreach project for at-risk urban anglers in New Jersey. The project also included work with children and women. Ms. Pflugh explained the challenges and successes of this project in detail as well as the lessons learned. Henry Anderson, Wisconsin Department of Health and Family Services, discussed two projects with which Wisconsin is involved, then focused on an evaluation of mercury advisory awareness by 3,000 women in 12 states and suggested how these results could affect fish consumption advisory program development.

Choosing and Developing the Message Content

The second day of the conference opened with Session 4: Choosing the Message Content, presented by Joanna Burger, Rutgers University. Dr. Burger discussed two case studies that revealed the importance of choosing a message that takes into consideration cultural and socioeconomic characteristics of the target audience. The case studies were based in the Newark Bay Region of northern New Jersey and the Savannah River region, which straddles the states of South Carolina and Georgia. Through these studies, Dr. Burger emphasized the need to look at local consumption patterns and the appropriateness of the message.

Conference participants then attended either Breakout Session 2: Issues in Developing Message Content, or Risk Communication Basics Course, Session 2: Developing the Message and Selecting the Medium for the Message. Christine Arnesen, California Department of Health Services, taught the Risk Communication Basics course. As in Breakout Session 1, the discussions in the five breakout sessions were summarized into recommendations for best practices and information needs and were presented in the plenary session following the breakout sessions. In addition to the five facilitated breakout group sessions, a sixth breakout session met. Participants in the sixth group met to discuss fish consumption concerns specific to indigenous communities. They also presented a summary of their discussion in the plenary session.

Recurring themes in Breakout Session 2 discussions included the need to know the audience, problems with a lack of communication about risks associated with commercially available fish, and the desire to weigh the benefits of eating fish against the health risks. Recommendations of the six topic area sessions in Breakout Session 2 include the following:

- **Mercury, Especially as It Relates to Child Development—also, Pregnancy, Nursing, Childbearing Age.** The audience must be well understood because message content must be adapted to the audience. Test the message and provide risk communicators with the risk assessment information necessary for interpreting messages and answering questions. A five-part message can be used to describe the problem, the impact, the alternatives, the importance of good nutrition, and the importance of nursing. Carry out further research on the acute effects of contaminants on the fetus and conduct a risk/benefit comparison of fish that are typically eaten.

- **Communicating Risk/Benefit Information.** When fish are consumed for subsistence purposes, there is no clear alternative to eating fish; consequently, a "do not eat" message is not well received. It may be appropriate to factor the benefits of eating fish into the risk assessment equations, especially for tribal communities. Articulate information on a holistic approach to diet and the benefits of fishing and fish consumption in communicating risks, and involve consumers in creating and testing messages. In addition, risk communicators must be very clear about why they are providing benefits information and information needs, including collecting data on contaminant levels in commercial fish and refining the accuracy of health benchmarks to try to reduce uncertainty of the risk assessment equation.

- **Developing One Message vs. Many Messages for Diverse Audiences.** There is a trade-off between one simple message and many messages that meet the needs of a diversity of audiences. Messages should be consistent across agencies and be simple, visual, and capable of leading people to learn more about the advisory, for example, through a state toll-free telephone information hotline.

- **Communication Paradigms.** The content makes a message effective. Use combinations of the different types of messages (prescriptive vs. explanatory, simple vs. complex, general vs. site-specific), create multiple messages, and use special features to direct people to the more detailed information they might want. Establish an information clearinghouse to improve sharing of currently available examples of advisory messages using different media.

- **Issues in Developing Message Content: Common Misperceptions.** Ensure that messages from different agencies are consistent; empower the community in decisions, messages, their creation, and solution; and create messages specific to each audience using media appropriate to the audience. Information needs include how to translate technical data into practical information for the target audience and research on comparative risks of consuming fish to other risk sources.

- **Native American Viewpoint.** Most of the indigenous community representatives wanted to meet separately so that they could provide constructive suggestions to EPA about future meetings. The tribal representatives wanted more participation in developing the program for this Risk Conference and more opportunities to make presentations. They also want an opportunity to meet and network among themselves and the involvement of additional tribal groups in any future meetings. They discussed inviting EPA staff to their regional meetings and possibly using any future conferences as in-service training opportunities. Emphasis was placed on the sovereignty of the tribes and their need to be recognized on a government-to-government basis. They emphasized that their tribal peoples are concerned about rapid changes in traditional diets, that tribal communities need to be involved from the beginning in the risk communication process, that they need to be included in federal meetings, that they will receive documents or proceedings from this conference, and that the burden of action should not be placed on the tribal communities, but on the polluters who are creating the need for advisories.

Choosing the Medium for the Message

John Cahill, New York State Department of Health, presented Session 5: Choosing the Medium for the Message—Overview. Mr. Cahill examined current media and communication channels and discussed the advantages and disadvantages for each of these methods. He stressed the importance of identifying and understanding the audience to be reached by age, gender, race/ethnicity, income, and whether they were licensed anglers. He emphasized that nearly half of the potential audience for fish advisory information includes unlicensed anglers. He also discussed the use of focus groups that were used in New York to obtain information from minority and other hard-to-reach community audiences. In addition, he discussed advantages and disadvantages of special events, produced programs, and gimmicks and giveaways and provided lists of potential organizations with whom states/tribes might partner to get the advisory message to the target audience.

Implementing the Communication Program

Session 5 continued with examples of state and community communication activities. Kristine Wong described the methods used by the Seafood Consumption Information Project at the Save San Francisco Bay Association. Through survey methods, the project was able to best determine the target population and design the most appropriate public education campaign for that audience. She discussed using multilingual interviewers to obtain information from the many ethnic community members that fish in San Francisco Bay and the components of the project's public education campaign. Josee Cung, Minnesota Department of Natural Resources, related her department's efforts to design culturally appropriate models of education for Southeast Asian immigrants. She gave examples of these communication methods, including standard classroom training workshops, meetings at anglers' homes as a version of the storytelling tradition, day field trips that included travel to fishing sites, visits to the state biology laboratory, production of translated materials for the purpose of reinforcing the message, and radio announcements and videos for airing on community TV network.

Evaluating the Risk Communication Program

Barbara Knuth, Cornell University, presented Session 6: Evaluating the Risk Communication Program—Overview. Dr. Knuth described the three elements of evaluation—formative, process, and summative—and ways the elements could create a useful evaluation. She also discussed how to judge advisory success. It can be evaluated by determining its effects on a range of indicators, such as overall diet quality, local economy, and human health. Evaluation endpoint behaviors include fishing-related, information-related, and fish-eating behavior. She also emphasized that not seeing a change in behavior does not necessarily mean the message has had no effect. Audiences may make a conscious, informed decision about not following voluntary health advisories, or baseline behaviors may be already within the recommended guidelines and the risk communication information helps maintain those desired behaviors.

Following the introduction to the topic by Dr. Knuth, two presentations focused on examples of methods used to evaluate the effectiveness of the message. Barbara Hager, Arkansas Department of Health, discussed the evaluation efforts for the Arkansas Mercury in Fish Project. She spoke of the challenges in evaluating health advisory risk communication programs and the lessons that could be learned. She discussed questions that Arkansas used to evaluate their program. Thomas Nighswander, Alaska Tribal Health Consortium and University of Washington Medical School, used lessons learned from the Exxon Valdez oil spill to discuss how to create an effective message and then evaluate its success. A primary point of his talk was that the subsistence fishers in the area of the spill needed to be involved early on in the planning and execution of the sampling program, reviewing the results, developing the message, and the tools to deliver the message to the tribal communities affected. A question-and-answer period followed these two presentations.

After Session 6, conference participants attended either Breakout Session 3: Issues in Evaluating Health Advisory Risk Communication, or Risk Communication Basics—Session 3: Implementing and Evaluating the Message. Eric Frohmberg, Maine Bureau of Health, led the final session of the Risk Communication Basics Course. As in previous Breakout Sessions, a facilitator and notetaker led the discussion within each topic session. The topic groups condensed their discussions in the five breakout sessions into recommendations for best practices and information needs, which were presented in the following plenary session.

A theme common to many of the groups in Breakout Session 3 was to include the target audience in the work of designing and implementing the evaluation. Another common theme was that face-to-face evaluations, through individual contacts, interviews, and focus groups, provided the highest-quality data, particularly when carried out by members of the target community. Recommendations of the five topic area sessions include the following:

- **Women and Children—Reproductive Concerns.** Conduct a formative evaluation as the risk communication materials and plan are developed. Find an already assembled audience (at a boat show, environmental or health fair), include an evaluation piece in the dissemination of the risk message, and use focus groups and interviews. Questions asked during the evaluations are critical and must be carefully designed and tested on the target community.

- **Cultural Enclaves—Native American and Other Cultural and Traditional Communities.** Plan communication goals and message content with the target audience from the beginning of the advisory process. Assess what messages were actually heard by the target audience. Evaluation of the message needs to be an ongoing process as the demographics of the target audience may change or the advisory message may need to be revised to reflect changes in contaminant concentrations or revision in health benchmarks based on more recent information. Fish advisories should contain information on the nature and sources of contamination so that the affected community is empowered to take action to reduce pollution sources and clean up existing contaminated sites or obtain financial compensation for the loss of the natural resource.

- **English as a Second Language.** Build trust, know the community, and provide follow-through by identifying a respected community leader to partner with. Show that program goals are achieved. Take time to evaluate the message effectiveness and response of the community members. Involve the target audience in designing and implementing evaluation through focus groups or community meetings.

- **Costs of Evaluation Methods—Reducing Costs.** Carefully assess past evaluations when planning the evaluation of a program. Partner with other state agencies, nonprofits, other federal agencies, and universities to save costs on evaluation. Reduce costs by asking evaluation questions of callers who request additional fish advisory information and focusing evaluation on the populations of greatest concern to the program. Use evaluation data collected by others to make programmatic decisions. Communicate fish advisory success stories to legislators to obtain more funding.

- **Measuring Success to Improve Communication.** Begin with baseline data, create measurable objectives and a timeline for the planned communication, and have an end goal in mind. Involve stakeholders, maintain flexibility, and use both qualitative and quantitative evaluation. Human biomonitoring currently conducted by the federal government should be expanded to include more fish contaminants.

Closing/Summary

Elizabeth Southerland, U.S. Environmental Protection Agency, summarized conference achievements and discussed EPA's future actions to be developed based on the conference findings and recommendations. She emphasized the enormity of pulling together the conference, which included a broad spectrum of participants (over 350 attendees) from state health and environmental staff, tribal representatives, various federal agencies, university researchers, and community-based organizations.

One objective of the conference was to have a meeting that would generate discussion and recommendations that would result in substantial improvements in *Volume 4: Risk Communication* of the Agency's *Guidance for Assessing Chemical Contaminant Data for Use in*

Fish Advisories. This volume was first published in 1995 and reflected state practices for communicating fish advisory information primarily to recreation and sport fishers. This conference provided the Agency with current recommendations on communicating fish advisory information to sport fishers but also to hard-to-reach populations—subsistence fishers or traditional or cultural users of this resource.

A second objective was to obtain examples of communication and outreach materials from state, tribal, and community organizations to establish a clearinghouse for this information on the EPA fish advisory website. These materials were provided to conference participants on CD-ROM . The Agency is committed to the development, maintenance, and updating of this clearinghouse.

Dr. Southerland closed her presentation with an explanation of the funding for attendance at the National Forum on Contaminants in Fish, which was held in conjunction with the National Risk Communication Conference.

Part II

Presentations and Panels

Conference Welcome/Introductions

Kathy Svanda, Assistant Division Director, Environmental Health Division, Minnesota Department of Health

I want to thank everyone for joining us in this risk communication conference. My name is Kathy Svanda. I am the Assistant Division Director in the Environmental Health Division at the Minnesota Department of Health.

This conference is co-sponsored by the U.S. Environmental Protection Agency (EPA), the Minnesota Department of Health, and the Society for Risk Analysis. We at the Minnesota Department of Health are pleased to have taken a lead role in planning this conference.

During the past year, we have solicited risk communication ideas for this conference from a wide range of individuals. Our technical advisory committee was especially helpful in providing valuable input in planning the content and format of this conference. I would like to thank the members of the committee:

- Dr. Henry Anderson, Wisconsin Division of Public Health
- Patricia Cochran, Alaska Native Science Commission
- Henry Folmar, Mississippi Department of Environmental Quality
- Mike Haars and Kristin Ryan, Alaska Department of Environmental Conservation
- Ed Horn and Faith Schottenfield, New York State Department of Health
- Amy Kyle, University of California-Berkeley
- Brian Merkel, University of Wisconsin-Green Bay
- Barbara Knuth, Cornell University
- Andrew Smith, Maine Bureau of Health
- Moses Squeochs and James Thomas, Yakama Nation
- Patricia Cunningham, Research Triangle Institute
- Steve Blackwell, Agency for Toxic Substances and Disease Registry

Also on the planning committee, from EPA, were

- Jeffrey Bigler, National Fish and Wildlife Contamination Program Manager
- Elizabeth Blackburn, Office of Children's Health Protection
- Kathryn Mahaffey, Office of Prevention, Pesticides, and Toxic Substances

with support from Milton Clark, Region 5, and Ed Ohanian, Health and Ecological Criteria Division.

Leading the planning for the Minnesota Department of Health were

- Patricia McCann, Fish Consumption Advisory Program
- Pamela Shubat, Environmental Toxicologist
- Molly Madden.

The turnout here today is impressive. As of last week, there were 336 registrants for the conference from

- Forty-nine states, the District of Columbia, and Canada
- State and tribal fish advisory programs and state and tribal natural resource and water quality programs, as well as the federal government
- Academic institutions, community groups, and health and environmental protection advocacy groups.

With this diverse mix of participants, we look forward to many stimulating discussions during the next 2 days.

The Minnesota Department of Health became involved in planning this conference because we knew we would learn from the discussions that take place here. Understanding risk, recognizing the barriers to communicating risk, and ensuring our communication is effective are all very basic issues for environmental health initiatives. The discussions that we will have during this conference are relevant to every issue in environmental health where disparities in exposure or prevention may occur. We are especially pleased to focus these discussions on eating chemically contaminated fish, because of our own long history and experience with fish advisories.

The Minnesota Department of Health also became involved because

- We feel it is important to bring together local, state, federal, and tribal experts to share information in order to take advantage of expertise gained at many levels of organization, from community activism to federal policymaking.
- We believe it is important to work collaboratively not just to share these experiences, but also to critically evaluate what has been done and recommend our successes to others.

There is a wealth of experience represented in this room. We want to learn from all that you bring to this conference over the next 2 days. Thank you for coming.

***James Hanlon, Acting Director for Office of Water,* U.S. Environmental Protection Agency**

Thanks to the Minnesota Department of Health for their leadership role in co-sponsoring this conference. About 15 to 18 months ago, a conference like this was a glimmer in the eye of a couple of people. I don't think they had any idea we could attract a crowd like this with the interest that you all bring to the subject. Again, thanks to Minnesota for stepping up and playing a key role in getting this conference together. For a successful conference, probably in excess of 50 percent of the input that drives the success of a conference is the preorganization: setting the

agenda, bringing in the appropriate speakers, and bringing in the participants. I also want to recognize Pam Shubat and Pat McCann for their efforts in bringing us all here this morning.

Why is this conference important? From EPA's perspective, we have three reasons or background elements. We have contamination, effects, and communication issues to deal with.

One way to identify the background levels of contamination is to look at actions the states and tribes have taken in terms of advising the public of contamination in their waterbodies and in the fish they eat. Based on our information, on an annual basis, beginning in the 1990s, every year that the states have looked at their waterbodies, fish contamination numbers have increased. In 2000, 48 states issued fish consumption advisories for in excess of 63,000 lakes across the United States and 325,000 river miles.. Advisories cover 71 percent of our national coastline, all the Great Lakes and connecting waters, and all of the Gulf of Mexico. In all those locations and many others, fish are not safe to eat in unlimited quantities.

What do we know about effects? Because of widespread mercury contamination, we are especially concerned about risks to fetuses and young children. The health threat posed by contaminated fish is not abstract or theoretical. We know it is real. Studies demonstrate that exposure to contaminants in fish can result in a range of health problems. For example, studies of mercury show that women who consume contaminated fish put their babies at risk of increased learning disabilities and developmental problems. Other studies indicate concerns such as increased cancer risk and liver disorders associated with exposure to contaminants known to occur in fish, such as PCBs, dioxins, and a litany of banned pesticides.

Effectiveness of communications: States, together with EPA, working on our risk communication messages, have made dramatic increases in our efforts to reach out to the public to communicate associated risks.. Monitoring is key. Many states have significantly increased their investments in monitoring resources in terms of taking fish samples, doing the risk assessment, and providing that information to the public. Despite our best efforts, the concern is are we communicating effectively? In particular, these at-risk populations often include urban and rural poor and those who regularly consume fish in significant amounts. These groups are also those for whom many of our traditional communication mechanisms may not be appropriate. That is one of the major reasons we brought you all together here to look at these traditional communication techniques and provide advice to EPA and the states to improve them over time. EPA's role in the national fish contamination program is one where we have gathered information over the years from states. We've also played a role in providing guidance to states on how to establish fish consumption advisories. In the early 1990s, EPA developed a four-volume set of guidance documents for the states to use to develop their monitoring, sampling, analysis, and communication protocols. We have also conducted special studies from time to time. One of those studies is now in the third year of sample collection. We are in the process of gathering fish tissue samples from a random sample of 500 lakes across the country, and we are analyzing those samples for approximately 90 individual contaminants. The preliminary data from that study will be available in late 2001, and we're hoping to have the study complete and published in 2003. That will give us a perspective across the lower 48 states, based on a statistically random sample across 500 lakes looking at a wide range of pollutants in terms of what's in fish tissue. This will allow us to begin to look at policy options for dealing with pollutants identified in that effort.

The Agency also develops communication materials about fish safety and, in conjunction with the Agency for Toxic Substances and Disease Registry, regularly distributes that information to a wide variety of stakeholders. In rare instances, the Agency has also taken the step of issuing fish consumption advisories ourselves. An example of that was based on the work of the National Academy of Sciences last summer. EPA, together with FDA, issued a national fish consumption advisory–the FDA advisory dealing with fish in commerce; the EPA advisory dealing with fish caught locally. We believe the fish advisory is an important piece of the risk communication puzzle. Certainly we have made every effort in our communication materials to make it clear that, where there are local advisories that have been issued by states, the public should rely on those first. That is the most relevant information. However, some states have not been able to issue wide-ranging advisories across the waterbodies in their states. In those cases, the void that the national advisories are designed to fill is to communicate risk to those populations.

What are our objectives for this conference? We believe 50 percent of the work has already been done in terms of putting together a strong agenda for the next 2 days and also in getting the right people here. What we want to do is, first, to better understand how different at-risk populations receive risk information. The perspective that the state representatives bring is critical. I believe there are representatives from over 50 tribes at this meeting. They also bring perspective to this discussion that is very powerful. Other federal agencies are in the room as well. Together with the EPA participation, our hope is that we will be able to communicate with each other regarding appropriate mechanisms for risk communication.

Second, what are the barriers? What are the issues with these at-risk populations that we are not aware of? The federal government and the states have traditional communication vehicles as evidenced by the exhibitors (and I thank all the exhibitors for sharing them). These exhibits show traditional communication techniques. Are there other more focused, more enhanced, more targeted communication techniques that will allow us to get the word out? We are looking forward to that input in terms of communications at this meeting. Additionally, this is a golden opportunity for EPA, other federal agencies, and the states here to establish relationships with people who we haven't had a chance to deal with very directly on an ongoing basis. We look forward to beginning those relationships and nurturing them over time.

Everyone who is registered for the conference will receive a copy of the proceedings from this conference. As we begin the conference–no, let's call this a workshop, albeit a large workshop. It's very important to the success of this workshop to have your input. It's only through your input and the give-and-take in that will occur in the breakout sessions that we can receive the important information that we need from you to take the next step in this program. Our plan, based on that input, is to update the risk communication volume of the EPA guidance that supports the fish advisory program. Based on your input, we believe we will have the information to make a material improvement to that document. We hope to have it out late this calendar year. That will be an important next step in terms of our ability to communicate with the public and, in particular, at-risk populations.

Thank you very much. Again, I encourage you to participate in the workshop.

Keynote Address: Risk Communication Challenges: Are Audiences Hard to Reach? Or Are the Messages Hard to Send?

Barbara A. Knuth, Human Dimensions Research Unit, Cornell University

Today we're going to be talking about risk communication challenges. What makes audiences hard to reach and what makes the message in a fish consumption advisory (FCA) hard to send? There are three major elements of concern: the audience, the message, and the communicators. Risk communication must be thought of as an interactive process. It is truly a process of sharing information about perceived and potential dangers associated with fish consumption.

The risk communication process starts with problem analysis and leads into audience needs assessment, which will be the focus of today's discussion. Tomorrow, we will look at communication strategy design and implementation of those communication strategies. We will also talk about the elements of evaluation: formative evaluation, process evaluation, and summative evaluation.

We must lay the groundwork for problem analysis and consider the context of the problem. The context differs depending on who is involved, who is affected and what their concerns are, and what your objectives are. The health effects—what are they and to whom do they accrue? Communities and individuals affected—what are their concerns? What are elements of culture and communication and how does that affect the communication process as well as the response process? Think of the multiple agency mandates and the different objectives that implies you are trying to reach. Think about the program budgets that you have to work with; sometimes those are quite limited. And think of the staff background; many of you dabble in risk communication and other agencies don't have any risk communicators at all.

Another element is the message—what is the message?

- Eating fish is good for you
- Fishing is a healthy activity
- Fish meals are part of tradition
- But—some fish are not safe
- Some people are more affected than others
- Advice depends on who is giving it.

Who are the audiences we're dealing with?

- Licensed anglers
- Other anglers; studies have been done that show at least 25 percent of anglers are not licensed

- At-risk fish consumers, friends, and family
- Cultural considerations—issues of sharing, of community building
- Economic issues—importance of fish as a food source
- Demographics—the characteristics of potential audiences.

Let's look at this first audience—the more traditional outreach:

- 35 million licensed anglers
- 75 percent with income greater than $30,000
- 27 percent with at least college education
- 73 percent male
- 90 percent white.

Demographics, culture, and level of education have implications for how we communicate with this audience:

- 58 million women of childbearing age in United States
- 9 percent pregnant in 1 year
- Licensed anglers: 73 percent male.

Looking at education statistics, the U.S. Census Bureau reported last year that

- 42 percent Asians/Pacific Islanders with college education
- 26 percent Whites
- 15 percent Blacks
- 11 percent Hispanics
- Licensed anglers: 27 percent.

If we break this out further and look at those who do not have a high school education, we find 16 percent among Whites, 23 percent among Blacks, and 44 percent among Hispanics. This has real implications for the level of language and type and complexity of language we use when we communicate about fish consumption.

Other elements of demographics and culture are

- 82 percent of U.S. population, White
- 1 percent American Indian, Aleut
- 4 percent Asian, Pacific Islander
- 12 percent Hispanic
- 13 percent Black
- Licensed anglers: 90 percent White.

What are the challenges? How do we interact with populations who are exposed and susceptible to contaminants in fish, especially those who may not receive, understand, or accept risk information?

What makes audiences hard to reach? We can think about the difficulty of addressing the complexities of cultural practices and tradition, including religious and spiritual traditions that involve fish consumption, traditions that build community cohesiveness, rituals, and community celebrations. They complicate the message and the way the message is received. Why might people be hard to reach?

- Language differences/how language is used is also very important.
- Fourteen percent do not speak English in the home.
- Eight percent speak Spanish in the home.
- U.S. Census Bureau identified 50 languages.
- They may be economically disadvantaged.
- They may be unable to meet minimum family needs (e.g., nutrition).
- They may be suspicious of government and those sending the message.
- They may be isolated geographically and lack access to communication channels.
- Lack of access to information: Two-thirds of Americans have Internet access—86 percent of college graduates have access; 53 percent of high school graduates have access; and 31 percent of nongraduates have access. This mirrors access to other kinds of communication vehicles.
- Fishing is a social identity. It defines who you are and is an outlet for stress reduction and for being with friends and family. The audience may be hard to convince.

Are people really hard to reach or hard to convince? Some choose not to follow advice; they may believe the benefits outweigh the risks. Looking at a variety of ways people can reduce risk, they may be more likely to change the amount they eat and less willing to change the cleaning method, fishing location, species fished, size fished, and cooking methods. These, especially cooking, reflect your history, tradition, and culture. We need to provide a range of options to be successful over all.

When we think about communication strategies, think about two major elements: the ways we can convey the message and also partnerships. By partnerships, I mean partnerships in two ways: partnering with the audiences with whom you are trying to communicate and partnering in terms of getting your message out. What are the vehicles by which people normally receive health-related information and how can you work with those groups?

What is effective risk communication?

- Did we identify the problem correctly?
- Did we identify audiences correctly?
- Did audiences receive advice?
- Did audiences follow advice?
- If not, why not? We need to understand more about the linkages between motivation and behavior.

To judge an advisory's success, evaluate its effect on

- Overall diet quality
- Support for toxics reduction
- Local economy
- Tourism
- Public trust in government
- Human health.

What media should we use to deliver the message?

- Posters giving general information with 800 number
- Metal signs at sites on water/or specific posters at fishing locations
- Posters, species lists, consumption advice
- Specific advice in small print
- Color-coded graphics
- T-shirts with 800 number
- Paper pads and magnets
- Children's text book covers
- Canvas bags
- Specific advisories with specific fish pictured
- Partnering with physicians
- Expectant mother's guide showing fish that are safe and those that are not and showing cleaning techniques.

All of these are important evaluators. Risk communication is a process of sharing information about perceived and potential dangers associated with fish consumption and benefits associated with fish consumption.

Session 1: Perceptions of Fish Safety: Voices from the Community

Introduction
Pat Cunningham, Research Triangle Institute

It is with great pleasure that I introduce the speakers in our first conference session—Voices from the Community. The conference organizers agreed that the best way we can begin to understand how to improve risk communication messages is to listen to some of the concerns, fears, and frustrations of the recipients of those risk communication messages.

These voices from the community represent the surprising diversity that exists among hard-to-reach populations—a diversity that challenges even the most sensitive, conscientious, and caring of risk communicators. The speakers represented on this panel today reflect this diversity.

One voice speaks of a geographically isolated community in Alaska whose members are dependent on traditional hunting and fishing for their subsistence and often have no alternative to consuming locally caught fish because there is no such thing as a neighborhood grocery store on the tundra.

Another voice across the continent comes from an urban community member from the New York metropolitan area who represents a Hispanic community, one of the fastest growing ethnic groups in America. While Hispanic groups may share the same language, they often represent very different cultures and traditions.

Another speaker represents the voice of an economically isolated community in the South whose members struggle with rural poverty and supplement their diet, by necessity, with locally caught fish.

A voice from Minnesota represents still another important ethnic segment of our population, the Asian American community whose members struggle with language and cultural traditions often quite different from those of the mainstream U.S. population.

Last, a Native American voice from the Great Lakes region represents the voice of women—and especially pregnant women and nursing mothers who have concerns about the safety of consuming contaminated fish not only for themselves but for their developing fetuses and nursing infants.

By prior agreement with these voices from the community, I will introduce each one to you now only by name—and let them frame their lives and their communities' concerns by describing in more detail for you their experiences from the communities that they represent.

Josee Cung, Program Manager, Southeast Asian Program, Minnesota Department of Natural Resources

Here are the voices of Minnesota's Southeast Asian immigrants, a community of four distinct ethnic subgroups: Cambodian, Hmong, lowland Lao, and Vietnamese. Estimated at 130,000, Southeast Asians are the state's largest and fastest growing minority. Back in their homelands, they practice all forms of fishing, primarily for food. This tradition continues here in this country.

Fish continues to be an important part of Southeast Asians' daily diet, and so the community's main concerns around the issue of fish consumption are

- Where to go and catch fish
- What the less contaminated fish species are
- Where to find cleaner and safer fish for the family table.

As to cultural traditions and views regarding contamination, they have very little understanding of, and little experience with, contamination by pollutants. Southeast Asians are more familiar with, and better prepared to deal with, fish diseases (e.g., parasites, worms). Major challenges include

- To provide concrete examples when discussing and teaching about chemical contaminants

- To overcome major cultural and language barriers because

  — Southeast Asian has an oral tradition of passing on/sharing information and learning.

  — There are no easy equivalents of technical/science-related terminology in any of the four Southeast Asian native languages.

  — The majority of learners have no, or low, educational background and especially lack basic science knowledge.

  — They are unfamiliar with fish advisories that are seen as too complicated, difficult to use, and not user-friendly; most people would go out to catch fish with not the slightest thought for current fish advisories.

There have been important changes in Southeast Asian traditional consumption patterns as a result of education and, therefore, better awareness of health risks associated with consumption of contaminated fish. Changes are in two main areas:

- Fish species: There is now a tendency to stay away from bottom feeders and a preference for smaller and leaner fish.

- Fish preparation: There is more acceptance and practice of discarding fat parts, skin, and internal organs and to fillet fish.

But Southeast Asians still believe that, if waters look clean and clear, fish from these waters are also safer to eat. They also believe that ocean fish are safer; therefore, there is increased reliance on imported frozen fish from Asia for food.

Maria Maybee, Great Lakes United

I am Haudenosaunnee, People of the Longhouse. I am a member of the Seneca Nation of Indians, born into the Heron clan. I live on a reservation about 30 miles south of Buffalo, New York, and about 50 miles south of Niagara Falls. Currently, I am employed by Great Lakes United and have been with them for a year-and-a-half. Great Lakes United is an international coalition dedicated to preserving and protecting the Great Lakes and St. Lawrence River ecosystem. We represent environmentalists, conservationists, hunters, anglers, labor unions, community groups, and citizens of the United States, Canada, and First Nations and Native American tribes. At Great Lakes United, we develop and promote major policy initiatives, carry out educational programs, and promote citizen action and grassroots efforts within the Great Lakes Basin. We do this to ensure clean water and air for everyone and to provide better safeguards to protect the health of people and wildlife—a conservation ethic that will leave a healthy Great Lakes ecosystem.

Great Lakes United has five major task forces:

- Healthy Community
- Sustainable Water Use
- Nuclear-Free Great Lakes
- Clean Production
- Biodiversity and Habitat Protection.

The goal of the Biodiversity and Habitat Protection task force, of which I am a member, is to develop strategies to reestablish self-sustaining diverse native fish and wildlife communities throughout the Great Lakes Basin. I provide information to citizens on aquatic habitats and key initiatives around three different funds. The first is with the Great Lakes Aquatic and Habitat Fund. We provide wetlands and grassroots support with networking and financial support, which is provided to citizens and groups. Basically our work is within the shoreline, inland lakes, and rivers that include the aquatic habitat within the basin.

We have a newsletter that goes to all members, we provide an online resource directory that goes out to all the members, and we have access to 22 professionals across the entire basin to help with any issues. Fish is one of our key objectives—to maintain healthy and sustainable fish populations.

We have hubs in every state and are going on line with a new hub to target First Nations and Native American tribes around the entire basin. This new project deals with fish consumption, fish habitat, aquatic habitat, wetlands issues, and water quality on a grassroots level—not just what our governments can do but what the tribes can do as well. Another one of my hats is with the Marsh Monitoring Program out of Canada. I help recruit volunteers. I think it is very important that all peoples of the Great Lakes Basin can identify fish, plants, and habitats, which all leads to knowing your environment.

The reason I am here today is because of my work with fish advisory outreach in western New York, which is part of the Lake Erie Binational Public Forum outreach program to provide fish consumption education. These efforts grew out of the environmental justice task force's commitment to protect the health and welfare of people in the basin regardless of race or economic standing. Cultural consideration and economic diversity contribute to high fish consumption rates among minority and tribal groups around Lake Erie, as well as in the rest of the country. Populations tend to be concentrated in urban areas along the Lake Erie shoreline. This is also where minority and lower income populations are found, including African American, Latino, Asian American, Arab, and Native American communities. My reservation is on the Lake Erie waterfront. This project is in partnership with the Ohio Environmental Council, Great Lakes United, and workers for environmental justice, and it is managed through the Delta Institute under Kate Bloomberg. Last year, the working groups and partnerships developed a family guide for eating fish in the Great Lakes Basin. The guide is handy and easy to read and is developed so that everyone down to the 7th-8th grade reading level can understand it. My work area is Buffalo River, Buffalo Harbor, and Niagra River, but that is hard to do in western New York because lots of people come to fish in many different areas along the lake front. Regardless of where they are from, we try and get them the information because it is also relevant to the entire state.

Some of my successes have been collaborations that I have had with the Boys and Girls Clubs of Western New York. I have been instrumental in helping to develop outreach programs. One child can teach 10 adults faster than I could ever think of doing. The children helped me last summer create papier-mâché fish heads; during this process, several volunteers and I were able to educate the children about what we were doing and why we were doing it. This was a fun thing to do for the children, who took information back to their families and their communities. They worried about their parents, aunts and uncles, and other family members eating contaminated fish. Sending information out this way was a great tool, because the children are not going to let their family member eat the fish. When given the facts, children know the risks associated with eating the fish and they take their own actions.

Another group that I have worked with is the Sisters of Mercy. They help spread the message to the women they serve who are most at risk because of their economic status. The Sisters know that these women will eat fish, if given it, in order to feed their families. The Sisters try to make them aware of the problem and give them choices as to where the safer places are to catch fish, but in western New York this is very hard to do. Another one of my successes in doing this work is that I need more people to help me. I have to identify more people within the communities that I serve. I work effectively in my community and, when I go to some of the other reservations, I feel the people are listening to me, but when I go to the Asian community, I'm clueless as to how to reach them. I still try my hardest and give the message to the people,

but right now I rely on volunteers, and getting enough volunteers is a struggle in itself. The New York Anglers Study basically agrees with me, that it has to be someone from the community and that it has to be a message that is understandable and comes from someone who can relate to their own experiences.

I grew up in the Cattaraugas Creek area. All summer long we fished and swam in Cattaraugas Creek. I had 18 brothers and sisters, so the work I do now is very relevant to me. We grew up going to the creek. We would all go to the creek after we had finished our chores. On the way, we would pick berries, rhubarb, whatever was there that we knew we could eat. We would get to the creek and go fishing, and we would cook the fish there. We would enjoy the afternoon swimming and frolicking in the water. My brother came home last summer, and we said we were going to take all the children down to the creek since they had never had that experience. It was a flop; some of the children got rashes and it was terrible.

I worry about the long-term effects for my family as well as my community. In my own family, there is a history of diabetes and thyroid disease. Some of our children were born with neurological problems or developmental disabilities. Where did these come from? It can't all be from our diet and our lifestyles, unless our lifestyles are because of the environment that we live in. There is a Superfund site within a few miles of our reservation right along the Cattaraugas Creek, and there is also the West Valley Nuclear Waste Facility farther upstream from the reservation, Both of these are known to have discharges in Cattaraugus Creek. There is no monitoring of this creek, which makes it hard for me to tell women what to eat and not to eat or what their options are when I really don't know myself. When I speak with the New York Department of Health, they say they don't have the money to monitor the creek. So I have said to them: What if we find the opportunity to do the sampling ourselves? But this will not work unless we go into a close working relationship with them to collect the data. If we do it ourselves, it won't be recognized by the state. The New York State tribes and the New York State government do not always agree on an issue.

Some of the challenges that I hear from the people are that they do not want the contaminants in their water—they want 0 ppm. They don't want to have to worry about how much is in the water. They just don't want the pollution. Why should they have to worry about it? They would rather change their behavior and their consumption habits, whether it is a product or food. They don't want to have to worry about whether fish have mercury or cadmium in them and how much of each, or not to exceed 52 meals a year. Should they eat one meal per month or one meal per week? If the fish are deformed, then they obviously won't eat them. But what about the contaminant effects on the fish that you can't see? It's a very confusing advisory. Out of respect for the people who spend a lot of time creating these advisories, I am sorry to say that they just don't work. People want to go to a list of the waterbodies and know what is safe and what is not safe and what they can or cannot eat. How much can they eat safely? They really don't care what the contaminant is until they are more educated about it. They just don't want the exposure to the contaminants. What about radionuclides? There are no fish advisories for radionuclides. That is an issue for me as well as my community.

From my own experience, within 6 months of stopping eating fish, I developed diabetes and had to struggle with it. But when I resumed eating fish again my levels came down to normal. That is the fact of the world. So, if I can drink the water, if I can swim in the water

alongside the fish and not develop rashes or nausea, and if I can eat fish for my welfare—without worrying whether it is in group 1 or group 2, or whether I can have one fish or two fish—then I will know that our ecosystem is in a good state. Thank you.

José Cuevas, Commissioner for Human Rights, Elizabeth, New Jersey

I am not a hard-core environmentalist. I do have concerns about the environment, especially around where I do most of my living and breathing. My involvement in environmental issues started with serving as a stakeholder in a Brownfield Task Force in Elizabeth, New Jersey. This was my first contact with Department of Environmental Protection (DEP) staff in the form of DEP inspectors. I developed a good working relationship with these inspectors, because I am always brutally honest in these types of meeting so as not to waste time. The inspectors, for their part, were always ready to provide any information we requested.

At about the same time, I received a phone call from a staff person working for the Science and Research Department of the DEP, requesting to meet with me to talk about a study that was going to focus on the effects on Hispanic women and children who were consuming fish caught in the Arthur Kill waterway between Elizabeth, New Jersey, and Staten Island, New York. This sounded interesting to me, so I invited them down to my home for a meeting. Four people came down for that meeting, and we had a very informative discussion. I was impressed with their knowledge and manner, which gave me the impression that they collectively had a real concern for the people targeted in this study.

I was extremely surprised and amazed to discover that none of the four people meeting with me could speak Spanish. So, my first question was: How are you going to communicate with your target group if you cannot speak Spanish. Their answer, logically, was: We are going to hire someone fluent in Spanish. Someone from this area I asked? Yes, if possible, was their answer. You are going to have problems getting information from people in this area if your outreach person is not from this neighborhood was my answer. The only way around this is to hire an experienced community organizer or an activist in the area and, in the case of an activist, to be sure to win their buy-in to the program.

They had other priorities that needed to be considered and hired a graduate student, because they needed a case study written up, and other considerations may have been a factor. A Spanish graduate student was hired, but she was not very successful in her outreach efforts. I was called to see if I could offer any suggestions. I receive requests from people from time to time and it's not a problem to provide some information. But they had hired someone to do this and I was not offered any compensation, so my general rule is that you get all you can out of me on that first meeting because I have little spare time. In the case of this study, because it was in my neighborhood dealing with my neighbors and because I felt that there was a real concern for the people targeted, I agreed to meet with them one more time on this issue.

Here are the recommendations that I made to them:

- Go out to the fishing spot and fish. There is no need to talk right away, just to be seen.
- Contact the two area schools; they both have community liaisons who are always looking for information to give parents. (This will also make them look good.)
- Science and research has tons of materials on the fish found in these waters. Bring color pictures, coloring books, etc.
- Don't mention the signs; everybody in this area knows what they say.
- Focus your discussion on the dangers to children. (There are adults in this area who have been eating this fish for 20 to 30 years.)
- Be aware that it will take time to develop relationships.
- Once you begin to talk with people, try to get one name from them and ask if you can use them as a referral.
- Within sight of these no-fish areas, there is commercial fishing going on, or at least that is people's perceptions.
- People want to see data about the dangers; if there is no data, explain why.
- Translate all the information that you do have.
- Health fairs go over well in this area.
- Undocumented residents have no health insurance.
- Study the people carefully in each spot. There will be a leader or leaders; these are the people you must win over to get the rest to open up.

Ora Rawls, Executive Director, Mississippi Rural Development Council

By way of introduction, I am a native Mississippian, born in the Delta Region, which is very poor, rural, and has some of the most gruesome statistics in the country concerning health care, education, infrastructure, economic development. I will not belabor you with the details of the region.

Currently, I serve as the Executive Director of the Mississippi Rural Development Council, State of Mississippi. For a few minutes, I will step out of that role as I share with you—as a voice of the community—views, concerns, and responses concerning perceptions of fish consumption in the rural Delta in Mississippi. We were given approximately 8 to 9 minutes to tell you about a way of living that has expanded over five generations. I lived in several states (Florida, Texas, Illinois, Michigan, Louisiana) and by choice returned to Mississippi.

I come from a very large family; therefore, fishing, hunting, and farming are part of the landscape. We had our own gardens, cows, pigs, etc. I can remember walking a mile to carry water and was very, very happy when the pipes were finally installed to run water outside of our home, and, later, as water was finally put inside (never mind that it was only cold water). This is the same water that we drank and used to wash clothes, plant our gardens, feed our animals—that was safe. Yet, you say: Don't eat the fish that comes out of this water. You see, I lost both my parents at early ages. Maybe there was something in the water and the fish and everything else. I provide this background as a framework for your understanding the attitudes of the community toward fish consumption advisories.

I talked to my 85-year-old brother, who has cancer and gets shots that cost $400+. He said, "Darling, they say don't eat the beef (mad cow disease), don't eat the pork (causes high blood pressure), don't eat the chicken (they are raised overnight in poultry houses and never see daylight); you tell me that all of these things we cannot now eat. I believe that I'll die with something, so I'll continue to eat the fish." This attitude is indicative of the attitudes within the region, considering that fish is economical—cheaper than most meat, more often than not free—and that fishing offers good recreation at the same time. Remember the Tuskegee Project? Mistrust of the government is not limited to any one group. But, in particular, when you purposely "disease-infect" individuals, mistrust is elevated to a new level. It doesn't make sense to them that you would be honest about the contents of water, food, or anything else.

For 2½ years, I served on a task force for clean drinking water (State of Mississippi), whose primary effort was to ensure that access to water was made available to every citizen. The level of contaminants was a secondary issue. Many communities, due to sparse density, racial composition, or a low tax base, did not have access to the minimal level of clean water. So the initial priority for rural communities was clean running water and, yes, inside water.

What are the concerns in your community regarding the safety of fish consumption, the importance of fish consumption in your community, and chemical contaminants in fish?

One concern is level of awareness. The message has not yielded the outcry for attention that one might think as you talk to African Americans about the issue. The priorities are jobs, health (access, medicine), housing, etc. There is a general assumption that foods obtained from your own gardens or local streams are safer than those obtained from grocery stores. Every year, several groups issue warnings about what impacts your health, longevity, etc., which include advisories on what not to eat.

Fish consumption (volume) has been underestimated. As I shared with a DEQ (EPA) official, many individuals (African American) eat fish two to three times a week—in rural areas, as often as five times a week. Where I lived on the Coast (Gulfport/Biloxi), four to five times a

week. This volume is from personal fishing (streams, lakes, ponds), not from retail sales data that is used to capture consumption patterns.

Fish and hunting licenses currently are the major method of advisories along with newsletters. Advisories are not communicated through a mechanism that the rural community uses.

How do you get the message (fish consumption advisories) out?

- Choose a message that is consistent. (Remember what A. Hitler said: If you tell a lie, and you tell a lie over and over, then it becomes the truth or perceived as the truth.)
- People believe that which is consistent. Tell them that, if the water is contaminated for the fish, then it is rightly so for the soil and everything else. Yet, ingestion of the fish provides more direct contaminants to individuals due to the high levels of carcinogens and the frequency of times eaten.
- Present that message in layman's terms.
- Use local health departments, churches, general stores, laundromats, day care centers, Headstart facilities, etc., as a means of providing advisories.
- Work with other agencies—state and nonprofits—to ensure that all concerns are delivering a similar message and, for sure, not a conflicting message.

(*Clarion-Ledger*, 2/14/01) "DDT discovered in Delta streams: More than 60 percent of samples collected from rivers and streams in the Delta contained unsafe levels of pesticides, including the banned DDT, according to information released by the U.S. Geological Survey. However, groundwater, the source of most drinking water in the region, was found largely uncontaminated and within federal drinking water standards."

I thank you for the opportunity to briefly share with you, and I welcome the opportunity to work with you and become a part of the solution of providing information concerning fish advisories and alternatives in the rural areas of Mississippi.

Patricia Cochran, Traditional Knowledge and Contaminants Project

Before I start my talk this morning, let me give thanks, as I have been taught in my community, to the creator for this wonderful day that has been given to us, by stopping and honoring all of my elders here and by remembering all of our ancestors who came before us. My name is Patricia Longley Cochran. I am the Director of the Alaska Native Science Commission in Anchorage, Alaska. Most importantly, my Inubiat name is Sigwana. I am Inubiat Eskimo and I was born and raised in Nome. My people come from Nome and King Island and from Wales. My name, Sigwana, was given to me as a gift from my mother and my aunt, and this gift was the

name of a young girl who had died very early in her life. I was given the gift of her name to carry on her life, to remind me every day of my life that I live my life for another person, and to remind me, in all that I do, that I should live my life in the benefit of other people.

I wanted to come today to talk to you about a project that we have been working on in Alaska at the Alaska Native Science Commission and to bring to you the words of our own community rather than my words. The project is call the Traditional Knowledge and Contaminants project. Most of the information that I will present today you can call up from our website, www.nativeknowledge.org.

The goals of the project are to help Alaska Native communities identify and address their concerns about contaminants, human health, and environmental changes. I am bringing this to you in this way because in our world view—in our Alaskan and in our Native world view for all Alaskan and Native American people, our world view incorporates everything—all things are related. For us, we cannot talk about the health of the fish without talking about the health of our land, our water, our air, our people, our communities; all things are related. It is a very western way of thinking that we can take only one issue and look at that and find and solve the problems. We must look at this as an issue that addresses all of these concerns.

The project objectives are, first of all, to use our own native ways of knowing, learning, and teaching to gather information. We held our own talking circles in our own communities. We did not send out survey forms. We didn't have people that had focus groups. We went and sat with our people for days at a time—laughing, singing, dancing, and eating a lot of food—because this is a part of what we all do. So, we could really gain the knowledge from our communities. Our communities, we understand, are the first observers of what happens on our land, to the people, in the air, in the water, and in the environment around us. Long before a researcher or scientist or anyone else enters the community, our people are the ones who perceive what happens every day, and also generationally over centuries and beyond from information that has come down from their people. We are also providing grant opportunities to our communities and we are looking at developing a common research agenda that answers concerns and questions about our communities and not just of somebody's Ph.D. dissertation research topic. And we are also developing a database. We held regional meetings across the state of Alaska. This is an overview of things that we heard from communities across the state of Alaska, communities that were concerned about global warming, abnormalities in subsistence foods, human health, the impact of commercial and sport fishing, local sources of contaminants and outside sources of contaminants, changes in the ecosystem, and perpetuation of our culture.

Concerns about Global Warming:

- Ice conditions are changing—the thickness of sea ice has decreased.
- Warmer ocean temperatures appear to be bringing tuna, mackerel, barracuda, sunfish, giant turtles, and white sharks to the region. Dirty ice conditions and the number of sharks has increased dramatically.
- The weather is changing, with warmer and wetter seasons.

- Lakes and normally wet areas are drying up.

Concerns about Abnormalities in Subsistence Foods:

- Abnormalities are appearing in animals and fish (e.g., wormy whitefish, lesions on salmon, fish swimming in circles [whirling disease] introduced from outside fishers fishing in Alaska waters.
- Moose meat tastes different and there are water bags in their lungs.
- Muskrats have spots on their liver and lungs.
- Caribou have runny bone marrow.

> "People on the island are very concerned about the animals we eat now. They think there might be something wrong because they are getting very skinny. A couple of years ago there was a lot of dead birds all over the beach. I wonder why this is happening?"
>
> Herman Toolie, Savoonga, St. Lawrence Island

Concerns about Human Health:

- Residents are alarmed by high rates of cancer and perceive there to be a relationship between rates and local military sites.
- People's diets are increasingly including store-bought foods, pop, and improperly stored canned and frozen foods.
- More people are dying from stomach cancer, ulcers, and other cancers.

Concerns about the Impact of Commercial and Sports Fishing:

- Sports fishing has increased (hard concept for native peoples to understand), resulting in increased waste in rivers and destruction of habitat.
- Fish are being destroyed. Too many people are touching them, measuring them, and tearing up their mouths.
- Commercial fishing pressures exist for herring and habitats.
- There is a need for marine buffer zones.

Concerns about Outside Impact on Subsistence Foods, Culture, and Environment:

- Russian sources of contaminants
- Tourists who are uneducated about the environment and local customs
- Trans-boundary pollution from Russia and Europe

- Ballast water from barges that introduces foreign organisms, species, and pollutants.

Concerns about Changes in Ecosystems:

- Loss of old-growth forest habitat
- Increase in number of otter, beaver, bear and wolves. Beaver weren't there before because there were no trees, we now have tree growth.
- Decrease in edible plants
- Decline in herring spawning areas and a shift to earlier spawning
- Decrease in availability of medicinal herbs and plants
- Decline in number and size of fish.

Concerns about Local Sources of Contaminants:

- Mines, military sites, chemicals used for dust control, vehicle oil leaks, fire retardants, and acid rain
- Local sources of contaminants ranging from fuel tanks, asbestos, lead-based paints, and pulp mills
- Mercury from mining camps in rivers.

> "You know when you see a dead fish in a river you know something is wrong. . . .the people have been mining that area since I can remember. What have they been putting into that lake? It makes you wonder."
>
> John Starr
> Tanana, Alaska

Concern about Perpetuation of Culture:

- Loss of spiritual connection and traditional training relating to the environment
- Loss of traditional medicine people and an increased use of the clinic
- Need to return to using traditional medicines and to draw on healthier lifestyle practices
- Need to teach our youth to be caretakers of the ecosystem
- Changes in traditional diet and lifestyle
- Failure to follow traditional restrictions

Session 2: Risk Communicator Presentations

Ed Horn, Bureau of Toxic Substance Assessment, New York State Department of Health

I have been involved with fish advisories since the early 1980s and was working with the New York State Department of Environmental Conservation. This is the agency in our state that actually catches the fish and grinds them up and analyzes them for various contaminants. Since 1990, I have been in the Health Department and am currently the bureau director there. I am involved in deciding what the message should be on the basis of the analytical data and how to get the message out to those who fish or eat fish.

We are concerned about at-risk populations and hard-to-reach audiences. These are really two different aspects of our populations. For our conversation, it is important to recognize a distinction between the two. There are two aspects to at-risk populations: exposure (eating contaminated fish) and sensitivity. (Young and unborn children are more sensitive to many of the contaminants that are found in fish, particularly PCBs and mercury.) Therefore, women who may be having children are at greater risk. It is not because the women themselves are at greater risk, but it is the children they carry who are at greatest risk.

Hard-to-Reach Populations:

- People who are unaware of the advisories: They don't receive the message because of the traditional ways we disseminate them, which is through fairly lengthy and complicated booklets and documents. We also provide that information through guidelines that go to licensed anglers (1 million licensed anglers and an estimated 0.5 to 0.75 million unlicensed anglers). What about the unlicensed anglers? You don't need a license in New York State to fish in tidal rivers such as the Hudson or in marine coastal waters.

- People who don't understand the advisories: We can't change the fact that the risk of consumption is a complicated message. In addition, the risks associated with contaminated fish are still a matter of controversy, particularly at the levels we are finding the contaminants, which are typically at the lower levels of contamination. There is not a clear, well-documented scientific fact of what exactly the risks of low levels of contamination are.

- People who don't read and understand English: About 80 to 90 percent of the target population does speak English, but it is important to communicate to at-risk and hard-to-reach communities particularly when they do not understand English.

- People who don't believe the advisory message for various reasons: For example, if the fish taste fine, they must be ok to eat, and many individuals think they can distinguish a chemically contaminated from an uncontaminated fish simply by looking at the skin of the fish. It's ok for commercial fishers to catch the fish, but

not ok for us to catch the fish; the perception is that the government is protecting certain interests and not others. Response of government to the Hudson River PCB contamination incident was to prohibit fishing (even the possession of fish) altogether on 70 miles of river.

- People who don't trust the agency generating the advisories: There is a problem of not trusting government or individuals who are supporting interests different from those of the people receiving the message.

- People who are geographically isolated: This is not a major problem in New York State, although there are some isolated areas in upstate New York, but they are nothing compared to the isolation in Alaska or northern Canada.

What are some of the major challenges in New York State?

- Communicating uncertainty and complexity in the advisories: Some of our populations want species-specific, waterbody-specific, length-specific information in advisories, and they want the advice to be relatively simple. There are others who don't discriminate one species of fish from another and simply want to know if "the fish are safe to eat at this location." Despite an extensive database of information, the contaminant levels from year to year, even among the same species, are difficult to interpret. Complex waterways like the Hudson River are not easy to monitor or evaluate. For example, what is the effect of the striped bass migration up the Hudson on the levels of contamination in the fish? It's not easy to decide precisely how much fish is safe to eat. There is still scientific uncertainty. Part of our role is to communicate that uncertainty—and that's not easy to communicate to the urban poor and those who don't have college educations.

- Our ability to measure the success of communication efforts other than anecdotally: We have attempted to do a number of different things, but we discovered that the better the information you want to get about the target population, the more expensive and difficult it is to collect. We use an information hotline and postcard responses, but the number of returned postcards is very, very small. A survey of the Hudson River over a summer reached only about 200 anglers. While we have a much better understanding of the licensed anglers in the state, other populations are very difficult to identify, reach, survey, and get information that allows us to develop a program. And there are considerably more differences within the groups we are trying to reach than we had anticipated.

- Marine fish and fish from the market: How do we communicate that there are health benefits and some species can be eaten without concern for health consequences while others are of greater concern (swordfish, shark, etc.)?

Focus groups have been extremely helpful from time to time in talking with small groups of people, which can allow a more lengthy conversation about what is important to them and

what we can do to change our way of communicating with people so that they will both understand and follow the advice. We used focus groups extensively in development of the advisory signs. We took a variety of signs to the focus groups to get responses from the participants. Signs are seen as no fishing signs rather than warnings to not eat certain types of fish, and they anger anglers. The state has used signs primarily in the Hudson River, only where we know we do not reach many of the anglers through the traditional methods.

We have also used public radio and public service announcement. Spanish radio announcements generated 800 phone calls. Last year, we had free public service announcements, and these also got good responses in both English and Spanish and many of these spots were played at prime times during the day.

Bait-and-tackle shops have been found to be a good place to list advisory information (one-page summaries of our advisories for regional areas). We have not been able to evaluate posters completely. The commercial fishing industry is upset with posters and we had to be very careful about the language on the posters, because they think the posters will turn the public off to eating all fish, no matter where they are caught. The state would like to evaluate this at some time in the future.

Providing promotional items (refrigerator magnets, t-shirts, bandanas) is surprisingly effective (although results may be biased).

Networking with community organizations, we think, is one of the most important ways to communicate with the target population. It is probably the only method left that will allow us to reach many of the groups that we have not been able to reach via any other methods, particularly those that are culturally different from our staff risk communicators. It is, however, very difficult to measure the effectiveness of this effort since we have to communicate with a leader in the community and then have the leader communicate with the target population.

The most effective ways of communicating with hard-to-reach populations are extremely labor intensive. They are going to require someone in the target community who has the respect of the community and an understanding of the community. It requires constant work; it's not just a matter of sending a brochure out. We can send 20,000 brochures out fairly easily and inexpensively, but if we have to travel to meet with the target population in small groups, then this requires additional staff. In New York State, we only have 1-½ FTEs (full-time equivalents) working with fish advisories to reach several million people. These are some of the challenges and we are hoping to make progress in meeting them.

Stephanie Allen, Sagamok Anishnawbek First Nation

I'd like to present a case study on the E.A.G.L.E. (Effects on Aboriginals from the Great Lakes Environment) project, to give you some ideas for working in partnership with First Nations, the term used for tribes in Canada. I'd like to present an overview of E.A.G.L.E., which

created fish consumption guidelines for the First Nations; what lessons we have learned from the project; and what we feel are the next steps as they relate to the fish consumption guidelines work; and then to discuss the key points that I hope that you take from this for work that you may consider doing with First Nations or tribes.

Overview of E.A.G.L.E.:

- Initiated in 1990 /Canadian Federal Green Plan
- Effects on aboriginals from the Great Lakes environment
- Partnership approach to research—critical to success
- Holistic definition of health—looking at physical, cultural, and economic health.

E.A.G.L.E. Research Programs:

- Eating patterns survey
- Freshwater Fish and Wild Game (FF&WG) Program
- Contaminants in human tissues (community populations eat fish that no sport anglers would fish for); body burden, levels of mercury in hair, 26 nations participated
- Health survey (29 First Nations, 2,400 people); background information on health status—high rates of diabetes, long-term and reproductive health effects
- Sociocultural program: impacts on community health and well-being.

Fish Consumption Guidelines:

- One of four objectives of FF&WG research programs
- Interactive CD-ROM version for 33 First Nations; first time guidelines created; project ended in 1989, no subsequent work
- First Nations need information. First Nations have to be involved and have control. Limitations of state of science need to be known and communicated.
- Infrastructure exists. We have community health centers; we're easy to find.
- Capacity doesn't exist: most communities don't have environment committees or resources; training is needed to understand information.
- Commitment must be there, both time and resources. Once E.A.G.L.E. ended, commitment ended.
- Culturally appropriate and relevant communication is the key to success.

Next Steps:

- First Nations fish monitoring program—lot of general information out there, but we don't know what's happening in our lakes and rivers.
- Fish consumption guidelines—information is critical.
- Public education campaign.

Related Benefits:

- Further research
- Policy directions.

Key Points:

- Partnership approach—First Nations ownership is essential.
- Difficulties are not in identifying at-risk but in action.
- Guidelines alone will have little success.
- Goal should be to provide information to allow First Nations to make informed harvesting decisions.
- Success is not measured by decreasing consumption.
- Success is measured by First Nations action on the real issue—contamination of our environments.

Henry A. Anderson, Wisconsin Division of Public Health

As a risk communicator I thought we should have some audience interaction—so I thought I would give you a little quiz to bring you all back to reality.

- How many of you believe you have enough funding—all the money you need for risk communication?
- How many think you have half of the money you need?
- How many have $50,000 or more specifically allocated to risk communication for fish advisories?

What are the chances of marketing a product with a budget of less than $50,000? Zilch.

So given the amount of resources we have all been given to do this job, we probably aren't doing too badly. That's the positive note, but then there are the challenges. We don't have enough money—how do we go about getting more resources?

How do we go about realistically promoting and establishing fish consumption advisories?

If you are a cynic, then you say go for volunteers, do it for nothing. Does that work? It doesn't usually fly very well in the community because people may be stressed out from a lot of other volunteering. On the other hand, how many of you in the audience represent community-based volunteer organizations? We face serious challenges and have to be realistic here about what we have and build on what we do have. One commonality is that we all agree that, if you want to be effective, you have to have as close to a common message as you can have. If you have conflicting messages in your fish advisories, that only confuses the audience.

The reality is what we can try to do is decrease the confusion and have some commonality. You will see, for example, that there is some commonality in the Great Lakes area concerning posters, magnets, other fish advisory materials.

Look for what is a means of communication that we can work on together. Share resources of developmental materials. For example, you have the conference CD-ROM that has examples of fish advisory information that may be helpful to you in your state program. Please feel free to use this as a resource if you feel it can be effective.

How many of you have a fish forum or workgroup in your state or region that brings together the disparate communities to come to common ground? A program that would bring the angler community and the tourism trade together for discussion?

How do you communicate when you don't have resources? You can use the press (newspapers) and people will be aware that it's an issue if it gets a lot of coverage, but that doesn't always give you positive coverage.

What can we do with resources that we have and move forward on a communications strategy? The awareness in certain communities is not very good and that is probably directly proportional to the amount of money or activity in those areas. If we feel risk communication is an important area, then we need to come up with effective strategies. How can we more effectively get a message out? This should be a goal of some of the workshops later today. We may have some disagreements on some issues, but we need to come together and look at those commonalities.

Session 3: How to Gather Information on Target Audiences

Sharon Dunwoody, Evjue-Bascom Professor and Director, School of Journalism and Mass Communication, University of Wisconsin-Madison

First, decide whom you need to reach.

- Audiences is a plural—not a singular—word.
- Different audiences require different information strategies.
- What's lethal—opting for too general an audience or for the wrong subset.

Decide what you want your audience to know.

- Do you want to explain or prescribe?
- Increased knowledge may not be closely linked to behavior change.
- How can you be persuasive?

What's lethal?

- Assuming a tight fit between your information and their behavior
- Assuming that one message channel will meet all your needs.

Understanding your audience well enough requires systematic evidence of

- Current knowledge about a risk
- Level of worry about the risk
- Preferred channels of information
- Perceived ability to cope.

How do you gather systematic information to help you target your audience?

- Focus groups (nonprobability sample): 8-12 individuals, selected to meet certain demographic criteria
- Purposive surveys (nonprobability sample): can be much larger, chosen for reasons of availability or demographics
- Mail surveys (probability samples)
- Telephone surveys (probability samples)
- In-person surveys (probability samples)
- E-mail surveys (probability samples).

Pros and Cons of Information-Gathering Techniques

Technique	Pros	Cons
Focus group	■ Economical ■ In-depth information	■ Bias risk ■ Can't generalize
Purposive survey	■ Can focus on rare population subgroups ■ Can generate large samples	■ Can't generalize
E-mail survey	■ Representative sample is possible ■ Economical	■ Low response rate ■ Lots of missing data ■ Who actually filled out the questionnaire?
Telephone survey	■ Representative sample is likely ■ Can gather a lot of data	■ Declining response rates ■ Expensive ■ Closed-ended questions are not always ideal
In-person survey (the cadillac of surveys)	■ Maximizes respondent coorperation ■ Maximizes response rate	■ Very expensive for any but the smallest populations

How about e-mail surveys?

- Surveys are still too risky.
- E-mail is the domain of higher socioeconomic status people.
- Sampling is very difficult.
- Individuals will not tolerate lengthy questions.

Case Study:

The goal of this effort is to better understand how to communicate about the risks of eating contaminated fish to women of reproductive age living in the households of anglers.

The Problem:

- Women are less likely to fish than are men.
- Most risk messages are sent to anglers.

Do anglers talk to women? Do anglers protect household members by avoiding contaminated fish? Can we reach women in angling households directly?

Field Experiment:

- "Trickle down" condition
- Direct message condition
- Redundant condition
- Control condition.

Can we influence

- Perceived importance of the issue
- Knowledge of the risk
- Risk estimates
- Perceived worry?

Sample

- Randomly selected fishing licenses in Wisconsin counties
- Screened for women of childbearing age
- N = 1,600
- 400 in each of the four conditions
- Response rate: 82 percent

What did we find? Information interventions influenced all four goals:

- Perceived importance
- Knowledge
- Risk estimate
- Level of worry

What did we find?

- The most successful intervention? The newsletter produced the biggest jump in knowledge levels.

- Trickle-down does not work well. It had no effect on either perceived importance or on knowledge.

The take-home message? Agencies can communicate successfully with at-risk women in angling households, but that communication needs to be direct, not indirect.

The process includes

- Focus groups
- Mail surveys
- Field experiments.

Case Studies of Fish Advisory Scenarios

Community Outreach to At-Risk Urban Anglers: A Case Study in Risk Communication of Fish Consumption Advisories

Kerry Kirk Pflugh, Bureau Chief, Raritan Watershed, Division of Watershed Management, New Jersey Department of Environmental Protection

I will talk to you today about a project that has evolved into a program that started in New Jersey in 1993. This project has taken on a life of its own. I will summarize its aspects and some of the lessons we've learned over the past 8 years. I want to first acknowledge three key people in this project who are here today: Captain Bill Sheehan, the Hackensack RiverKeeper; Dr. Joanna Burger; and José Cuevas.

In New Jersey, we have approximately 130 miles of coastline, and fishing is a multimillion dollar business. It is concentrated primarily in the lower part of the state, and the part of the state that I'm going to talk about is very actively used for recreational fishing. That is the New York/New Jersey Harbor, and I further subdivide it into the Newark Bay Complex. The complex consists of the tidal portions of the Hackensack and Passaic Rivers, the Newark Bay, the Arthur Kill, and the Van Kull. It's a highly industrialized urban area with 5 counties and more than 20 municipalities. It's part of the port of New York and New Jersey and the third largest port in the country. It's heavily used by urban anglers on a daily basis during the fishing season. Also in this region, we find very diverse cultures and a rapidly changing population from year to year, in terms of who we need to reach with information.

In the early 1980s, the DEP and the Division of Science Research and Technology, in particular, began to explore the subject of contaminants in fish. Several research projects were conducted and fish tissue analyses were done, and we found that there were elevated PCBs and dioxin in the fatty portions of the fish and crab that we investigated. Advisories were issued for the entire state and for Newark Bay in particular. We developed both regional and statewide advisories. For the Newark Bay Complex and for some other areas of the state, the species we have under advisories are the blue claw crab, striped bass, white perch, bluefish, American eel, and white catfish. These species are primarily bottom dwellers or bottom feeders with a high lipid content and, therefore, have absorbed and stored contaminants that they are feeding off the sediment of the Harbor area.

The contaminants of concern are PCBs and dioxin. These are colorless and odorless, and do not affect the appearance of the fish. They bind to the fatty tissue of the fish and to the sediments of the estuary. Therefore, your perception, your ability to sense danger, is not a way to evaluate whether or not fish contaminated with PCBs or dioxin are in fact dangerous to eat.

The health outcomes of concern are reproductive disturbances and developmental problems, and an increased chance of developing cancer if consumed over a lifetime.

For the Newark Bay Complex, the advisories that we have in effect include

- For striped bass: Do not eat.
- For American eel: Do not eat more than once a week.
- For blue crab: This is the only species for which we have a ban on the taking of the species and it's an enforceable ban. We can issue fines anywhere from $100 to $3000 for the first offense for one crab; however, that has yet to be tested. We have issued warnings; those cases where we attempted to give a fine, the local courts threw them out because they didn't have local ordinances that supported that fine.

In the tidal portion of the Passaic River, there is an advisory not to eat any fish or shellfish from those waters. For the high-risk population that I am most concerned with, the advisories are essentially to not eat any of those species. How did we communicate these advisories? Historically, in two ways

- *Fish and Wildlife Digest*—issued twice annually, marine and fresh water versions, goes to licensed anglers
- Press releases.

The problem with anglers in the Newark Bay Complex is that, because the waters are tidal and New Jersey does not have a marine license, this has not been an effective way to reach urban anglers with the advisories.

In 1993, a gentleman from the Bay Keeper Program approached the department and told us that there were a large number of people who were not complying with the advisories. They were very concerned as an advocacy organization and they demanded that the department do something about it. Our response was to obtain funding from EPA Region 2 to do a concentrated, extensive public outreach program. We surmised at the time that the reason people were still eating, despite the issuing of advisories, was that somehow they were unaware or didn't believe them or weren't picking up the information that we were distributing. We decided we needed to do a more grassroots or community-based approach to talk about our advisories in this critical area. The reason this area is critical is that it is highly contaminated and highly populated and there is substantial recreational fishing taking place.

We needed to go into the community and have a better understanding of people's knowledge and understanding of the issue and their level of concern. We went in through the health departments. The first year of the project was spent getting the health departments to believe that this was an important issue. We presented a lot of the data that we had collected over the many years and finally convinced several of them to participate as partners in this effort. From there, we developed some goals:

- Inform anglers of the advisories.
- Explain health risks from consumption of these fish and crabs.

- Come up with strategies to reduce exposure.
- Establish mechanisms that we could depend on to funnel information through.
- Don't discourage fishing.

Our Division of Fish and Wildlife feels very strongly about the message of fishing. To say "don't fish" as a solution to the whole fish advisory problem was unacceptable to them. We had to work with our Fish and Wildlife Division on developing a message on catch and release. Of course, this is a complicated message for people who are relying on fish for economic reasons, for cultural reasons, and for traditional family reasons, but that has become part of our overall message.

We tried to be consistent with some of the basic tenets of risk communication in developing this project by looking at the inequity of traditional communication channels and coming up with alternatives to these traditional methods such as press releases and the Digest and just communicating to local leaders and not going to that next step beyond.

We also designed the project so that local leaders would direct us in terms of what they needed to have developed and how we would communicate within their communities. We did this by establishing site teams. The site teams were organized around areas that had been identified as very active fishing sites. The site team consisted of city officials, community activists, civic groups, anglers, the environmental community, and average concerned citizens. We had three site teams: one at the northern end, the southern end, and in the middle. We probably could have had more because the population is vast, but that worked pretty well. Each team emerged with its own personality, own level of concern, and own approach in terms of how their communities communicated.

In doing an assessment of the site team members, one fact came out—that information needed to be developed. Up to this point, there had been very little information put in any form for distribution to the public. We had some early publications back in the early 1980s when advisories were first issued, but nothing had been reprinted or issued in an ongoing way. There was a desperate need for information materials and that was what we focused on in the first couple of years.

We created a checklist of things that should be developed and things that we should do. The checklist included information meetings, publications, a video, and signs. We designed an education program and conducted research.

This document was one of the first things we developed and it is still in circulation. It was for the general population, something that we could make available to anyone and everyone. Very quickly, we realized we needed to develop something specifically for women who were, in fact, our target, our key audience. This document was developed in both English and Spanish under guidance by both citizens and people internally. This was a bear to try to create. We modeled it after Minnesota. It was a process; the review that we went through to get this out the door was just extraordinary.

We also created signs. Everyone wants signs—they think that if you have signs up you've done your job. I was on the fence about signs but the community wanted it. So we put the signs up. Signs can work—but not for providing information!

"In one of his travels up and down the river, Captain Bill met a family who were crabbing and they had taken the sign from its spot and had placed it on a car tire that was on fire; they had a pot on the sign and in the pot was Hackensack River water and the crabs that they had just captured."

We also developed an 11-minute video. It goes through what the advisories are, how they affect women, what to do to reduce your exposure, and how to clean fish. It was all shot locally and we have distributed that to the population and will have it translated into Spanish so that we can get it out to other communities as well.

We wanted to know more about our anglers. We had done a midpoint evaluation and found that, despite all the wonderful things we had developed, all the great stuff we were doing, and how the community was so much more informed, the target audience still were eating the fish and were largely unaware. So we did an in-person survey during the course of one season and interviewed 300 anglers at the site. It was a very deliberate decision to do this kind of survey because we wanted to get to the people who were actually doing the fishing and crabbing, so we had a better understanding of their demographics, their perceptions, and their consumption patterns. One interesting result was that when it comes to learning about advisories, they were using traditional kinds of methods to seek that out. However, when they wanted information about fish and fishing, they were relying on fishers and bait-and-tackle shops. We needed to use both avenues to get that message out.

The one project that I am very proud of developing and that has received accolades both regionally and nationally is our Harbor Estuary Urban Fishing Program. This is a 4-day in-classroom program that we do with 5th and 6th graders. It came out of a suggestion made by health officers to take kids fishing if you want to teach them about advisories. It started as a 1-day fishing course and I began to think a bit broader in terms of water and water quality and what kids ought to know about fish. We designed this 4-day program that deals with the function and value of the estuary and knowledge of the advisories, bioaccumulation, the link between what humans do on land and how it affects the water. It starts with a classroom day, a storm water drain stamping day, and a waterfront cleanup. We do water quality monitoring and Captain Bill takes the kids out on an eco-cruise of their estuary. For many of these young people, it's the first time they've ever seen their community from the water. We also take them fishing. Something that many of them have never done in their own community. We do pre- and post-tests and the curriculum is linked to core curriculum standards, which is critical if we want teachers to participate. The Fish and Wildlife Division is a major part of this and delivers its message about resources, conservation, and being an ethical angler.

We are very much focusing on the negative and not on the positive of the (Newark Bay Complex) area. I wanted the children to feel proud of where they live. So we did a study of the species that you can find only in this area and did a poster by an award-winning artist. We distribute this to classrooms, along with a brochure, so that teachers can use them as part of their science program.

Lessons Learned:

- Local liaison is critical.
- Understanding local issues, networks, and communication patterns is essential.
- Partnerships are necessary.
- No one model works everywhere even if the waters are shared, the city is the same, and the environmental issues are similar.
- Be flexible, take time to visit, listen, and learn.
- Offer alternatives that are real and safe.

Where are we now? We're doing a women's Latino study; our Harbor watershed program is ongoing; our fish advisories in New Jersey are being updated. Exposure studies are being conducted and our whole communication program is going to need to be reexamined, particularly as we issue our new advisories.

Henry Anderson, M.D., Chief Medical Officer, State Environmental and Occupational Disease Epidemiologist, Wisconsin Department of Health and Family Services

One of the first things I did when I arrived in Wisconsin in 1980 was to evaluate our advisories. A common evaluation method in the past was to mail or telephone surveys to licensed anglers. Generally, the level of awareness among licensed anglers in the Midwest was very high. Compliance, on the other hand, wasn't so good. Just putting a little information in the license booklet and getting press out once a year is simply not enough anymore to have an effective program.

We have two projects that have been funded by ATSDR and EPA. One project, started by special legislation, created the Great Lakes Initiative and, since 1992, we have established a Great Lakes Sport Fish Consortium. We meet once a year with all but one of the Great Lakes states to come up with a strategy, a new theme, and an approach, and then work together to have some commonality in our approach. This project specifically looked at advisory effectiveness, largely awareness and understanding. We wisely listened to expert counsel and did not address the issue of whether we actually effected behavior change. We then did a number of health outcome studies, and now the seven states are working on collaborative advisory implementation.

The second project was initiated by Maine and is a consortium of two states, Maine and Wisconsin. Here, there was a lot of interest in mercury, whereas the other project looked at organochlorine, specifically PCBs. The emphasis in the Great Lakes has been on PCBs since the

early days, and most of our focus was on PCBs. In fact, we have far more waterbodies that are covered by mercury. The vast majority of fish that are caught in our state are more likely to be contaminated by mercury. The largest fish, on the other hand, are PCB concerns.

This project was started in 1998 and is ongoing. We asked for volunteers from states to allow us to conduct random digit dialing surveys with states. For the first time we tried a mailed biomonitoring process. We interviewed the women in the states by phone but at the end of the interview, they were offered information from their states on advisories. Since we quizzed them, if they got the information wrong, we wanted to be sure that they left the interview with correct information. We also asked if they would be interested in sending in a hair sample. Interest was high but the response rate was not as high as we'd like, because people saw they had to send more than just a hair in the sample pack. We did get 413 specimens. And we did prove that, as a methodology, one could do a biomonitoring project through the mail cheaply for hair.

The state has diversity of advisories: different levels of advisory, different implementation. One of the prerequisites from Wisconsin and the Great Lakes is that we've always been the research center, the focus. Everyone has had the concept that the only place with the problem is the Great Lakes; therefore, we've tried to encourage federal agencies and others to look elsewhere, that this is not a single source issue for the Great Lakes. We have quite a spread here with the 12 states, different degrees of effort. We interview both in English and in Spanish. We have also found that people in some states people will actually answer their phones and are thrilled to talk with you, whereas in others, for example, the response rates in Florida and California, leading up to an election, were not as strong as we would have liked. Timing your interview is critical.

We really wanted to know how many people are eating Great Lakes or other sport fish. In Minnesota, with a wealth of waterbody and fishing, 54 percent had eaten a combination of Great Lakes or sport fish. So, mostly it's an inland water fishery with Michigan, which is surrounded by Great Lakes, leading the list with the number of people who had actually fished and eaten out of the Great Lakes. There is some variability in New York, where much of the state is quite a distance from the Great Lakes and, thus, has a low percent of Great Lakes anglers and consumers.

For mercury, we decided to focus exclusively on women of childbearing age, 18-45. The other study included males and females. Here, we focused on 3,000 women in the 12 states. About 80 percent eat fish every year and that was the same as in the Great Lakes, but there is quite a difference between these states when you look at the number of women who have eaten sport fish in the previous year. Fish fillets and tuna are right up there at the top.

Advisory awareness ranges quite a bit. Maine came out on top. Wisconsin didn't do too badly. This parallels quite nicely the aggressiveness of these programs, but you can see, when it comes to women [about 20 percent], we have a ways to go. .

For adult residents, males and females, across the Great Lakes it's quite a bit better when it relates to PCB rather than to mercury. This is an area of the country that has had advisories in place. There's been a lot of information that's been out. When you combine both men and women, it looks quite a bit better than when you look at just women.

What we did in the mercury study that we did not do in the other was to ask them questions that concerned their knowledge such as: Where would you find the highest level of mercury in a fish? One of our concerns was that we pushed so hard on cooking, cleaning, and removing the fat and the skin that the message to the public was that they were reducing risk by removing skin and fat. That is a misperception for mercury. In answer to the question on the health effects of mercury, most of the women identified that it harms developing children. There was a pretty good response on muscle function as well. Cancer risk was not an issue. So, here the broad issue of understanding mercury was pretty good.

We asked a series of questions on where people get their information. Most get their information from TV and newspapers. Our strong government program is at 8 percent and talking with a doctor is the lowest. Friends, about 15 percent. We need to rethink how we address our program. Government communication in Montana is good, but, in general, the source of information for women across the country seemed to be quite uniform.

We looked at awareness vs. whether they were sport fish consumers. Those that were sport fish consumers had higher awareness of the advisories than those who were nonconsumers. In a couple of states, it's reversed: California, North Carolina, and Connecticut. We don't know whether they were aware of the advisory and quit eating fish all together. Good news is that those who were eating sport fish were more aware of the advisories. What we couldn't sort out was whether they were in compliance with those advisories.

We go by fishing licenses, keeping in mind that those states with saltwater fishing may not even have a requirement for a license. If they had licenses, they were more likely to be aware of advisories. But the percentages are relatively low.

Looking at the comparisons of different groups in the Great Lakes: males with 58 percent awareness vs. females with 39 percent. The White population was much more aware than the non-White population. Those with college degrees, 62 percent; those with less than high school at 34 percent. Of those who ate a lot of fish, 62 percent were aware; of those who didn't eat much fish, 35 percent were aware. There is room for improvement, specifically targeting the high-risk or hard-to-reach.

The analysis of hair mercury is not a random sample. The numbers, when you spread them out among the states are relatively different, but they did show that levels, in general, are quite low.

We really need to continue to work to make the advisory messages easy to read and understand and to put more effort into finding new creative, effective ways to reach all the populations, as well as at-risk groups. We need more collaboration among the interested parties.

Recommendations:

- Each state needs to reevaluate its programs.
- We need multiple messages for low-awareness groups, specifically women who do not fish, minorities, and those with a lower level of education.

Session 4: Choosing the Message Content

Joanna Burger, Consortium for Risk Evaluation with Stakeholder Participation
Environmental and Occupational Health Science Institute, Institute of Marine and Coastal Sciences, Rutgers University

Fishing and fish consumption are important aspects of culture in many parts of the United States, and fish can be a significant part of the diet. Yet, data to evaluate the risk to consumers, to understand compliance levels, and to effect changes in consumption patterns for high-risk populations are insufficient. Many types of data are essential to understand fishing practices, consumption patterns, and compliance, including sources of information, reasons for fishing, and the ethnic, cultural, and socioeconomic reasons for fishing and consumption. One key aspect of risk communications about the risks from fish consumption is choosing the appropriate message, which should be based not only on site-specific data on contaminant loads and consumption patterns, but also on the cultural and socioeconomic factors that contribute to fishing and consumption. Such information is as critical to choosing the message as the risk-based information.

Several studies conducted over the last 15 years have indicated that there are ethnic, socioeconomic, and educational differences in consumption patterns that suggest that one communication message is not enough for the diverse fish-consuming public. Instead, targeted messages are essential to meet the different needs. Where fishing is part of a traditional culture, alternative methods of reducing risk must be found that do not rely on cessation of fishing, and where fish is an important part of the diet (whether for economic or cultural reasons), alternatives must be found to allow continued consumption while reducing risk.

We all have an impression that there are a lot of factors that affect the decisions we make in our lives, not only qualitatively in terms of a holistic approach, but also in terms of getting hard data.

How important is fishing? Is there really risk? If there isn't, we don't need a message. How do we choose the message once we get there? And how do we evaluate?

The number of total anglers, saltwater anglers, and even freshwater anglers has increased dramatically over the years. If you look at who's doing the fishing, it's mostly males. However, certain populations include quite a few female fishers. If you look at the percent of men fishing by ethnic groups, there are different fishing rates. But the rates are quite high, even in southern states with White fishers, and much higher than in the northeastern states.

Case Study: Newark Bay Region

In this region, the ethnic composition changes dramatically depending on the latest influx of people. The fastest growing group was primarily Hispanic, but now is Asian. One problem with choosing a message is that the target population may change. There is a clear difference in

who ate their catch; a fairly high percentage are eating them. A particular problem is blue crab; this presents a higher risk than any other risk. People think that because they are filter feeders they can filter it out. "If they look healthy, I can eat them." Paradoxically, because there is no commercial harvest of crabs, the crabs are significantly larger than anywhere else. Ask people if they don't know, so that you can gather the most complete information. No matter how scientific you are, we all have biases. It's important to try and sort those things out.

One of the questions we asked was: Where do you want to get information about fishing? The public may not see fishing as a health-related issue. Many fishers say they're getting their information from other fishers. So, who has the information? We're all getting information from those around us. Bait-and-tackle shops are a big source. Not too many from the newsletter.

I was interested in who is aware of the warnings. We often ask people if they've heard of any warnings; they respond yes or no. But if you ask how many actually know what the warning says, the percent who do is very small. That is disturbing because they don't know what to do even though they know there is a warning. The relevant question is: Do you know what the warning contains? Many think the fish are fine, regardless of the warning. How many people know about the potential increase in risk? There's really not a good information base. Is there a difference in the places you go for information based on your language? The largest non-English group at the time (Spanish) of a previous study in all cases had lower rates of looking at the traditional sources of information.

There are a number of people who are social scientists who look at why people do what they do. In the case of hunting and fishing, there are lots of journals dedicated to these issues. There is almost no relationship between why people want to fish and consumption and risk. We recently asked people why they went fishing. We did this in two different ways. We asked open-ended questions and we gave them a list of characteristics to rate. Respondents rated relaxation and to be outdoors as a fairly important reason; they rated eating fish as fairly unimportant. In the South, they give them away. Not in Newark. Low-income folks still consider the reason they fish is to relax and be outdoors. Risk communicators need to realize the people fish because they like it; I don't recommend that we ask people to change doing what they like to do. In this area, the only place to see trees is to go along the river. Their view from a small boat is of a reasonable ecosystem. People rate most of the social aspects of fishing higher than practical value.

Case Study: SC and GA Study

In another study on the Savannah River, it was important to collaborate with the local people who are involved. It's very important to have collaborators and advisors who understand the local situation. Surveys should be done by local people who know the culture. That means the surveys took much longer because the local people have to chat, but you're also getting more correct information. The only exception was in Puerto Rico at a Superfund site, where we had a local person, male, start out doing interviews who was perceived as a potential undercover. As a female, I was able to get better answers because I was not perceived as a government agent. It is important to involve lots of people all along.

How many fishers do you need to interview to get statistically sound results? We did a pilot study of fishermen on the river and we changed the survey instrument based on what the

people wanted (citizen advisory board). It was very important to go back to all the people involved, but it does take longer. But then you have results that everyone can buy into.

Consumption patterns can differ from place to place and should factor in wild-caught fish and other fish. Clearly, there is a significant interaction between ethnicity, education, and consumption, but not what we expected. The reasons people think the fish are safe differ. Another aspect to look at is the length of time the population stays and fishes in one place. In some places, people stay in the same place all their lives. We found out that the Black community is eating a lot more fish than the White community. It becomes an environmental justice issue.

Look at the relationship between wild-caught and supermarket fish. The more fish you eat, the more likely that these are all wild-caught fish. But you must consider that people are getting fish from other sources and the fishing seasons (risks can differ throughout the year). Consider mercury levels; it matters which fish people are eating. If you look at new guidelines, there are a lot of fish above guidelines in the Savannah River.

In choosing a message, the key items are the species of concern, contaminant of concern, who's at high risk, and chronic vs. acute exposure. There are relative risks; eating fish is a good thing to do. Look at the benefits and risks. You need to realize there are trade-offs: red meat vs. fish vs. no protein. Top-level predators vs. bottom-level. Large vs. small fish. Fillets vs. whole fish or stews. Deep-fried vs. broiled. We need to do more science to know more about risk.

We need to think about the appropriateness of the message in relation to education level, culture, visual appeal, risk benefit level, and length. You need to understand why people fish. You need site-specific information—what are the people doing and why. Aim at a target audience. Provide alternatives that fit cultural imperatives—catch and release (doesn't make sense to most people), alternative species, sizes. The best alternative is cleaning up the contaminant.

Fishing may be correlated with income and it may not be. Fishing can be very important despite income, education. What are the consumption patterns rather than subsistence? It's important to know the target audience, to provide information on health effects and the time course of effects. We don't often consider or have the science to know the effect of acute exposure during pregnancy. Nobody relates to a 10^{-6} risk; it doesn't mean anything to many. Tell them in quantities that they can relate to: what does it translate into in meals. People also need to know how body weight affects it.

We need to know about daily intake vs. one large meal (e.g., large fish fries in the South). We need to think about mixtures of contaminants. We can add the risk together but don't really know what's happening in the body.

Evaluation is very important: did people get the message that they can reduce their risk? Yes, they did get the message but whether they change is a different issue. Risk communication is an iterative process. It is critical to have everyone involved at every step!

Session 5: Choosing the Medium for the Message—Overview

John M. Cahill, Director, Bureau of Community Relations, New York State Department of Health

Before you can begin to select media or communications channels, you must know as much as possible about the group(s) of people you're trying to reach. For example, in 1996, the demographic characteristics of New York's Hudson River anglers included:

Age	<24 yrs	13.3%
	25-34 yrs	25.9%
	35-44 yrs	32.7%
	45-59 yrs	16.0%
	60+ yrs	11.9%
	Refused	0.3%
Gender	Male	87.4%
	Female	12.6%
Race/ Ethnicity	White	69.4%
	Black	12.2%
	Hispanic	13.3%
	Other	5.1%
Income	<10K	15.0%
	$10-29K	27.6%
	$30-49K	21.8%
	$50K+	9.5%
	Refused	26.2%
License	Yes	57.5%
	No	42.5%

Each of these characteristics provides clues regarding the media that would be most appropriate for reaching segments of this group of anglers. It's important, too, that your audience information be as up-to-date as possible. For example, between 1992 and 1996, the following changes occurred among Hudson River anglers:

- Those under age 24 decreased by 8 percent, while those aged 35-44 increased by 9 percent.
- The percentage of women doubled, from 6.6 to 12.6 percent.

- Whites decreased by 10 percent, while Hispanics increased by 9 percent.

Perhaps the most telling statistic is that nearly half of the anglers were not licensed. This means that up to half of the audience cannot be reached through license-related activities.

As important as who makes up your audience are their media habits. For example, African Americans spend more time watching television—75.8 hours per week—than either Hispanics (58.6 hours) or non-Blacks (53.6 hours). Compare this to the average amount of time Americans spend reading. Currently, Americans spend only 1 hour per week reading newspapers and only 1.8 hours per week reading books or magazines.

Imagine, between 1989 and 1999, daily newspaper circulation fell from 62.3 million to 56 million—this in a country that has 103.9 million households. In the same period of time, cable TV subscribers climbed from 50 million to 65.5 million.

What about the Internet? Last year, 56 percent of Americans used the Internet. However, only 23 percent of African Americans had Internet access, compared to 46 percent of White households. A majority, 82 percent, of Americans earning $75,000 or more had access, compared to only 38 percent of those earning less than $30,000. Nearly three-quarters of American children go online (including in school), compared to only 15 percent of those ages 65 and older.

Equally important is the target group's perception of the reliability of various sources of information. In the health arena, health care professionals—doctors, pharmacists, nurses, chiropractors—are seen as most reliable. Spouses, other family members (including children), and friends are in the second tier. Media sources—including magazine articles, newspaper articles and TV commercials—are seen as least reliable.

The Internet, too, fares pretty poorly. Nearly half, 45 percent, of African Americans with access use the Internet to get health information, compared to 35 percent of Whites. However, 30 percent of those who seek information on the Internet don't use it; 51 percent use it, but warily; and only 19 percent use it and trust it.

Sometimes, when looking for ways to communicate with minority and other hard-to-reach audiences, it is necessary to go beyond quantitative data and seek qualitative information from the audience members themselves.

In 1999, the New York State Health Department sponsored a series of focus groups of Latino anglers in Buffalo. The purpose of the groups was to elicit information regarding participants' risk awareness, risk perception, and fishing practices.

As with our general audience of Hudson River anglers, noted earlier, only about half of the Latino anglers were licensed. While they were aware of the advisories that came with licenses, they found them difficult to understand because they were in English. As well, some who could read the advisories simply did not pay attention to them. Similarly, signs posted near waters that advised against fishing or eating the catch were not always understood because they

were in English. Also, participants noted that the signs did not detail which they should not fish, leaving them with unanswered questions.

Participants who believed that the waters of western New York were generally clean and safe also felt that any polluted waters could be avoided based on smell or appearance. They generally opted for areas of rapidly running water free of debris, other waste, or foul odors. They also believed that they could judge if a fish was contaminated by its appearance. They thought that sick or contaminated fish would be different in color around the gills, contaminated by worms or parasites, or have a cancer or growth. It was also believed that they would smell like dirt or mud or have an oily smell.

Information regarding good or safe places to fish was usually communicated by word of mouth. Since there were seldom any announcements on television, the water looked clean, and there were no outreach efforts to heighten awareness in the Latino community, the anglers felt that most people were not aware of any hazard or did not believe there was any risk associated with eating sport fish.

Preliminary results of a set of focus groups, conducted among African Americans in 2000 by the University of Buffalo, yielded results that mirrored those of the Latino study, with the exception of the language barrier.

Similar information must be gathered about other target audiences—pregnant women, children—and subsets of the larger groups—subsistence fishermen, high-end fish consumers, etc.—before you can even begin to think about how you plan to reach them.

According to the proceedings of the 1999 American Fisheries Society Forum on Contaminants in Fish, states have used a variety of locations to make fish advisories available to the public and use a variety of ways to communicate the information. The top ten methods/means of communication were

- Press releases distributed to media (46 states)
- Mailed information upon request (40)
- Posted signs (34)
- Internet postings (32)
- Annual fishing regulations booklets (30)
- Printed pamphlets/fact sheets (29)
- Public meetings (22)
- Targeted newspaper stories (21)
- In state 305(b) reports (21)
- Agency telephone information services (12).

We will look at the pluses and minus of each of these as we explore the vast array of communications media and channels that are available to you.

Available Communications Media Analysis

Media/ Target Audience/ Formats	Target Audiences	Advantages	Disadvantages
Broadcast			
Broadcast TV PSAs Paid advertising News shows Talk/interview shows Program adjacencies Station I.D. with voice-over (V.O.)	All	Reaches broadest audience; can direct audience to other resources; visual with audio allows emotional appeals; can reach low-income/other audiences that do not access health sources; easy to demonstrate behavior; station I.D. w/V.O. is very inexpensive	No control over PSA use; information may be insufficiently detailed for specific target groups; viewer is passive; viewer must be present when message is aired; less than full attention is likely; message may be obscured by clutter; production is expensive; time is expensive; access to other formats is time-consuming and uncontrolled.
Cable TV PSAs Paid advertising Local access programs Program adjacencies	All	Allows geographic and demographic targeting; can direct audience to other resources; visual with audio allows emotional appeals; local programming (30-minute blocks) possible; easy to demonstrate behavior; PSA time is more available than on broadcast TV; paid time is less expensive than broadcast TV	Limited control over PSA use; audience limited to subscribers; information may be insufficiently detailed for specific target groups; viewer is passive; viewer must be present when message is aired; less than full attention is likely; message may be obscured by clutter; production is expensive.
Radio PSAs Paid advertising News shows Talk/interview shows Program adjacencies Announcer spots	All	Variety of formats eases audience targeting; can direct audience to other resources; audio alone may make messages less intrusive; can reach low-income/other audiences that do not access health sources; allows direct audience participation in call-in shows; announcer spots very inexpensive; production is less expensive than TV; time is less expensive than TV.	Limited control over PSA use; information may be insufficiently detailed for specific target groups; audience is generally passive; audience must be present when message is aired; less than full attention likely; message may be obscured by clutter; spots must fit station format; access to other formats is time-consuming and uncontrolled.

(continued)

Available Communications Media Analysis (continued)

Media/ Target Audience/ Formats	Target Audiences	Advantages	Disadvantages
Other In-home			
Daily Newspaper Public service ads Paid advertising News coverage Feature stories Community calendar Info-line directory Letters to the editor Op-ed pieces	All	Reaches broad audience rapidly; can convey information more thoroughly than radio or TV; feature placement possible; audience access to in-depth coverage; ads are inexpensive to produce; paid space is less expensive than TV time; foreign language and minority dailies exist in major cities	Requires 8th-grade reading level; reaches fewer people than radio/TV; short lifespan limits re-reading and sharing with others; public service space virtually nonexistent; feature article/letter/op-ed piece placement may be time consuming
Weekly newspapers Public service ads Paid advertising News coverage Feature stories Community calendar Letters to the editor Op-ed pieces	All	Allows geographic targeting; can convey information more thoroughly than radio or TV; news and feature placement easier than dailies; audience access to in-depth coverage; ads are inexpensive to produce; public service space may be available; paid space is less expensive than dailies/radio/TV; foreign language and minority weeklies are more common than dailies	Requires 8th-grade reading level; reaches fewer people than radio/TV/dailies; only a slightly better chance of re-reading and sharing than dailies; production schedules not conducive to hard-breaking news.
Internet Web page Ads Banner ads Links Listservs Chat rooms Discussion groups Search engines	All	Immediate worldwide access to audience; allows targeting by interest; messages can be individualized and detailed for each group; allows interaction; can direct audience to other resources; audience access to in-depth coverage; can be less than other media; translation/ ethnic targeting possible; visual with audio allows emotional appeals; can emphasize skills development; information may be shared; audience can retain anonymity when accessing sensitive information.	Audience limited to those with Internet access; limited access to low-income groups; some reading skills required; the longer the document, the less likely it will be read.

(continued)

Available Communications Media Analysis (continued)

Media/ Target Audience/ Formats	Target Audiences	Advantages	Disadvantages
Other Print			
Newsletters Public service ads Paid advertising News coverage Feature stories Editorials	Subscribers	Permits targeting by interest; messages can be individualized and detailed for specific audience segments; permits active referral; potential for sharing w/nonsubscribers; may be read at reader's convenience; ads are inexpensive to produce; public service space is available	Reading level depends on subscriber base; audience limited to subscribers; ad/articles must be carefully targeted to audience; production schedules preclude hard-breaking news.
Literature Brochures/folders Booklets Flyers Paycheck inserts Utility bill inserts Other inserts Wallet/palm cards Preprinted Rx pads	All	Messages can be individualized/detailed/graphic for each target group; permits active reference; can be shared; can be read at reader's convenience; costs can be controlled; translation/ethnic targeting possible; inserts/cards best for promoting special events, hotlines, etc.	Requires literate audience; may be less effective among how-income/other audiences that may not access materials; the longer the document, the less likely it will be read; distribution and inventory control are time consuming; care must be taken when translating/tailoring for ethnic groups.
Out of Home Posters/signs Billboards Transit Countertop displays Grocery bags Bulletin board notices Bumper stickers	All	Can reach specific target audiences; can direct audience to additional resources; complements/enhances impact of other media; reinforces messages; most appropriate to promote special events, hotlines, etc.; some production costs can be controlled; translation/ethnic targeting possible.	Requires some reading sills; provides limited amount of information; production can be expensive; distribution, posting & inventory control are time-consuming; care must be taken when translating/tailoring for ethnic groups.

(continued)

Available Communications Media Analysis (continued)

Media/ Target Audience/ Formats	Target Audiences	Advantages	Disadvantages
Other			
Special Events News conferences Health/wellness fairs Health screenings Demonstrations Open houses Live presentations Teleconferences	All	Allows targeting by interest; messages can be individualized and detailed for specific audience segments; allows one-on-one interactive exchange with reporters/public; can emphasize skills development; ethnic/foreign language targeting possible; complements/enhances impact of other channels; can be very inexpensive.	Very labor intensive; requires staffing; may require staff training; audience limited to event attendees; supporting materials must be carefully targeted to audience.
Produced Programs Videotapes Audiotapes CD-ROMs Computer kiosks	All	Allows targeting by interest; can emphasize skills development; allows for emotional appeals; translation/ethnic targeting possible; can be presented in waiting rooms; good for non-readers/poor readers	Production is very costly; purchase may be costly; equipment must be secure; user is passive; audience must be present.
Gimmicks/Giveaways T-shirts Caps/visors Key chains Pens/pencils Buttons Bags Water bottles Magnets	All	Complements/enhances impact of other channels; reinforces messages	Production is very expensive; provides limited amount of information; best for promoting hotlines/addresses

PSAs = Public Service Announcements.
VO = Voice over.

Available Community Channels/Potential Partners

Government Offices	**Associations/Clubs (cont.)**	**Associations/Clubs (cont.)**
Governor's Office	Chamber of Commerce	Colleges/Universities
State Legislature	Local tourism agency	High Schools
State Health Department	Community Centers	PTAs
State Environment Department	Council on Comm'ty Svcs.	Political orgs.
Local health department	Veterans Organizations	Environmental orgs.
Mayor's Office	Elks Club	
City Council	Girls Club	**Private Sector**
Boards of Supervisors	JAYCEES	Hospitals
Town Board	Junior League	Health clinics
County Executive's Office	Kiwanis	HMOs
County Legislature	Knights of Pythias	Insurance agents
Fire Department	Knights of Columbus	Sports teams
EMS Unit	Labor Council/labor unions	Fitness centers
Police/Sheriff's Dept.	Lions Club	Local industry/businesses
Parks/Recreation Dept.	Masonic Lodge	Pharmacies
School districts	Rotary Club	Shopping malls
Local social services dept.	Volunteer Centers	Sporting goods stores
Local national guard/reserve unit	YMCA/YWCA	Bait & tackle shops
Libraries	YMHA/YWHA	Supermarkets/bodegas
	WIC programs	Utility companies
Associations/Clubs	Planned Parenthood	Department stores
Sportsmen's clubs	Prenatal Clinics	Restaurants
Rod & gun clubs	4-H club	Bars/taverns
Boy Scouts	Grange	Hotels/motels
Boys and Girls Clubs	La Leche League	Resorts
Business/professional orgs.	Church/Temple groups	Campgrounds
		Car rental agents

A final note...

No matter how important **you** think your message is, it will never reach the people with whom you wish to communicate unless you

- Carefully segment them by common attributes and interests, including media preferences
- Carefully identify the media/channels they commonly use

- Carefully present the information in a form and format that is acceptable to the group

- Carefully select the most appropriate languages and/or reading levels.

The more time and money you spend on up-front research, the more likely it will be that your end product will be effective.

Fish Suits or "Fish Tales": Choosing the Medium for the Message
Kristine Wong, MPH (No affiliation)

The Seafood Consumption Information Project (SCIP), a former project of Save San Francisco Bay Association (Save the Bay) in Oakland, CA, addressed the environmental justice issue of people of color and low-income people who fish from San Francisco Bay. The Project's components were community outreach, education, advocacy, and gathering information as a tool for community organizing.

In 1994, the San Francisco Regional Water Quality Control Board conducted a San Francisco Bay fish tissue study. They found that several types of Bay fish were significantly contaminated with six chemicals: DDT, dioxin/furans, PCBs, dieldrin, chlordane, and mercury. Exposure to these chemicals has been associated with cancer, learning disabilities, and dysfunction of the nervous, reproductive, and immune systems. As a result, the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) issued a health warning recommending that adults eat no more than one meal of Bay fish, while pregnant/breastfeeding women (as well as women planning to become pregnant) and children under age 6 should eat no more than two meals of Bay fish per month.

In 1995, recognizing that people of color and low-income people regularly fish San Francisco Bay (whether it be due to cultural habits, subsistence, hobby, or for a combination of all these factors), SCIP conducted a survey of Bay fisherpeople (Wong, 1997). The purpose of the survey was to give SCIP a greater profile of who fished the Bay: their ethnic composition, whether people were eating their catch (as well as how much they were eating), if they were aware of the health warnings, and whether or not the health warnings had any impact on their consumption. SCIP used this information as an organizing tool in outreach and education, as well as when briefing and advocating government agencies and elected officials. For example, SCIP used the information about the prevalence of organ consumption to successfully lobby the San Francisco Bay Regional Water Quality Control Board to sample and test fish organs in the followup to the Bay fish tissue study completed in 1994.

Using multilingual interviewers, SCIP found that the 228 respondents were mostly people of color (70 percent). Of those who had eaten Bay fish, 80 percent were people of color, and 90 percent of those who had eaten fish in the past week exceeded OEHHA's recommendations. Organs, some of the most contaminated parts of the fish, were eaten frequently. In addition, 42

percent had not heard about the health warnings; Latinos and non-English speakers were the least likely to have heard the warnings. Less than one-third (28 percent) changed eating habits after hearing the warnings. This led SCIP to conclude, among other things, that people of color are disproportionately impacted by contaminated fish, which makes it an environmental justice issue; government-issued health warnings are not reaching the most affected populations, and health warnings have little effect on their consumption habits.

Based on the survey conclusions, SCIP designed a multilingual public education campaign focused on people-of-color communities. SCIP's goals and beliefs were not to make people eat less fish, but rather to have them make their own decisions after being informed about the health warnings. Through workshops, SCIP demonstrated alternative ways to cook the fish that reduced their risk and retained cultural traditions. SCIP believed that the public education campaign was a two-way learning process and that the communities were experts in their own right.

The components of SCIP's public education campaign were multifold. They consisted of community-based workshops; the SCIP educational video, "Fish Tales" (Wong and Plutchok, 1997); public outreach through piers, schools, and street festivals; multilingual brochures and posters; the ethnic and mainstream media (TV, radio, and newspapers); and advising on a task force with the State of California Department of Health Services and OEHHA on sign postings/education materials.

When choosing the medium, one must first determine the target population. SCIP accomplished this through its survey, through talking to fisherpeople regularly, and consulting related reports and statistics already published on the subject. One must consider several factors about the target population that will determine which medium is chosen to disseminate the message. Each media outlet should also pass a list of criteria as well—not just its reach or reputation among the population, but its history/ties to the community or its ability to transcend community politics. When choosing the medium, one should consider how complex the message is; media where the message can be explained more in depth (radio talk shows, videos) as well as absorbed visually (newspapers) should be chosen for more complicated messages. Statistics should be avoided—simpler is better. For illiterate populations, or populations where the language is steeped in more of an oral than a written tradition, pictoral materials or radio should be used. For the challenge of reaching fish cookers vs. the fish catchers, get the message home through kitchen giveaways or through workshops. Keep in mind that translations must be backtranslated—small differences in tone or character can represent significant changes in meaning.

Although choosing the medium for the message was a complex process, the take-home message was simple.

SCIP's Goals and Beliefs:

- Respect cultures.
- Present alternatives.
- Acknowledge that it's a two-way learning process.
- Listen to the community!

Wong, K. 1997. *Fishing for Food in San Francisco Bay Part II: An Environmental Health and Safety Report from Save San Francisco Bay Association.* Oakland, CA: Save San Francisco Bay Association.

Wong, K. and R. Plutchok. 1997. *Fish Tales: A Health Education Video from SCIP at Save San Francisco Bay Association.* Available in Cantonese, English, Spanish, and Vietnamese. Oakland, CA: Save San Francisco Bay Association.

Choosing the Medium for the Message—State and Community Communication Activities

Josee N. Cung, Program Manager, Southeast Asian Program, Minnesota Department of Natural Resources

In the past 5 to 6 years, the Minnesota Department of Natural Resources (DNR) Southeast Asian Outreach Program has collaborated with the Minnesota Department of Health (MDH) to provide education to Southeast Asian immigrants on health risks associated with the consumption of contaminated fish. In this joint effort, DNR works with community leaders to design culturally appropriate models for education—the medium—and then coordinates with MDH to deliver the curriculum—the message.

Several education delivery models have been devised and carried out, among them

- Standard classroom training workshops held at a community center or facility
- In anglers' homes, as a version of the storytelling tradition and often involving elders
- Day field trips that include bus travel to fishing sites, the education component followed by a hands-on session of actual fishing and fish cutting and preparation
- Visits or tours of a DNR biology lab where fish are studied, followed by the biologist's demonstration and explanation
- Translated materials for purpose of reinforcing the messages and reference, **not** to replace the above models
- Radio announcements and video, for airing on community TV networks.

Some unique aspects of the above education delivery models include

- Both English and the native language translation are used.
- Color photos or live samples are presented.

- Several sessions have ended with a communal meal of the caught fish prepared jointly by instructors and students.

- All activities are planned and take place under community sponsorship. Heads of community organizations promote and publicize the educational sessions and work with DNR to recruit and enroll participants.

Session 6: Evaluating the Risk Communication Program—Overview

Barbara Knuth, Associate Professor and Co-Leader, Human Dimension Research Unit, Department of Natural Resources, Cornell University

Evaluation can help ensure that programs are meeting the needs of health evaluators and communicators. It helps monitor whether a program is being implemented as intended. There are three elements of an evaluation:

- Formative (in early stage)
- Process
- Summative.

Evaluation requires institutional support, philosophical and budgetary. It requires staff who have the skills and experience to do the evaluation.

A formative evaluation takes place in the early stages, as audience objectives are being identified. What is the problem and how should it be addressed? It assesses the likelihood of attaining your objectives through the identified process. Processes involved include brainstorming, readability testing, focus groups, and pretesting.

In the process evaluation, we look at whether resources are being used as intended and staff are doing what was intended.

The summative evaluation focuses on how the objectives have been met and on examining the impact our outcomes have had. You have to allow enough time and implementation to see outcomes. What changes in the audience have occurred; what changes in the problem context have occurred? These objectives are extremely critical.

Objectives associated with health advisory programs may be conflicting. How many can be obtained simultaneously and how many are mutually exclusive?

1. To enable potential fish consumers to make informed decisions about eating fish

2. To encourage risk-reducing behaviors (fish cleaning, fish cooking, species, locations, sizes) that are appropriate to the audience

3. To protect public health (minimize risks).

If we want 1, we assume they are truly informed and that we are willing to live with their decision. That's very different from 3.

1. Inform potential fish consumers about the health benefits of eating fish.

2. Encourage public support for toxic cleanup programs.
3. Encourage public use and enjoyment of fishery resources.

1-800-GOT-FISH; National fishery agencies. In many states, budget comes from licensing fees.

How do we judge advisory success? We determine its effects on a range of indicators:

- Overall diet quality
- Support for toxics reduction
- Local economy
- Tourism
- Public trust in government
- Human health.

Evaluation endpoints include

- Use of information sources (what are they)
- How that relates to advisory awareness
- Beliefs, attitudes, and knowledge
- Fishing and fish-eating behaviors (affected by culture, traditional behaviors)
- Health status—expensive to measure.

There is a suite of endpoint behaviors:

- Fishing-related behavior—locations fished, species sought, and fishing frequency
- Information-related behavior—sources of information and frequency used
- Fish-eating behavior—source locations, amounts and frequencies, species, preparation methods.

The key to a useful evaluation is to plan early so that you can build up to do a summative evaluation. Be clear about your objectives. One caveat: if you see no change, it doesn't mean you haven't had an effect; you have to understand the before and after.

Risk communication is a process of sharing; it should start early on.

Barbara Hager, Director, Health Education and Promotion, Arkansas Department of Health

How we evaluated the mercury in fish risk communication program:

- Segmented intended audiences—women of child-bearing age and children up to 7 years of age, sports fishers, and subsistence fishers

- Developed messages unique to each intended audience group.
- Use of several methods to collect evaluation data.

The challenges in evaluating health advisory risk communication programs, particularly with at-risk and hard-to-reach audiences include

- Delineating which methods worked better than others
- Determining if intended audience groups were being addressed
- Assessing actual behavior change.

Lessons learned through evaluation:

- Specific information doesn't need to be developed by county or body of water. Instead, aggregate information can be provided as well as general guidance.
- Intended audiences really do respond positively to information that is designed specifically for them.

Mercury in Fish Campaign, Results 1996—1997

Evaluation questions:	**Yes**	**No**	**Other**
The information in the brochure was clear and easy to understand.	8%	1%	1%
I am more aware of the mercury in fish problem and how it can affect me.	91%	1%	8%
As a result of reading the brochure:			
I plan on limiting and/or not eating fish from advisory areas (depending on guidelines)	88%	2%	10%
I will follow the guidelines for eating fish from advisory areas and feeding my children	83%	1%	17%
I plan on sharing the information I learned with others I know that eat fish.	95%	1%	4%

Question and Answer Session

Q: For Barbar Hager [tape is unclear]

A: Yes, it did. We started working with them immediately with some short-term measures, but we knew we had to do the long-term change strategy. It picked up within a year. They also got a dedicated tax and are just rolling in money now.

Q: You indicated that you had measured blood mercury levels and that they did change in response to the advisories? Could you tell us a little more about that?

A: Yes, when we went back and said it's a problem that we could live with, we took a group of volunteers—self-selected—to have their blood levels tested. We did the interventions with them and after a period of time we went back and tested their blood levels again, and their blood mercury levels had been reduced in all cases. Although they were still fishing, they were fishing smart and they were limiting their intake. Although we didn't test any children, they took their kids out and they were limiting the consumption for their kids. Again, this was a self-selected group.

Q: When you said you do an evaluation and it doesn't show any change, it doesn't mean you're ineffective. Could you say a little more about that?

A: Depends on what conditions you start with. If you start with a population that engages in behaviors that are acceptable, why try to change them? It's important to know your baseline.

Q: I'm curious about your "mercury is something we can live with." Is that the message? Do you have an environmental community in Arkansas and how did that message fly? They're the ones driving the environmental process in New Jersey and something like that would not have been acceptable at all.

A: You have to understand the nature of methylmercury. We don't think that industry is the offender here. We have a lot of slow-moving waters that have a lot of vegetation and the mercury methylates. Now, where the mercury came from, we don't know. If you eat smart, you're good; you can still use it as a protein source. That was our overarching message and we didn't get any potshots from the environmental community.

Cross Cultural Risk Communication—Lessons Learned from the Exxon Valdez Oil Spill

Thomas S. Nighswander, MD, MPH

On March 24, 1989, the Exxon Valdez oil tanker ran aground, spilling 10.8 million gallons of North Slope crude oil, which eventually fouled 800 miles of shoreline. This represented the world's largest ecological disaster and the first time an oil spill had impacted the subsistence food collection area of a native population (15 villages) highly dependent on subsistence food. In addition to nutrition, subsistence food gathering and distribution help define the culture. Walter Megabuck, then tribal chief of Port Graham, described this event as the "The Time the Water Died." In his written commentary he said

> "what white men do for sport and recreation, and money, we do for life: for the life of our bodies, for the life of our spirits, and for the life of our ancient culture."
>
> Walter Megabuck
> *The Time the Water Died*

Pre-spill household surveys had revealed per capita annual consumption of subsistence food that ranged from 200 to 600 lb coming from 19 to 25 different subsistence foods such as shellfish, finfish, ducks, and seals.

From the summer of 1989 through the summer of 1991, 1,062 samples from 18 different invertebrate species and 312 samples from 15 different fish species were tested for polycyclic aromatic hydrocarbons (PAHs) at parts per billion levels. Based on insignificant levels of PAHs in non-oiled beaches in the oil spill areas, the Oil Spill Health Task Force (OSHTF) was able to provide consistent and reassuring advice: Subsistence food from beaches not obviously contaminated with oil were safe to eat.

A variety of tools were used to communicate this information to the villagers, including five state department health bulletins, nine issues of the Oil Spill Health Task Force Report mailed to 4,500 households in the oil spill communities, subsistence sampling maps and results for each village, a video entitled *The Oil Spill Threat to Subsistence* (featuring villagers telling the story of the testing and the results), and two series of village visits by member of the OSHTF for village meetings and discussions. Additionally, in 1990, a risk communication workshop was held with village representatives to assess the effectiveness of the communication strategy.

There were significant lessons learned through this process. The most important was gaining an understanding of the difference between the native science and the western science paradigm: The western science community compartmentalizes the whole to study the pieces; the native community observed the local ecosystem, compared it to their previous observations and oral history of observations, and made a judgment about the system being in balance. In the native view, the water, shoreline, vegetation, fish, shellfish, birds, and animals are a vast network of interrelationships; an abnormal observation indicates the ill health of all.

Of almost equal importance was the importance of early, significant inclusions of native subsistence users from the oil spill area in the planning and execution of the sampling, reviewing the results, developing the message, and the tools to deliver the message. More native participation would have been even better.

There also was inherent ambiguity in our message: PAHs were present in subsistence food in insignificant amounts, but the food was safe to eat. The question from the villagers was that if there was any contamination (PAHs), how could the food be safe to eat.

In spite of the above difficulties, positive results included

- Reliable scientifically sound information and advice was given consistently over time.
- The same beaches were evaluated over 3 years, demonstrating a decrease in the PAH levels.
- These data were evaluated and advice developed by some of the most prominent toxicologists in the United States.
- Consensus decisions were reached by organizations who were bitter antagonists in a genuine effort to respond to the concerns of the affected communities.

In 1988, the year before the oil spill, the average per capita consumption of subsistence food in 10 affected villages was 345 lb of subsistence food. In 1989, after the spill in March, the average consumption fell to 181 lb. Two harvesting seasons later, 1992, the average consumption returned to 324 lb. This was a result, in part, to the subsistence sampling and the risk communication to the villages using a western science approach. This was coupled with a general improvement in the ecology and clearing of the oiled beaches of Prince William Sound, thus providing data to the native science approach that subsistence food was becoming safe to eat.

Question and Answer Session

Q: For Dr. Nighswander, did you say that blood levels in humans were checked?

A: No, we did not do blood levels in humans. We were getting values of 5 and 6 ppb, the highest samples we got were in some shellfish from oil spill areas. And that was in the advisory not to pick shellfish from affected areas. They went up as high as 122 ppb; over a 3-yr period, the levels dropped. What happened is people stopped eating, and they still don't pick from Windy Bay. The other piece of the evaluation we had is that, although it came back in the amounts, species choice was different. So they are still harvesting the same food but changed a little in amount of subsistence food they were eating. Finfish were always safe because they degraded the stuff.

Q: Has the health status of these individuals been affected in any way?

A: Not that you can tell, but remember 15 villages were involved, with a total population of 7,000 people, and cancer risks are measured in one cancer case per 100,000. In fact, the biggest health impact was the mental health issue. Not only did the waters die, it was so lucrative to go with the cleanup that we had some villages that were abandoned and there were only elders and kids left. The public safety officer disappeared; he was off working on the cleanup. It was a very disruptive time. The social disruption was the big health impact.

Q: The problem was when the message given to commercial fishers was to not harvest, especially that first following year and we were telling subsistence fishers to go ahead. And I knew the reasoning was that we could trust them to tell that the fish was oily and not to eat them and we couldn't trust the commercial fishers to do that.

A: It was an issue about marketing. They really stopped harvesting fish during the height of the oil spill. Part of it was a concern that you bring your nets up through the oil and you contaminate the fish. But deep down we think it was a marketing ploy. So the message went out that it's ok to eat and collect your subsistence food but it isn't all right to go out and commercially harvest fish. Talk about a double message. That came back to plague us again and again. We didn't have any control over the commercial fishing fleets.

Q: Why are there no fish advisories issued in Alaska? Is it because the levels are low or is it for other reasons?

A: [Referred the question to Patricia Cochran.] Because we're just getting there; there have been some.

Q: Alaska is not so pristine; we have over half the military sites in the U.S.

Q: For earlier speakers, I want to share something with you that I learned just recently. We have health educators that work with various cancer programs across the state. We have cancer coalitions, various groups of NGOs mostly and county health people who get together and discuss ways to get the message out about cancer One of the community health nurses told an interesting story. She wanted to get a smoking cessation message out but had only $50,000. She got a video camera and went into 5th grade classes, asked them to create a commercial, and said the winner would run on a local station. This cost her almost nothing and got lots of coverage because they were local kids. Since that time, even bigger cities have picked up this same idea. I think it could be converted into a fisheries message. You might have to teach the kids first in a health lesson. You can imagine how innovative some of the kids were in those messages.

Closing Remarks

Elizabeth Southerland, U.S. Environmental ProtectionAgency

I want to thank the Steering Committee who organized this conference, especially Pam Shubat and Pat McCann for the fantastic job they did leading the planning. They've been working on this for over a year. The Steering Committee did a magnificant job putting together an excellent combination of plenary and breakout sessions.

I want to try to explain how unique this conference was for us. At EPA Headquarters, we're used to working with state health department representatives and with the state water quality agencies. That's generally what we do. We're used to working with the bureaucrats involved in public health protection and pollution control. We depend on the regional offices or the state offices arranging public participation opportunities when they are doing rule making or undertaking a project at the local level. We do not generally bring community activists together for a national meeting. To my knowledge, this is the first time we've ever done anything like this with regard to fish contamination. We normally depend on the state and local government public participation processes to include community activists.

When we decided to do this conference, we knew we needed a lot of travel money to pay community activists to attend. We went to every EPA office to ask for travel money. I think we achieved an excellent turnout. Registration as of this morning was over 350 people. I want to acknowledge the individual EPA offices that contributed funding:

- Office of Water
- Office of Pollution Prevention and Toxic Substances
- Office of Pesticides
- Children's Health Office
- Office of Research and Development
- Office of Air.

All of these offices have participants here who have been taking notes for their own risk communication purposes.

What were our objectives in having this critical mass of community activists come together in this precedent-setting conference? First, we wanted to make substantive improvements in our national guidance document on how to communicate risk regarding fish consumption advisories. We published the guidance several years ago, focusing on state practices for communicating with recreational and sport fishers. We realized that we need a different approach to communicate with subsistence fishers and traditional/cultural fishers. That's why we had you come together. It certainly has been an eye-opener and will result in substantive changes in our national risk communication guidance.

Second, we wanted people to give us examples of their communication and outreach materials. We have collected those and will establish a clearinghouse of that information on our fish consumption advisory Internet site. We will commit to updating and maintaining that information with all the successful outreach materials that you develop at the community or state level.

Finally, I want to give an apology. Every year we have a meeting with our state health departments and our state water quality agencies; that's the annual fish forum conference that we scheduled for tomorrow. The reason we were not able to have everyone stay for that forum was strictly because of our limited budget. We collected half a million dollars to pay for travel expenses for the risk communication conference and tomorrow's forum. We just didn't have enough money to pay for everyone to stay over for the forum. The people we invited were state fish advisory and water quality agency representatives and Tribal representatives who have either treatment as a state and water quality standards or fish advisories. As a result, only a small group out of this 350-person conference has been funded to stay over for the annual forum. Those of you who can stay are certainly welcome to stay.

Part III

Breakout Session I

Breakout Session 1: Determining What the Audience Wants to Know

1A. Women's Health Issues—Pregnant, Nursing, Childbearing Age

General Discussion

Determining Information Needs

Participants discussed methods to determine the information needs and wants of the target audience (pregnant women, women of childbearing age). The first step in determining the information needs is to find out what women do not know and what questions they have. There are many ways to find this information—survey women who apply for fishing licenses, find local leaders willing to assess the needs in their communities (especially for non-English speakers), ask women who have had children what they wish they had known, survey women at the doctor's office, hold focus groups and surveys in different communities, and survey other states to find out what information needs they may have assessed already.

Session 1A Summary

How to determine information needs

- Go to community organizations and leaders, women's groups, churches, etc.
- Go to doctors and health care providers, nurses, midwives.

How to know the audience

- Use "profiling" methods to identify the issue, the community and how it works, and the audience.
- Evaluate your methods throughout the process.

Who should be involved

- Women must be involved from the beginning to the end of the process.
- It is important to use test audiences to test your format and message content.

Many participants preferred to discuss the actual needs of women, rather than just the methods for determining those needs. Women need to know if they are at risk and what their level of risk might be based on their exposure. There was general concern that women need to hear this information before they are pregnant, ideally when they are teenagers. Ideas for communicating with younger women included reaching them through schools, health classes, youth groups, doctors, and nurses. The group also spent some time discussing who should be conveying this information to women. Survey results show that, in most cases, health care providers (doctors and especially nurses) are the most trusted for conveying this type of message. However, the healthcare providers need to be educated as well—this message needs to be included in their curriculum while they are in school.

How To Know the Audience

A "profiling" method was recommended for getting to know the audience. You first need to understand the issue and the target audience—the way the audience communicates and what the history of communication is between the agency and that audience group. Begin talking with local leaders and local health departments to find out who the contacts in the community should be and which groups you need to talk to. Talk with them about the issues and identify the issues from their perspective(s). The community will begin to tell you the best methods for reaching your target group. The next step is to work with the stakeholders to develop the outreach program. Conducting evaluation at every step is also important, so you know if you are being effective and reaching everyone that you need to reach. New Jersey has developed a publication that describes a profiling method for identifying the audience (*Establishing Dialogue: Planning for Successful Environmental Management*, Division of Science Research and Technology, New Jersey Department of Environmental Protection, 1992).

Who Should Be Involved

To identify the audience and develop the message, women must be involved from the very beginning and throughout the process. Focus groups should be included as an important tool to identify many types of information from the audience. For instance, focus groups can tell you what the current awareness level is, what the information needs are, and the importance of the issue to women. Focus groups can help to design surveys. Test audiences should be involved to test the reactions to different message formats and content. It is also important to remember that the audience will not always be the same—women in a tribal subsistence group are much different from women who eat sportfish once a month, and the message needs to be tailored to reflect their specific needs.

The healthcare industry should also be involved in developing the message for women (including state and local health departments and healthcare providers). It is sometimes difficult to work with health professionals, because it is a challenge to convince the health community that this is an important issue. The health community needs to be convinced that this is an important message to deliver to women in order to get their help in crafting and delivering the message.

Other Issues

More information is needed about how to build relationships with this audience and how to identify their information needs. One of the important questions is how to get to the women specifically. One idea is to go to the places that women go to; including doctors, schools, and educators, Weight Watchers groups, community groups, and

Other Issues

- Communicating with women is different from communicating with men—need to understand the differences and how to tailor the message to women, rather than using the same methods used for men.
- Message must be clear and not conflict with the message(s) coming from other sources (or the same source).
- Doctors, nurses, and midwives must be educated about the message, so they will pass it on to their patients.
- How do we communicate with the women we can't reach through doctors, nurses, and midwives?

women's organizations. It is also important to tailor the message to women and to recognize the differences between the ways men and women learn about an issue such as this. It is very important to craft a message that is clear and not contradictory. The message might also include information about other foods that may be unhealthy to pregnant/nursing women. Also a subject of much discussion was how to educate the healthcare providers about the risks to women from eating fish contaminated with mercury. Doctors, nurses, and midwives need to be educated about the importance of this issue, because they are likely to be the most trusted source for communicating this message to the women. "Women are very busy. You need to reach them where they live."

1B. Cultural, Traditional, or Geographically Isolated Subsistence Fish Eaters, Including Native Americans

General Discussion

Major issues including best practices associated with obtaining information from the target audience were discussed. Ideas were also solicited on major "data needs" important for this type of target audience. Between 60 and 70 people participated in this facilitated breakout session. Because of the large size of the group and the large number of issues that needed to be discussed, the facilitator decided to have group members break into smaller groups of 10 to 12 people to discuss one or two issues instead of meeting as one body. This was met with strong resistance from the tribal representatives; however, they did break out into six subgroups. Suggested themes were reread from the "Breakout Session Guide." Members from the groups then discussed one or two topics to report back with recommendations to the whole group at the end of the discussion. Many groups also suggested several additional themes. From the set of topics raised by each group, a representative presented the findings to the whole group, so the whole group could come to a consensus. At the end of the session, Dr. Patricia Cochran further assisted the facilitator in identifying the major recommendations and research areas. These major recommendations and needs were summarized and presented at the plenary session.

Session IB Summary

Best Practices

- Tribes need to take responsibility to educate EPA and other agencies.
- There is no one answer; we need to look at each community as discrete population.
- People need to learn to listen effectively; to listen to the perspective of the communities.

Research Needs

- Determine realistic subsistence consumption rates.
- Eliminate contaminant sources.
- Clean up existing contamination.
- Research social, cultural, spiritual, and nutritional importance of fish consumption

Comments and Summary Notes Submitted by Group Note Takers

Group 1 Comments

Session IB Recommendations

- Learn more about tribes/living the life of the tribes, look at legal issues and trust responsibilities
- Need to work on government-to-government relationships; tribes need full partnerships; tribes need to be in charge
- Greater government sensitivity to messages
- Look at cumulative effects of fish consumption; look at alternatives
- Provide information on replacement protein sources
- Clearly communicate benefits of our traditional foods

- Identify all tribes in Alaska.
- Federal/state agencies should coordinate to provide tribes with information on past, present, and future research projects.
- Identify ethnic community groups by looking at ethnic differences (i.e., Asian) and use someone from the target community to deliver the message.
- Since different ethnic groups have churches or religious affiliations, go there to inform the target audience as appropriate.
- Additional information is needed on oil and gas exploration in Alaska and how it directly affects cancer risk.
- Additional funding for research is necessary.
- EPA has not done research on fish consumption rates for Native Hawaiians. Current EPA consumption assumptions for this population are unrealistic.
- Look at the amount of fish consumed for each major waterway on a regional basis.
- Identify point sources of contamination and what is being done about them (including transboundary and persistent organic pollutants [POPs] issues).
- Nutritional benefits of subsistence foods and how health risk is affected by traditional diet.
- More information is needed on consumption patterns of different segments of the human population and within tribal populations.
- Agencies need to understand how tribes view contaminants by merging western science and traditional tribal knowledge.

Group 2 Comments

- Alaskans eat a lot of subsistence food—there is a complete difference between western and tribal ways of looking at food.
- There is a conflict between western science paradigms and native science paradigms.
- Native communities look at the total environment and have a global perspective.
- Scientists want to measure specific things at the ppb level.
- Don't tell the target population what to do—ask them what their problems are and they will provide suggestions. Use this information to develop solutions.
- Have a holistic approach to taking care of the whole ecosystem.
- Sharing information with the target population is important.
- Consider the option of not issuing advisories if it will cause more harm than good.
- The problem requires time, discussion, and deliberation.
- We need to understand the health benefits of consuming fish, not just the risks.

Group 3 Comments

- Identify the audience.
- Find out, within a reservation, the past and present land use practices.
- Which parts of natural resources are used traditionally versus present use?
- From the federal perspective, don't overpersonalize and stereotype.
- Women of childbearing age is the group at greatest health risk.
- Capture community perspective by survey. Many target audiences would prefer that someone come and talk to each member in person. A survey works on a small reservation and ideally should be conducted by a tribal member.
- Ultimately reach individuals. Find out who is the best person to use to survey the views of the tribe.
- What does the audience want to know?

- Identify the problem related to the target population.
- Listen to the questions people are asking.
- People don't need more bad news.
- Just ask people. Talk to people. They won't talk at public meetings. You can't predict the questions.
- Ask, and listen.
- Measure concern about more problems through survey.
- Send a knowledgeable person to do the survey, so they can answer people's questions.
- Research the role of fishing in the tribal culture.

Group 4 Comments

Recommendations

- We need to rebuild burned bridges and trust relationship with the tribes.
- Mandate protocols for treaty responsibilities and obligations.
- Look at cultural, social, and spiritual research needs via traditional knowledge.
- Provide information on the benefits of traditional diets versus modern consumer diets.

Research Needs

- The state issues advisories without consideration for the tribes.
- The audience should be federal, state, and local governments; industries; and tribes.
- There should be full partnership representation and community-initiated and -owned research.
- Fish advisories for 90% White population, not for the tribes (tribal subsistence harvest).

Group 5 Comments

- Target audience (audience identified for tribes and states in treaties and in CWA, reservation population including future generations)
- Tribal members—subsistence, live along waterways
- Nontribal licensed anglers who fish on reservation, but don't have long-term exposure
- Distribute angler survey to identify target audience.
- Include list of fish and space to write in where tribal members prefer to fish.
- We need to be able to isolate segments of the community that are at greatest risk.
- More information is needed on cumulative risk.
- The Cheyenne River Sioux (CRS) are not seen as fish eaters. Big game tribes brought the fish contamination problem to the state's attention, and the state assumed that CRS were not fish eaters when preparing the advisory.
- Treaties and CWA say we should have clean (uncontaminated) fish. What the audience wants to know—they want clean fish.
- Communicating fish advisory means buying into acceptance that fish are contaminated, instead of communicating that something needs to be done to clean up contamination. Identify pollution at source so that tribes can exercise treaty-protected rights instead of fish size restrictions
- The tribe is the audience. What can they eat? Research needs to include mercury, PCBs, and all other pollutants and their cumulative effects.
- The tribes' approach to fish contamination is to stop pollution.
- There is cumulative risk (dioxin, PCBs, DDE) and risk from replacement proteins (e.g., dioxin levels in lamb, cheese, deer, moose, muskrat).

Group 6 Comments

- Detection limits need to be decreased
  - — Economical and technology issue
  - — Budget a limiting factor
  - — Contaminant mobility—funding for all waterbodies of concern

- Research need is to determine actual consumption rate of each tribe. What is the rate? What segment of target population is actually eating fish and how do they prepare it?
- We need to find a common group—tribes need to have vehicle to tell those outside.
- Lack of knowledge of trust responsibility—only applies to tribes —political status
- Fundamental first step of the problem (e.g., federal tribe fishing rights = vested rights, inherent rights)
- Treaty rights are not in any way similar to sport or commercial rights of nonnatives. Native Americans want government-to-government relationship (sovereignty of tribes).
- What audience wants to know—most people don't even know there is a contamination issue.
- Advice for small tribes—go door to door, but communicator must be someone tribe trusts (e.g., in open public meetings on issues many people do not participate).
- Fish advisories need to be supported by sampling programs—advertised in the papers (e.g., South Dakota is not doing any fish sampling or issuing advisories—it is up to the tribes to do it themselves).
- We (the tribes) identify who we are and we determine what is needed.
- History of anti-trust by government
- Important to educate our people and provide them with information
- Outside risk communicators must approach tribes on a government-to-government basis.

1C. Fish Eaters Whose Native Language Is Not English

Participants in this breakout session were subdivided into two subgroups for better discussion.

General Discussion (Group 1)

Participants addressed the challenges of going into communities to communicate risk information. Discussion centered on knowing the community and identifying a community leader. Advice included:

- Pay community members to provide help, even give gifts or rewards.
- Establish an advisory council.
- Find a community leader.
- Make as many friends as you can.
- Look to community-based organizations, those that are faith-based and culturally sensitive.
- Include community members in the decision making and prioritization.
- Find the community's self-interest.

Session IC Summary

Best Practices

- Build trust (listen).
- Know the community.
- Ongoing communications practices (follow-through).

Research Needs

- Offer alternatives.
- Understand how the community perceives risk.
- Understand customs, traditions, and practices.

Planning is key. Teach the teachers. Educate the community first, then allow the community to pick its own priorities. There are many needs in each community. You need to know if there are any factions or stigmas within a community. You need to know the degree of proficiency of the community, what percentage can read. It is important to listen to the community and craft the message interactively. Controversy can be good if it raises consciousness.

Start out fresh with each group; don't use a cookbook approach. How does the community perceive risk. Once they decide what the problem is, communities can have ownership in making a decision. For instance, not eating fish results in loss of a protein source, which in turn can result in a high rate of diabetes. The message has to be presented in the context of what's happening in the community—not as the "disaster of the day."

The language that EPA uses doesn't mean anything; it's too bureaucratic and technical. There must be clear communication of what the risks are. Long-term exposure complicates the message. All agencies should deliver a consistent message. Don't do "vampire" studies; that is, come in to draw blood and never come back or report back the results.

Target food preparers. Target the elders who transfer traditional knowledge to children. However, you can't always go through the kids to reach the adults; it may invert their elder culture. Have residents bring in the fish they catch for sampling.

There are trust issues. Some cultures have good reason not to trust the government. Also, some see the United States as a Utopia—they don't believe there are problems.

General Discussion (Group 2)

Group 2 discussed who should be involved in the risk communication process. Department of Health and Natural Resources has to be involved and collaborate with the community for communication to people at risk. Providing written information is not effective if people do not read it. Face-to-face communication is most important. Native speakers should be involved—there are not enough representatives within the government. It is up to the government to reach out to those community members who are accessible. (One participant noted that you can't use interpreters in South Carolina unless they are certified.) We need to identify activists within the community.

What do we still need to know about the process of building relationships? You need community-based outreach. Work with community-based organizations—they can reach out to the community because they already have a relationship.

What does the community need to know about being fully informed? It needs to focus on what people need to hear and how they can hear it best. An advisory is given, but no alternatives are given. You need to know what people are eating and how. You have to ask the community how they want/need to be communicated with. For Southeast Asians, it becomes a moral issue. Tribal people are isolated—more on guard with acculturation than immigrants.

What is government outreach about—tends to be one-sided. Government equates with no trust. Risk communicators need to learn how to communicate better and then the message needs to be translated into different languages. Different ethnic groups learn and communicate in different ways.

What Communication Networks Already Exist

- In Great Lakes, community-funded Hmong radio station
- New York City pirate radio stations
- Newspapers
- Health fairs
- Community events (e.g., Taste of Chicago)
- Churches/temples, etc.
- Fishing guides
- Southeast Asian community—incorporate into videos using community to get word out.

1D. Economically Dependent Fish Eaters—Urban and Rural Poor

General Discussion

Participants recommended that before entering a community, state officials should find a person who can be a community link to elicit information you need to use to approach a community. The community leader(s) selected for liaison should be knowledgeable about the community, e.g., a community matriarch. There may be more than one community link based on the diversity of the population.

The state's message to the target audience should emphasize the positive. States should not tell the audience (i.e., fish eaters) what they cannot do but rather what they can do. For example, states should not say "don't eat this fish"; they should say "prepare the fish differently" (to be safer) or eat another type of fish if cooking is irrelevant to risk. That is, the content of the message should either give options or prescribe what to do.

Session ID Summary

Best Practices

- Identify the target group (e.g., welfare-to-work participants, churches, schools, physicians), select a community leader, and then build trust and self-determination with the target group.
- Take a positive approach.
- Pretest your message and be receptive to feedback.

Research Needs

- A better way of defining the group you wish to target (in the areas of education, dietary intake profile, vital statistics such as birth weight)
- Research that is locally and/or regionally based, not nationally based

States should develop trust and self-determination in their target audience, i.e., use a participatory model. States should also reach out to adults through the community's youth—a proven effective strategy.

New York City recently completed a pilot study of fishermen to test for mercury. The results showed high mercury levels in blood, hair, and urine. The research is currently undergoing peer review.

1E. General Population Sport Anglers

General Discussion

What Do Anglers Need To Know

Sports anglers will often want site-specific "prescriptive" information related to a public health advisory. Among the types of "core" information they may want would be the following:

Locational information (coarse resolution indication of which part of state)

- Higher resolution boundary information ("start/stop" river mile locations for streams)
- Pollutants involved
- Which fish species (and slot lengths)
- Which agency (or agencies) generated the data to support the advisory.

In addition to the "prescriptive" information often contained in public health agency technical documents or even shorter communications found on warning signs or notices in fish licenses, sport anglers are interested in a range of "explanatory" information items. Public health agency risk communication products should contain "redirect" features. This could take the form of a Web address, a citation for other documents, or the e-mail or phone number of an agency contact person where additional information could be obtained. Public interests will vary widely in terms of what they expect in such explanatory information. Some people will want a condensation of an agency's technical document into general terms; others will want leads to databases or scientific monographs that are even more technical than the typical agency fish consumption advisory guidelines. Several participants expressed an interest in working up trends data. However, if you

Session IE Summary

Best Practices

- Provide the core information sport anglers need to make decisions involving risks from fish.
- Provide "redirect" leads so anglers can get more detailed information or other explanatory tools.
- Highlight a range of healthy choices and behaviors that can reduce potential adverse health impacts.
- Show how issues apply to anglers as well as others (e.g., family members or friends). Take advantage of "information pass-along" potential by sharing information through sport angler networks.
- Be resourceful — use innovative ways to supplement conventional vehicles (e.g., brochures or signs) for risk communication.
- Guest speakers at angler organizations or fishing piers make outreach efforts more effective.
- Add REDIRECT information to traditional signs and brochures.

Research Needs

- Benefit/cost balance in changing eating patterns or other behaviors
- Current perceptions of anglers
- Safety of alternatives to eating fish
- Develop ways to measure (quantitatively if possible) consequences of changes in behavior.
- Evaluate the relative effectiveness of different communication vehicles.
- Identify innovative ways to stretch available resources to produce more effective messages.

want comparisons between current conditions and a baseline going back 20 or 30 years, historical data are often not available to support such "before-after" comparisons.

Effective Messages and Vehicles To Reach Sport Anglers

Several participants stressed that conventional booklets and other prepared documents can be delivered much more effectively if incorporated in an outreach effort where a guest speaker makes personal contact with a sport fisher organization or event. In addition to scheduled events, it is often very easy to reach the target audience if an outreach person visits public fishing piers. In addition to personnel from public health or natural resource management agencies, nongovernment organization (NGO) people and grassroots/community-based contacts are a good idea. Risk communicators should take advantage of virtually any "no cost" ways to get out the message. Public service TV (especially cable TV) spots are ways to reach a wider audience even when budgets are limited. Workshops or clinics that attract nature or outdoors writers can lead to messages included in newsletter or magazine articles or passages in books. The importance of taking steps to minimize needless confrontations and the production of misleading or contradictory messages from different factions was stressed. Working with land developers (especially developments in lake-front areas or shoreline development projects) often pays dividends where needless confrontations can be avoided. This helps to promote consistent messages. Sports anglers are often the most well-informed segment of the public concerning the technical and institutional ramifications of fish consumption advisories. Sport anglers can even be effective advocates to help clean up the underlying sources of pollution that lead to these public health problems. Much of the underlying body of legal principles (e.g., the Public Trust doctrine) related to such modern environmental legislation as NEPA or the Clean Water Act have benefitted from the strong backing and encouragement of sport angler groups.

Other Issues

- Define a cohesive strategy to tailor risk communication messages to specific target audiences.
- Aim to increase interagency coordination.
- Seek ways to better involve grassroots and other community-based stakeholder groups.
- Identify other aspects of communicating with sport anglers that require more research.
- Identify ways to reach subgroups within sport angler groups (e.g., unlicensed fishermen).
- Identify ways to measure the success of our risk communication efforts.
- Identify ways to avoid "mixed messages" and to deliver more unified messages.

Breakout Session 2: Issues in Developing Message Content

2A. Mercury, Especially As It Relates to Child Development—Also to Pregnancy, Nursing, Childbearing Age

General Discussion

Developing the Message Content

The first step in communicating a risk to the audience is for the risk assessor to educate risk communicators so they can most effectively develop the message and take it to the target audiences. To do this job, the communicator needs the right amount and type of information from the risk assessor. The group overall felt that the communicator needs fairly specific information from the risk assessor, so she can field questions accurately and people will be confident that she truly understands the basis of the risk. There was some disagreement in the group about how much detailed information people need to hear about the risk—most agreed that it depends on the target audience. People mentioned that knowledge of acute, sub-chronic, and chronic health effects is important in developing a message to target specific audiences. Detailed information makes the message valid and gives people information on why the advice is being given and why there is a health risk. A dynamic relationship between the assessor and the communicator is necessary so that the audience hears and understands enough detail, but not so much that the message is unclear. The communicator decides where to draw the line and how much information to ultimately include in the message—but she has to be prepared and know more in-depth information as well.

Session 2A Summary

Recommendations

- Need to know the local populations—different cultures and languages. Listen to their concerns/ideas and adapt the message.
- Test message with target audience.
- Risk communicators need enough information from assessors to understand and be able to field questions.

Key Needs

- Educate medical profession.
- Educate children—health class.
- Get information—women directly.

Research Needs

- Acute effects—what is effect on fetus.
- Nutritional benefits vs. risk of lower fish. Most research has been on fish with higher fat content and higher levels of beneficial fatty acids.

Message Content Should Include:

- What the problem is.
- What the impact is.
- What alternatives do they have (focus on what you **can** do).
- Importance of fish, especially during pregnancy; need to work with nutritionists
- Nursing is still beneficial.

What the Message Needs To Include

Developing a message that includes enough but not *too* much information is a challenge, as seen by the many opinions of the group participants. Items that some people feel the message should include are

- Provide options on how to minimize their risk and positive feedback on the things women can do to lower their risk (such as eat smaller fish, eat certain types of fish, eat other protein sources).

- What is the problem? Mercury. What does it do? Causes problems with the fetus. What are the alternatives? Minimize risk in these ways (i.e., give advice).

- Tell people what they can do about the mercury problem in the environment. It does not help with the immediate problem, but people may feel more empowered if you give them some things they can do to help the root of the problem.

- Add some "redirects" to the advice that tell women to go to other sources for more information.

- Mercury is different from some other contaminants—they have to know you cannot get rid of the mercury by cooking differently.

- Fish are important, *especially* during pregnancy. This can be a confusing message. Maybe present a table of fish, which highlights the fish that are safe to eat.

- Nursing is still beneficial overall, even if the mother has some mercury in her system (wide agreement in the group on this point). Message has to be balanced for women, before and during pregnancy; the risk during pregnancy should not affect the decision to nurse.

- Characteristics of mercury in humans—tell women that it will be in their bodies for a long time, so that even if they are not thinking of having children yet (i.e., teenager's health class), what they eat now will still be in their body if they are pregnant 10 or 20 years later.

Needs To Develop the Message

The group mentioned some types of information that are necessary to develop the message. For instance, the communicator needs to know about the different cultures of the target audience. Using focus groups to help develop the message for different cultures can be very useful, and allows you to adapt the message content based on what you hear from those groups. Pretesting the message with the target audience is also important—if you test a message and it doesn't work, you can change the message content to be more effective. Many people also cited the need for more input from nutritionists on the health benefits associated with fish

consumption, because the message content really concerns nutrition advice as well as the risk of eating contaminated fish.

Other Discussion Topics

The group spent most of the time discussing issues related to what the message content should be for pregnant women and women of childbearing age. Many people discussed problems that they see in communicating the message clearly. For instance, the public tends to think the fish are fine because they have been eating fish for years. Communicators have to make sure people understand that these warnings are for women who are, or will, become pregnant and that the risk is to the fetus more so than to their general health. They may be able to eat the fish and be healthy, but the circumstances are different when a woman is pregnant. Another problem might be that the information too often only goes to the men, and it does not get passed on correctly to the women who are at risk. Additionally, some people brought up the issue of commercial fish, and the concern that women may be getting mixed messages. Is it possible to come up with guidelines for the commercial fish industry? Maybe they can take measures, such as reducing the sale of whole fish, to help reduce the risks.

Another concern raised was the testing of mercury levels in women, in order to provide women at greatest risk with the most specific information. People in the group had some different opinions about testing mercury levels—although most were opposed to the idea. Those opposed argued that such tests are expensive and can be unreliable due to differences between labs. Also, if you test someone and they have a high level, what do you tell them? Women would get very upset and worry that they have harmed their baby. In the U.S. today, the effects of mercury are likely to be fairly low, so unless the woman has done something to really raise her mercury level, it is irresponsible to test her mercury level and subject her to all of that worry needlessly. The effects of mercury from eating fish are not going to be at a high enough level to require testing. Rather than testing, it might be a good idea for the woman to conduct a self-assessment—ask her what her fish consumption habits are, as part of a prenatal questionnaire. Then she and the nurse can figure out what can be adjusted, if adjustments are necessary. This again requires education of health care community, which is a concern that came up in numerous

> Don't target the medical community, I recommend, but go beyond them.
>
> In Hawaii, we have mailed information on mercury and lead to every registered physician. We also made it mandatory, by law, for physicians and medical laboratories to report blood/urine results for lead/mercury to the Department of Health. Result: the physicians almost uniformly ignore the mandatory requirement (penalty: $1500) to test and report, and the labs always tell the Department of Health of every result.
>
> Then the Department of Health can look at the reports, note which ones show high results in women of childbearing age or children, and then either call the physician or send a public-health nurse to the person's home.
>
> But many subsistence fishing families are too poor to go to physicians or community clinics. The only way to reach those families is for a Department of Health van to go to a neighborhood and offer free blood/urine screening.
>
> So, for mercury exposure to women and children, we try to cut it off at the source (posting signs at fishing waters) or at the grassroots level - either information in schools or at free screenings or from public health nurses doing home visits.
>
> Leslie Au, Hawaii

breakout groups, because there is a perceived lack of education in the medical profession about the risks of environmental contamination.

2B. Communicating Risk-Benefit Information

General Discussion

Risk-benefit cannot be framed in the same way for Native American fishers as for the general population. Fish consumption for many tribal people is associated with physical, spiritual, and cultural well-being and, for many tribal communities, there is no clear alternative to eating fish. Fish consumption is not a voluntary risk for many tribal and subsistence fishers. For tribal communities, risk reduction practices such as fishing at several different locations, eating smaller fish, eating a variety of fish species, and providing information on preparation and cooking practices to reduce exposure are received better than advisory messages not to eat the fish. Could the EPA risk assessment equation be modified to include a health benefits factor for tribal and other subsistence populations? This discussion was lengthy and some participants were strongly divided on whether this would be an appropriate public health practice, even though the group recommended it as an information need.

Ethno-religious, social interaction, recreation, and subsistence are some of the benefits of fishing and eating fish. One participant asked what is a good number of fish meals to consume to obtain a health benefit. Perhaps the American Heart Association recommendation of two fish meals per week should be more widely publicized as part of the benefits message.

Risk communicators need to be clear about why they are providing benefits

Section 2B Summary

Recommendations

- Provide information on holistic approach to diet and list benefits of fishing and fish consumption.
- Involve consumers in message preparation from beginning to help meet needs and reduce advisory complexity.
- Test message with sample target audience to ensure message is clear.
- Consider context when communicating risk/benefit information—especially to populations with no alternatives; clearly identify goals of what you want target audience to do.

Information Needs

- Evaluate modifying the risk assessment equation to factor in benefits of eating fish for people who have no clear alternative.
- How do we communicate risk/benefit without implying an acceptance of contamination?
- Collect better data on contaminant levels in commercially caught fish.
- Incorporate data on risk perception and information-seeking behavior to better design messages for specific audiences.
- How do we communicate acute (lethal) consumption health risks to target population?
- Gather more information to refine accuracy of health benchmarks to try to reduce uncertainty in risk assessment equation.

information and how the information should be used by the target population. If the target population has no alternatives to eating fish, as is true for many geographically isolated subsistence fishers, how do we approach benefits? If the target population has alternatives to eating fish, then we can remind people that eating fish is good, but perhaps they need to buy some fish in the marketplace rather than eating all of their fish meals from one waterbody. However, more information is really needed about the safety of commercially purchased fish. Are we really sure that commercially purchased fish are any less contaminated than locally caught fish? As risk communicators, we should not be recommending an alternative unless we are certain about the safety of commercial fish.

Risk communicators are now typically using benefits information to encourage people to keep eating fish, especially for those with a history of heart disease as well as pregnant and nursing women. There are benefits to eating fish for children, and breast feeding should be encouraged.

The risk-benefit message should always be tested on the target population to determine their understanding of the message, as the message can easily become muddled and confusing. A general, more holistic approach to dietary recommendations that emphasizes a variety of foods in the diet might also be helpful information and should be provided to all consumers.

Other Issues and Concerns

- Some species of fish may be more beneficial than other species with respect to their omega 3 fatty acids and nutrients. More information on this should be made available to the fish-consuming public.

- Elevated blood levels of contaminants may not translate into increased disease. Consumers may want to take the risk of eating fish over 20 years to improve their health and lifestyle.

- Fish advisories are often very confusing. Keep the information simple and easy to understand.

- If people don't accept the message, what can we [risk communicators] do? Paralytic shellfish poisoning (PSP) is lethal; there is no benefit to eating PSP-contaminated shellfish, but some people still persist in consuming the affected shellfish.

- Include information in the message on the pollutant and the source of the pollution. Some Native Americans and other subsistence fishers don't want to change their fish-eating behavior. Give them information to help them change the problem of pollution and its sources.

- How do we communicate risk-benefit without implying acceptance of contamination?

- Before we recommend eating more commercial fish species, we need to know if commercial fish are really safer to eat.

2C. Developing One Message Vs. Many Messages for Diverse Audiences

General Discussion

Participants discussed the need for many messages for diverse audiences as compared to the need for one message but many ways to deliver it. As you try to target the message, it gets more complicated and more costly. Cost is a good reason for sending a simple message.

- One simple message: Just be aware of risk, especially to pregnant women and children.
- Another simple message: There are fish advisories, be aware.

Session 2C Summary

Best Practices

- Consistency across agencies.
- Message needs to be simple and visual and encourage people to find out more (e.g., 800 number).
- Know your audience.

Ongoing Issues

- Different opinions and standards, different value systems of recipients.
- Commercial fishing industry.
- Integrating government teams (audience needs to see that coordination).

What Should the Message Be and Should There Be One Message

Toxicologists and agencies need to deliver a simple message. However, in a lot of communities, fish eating is important and you may need to have more complicated advice for some groups. One message is not very effective. You could send out a first simple message as a teaser. For example, have one message to draw people in first, then have personal contact such as through a hotline. You must consider different ways of wording or representing the same message for different levels of complexity. Use one message to open the door, e.g., be aware of advisory.

When the message goes to the angler, is his pregnant wife going to hear it and believe it? What can we do to convince people who have been fishing for years? Even experts don't know. Use other sources—OB-Gyn doctors, river keepers, Spanish community, fishers. (Sometimes fishers are hard to convince.) Arkansas used a well-known fisherman as a spokesperson.

Are There More Contaminants than 60 Years Ago

More than 60 years ago, there were less than 10. There was no cohesion with people working with different chemicals. Water quality is more subtle and dangerous than once thought, leaving fishers confused.

What about Risk Communicators, State Agencies, Organizations

The public will give up if different agencies send different, and thus confusing, messages. If there are many different environmental agencies working together, the team needs to be cohesive and cooperate so it doesn't lose public trust. It is hard to find consensus between different interests. The public sees different agencies as all from same "government." They need to work with the community. Visuals are important, and they should be short and sweet. The message needs to include alternatives; otherwise, there is more confusion.

Ramifications of Different Messages

Credibility is the first thing to go. Who are they going to believe? The person telling them what they want to hear or the community person who is culturally involved? What about commercial fishing? Shouldn't an advisory address more than just catching fish? It should address eating other fish you don't catch. Admit you don't know about commercial fish; tell the public to follow advisory for state guidelines. Acknowledge to people that there are different opinions and standards. The problem is that people aren't given the information for commercial fish a lot of times because the industry has power. Can't we cut back on the detail of sport catching and go more toward commercial? (Some people want detail for credibility.) The message for the general audience is moderation and variety. The real messages should be directed to pregnant women.

Recommendations

- Use simple visuals to catch attention.
- Consensus of all groups: Everyone needs to be at the table from the beginning so as to not send out confusing messages.
- Develop the message recognizing the political, economic, and cultural context.
- Who is your audience, how broad? Determine the message, who it's for, test it. When dealing with different audiences, there are different degrees of complexity. The message means different things to different people.
- Politics is an issue (FDA, etc.); politics complicates the message.
- If there is one message, it needs to be strong enough to push people to find out more.
- Don't know where commercial fish come from.
- Difficult to send message to people that includes different issues.

2D. Communication Paradigms

General Discussion

Discussion began working from the two themes of

- What types of message content help make the message most effective?
- How do you define simple versus complex messages?

There are two major types of messages: prescriptive and explanatory. Prescriptive messages are generally issued through a public health agency and often include "do this " or "don't do that" types of statements. Explanatory messages seek to make the prescriptive information more relevant to specific target audiences. Where public health agencies are seeking to alter behaviors or to teach new concepts, you will usually need both prescriptive and explanatory information tools.

Session 2D Summary

Best Practices

- Messages need to accommodate both prescriptive and explanatory information.
- Different vehicles are needed that range from detailed to complex, site-specific to more geographically generalized (regions, basins, or whole state).
- Redundancy helps get out the message. Multiple vehicles work better. Messages need to be updated periodically to make sure content is current and to help point to trends.
- Messages should have **redirect** features/links to help people get access to different or more detailed information (e.g., Internet applications).

Data Needs

- More effective ways to evaluate how well different approaches work.
- Clearinghouse system (Internet-based perhaps) to improve sharing of currently available examples on getting out the message using different types of vehicles.

Getting people to actually change their habits (or use the message) is much harder than simply passing out pamphlets or putting up warning signs. While different groups in the general population are the targets for the explanatory messages, many people find the content of the prescriptive messages very valuable.

Both the prescriptive and the explanatory messages can range from simple to fairly complex items. For instance, a warning sign is a relatively simple kind of prescriptive message, but most public health agencies will also provide substantive advisory guidelines documents that, for many people, would be deemed quite complex. Explanatory messages could include "redirect" information providing links to technical reports or other types of information of a complex nature. In many cases, however, the explanatory messages would likely show some degree of simplification. For instance, an explanatory message might be limited to just two or three major themes to avoid overloading the message. While even simplified explanatory messages might be expected to contain some qualitative facts and figures, such messages would often aim to avoid unnecessary jargon and seek ways to relate technical terms to common sense concepts. For example, relate fish consumption levels to the idea of so many meals with fish per week as opposed to more technical dosages involving the weight of the fish serving relative to the weight of the person eating the fish and a time period.

Examples of What Seems To Work

Participants shared examples of approaches they felt can lead to effective risk communication messages:

- One state maintains a series of detailed advisory documents and a series of press releases that vary in the amount of content and the degree of complexity (or simplification). Your first hunch might be that people will want simplified information products; it is surprising how many times people actually want even more technical detail than found in any of their ordinary "prescriptive" documents. You need a multilayered (or tiered) approach with several types of messages.

- Another state has had success putting out special regional or community-based documents in cases where a community is concerned over the effects of a major spill or the offsite effects from something like a Superfund site.

- Another state sees a need for documents that give detailed site-specific information as well as more generalized items that provide summaries for large regions within the state (e.g., coastal versus inland). It may not make sense to try to define a single type of message in terms of the level of detail or simplification. You likely need several different products. For more simplified explanatory messages, a good rule of thumb is that, if you include more than about three main points, you will overload things so that people will not "get the message." Avoiding message overload is also important if you are trying to do polls or focus groups to see if the message was "successful." You are faced with different target audiences, so you will need more than a single paradigm. Public interest will also vary depending on the contaminant. For instance, perceived threats from something like radiation tend to grab attention more than the more widespread problems from things like mercury and PCBs. Information also needs to be updated.

- Several participants shared ideas on how to use maps and icons and other approaches that often lend themselves well when information is put out on Web sites. Web links allow people to point and click on map images, to zoom in to get site-specific information; clicking on an icon image of a certain type of fish can lead to detailed information on risks associated that type of fish. While getting out the message using the Internet is clearly a growth area, not all people have ready access to computers, so that noncomputer media still have a role to play. Hard-copy documents can still achieve many of these effects. Laminated "flash cards" or other ways of waterproofing documents or brochures can work well if the materials are to be on or near the water.

2E. Issues in Developing Message Content: Common Misperceptions

General Discussion

Section 2E Summary

Best Practices

- Deliver unified messages from all agencies for one waterbody.
- Shift power—empower target audience from the start in decision, message creation, and solution.
- Target audiences effectively and use appropriate media.

Information Needs

- Guidance on how to translate technical data into relevant social information (be practical).
- More comparative risks to other risk sources.

Participants identified a number of misperceptions they believe exist. Some audiences believe that after an advisory is issued, all fish are too contaminated to eat. In contrast, other people believe that if the fish look fine (e.g., no sores), then they are safe to eat. Other fishers/consumers use an informal, comparative risk assessment, with the perception that if everything is bad for you to eat, then how bad—comparatively speaking—is the risk of eating contaminated fish. This dismissal of advisories may be an attitude of "risk du jour," given the frequency of health risks publicized for numerous products and lifestyles.

Another common misperception is that, if there is no tangible damage to a fish eater (obvious physical ailments), then people do not consider the fish to be impacting their health. In a similar vein, the public considers that, historically, people have eaten fish from the waterbody of concern without known visible side effects, so they choose to continue eating the potentially contaminated fish.

Some people question fish consumption advisories based on their perception of water pollution. They believe that, if the water is safe to drink, then the fish living in that water are safe to eat. They do not grasp the concept of bioaccumulation. Similarly, some people believe that, if there is no visible source of pollution to the waterbody, e.g., a wastewater outfall from a manufacturing plant, then the fish must be clean. This relates to a perception that manmade materials (waste) equal bad or contaminated water and fish, whereas natural materials equal good water and safe fish. One example offered was that of modern-day Eastern European immigrants who settled and fish along Oregon's rivers. The rivers look pristine to immigrants whose home rivers were more polluted; therefore, they believe the fish are relatively safer to eat.

The dichotomy of private vs. commercial fishers also poses misperceptions when private fishers assert that, if the fish are safe enough to allow commercial fishers to catch and sell for consumption, then the fish should be safe enough for them [the private fisher] to eat.

Participants also believe there is a lack of forward thinking or awareness of health impacts from eating contaminated fish. Some people have difficulty understanding that their current actions may not have consequences for 5 or more years. Another theme reported by participants is that some women disregard advisories because they do not intend to become pregnant—the condition on which most advisories focus. The assertion that "It [pregnancy] is not going to happen to me" leads women to eat contaminated fish.

Finally, there's the public's misunderstanding about the governing body's intent with fish advisories. Some people believe that the government is conspiring to take away their rights to fish. Other people simply have difficulty grasping what a fish advisory means and what it is intended to accomplish. Because a fish advisory is government-issued, some people may perceive it as a ban on fishing. They also perceive an advisory as a regulation when, in fact, it is guidance only.

> "One possible solution is informative/ educational meetings with representatives of the media. In my [state], we are speaking at organizational media meetings. The meetings are not covered as stories and are not press conferences. It allows us to educate the media so they understand the topic. It will help when they are doing stories."

Because the risk communicator is not "one of the audience," he or she may mistarget the audience by addressing it as one group when, in fact, more than one group may exist within the audience, thus requiring more than one technique of effective communication. This weakness of the risk communicator may include a lack of understanding of the literacy and education level of the public as well as language barriers. For example, some cultures comprehend messages better in a visual (symbolic) or auditory context than in written word. One size or style of message does not fit all audiences.

Government bureaucracy, though well-intended, may also be a reason for ineffective risk communication. Sometimes there are "too many chefs in the kitchen"; that is, too many agencies play a role in the public's consumption of fish and these agencies may send conflicting messages. The government advisory bodies may not be getting along due to different agendas/policies or the existence of political or turf battles. Also, the messages can be too technical, complicated, and long.

Messengers may sometimes be the cause of misperceptions. The press does not always get the facts straight or misfocuses on an aspect of the advisory and risk. Other messengers let emotions get in the way. Politicians may send mixed messages or counterproductive messages when they state, "Our state is cleaner than it was." "The contamination source is fixed." These messages imply things are okay when, in fact, the contaminant that is already in the environment may persist for years. Industry-supportive messengers may state that the government is going overboard with cleanup or that the contaminant may come from multiple sources (not just fish).

Reasons why certain risks advisories are frequently misperceived include

- Size of risk and saliency
- Comparative risk
- Mixed messages
- Adversarial conditions (us vs. them)
- Lack of visual communication
- Don't know what to do ("learned helplessness").

The group generated recommendations to the full conference on best practices and research needs.

Working List of Best Practices

- Target audiences effectively—right message to each audience; understand the audience.
- Incorporate empowerment.
- Provide alternatives.
- Disseminate unifying messages (among agencies) for each waterbody.
- Encourage shared ownership of issue—paradigm shift from control to building relationships—from the top down and bottom up—at leadership level.
- Clarify and make the message unambiguous.
- Send messages that are visual and auditory (with minimal wording).
- Improve accessibility to messages.

Working List of Research Needs

- Gather social information—make technical information relevant practice using the data.
- Gather data on consumption for new groups.
- Determine what are the most effective "bridges" to communicate information to groups
- Acknowledge that [the government] doesn't know everything (to create ability to learn more).
- Develop a better assessment of the comparative risks of fish advisories to other risk sources.

Tribal Breakout Session

Many of the indigenous community representatives met separately on Tuesday morning so that they could discuss and provide constructive suggestions to EPA about future meetings. Their goals were to

- Make sure they are getting across the relevant information to EPA
- Decide how to interact with the rest of the conference—whether to go to scheduled breakouts or continue meeting on their own

- Determine the kind of message to deliver at the Wednesday meeting [National Forum on Contaminants in Fish] and highlight where the message could be delivered in the agenda.

This breakout session is summarized below, followed by a summary of areas of concern.

Discussion

There was confusion about the Fish Forum being held in conjunction with the Risk Communication Conference and difficulty getting information about the Sunday and Wednesday Fish Forum sessions. Some people were told that there were two complementary conferences and some were not invited to both. The two meetings were obviously very confusing. The agenda for the Wednesday meeting includes

- Recap of summary reports
- Q&A session about Sunday meetings
- Mercury update
- PCB update
- Dioxin update
- Arsenic update
- Stuart Harris speaking on impacts to Native Americans
- Federal overview of 2000 standards.

The tribes want access to that information. Some information is in the CD received at the conference. Why are we going to a work session when the results are already on the CD? Help us do the data collection. The Wednesday meeting should be open to the public. Some of us have data that we've been looking at for a while that may be impacted by what goes on in the meeting on Wednesday. It was noted that a report from Wednesday's meeting will be in the proceedings document.

At the fish contamination conference in Virginia 3 or 4 years ago, it was brought up that more input is needed from the tribes; we are all human beings; fish know no boundaries. Even if you don't have jurisdiction, you should work with those who do. Four years later, numbers have increased; still we are like an afterthought. My recommendation–talk to organizers, funding agencies.

We should have meetings of our own to discuss funding, where we are in our studies, results of those studies, tribal data, and see what kind of risk management and planning they have done. Basic concept 4 years ago, when you talk about fish consumption, you're talking about nontribal. Numbers don't mean anything to Tribes. They eat 7 ounces as an appetizer. If they want us to piggyback, that's fine; but we should have our own meetings.

Don't regionalize meetings by geographic boundaries but by issues. Having a tribal conference helps us. This conference has painted an ugly picture for us because we don't think of contamination in fish and our consumption is very big. Everyone everywhere eats fish. It is bizarre that a fish consumption advisory says if you're 8 years old, you can only eat so much. There are no boundaries for fish. How do we tell an innocent people that your fish are

contaminated? In Alaska, we don't worry as much about that as we should. We can't relate to a Hudson River problem.

There's a fish consumption advisory based on consumption use but it doesn't consider genetics. How many generations have we been consuming contaminated fish? The human body can evolve; we can build up immunities to natural things. Who's to say that I don't have immunity from my great-great-grandfather? For generations, we bathed in arsenic waters and drank the water. Arsenic is a natural preservative. If someone in Hudson Bay says this fish is bad, how appropriate is it for us, who have been consuming it for the last 2000 years, to be concerned? They need to do the study.

The other factor is that we have an outrageously high cancer rate in an environment that looks so pristine: blood pressure, heart problems, asthma, cancer. To look around, it is hard to believe that this small population has this rate of disease. The reason we may have all these high cancer rates is that the government/military is putting toxins here and here, but we're still here.

Take a look at genetics but also at cumulative effect. Maybe not everyone consumes the same amount of fish, but there are practices of spraying pesticides on berries and fruits. In reality, there is a cumulative effect no matter what the source is. The government is trying to eradicate the Indians, they're giving all these surplus commodities that are extremely dangerous to our health. Yet, they still give them out.

One of our main needs is how we can share information about what is happening to us on each reservation; who's having high cancer rates, who's seeing tumors in caribou, etc. Maybe we can have our own meetings to share information and help each other. It's divisive when we don't know what is happening to each other. It hurts us. There are 50 tribes here, but where are the others? I don't know of any tribe that doesn't have issues with contaminants. They need to be here.

Alaska is so new in this fisheries situation. When we talk about regionalizing, I'm concerned because we can learn from what other tribes have done. Have speakers come to tribal conferences. Invite others to EPA Tribal Environmental Conference in Alaska, EPA Region 10. The lower 48 tribes can learn a lot from what the Alaskan tribes are facing. Tribes want to be participants in all regional meetings.

Our tribe recently formed a commission (Great Plains Intertribal Commission), and it's a great vehicle for getting together and doing things together–to understand the differences in the way we are affected and the similarities.

We want to have a different agenda next time; have an in-service training session for all communicators, and a special tribal session at the EPA conference. Have a geneticist with expertise in mutation and mutation tolerance.

What is more effective is to become results-oriented, there are a lot of success stories. Suggestions: more tribal input to next year's agenda; we don't want to separate out from this conference, we want to share with others.

Concerns and Issues

- Treaty and sovereignty; case studies; networking and outsourcing with Indian communities; cooperating agencies work with funding agencies; those of us out in the middle of nowhere with little funding; dual roles of states and tribes; both have to deal with any environmental problem. Have non-Indian communities understand where we are coming from. How do we make this an effective process for next year. We want to get our message out there.

- Some have larger staffs than others. We are capable and we know what environmental concerns are all about. No one has to teach us that. We have to integrate something though. Success stories; set agenda for next year.

- I came to this conference for two reasons: to learn from other success stories and to network. Klamath River Basin Commission has had some success stories; we have many battles with other agencies. We as Indian people are always being asked to serve as ambassadors. Tribal sovereignty has to be exercised; let people know that we are not just another interest group; we are a government entity. You cannot compare the trust relationship we have with any other group. We as tribes have always been told what is best for us. We want to explain and determine our own future given the facts. A lot of our elders are teaching the same practices to our youth as in the past. I see our brothers and sisters deal with protestors on right to hunt whales and also dealing with political agenda. We as tribal leaders educate who we are and what our jurisdictions are. Students always learn about state government, federal, but not tribal. Allow tribes a chance to tell our own story. Classic example yesterday of what it's like to be in boarding school—putting outcomes ahead of content.

- There is a high rate of cancer incidence in Alaska. We looked at her [mom's] diet for first 30 years; then she went to highly processed foods; developed stomach cancer. In Alaska, we didn't have highly processed foods like we do now. We forget how bad white sugar, white flour, and carbohydrates are. It may be the rapid change of diet.

- It is important to meet all together; the divide and conquer tactic is still very alive in the federal government.

- Comprehensive risk profiling is very important; we need to know not just the fish but all risk factors.

- What are they doing about the problem? Are the 49 states and 50 tribes willing to put together a resolution here? Can we generate some kind of document? We're making headway but we have to keep pushing issues.

- I get a sense from some conversations that some people think the tribal peoples are beginners in this process and underestimate our legal, restoration, and communication experience/skills. We are doing a lot of things, from sampling to visiting with our elders.

- I left my babies for 2 days to come here. I wanted the opportunity to talk with others about what works; e.g., what about GIS maps. The only message I took is that our intuitive methodologies in terms of one on one seems to be the only thing that works. Even the nonnatives are realizing this is the way to go. I'm leaving with more confidence that what we're doing is right. But I want to learn more.

- We're here talking about communication which is at the tail end of the process. First Nations have their own ways of making decisions. I'm not throwing out the science; I'm a toxicologist. We are gathering critical information. What kind of message can you communicate if you don't have the information. When looking at the whole scientific basis for risk assessment, there is uncertainty.

- Risk/benefit. Yes we have to support the benefits of eating fish, but we can see that being used against us. People are eating fish; our elders are at 95th percentile. Yes, we need to support our cultures, but don't just put the burden on users. The problem with the risk assessment formula is if there's no exposure, there's no effect. However, the burden of responsibility has to be on the remediators and restoration. The law says we have to bring the resource back to what it is. We have a message for you; we want to push the burden back on you.

- I'm very keen on hearing what the EPA will be doing from here. This group needs to decide if the focus should be national or regional. Your input to the Tribal Council that EPA just formed is invaluable. EPA is looking at funding a national subsistence summit for the fall of this year. They will work with a national advisory group.

- Who explains risk to other creatures who are dependent on fish?

- If you have a meeting of tribes, get it on tape so that we can communicate it to states and the federal government.

- Tribal input on brochures; I don't want a brochure. I want EPA to turn the responsibility back to the polluters in our country and not put it on us.

- I want everyone to listen to what's being said today. Yesterday we decided to segregate ourselves because we want to discuss. The people who need to hear us are at this conference. I don't want to be segregated. Everyone should hear the Native American perspective on the problem. The problem is not getting the message out to our people. The message is getting the responsibility back on those who caused the problem. The U.S. needs to hear the message. Yes, there is a special relationship between tribes and the U.S. government–but on paper.

- Keep it simple; it is our responsibility to take care of the fish. We just want to do what we know is right. It is important to add Native Hawaiians where appropriate.

Tribal Issues Summary

- Many indigenous groups did not know about the Fish Forum meeting or were not invited. Please distribute this information to everyone. Don't separate the technicians from everyone else.
- More Tribal participation needed in developing program/giving more presentations
- Need opportunity to meet and network among ourselves as populations; be able to support one another, not just by individual regions
- There are many ethnic studies done but not genetic studies; look more at genetics
- We want to see more tribes attend these types of meetings.
- All of our regions hold environmental conferences; it is important to invite agencies (EPA) to them.
- Make sure that we are using existing resources/success stories.
- Look at using conference as in-service training opportunities
- Dual roles and partnerships of communities and agencies
- Indigenous communities are not just another interest group; we are sovereign nations; we have different relationship with federal government that needs to be recognized
- Concern about rapid changes in our peoples' diets
- Comprehensive risk profiling
- What documents and policies coming from this meeting? How would we know be informed?
- Our indigenous communities are experts as well; many have sophisticated programs that have been going on for many years. We have our own experts.
- Make sure that we do get out basic information to all communities
- Do sampling in each of our communities
- Risk/benefits studies can be used against us.
- Burden of action not just on our communities but on those involved in the remediation.
- Risk communication is at the tail end of a process, but tribes need to be part of risk assessment as well.
- Our message to EPA, we want to turn the responsibilities back to polluters
- Mandating protocols; make sure that there are policies mandated on how agencies work within communities
- Want to make sure that our community representatives are being integrated so you can hear from us and we can hear from you.
- Definition of subsistence varies across participants. We need to understand how we all use that word.
- Tribes have government that represents them; communicators may not view tribal resources as collaborators in getting the message out.
- Infrastructure, financing, and manpower are pretty well organized.
- Seems to be some reluctance to bring this broader view of tribal nations to the rest of the group.
- Views of all participants need to be heard.

Breakout Session 3: Issues in Evaluating Health Advisory Risk Communication Programs

3A. Women and Children—Reproductive Concerns

General Discussion

This group's discussion focused on sharing new ideas for evaluation methods and sharing proven techniques for inexpensive and effective evaluation methods. Overall, there was agreement that it is important to conduct evaluations throughout the risk communication process. Early on in the process, evaluation with a test audience will help determine if the right methods and message content are being used. After the message has been communicated to the target audience, you can then evaluate the responses and opinions of the audience and find out to what degree the communication effort was successful. Everyone also agreed that the questions asked during evaluations are critical and must be carefully designed. The evaluation must also accurately describe the person who is responding—age, sex, ethnic group, and other information so that you know which parts of the audience you are reaching.

Session 3A Summary

Best Practices

- Go where your audience is already assembled (boat show, fair) and add your evaluation to an activity/survey that is already taking place.
- Go through healthcare providers—not just OB clinics—also nurses, midwives, and county health clinics.
- Include all interest groups and different communities.

Recommendations

- Evaluate methods early on, with focus groups or interviews (before sending evaluation out).
- Include all interest groups from the beginning.
- Make sure you know that the evaluation results are actually coming from your target audience.

Examples and ideas for evaluation include the following:

- Go to an event that already has people assembled from the group you want to target and add your questions onto other surveys, such as fishing surveys (if you offer a prize, people have a high rate of response). This is effective in reaching people at boat shows (where there actually are a lot of women and people with relatively low incomes), also at state and county fairs. Lots of people like to watch a "fish cleaning" demonstration at these events—you could add to that a survey of the people to find out the level of awareness about fish advisories. (However, the fish cleaning demo that Missouri found popular is a lot of work and expensive.)

- Make the evaluation part of the dissemination of the advisory—attach postcards to the advisory and see who is sending those back and what the effect of the message is.

> "One interesting question for an evaluation would be to find out if women are also getting the message that they *should* be eating fish."

- Focus groups or face-to-face interviews give more substantial evaluation, although these methods are also more expensive.

- Use anglers as a vehicle to get information to women who are eating the fish that the men are catching. That is the vehicle through which some people will have to be educated.

- Wherever women are going, get the evaluation to them there. For instance, have brochures with surveys in doctor's offices, clinics, etc. Women can drop a card in a box at the doctor's office; they are more likely to do it there than they would be if they got it in the mail because of the level of trust in the doctor.

- Computer games at state fairs are also popular ways to get input from people. People will answer some questions in the course of the computer game.

- Bring in all stakeholders and have them help with the evaluation (design and implementation). Have members of the community themselves go out and do the evaluation if possible.

- Immediate feedback is desirable and should be part of the process as much as possible.

3B. Cultural Enclaves—Native American and Other Cultural and Traditional Communities

General Discussion

Throughout this group's discussion, there was a very clear suggestion of improving the evaluation process by including the target population—from the beginning of the problem analysis phase of the advisory development through the development of the message content, selection of the media for delivering the message, and evaluation of the message. There was also a realization that fish advisory communication is not a static process. In many cases, evaluation of the message needs to be an ongoing process, as the composition of the target population might change demographically over time or the advisory message itself may need to be changed to reflect more recent health risk information or changes in contaminant concentrations from additional sampling/analysis activities.

In general, most of the participants agreed that door-to-door surveys or one-on-one personal contact with members of the target population (preferably conducted by a member of the target community) was the best way to evaluate whether the message was influencing fish consumption behavior. Although the ultimate goal of an advisory is to reduce adverse health impacts for the target population, tribal members as well as members of cultural enclaves indicated that the fish advisory programs must also provide information on suggestions for reducing exposure, healthy alternatives to fish consumption, and the nature and source of the contamination, so that the community could be empowered to take action to reduce pollution sources or obtain financial compensation for the loss of the natural resource.

Session 3B Summary

Recommendations

- *The first step in the risk communication process* is to develop clear communication goals in concert with the community.
- Communication is a two-way street, modifying the behavior of those who eat fish as well as the behavior of the polluters.
- Listen for your message to be repeated from the target population. Your audience should evaluate your evaluation of the message.
- Empower recipients of advisory messages with civil rights information.
- Educate government agencies and private industry to change their behavior.
- Focus communication on those responsible for the sources of contamination of natural resources.
- Restoration/remediation of natural resources is *vital to the process.*

Another major theme discussed was that the focus of the fish advisory message was not only the target population, but also needed to be heard by the industries responsible for the contamination and by the government agencies who are empowered with the responsibility to protect the environment by regulating sources of contamination. The group then reviewed the topics that had been discussed and identified a set of key themes to bring to the plenary session as recommendations.

Additional Issues, Concerns, and Recommendations

- What is successful is door-to-door communication with person-to-person contact.
- You can inform a target population, but whether they change their behavior is up to them.
- When we (the target population) talk about contaminants and still continue to eat the fish, it puts the blame on us rather than on the polluters.
- Best practice is to build local capacity.
- The government does not have a lot of funding.
- Build a message that is sustainable within the target community and reshape it on an ongoing basis.

- Evaluate what you have done. If the goal is to educate people and then work to establish a change in their behavior, ask: Did you educate the population?
- Clearly state what the communication goals are so you can evaluate the success.
- Regulators need to understand that they should be educated by the tribes.
- Regulators need to understand the tribal views.
- Why do tribal peoples have to change; why don't polluters change their behavior?
- The institutional approach is a tradeoff for health and jobs to allow industry to develop.
- Build power and infrastructure—Protocols of Environmental Justice. We (target population) are recipients of negative action (pollution), but the majority population does not have to change their lifestyle—Cultural Chamber of Commerce.
- Education is going two directions—framework for restoration side is not having to have fish consumption advisories.
- Natural resources remediation is vital to the process.
- Native peoples do not use pollutants, pesticides, or radiation, but they are showing up in Alaska.
- Ask tribal groups what their objectives and programs are. What is causing the problems?
- Evaluation starts at the beginning of programs, and tribes have been left out of this process.
- There should be an international focus on using short, half-life chemicals that will not be transported via the atmosphere to Alaska.
- What are the sources of pollution that are changing our lifestyle? Stop the releases that continue to destroy the ecosystem and its ability to recover, or minimize the message to us.
- Sometimes contaminants are in the sediment and you can do environmentally sensitive remediation.
- In the Great Lakes region, fish are contaminated from 100 years of pollution, but we may speed cleanup to 50 years. Money should go into natural resources damage claims if they [industries] are not going to clean up the pollution.

- The tradeoffs of short-term remediation are real cultural loss to communities. What are safe alternative protein sources? Industry should have to pay the community to compensate for the loss of the resources.

- People can sue for natural resource damages, but only if they are Native American.

- Educate tribal peoples. Build a tribal implementation plan. The best practice is to go to the specific target community. See if you hear the message you gave them back.

- Our tribe used an angler survey to tribal members as part of the fishing license on the reservation. At almost no cost, we had tribal members fill out a 1-page survey. When mercury was found in fish, I went door to door in the community to inform people of the problem. I then went back to the angler survey and it proved useful, as the answers the tribal members gave changed over time and did reflect a behavior change in choosing lakes to fish in that had lower mercury contamination.

- When talking to women about risks, the offer of an alternative fishing site that is cleaner is a good alternative.

- During door-to-door canvassing, you can measure the change in behavior. Did we change the behavior to go to less desirable foods—it then becomes a negative iterative reassessment.

- Evaluate shifts away from traditional foods to foods that are less desirable.

- The evaluation must be involved from the beginning of the advisory process. Make sure that all aspects are dealt with up front. We may not have to change behavior in the short term or we may have to change, but what do we change to? What are viable alternatives?

- Target populations maintain connection with the traditional lifestyle while the river is clean, but lose that when the river is polluted. Target community must be involved in the whole process from the start.

- What should we do with naturally occurring contamination? Not much to do, but for manmade pollutants become very familiar with the Clean Water Act and Clean Air Act, and take action and make industries clean up their act.

3C. English as a Second Language

General Discussion

Participants discussed the best ways that they have used to reach this audience. Differences are great about what the objectives are. We're not here to impose on personal freedom. These are health advisories; they are not mandates. Do we provide information and then let groups make choices for themselves? It depends on the situation; there are cases where you have horrific contamination levels and cases where you do not. Human studies are not done on humans, so you should err on the side of caution. There is evidence of the benefits of fish consumption.

Section 3C Summary

Best Practices

- Build trust.
- Know the community.
- Support an ongoing communications process (follow-through).

Further Research

- Offer alternatives.
- Understand how the community perceives risk.
- Understand the customs, traditions, and practices of the community.

How much more difficult is it to communicate to an ESL audience?

Colors are very important for Latinos. The message has to be visual to catch the eye. If you are going to send messages that must be read, keep them simple. The audience may not be literate in its own language.

What evaluation methods have you used?

If you can't show you made a difference, you don't get to do it again. Pre-testing and post-testing are important, but that takes a great deal of time. That's a complexity of this session. There is always the pressure to produce. It is important that you are confident that the community knows enough to make a decision. You need to evaluate your program to determine if it is doing what you want it to do. What is most important is that the public is informed.

If your goal is to inform them, how do you do that?

Maybe a focus group, maybe a survey or a video. Then test them before they leave. It takes a lot of time. That's the cost of doing business. Consider how you design your evaluation form if they don't read the language. Some communities have a high percentage of illiteracy. Focus groups are ok, but they can be badly used (e.g., FDAs on mercury).

How do you get to them in the first place?

Go into the communities. If you have a hard time finding people and getting invited to things, use every tool at your disposal. Beg and bribe people; spend afternoons with La Leche, join in fishing roundtable discussions. Go to the community and discuss fish advisories with

them. In every state, there is an ESL tutorial program or an adult education program. Schools are not used enough. The local high schools have clubs.

> "You white folks may come up with great ideas, but the folks who are out there in the communities can tell it better."

Finding the leaders in the community is critical. Form a relationship through a leader; you have to make friendships, to develop a level of trust. Find out what is an important issue in their life. Instead of leaders you can partner with peer teachers. In the Latino community, you can partner with "promotoras de salud." Invite them and ask what they need; then get them what they need. Their priorities are very different from ours; you have to keep that level of communication open.

In some cultures you can get to parents through kids. In Latino culture you can, but don't go to children first when trying to communicate message to an Asian community. Be cautious about relying on kids; in some of the ethnic communities that don't have the English language skills, kids may misinterpret the message to their elders. It's best to get information to mom, who does the cooking and food preparation.

How do you design the evaluation?

The audience ought to be involved in how you evaluate success. The best evaluation may not be quantitative, just qualitative. It's helpful in organizing a focus group to go and deliver the message, and then go back later to evaluate. One key thing is to use somebody within the home community to conduct surveys, to get honest answers. Having a peer teacher to organize the community and conducting meetings from the peer teacher's house have been successful. You can only measure to a certain point; how do you go beyond that? For example, blood drawing is not accepted in some communities. It usually generates a bad feeling.

What about nontraditional methods?

Fish demonstrations are good or putting together a recipe book; have community members demonstrate what they have learned. Ask community members to bring 10 different fish and ask them to pick the safest after your presentation. And they can tell you what they call it. Ask them to bring the type of fish they like to fish. After the presentation, you can determine who heard, but you can't determine how people change later. Certain groups fish for certain fish. For example, the Minnesota Hmong fish for striped bass; they travel to North Dakota where there is no limit on the number. That is true not only of cultural groups; Iowans come up to Minnesota to fish bullheads.

How do you explain different types of fish contamination?

In different places it might differ; high in one place and low in another. Don't just teach them, but empower them how to find their own information, e.g., teach them what "public library" looks like in English or give them a telephone number for the local advisor. However, making phone calls is very difficult for those who don't speak English. If they are immigrants, they are afraid to call.

Followup is important.

What's the reality? Do you expect something else to happen? How reasonable is it? Can you measure it? It is important to identify the goal and make sure it's reasonable. With any program, there must be a plan; then it's easy to see progress and change your expectations if necessary.

3D. Costs of Evaluation Methods— Reducing Costs

General Discussion

States should ask the following fundamental questions when planning to evaluate a program:

- How was the evaluation performed in the past?
- What worked vs. what didn't work?
- What has it cost in the past?
- How can we best utilize our resources?

Section 3D Summary

Best Practices

- Initiate methods to reduce cost or find funding:
  - — Partner with universities/other states.
  - — Use information from universities or other states.
- Seek alternative funding:
  - — ATSDR
  - — Private foundations
  - — Add questions to other studies, e.g., New York Creel Census.

Research Needs

- Determine: "Can we afford to evaluate?"
- Very limited resources.
- Direct [resources] to high-risk groups.

Participants noted that since fish consumption advisory program budgets are diminishing, state officials should take interest in partnering to leverage dollars and impacts. They can partner with nonprofits and other government programs. States should also seek to get buy-in from the public interest groups to help with FCA efforts if cleanup has reached its capacity. They can collaborate with the fish and wildlife services and state commerce departments to collect information by tapping into their tools. They can tap university research grant efforts or partner with other states for federal dollars.

One participant believed that states can do a lot with little resources. She suggested state FCA programs use a booming budgetary cycle to gather information/resources for the long-term when lean budgetary cycles occur.

The group discussed that surveys give the best information but can cost the most. In contrast, however, New York said its face-to-face survey of anglers cost only $20,000. They used a professor's students as interviewers; recycled a survey used 4 years earlier (unchanged) that was originally written by an environmental interest group; and used the Agency for Toxic

Substance Disease Registry health consultation funds because the area was in a Superfund cooperative agreement state. New York has also tapped into other programs. Its Department of Natural Resources is developing a creel census, and the Department of Health has asked them to add a couple of questions to that survey.

The participants identified two forms of no-cost evaluations:

- Ask questions of those who call into the state to learn about FCAs. Questions can help states know which multiple risk communication strategies are working, e.g., newsletters vs. refrigerator magnets.

- If one state (or group of states) proved via an evaluation that a particular method of risk communication worked well, another state would not have to perform that evaluation again. States should share data from other sources (other states) and communicate to their own state legislators those success stories about communicating FCAs. Success stories may be effective in getting more funding.

Two additional strategies to address budgetary constraints were discussed:

- Reduce cost by focusing on the most sensitive population (e.g., pregnant women vs. all women).

- If a state has limited resources, they may have to choose which is more important to invest in—outreach or evaluation of outreach.

3E. Measuring Success To Improve Communication

General Discussion

Many of the participants in this breakout session work in state or federal agencies in charge of operating risk communication programs. Several participants have worked in environmental justice programs with a strong community-based dimension—often encouraged by a focus on risks from Superfund or similar localized "hotspots." There was a very clear interest in improving very basic efforts to conduct better process evaluations for agency programs or projects. There was also a realization that, if one of the ultimate goals is to reduce adverse health impacts for human populations, then fish advisory programs must usually operate somewhat indirectly. Routine collections of samples from human tissues are extremely limited and almost never organized into formal registries. Surrogate measures must be used involving behavior patterns in terms of what fish are consumed, in what quantities, and using what preparation techniques. This complicates the evaluation of risk communication success, since target groups must be polled or otherwise checked to see if messages were not only received but translated into a range of healthful behavioral responses. After the group introduced themselves to each other, a round robin discussion noted the following ideas:

- Where a project (or program) is to be evaluated, it is vital to secure strong stakeholder buy-in from Day 1.

- Evaluation results are becoming a pressing need to ensure support from upper management or important interest groups (especially elected officials). The political process is beginning to demand evidence that programs are achieving their goals.

- Objectives (goals, criteria, endpoints, or outcomes) should be clearly defined—using quantitative measures where possible. Some criteria, however, are best handled using qualitative measures. Baseline conditions should be documented and a commitment made to gather information at an appropriate future point in time to allow for even simple "before and after" checks on program effectiveness.

Section 3E Summary

Focus Topics

- How do you measure both short- and long-term success?
- Defining "Best Practices" involves identifying which parts of programs to measure and clearly defining the criteria to measure.

Best Practices

- Begin with a known baseline, measurable objectives, a timeline for followup, and an end goal in mind.
- Consider end-to-end stakeholders, including data collection, process, message refinement, and message delivery.
- Practice flexibility—ability to change and adapt during process.
- Engineer qualitative and quantitative elements into program (i.e., case studies, interviews, surveys).

Information Needs

- Obtain EPA/CDC support on NHANES studies on toxins in fish advisories.
- Gather more data in projects to help make before-and-after comparisons.

- Projects should create roles for local people or other non-agency people that are respected by the local communities. Grassroots involvement can include actual data collection or support in evaluation methods, such as focus groups or polling.

- More attention is needed to evaluate changes over time within agencies in charge of advisory and risk communication programs. Have agency perceptions changed? Are there changes in the way the agency delivers its support or services? Recognition for hard work by agency staff to make projects a success is important.

- In addition to more attention to working up routine program process evaluations, a few detailed case studies are very valuable. Such case studies can go into more depth and help highlight additional criteria to include as part of routine checks.

Best Practices

- Begin with a known baseline; define measurable objective(s); identify a time horizon to do followup evaluations for "before and after" comparisons; have an end goal firmly in mind. Most evaluations will likely be routine process evaluations for public health agency projects.

- Strive for stakeholder inclusion from the beginning to the conclusion of the project. Track data collection; major process/project milestones; message delivery.

- Be flexible—ability to change and adapt programs based on evaluation signals.

- Include qualitative and quantitative evaluation criteria; use a variety of evaluation tools, including case studies, interviews, surveys/polls.

Data Needs Recommendations

- EPA should coordinate with the CDC to establish NHANES registry coverage for toxics commonly encountered in fish consumption advisories. (NHANES, the National Health and Nutrition Examination Survey, is a survey conducted by the National Center for Health Statistics, part of the Centers for Disease Control and Prevention, U.S. Public Health Service. This survey has been designed to collect information about the health and diet of people in the United States. It includes sampling of human blood, tissues, hair, and so forth to establish the actual body burdens in human beings of specific toxins.)

- Gather more data on risk communication projects to help make before-and-after comparisons to document successful approaches.

Part IV

Risk Communication Basics

Risk Communication Basics Course

Stories from the Frontline: Case Studies in Risk Communication

The three sessions of the Risk Communication Basics Course are designed for conference attendees who would like to hear practical applications of risk communication techniques. The course will cover the fundamentals of the entire process as described in US Environmental Protection Agency document — ***Guidance For Assessing Chemical Contaminant Data For Use In Fish Advisories - Volume IV - Risk Communication***. Each session is taught by an experienced risk communicator from three different geographic regions of the United States to give participants a broad perspective of advisory processes with specific case study examples. All attendees will receive a copy of the EPA's Volume IV document.

Problem Identification and Target Audience Identification —

The risk communication process - Theory is nice, but how does it really work?

The first session will present a general overview of the risk communication process and will then focus on the elements of problem identification and analysis and target audience identification. Practical experiences from the State of Georgia's own focus group research will be used to illustrate some points of these processes including what methods work well and those methods that don't work well at all.

Developing the Message and Selecting the Medium —

What we have here is a failure (or success) to communicate

This second presentation will focus on two projects in large metropolitan areas- San Francisco Bay and Santa Monica Bay in Los Angeles. Individuals who fish in these two areas come from a wide variety of ethnic backgrounds, speak many different languages, have varying literacy rates, and different cultural practices related to fishing and fish consumption. This presentation will examine issues about how to communicate fish consumption advice, what languages to communicate in, what additional advice to communicate, how to respect cultural practices while communicating advice, and what avenues to use to get the information to various populations.

Implementing the Message and Evaluating the Message —

The thrill of victory and the agony of defeat

Maine has recently implemented a new strategy to develop and distribute our new "easy-to-read" brochure identifying our safe eating guidelines for mercury in fish. This strategy includes a very targeted delivery to the population most at risk. The new risk communication strategy is heavily driven by identifying appropriate literacy levels, designing a brochure to maximize an "easy to read" format, and using focus groups of convenience and key informants to both develop and test drafts of the brochure. We are able to target and mail advisory information to individuals at risk by using existing state registries (e.g., birth certificate registry combined with fishing license registry or marriage license registry). We have used and plan to use several methods to evaluate the brochure – including mail-back surveys handed out at events, Behavioral Risk Factor Surveillance Surveys (BRFSS), and random digit dial surveys. This was all done with limited staff and on a limited budget. This presentation will build on the other two Risk Communication Basics presentations to identify strategies for evaluation and implementation, and review Maine's successes and failures in this venture.

Session 2, Developing the Message and Selecting the Medium

Christine Arnesen, R.N., M.P.H., California Department of Health Services

California covers 155,973 square miles and has numerous inland lakes and waterways including a major Delta and 1,264 miles of coastline. Fish consumption health advisories have been issued by the California Environmental Protection Agency in seven of the eight large fishing districts and cover at least 10 specific fishing locations including 2 large Bay areas- San Francisco Bay and Delta and Santa Monica Bay in Los Angeles. It is estimated that at least 11% of Californians fish and numerous others consume fish that is caught from various California waterways. The main chemicals of concern are mercury, PCB's and DDT. Chlordane and other pesticides have also shown up in fish samples and Selenium is of concern in the Salton Sea, an inland waterway in the southern California desert.

In California, individuals who fish come from a wide variety of ethnic backgrounds, speaking many different languages and with varying levels of literacy in English and in their own languages, and with different customs related to fishing and fish consumption. In the San Francisco School District, it is estimated that there are 45 languages spoken in the schools while in Los Angeles, the estimate is 83. Many of the ethnic groups that are represented in the fishing population also have very specific cultural practices related to fish consumption, some of which may put them at additional risk

This presentation will focus on two projects; one in the San Francisco Bay and Delta Area and one in Santa Monica Bay in Los Angeles and will examine issues about how to communicate fish consumption advice, what languages to communicate in, what additional advice to communicate, and other issues. Using two case studies, the challenges and lessons learned will be examined in relation to the following specific issues:

- How much information should be included in advisories, or materials about advisories
- How much discussion should there be about specific chemicals of concern and their potential adverse health effects
- Should the information include a discussion about the benefits of consuming fish
- Whether, and how to communicate information about fish cleaning and fish cooking recommendations
- What to say, if anything, about the risk assessment process and the lifetime risks of cancer or reproductive concerns; what to say about scientific uncertainty
- How to include information about sensitive populations
- How to decide what languages to translate materials into
- How to address concerns about commercial fish along with concerns about recreationally caught fish
- How to respect cultural practices while still communicating a message
- How to utilize the best avenues for getting information to different populations

Part V

Written Comments

Breakout Session 1: Determine What the Audience Wants to Know

1B. Cultural/Traditional or Geographically Isolated Subsistence Fishers, Including Native Americans

Recommendations

1. What fish can we eat and what good are free tribal lands if those lands are contaminated Restoration—Natural Resource Catastrophe (Settlement agreement, EPCRA, CERCLA.)

2. To identify the audience, go to the community where audience lives and talk with community members to see if you have included everyone—only effective method.

3. Learn about community you are trying to reach.

4. What audience needs to know? Ask them by talking to them. Go to the audience and ask them. Let them frame the problem and see if they have a suggestion on how to frame a solution. Get support from community leader to help "get" to community?

5. Use culturally appropriate dialogue circles led by a community member or First Nation (FN) consultant. Have separate meeting with community member or FN consultant and band/leaders, community leaders, Aboriginal fishers, educators, youth, health providers, and elders.

6. Burden of proof is on affected community. Studies prove effects and back up advisories **BUT** why doesn't it affect **CLEANUP/REMEDIATION!!!**

7. Success is not that the community stops eating fish—that is interim solution. Remediation is the primary goal.

8. When collecting data, researchers must disaggregate data by subpopulations to better pinpoint populations at risk. For instance, the Asian Pacific population is socioeconomically and culturally diverse. Simply lumping all Asian Pacific Americans together misses the point that certain subpopulations are much more adversely affected by consuming contaminated fish because of their subsistence diet. Examples include Southeast Asians such as Hmong, Cambodians, Laotians, Thais, etc. If you lump everyone together, for the more affluent Asians, it looks like we don't have any significant problems with fish consumption. One of the most important actions that should result from this conference is to study the level or degree to which at-risk populations are adversely affected by contaminated fish. This is where you will see the stark contrast between subsistence and sportfishing and fish consumption. The numbers of low income and minority groups who consume contaminated fish may be relatively smaller than the equivalent white population, but they may be more affected because of cultural and socioeconomic reasons. Simply looking at the amount of fish caught and/or consumed does not capture the real issues. Don't just study who is at risk but the degree to which they are relatively at risk.

9. By the time CLEAN UP is done—generations later—the cultural/traditional practices may/will be lost!! Language is lost/fishing (traditional) methods are lost if we are told not to eat fish anymore.

10. Recommendation—Federal agencies administering advisories need to link REMEDIATION with the interim solution of cutting back on eating fish (fish advisories).

11. Identify the target audience by ethnic group and community (tribe). Use community individual to reach out/educate that particular culture/group.

12. In Alaska we do not have fish advisories. The audience is usually a Tribe or community who asks for information about contaminants in subsistence foods or a community near a contaminated site. To determine what the audience wants to know—we ask them.

13. The risk assessors need to do more work on understanding the audiences their consumption advice is going to—need to assess benefits of eating fish and risks of not consuming fish.

14. Identify audience—this seems straightforward—fishers within tribes.

15. Generally (tribal audiences) but remember all tribes are different culturally and are different governments.

16. What audience wants to know? Is the fish safe to eat?? Actually, they probably don't want to know anything—if they want the information, it wouldn't be so hard to communicate. People don't want more bad news.

17. Define the risk (past activities/traditionally). Estimate who will be affected by the risk geographically. Meet the community leader. Try to meet expected audience and identify. Listen to your audience.

18. Audience: Minority Groups. Identify the problem related directly to the individual. Communication needs to be in nonscientific terms—people can't relate to the definition of the problem in scientific terms. They don't understand the terms. Educate the tribes by using an authoritative person. Target those most at risk and most vulnerable populations—women of child-bearing ages, children, subsistence fishers and their extended families (tribes). Conduct survey on reservation, survey tribal members and nontribal members through creel? Obtain information through the survey. Hold public meetings to get information on problems.

19. You can address how to identify the audience and find out what they want to know by having a tribal member that is a part of the community personally survey the tribal community to determine what portion of the community are fish eaters.

20. The audience is known by the community, so find community members to work with. Because of cultural differences, it is important to include community members in assessing what the audience needs to know.

21. Audience: community members (tribal members); non-Indian, but non-English-speaking people. Survey on a one-to-one basis the target audience. Listen to all their concern; don't

turn them off. Ask about their concern, listen. Learn about beneficial diets. Find partnership representation—CWA in treaty—define—Native American want to be treated on a government-to-government relationship.

22. Someone from the village (tribe) knows the audience. Someone from the village (tribe) knows what the audience wants to know.

23. Alaskan tribes consider themselves different than Alaskan or U.S. residents, and are similar to other North American tribes.

24. Almost all state and federal agencies in Alaska are European American personnel who relate poorly to tribes. State or federal agency should contract or hire tribal member to do research.

25. Have to identify the audience, and what they want to know has already been stated by the Native American/Native Alaskan communities. This does not need to be determined, as new.

26. The best practice is to use the approach provided by these communities and **not** impose others' way of communicating.

27. How do we determine what audience needs to know? Hold public meeting with media.

28. Get educated about the audience and work on a government-to-government basis with the tribes.

29. Ask them what they want to know—My general perception is that the advisories are targeted to specific groups. What are in the fish and will they cause health problems? People need information to make their own decisions.

30. Ask what the audience wants to know? One-on-one communication, points of contact at tribal conservation office, clinic, elderly nutrition program. Identify the audience? The band (tribe).

31. If focus is tribal entities, identify audience through geographical/high-risk assessments. Survey audience to define their needs, use target audiences and ask what they want to know.

32. Identify audience—tribes need to educate federal and state agencies, and organizations, etc. What audience wants to know—is determined by individual communities.

33. How do we identify our audience? The people who live in the area and the agencies that are involved. How do we determine what the audience wants to know? Ask them. Start with the target audience. Empower them.

34. Tribal audience is already identified, the audience to be identified should be EPA. More money to do research; not have funding cuts each time we try to get research going. Bring tribes into advisory process instead of just giving us an advisory.

35. Western Paradigm: Tribal group—high-risk individuals within fish-consuming families/high-end consumers. Tribal group want to know how to continue their traditional

practices without endangering their health—"Which fish can I eat without harm? True risk-epidemiology/health effects from the conglomerate of toxics (multiple contaminant effects) not each contaminant one-by-one.

Tribal Paradigm: The audience is the policy/power elite who have the responsibility to protect the environment and keep it clean. It is their responsibility to respond to our tribal needs—whether they want to or not. How do we get them to respond?

Tribal members want to know if fish is safe to eat. Need to communicate risks and benefits of fish consumption. Allow tribal members to make choices.

Need to determine actual consumption rates of tribal members, each tribe is unique, develop survey/interview/other methods to determine actual consumption.

Information Needs

1. Role of fishing in culture and nutrition needs.

2. 1st priority—tribal partnerships. Mandate protocols for working with tribes. Cultural, social and spiritual research not just analysis etc. Answer questions of communities— don't just give science. Include Traditional knowledge.

3. More specific information on levels of contaminants for children, adults, by weight, etc.

4. Better information on consumption patterns (not all tribal members consume the same amount) and contaminant levels in the fish.

5. Funding for research programs.

6. How to communicate concept of cumulative effects.

7. What species of fish are ok to eat and what the particular health risk is.

8. Cumulative risk.

9. Better integrated benefits and risks associated with lifestyle choices.

10. Consumption patterns by different segments of population and seasonal differences.

11. Contaminant levels in fish and wildlife.

12. Better cooperation needed between state and tribal entities.

13. We need to better understand tribal perspectives on contaminants.

14. Research—study examples of fast food. Show results in a way we can understand and show benefits of traditional diets vs. fast foods.

15. Cultural, spiritual research—needs our own knowledge and beliefs incorporated into research.

16. Tribal involvement in the process—EPA needs to work with tribes and develop real partnerships within communities.

17. Contaminant concentrations in foods that would replace the contaminated fish. Is the alternative food really a better alternative?

18. We cannot expect our government (state, federal, tribal) to come looking for us to spread advisories. EPA provides funding or (other federal agency) for state and tribes to apply for these grants for projects and it is our responsibility to notify our community(ies).

19. Nationwide advisories should be slimmed down according to community needs, then the community members will decide whether they should consume fish or not. They know, if any type of sickness occurs in their blood, they shouldn't blame anyone else or they should reapply for another grant and develop an alternative strategy. Look at their **culture** and come up with **alternatives.**

20. What aspects of identifying target audience informational needs do we still need to know more about? Bring the indigenous people into the process with the state agencies.

21. Find out past and present land use activities for each government entity—state, tribal lands; private stakeholders.

22. Research and receive pointers on local case studies. Each government entity has a staff and if we could focus research locally it would be better.

23. Since resources are scarce, are the benefits (cost savings) to study other points in the pathway contamination of foods? Such as plankton, macroinverts, etc.?

24. Compare resources spent on community health effects and risks vs. resources spent on allowing pollution to be permitted? Distribute results to community to empower a change in environmental policy.

25. Benefits—what are the overall benefits of fish consumption? Benefits are not limited to nutrition. Include benefits of traditional ways of food gathering, preparation and cooking, and benefits of traditional diet.

26. Document traditional ecological knowledge and get direction from Native elders on what changes have been seen, and where to go to get what information is needed, except for "Intellectual Property Rights."

27. Tribes should direct research not Federal.

1C. Fish Eaters Whose Native Language is Not English

1. "Target audience identification and needs assessment phase of a health advisory communication program."

2. Best practices: Build trust, find out what concerns them, how they eat fish and tailor education to these needs and practices.

3. Ongoing process: Also includes initial discussion of what they need (before we assume that they need certain information).

4. Involve the community as whole part of process.

1E. General Populations Sport Anglers

1. We need to provide better answers to the question: Are things getting better or worse?

2. In general, the aquatic environment is much better today than it was 30 years ago. This doesn't mean it is good enough, but it is definitely better. Yet, recent surveys have shown that most people feel that it is worse or getting better.

3. A participant (from Alabama) noted an EPA/NSF-supported research project that features stakeholder involvement from such groups as tournament bass anglers to help collect fish for tissue analysis. The angler organizations also get regular presentations from experts on fish advisory issues at local bass club meetings and items that are included in organization/club newsletters. These approaches help secure public "buy in" to help continue the research efforts. The anglers provide valuable inputs for the researchers to get up-to-date information on the locations of boat launching sites, issues of concern to anglers, and so forth.

Breakout Session 2: Issues in Developing Message Content

2B. Communicating Risk Benefit Information

Recommendations

1. Be honest with the target audience

2. Make the message simple and clear

3. Avoid using voluntary or involuntary risk comparisons

4. Have consumers involved in preparation of the message content

5. Know audience needs and what the audience responds to best

6. Identify third-party spokesperson to deliver the message

7. Identify carefully who will deliver the message

8. Know the outlet for the message information (medium); TV, radio, publications, pamphlets, posters, etc.

9. Information needs to come from Tribal members

10. Give alternatives to eating fish

11. Target women of childbearing age/pregnant women with risk/benefit information

12. Cultural body cleansing techniques, i.e., fasting, sweating, use of herbs

13. Educate the agencies—cultural Chamber of Commerce

14. Risk communicators need to work through local, trusted, and known women's groups and organizations or community leaders so that the message is accepted.

15. Understand the consumption habits of the target population

16. Identify the advisory and understand the issues related to the advisory before going to the consumer

17. Stress dialogue with the target population (2-way communication)

18. Be clear about who is most at risk and why (e.g., fetuses or nursing children for neurological development)

19. Be clear about what contaminant in the fish is causing the risk (PCBs, mercury, or a combination of contaminants)

20. Be clear on where in the fish (tissue) the contaminants are concentrated (fatty tissues, muscle, organs, etc.)

21. Are we trying to fix the problem (through remediation) or will this advisory go on for a long time and what about effect on the fish?

22. We need to stress in our communications that despite mercury exposure, there are benefits of breastfeeding that outweigh the risks

23. It should be clear that the end point of the advisory is changed behavior, not just understanding risk potential

24. Fish is healthy, especially for those with cardiovascular disease in their health history which needs to be included in the message

25. Fish is healthy for the developing fetus, children, and women, BUT emphasize it is important to choose fish lowest in contaminants

26. Continue to breastfeed should be the message

27. Emphasize benefits of fish as a high-protein, low-fat food source

28. Encourage people to continue to eat fish, but to choose wisely

29. Provide statement of benefits for qualitative consideration in considering level of risk to accept

30. Quantitate benefits—what is the window of the number of meals to obtain benefit from eating fish

31. Provide information on the benefits and what they are specifically

32. Benefits should be used to discourage over-reaction to risk

33. Benefits outweigh the risks. Do not use scare tactics when developing the message

34. Provide clear suggestions about how to continue to eat fish but reduce your exposure to contaminants (fishing location, sizes of fish, timing of fish meals [large bolus dose versus one meal per week], store purchased vs. self-caught fish)

35. In cases where advice is to reduce consumption of certain species, as opposed to avoiding consumption, we need to really ensure that the benefits message is clearly understood and communicated so consumers can continue to incur benefits (as opposed to eliminating fish from their diet altogether)

36. Need to put the contaminant-risk issue into perspective such that the benefits of fish relative to other protein sources that are high in saturated fats are clearly communicated

37. State obvious benefits of fishing and fish consumption—recreation, family, holistic, nutrition, psychological, ethno-religious

38. Current risk assessment methodology and risk communication process may not be applicable or appropriate for all audiences that may need or want a different approach

39. How can you say eating fish is good for me (protein source, other nutrients, etc.) when eating the fish might make my family sick? (mixed message confusing)

40. Native Americans and other subsistence fishers cannot stop eating fish. What you are telling us is making us angry. Don't tell us we can't eat the fish. It is not acceptable to us that the fish are contaminated. The government should not be telling us the fish will make us sick; the government should be cleaning up the water. That is linking the source problem to the risk in the message

41. Emphasize healthy eating options such as where to fish, safer species, smaller sized fish, cleaning and preparation procedures to reduce contaminants rather than prohibitions/limits

42. If given a range of options, will people always choose the option that results in the least change and thus the riskiest choice?

43. Most importantly, we need to be clear on why we want to present benefits information

44. We need to discuss pro's and con's of comparative risk and benefits

45. One needs to consider to whom risks vs. benefits accrue

46. One needs to consider where information on benefits appears in the printed materials relative to where risk information appears (i.e., the specific order of this information in the message)

47. Need to make sure consideration of benefits does not imply acceptance of pollution

48. List areas where fish have been tested and have been found to be relatively free of contaminants so people can choose these relatively clean areas to fish

49. Provide information as to whether some fish are more beneficial to eat than others

50. State specific benefits of fish consumption

51. State how many fish meals are beneficial (meals per week)

52. Voluntary/involuntary risks should not be compared in communication—for subsistence fishers, consumption is an involuntary risk—there are no alternatives

53. Provide information on how to reduce exposure by choosing other species, fishing other locations, and through using other preparation techniques

54. Better to come up with a very simple risk-benefit message that eating smaller fish and reducing consumption of bottom feeding fish (carp) will maximize the benefits relative to risks versus attempting to quantitative (an inappropriate) risk-benefit comparisons

55. Benefits of breastfeeding probably exceed risks—but reduce exposure to contaminants should be in the message

56. Benefits for older individuals primarily

57. Do not translate a standard public message, message should be developed and directed at the needs of the target population

58. Information in the message should be tied with current concerns and timed to fishing season

59. If the fish are so contaminated that you should never eat the fish, then you should say so. Otherwise point out that eating some fish from this waterbody is good for you

60. Do not tell people not to eat fish unless it is lethally contaminated (e.g., paralytic shellfish poisoning). This is an offensive statement to many whose identity is linked to a way of life they have fought for generations to preserve, and that is guaranteed by treaties predating pollution discharge permits by 100 years. Few healthy alternatives for subsistence fishers

61. Include information on causes of fish contamination and ways it can be prevented, cleaned up, or reduced through legislation (or list sources for this information)

62. Cultural identity is a benefit to consider and include in the message

63. Include reference to population variability in response to exposure (i.e., some people with liver dysfunction are at greater risk)

64. Cannot use or factor in quantitative information on benefits of fish consumption since comparison basis of cardiovascular benefits vs. neurological/cancer are not the same endpoints

65. Can have simple statements that diets based upon the consumption of high fat—beef, dairy, etc., also have increased cardiovascular and chemical risks. People should minimize fat intake

Additional information needs

1. Research on contaminant levels and the risk of eating commercial fish (fish purchased in supermarkets or fish markets)

2. More research needed about contaminant exposure to infants?

3. Risk/benefit comparisons between specific fish and other protein sources need to be available to consumers

4. More research on how different cultures want to be able to judge fish consumption in relation to their cultural and spiritual needs and traditions

5. Quantify nutritional benefits, refine risk numbers (health benchmark values), quantify additive or synergistic risks

6. Evaluate whether it is more effective to include a benefits factor in the risk assessment equation than offer the individual the option to factor it in themselves

7. Body burdens are established before people have children—reducing consumption while nursing does not necessarily reduce a woman's risk if she has been eating fish for many years (subsistence fishers). We need to know the relationship of exposure levels in fish and levels in breast milk for specific populations.

8. For nursing mothers, the message has always been the benefits outweigh the risk—we need a scientifically supportable message that the public/mothers can believe and that will reduce their fears. If women feel that they can derive benefits through vitamins, etc., for their children vs. nursing with contaminated milk where they may not see a way to override those risks, they may choose the vitamins. How do women make a choice? Women feel—many people do not nurse and their children are fine, why should I nurse my child and take a risk?

9. Which fish or fish components confer greatest benefits?

10. Do benefits of eating fish plateau at some point with increased consumption?

11. Do children benefit from eating fish?

12. Do infants benefit if their mothers eat fish?

13. Cultural differences as they relate to perception of the message

14. How women differ from men in terms of risk perception of advisory information seeking behavior

15. Who do women trust as sources of information

16. What are health consequence of high fish consumption for specific high-risk groups?

17. What are sources of contamination causing the advisories?

18. Calculate and compare relative risks

19. How many fish meals/week are necessary for proper fetal development/nutrition?

20. Some target populations will not voluntarily reduce their consumption regardless of the message. This is due to many factors including cultural identity, lack of healthy alternatives, and outrage at destruction of a natural resource guaranteed by treaties that they have fought long and hard to enforce. The target populations need an alternative way to respond to the advisory

21. How might nutritional benefits of subsistence food consumption affect risk calculations

22. How is risk affected by naturally occurring variations in geology/geography?

23. How are oil and gas exploration in Alaska affecting cancer risk?

24. What are uncertainties associated with the studies upon which the perceived risks are based?

25. What are uncertainties associated with setting the advisories themselves?

2D. Communication Paradigm

1. Both simple and more detailed information needed. Focus groups and surveys/polls appear to be best ways to test for effectiveness. EPA resource support for such testing would be helpful. In more complex messages, a major information item should be to communicate exposure/dosing in terms of more easily understood concepts of number of meals per week. For more simplified messages, the following matters could be highlighted: (1) eat more fish in smaller size ranges; (2) eat fewer bottom-feeder species; (3) make liberal use of pictures of fish; (4) use maps with good coloring coding for lakes/river (maps from the Great Lakes Indian Commission are a good example); use scorecard or "thermometer" icon approaches to highlight places or type of fish that provide healthy alternatives (example noted in materials from Maine on mercury risks).

2. Need for more research to document effective techniques to present risk information. Important items are the number of meals per some time period that provide a relatively risk-free level of consumption. A single communication "vehicle" (e.g., a brochure) should

focus on just a small number of message components—but how many? Scorecard color-coding and various icons could help get out important messages (e.g., fish here/fish elsewhere; picture of fish; and so forth)—but which presentation formats work better than others?

3. Exposure information best expressed in terms of meal limits per time period. Need simplified versions of longer and more technical prescriptive information products. Explanatory materials need a range of formats from simple to complex. Web sites often a good way to provide access to a range of different formats (simple to complex). Icons (starting with pictures of fish or maps) a good way to steer audience to extra information. Pictures and icons can also be used as "front-ends" to explain how some contaminants are concentrated in certain parts/ organs in fishes. There is still uncertainty—even among professional toxicologists—on how incremental increases in fish consumption are expressed in terms of actual human health impacts. The audience is so vast and complex that using a single paradigm may not work. Evaluations of a set of vehicles with simple messages and using icons/pictures to document what works best would be worthwhile. Describing risk to many target audiences is hard. Reducing risks through alterations in one or more behaviors is also hard to get across—and hard to tell if behaviors actually change.

Breakout Session 3: Issues in Evaluating Health Advisory Risk Communication Programs

3B. Cultural Enclaves—Native American and Other Cultural and Traditional Communities

Recommendations

1. Go back to the community and survey their understanding of the advisory information. Have the local community do the survey by contracting with a community member.

2. Confirm your evaluation of advisory success with the community studied by conducting a survey of households.

3. Evaluating success of the message can only be ascertained by a survey—or working directly with people.

4. State versus Tribal interpretation and evaluation—they differ because of politics and can be BIASED. Also, no one can come in and tell the tribe what to do—its their choice.

5. Send flyers to households.

6. Visit community to communicate, inform, and follow up.

7. Need to reduce the half-life of the chemicals used in the environment.

8. Evaluating success is dependent upon original goals.

9. Are people understanding and using the advisory? Community input is needed in the original development of the advisory. Has the advisory changed behavior? Is the target audience eating smaller, less risky fish? Have there been shifts away from eating fish to eating other foods which are less desirable like fatty foods?

10. For more information on evaluation techniques, a good reference source is the International Association of Business Communicators (IABC) Evaluation Course that is available on the Web. The following book also provides information that may be useful to the fish advisory process: Doug MacKenzie-Mohr et al. *Towards Sustainable Behavior: Community-based Social Marketing*. The author is a psychologist recommending community-based marketing tools to change behavior, especially regarding sustainable activities—car pooling, composting, recycling. Good book for community-level activities. Great tips applicable across environmental issues.

11. Community-based focus groups are useful in evaluating target audience response.

12. Settlements should be used to build independent sustainable capacity—within impacted communities. The ability to have a sustainable program that can characterize and communicate potential risk. Build culturally sensitive local expertise that will be better able to deliver an effective message. Bottom up and bottom-owned approach!!! Process-oriented versus results-oriented.

13. If you hear your technical messages being spoken in District meetings or in the Council, then the message was heard.

14. If anyone asks you about your message, then the message was heard.

15. Ask the target audience face-to-face if they understand the message.

16. Actually seeing changing in the environmental (increased regulation or polluting practices).

17. What is success? Trust is the long-term goal. It is difficult to measure, but critical to achieve. Go to meetings with the target population and listen for the message. Note how many times your message is mentioned.

18. This is assuming the goal of message is to inform and not necessarily change behavior. Another way I measure success is if the Council approves our resolution. This means that we have developed something the people like and support.

19. Mandate protocols instead of trust responsibilities. Lack of knowledge of trust responsibilities.

20. Measure what changes in fish consumption practices have been made. Use traditional approaches in communities; elders, children, talking circles. Seasonal consumption spike of walleye (treaty rights issues): focus message on children and women of childbearing age. Evaluate awareness of the safer sizes and species of fishes for unlimited consumption.

21. Responses by phone or in-person requests for information are best for evaluating response. Evaluate message at annual reservation-wide health fair. Evaluate message to kids in the classroom.

22. Have health advisory be bi-lingual. Have health advisory take into consideration cultural traditions.

23. How can we empower at-risk communities who are disenfranchised to participate in the process of delivering risk messages to their people, and how can they participate in resolving the problem by knowing their rights in terms of action both legally and activism-wise.

24. Create a tribal fish consumption advisory format, for tribes to follow as a guide. Do regulators understand why their advisory paradigms are not relevant to tribes? Educate regulators one on one, face to face, so they understand why advisory goals are different for tribes. Have regulators "developed capacity" to listen? Our goal is to advise regulators and assessors, not to change the tribe.

25. Do tribal members eat the same amounts of fish, but take ownership on addressing the sources of the problems?

Information Needs

1. How to get tribal perspectives into the risk framework that results in changes in regulatory attitude and actions.

2. How to make industry truly liable for the long-term consequences of historic and present pollution problems.

3. Fish residue data and information on sources of contamination.

4. Trust responsibilities—government to government relationship between federal government and tribes. Among federal Agencies, are interpretations the same?

5. Tribal members not aware of problems—who knows what?

6. Determine benefits of fish consumption and benefits of traditional preparation methods vs. other methods.

7. Community-based research of point source contaminants, realistic consumption rates, and traditional knowledge needed.

8. Research on transport of fish from one region to another for commercial purposes.

9. Research is needed on what natural plants were used to help clean the body and are they being used now. If not, how could these plants be reintroduced?

10. Develop community-based strategies and risk communication.

National Risk Communication Conference Facility Evaluation

1. I am a PIO. Much of the content is information I have gained through City County Communications and Marketing Association (3CMA). I think for toxicologists this was a good conference but they should rely on their PIOs to help them with communication technologies. Many PIOs could teach these sessions.

Evaluating the Risk Communication Program—Overview

1. Not enough shareholders. Awareness in my opinion is beginning—the problem as I see it is, what is the root cause, this is the missing component! Example, past companies that were faulted with EPA violation, related back to human health—the companies are participants too!

2. Agencies must focus on their missions of protecting public health and the environment. Commercial fishing and other interests are secondary. Outreach to grass roots groups not tied to politics may help with this issue. Agency cooperation is imperative—FDA, EPA, health departments should pool resources to accomplish goals discussed at conference so messages to public are consistent. From a grassroots perspective, we hope this effort to involve local groups will continue.

Choosing the Medium for the Message

1. Would be interested in knowing more about where/why these programs were funded. What was the driving factor in getting these programs funded? Did other programs suffer due to the need to fund these programs?

2. What is the follow-up after the project? Any follow-ups on any of these projects?

3. It struck me during Ms. Wong's presentation the importance of identifying different subgroups within a population, like different Asian groups. Do we need to break down separate groups in the 'white' or 'black' population—are all 'whites' the same, are all 'blacks' the same?

4. John Cahill—next time mention Cable Access. I've used it several times with success and it is free often. Older people will watch televised public meetings and interviews, etc. More doable in small communities where producers are desperate for copy.

Choosing the Message Content

1. We still are talking single pathway/contaminant—the larger picture needs to be considered as well. How do we approach risk management/prevention in multiple pathway/contaminant issues?

2. This may not be the conference, but the issue of not only educating people about the risk but also empowering them with info on how they can solicit change and be an active part of the reclamation should be part of this outreach effort to the public.

3. Joanna noted that consumption of blue crab was a big problem for all populations, yet for the black population, nearly 100% ate striped bass. Perhaps this could have been pointed out.

4. Referring to "educational level" can be insulting. Do you mean "formal education level" or literacy? Literacy and formal education is more specific to me.

5. Not everyone will ever have the resources/time to such fully investigate study areas like Dr. Burger has the luxury to do. Desperately need info/techniques for low-resource programs.

Perceptions of Fish Safety: Voices from the Community

1. More time, effort, and emphasis should be placed on what the communities need to make good decisions, not who the scientists are curious about. If you can't answer the communities questions then everything is for naught.

2. All panelists provided equally valuable information. However, Mr. Cuevas probably offered the information that was most relevant to the community or communities in my area. Why? Because he highlighted the differences within the "Hispanic" community, culturally speaking. He underscored developing relationships, having a "local" help with translation, seeking out community "leaders."

3. This session really illuminates the need for local input and buy-in from the community to have an effective campaign. Community empowerment is also a key that needs to be incorporated into public process.

4. This session had the potential for the greatest impact on attendees. We in government need to hear the voices from the community. We need to hear what works, what doesn't in terms of material.

5. From info from this panel, it seems that the white, male angler is not the population group which bears the most individual person risk. Yet it seems that the fish advisory program is targeted at white, male anglers.

6. I wish they had included a sport angler as part of the voice of the community. We need to hear from a representative from this group and their perceptions and reasons for resistance to fish advisories.

7. Alaska is "pristine." However, I now suspect more that our fish have mercury content and other POP. Alaska doesn't test for mercury content—my guess is that we need to.

8. I believe that Josee Cuevas gave an excellent account of the importance of communication in the community—the importance of being someone from the community. Also, how to disseminate the information from children to parent.

Response to what did you like least about this session?

A lot! What about tolerance levels among those who have been eating fish as a lifestyle (Asians, Alaskans, others). Also, naturally occurring Hg, how much is there regardless,

historically! People live longer, healthier lifestyles than before. Diets are better. We should focus on "this" as a health issue and not as an advisory issue. We need info on criteria of water quality; this range of parameters vs. normal levels of "toxins." PPB, mg, kg/day, oz /serving/person.

How to Gather Information on Target Audiences

1. She needs to put these methodologies on a CD and send to each participant.

2. It was unclear to me how possible it would be for all agencies and non-profits to do this. It would be good to have the context more clearly displayed.

3. The next part of what Sharon said was that if we buy into doing risk communication, people will ask us questions we can't answer; we're not there yet.

Risk Communicator Presentations

1. Community ownership of risk communication projects is necessary.

2. Risk communicators are under funded and subject to political pressures. Studies in minority populations are often inadequate and unfortunately not ongoing.

3. We only think in terms of the Cadillac of the fish world—all salmon, halibut. We in Alaska—or I should say, Alaska Natives—have a spiritual connection to our fish and wildlife and this conference makes that connection stronger.

4. As someone who is new to this issue, I am surprised with what is done with so little money.

5. We concentrate on fish tissue and recommend to limit consumption, but how safe are alternatives, i.e., commercial fish, beef, etc.? What are levels of PCB or mercury in beef?

6. It's hard in a huge conference like this not to cater to the lowest level of knowledge on this issue. I hope a future conference can be developed for people with knowledge and experience to talk about innovative ways and the latest research around communicating our message.

7. Limitations on funding were expressed clearly here, and the need to find creative ways to work together to effectively communicate results—building partnerships is key.

What did you like most

Stephanie's emphasis that cleaning up and addressing sources of pollution should be the focus of future efforts—organizing local groups to demand change for a brighter future.

Risk Communication Basics – Randall Manning

1. Environmental protection agencies must be sure to uphold their mission of protecting the environment—there's a problem when reluctance to publish advisories or share info with the

public is occurring due to the possible impact on industry/commercial fishing. Protecting commercial fishing is not the mission.

2. Agencies must also look to outside groups (non-political) who can help disseminate this information and help lead the charge to cleaning up the environment.

3. The EPA guidance document is too much. It should be re-written by a PIO to be more user friendly.

Breakout Sessions – Cultural/Traditional Subsistence Fisheries

1. The issue of what proteins will Tribal members substitute for fish if consumption advisories are issued and adhered to (replacement proteins). Fish eaters need to know if dioxin levels in fish are greater or less than those in hamburger, cheese, deer, muskrat, etc. The same can be (needs to be) done for mercury, PCBs, DDE, toxaphene, etc., so cumulative risks may be communicated to the audience. Research needs to be done supporting these data gaps, ensuring that contaminant detection levels address Tribal Treaty and subsistence uses.

2. It is ironic that in a session talking about the need to understand your audience to communicate effectively that the expressed audience needs were ignored. This did reinforce the need to "do it right" to avoid frustration and contention (as resulted in this case).

Breakout Sessions – General Population Sport Anglers

1. We need to educate anglers to get their support for more funding for programs and pollution reduction.

2. Possible sub-populations to address: (1) Trophy anglers; (2) Land developers who oppose "bad news" (contaminated fish adjacent to their project).

3. Clearing up the misconception: Money is never THE problem. The problem is putting together an outline or strategy of WHERE and HOW the money will be used. The problem is people after receiving the money.

Breakout Sessions – Native American Session

What did you like least about this session?

1. Were not able to involve the general group (other conference attendees) in the discussion.

2. There needs to be a forum that all Tribes can come together to discuss, present, quantify, prioritize, identify, categorize Tribal aquatic resource issues and exchange issues. It may exist but I and (I'm sure) many Tribes are not aware of this. Kudos to EPA for bringing us to this level—we have a long way to go—but this conference demonstrates Tribes are at least on the train.

Breakout Sessions – Cost of Evaluation Methods – Reducing Costs

1. Suggestions: (1) Build on existing surveys; and (2) Know the community, sometimes they are conducting surveys and such—states can as technical support.

Breakout Sessions – Measuring Success

1. Federal partners should partner to issue RFP for risk communication projects on fish advisories—making funding available to states, tribes, and NGOs.

Comment Card

1. Use the basic trust doctrine to communicate the fact that polluters have stolen the living trust creatures under advisory.

2. How are you going to look at water quality criteria for states that have minimal fish tissue data for methylmercury? And, therefore, no advisories issued? (Referring to mainly states such as Idaho where total mercury has been found in sediment.)

Part VI

Appendixes

Appendix A

Conference Materials and Information

Risk Communication Conference

Effectively Communicating Health Risks From Fish Contaminants

Purpose:

The purpose of the conference is to learn about, discuss, and form opinions about risk communication methods designed for populations that are exposed and susceptible to contaminants in fish, especially those who may not receive, understand, or accept risk information.

The desired outcome is to develop recommendations on risk communication techniques that are effective in reaching and informing specific audiences with information on risks from eating contaminated fish.

Participants in this conference will:

(1) Become familiar with appropriate steps to develop and deliver a message about environmental health risks.

(2) Learn a variety of risk communication approaches used in health protection strategies directed at protecting children and others in hard-to-reach (target) populations from environmental health risks.

(3) Learn about barriers to risk communication that may be unique to specific target populations.

(4) Discuss the use of risk/benefit information in communicating risks from contaminants in fish.

(5) Become knowledgeable about risk communication practices currently used by programs concerned with contaminated fish.

At the end of this conference, participants will be able to choose risk communication approaches most suitable for informing particular populations about the health risks associated with eating contaminated fish.

Other desirable objectives include:

- Bring representatives of states, tribes, or community groups together to share successes and failures in communicating environmental health risks to target populations by soliciting representation and presentations from these entities.

- Create a forum for federal programs to share their expertise, direction, and priorities concerning environmental health risks to target populations by soliciting representation

and speakers from specific environmental health programs at the Centers for Disease Control, Agency for Toxic Substances and Disease Registry, Environmental Protection Agency, and Food and Drug Administration.

- Share the most current research in risk communication techniques by soliciting presentations from academic researchers and other practitioners actively using and evaluating effective risk communication approaches.

Conference Proceedings/Recommendations:

Conference organizers will structure the agenda so that the conference results in recommendations for effective communication with target populations. These recommendations will be the result of discussions held amongst participants and speakers in reaction to presentations by speakers and questions raised by participants. These recommendations will focus on what are known to be effective methods for communicating environmental health information to populations that are exposed but hard-to-reach with risk information.

Who should attend:

Anyone interested in improving their ability to effectively communicate risks from environmental hazards in general and fish contaminants in particular will find this conference useful. This conference is designed for those with a special interest in health risks to fish eaters who may not hear, understand, or accept risk information due to barriers of language, cultural values, socio-economic conditions, or geographic isolation. Risk communication for these fish eaters may be directed at the fish eater, family members catching or preparing fish for food, or individuals who influence the fish eating habits of others.

Conference organizers are seeking representation from
state and tribal government,
local government involved in environmental health,
community groups including environmental and children's health advocates,
health care providers (including those who provide culturally-specific care)
industry, and
academia.

Efforts will be made to promote the participation of and include presentations by representatives of target populations.

Barriers to communication (corresponding to "hard-to-reach" or reasons why people may not receive, understand, or accept (believe) risk information)

- suspicion of the government or others creating the message
- economically disadvantaged
- fishing for cultural or social reasons
- geographic isolation
- inability to meet minimum needs of family (lives in "chaos")

- non-English speakers
- no access to the communication medium (e.g., people with low literacy skills)

Examples of groups that may be hard-to-reach

- Newly arrived immigrants who prefer fish as a food or fish to be self-sufficient and are unable to read or hear fish available advisory messages due to language barriers.

- People eating fish for social, cultural, or religious reasons.

(Hard-to-reach may be confused with people who receive, understand, and believe risk information, but choose to NOT reduce their risk)

National Risk Communication Conference, Effectively Communicating Health Risks from Fish Contaminants

Agenda

Monday, May 7

8:00 a.m. - 8:30 a.m.
Conference Welcome/Introductions
EPA and Minnesota Department of Health staff

8:20 a.m. - 8:50 a.m.
Keynote Address
Barbara Knuth

8:50 a.m. - 9:00 a.m.
Description of Conference Organization/Format
Conference Organizer

9:00 a.m. - 10:00 a.m.
Session 1: Perceptions of Fish Safety: Voices from the Community
Pat Cochran, Maria Maybee, Josee Cung, Ora Rawls, Jose Cuevas

10:00 a.m. - 10:15 a.m.
Break

10:15 a.m. - 11:15 a.m.
Session 2: Risk Communicator Presentations
Stephanie Allen, Ed Horn, Henry Anderson, Michel Gelobter

11:15 a.m. - 12:00 Noon.
Session 3: How to Gather Information on Target Audiences
Sharon Dunwoody

12:00 Noon - 12:15 p.m.
Instructions to Audience for Breakout Groups
Conference Organizer

12:15 p.m. - 1:30 p.m.
Lunch - On your own

1:30 p.m. - 2:45 p.m.
Breakout Session 1: Determining What the Audience Wants to Know
Conference participants will choose one of the following sessions A through E to discuss information needs or attend Risk Communication 101, Session 1

(A) Women's Health Issues - pregnant, nursing, child-bearing age
(B) Cultural/traditional or geographically isolated subsistence fishers including Native Americans
(C) Fish eaters whose native language is not English
(D) Economically-dependent fish eaters - urban and rural poor
(E) General population sport anglers

Risk Communication 101 - Session 1
Overview of Risk Communication Process, Problem Identification, and Target Audience Identification
Randy Manning

2:45 p.m. - 3:00 p.m.
Break

3:00 p.m. - 3:45 p.m.
Reconvene Plenary Session - Summarize Breakout Groups Findings
Report recommended best practices and research needs

3:45 p.m. - 4:30 p.m.
Case Studies of Fish Advisory Scenarios
Kerry Pflugh, Henry Anderson

4:30 p.m. - 6:30 p.m.
Risk Communication Display Session - refreshments
National Listing of Fish and Wildlife Advisories (NLFWA) Training

6:30 p.m.
Dinner - On your own

Tuesday, May 8

8:00 a.m. - 9:00 a.m.
Session 4: Choosing the Message Content
Joanna Burger

9:00 a.m. - 9:15 a.m.
Instructions to Audience for Breakout Groups
Conference Organizer

9:15 a.m. - 10:30 a.m.
Breakout Session 2: Issues in Developing Message Content
Conference participants will choose one of the following sessions A through E to discuss issues or attend Risk Communication 101, Session 2
(A) Mercury, especially as it relates to child development - also, pregnancy, nursing, child-bearing age

(B) Communicating risk-benefit information
(C) Developing one message versus many messages for different audiences
(D) Communication paradigms (qualitative versus quantitative; simple versus complex)
(E) Common misperceptions (content and media solutions for misinformation)

Risk Communication 101 - Session 2
Developing the Message and Selecting Medium for the Message -
Christine Arnesen

10:30 a.m. - 10:45 a.m.
Break

10:45 a.m. - 11:45 a.m.
Reconvene Plenary Session - Summarize Breakout Groups Findings
Report recommended best practices and research needs

11:45 a.m. - 1:00 p.m.
Lunch - On your own

12:00 Noon.
Risk Communication Display Session Closes, dismantle displays

1:00 p.m. - 1:20 p.m.
Session 5: Choosing the Medium for the Message - Overview
John Cahill

1:20 p.m. - 2:00 p.m.
Session 5: Choosing the Medium for the Message, continued
Examples -- State and community communication activities
Kristine Wong, Josee Cung

2:00 p.m. - 2:15 p.m.
Session 6: Evaluating the Risk Communication Program - Overview
Barbara Knuth

2:15 p.m. - 3:00 p.m.
Session 6: Evaluating the Risk Communication Program, continued
Examples -- methods used to evaluate the effectiveness of the message
Barbara Hager, Tom Nighswander

3:00 p.m. - 3:15 p.m.
Instructions to Audience for Breakout Groups
Conference Organizer

3:15 p.m. - 3:30 p.m.
Break

3:30 p.m. - 4:30 p.m.
Breakout Session 3: Issues in Evaluating Health Advisory Risk Communication Programs

Conference participants will choose one of the following sessions A through E to discuss evaluation criteria and methods or attend Risk Communication 101, Session 3

(A) Women and children - reproductive concerns
(B) Cultural enclaves (Native American & other cultural/traditional communities)
(C) English as a second language audiences - Asian American, Hispanic
(D) Costs of evaluation methods - reducing costs
(E) Measuring success to improve communication (general cross-cutting evaluation issues)

Risk Communication 101, Session 3
Implementing the Message and Evaluating the Message
Eric Frohmberg

4:30 p.m. - 5:00 p.m.
Reconvene Plenary Session
Summarize Breakout Group Findings/Closing Remarks
Report recommended best practices and research needs
Pam Shubat

RISK COMMUNICATION DISPLAY SESSION

The National Risk Communication Conference provided a forum for the exchange of information and ideas about barriers to communication concerning fish contamination. In accordance with the theme, "Effectively Communicating Health Risks from Fish Contaminants," state and tribal programs were asked to display their risk communication materials at the conference. A CD of these materials was prepared and distributed to conference attendees. Materials on this CD were submitted by programs to be used as examples of risk communication. Not all materials found here are currently available. To find out more about these programs or material availability please contact the following display session participants:

1. Arkansas Department of Health – Jennifer O'Neal

2. ATSDR and U.S. EPA – Jeffrey D. Bigler and Steve Blackwell

3. Connecticut Department of Health – Brian Toal

4. Delaware Department of Natural Resources and Environmental Control (DNREC) and Division of Public Health – Rick Greene and Chuck Nace

5. Georgia Department of Natural Resources/Environmental Protection Division – Randall Manning

6. Great Lakes Indian Fish and Wildlife Commission – Kory J. Groetsch

7. Idaho Department of Health and Welfare/Bureau of Environmental Health and Safety – Dr. Mingyi Wen

8. Illinois Department of Pubic Health – Tiffanie Saxer

9. Maine Bureau of Health/Environmental Toxicology Program – Eric Frohmberg

10. Miccosukee Tribe of Indians of Florida – Truman E. Duncan, Jr.

11. Minnesota Department of Health – Pat McCann

12. Missouri Department of Health – Gale Carlson

13. Montana Fish, Wildlife and Parks – Don Skaar

14. Nebraska Department of Environmental Quality – Michael Callam

15. New Jersey Department of Environmental Protection – Kerry Kirk Pflugh

16. New Mexico Environment Department – Gary Schiffmiller

17. North Carolina Department of Health and Human Services – Carol D. Schriber

18. Office of Environmental Health Hazard Assessment (Cal-EPA) – Dr. Robert K. Brodberg

19. Oregon Health Division, Office of Environmental Toxicology – Kenneth W. Kauffman

20. University of Washington – Nancy L. Judd

21. U.S. EPA Region 5, Resources Management Division, Office of Information Services – Dr. Thomas M. Brody

22. West Virginia Division of Environmental Protection – Janice Smithson

Appendix B

Biosketches of Presenters at the 2001 National Risk Communication Conference

Stephanie J. Allen
Program Manager, E.A.G.L.E. Communications Strategy Program
Chiefs of Ontario
Sagamok Anishnawbek First Nation, ON, Canada

Stephanie Allen is a Mohawk from Six Nations and lives with her husband and children on the Sagamok Anishnawbek First Nation on the north shore of Lake Huron. She was raised off-reserve in a community on Lake Erie where her father was a commercial fisherman. She received her degree in Environmental and Resource Science from Trent University. Stephanie has worked as a fisheries technician and, for the past 3 years, has been working in partnership with 47 First Nations and Health Canada on the former E.A.G.L.E. (Effects on Aboriginals from the Great Lakes Environment) Project, now the E.A.G.L.E. Communication Strategy Program. During her time with E.A.G.L.E., she has been involved in the production of First Nations Fish Consumption Guidelines for 33 First Nations in the Great Lakes basin. She also coordinated development of the E.A.G.L.E. Project Environmental Health Research Tool Kit, a "how to" guide for First Nations interested in conducting research on environmental health. Currently, she is preparing the final reports on the E.A.G.L.E. Project, including a technical series of reports and First Nation community-specific reports.

Henry A. Anderson, M.D.
Chief Medical Officer
State Environmental and Occupational Disease Epidemiologist
Wisconsin Department of Health and Family Services
Madison, Wisconsin

Henry Anderson is certified by the American Board of Preventive Medicine with a subspecialty in Occupational and Environmental Medicine. Dr. Anderson has been involved in the study of human exposure to PCBs for more than 20 years and led the effort for a Great Lakes Basin-wide uniform sport fish advisory protocol. He leads a consortium of five state health departments funded by the Agency for Toxic Substances and Disease Registry to study the reproductive and endocrine functions of frequent Great Lakes sport fish consumers. The consortium also assesses advisory awareness and understanding in the Great Lakes Basin. Together with Maine, he is assessing women's awareness of mercury toxicity and state fish consumption advisories in 12 states.

Christine Arnesen
Chief, Community Participation and Education Section
Environmental Health Investigations Branch
California Department of Health Services
Oakland, California

Christine Arnesen has worked in the California State Health Department for the past 14 years and has been involved in developing, implementing, and evaluating programs designed to communicate information about fish contamination and fish consumption to a variety of communities throughout the state. Audiences have included anglers, subsistence fishers, non-English-speaking and low-literacy populations, and the general public, as well as local health

department staff and health professionals. Projects have used many different approaches, including PSAs, fact sheets, videos, activities with community-based organizations, posters, and focus groups.

Joanna Burger
Professor of Biology, Rutgers University
Professor, UMDNJ School of Public Health

Joanne Burger is an ecologist, human ecologist, behavioral biologist, and ecotoxicologist who has worked with seabirds for over 30 years in many parts of the world. She has worked extensively with oil spills and edited a volume that made a holistic analysis of the Exxon oil spill in the Arthur Kill. For the past 15 years Dr. Burger has been involved with examining recreational and subsistence fishing, in terms of recreational rates, consumption patterns, sources of information, risk to human consumers and methods of risk management. For the past 5 years she has been involved with the development of ecological risk methods and bioindicators for Department of Energy sites, including evaluating attitudes toward recreational, ecological services, and future land uses. She has authored or co-authored over 300 papers in refereed journals, numerous book chapters, and six BNA accounts on gulls and terns. She has edited six volumes on avian behavior and seabirds and written two books on the behavior of colonial-nesting birds:

John M. Cahill
Director, Bureau of Community Relations
New York State Department of Health
Albany, New York

John Cahill has been director of community relations with the New York State Department of Health since 1986. He has more than 30 years' experience in conducting health communication, public relations, social marketing, health promotion, and community advocacy programs on a wide variety of issues, ranging from AIDS to zoonosis. He has broad experience in planning, developing, implementing, and evaluating targeted health communications programs for audiences of all educational levels through a wide variety of media and channels. He provides consultative services and training in social marketing to health-related agencies and organizations at the local, state, and national levels.

Patricia A. L. Cochran
Executive Director, Alaska Native Science Commission
Anchorage, Alaska

Patricia Cochran is an Inupiat Eskimo, born and raised in Nome, Alaska. Ms. Cochran serves as Executive Director of the Alaska Native Science Commission (ANSC), a cooperative program of the Alaska Federation of Natives, University of Alaska—Anchorage, and the National Science Foundation. The ANSC provides a linkage for creating partnerships and communication channels between science and research communities and Alaska Native communities. Over the past 6 years, ANSC has been conducting statewide regional meetings to discuss community

issues and concerns and documenting local and traditional knowledge about contaminants and the environment. Meetings with Western scientists enable scientists and communities to identify common and divergent understandings of environmental change and the role of contaminants.

Jose R. Cuevas
Commissioner for Human Rights
Elizabeth, New Jersey

Jose Cuevas was appointed to the Human Rights Commission 6 years ago by the mayor of Elizabeth because of his grassroots organizing efforts in Elizabeth. He served as the first chairman of the Environmental Equity Advisory Council, an appointment made by Department of Environmental Protection (DEP) Commissioner Shim. He became involved with fish contamination when he assisted the DEP with its science and research study on the effects on women and children of consuming fish caught in the Arthur Kill. An experienced community organizer, he has worked in Newark, Jersey City, Brooklyn, the Bronx, and Baltimore with the Industrial Areas Foundation. Currently, he is working in Plainfield, New Jersey, as the lead organizer with the Community Building Team, a project of the Interfaith Council for the Homeless of Union County.

Josee N. Cung
Program Manager, Southeast Asian Program
Minnesota Department of Natural Resources
Saint Paul, Minnesota

Josee Cung is the program manager of a special Southeast Asian outreach program that she created in 1990 for the Minnesota Department of Natural Resources. For the past 10 years, she has worked with community leaders to break down language and cultural barriers in their access to education and information and use of the state's natural resources, primarily for fishing, hunting, and gathering forest products for food. She has organized numerous community meetings on natural resources topics, such as game and fish laws and environmental issues, using bilingual or native-language only explanations instead of technical and professional terminology to provide information to her audience. In 1996, she won a national award from American Rivers for a project that taught Hmong immigrants about the risks of eating fish from the Mississippi River and how to use fish advisories.

Patricia Cunningham
Environmental Biologist
Research Triangle Institute

Pat Cunningham has worked for the Research Triangle Institute Water Quality Department for the past 21 years. Dr. Cunningham has been actively providing support to the U.S. Environmental Protection Agency's (EPA's) Office of Water Fish Contaminant Program for over 10 years. One of her first projects for EPA involved development of a database of fish advisory information. The database, now known as the National Listing of Fish and Wildlife Advisories (NLFWA), has grown and evolved into an on-line web application. Dr. Cunningham

also provided technical support as one of the principal authors for the development and revision of *Volume 1: Fish Sampling and Analysis* of the EPA national guidance series—*Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories* and for the expansion and redesign of *Volume 2: Risk Assessment and Fish Consumption Limits* in this same guidance series. For the Office of Water, she has developed and presented regional workshops on fish advisory issues, has written several of the annual NLFWA fact sheet and other chemical fact sheets for bioaccumulative contaminants, and has prepared fish advisory posters and other outreach materials for use by states and tribes in their fish advisory programs.

Sharon Dunwoody
Evjue-Bascom Professor and Director
School of Journalism and Mass Communication
University of Wisconsin—Madison
Madison, Wisconsin

Sharon Dunwoody has studied the relationship between risk judgment and information use for nearly two decades. Much of her risk communication work has focused on how individuals use information channels to make judgments about the risk of eating sport-caught fish. To accomplish this, she has surveyed anglers and women who live in angling households, conducted focus groups of anglers and non-anglers in several cities, and conducted experiments. More broadly, she studies public understanding of science issues, including how people learn about science from science Web sites. Her most recent book, co-edited with Professors Sharon Friedman and Carol Rogers, is *Communicating Uncertainty* (Erlbaum, 1999).

Eric J. Frohmberg
Environmental Toxicology Program
Maine Bureau of Health
Augusta, Maine

Eric Frohmberg is a toxicologist with the Maine Bureau of Health. He has been involved in the development of fish consumption advisories as well as the Bureau's fish advisory communication program. His role in these activities included creating new brochures, testing efforts with low-literacy focus groups, and developing the fish consumption advisory website. Before working for the state of Maine, Mr. Frohmberg worked with the Western Shoshone and Southern Paiute to evaluate risk from consuming traditional foodstuffs affected by aboveground nuclear weapons testing. Additional projects included working with the Laguna Pueblo to understand effects on local populations from a uranium strip mine and with the Creek and Cherokee to evaluate risk associated with a uranium hexaflouride production facility.

Barbara L. Hager, MPH, CHES
Director, Health Education and Promotion
Arkansas Department of Health
Little Rock, Arkansas

Barbara Hager has been director of Health Education and Promotion at the Arkansas Department of Health since 1990. She was a member of the team that developed, implemented, and evaluated education and outreach strategies for the state's mercury in fish advisory program. She directed the development of focus group selection procedures and questions, summarization of findings, production of messages, implementation of other educational interventions, and evaluation of education and strategy results. Audiences included the general population, women of childbearing age, young children, and subsistence fishers. Ms. Hager has co-authored two articles about Arkansas's fish advisory experiences.

James A. Hanlon
Acting Deputy Assistant Administrator
Office of Water
U.S. Environmental Protection Agency

James Hanlon is a career civil servant with over 28 years of government service with the U.S. Environmental Protection Agency. In 1984 he was appointed to the position of Director, Municipal Construction Division and was responsible for the management of EPA's national construction grants and state revolving fund programs, providing assistance to municipalities in their wastewater infrastructure construction programs. He was appointed to the position of Deputy Director of the Office of Science and Technology in the Office of Water in 1991. In this capacity, Mr. Hanlon was responsible for the scientific and technical basis of the federal water quality and safe drinking water programs.

Edward G. Horn, PhD.
Director, Bureau Toxic Substance Assessment
New York State Department of Health
Albany, New York

For nearly 12 years, Ed Horn has been with the Center for Environmental Health in the New York State Department of Health. He currently directs programs that assess exposures to and health risks from environmental chemicals and airborne biologicals such as mold. His office is responsible for issuing the health advisories related to eating fish, many of which are the consequence of mercury contamination. Prior to joining the Department of Health, Dr. Horn served for 8 years as Chief of the Bureau of Environmental Protection in the New York State Department of Environmental Conservation. During that time, he served for 4 years as a member of the Adirondack Lake Study Management Committee, which provided oversight to an extensive survey of lakes in the Adirondacks for water quality and biological community status related to acid rain issues.

Barbara A. Knuth
Associate Professor, and Co-leader,
Human Dimensions Research Unit
Department of Natural Resources
Cornell University
Ithaca, NY

Barbara Knuth, an associate professor and co-leader of the Human Dimensions Research Unit in the Department of Natural Resources at Cornell University, has conducted research and published many articles addressing issues of risk perception and risk communication related to fish consumption health advisories. She developed *Volume 4: Risk Communication* in the U.S. Environmental Protection Agency's series *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories*. She has served as a consultant on many projects and public outreach efforts, including fish consumption survey development, fish advisory fact sheets, and fish consumption advisory brochures. She is a past president of the Water Quality Section of the American Fisheries Society.

Randall O. Manning, Ph.D., DABT
Coordinator, Environmental Toxicology Program
Georgia Department of Natural Resources, Environmental Protection Division
Atlanta, Georgia

Randall Manning is the Coordinator of the Environmental Toxicology Program with the Georgia Department of Natural Resources Environmental Protection Division. He is responsible for providing toxicology and risk assessment support to the division. His interest in fish consumption advisories began in 1991, when he coordinated the development of guidelines for a monitoring strategy and risk-based advisories. Dr. Manning worked with focus groups to acquire input for the program and to develop communication strategies. He continues to manage the fish advisory program and speaks frequently on fish consumption and risk. He is particularly interested in uncertainties regarding fish consumption rates and patterns and potential benefits from fish consumption as they relate to risk communication.

Maria Maybee
Habitat and Biodiversity Coordinator
Great Lakes United
Buffalo, New York

Maria Maybee, who is a member of the Seneca Nation of Indians from the Cattaraugus Indian Reservation, coordinates fish consumption advisory outreach to at-risk communities as part of a project of the Lake Erie Binational Public Forum. Emphasis in her programming is placed on women and children who eat or prepare fish in the New York region of the Lake Erie Basin. Working in conjunction with the New York State Angler Cohort Study, Ms. Maybee's most recent efforts may provide better insight into issues relevant to the communication of sport fish consumption risk to Native American communities in New York. In addition, Ms. Maybee will be working with researchers and educators to develop an educational outreach program for elementary school science students that focuses on Buffalo River ecosystem health.

Tom Nighswander, MD, MPH
Alaska Native Medical Center
Anchorage, Alaska

Tom Nighswander has been active in rural health in Alaska since 1972. The majority of this time has been spent as a Family Practitioner and Emergency Room physician at the Alaska Native Medical Center in Anchorage. Dr. Nighswander's work has required extended travel to the villages and included supervision of community health aides and mid-level practitioners in the remote parts of Alaska. He is a faculty member of the University of Washington School of Medicine. During the Exxon Valdez Oil Spill and its aftermath, he chaired the Oil Spill Health Task Force, a multi-agency and community-based group charged with evaluation of substance food safety and communication of this information to the involved villages. He is a joint editor of a book reviewing this 8-year experience entitled *Evaluating and Communicating Subsistence Seafood Safety in a Cross—Cultural Context: Lessons Learned from the Exxon Valdez Oil Spill.* Today, as well as maintaining a clinical practice, he is the facilitator of the Alaska Telehealth Advisory Council, which was established by the Commissioner of Health and Social Services in January 1999 to provide high-level policy development and coordination of telehealth efforts in Alaska.

Kerry Kirk Pflugh, M.S.
Research Scientist, Division of Science, Research, and Technology
New Jersey Department of Environmental Protection

Kerry Kirk Pflugh has a background in agricultural journalism and environmental communication and has been employed by the state of New Jersey for more than 13 years and involved in fish consumption advisory projects for the past 9 years. Her area of expertise is strategic communication planning, focusing on citizen participation in environmental management decisionmaking. She developed and coordinated a community-based outreach and education program on fish consumption advisories, which received an Urban Hometown River Award from American Rivers for the category of education. Her research on knowledge, awareness, and consumption patterns of urban anglers has been published in several journals. Additional research focuses on the perception of risk related to fish consumption advisories in the Latino community. She is currently coordinating a project to develop information and education materials for pregnant women. In addition, she has created an award-winning education program for elementary school students to teach them about fish consumption advisories and other water-related issues

Ora C. Rawls, Executive Director
Mississippi Rural Development Council

Ora Rawls serves as the Executive Director of the Mississippi Rural Development Council (MSRDC) for the State of Mississippi. Council activities in which Ms. Rawls participates related to environmental issues include: board member for the Mississippi Rural Health Association, Mississippi Access for Rural Care and Career Forum; member of Ag Summit II, Task Force on Capital Development, Mississippi State University; member of State Legislative task force Utilities Committees (Rural Water); stakeholders participant for Mississippi Robert

Wood Johnson Southern Rural Access Program; and Mississippi Basin Stakeholders Member (Mississippi DEQ). She has coordinated through MSRDC the 4-H Youth programs (Character Counts) and served as an advisor for Mississippi Community Development Society. Ms. Rawls works with State Chambers of Commerce and nonprofit groups on behalf of women and underserved communities on economic development initiatives at the grassroots level in rural and urban areas. Her work with the Rural Water Task Force resulted in a statewide water-testing program requiring rural water systems to advise consumers of water contaminants and notice timeline for boiling water; to train operators; and to provide financial reporting. A Habitat project leader, Ms. Rawls also volunteered with transition programs for domestic abuse and projects involving youth and senior citizens.

Deborah Rice, Ph.D.
National Center for Environmental Assessment
U.S. Environmental Protection Agency

Dr. Deborah Rice received a Ph.D. in toxicology from the University of Rochester and is currently a risk assessor in neurotoxicology with the National Center for Environmental Assessment at the U.S. Environmental Protection Agency. She is the co-author of the background document to derive a reference dose for methylmercury and is the chair of the working group for the derivation of a reference dose for PCBs. Before joining EPA, Dr. Rice was a research scientist in the Toxicology Research Division of Health Canada, where she headed a research program to characterize nervous system impairment produced by developmental exposure to the major environmental pollutants lead, methylmercury, and PCBs. Robust behavioral impairment was observed as a result of ongoing exposure to lead at blood lead concentrations as low as 10 μg/dl. Dr. Rice identified impairment in visual, auditory, and somatosensory function as a result of developmental methylmercury exposure; delayed neurotoxicity as a result of early exposure was also documented, as well as an age-exposure interaction in functional decrement in aging monkeys. Dr. Rice identified behavioral deficits in monkeys exposed postnatally to an environmentally relevant congener mixture of PCBs, and who9 had blood PCB concentrations typical of environmentally exposed humans. Dr. Rice is currently an Associate Editor for the journals *Neurotoxicology, Neurotoxicology and Teratology, and Environmental Research*. She has authored or co-authored more than 100 research articles and book chapters on neurotoxic effects of specific agents, methodologycal approaches for neurotoxicology research, and risk assessment.

Pamela Shubat, Ph.D.
Minnesota Department of Health
St. Paul, Minnesota

Pam Shubat has been employed by the Minnesota Department of Health since 1989 as an environmental toxicologist. Past responsibilities include developing and managing the state's Fish Consumption Advisory Program and the state's Childhood Lead Poisoning Prevention Program, which is funded by the Centers for Disease Control. Currently Dr. Shubat is involved in research, policy, and program development around the issue of children's environmental health. Past work concerning risk communication for fish consumption advisories included developing advisory formats and outreach materials for a variety of audiences, including

Southeast Asian immigrants. Her past work in developing advisories and outreach materials (for both fish contaminants and lead prevention programs) emphasized community involvement through advisory groups, partnerships with community-based organizations, and focus groups.

Elizabeth Southerland, Ph.D.
Standards and Health Protection Division
U.S. Environmental Protection Agency
Washington, DC

Elizabeth Southerland has worked for the U.S. Environmental Protection Agency since 1984 as an environmental engineer and manager of water quality programs. Currently, Dr. Southerland is director of the Standards and Health Protection Division in EPA's Office of Water. The Division is responsible for overseeing the approval/disapproval of state and tribal water quality standards as well as developing national assessments of water pollution and advice on how to prevent public health effects from this pollution. Ongoing work in the Division regarding chemical contamination in fish includes monitoring contaminants in fish from lakes and reservoirs throughout the United States, developing national guidance and data on fish consumption advisory programs, and preparing public education materials on avoiding risks from fish contamination.

Kristine A. Wong, MPH
No affiliation
(Currently not working for Save San Francisco Bay Association)

Kristine Wong has been working on environmental health and justice issues for the past 6 years in the San Francisco Bay Area and Seattle. At Save San Francisco Bay Association, she directed a project focused on communities of color fishing from the Bay. Her work includes: directing a community-based study of Bay fishers; developing and implementing toxics education/safe fish cooking workshops with multiethnic groups; developing multilingual posters and brochures; conducting policymaker briefings and media advocacy to the mainstream and ethnic media; and co-producing and directing a health education video translated into multiple languages. The educational materials have been distributed widely. She also involved youth through a fishing pier outreach program and has been an advisor and trainer on the issue for various groups.

Appendix C

Registered Conference Participants

Conference Participants Contact Information

Eric Aakko
Wisconsin Division of Public Health
One West Wilson, Room 150
Madison, WI 53701
608-267-2987
aakkoe@dhfs.state.wi.us

Bonnie J. Alexander
Valley City State University
101 College Street
Valley City, ND 58072
701-845-7453
Bonnie_Alexander@mail.vcsu.nodak.edu

Syed M. Ali
CA State Water Resources Control Board
1001 I Street
Sacramento, CA 95814
916-341-5555
alis@dwq.swrcb.ca.gov

Stephanie Allen
Sagamok Anishnawbek
PO Box 1017
Massey, Ontario Canada POP 1P0
705-865-3223oakes@primus.ca

Catherine A. Allen
USEPA
1200 Pennsylvania Ave., NW, R 2660
Washington, DC 20460
202-564-6115
murray@nwf.org

Henry A. Anderson
Wisconsin Division of Public Health
PO Box 2659
Madison, WI 53701
608-266-1253
ANDERHA@dhfs.state.wi.us

Don J. Aragon
Wind River Environmental Commission
Building Ten Washakie St., PO Box 217
Fort Washakie, WY 82514
307-332-3164
Daragon@Wyoming.com

Lisa Arcand-Hoy
BBL Sciences
6723 Towpath Rd., Box 66
Syracuse, NY 13214
315-446-2570 x 452
lda@bbl-inc.com

Glen R. St. Armant
Muckleshoot Indian Tribe
39015 172nd Avenue, SE
Auburn, WA 98092
253-939-3311
Gstamant@muckleshoot.nsn.us

Tom Armitage
USEPA - Fish Forum Speaker
1200 Pennsylvania Avenue, NW
Washington, DC 23060
202-260-5388
armitage.thomas@epa.gov

Christine Arnesen
California Dept. of Health
832 Indian Rock Avenue
Berkeley, CA 94707
510-508-8715
carnesen@dhs.ca.gov

Scott Arnold
Section of Epidemiology, Anchorage AK
3601 C Street, Suite 540
Anchorage, AK 99503
907-269-8000
scott_arnold@health.state.ak.us

Deborah Arnwine
Water Poll. Conrol, TN Dept. Environ.
7th Floor, L & C Annex, 401 Church St.
Nashville, TN 37243-1534
615-532-0703
darnwine@mail.state.tn.us

Mary F. Arquette
Akwesasne Task Force on the Environ.
613 Cook Road
Hoganburg, NY 13655
518-358-9607
mfadden@westelcom.com

Leslie K.L. Au
Hawaii Dept. of Health
919 Ala Moana Blvd., Suite 206
Honolulu, HI 96814
808-586-7539
lau@eha.health.state.hi.us

Laura Au-Yeung
Univ. of Minnesota Extension Service
1525 Glenwood Avenue
Minneapolis, MN 55401
612-374-8430
auyeu001@umn.edu

Martha I. Aviles-Quintero
USEPA
77 W. Jackson Blvd., WQ-16J
Chicago, IL 60604
312-353-4227
aviles-quintero.martha@epa.gov

Wayne Ball
Utah Department of Health
288 North 1460 West, PO Box 142104
Salt Lake City, UT 84114-2104
801-538-6191
wball@doh.state.ut.us

Jennie J. Ballew
Gila River Indian Community
P.O. Box 370
Sacaton, AZ 85247
520-562-2234 x 238
jballew@gilanet.net

Richard E. Barrett
Dept. of Environmental Conservation
500 S. Alaska Street
Palmer, AK 99645
907-745-3236
dick_barrett@envircon.state.ak.us

Karen J. Bataille
Missouri Conservation Department
1110 South College Avenue
Columbia, MO 65201
573-882-9880 x 3215
bataik@mail.conservation.state.mo.us

Thomas A. Baughman
Illinois Dept. of Public Health
245 W. Roosevelt Road, Building 5
West Chicago, IL 60185
630-293-6800
tbaughma@idph.state.il.us

Santina Baumeister
USEPA - Alaska
222 W. 7th Ave. #19, RM#537
Anchorage, AK 99513-7588
907-271-3413

Jennifer Bellman
Gov. of Canada-Dept. Indian Affairs
PO Box 1212
Yellowknife, NT X1A 2N9
867-669-2584
bellmanj@inac.gc.ca

David A. Bennett
USEPA (5202G)
Ariel Rios Building, 1200 Penn Ave, NW
Washington, DC 20460
703-603-8759
bennett.da@epa.gov

Conference Participants Contact Information (cont.)

Jerry Big Eagle
Cheyenne River Sioux Tribe
PO Box 590
Eagle Butte, SD 57625
605-964-7812
crstgameandfish@sodak.net

Jeffrey D. Bigler
USEPA 4305, RM515B
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-260-1305
bigler.jeff@epa.gov

Bri Bill
USEPA
77 W. Jackson Blvd. (P-19J)
Chicago, IL 60604
312-353-6646
bill.briana@epa.gov

Catriona M. Black
Columbia River Inter-Tribal Fish Comm.
729 N.E. Oregon, Suite 200
Portland, OR 97232
503-731-1315
cat@critfc.org

Steve R. Blackwell
ATSDR
1600 Clifton Rd. NE, MS-42
Atlanta, GA 30319
404-639-6298
srb0@cdc.gov

Kate Blumberg
Delta Institute
53 W. Jackson Blvd., Suite 1604
Chicago, IL 60647
312-554-0900
kateblumberg@delta-institute.org

Darlene H. Boerlage
EPA/Office of Environmental Information
401 M St., SW 2843
Washington, DC 20460-0001
202-260-0353
boerlage.darlene@epa.gov

Mark Bollinger
US DOE Center for Risk
9800 S. Cass Avenue
Argonne, IL 60439
630-252-9126
mark.bollinger@ch.doe.gov

Ron Boquist
Shoalwater Bay Environmental Lab
PO Box 130
Tokeland, WA 98590
360-267-3101 x 21
ronbo@techline.com

Raymond Borgen
Grand Portage Reservation
PO Box 428
Grand Portage, MN 55605
218-475-2415
gpenviro@boreal.org

Denis R. Borum
USEPA, Office of Science & Technology
1200 Pennsylvania Avenue, NW
Washington, DC 20460
202-260-8996
borum.denis@epa.gov

Peter C. Boyer
International Joint Commission
100 Ouellette Avenue
Windsor, Ontario NOR 1B0
519-257-6713
boyerp@windsor.ijc.org

Robert Brodberg
Cal/EPA, Office of Env. Health Harzard
P. O. Box 4010
Sacramento, CA 95812-4010
916-323-4763
rbrodber@oehha.ca.gov

Tom Brody
USEPA Region 5
77 W Jackson Blvd.
Chicago IL, 60604
312-353-8340
brody.tom@epa.gov

Hobson Bryan
University of Alabama
Box 870322, Dept. of Geography
Tuscaloosa, AL 35407-0322
205-348-1950
hbryan@alabama.ua.edu

Joanna Burger
Rutgers University
604 Allison Road
Piscataway, NJ 08854
732-445-4318
Burger@Biology.Rutgers.Edu

Bonnie Bush
USEPA
77 West Jackson Boulevard
Chicago, IL 60604
312-353-6684
bush.bonnie@epa.gov

Linda Bylander
Minnesota Dept. of Natural Resources
1601 Minnesota Drive
Brainerd, MN 56401
218-828-6044
linda.bylander@dnr.state.mn.us

Reggie Cadotte
Red Cliff Tribe
PO Box 529
Bayfield, WI 54814
715-779-3700
wrc4pres@yahoo.com

John M. Cahill
New York State Department of Health
1748 Corning Tower
Albany, NY 12237
518-474-5370
jmc04@health.state.ny.us

Charlotte A. Caldwell
Indigenous Environmental Network
PO Box 485
Bemidji, MN 56619
218-751-4967
caldwell@northernnet.com

Michael Callam
Nebraska DEQ
Suite 400, 1200 N Street
Lincoln, Nebraska 68509
402-421-4249
michael.callam@ndeq.state.ne.us

Bruce K. Campbell
Pine River Watershed Group
8181 CR 203
Durango, CO 81301
970-259-3968
bkcampbell@arimas.net

Sheila C. Canavan
OPPTS/USEPA
1200 Pennsylvania Ave., NW, MC7101
Washington, DC 20460
202-260-8616
canavan.sheila@epa.gov

Conference Participants Contact Information (cont.)

Phillippa Cannon
USEPA Region 5
77 W. Jackson Blvd. (Pl-19J)
Chicago, IL 60604
312-353-6218
cannon.phillippa@epa.gov

Frank Carl
Savannah River Basin Watershed Project
14501 Smith Road
Charlotte, NC 28273
704-588-4295
fcarl@carolina.rr.com

Gale Carlson
Missouri Department of Health
PO Box 570
Jefferson City, MO 65102
573-751-6090

Rita M. Cestaric
Great Lakes National Program Office
US EPA
77 West Jackson
Chicago, IL 60657
312-886-6815
cestaric.rita@epa.gov

Lee Cha
IRCO / Asian Family Center
4424 NE Glisan St.
Portland, OR 97213
503-235-9396
s_vanderburg@hotmail.com

Maleva D. Chamberlain
Kentucky Division of Water
14 Reilly Road
Frankfort, KY 40601
502-564-3410
Maleva.Chamberlain@mail.state.ky.us

Kaatz Chary
UIC School Public Health
7726 Locust Ave.
Gary, IN 46403
219-938-0209
lchary@uic.edu

Francis K. Chin
Maniilaq Association
PO Box 256, 733 2nd Avenue
Kotzebue, AK 99752
907-442-7673
fchin@maniilaq.org

Elaine Christian
Section of Epidemiology, Anchorage AK
3601 C Street, Suite 540
Anchorage, AK 99503
907-269-8000
elaine_christian@health.state.ak.us

Dennis E. Clark
Indiana Dept. of Environ. Management
100 North Senate Ave., Box 6015
Indianapolis, MN 46206
317-233-2482
dclark@dem.state.in.us

Milt Clark
USEPA Region 5
77 W Jackson Blvd
Chicago, IL 60604
312-886-1918
clark.jmilton@epamail.gov

James Clift
Michigan Environmental Council
119 Pere Marquette, Ste. 2A
Lansing, Michigan 48912
517-487-9539
jamesmec@voyager.net

Patricia A.L. Cochran
Alaska Native Science Commission
3211 Povidence Drive
Anchorage, AK 99508
907-786-7704
patricia.cochran@uaa.alaska.edu

Maxine A. Cole
Akwesasne Task Force on the Env.
PO Box 992
Akwesasne, NY 13655
518-358-9607
a3235@glen-net.ca

Walter Combs
Rhode Island Dept. of Health
Three Capitol Hill
Providence, RI 02908
401-222-7790
waltc@doh.state.ri.us

John R. Cooley
Western University of Michigan
2504 Crescent Drive
Kalamazoo, MI 49001
616-552-4717
Fernhill60@aol.com

William S. Cooter
Research Triangle Institute
3040 Cornwallis Rd
Research Triangle Park, NC 27709
919-990-8694
sid@rti.org

Patricia A. Cunningham
Research Triangle Institute
3040 Cornwallis Rd
Research Triangle Park, NC 27709
919-990-8609
patc@rti.org

Greg Cope
North Carolina State University
Dept. of Toxicology, Box 7633
Raleigh, NC 27695
919-515-5296
greg_cope@ncsu.edu

Ted Copewood
USEPA - Office of Children's Health
1200 Pennsylvania Ave., NW 1107A
Washington, DC 20460
202-564-2197

Nancy Costa
Fond du Lac Reservation
1720 Big Lake Road
Duluth, MN 55720
218-878-8010
nancycosta@fdlrez.com

Jean Cowden
Consultant
5629 Comanche Drive
Madison, WI 53704
608-244-3407

Douglas G. Cox
Monominee Tribe of Wisconsin
Hilary J. Waukau Env/Forestry Center
Keshena, W I 54135
715-799-4937
dcox@itol.com

Valerie Craven
Exponent
613 First St., Suite 200
Santa Rosa, CA 95404
cravenv@exponent.com

Jose R. Cuevas
Human Rights Comm. City of Elizabeth
234 E. Jersey Street
Elizabeth, NJ 07206
908-353-0722
jrcpeto@aol.com

Conference Participants Contact Information (cont.)

Columbine Culberg
Institute for Fisheries Resources
1230 27th Avenue
San Francisco, 94122
415-566-9703
columbine@mindspring.com

Josee Cung
Minnesota Dept. of Natural Resources
500 Layfayette Road, Box 10
St. Paul, MN 55155-4010
651-297-4745
josee.cung@dnr.state.mn.us

Steve Curcio
Pennsylvania Sea Grant
Penn State Erie - Station Road
Erie, PA 16563-0101
814-898-6358
xsc2@psu.edu

Marc Dahlberg
Arizona Game and Fish Department
221 W. Greenway
Phoenix, AZ 85023
602-789-3260
mdahlberg@gf.state.az.us

Marjorie L. Davidson
U.S. Food and Drug Administration
HFS-32 200 C Street, SW
Washington, DC 20204
202-205-2127
mdavidso@cfsan.fda.gov

Jennifer A. Davis
Illinois Dept. of Public Health
535 West Jefferson Street
Springfield, IL 62761
217-782-5830
jdavisl@idph.state.il.us

Dana Davoli
USEPA
1200 Sixth Avenue
Seattle, WA 98117
206-553-2135
Davoli.dana@epa.gov

Marion E. Deerhake
Research Triangle Institute
3040 Cornwallis Rd
Research Triangle Park, NC 27709
919-990-8680
med@rti.org

Vicki L. Deisner
Ohio Environmental Council
1207 Grandview Avenue, Suite 201
Columbus, OH 43212
614-487-7508
vicki@theoec.org

John Dellinger
University of Wisconsin - Milwaukee
PO Box 413
Milwaukee, WI 53126

Sam Dennison
Metro Water Reclamation, Chicago
600 W. Pershing Boulevard
Cicero, IL 60804
708-588-4223
sam.dennison@mwrdgc.dst.il.us

Ticiang Diangson
Seattle Public Utilities
710 Second Avenue #505
Seattle, WA 98104
206-684-7643
ticiang.diangson@ci.seattle.wa.us

Leslie E. Dorworth
IL-ID Sea Grant College Program
2200 169th St.
Hammond, IN 46323
219-989-2726
dorworth@calumet.purdue.edu

Laurie A. Draheim
Wisconsin Division of Public Health
1 W. Wilson Street, Room 150
Madison, WI 53701
608-266-3393l
draheim@facstaff.wisc.edu

John J. Dreisig
NH Dept. of Health and Human Services
6 Hazen Drive
Concord, NH 03301-6527
603-271-4664
jdreisig@dhhs.state.nh.us

Truman Duncan
Miccousukee Tribe of Indians of Florida
PO Box 440021 Tamiami Station
Miami, FL 33144
305-223-8380 x 2240
duncan2u@aol.com

Sharon Dunwoody
University of Wisconsin-Madison
1306 Seminole Highway
Madison, WI 53703-2200
608-263-4080
dunwoody@facstaff.wisc.edu

Gail E. DuPuis
EPA Environmental Service
218 Roosevelt
Glen Burnie, MD 21001

Monty J. Elder
Oklahoma Department of Env. Quality
PO Box 1677
Oklahoma City, OK 73072
405-702-1017monty.elder@deq.state.ok
.us

Daniel Ellanak
Native Village of Ouzinkie - Alaska
PO Box 96
Ouzinkie, AK 99644
907-680-2310 x 907
dellanak@hotmail.com

Steve G. Ellis
Pentec Environmental
120 Third Avenue S., Suite 110
Edmonds, WA 98020
425-775-4682 x 953
steve.ellis@pentecenv.com

Mohamed T. Elnabarawy
3M Environ. Tech. & Safety Services
Building 42-2E-27, PO Box 33331
St. Paul, MN 5133-3331
651-778-5151
mtelnabarawy@mmm.com

Mark Elster
USEPA-Great Lakes Office
77 W. Jackson Blvd. (G-17J)
Chicago, IL 60604
312-886-3857
elster.mark@epa.gov

Jill A. Engel-Cox
Battelle Memorial Institute
2101 Wilson Blvd, Suite 800
Arlington, VA 22201
703-875-2144
engelcoxJ@batelle.org

Rich Eskin
Maryland Department of the
Environment
2500 Broening Highway
Baltimore, MD 21224
410-631-3691
reskin@mde.state.md.us

Thomas J. Fikslin
Delaware River Basin Commission
25 State Police Drive, PO Box 7360
West Trenton, NJ 08628
609-883-9500 x 253
tfikslin2drbc.state.nj.us

Conference Participants Contact Information (cont.)

Eugenia M. Flatow
NY/NJ Harbor Esturary Program
121 Avenue of the Americas, Suite 501
New York, NY 10013
212-431-9676 x 306
flatow@worldnet.att.net

Tony Flood
International Food Information Council
1100 Connecticut Ave., NW #430
Washington, DC 20036
202-296-6540
flood@ific.org

Henry G. Folmar
Mississippi Dept. of Env. Qualtiy
1542 Old Whitfield Road
Pearl, MS 39110
601-664-3910
Henry_Folmar@deq.state.ms.us

Chuck L. French
U.S. EPA, Office of Air and Radiation
Mail Drop 13
RTP, NC 27711
919-541-0467
french.chuck@epa.gov

Bob Frey
PA DEP
8555, 400 Market Street
Harrisburg, PA 17569-8555
717-787-9637
rofrey@state.pa.us

Eric Frohmberg
Maine Bureau of Health
157 Capitol Street/11 SHS
Augusta, Maine 04333
207-287-8141
eric.frohmberg@state.me.us

Charles Garcia
Oklahoma Dept. of Environmental Quality
PO Box 1677
Oklahoma City, OK 73101
405-702-8220
cgarcia@up.net

Connie Garrett
Florida Dept. of Health
4052 Bald Cypress Way
Tallahassee, FL 32399
850-245-4444
connie_garret@doh.state.fl.us

Margy Gassel
Cal/EPA Office of Env. Health
1515 Clay Street, 16th Floor
Oakland, CA 94612
510-622-3166
mgassel@oehha.ca.gov

Tim Gatewood
White Mountain Apache Tribe
PO Box 220
Whiteriver, AZ 85941
520-338-4385
timgatewood@cybertrails.com

Lisa K. Geist
US Army Corps of Engineers, AK District
PO Box 898 ATTN: CEPOA-EN-EE-A
Anchorage, AK 99506
907-753-5742
lisa.k.geist@poa02.usace.army.mil

Glen Gentry
Nevada Division of Environ. Protection
333 W. Nye Lane, Suite 138
Carson City, NV 89701-0851
775-687-4670 x 3097
ggentry@ndep.carson-city.nv.us

Merv George
California Indian Basketweavers Assoc.
PO Box 1449
Hoopa, CA, 95546
530-625-1646
mervgeorge@hotmail.com

Michael Gilbertson
International Joint Commission
100 Ouellette Avenue, 8th Floor
Windsor, Ontario N9A 6T3
519-257-6706
Gilbertson@windsor.ijc.org

Susan Gilbertson
Office of Water, USEPA
1200 Pennsylvania Avenue, NW, 4305
Washington, DC 20460
202-260-1188
Gilbertson.sue@epa.gov

Wayne F. Goeken
Red River Basin River Watch
RR 3, Box 75A
Erskine, MN 56535
218-574-2622
wrg@gvtel.com

Michael Goldberg
Action Media
35786 Northstar Lane
Grand Rapids, MN 55744
218-327-2737
action@uslink.net

Dorothy K. Gonzales
Genesee County Health Department
630 S. Saginaw St.
Flint, MI 48502-1540
810-257-3190
dgonzale@co.genesee.mi.us

Wendy M. Graham
USEPA
1200 Pennsylvania Avenue, NW, 2610R
Washington, DC 20004
202-564-6602
Graham.Wendy@epamail.epa.gov

Lester Graham
Great Lakes Radio Consortium
213 Goodrich St.
Jerseyville, IL 62052-2213
618-498-3462
graham@gtec.com

Rick Greene
Delaware DNREC
820 Silver Lake Boulevard, Suite 220
Dover, DE 19904-2464
302-739-4590
rgreene@dnrec.state.de.us

Jean W. Gregory
Virginia Dept. of Environmental Qualtiy
PO Box 10009
Richmond, VA 23240
804-698-4113
jwgregory@deq.state.va.us

Kory J. Groetsch
Great Lakes Indian Fish & Wildlife Comm.
100 Maple Street
Odanah, WI 54861
715-682-6619 x 189
groetsch@glifwc.org

Jeffrey L. Gunderson
Minnesota Sea Grant College Program
2305 East Fifth Street
Duluth, MN 55812-1445
218-726-8715
jgunder1@d.umn.edu

Conference Participants Contact Information (cont.)

Cecilia Gutierrez
Registered Onsite - No Contact Information Available

Mike Haars
Alaska Dept. of Environmental Conserv.
555 Cordova
Anchorage, AK 99501
907-269-3084
mike_haars@envircon.state.ak.us

Holly Hadock
USEPA
75 Hawthorne Street, SFD-7-1
San Francisco, CA 94941
415-744-2244
hadlock.holly@epa.gov

Barbara L. Hager
Arkansas Department of Health
4815 W. Markham St , Slot 63
Little Rock, Arkansas 72205
501-661-2495
bhager@healthyarkansas.com

Cynthia A. Hagley
Minnesota Sea Grant College Program
2305 East Fifth Street
Duluth, MN 55812
218-726-8715
chagley@d.umn.edu

Michael S. Haire
EPA - HQ - AWPD - Fish Forum Speaker
401 M Street
Washington, DC 20460
202-260-2734
mhaire@epa.gov

Faith Hambleton
Texas Natural Resource Conserv. Comm.
PO Box 13087
Austin, TX 78711-3087
512-239-4600
fhamblet@tnrcc.state.tx.us

Doug Hampton
Cheyenne River Sioux Tribe
PO Box 590
Eagle Butte, SD 57625
605-964-7812
crstfish@sodak.net

Soo Han
International Joint Commission
1250 23rd Street, NW, Suite 100
Washington, DC 20440
202-736-9023
hans@washington.ijc.org

Jim Hanlon
Office of Water, USEPA
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-260-5700
hanlon.jim@epa.gov

Joel A. Hansel
USEPA Region 4
6 Forsyth Street, SW, 15th Floor
Atlanta, GA 30303
404-562-9274
hansel.joel@epa.gov

Keith Hanson
Registered Onsite - No Contact Information Available
khanson@mnpower.com

Paul Harp
NH Dept. of Health and Human Services
6 Hazen Drive
Concord, NH 03301-6527
603-271-4878
pharp@dhhs.state.nh.us

Barbara L. Harper
Yakama Nation
44803 E. Alderbrook Ct.
Richland, WA 99353
509-967-5174
bharper@nwinfo.net

Stuart G. Harris
Confed. Tribes of Umatilla Indian Res.
PO Box 638
Pendleon, OR 97801
541-966-2408
stuartharris@ctuir.com

Jenny Hayes
WI Dept. of Health and Family Services
One West Wilson, Room 150
Madison, WI 53701
608-267-7199
hayesjm@dhfs.state.wi.us

Alan Hayton
Ontario Ministry of the Environment
125 Resources Road
Etobicoke, Ontario L6Z 1P7
416-327-7470
haytonal@ene.gov.on.ca

Jeffrey J. Hayward
NCDENR Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641
919-733-1475
jeff.hayward@ncmail.net

Marla Hendriksson
EPA
1200 Pennsylvania Ave., 3610A
Washington, DC 20460
202-564-1897
hendriksson.marla@epa.gov

Diane S. Henshel
Indiana University
1315 E 10th St. #340
Bloomington, IN 47405
812-855-4558
dhenshel@indiana.edu

Kyoungsun Heo
Indiana University
Registered Onsite - No Contact Information Available

Carolyn A. Hicks
EPA/OIA
1200 Pennsylvania Ave. NW 2610R
Washington, DC 20460
202-564-6601
hicks.carolyn@epa.gov

Heraline E. Hicks
Agency Toxic Substances & Disease Registry
1600 Clifton Road, E-29
Atlanta, GA 30333
404-639-5097
heh2@cdc.gov

Jennifer Hill-Kelly
Oneida Nation in Wisconsin
3759 W Mason St, PO Box 365
Oneida, WI 54155
920-497-5812
jhillkel@oneidanation.org

Deanna N. Himango
Fond du Lac Reservation
1720 Big Lake Road
Cloquet, MN 55720
218-878-8023
deannahimango@fdlrez.com

Razelle Hoffman-Contois
Vermont Department of Health
195 Colchester Avenue
Burlington, VT 05402
802-863-7558
rhoffman@vdh.state.vt.us

Conference Participants Contact Information (cont.)

David Hohreiter
BBL Sciences
6723 Towpath Road, P. O. Box 66
Syracuse, NY 13214
315-446-9120 x 402
dh@bbl-inc.com

Ed Horn
New York State Department of Health
547 River Street
Troy, NY 12180-2216
518-402-7800
egh01@health.state.ny.us

Thomas Hornshaw
Illinois EPA
PO Box 19276
Springfield, IL 62794-9276
217-785-5735epa8566@epa.state.il.us

Robert Hotchkiss
MS State Dept. of Health
PO Box 1700
Jackson, MS 39215
601-978-7864
rhotchkiss@msdh.state.ms.us

Patti J. Howard
Nez Perce Tribe
PO Box 365
Lapwai, ID 83540
208-843-7368
pattih@nezperce.org

Jackie Hunt Christensen
Health Care Wtihout Harm
c/o IATP, 2105 First Avenue, S.
Minneapolis, MN 55404
612-870-3424
jchristensen@iatp.org

Orville Huntington
US Fish & Wildlife Service
PO Box 107
Huslia, AK 99746
907-829-2266
orville_huntington@fws.gov

Jerolyn I. Ireland, RNC
Micmac Health Department
8 Northern Road
Presque Isle, ME 04747
207-764-7219 x 129
jireland@micmachealth.org

Franky L. Jackson
Sisseten Wahpeton Sioux Tribe
Box 509
Agency Village, SD 57262
605-698-4998
wfjackson@basenet.com

Sharon J. Jaffess
EPA-R2, Emerg. & Remedial Response
290 Broadway
New York, NY 10007
212-637-4396
jaffess.sharon@epa.gov

Ronald A. Jamison
Seneca National Health Department
1510 Route 438
Irving, New York 14081
716-532-5582 x 5296

Charlie J. Jaquez, Jr.
Costilla Cty. Comm. for Env. Soundness
PO Box 333
San Luis, CO 81152
719-672-3511
cjaquez@amigo.net

Cindy G. Jardine
University of Alberta
13-103 Clinical Sciences Building
Edmonton, Alberta T6G 2G3
780-492-2626
cindy.jardine@ualberta.ca

Paul B. Jiapizian
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224
410-631-3906
pjiapizian@mde.state.md.us

Robert L. Johnson
Ohio Department of Health
8390 Orchard Knoll Lane
Columbus, OH 43235
614-466-1060
bjohnson@gw.odh.state.oh.us

Marlene Johnson
Native Village of Eklutna
625 Delaware Place
Anchorage, AK 99504
907-245-0674
MJ-Consulting@worldnet.att.net

Ted Johnson
USEPA/Office of Water
1200 Pennsylvania Avenue, NW
Washington, DC 20460
202-260-8142
johnson.theodore@epamail.epa.gov

Thomas Johnson, Jr.
US Dept. of Energy, Savannah River Site
PO Box A
Aiken, SC 29802
803-725-4319
thomas-jr.johnson@srs.gov

Tom Jones
Neuse River Foundation
PO Box 15451
New Bern, NC 28561
252-637-7972
riverkeeper@neuseriver.org

Nancy L. Judd
University of Washington
4311 Thackeray Place, NE
Seattle, WA 98105
206-616-4876
nlj@yahoo.com

Paul A. Kakuris
Illinois Dunesland Preservation Society
PO Box 466
Zion, IL 60099

David B. Kallander
Indiana Dept. of Environ. Management
100 North Senate Ave., Box 6015
Indianapolis, MN 46206
317-233-2472
dkalland@dem.state.in.us

Chuck Kanetsky
US EPA Region 3
1650 Arch St.
Philadelphia, PA 19103
215-814-2735
kanetsky.charles@epa.gov

Kenneth W. Kauffman
Oregon Health Division
Ste 608, State Office Bldg, 800 NE Oregon St.
Portland, OR 97232
503-731-4015
Kenneth.W.Kauffman@state.or.us

Conference Participants Contact Information (cont.)

Becky Kenow
MN Department of Health
121 E. Seventh Place, PO Box 64975
St. Paul, MN 55164
651-215-0732
rebecca.know@health.state.mn.us

David F. Kern
Arkansas Dept. of Environmental Quality
8001 National Drive
Little Rock, AR 77209
501-682-0916
kern@adeq.state.ar.us

Marva E. King
EPA - Office of Environmental Justice
1200 Pennsylvania Ave., NW (2201A)
Washington, DC 20460-0001
202-564-2599
king.marva@epa.gov

Barbara A. Knuth
Cornell University
122A Fernow Hall, Dept. Natural Res.
Ithaca, NY 14853
607-255-2822
bak3@cornell.edu

Andrew Kolosseus
Washington State Dept. of Ecology
P. O. Box 47600
Olympia, WA 98504
360-407-6440
akol461@ecy.wa.gov

Bill Kramer
USEPA - Water Quality Standards
1200 Pennsylvania Avenue, NW, 4305
Washington, DC 20460
202-260-5824
kramer.bill@epa.gov

Elaine T. Krueger
MA Dept. of Public Health
250 Washington Street
Boston, MA 02108
617-624-5757
Ekrueger@state.ma.us

Amy D. Kyle
Schl. of Public Health, Univ. of Cal. Berk.
332 Cortland Avenue, PMB-226
San Francisco, CA 94110-5536
510-642-8847
adkyle@socrates.berkeley.edu

Bill Lambert
Oregon Health Sciences University
3181 Sam Jackson Park Road
Portland, OR 97201-3098
503-494-9488
lambertw@ohsu.edu

Regina Langton
USEPA Office of Pesticide Programs
1200 Pennsylvania Avenue, NW
Washington, DC 20460
703-305-7161
langton.regina@epa.gov

Leah M. LaPointe
Red Cliff Tribe
PO Box 529
Bayfield, WI 54814
715-779-3700
leahla2001@yahoo.com

Rosa E. Lara
Multicultural Area Health Edu. Center
5051 E Third Street
Los Angeles, CA 90022
323-780-7640
mahec@msn.com

Shawna Larson
Alaska Community Action on Toxics
135 Christensen Drive, Suite 100
Anchorage, AK 99501
907-222-7714
shawna@akaaction.net

Trina H. Lee
Virginia Department of Health
1500 East Main Street, Room 123
Richmond, VA 23218
804-786-4265
tlee@vdh.state.va.us

Fred Leslie
Alabama Dept. of Environ. Management
PO Box 301463
Montgomery, AL 36130-1463
334-260-2752
fal@adem.state.al.us

Alan S. Levy
Division Marke Studies, CFSAN/FDA
200 C Street, SW
Washington, DC 20204
202-205-9448
alan.levy@cfsan.fda.gov

Gerald C. Llewellyn
Delaware Public Health
PO Box 637
Dover, DE 19903
302-739-5617
gllewellyn@state.de.us

Belindo Lo
Health Canada
1F1 E., Banting Bldg, Ross Ave., PL 2201B1
Ottawa Canada K1A 0L2
613-941-6224
belinda_lo@hc-sc.gc.ca

Linda Logan
Haudenosaunee Environ. Task Force
271 Councilhouse Road
Basom, NY 14031
716-542-2243
doof@buffnet.net

Roseanne M. Lorenzana
USEPA Region 10
1200 Sixth Avenue, OEA-095
Seattle, WA 98101
206-553-8002
lorenzana.roseanne@epa.gov

Fidel R. Lorenzo
Haaku Water Office
PO Box 309A
coma, NM 87034
505-552-6604 x 239
haakuwater@aol.com

Jack Lorrigan
Sitka Tribe of Alaska
456 Katlian Street
Sitka, AK 99835
907-747-3207
jackl@ptialaska.net

Susan Loucks
Chelsea Creek Action Group
22 Paris Street
E. Boston, MA 02128
617-569-0059
susan.loucks@noahcdc.org

Chhay Loy
Indochinese Cultural and Service Center
1724 East 44th Street
Tacoma, WA 98404
253-473-5666
chhay_l@hotmail.com

Conference Participants Contact Information (cont.)

Charlie Lujan
Pueblo of San Juan
P. O. Box 717
San Juan Pueblo, NM 87566
505-852-4212 x 233
cwlujan@yahoo.com

Kathy J. Luther
Indiana Dept. of Environ. Management
504 N. Broadway, Suite 418
Gary, IN 46402
219-881-6730
kluther@dem.state.in.us

Sean P. Lynch
Atlantic States Legal Foundation
658 W. Onondaga Street
Syracuse, NY 13204
315-475-1170
SeanLynch@asIf.org

David P. Macarus
USEPA, Region 5
77 West Jackson Boulevard
Chicago, IL 60604
312-353-5814
macarus.david@epa.gov

Dorene E. MacCoy
US Geological Survey
230 Collins Road
Boise, ID 83703
208-387-1354
demaccoy@usgs.gov

Richard G. Mach, Jr.
Navy
1230 Cloumbia St., Suite 1100
San Diego, CA 92101
619-532-0913
machrg@efdsw.navfac.navy.mil

Molly K. Madden
Minnesota Department of Health
121 E. 7th Place, Ste 220, PO Box 64975
St. Paul, MN 55164-0975
651-215-0907
molly.madden@health.state.mn.us

Patricia Maddox
Idaho Dept. of Health and Welfare
450 W. State Street
Boise, ID 83720
208-334-5500
maddoxp@idhw.state.id.us

Kathryn Mahaffey
USEPA - Fish Forum Speaker
1200 Pennsylvania Avenue, NW, 7203
Washington, DC 20460
202-260-3573
mahaffey.kathryn@epa.gov

Aaron Mair
Arbor Hill Environmental Justice, Inc.
200 Henry Johnson Boulevard
Albany, NY 12210
518-463-9760
dreams@global2000.net

Ronald W. Malanowski
WSRC/Savannah River Site
220 Bay Tree Ct.
Aiken, SC 29803
803-952-6532
ronald.malinowski@srs.gov

Randall O. Manning
Georgia Dept. of Natural Resources
745 Gaines School Road
Athens, GA 30334
706-369-6376
randy_manning@mail.dnr.state.ga.us

Koenraad Marien
Washington State Department of Health
7171 Cleanwater Lane, Bldg. 2
Olympia, WA 98504
360-236-3175
koenraad.marien@doh.wa.gov

Alyn C. Martinez
Pueblo of Pojaque Tribal Works
16 Viarrial Street
Santa Fe, NM 87501
505-455-3383
alynmartinez@hotmail.com

David Maschwitz
Minnesota Pollution Control Agency
520 N. Lafayette Road
St. Paul, MN 55155-4194
651-296-7255
david.maschwitz@pca.state.mn.us

Joseph Matassino
Partnership for The Deleware Estuary
1009 Philadelphia Pike
Wilmington, DE 19809
302-793-1701
partners@udel.edu

Maria R. Maybee
Great Lakes United
Buff. St. Coll., Cassety Hall, 1300
Elmwood Ave
Buffalo, NY 14222
716-886-0142
mmaybee@glu.org

Kathleen R. Mayo
USEPA
77 West Jackson Boulevard
Chicago, IL 60604
312-353-5592
mayo.kathleen@epa.gov

Freya R. McCamant
National Wildlife Federation
506 E. Liberty Street, 2nd Floor
Ann Arbor, MI 48104
734-769-3351
mccamant@nwf.org

Pat McCann
Minnesota Department of Health
121 E. 7th Place, Ste 220, PO Box 64975
St. Paul, MN 55164-0975
651-215-0923
patricia.mccann@health.state.mn.us

Ellie McCann
OPPTS/USEPA
1200 Pennsylvania Ave., N.W., MC 7101
Washington, DC 20460
202-260-4168
mccann.ellie@epa.gov

Beverly M. McClellan
Lake Michigan Federation
1327 C South Plymouth Court
Chicago, IL 60605
312-939-9838
bevmcclellan@earthlink.net

Bob McConnell
CO. Dept., Public Health & Env. Water
4300 Cherry Creek Drive South
Denver, CO 80246-1530
303-692-3578
robert.mcconnell@state.co.us

Danna McDonald
USEPA
13900 Longwood Manor Court #302
Woodbridge, VA 22191
202-260-9521
McDonald.Danna@epa.gov

Conference Participants Contact Information (cont.)

Eric W. Melaro
SC Department of health and Env.
2600 Bull Street
Columbia, SC 29201
803-896-9730
melaroew@columb30.dhec.state.sc.us

Brian J. Merkel
University of Wisconsin - Green Bay
2425 E. Ridge Terrace
Green Bay, WI 54311
920-465-2262
merkelb@uwgb.edu

David J. Micklos
South Dakota State Dept. of Health
600 East Capitol Street
Pierre, South Dakota 57501-2536
605-773-3364
dave.micklos@state.sd.us

Debbie Miller
Texas Natural Resource Conserv.Comm.
PO Box 13087 (MC 150)
Austin, TX 78711-3087
512-239-1703
demiller@tnrcc.state.tx.us

Michael Mills
Water Quality Branch, Division of Water
14 Reilly Road
Frankfort, KY 40601
502-564-3410
Mike.Mills@mail.state.ky.us

Kathleen Mohar
Research Triangle Institute
3040 Cornwallis Rd
Research Triangle Park, NC 27709
919-541-6043
kbm@rti.org

Phillip Moershel
Oklahoma Water Resources Board
3800 N. Classen Boulevard
Oklahoma City, OK 73118
405-530-8800

Mike Montoya
Ute Tribe of Uintah & Ourary Reservation
PO Box 460
Fort Duchesne, UT 84026
435-722-5511
utefish@ubtanet.com

Susan M. Moore
Agency Toxic Substances & Disease Registry
1600 Clifton Road, E-32
Atlanta, GA 30333
404-639-0616
Smoorel@cdc.gov

Thomas Morrissey
Connecticut Dept. of Environ.Protection
79 Elm St.
Hartford, CT 06106
601-424-3704
thomas.morrissey@po.state.ct.us

William J. Morrow
USEPA -OW-OST
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-260-3657
morrow.william@epa.gov

Ted Morton
American Oceans Campaign
600 Pennsylvania Avenue, SE, Suite 210
Washington, DC 22201
202-544-3526
tmorton@americanoceans.org

Kurt Moser
Lac du Flambeau Band of Lake Superior Chippewa
PO Box 67
Lac du Flambeau, WI 54531-71551
715-588-3303
krmoser@newnorth.net

Andrew Mullard
Wisconsin Division of Public Health
1 West Wilson St.
Madison, WI 53701
608-266-6762
mullaaj@dhfs.state.wi.us

Karl J. Musgrave
State of Wyoming, Department of Health
2300 Capitol Avenue, 4th Floor
Cheyenne, WY 82002
307-777-7958
kmusgr@state.us

Sonny Myers
1854 Authority
4428 Haines Road
Duluth, MN 55811-1524
218-722-8907
roadwolf@1854.org

Erica Myles
Gov. NW Territories Health & Social Service
Box 1320
Yellowknife, NT X1A 2L9
867-920-3281
erica_myles@gov.xt.ca

Chuck Nace
Delaware Division of Public Health
Jesse Cooper Building, PO Box 637
Dover, DE 19903
302-739-6619
cnace@state.de.us

Phuong Nguyen
EPA Region 5
77 W Jackson Blvd AR-18J
Chicago, IL 60604
312-886-6701
nguyen.phuong@epa.gov

Brian C. Niewinski
Pyramid Lake Fisheries
Star Route
Sutcliffe, NV 89510
775-476-0500
bcn@powernet.net

Thomas S. NighswanderA
laska Tribal Health Consortium
2105 Otter Street
Anchorage, AK 99501
907-729-3682
tnighswander@anthc.org

Ken P. Norton
Hoopa Valley Tribe
PO Box 1348
Hoopa, CA 95546
530-625-5515 x 303
kentepa@pcweb.net

Gregory L. Nothstine
Alaska Native Science Commission
3211 Providence Drive
Anchorage, AK 99058
907-786-7776
gregory@uaa.alaska.edu

Lydia Olympic
Igiugig Tribal Council
PO Box 4008
Igiugig, AK 996139
07-533-3260l
olympic@aol.com

Conference Participants Contact Information (cont.)

John R. Olson
Iowa Department of Natural Resources
Wallace Building, 502 East 9th Street
Des Moines, IA 50319
515-281-8903
john.olson@dnr.state.ia.us

Jennifer K. O'Neal
Arkansas Department of Health
4815 West Markham, Slot 36
Little Rock, Arkansas 72205
501-661-2207
joneal@healthyarkansas.com

Peter Orris
University of Illinois at Chicago
901 S. Wolcott Avenue, Rm E-144 CHS
Chicag, Illinois 60612
312-996-5804
porris@uic.edu

Toney Ott
USEPA, Region 8
999 18 th St.
Denver, CO 80202-2466
303-312-6909
ott.toney@epa.gov

James L. Padilla
New Mexico Department of Health
1190 St. Francis Drive, N1300
Santa Fe, NM 87502
505-476-3583
jamesp@doh.state.nm.us

Ira F. Palmer
District of Columbia Government
51 N Street ,NE, 5th Floor
Washington, DC 20002
202-535-2266
ira.palmer@dc.gov

Rebecca T. Parkin
The George Washington University
2300 K Street, NW
Washington, DC 20037
202-994-5482
eohrtp@gwumc.edu

Glen M. Patrick
Washington State Department of Health
P. O. Box 47846
Olympia, WA 98504
360-236-3177
g.patrick@doh.wa.gov

Neil V. Patterson
Tuscarora Environment Program
2045 Upper Mtn. Road
Sanborn, NY 14132
716-297-5553
tuscenv@igc.org

Steven Pawlowski
Arizona Dept. of Environmental Quality
3033 North Central Avenue
Phoenix, AZ 85012
602-207-4219
pawlowski.steven@ev.state.az.us

Nathan Pechacek
Texas Natural Resource Conserv. Comm
PO Box 13087
Austin, TX 78711-3087
512-239-1336
npechace@tnrcc.state.tx.us

Rob Pepin
USEPA Region 5
77 W Jackson Blvd
Chicago, IL 60604
312-886-1505
pepin.robert@epa.gov

Jane Perry
Georgia Dept. of Human Resources
2 Peachtree Street, Suite 16.236
Atlanta, GA 30303
404-657-6517
jmperry@dhr.state.ga.us

John Persell
Minnesota Chippewa Tribal Government
PO Box 217
Cass Lake, MN 56633
218-335-6303
mctwQ@paulbunyan.net

Dan Petersen
EPA/ORD
26 W. Martin Luther King Avenue
Cincinnati, OH 4528
513-569-7831
petersen.dan@epa.gov

Kerry K. Pflugh
New Jersey Dept. of Env. Protection
401 E. State Street, PO Box 409
Trenton, NJ 08625
609-633-2312
kkirk@dep.state.nj.us

Jay B. Pitkin
Utah Division of Water Quality
P. O. Box 144870
Salt Lake City, UT 84114-4870
801-538-6087
jpitkin@deq.state.ut.us

Cole Poindexter
Staunton River Watch
1629 Lambs Church Road
Altavista, VA 24517
804-369-4444
cpoindex@lynchburg.net

Motria Poshyvanyk
USEPA
77 W Jackson Blvd. AR-18J
Chicago IL, 60604
312-886-0267
poshyvanyk.motria@epa.gov

Munty M. Pot
Lowell Community Health Center
15-17 Warren Street
Lowell, MA 01852
978-934-0164 x 210
MuntyPO@ichealth.org

Charles A. Potts
Oklahoma Water Resources Board
3800 N. Classen Boulevard
Oklahoma City, OK 73118
405-530-8800 x 405
capotts@owrb.state.ok.us

Maria C. Powell
University of Wisconsin-Madison
2806 Wilard Ave.
Madison, WI 53704
608-240-1485
powell@students.wisc.edu

Joan Radovich
Sidley & Austin
10 S. Dearborn St.
Chicago IL, 60603
312-853-7035
jradovich@sidley.com

Paul Rauber
Sierra Magazine
85 Second Street, Second Floor
San Francisco, 94105
415-977-5612
paul.rauber@sierraclub.org

Conference Participants Contact Information (cont.)

Ora C. Rawls
Mississippi Rural Development Council
6310 155 North, W121, Box 11
Jackson, MS 39211
601-899-5300
msrdc@bellsouth.net

Sam M. Rector
Arizona Dept. of Environmental Quality
3033 N. Central
Phoenix, AZ 85012
602-207-4536
rector.sam@ev.stste.az.us

Marlene Regelski
USEPA, American Indian Environ. Office
1200 M Street, NW, Mailcode 4104
Washington, DC 20460
202-260-7284
regelski.marlene@epa.gov

Dianne M. Reid
NCDENR/DWQ
1617 Mail Service Center
Raleigh, NC 27699-1617
919-733-5083 x 568
dianne.reid@ncmail net

Steve Rembish
Parsons Engineering Science
8000 Centre Park Drive, Suite 200
Austin, TX 78754-5140
512-719-6067
steve.j.rembish@parsons.com

Mary E. Renwick
Water Resources Center, Univ. of Minn.
1485 Bedford Ave., 173 McNeall Hall
St Paul, MN 55405
612-625-9798
renwi001@tc.umn.edu

Jeffrey Reutter
Ohio State University
1314 Kinnear Road
Columbus, OH 43212
614-292-8949
reutter.1@osu.edu

Deborah Rice
USEPA
1200 Pennsylvania Ave. , MC 8623D
Washington, DC 20460
204-564-3404

Mike Ripley
Chippew-Ottawa Resource Authority
179 West Three Mile Road
Sault Ste. Mari, MI 49783
906-632-0072
mripley@northernway.net

Leonard Robinson
NEJAC Fish Comsumption Work Group
12459 Arrow Highway
Rancho Cucamonga, CA 91739
909-899-0631 x 203
RobinsonL@tamcostell.com

Tabitha M. Romero
Pueblo of Pojaque Tribal Works
16 Viarrial Street
Santa Fe, NM 87501
505-455-3383
tabitharomero@hotmail.com

Raymond R. Romero
Minnesota Dept. of Natural Resources
500 Layfayette Road, Box 10
St. Paul, MN 55155-4010
651-296-4945
ray.romero@dnr.state.mn.us

Kristin Ryan
Alaska Dept. of Environmental Conserv.
555 Cordova
Anchorage, AK 99501
907-269-7630
kristin_ryan@envircon.state.ak.us

Samuel H. Sage
Atlantic States Legal Foundation, Inc.
658 West Onondaga Street
Syracuse, NY 13204
315-475-1170
samuelsage@aslf.org

Susan Salter
Georgia Environ. Protection Division
4220 International Parkway, Suite 101
Atlanta, GA 30354
404-362-2568
susan_salter@mail.dnr.state.ga.us

Charlie Santerre
Purdue University
Registered Onsite - No Contact
Information Available
765-496-3443

David Sappington
Registered Onsite - No Contact
Information Available

Joan Saroka
City of Portland, Environ. Services
1120 SW 5th Ave., Room 1000
Portland, OR 97204-1912
503-823-5021
joans@bes.ci.portland.or.us

Neil L. Sass
Alambama Department of Public Health
The RSA Tower, 201 Monroe Street
Montgomery, AL 36104
334-206-5973
nsass@adph.state.al.us

Tiffanie S. Saxer
Illinois Dept. of Public Health
525 West Jefferson Street
Springfield, IL 62761
217-782-5830
tsaxer@idph.state.il.us

Robert Schacht
EPA
Registered Onsite - No Contact
Information Available

Rich Schiafo
Scenic Hudson, Inc.
9 Vassar Street
Poughkeepsie, NY 12601
845-473-4440 x 223
rschiafo@scenichudson.org

Gary Schiffmiller
New Mexico Environment Department
P. O. Box 26110
Santa Fe, New Mexico 87502
505-827-2470
gary_schiffmiller@nmenv.state.nm.us

Rita Schoeny
USEPA Office of Water
ML 4304 Pennsylvania Ave., NW
Washington, DC 20460
202-260-3445
schoeny.rita@epa.gov

Faith L. Schottenfeld
NYS Dept. of Health, Ctr. for Env. Health
547 River Street, Room 316
Troy, NY 12180-2216
518-402-7530
fls02@health.state.ny.us

Judith Schreiber
New York State Office of Attorney Gen.
The Capitol
Albany, NY 12224-0341
518-474-4819
judith.schreiber@oag.state.ny.us

Conference Participants Contact Information (cont.)

Carol D. Schriber
NC. Dept. Health & Human Services
2006 Mail Service Center
Raleigh, NC 27699-2001
919-733-9190
Carol.Schriber@ncmail.net

Amanda K. Sears
Natural Resources Council of Maine
3 Wade Street
Augusta, ME 04330
207-622-3101 x 205
asears@nrcm.org

Keith Sepulvado
Louisiana DEQ
PO Box 82178
Baton Rouge, LA 70884
225-765-0246
keiths@deq.state.la.us

Bill Sheehan
Hackensack Riverkeeper, Inc.
1000 River Road, T090C
Teaneck, NJ 07666
201-692-8440
captain@keeper.org

Tracy L. Shelley
South Carolina Dept. of Health and Env.
2600 Bull Street
Columbia, SC 29201
803-896-9731
shellet1@columb30.dhec.state.sc.us

Enoch Shiedt
Maniilaq Association
P.O. Box 256
Kotzebue, AK 99752
907-442-7690
eshiedt@maniilaq.org

Pamela J. Shubat
Minnesota Dept. of Health
121 E. 7th Place, Ste 220, PO Box 64975
St. Paul, MN 55164-0975
651-215-0927
pamela.shubat@health.state.mn.us

Nicoline Shulterbrandt
DC Dept. of Health, Env. Health Admin
5th Floor, 51 N Street, NE
Washington, DC 20002
202-535-2194
nicolines@mail.environ.state.dc.us

Don Skaar
Montana Fish, Wildlife and Parks
1420 East 6th Avenue
Helena, MT 59620
406-444-5686
dskaar@state.mt.us

Tracey M. Slayton
Gradient Corporation, Chicago, IL
1612 Shenandoah Drive
Waunakee, WI 53597
608-850-5556
tslayton@gradientcorp.com

Andrew E. Smith
Maine Bureau of Health
157 Capitol Street/11 SHS
Augusta, Maine 04333
207-287-5189
andy.e.smith@state.me.us

Janice Smithson
West Virginia Division of Env. Protection
1201 Greenbrier Street
Charleston, WV 25311
304-558-2108
jsmithson@mail.dep.state.wv.us

Charanjit S. Sodhi
Confederated Tribes of Chehalis Res.
420 Howanut Road
Olympia, WA 98568
360-273-5911
c.s.sodhi@olywa.net

Betsy Southerland
USEPA - Fish Forum Speaker
1200 Pennsylvania Ave., NW 4305
Washington, DC 20460
202-260-7301
southerland.elizabeth@epa.gov

Tina L. Souza
Gradient Corporation, Chicago, IL
1 West Superior Street, #3502
Chicago, IL 60610
312-649-5838
tsouza@gradientcorp.com

Moses D. Squeochs
14 Conf. Bands of Yakama Nation
1010 State Route 223
Toppenish, WA 98948
509-865-5121 x 4659
mose2yakama.com

Dyan Steenport
Wisconsin Division of Public Health
Registered Onsite - No Contact
Information Available

Alan H. Stern
New Jersey Dept. of Environ. Protection
PO Box 409, 401 East State St.
Trenton, NJ 08625
609-633-2374
astern@dep.stste.nj.us

Steven Strausbauch
Air Force IERA/RSRE; Brooks AFB TX
2513 Kennedy Circle, Bldg 180
Brooks AFB TX 78235
210-536-6134
steven.strausbauch@brooks.af.mil

Elizabeth Sullivan
Research Triangle Institute
3040 Cornwallis Rd
Research Triangle Park, NC 27709
919-990-8627
ewullivan@rti.org

Maryann E. Suero
USEPA, Region 5
77 W Jackson Blvd. T-13J
Chicago IL, 60604
312-886-9077
suero.maryann@epa.gov

Mardell Sundown
Haudenosaunee Environ. Task Force
6751 Meadville Road
Basom, NY 14013
716-542-2684
mfsun@buffnet.net22

Katherine S. Super
MFG, Inc.
800 Vinial Street, Building A
Pittsburgh, PA 15212
412-321-2278
ksuper@mfgenv.com

Kathy A. Svanda
Minnesota Department of Health
P.O. Box 64975
St. Paul, MN 55164-0975
651-215-0878
kathy.svanda@health.state.mn.us

Lawrence C. Swamp
St. Regis Mohawk Tribe Environ. Div.
412 State Route 37
Akwesasne, NY 13655
518-358-6211
earth2-swamp@northnet.org

Conference Participants Contact Information (cont.)

Mary B. Swanson
University of Tennessee
311 Conference Center Building
Knoxville, TN 37996
865-974-0642
mswanso1@utk.edu

Barbara Tarbell
St. Regis Mohawk Tribe Environ. Div.
412 State Route 37
Akwesasne, NY 13655
518-358-5937 x 23
earth3-nrda@northnet.org

Trent N. Temperly
Severn Trent Laboratories, Inc.
966 Saint Ana Drive
Greenwood, IN 46143
317-535-1252
ttemperly@stl-inc.com

Kavita Thakkar
Citizens for A Better Environment
205 W. Monroe, 4th Floor
Chicago, IL 60606
312-346-8870
ilcbe@cbemw.org

Dan Thomas
Great Lakes Basin Publication
Registered Onsite - No Contact
Information Available
bthomas@catg.org

Brian Toal
Connecticut Department of Public Health
28 Lawrence Avenue
Avon, CT 06001
860-509-7741
brian.toal@po.state.ct.us

William Toomey
West Virginia Bureau for Public Health
815 Quarrier St.
Charleston, WV 25361
304-558-2981
wtoomey@wvdhhr.org

Tom Trudeau
Illinois Dept. of Natural Resources
Registered Onsite - No Contact
Information Available

David H. Tunink
Nebraska Game and Parks Commission
2200 N 33rd Street, PO Box 30370
Lincoln, NE 68503
402-471-5553
dtunink@ngpc.state.ne.us

Ralph A. Turkle
Iowa Department of Natural Resources
900 East Grand Avenue
Des Moines, IA 50319
515-281-7025
Ralph.Turkle@dnr.state.ia.us

Eric Uram
Sierra Club - Midwest Office
214 North Henry Street, Suite 203
Madison, WI 53703-2200
608-257-4994, x 11
eric.uram@sierraclub.org

Tom C. VanArsdall
KY DEP/Division of Water
14 Reilly Road
Frankfort, KY 40601
502-564-3410
tom.vanarsdall@mail.state.ky.us

Darren J. Vogt
1854 Authority
4428 Haines Road
Duluth, MN 55811
218-722-8907
dvogt@1854.org

Chau H. Vu
EPA/Region I
103 Puffer St.
Lowell, MA 01851
617-918-1446
vu.chau@epa.gov

Lynn Waishwell
CRESP
Registered Onsite - No Contact
Information Available
732-445-0920

Randi J. Walker
New York State Department of Health
547 River Street, Room 330
Troy, NY 12180-2216
518-402-7815 x 7830
rjw03@health.state.ny.us

Jana L. Walker
Law Office fo Jana L. Walker
141 Placitas Trails Road
Placitas, NM 87043
505-867-0579
ndnlaw@sprintmail.com

Rachel C. Walsh
Indian Health Service
401 Buster Road
Toppenish, WA 98948
509-65-2102
cwalsh@yak.Portland.his.gov

Jim Warchall
Sidley & Austin
Bank One Plaza, 10 S. Dearborn
Chicago, IL 60603
312-853-7000 x 7692
jwarchall@sidley.com

Khizar Wasti
Virginia Dept. of Health
1500 E. Main St, Rm 124, PO Box 2448
Richmond, VA 23218
804-786-1763
kwasti@vdh.state.va.us

Shelly Watkins
Illinois Department of Public Health
525 West Jefferson Street
Springfield, IL 62761
217-785-2439
ewatkins@idph.state.il.us

Julie Watts
Massachusetts Department of Public Health
250 Washington Street
Boston, MA 02108
617-624-5757

Mingyi Wen
ID Dept Health/Welfare
450 W. State Street, 4th Floor
Boise, ID 83702
208-334-5682
maddoxp@idhw.state.id.us

Lora S. Werner
Agency Toxic Substances & Disease Registry
1650 Arch Street, 3HS00
Philadelphia, PA 19103
215-814-3141
werner.lora@epa.gov

Gwen M. White
Indiana Dept. of Natural Resources
402 W. Washington Street, Room W273
Indianapolis, IN 46204
317-232-4093
gwhite@dnr.staste.in.us

Conference Participants Contact Information (cont.)

Rita A. Whitehorse Larsen
Gila River Indian Community
PO Box 97 ATTN: DEQ
Sacaton, AZ 85247
520-562-2234
larzen@gilanet.net

Luanne K. Williams
NC. Dept. of Health & Human Services
2001 Mail Service Center
Raleigh, NC 27699-2001
919-715-3730
Luanne.Williams@ncmail.net

Johnnie M. Wilson
USEPA - Waste Pesticide Division
77 West Jackson Boulevard
Chicago, IL 60604
312-886-4759
johnie.wilson@epa.gov

Dwain Winters
Office of Water, USEPA
1200 Pennsylvania Ave., NW MC 7404
Washington, DC 20460
202-260-8558
winters.dwain@epa.gov

David Wolanski
DNRGC
820 Silver Lake Boulevard, Sutie 220
Dover, DE 19904
302-739-4590
dwolanski@state.de.us

Steve Wolff
Wyoming Game and Fish Department
5400 Bishop Boulevard
Cheyenne, WY 82006
307-777-4673
swolff@state.wy.us

Jeanette Wolfley
Shoshone-Bannock Tribes
1752 North Elk Road
Pocatello, ID 83204
208-232-1922
wolfeyj@nicoh.com

Gary Wolinsky
USEPA, Region 9
75 Hawthorne Street (WTR5)
San Francisco, 94105
415-744-1978
wolinsky.gary@epa.gov

Donna Wong
Hawaii's Thousand Friends
305 Hahani Street, PMB 282
Kailua, HI 96734
808-262-0682
htf@lava.net

Kristine Wong
no organization affiliation
532 14th Ave. E. #102
Seattle, WA 98112
206-903-2092
kristinewong@yahoo.com

John D. Woodling
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
303-291-7224
john.woodling@state.co.us

Ivan Wynecoop
Spokane Tribe of Indians
PO Box 100
Wellpinit, WA 99040
509-258-9161
ivanw@spokanetribe.com

Violet F. Yeaton
Port Graham Village Council
PO Box 5510
Port Graham, AK 99603
907-284-2227
vyeaton@yahoo.com

Chris Zell
MO Dept Nat. Resources/Water
Pollution
Conrol
PO Box 176
Jefferson City, MO 65102
573-751-7428
nrzellc@dnr.state.mo.us

Faith Zerbe
Delaware Riverkeeper Network
PO Box 404
Malvern, PA 19470
610-469-6005
srk3@worldlynx.net