

# Considerations in Risk Communication

A Digest of Risk  
Communication as a  
Risk Management Tool



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## A Digest of Risk Communication as a Risk Management Tool

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## Introduction to Risk Communication

Risk Communication is the process of informing people about hazards. Communicating risk is a two-way exchange in which you inform the target community of possible hazards, and also gather information from those affected by the risk. This two-way process allows the community to be informed about important issues surrounding a concern or risk, and also be part of the solution. The purpose of risk communication is to help residents of a particular community understand risk assessment and risk management, form scientifically valid perceptions of the likely hazards, and participate in making decisions about how the risk should be managed. Risk communications tools are developed to communicate to the public the magnitude of the risks involved in a particular situation and lay the groundwork for the trust that needs to be established between the community and the agency dealing with the risks involved. This is the point where trust is earned and hopefully strengthened throughout the duration that a community is at risk.



This communication digest will attempt to show how risk communication tools are developed and used to help manage a significant risk to a community. The tools are the key components of effective risk communication and may be beneficial to public health departments, county governments, local environmental organizations, and other agencies that may be faced with possible environmental or health risks to a community.

In the 21st century, the public is becoming concerned with its environment, human health and safety. How safe is the water we drink? How polluted is the air we breathe? Is it dangerous to be outside? What risks does the landfill down the street pose to my family and my community? These are just some of the serious questions citizens are asking and want answered.

Reducing the risks of environmental morbidity and mortality presents a formidable challenge. Reducing pollutants in the environment is only part of the solution. For many environmental risks, such as skin cancer caused by solar ultraviolet radiation, mercury poisoning from contaminated fish, or lead in drinking water, the challenge is getting people to start taking precautions.

In many cases, risk communication is a parallel approach to traditional risk management. For example, while efforts are underway to reduce mercury levels in the air that pollute lakes and streams,

risk communication towards reducing the consumption of affected fish populations can reduce overall risk at a faster rate.

People will make wise decisions about risk and how to avoid it when given information they understand and can use in their everyday life. Risk communication is the art of putting science in the hands of people, in a way they can use. This document outlines some planning and implementation steps to consider when communicating risks to the public.

## **Section 1. Risk Communication Basics**

The first consideration in Risk Communication is to determine the communication goal. Whether it is to reduce the risk of cancer or the common cold, you need to clearly establish a specific goal for a given period of time and a set of measures for evaluating effectiveness.

The next consideration is designing the components of the communication. All communication can be broken up into three parts: a message; a medium; and an audience. Effective communication considers all three components in developing a communication strategy.

## **Message**

When communicating a message, the main objectives are to inform and persuade. In order to reach these objectives, it is important to move the audience through the four phases of knowledge: awareness, understanding, decision, and implementation. In the awareness phase, messages are short, catchy, and just barely informational. Messages such as “Think Green” fall into this group. Messages intended to reach the understanding level usually contain data like, *cigarette smokers are 12 times more likely to die of lung cancer than non-smokers*. Decision-making messages often compare options such as when the best time of the day is to fuel your gas tank during a smog alert. Messages targeting implementing decisions usually are time related. For example, during a drinking water emergency, there may be a “boil water” advisory. People move through the four phases of knowledge in order. Many times the flow of information is ineffective and the process stops prematurely. For example, 90% of the people fishing at a nearby contaminated fishing hole had heard of fish advisories (awareness), but only 5% could name an impacted fish species (understanding),

0% had decided to fish elsewhere in the future (decision making), and 0% had changed their habits to avoid fishing there (implementation). In this example, the next information campaign should target the understanding level.

## Medium

The medium for the message whether it is the Internet, a brochure, a refrigerator magnet, or some other form of communication, has specific properties. For example, billboards are best for brief messages, brochures for complex information, television for moving images, and radio for specific target audiences. Cost is also a factor; generally the broader the outreach, the higher the cost. The choice of medium can be very important to the successful transmission and reception of the message. Many high-risk populations have low literacy rates so printed media, for example, may not be effective.

Medium selection is related to the level of messaging. For example, refrigerator magnets work well for short messages at the awareness level but don't contain space for the understanding level communications. Brochures present information at the understanding level, but unless people have already been reached at the awareness level, they won't devote the time to read it.



## Audiences

The target audience for your message is an important consideration. Risk may vary dramatically in different populations. Subpopulations have different risks when exposed to the same concentration of a toxicant. It is imperative to the risk communication process that the makeup of a community and its cultural diversity be studied and matched to the appropriate message and medium. Persons of lower socioeconomic means probably will not be effectively served by the Internet. For this particular audience, t.v. and radio messages may be more suitable.

Knowledge of the audience is a key resource. Any communication must be in a language the audience understands. For this reason, knowledge of how the public perceives risk is important. When researching audience dynamics, it is useful to distinguish between objective (scientific) and subjective (public) risk. Objective risk is calculated by scientists based on research. Subjective risk is the risk that the public perceives to be a hazard. Subjective risk is affected by issues of familiarity, dread, fairness, avoidability, and personal control.

## **Section 2. Rules of Risk Communication in Collaborative Decision Making**

There are seven cardinal rules of risk communication (Covello and Allen 1988):

1. Accept and involve the public as a partner. Your goal is to produce an informed public, not to defuse public concerns.

If you are communicating to groups of individuals, let them know from the very beginning that they will be included and involved, and identify their role as early as possible. When thoroughly and adequately informed, the public can often play a key role in creating excellent ideas for helping their own communities. Because different cultures have different risk perceptions, it is important to have a

representative of each affected community involved in the risk communication process.

It will help you gain credibility with your audience if you show them that you care about what they think. Communicating with the public about risk management should begin early in the process and continue throughout.

2. Plan carefully and evaluate your efforts.

A plan of action for situations that can pose significant health risks to the public, and risks to the environment should be in place ahead of time.

Develop ways to evaluate how effectively you have communicated your message to the public.

3. Listen to the public's specific concerns. People often care more about trust, credibility, competence, fairness, and empathy than about statistics and details.

It is your job to protect communities by communicating appropriate information and conveying an action plan if necessary. In order to be able to make an accurate diagnosis of the problem, your organization must first listen. We cannot understand people's problems if we do not truly listen when they speak. It is important to recognize that people's values and feelings are a legitimate aspect of environmental health, and that their concerns may convey valuable information. Know your audience.



Familiarize yourself with the community affected by the possible risk and the cultural diversity in that community.

4. Be honest, frank, and open. Trust and credibility are difficult to obtain; once lost they are almost impossible to regain.



The public will have more respect for you and your agency if you are straightforward and honest. No one likes to be lied to, especially when lives may be at stake.

5. Work with other credible sources. Conflicts and disagreements among organizations make communication with the public much more difficult.

When dealing with a crisis situation, bring in the appropriate experts such as scientists or public health officials, to answer questions or make recommen-

dations to a concerned public about the best way to handle the situation.

6. Meet the needs of the media. The media are usually more interested in the politics than risk, simplicity than complexity, danger than safety. Think of their perspectives; know their deadlines and policies.

When talking with or in front of journalists or news reporters, be specific about the risk. Do not make assumptions or give possible outcomes. The media can twist words and create a panic with information that is not solid and factual. Be prepared ahead of time to have your information and facts in order. Be clear and to the point.

7. Speak clearly and with compassion. Never let your efforts prevent your acknowledging the tragedy on an illness, injury, or death.

When you are dealing with a health threat or an environmental risk, you must be prepared to show compassion. This is a time when the community will need understanding. Let the community know that you will work with them as a partner and will keep them informed as things happen. Community involvement is key in reducing concerns and hostility.

In order to more deeply understand the communities and their needs, it is important to help them prioritize risks and other environmental concerns. Risk communication tools are designed to help prioritize environmental risks. Many studies use basic risk assessment

methodologies to determine what is classified as risk. It is important to incorporate risk perception into the definition of risk. The U.S. EPA's Office of Air and Radiation consider some attributes that may affect peoples' perceptions of a risk (U.S. EPA March 1991):

- How serious and dreaded is the illness?
- How certain is scientific knowledge?
- What is the catastrophic potential?
- Who bears the risk?
- Is the risk voluntary?
- Who receives the benefits of the "risky" activity?

### Section 3. Tools and Techniques for Risk Communication

Environmental outreach tools focus on helping communities, agencies, and individuals make informed decisions that either minimize negative impacts on, or



directly improve health and environmental quality. Here are some examples of public participation tools and techniques for risk communication:

### Surveys

Surveys conducted on a regular basis for a particular environmental issue or concern will allow citizens to express their concerns and opinions about possible risks that may affect them. These results can be made available to local agencies involved. Information obtained from surveys often help managers and agencies make appropriate risk management and assessment decisions using input from communities involved.



## Modeling

Modeling can sometimes be a good surrogate for environmental sampling. In many crises, continuous monitoring can lead to an understanding that allows determination of trends. This can then allow forecasting and warnings.

## Indexing Techniques

Indices like an air quality index, a water quality index, or a fish quality index, allow complete scientific informa-



tion and data collected through monitoring to be translated in a way the public can understand. Ranges of data are often compressed into 1-10 or 1-100 scales.

## Exhibits

Visual displays are an effective way to present information because people can sometimes better understand an idea or project presented in a visual form.

## Facilitated Meetings

Facilitation is used to guide meetings, mediate conflicts, deal with discussion, and it provides constructive feedback. Facilitators can help create an atmosphere of trust and fairness by allowing all participants to have an equal say in the discussion.

## Focus Groups

Focus groups consist of small groups of stakeholders who participate in facilitated discussions about the affected area and the surrounding community. Focus groups discussions are structured around a series of questions carefully designed to help participants talk freely. Focus groups help an organization understand stakeholders' knowledge, motivations, concerns, expectations, and opinions. Focus groups are helpful in establishing common ground to unify the community.

## Internet

The Internet is the electronic gateway to an array of multimedia (audio, video, photographic) databases and textual resources for searching and posting information. The Internet's powerful, intuitive search technologies can help you find specific information quickly; communicate with the public; and recommend information resources to others.

## Direct Mail

A mailing list is a tool that contains contact information regarding parties of interest to your organization. It is usually in an electronic format, such as a database and sorted in “fields” by last name, title, organization, city, state, region, or special interest. An organized and updated mailing list that encompasses the entire community can play an important role in communicating risk.

## Maps and Aerial Photographs

Maps and aerial photographs are visual aids that facilitate the communication of complex issues such as contamination and risk factors. They can be used at community involvement activities such as public meetings, and public availabilities such as poster sessions.

Easy-to-read maps that have been developed through a Geographic Information System (GIS) are an invaluable source of information for pinpointing particular areas of concern with regard to environmental risk. GIS is a computer based information technology that incorporates graphical features such as maps and other data in order to assess real-world problems and situations.

## Mass Media

In many communities, print and broadcast media play a crucial role in conveying information to the public. The

news media provide a principal and speedy means for members of a community to communicate and interact. However, the organization cannot control what the press will cover and how. Newspaper reporters or television cameras usually cover town meetings or press conferences to observe first hand how the public is reacting to the information they are receiving. An important point to note is that while mass media do not tell the public what to think, they tell them what to think about. (Trauth, 1988).

## On-Site Activities

On-site activities, such as site tours and observation decks help people understand the issue at hand. On-site activities can be used at any point in your project to explain site activities, educate residents, present technical information, answer specific questions, and give visual explanations about work being done on a project or highlight progress.



## Poster Sessions

Poster sessions are a less-structured alternative to public meetings. Posters are prominently displayed and guided by an expert who discusses the topic specified in the poster. These sessions can be used to help develop a public meeting agenda. Also, these types of sessions or forums are most useful for answering questions regarding information that has already been distributed. These can be very effective in low-trust situations.



## Notices

Public notices are advertisements that announce public comment periods for agency decisions and major project milestones. They can be published in local newspapers, broadcast on local radio, or sent as mailings. The public notice is one of the methods your agency may use to solicit community participation. The goal of a public notice is to communicate an important an-

nouncement to as many people as possible in the affected community. Public notices should present a simple, clear message in a conspicuous place.

## Special Events

Special events are activities near the affected community that celebrate the accomplishments of key milestones. Special events educate people about the risk assessment or management activities while highlighting the progress made. Special events can also add a sense of closure for you and the community. These events are an excellent way to involve community members in a positive activity surrounding the affected community.

## Toll-Free Hotline

Establishing toll-free hotlines for organization updates and community questions can be a very effective tool for promoting public involvement and feedback.

## Workshops

Workshops are formal, participatory seminars used to explore a subject, develop or improve citizens' awareness and involvement, allow citizens to see first hand how risks are assessed and managed, or to carry out a defined project. They can be developed as mini-courses on a discrete topic relevant to an affected community. A technical

expert can be invited to offer an inside perspective and to increase the effectiveness of a workshop.

## **Section 4. Outreach: Implementing an Environmental Risk Communication Plan**

The message, the medium, and the audience are interrelated in risk communication. As you implement your risk communication plan, the development of an outreach plan demonstrates an iterative process involving a number of interrelated steps. As you move through each of these steps, you might want to revisit and refine the decisions you made earlier in the process until you have an integrated, comprehensive, and achievable action plan.

Your outreach program will be most effective if you involve a variety of people in its development. Where possible, consider the following

- A communication specialist or someone who has experience developing and implementing an outreach plan.



- Technical experts in the subject matter (both scientific and policy).
- Someone who represents the target audience, i.e., the people or groups you want to reach.
- Key individuals who will be involved in implementing the outreach plan.

As you develop your outreach plan, consider whether you would like to invite any organizations to partner with you in planning and implementing the outreach effort. Potential partners include trade associations, community groups, health maintenance organizations (HMOs) and clinics, schools, day care centers, summer camps, local health departments, and other local or state agencies. Partners can participate in planning, product development and review, and distribution. Partnerships can be valuable mechanisms for leveraging resources while enhancing the quality, credibility, and success of outreach efforts.

When you select your program partners, you will need to consider their relationship to the target community as well as how they can contribute to meeting your project objectives. An organization that already has strong ties to a community can be ideal for conducting outreach and education for your project. Neighborhood health centers or community action programs can be a good choice for conducting these activities. A nearby college or university may be able to help with any research

components of your project, or provide assistance an equipment for sampling activities.

## Goals

What are your outreach goals?

Defining your outreach goals is the first step in developing an outreach plan. Outreach goals should be clear, simple, action oriented statements about what you hope to accomplish through outreach. Once you have established your goals, every other element of the plan should relate to those goals.

## Target Audience

Who are you trying to reach?

The second step in developing an outreach plan is to clearly identify the target audience or audiences for your outreach effort. Outreach goals often define their target audiences. You might want to refine and add to your goals after you have specifically considered which audiences you want to reach.

Target audiences for a water quality outreach program might include, for example, the general public, local decision makers and land management agencies, educators and students (high school and college), special interest groups (e.g., homeowner associations, fishing and boating organizations, gardening clubs, lawn maintenance/landscape professionals). Some audi-

ences such as educators and special interest groups might serve as conduits to help disseminate information to other audiences you have identified such as the general public.

## Profiling Your Audience

Outreach will be most effective if the type, content, and distribution of your communication tools are specifically tailored to the characteristics of target audiences. Once you have identified your audiences, the next step is to develop a profile of their situations, interests, and concerns. This profile will help you identify the most effective ways of reaching the audience.

For each target audience, you want to consider what the current level of knowledge is in that particular community about the environmental hazard. What do you want them to know about the hazard, and what actions would you like the citizens to take to avoid or protect themselves from the hazard? What information is likely to be of greatest interest to the audience? Are there any organizations or centers that represent or serve the audience and might be avenues for disseminating our message or outreach products? Profiling an audience essentially involves putting yourself “in your audiences’ shoes.” Ways to do this include consulting with individuals or organizations who repre-

sent or are members of the audience, consulting with colleagues who have successfully developed other outreach products for the audience, and using your imagination.

Community involvement is a great way to meet people face-to-face. This is important because people often need to establish familiarity and trust before they open their minds to our project.

Remember that news about projects like these spreads by word of mouth. Any negative perceptions will travel twice as fast as positive ones, so try to make every impression a positive one.

## **Message/Products**

What do you want to communicate?

In this stage think about the key points, or messages you want to communicate. Messages are the overall information you want your audience to walk away with, even if they forget the details.

A message is usually phrased as a brief (often one-sentence) statement.

For example:

- The ozone map provides you with real-time information about ozone levels in your community.
- You can take steps to protect your family's health from ozone pollution.
- You can help reduce ozone levels in your community.

Outreach products often will have multiple, related messages. Consider what messages you want to send to each target audience group. You may have different messages for different audiences.

From a risk management perspective, it is critical to understand how the target audience perceives the information presented to them.

What outreach media will you develop?

There are many different media for outreach communication: print, audiovisual, electronic, special events, and novelty items. Here are some examples:

## **Print**

brochures, editorials, educational curricula, fact sheets, newsletters, newspaper and magazine articles, posters, press releases, question-and-answer sheets, utility bill inserts, or stuffers.

## **Electronic**

cable television programs, exhibits and kiosks, public service announcements, videos

## **Special Events**

events briefings, community days, fairs and festivals, media interviews,



one-on-one meetings, press conferences, public meetings, speeches

## Novelty Items

banners, bumper stickers, buttons, coloring books, floating key chains for



boaters, frisbee disks, magnets, mouse pads

The audience profile information you assembled earlier will be helpful in selecting appropriate media. A communications professional can provide valuable guidance in choosing the most appropriate products to meet your goals within your resource and time constraints. Questions to consider include:

- How much information does your audience really need to know?

-How much does your audience know now?

- Is the medium likely to appeal to the target audience?

- How much time will it take to interact with the product?

- Is the audience likely to make that time?

- How easily and cost-effective will the medium be to distribute or in the case of an event, organize?

- How many people is this medium likely to reach?

- For an event, how many people are likely to attend?

- What time frame is needed to develop and distribute the medium?

- Do you have access to the talent and resources needed for development?

- What other related products are already available to build on?

- When will the material be out of date? (you probably will want to spend fewer resources on media with shorter lifetimes)

- Would it be effective to have distinct phases of communication tools over time? For example, a first phase designed to raise awareness, followed at a later date by a second phase to encourage changes in behavior.

- How newsworthy is the information?

Information with inherent news value is more likely to be rapidly and widely disseminated by the media.

You need to consider how each medium will be distributed and determine who will be responsible for distribution. The simplest and most straightforward products are usually the most effective. For some products, your organization might manage distribution. For others, you might rely on intermediaries (such as the mass media or educators) or organizational partners who are

willing to participate in the outreach effort. Consult with an experienced communications professional to obtain information about the resources and time required for the various distribution operations.

How will your communications (or message) reach the audience?

There are many avenues to consider for distribution:

- Your mailing list, t.v., a friend or partners' mailing list, radio, phone/fax, print media, hotlines, Internet, journals/newsletters, meetings, events, locations where your message can be made available such as schools or libraries.

Questions to consider include:

- How will the audience typically receive this information?

- What distribution mechanisms has your organization used in the past for this audience?

- Were these mechanisms effective?

- Can you identify an partner organizations that might be willing to assist in the distribution?

- Can the media play a role in distribution?

- Will the mechanism you are considering really reach the intended audience? For example, the Internet can be an effective distribution mechanism, but certain groups might have limited or no access to it.

- How many people is the message likely to reach through the distribution mechanism you are considering?

- Are sufficient resources available to fund implementing distribution via the mechanisms of interest?

When developing outreach tools, be sure to consider any special needs of the target audience. For example, if your community has a substantial number of people who speak little or now English, you will need to prepare communication materials in their native language.

What is the best schedule for implementation?

Once you have established your goals, audiences, messages and medium, the implementation phase of knowledge (fourth phase) is ready to be developed. For each project, consider how much time will be needed for development and distribution. Be sure to factor in sufficient time for product review. Whenever possible, build in time for testing and evaluation by members or representatives of the target audience in focus groups or individual sessions so that you can get feedback on whether you have effectively targeted your material for your audience.

What follow-up mechanisms will you establish to obtain feedback?

Successful outreach might generate requests for further information or concern about issues you have raised. Consider whether and how you will handle this interest. The following questions can help you develop this part of your strategy:

- What types of reactions or concerns are audience members likely to have in response to the outreach information?

- Who will handle requests for additional information?

- Do you want to indicate on the outreach product where people can go for further information (e.g., provide a contact name, number, address, or establish a hotline)?

## **Effectiveness Measures**

Because of the importance in communicating risk to the public, it is useful to measure how effectively you are communicating. In order to measure or evaluate how effectively a message has been communicated, many methods and techniques have been developed to allow you to hear first hand from the public what they understand to be the risk. Not only do you need to know what they understand, but more importantly, what they don't. Town meetings as well as telephone and mail surveys are some examples of effective ways to obtain feedback from the public regarding understanding and concerns about a potential risk to their community.

## **Section 5. Risk communication in Action-Case Studies**

The U.S. EPA's Environmental Monitoring for Public Access and Community Tracking program (EMPACT) worked with new technolo-

gies that made it possible to provide environmental information to the public in near real time. This program worked with the 86 largest metropolitan areas of the country to help communities collect, manage and distribute time-relevant information, and provide residents with easy-to-understand information they could use in making informed, day-to-day decisions.

## **Air Quality Case Study**

Ozone, when it occurs at ground level, presents a serious air quality problem in many parts of the United States. Ozone plays a major role in respiratory health effects. Residents in communities with high ozone levels can use timely and accurate information to help make informed decisions regarding their health, and take actions to reduce local ozone levels.

One of the most successful projects is the Ozone Mapping Project, which creates maps that provide hourly ozone data taken from monitoring networks in different regions of the country. They use color-coded contours to depict the level of health concern associated with different categories of ozone concentration. The Ozone Mapping Project is a cooperative effort of the EPA, state and local air pollution control agencies, and regional organizations, including the Northeast States for Coordinated Air Use Management (NESCAUM), the Mid-Atlantic Regional Air Management

Association (MARMA), and the Lake Michigan Air Directions Consortium (LADCO). In 1998, EPA's Office of Air and Radiation assumed coordination of the project.

Figure 1 is a map taken from the EMPACT project entitled, "Ozone Monitoring, Mapping and Public Outreach: Delivering Real-Time Ozone Information to Your Community." (EPA/625/R-99/002). It shows ozone values in the northeastern United States on August 24, 1998.

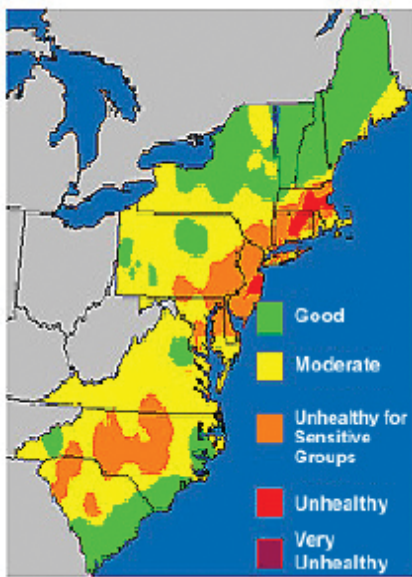


Figure 1. *Ozone values in the northeastern United States on August 24, 1998.*

The AIRNOW Website is set up to provide real-time air pollution data in an

understandable, visual format; provide information about public health and environmental effects of air pollution; and provide the public with information about ways in which they can protect their health and reduce pollution (<http://www.epa.gov/airnow>). The ozone maps are found on EPA's AIRNOW Website - part of the Ozone Mapping Project. AIRNOW displays still-frame maps that show today's ozone levels, yesterday's peak ozone values, and tomorrow's ozone forecast, as well as animated maps that depict the formation and movement of ozone throughout the day. This website, created as a result of the Ozone Mapping Project may be beneficial to people with asthma or other health conditions that relate to ozone and air quality. Health effects information of ozone and links to state and local air pollution control agencies with real-time ozone data are also contained on this website.

The number of cities served by the Ozone Mapping Project is growing but limited by available resources. The Technology Transfer and Support Division (TTSD) of the EPA's Office of Research and Development (ORD) National Risk Management Research Laboratory (NRMRL) develops risk communication tools such as the AIRNOW website maintained by the EPA's Office of Air and Radiation (OAR), and several environmental

handbooks to help interested communities learn more about the Ozone Mapping Project, and it provides them with the technical information they need to develop and manage their own ozone monitoring, mapping, and information dissemination programs.

## Soil-Based Case Study

Over the past few decades, blood levels in children have declined dramatically. However, lead poisoning remains a serious environmental health threat for children today. The legacy of lead-based paint and leaded gasoline will be with us



for many years to come. Without further action, large numbers of young children will continue to be exposed to lead in amounts that could impair their ability to learn and to reach their full potential.

A project entitled, “Community Based Environment Lead Assessment and Education Demonstration Program,” also known as the Lead Safe Yard Project (LSYP), is a joint effort with

EPA’s New England Regional Laboratory and several community partners in the Boston area: Boston University School of Public Health, Bowdoin Street Community Health Center, and two non-profit landscaping companies: Garden Futures, and Dorchester Gardenlands Preserve. The main goals of this project are to demonstrate low/no cost techniques to reduce lead poisoning from inner city soil, and to create an approach that can be modeled by other affected communities.

Other key objectives of this project were to:

- 1) Develop an education outreach program to inform the community of the dangers of lead outside the home, as well as steps to take to reduce the risk of lead in and around the home.
- 2) Demonstrate real-time delivery of data to residents to improve strategies for future community based lead in soil remediations.
- 3) Create a GIS mapping component to remediation.

The initial target community selected for this pilot project was the Bowdoin Street area, consisting of approximately 150 wood-framed, mostly older houses in the North Dorchester section of Boston. This is an inner-city community with a large minority and immigrant population, located in the “lead belt” of Boston, where the majority of children in the city with elevated blood levels reside.

This project was funded in two phases that took place in the summer of 1998 and 1999. During this period, the project addressed 42 residences in the target area, at no cost to the homeowner. A “tool kit” was developed for use by other communities, and numerous seminars were conducted on lead-safe yard work. In its’ first two phases, the project used a model for community education and outreach. These outreach activities ranged from distributing flyers and knocking on doors, to speaking at community meetings. These efforts were culturally specific to the neighborhood and conducted at an appropriate literacy level.

## **Water-Based Case Study**

The Lake Access Minneapolis Project provides the public with time-relevant and historical water quality data for lakes within the largest, most populated watershed districts in Minnesota. This timely and accurate information about lake water quality can help community members make day-to-day decisions about the lake use and lake issues. For example, information about fecal coliform levels can be used by swimmers to protect their health when levels of these bacteria are high in swimming areas. Recreational users and people who fish can use this water quality information to help them decide what areas are safest for those activities. This time-relevant information can help

lake users and residents better understand how water is affected by land practices within their watershed.

Figure 2 describes the steps taken during the process of developing time-relevant data for a project.

In order to make the project more effective, the U.S. EPA has formed a partnership with the National Oceanic and Atmospheric Administration and the U.S. Geological Survey. EPA is now working closely with these federal agencies to help achieve nationwide consistency in measuring environmental data, managing the information, and delivering it to the public.

The Lake Access Project team is using Remote Underwater Sampling System (RUSS) devices to collect time-relevant water quality data from three locations involved in the project. The concept of using time-relevant water quality data came from a desire to learn more about rapid, weather-related mixing events in Lake Minnetonka. Lake Access allows the public to track daily changes on Lake Minnetonka and Lake Independence; study how choices we make on land and in the water affect the quality of our lakes; observe the way storms and other seasonal changes can affect the water and impact the fish and fishing; and see how our lakes and streams have changed with time.

A geographic information system (GIS) is a software and hardware system that helps scientists and techni-

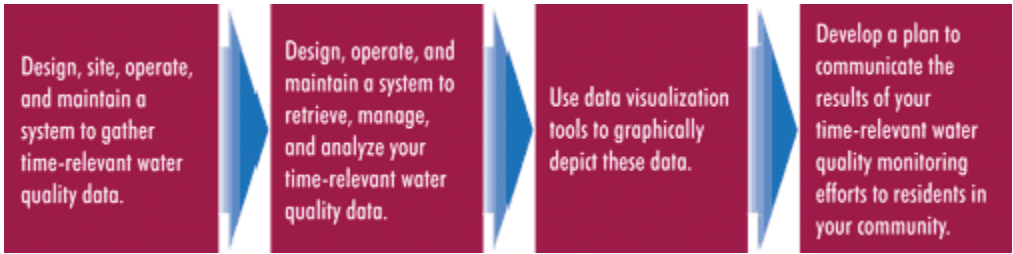


Figure 2. Process of collecting, transferring, and managing time-relevant data.

cians capture, display, and analyze spatial or geographic information. GIS and other data visualization tools offer the ability to better support and communicate observations, conclusions, and recommendations to the public, students, regulators, and resource managers. These audiences in turn can use this information to make daily decisions that can affect the quality of our lakes and streams.

The Lake Access Project assembled a group of museum officials, naturalists, teachers, and other experts to discuss ways to implement the outreach efforts of this project. Several types of outreach projects were developed and implemented. The public was surveyed to gauge how much information they had about water quality. An attractive user-friendly brochure about the project was developed. A website was built to give real-time water quality information to the public. (<http://wow.nrri.umn.edu/access>). The project team also trained a group of local school teachers on the RUSS unit and the project through a number of

workshops, including a two-week summer workshop held at the lake.

## Section 6. Conclusion

Successful risk assessment and risk management involve effective risk communication. By effectively conveying risk information to the public, risk communicators can minimize environmental exposures and save lives.

It is important to develop ways of not only communicating in a clear, concise manner, but also determining how your message is perceived. In the real world, information communicated to reduce environmental risk must compete with the barrage of other messages communicated from outside sources. These outside sources can cloud a message and distort key information that is necessary for successful communication of a particular risk.

The public is becoming increasingly aware of the state of the environment and the possible health risks they may



face. By developing partnerships with the concerned public, risk communication becomes the key resource for developing solutions that meet the needs of everyone involved, and minimize impacts on human health and our environment. The considerations identified in this digest help define your risk communication strategy.

Successful environmental risk assessment, risk management, risk communication, and the development of sound environmental policies depend upon open, two-way communication between risk managers and the public. Well-designed communication of risk information and careful attention to feedback will help to maintain the credibility of all environmental agencies involved and will help ensure that public values and concerns are incorporated into the decision-making process. Effective risk communication helps environmental agencies and communities make good decisions.



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