

## Action Research and Wicked Environmental Problems

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*Exploring Appropriate Roles for Researchers in Professional Communication*

The authors report on a 3-year action-research project designed to facilitate public involvement in the planned dredging of a canal and subsequent disposal of the dredged sediments. Their study reveals ways that community members struggle to define the problem and work together as they gather, share, and understand data relevant to that problem. The authors argue that the primary goal of action research related to environmental risk should be to identify and support the strategies used by community members rather than to educate the public. The authors maintain that this approach must be supported by a thorough investigation of basic rhetorical issues (audience, genre, stases, invention), and they illustrate how they used this approach in their study.

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Personal stories and social histories of resistance and change, the failures no less than the successes, need to be widely shared. Otherwise we are left with the impression that community issues and struggles are born out of nothing—or that only extraordinary heroic people can get involved and make a difference.

Marino (1997, pp. 30-31, cited in Pyrch, 2007, p. 206)

In a community we call Harbor,<sup>1</sup> the U.S. Army Corps of Engineers plans to dredge contaminated sediments from a shipping canal and transport them to a disposal facility—an engineered structure bounded by clay walls. Each phase of the dredging project (removal, transportation, storage) will take place in an urban area, with the disposal facility to be located within about 800 yards of two schools. Given the known toxicity of the sediments, the location of the project, and the possible spread of contamination, many local citizens have responded with understandable anger and fear. The situation demands that all parties communicate honestly and effectively with one another; otherwise, any action that is taken might raise hostility and suspicion. Thus, the project in Harbor presents risks not only to public health but also to social cohesion and trust.

We became involved in the dredging project as part of an effort to provide third-party, expert review of the Corps's plans to remove, transport, and store the sediments. (We discuss our roles in detail later in this article.) We attempted to help an organization (Technical Outreach Services for Communities) harmonize its communication practices with the community's existing practices. During this critical action-research project, we tried to support various stakeholders' efforts to define, understand, and articulate their responses to what Rittel and Webber (1973) would call a wicked environmental problem.

### Varieties of Action Research

We call our method critical action research in order to better define our work in Harbor. As Toulmin (1996) noted, action research comes in many varieties, including cooperative inquiry, participatory design (e.g., B0dker, 1991; Ehn, 1988; Spinuzzi, 2005) and participatory action research (e.g., Fals-Borda, 1991; Pyrch, 2007). Although our work overlaps with participatory action research (PAR), it does not fit completely. (Perhaps no methodological tradition can be defined clearly enough to fit one label.) So we describe how our study compares to some shared hallmarks of action research. To start, we assume that the goal of all forms of action research is to produce knowledge that benefits some nonscholarly community (or communities). Action researchers reject the notion that the only proper purpose of research should be "to produce more, or better generalized knowledge" for fellow scholars (Toulmin, 1996, p. 54). Action research is contextual, local, and requires intervention, not simply description. Also, action researchers must not, as Sullivan and Porter (1997) put it,

"instrumentalize" people—that is, researchers should not use others for their own ends, such as publication (pp. 110-111). With these two points as givens, action-research projects can then be described by the ways they manifest two hallmarks: (a) the researchers' commitment to social justice and (b) the relationship between researchers and participants.

Many who claim to work in the tradition of action research reveal different senses of, and commitments to, social justice. Bernhardt's (2003) action-research work in the pharmaceutical industry, for example, lacks a clear commitment to social justice. We are not saying that Bernhardt cares nothing for social justice. Rather, we are saying that although Bernhardt's work with the pharmaceutical industry can rightly be called action research because of its commitment to helping another group, it does not clearly express his commitment to social justice as the term is typically defined (empowerment for the oppressed). For those who do express in their research a commitment to social justice, the nature of such a commitment depends in part on the setting. One researcher may work in an industrial setting to facilitate participatory design, which is supposed to lead to better conditions for workers in a particular industry (e.g., Ehn, 1988); another may work with the unemployed or underemployed to help change social and economic conditions (e.g., Gianotten & de Wit, 1991); another may work with a long-shot politician to try to change the system from within (e.g., Faber, 2002). For the critical action research that we report here, we promoted people's access to "the mechanisms of policy and decisionmaking" (Sullivan & Porter, 1997, p. 115) by providing third-party reviews of the Corps's dredging and storage plans—reviews that citizens could use when formulating their own responses to the plans.

Just as the nature of people's commitment to social justice can vary from project to project, so can relationships between researchers and participants. For example, who poses the research questions—the researchers, the participants, or both? Who chooses the research methods? Who carries out the research? Who reports the results? Fals-Borda (1991) asserted that PAR should involve "collective research" in which all participants engage in these activities. In fact, Fals-Borda proposed that "simpler, more economic and controllable methods of research" should be developed so that participants "can carry on their own work without being dependent on intellectuals or external agents and their costly equipment and procedures" (p. 10). This ideal is not always possible in professional and technical communication because sometimes the data must be gathered by the kinds of "costly equipment and procedures" that Fals-Borda wanted to avoid. Thus, as Clark (2004) has suggested, PAR can be difficult to carry out in our field. And in some cases involving technical communication, the participants lack the equipment or time necessary to conduct the research themselves, so a group or collective may pose questions, but action researchers may carry out the research and report back.

Our opportunity to engage with citizens in Harbor occurred when we agreed to help the Technical Outreach Services for Communities (TOSC) program offer its reviews of the Corps's dredging and storage plans. In the early 1990s, the Environmental Protection Agency (EPA) began to address directly public concern and anger over contaminated sites (often designated Superfund) and the EPA's own processes. As one step, it established the TOSC program in 1994, providing grants to universities across the country, which meant that communities could turn to assistance providers other than the federal government or the parties responsible for the contamination. Since then, the TOSC program's primary goal has been to help communities develop locally grounded solutions to environmental problems.

TOSC takes a two-step approach, with both steps occurring simultaneously and throughout the course of the project. The first step centers on university provision of expert assistance—an approach, more recently labeled *outreach*, that is grounded in more than a century of university extension service. The university reaches out to those who can benefit from technical expertise (for an explanation of university approaches toward working with communities, see Boyer, 1990; Fear, Rosaen, Bawden, & Foster-Fishman, 2006). The second step rests on a view that communities must meaningfully engage in finding answers to any serious problem they face. In other words, the citizens pose the questions, and TOSC provides the expertise and education to enable these citizens to address them.

TOSC's approach to the project in Harbor<sup>2</sup> relied on a public involvement coordinator (coauthor Kirk Riley) who could use his experience in community development and environmental science to communicate with the varied parties: stakeholder groups, academic experts (particularly environmental engineers), and government agencies. TOSC often identifies and works with community partners, and in Harbor that key partner was eventually a group we call the Citizens' Environmental Committee (CEC). To help TOSC in its efforts, we worked with CEC members, who served mostly as key informants and gatekeepers to others in the community. We also attended a number of community meetings (particularly meetings organized by outside parties such as the local government and the EPA), reviewed the Corps's dredging plans, facilitated the involvement of public health experts from an area university at the request of community members, and worked on new communication models in order to facilitate communication and education in the community.

In summary, our work shared many qualities with PAR because we worked with community members to identify key research questions and to formulate strategies for communicating the results of studies. On the other hand, members of TOSC often worked as expert researchers, reviewing the Corps's plans and then communicating results to the community rather than engaging in the research with the community. TOSC experts conducted research on behalf of citizens rather than with them. Thus, we call our approach critical action research—akin to the kinds of research described by Sullivan and Porter (1997)—rather than PAR.

Before we present the four major findings of our work in Harbor, we provide some background on the community and the methods we used.

### **Background on the Harbor Project**

The canal at Harbor is one of the oldest industrial corridors in the country. The Y-shaped canal connects a river to the south with the harbor and one of the Great Lakes to the north. A spur runs east to west beneath its stem. As Figure 1 illustrates, the canal runs through a heavily populated and industrialized area. The dots in the upper left and lower right corners of the figure are storage tanks for oil refineries. The Corps has proposed dredging portions of the canal (millions of cubic yards of sediments) and storing the dredged sediments in a disposal facility on the canal's northern bank. Answers to why the Corps wants to do that depend on whom you ask—and when. The official reason for the project is navigation. The canal, which has not been dredged since 1972, must be deepened in order to let heavier barge traffic reach industries along the canal. Currently, companies must reduce their cargoes sometimes by as much as 500 tons before their barges can navigate the canal, which means more trips. In some cases, barges cannot approach the docks completely.<sup>3</sup>

Although the Corps cites the need to improve navigation, the project has environmental implications. The industrial uses of the harbor and canal have left the waters heavily polluted. The International Joint Commission, a United States-Canadian effort to oversee environmental quality on the Great Lakes, identified this harbor as one of the 6 worst of 41 "areas of concern" on the lakes, and the only one with all beneficial uses (e.g., fishing, swimming, and potable water) listed as impaired. Some of the toxins found in the sediment include arsenic, cadmium, chromium, dioxin, toluene, lead, mercury, oil, polychlorinated biphenyls (PCBs), and polyaromatic hydrocarbons (PAHs). Some stretches of the canal are so toxic that they cannot sustain life. Thus, an effort to improve navigation could also result in the cleaning of one of the most polluted sites in the Great Lakes region.

Although the idea of a cleanup is appealing, the possibility of dredging the canal has worried many citizens. They understand what one professor of engineering stated during a conference call on January 23, 2004: "Dredging is a nasty business." It can stir up ("resuspend") whatever is sitting at the bottom of a body of water, spreading toxins downstream. Some may even become airborne (as particles or as "volatilized" chemicals). Although dredging seems like a nasty business, doing nothing could be worse because resuspension occurs naturally: Normal water flow and turbulence from boats and storms cause contaminated

sediments to flow into the lake. Inaction has risks too. Given these possibilities, citizens have raised two questions about the Corps's dredging plans: (a) Will the dredging be characterized as navigational or environmental? and (b) Which type of dredge will be used?

Navigational and environmental dredging projects have different but complementary goals. Whereas the primary goal of navigational dredging is to open a river or harbor to vessel traffic, the primary goal of environmental dredging is to remove contaminants and reduce risk to human health and the ecosystem. These goals can overlap. Dredging to improve navigation certainly can remove contaminants from a body of water, and environmental dredging can improve navigation. But, even though a navigational dredging project can benefit the environment, an environmental dredging project must adhere to stricter rules for characterizing the extent of contamination and exercising precaution during the dredging.

In addition to how the project is characterized, some citizens have worried about the type of dredge to be used. At its simplest, the difference between dredge alternatives amounts to scooping versus sucking. Mechanical dredges scoop sediments much like a shovel or backhoe; hydraulic dredges suck sediments much like a shop-vac. The widespread belief among citizens in Harbor was that a hydraulic dredge would be preferable to a mechanical one—a belief that was not shared by the dredging experts with whom we spoke. During the conference call on January 23, 2004, a professor of engineering said that in the past, mechanical dredging techniques did usually result in greater rates of resuspension than did hydraulic dredging but that most of the resuspension was caused by an overflow of water out of barges. (Sediments scooped out of water bodies are often dumped into a barge for transport.) If barge overflow is prohibited, the professor claimed, then the difference in the rates of resuspension between mechanical and hydraulic dredging techniques becomes environmentally "comparable."

Perhaps, for many citizens, the most alarming aspect of the Corps's plans is the proposed solution for storing the dredged sediments. The Corps plans to unload the dredged sediments from barges directly on an existing brownfield, which is already contaminated with hydrocarbons (see "proposed disposal facility" in Figure 1). On the one hand, depositing these sediments directly into a brownfield makes sense because the site is already contaminated and the sediments would not have to be transported through town by truck. On the other hand, the site is located about 800 yards from two public schools where about 85% of the students are minority, so storing the sediments so close to these schools strikes many in the community as environmental racism. Harbor is about 40% African-American, 40% Hispanic Latino, and 20% other—largely white, eastern European.

To complicate matters even further, many people suspect that the site was chosen for fraudulent reasons. Many people told us that Harbor has a long history of corruption, having been governed, they said, by one of the last old-style political machines in the country. The dredging plans were made during the reign of a city administration that was later deposed by judicial ruling because of fraudulent election practices. During the course of our visits to the area, several city administrators, as well as one of the mayor's children, were charged with various counts of corruption, including fraudulent land deals and sales of construction contracts. Distrusting a city government that they perceived as corrupt, some citizens assumed that the city purchased the site from an oil company so that the company could pass its liability to the city and so that the city government (namely, the mayor at the time) could hand out construction-related contracts for years to come. (Although we heard this story, it is not a proven fact. We cite the story to illustrate the levels of distrust in the community.)

Because these citizens believe they live in a politically corrupt community, they are inclined to assume scientific corruption as well. They mistrust not only the local government but also those affiliated with the federal and state governments. Thus some citizens assume that government reports represent bogus science designed to convince citizens of the value of an agency's preferred solution. One citizen, for instance, said that the EPA and the Corps cherry-picked models that make the landfill and dredging alternative look safe. "You can always find a model to make things look safe," she said during a meeting on July 7, 2003. "It doesn't take a scientist to know that."

The dredging project in Harbor, therefore, is complex, involving a number of governmental and quasi-governmental bodies, from local to federal. The political context in the community is contentious and riddled with charges of corruption. The scientific context in the community is deeply inflected by these same narratives of power. And the scientists and engineers themselves are genuinely uncertain at times. No choice is risk free, and each is subject to multiple interpretations.

### **The Methods of the Project**

As TOSC confronted deep problems that were fundamentally communicative in nature, finding a way to work effectively with communities marked by severe distrust and broken relationships became a prime communication issue. Our inquiry was framed by simple goals and questions that reflect the two critical action components of the project: (a) to help TOSC work effectively in this community and (b) to help community organizations solve communication-related problems. The goals were to build trust with community organizations, enabling TOSC to do its work, and to help TOSC create good communication strategies and tools that were both ethical and effective, facilitating the communicative work of community organizations. Our four research questions were similarly simple and reinforced our action goals:

1. Who are the constituents in this community (around this project)?
2. How does this community (individuals and organizations) understand the project?
3. How does this community do research?
4. How does this community communicate?

Our research questions and our action goals were interrelated. The questions reflect genuine unknowns and problems that had to be addressed in order to help TOSC and our community partners work more effectively. In many ways, then, our project had a simple action-research trajectory. To be useful to both TOSC (who sponsored our work) and the community organizations with which we developed a relationship, we needed to ask and answer some questions and then, based on those answers, to help others act differently.

The rhythms of this action-based project were tied to TOSC's outreach activities. For example, we (Stuart and Jeff) first spent time in Harbor attending community meetings, either public or organizational, and arranging one-on-one meetings with a wide range of participants (e.g., newspaper editors, local academics, health professionals, citizens engaged in this project either personally or professionally). In this first phase, which lasted from February 2003 to March 2004, we focused on relationship building and answering our research questions. During this phase, we also helped plan and run TOSC-sponsored meetings. The purpose of these meetings initially was to introduce TOSC to the community and solicit community input regarding questions and concerns that TOSC might address, often by way of TOSC's scientific or engineering experts.

Once TOSC began producing technical reports based on its review of the science and engineering issues associated with the project, we (Stuart and Jeff) focused on helping TOSC communicate effectively based on our evolving understanding of how community organizations invented and communicated new knowledge. During this later phase of the project, which lasted from March 2004 to February 2005, our work shifted more explicitly to enacting the action goals of the project.

### **Data Sources**

Our routine data collection largely concerned public documents. We monitored the press and collected relevant government documents from the Corps, EPA, and other state and federal sources. We also collected TOSC's own materials—both its communications with key stakeholders and its public documents. And we collected public documents produced by community organizations. In addition, we observed public and organizational meetings and

conducted interviews. These public and organizational meetings were key to our data collection because they were sites for rhetorical performances as well as places where work took place. We attended several meetings per year of a local citizens' environmental group (the CEC). Because of the nature of this project, we consistently fed our results back into the project, sharing with both TOSC colleagues and citizens in Harbor. Communicating our growing and tentative understandings of the project as we developed them constituted an important research practice.

## **Data Analysis**

To analyze the data we gathered during this project, we used a two-part coding scheme that would account for different kinds of rhetorical performance. That is, we coded each unit for speaker and purpose. We identified five types of speakers:

- citizens, those who speak as members of local communities
- experts, those who are authorized to speak because of some perceived expertise relating to the project (e.g., knowledge of engineering or ecology) but who are not affiliated with the Corps or local governments
- corps, those who are affiliated with the Corps
- government, those whose governmental positions give them a stake in the project (e.g., city administrators, EPA employees)
- journalists, those who write about the project for established media such as newspapers

And we identified 12 purposes:

- to focus on the environment (e.g., a threat to flora and fauna)
- to focus on health (e.g., a threat to children's development)
- to focus on economics (e.g., home prices or revitalizing industry along the canal)
- to reveal political influences (e.g., decisions made for a politician's sake)

- to make moral claims (e.g., a situation that must be remedied because it is the right thing to do)
- to reveal injustice (e.g., a situation that must be remedied because it unfairly affects the poor, minorities)
- to describe data or information collection methods or practices (e.g., when people describe how they collect data)
- to make a credibility claim (for self, for others, or for data, information, or methods)
- to make a claim of certainty about an issue relating to science, engineering, the environment
- to organize (e.g., passages describing how citizens organize to promote their agendas and/or resist others)
- to share information (e.g., passages describing how citizens spread the word about events or scientific information)
- to make a claim about community identity (i.e., "This is who we are")

Given this scheme, we could code a unit as a citizen making a moral claim or another as Corps making a credibility claim.

The most significant problem we faced in using this scheme was agreeing on the notion of a rhetorical unit. We disagreed most often about the length of a given unit. Because we were coding not to analyze content (either quantitatively or qualitatively) but rather to identify clear rhetorical patterns within particular genres (e.g., Corps technical reports) and across the data set, we agreed to disagree at times about the proper unit of analysis and made no attempt to arrive at a norm when we disagreed about the unit and not the code itself. That is, we disagreed about the unit that bounded a rhetorical performance. Most standard units for this type of analysis—the T-unit, for instance—are often inadequate as a boundary for rhetorical work. We easily came to consensus, however, about the rhetorical work taking place in a given document (e.g., a type of speaker making a particular kind of claim about the project).

Our coding scheme helped us find trends within hundreds of pages of documents: reports from the Corps, newspaper accounts, Web pages produced by citizens, notes from interviews and meetings, fliers, and so on. Coding gave us a way to map, in a sense, the rhetorical substance of those documents. We identified where certain types of claims are made and how those types of claims cluster. For example, our coding revealed three major disagreements between citizens and the Corps: which dredging method should be chosen, where the disposal facility should be sited and how it should be built, and whether adequate studies have been done regarding threats to public health. In the remainder of this article, we present our four consistent findings in the data that reflect key data-driven insights and action-related issues addressed in the project. We also connect these findings to various action-based outcomes of the project.

#### **Four Major Findings**

As a result of our extended work in Harbor and our analysis of various documents and field notes, we found four issues that we believe future action researchers and consultants should address in order to help solve what Rittel and Webber (1973) would call wicked environmental problems: (a) the need to assemble a community, (b) the elusiveness of effective communication, (c) the difficulty of determining stases, and (d) the importance of understanding how citizens pursue science.

## The Need to Assemble a Community: Why Audience Matters

Effective public communication eludes many people's best efforts because the variability of real audiences can be overwhelming in situations like the one in Harbor. Thus, to help TOSC do its work, we looked for ways that people drew boundaries (us vs. them), made identity statements, and otherwise characterized the nature of the place and its people. We drew on models of symbolic interactionism such as Cohen's (1985) and work that draws on Cohen's model (e.g., Grabill, 2001, 2007). As we might expect, characterizations of this community depended first on who was doing the characterization, with the most obvious distinction being between the characterizations of those who were clearly outsiders and those who at least lived in or near Harbor. For many citizens (insiders) with whom we spoke, the lines between insider and outsider overlapped with the lines between the government and the community. The term *government* in this case meant not only any actual government institution but also outsiders, like us, who were associated with these governmental bodies. Given that the insiders perceived the local government as corrupt, they considered those associated with government guilty by association. One neighborhood leader in particular maintained this boundary between insiders and outsiders but left one crossing point. The question he always asked outsiders like us was this: Are you a good neighbor? How we answered enabled this neighborhood leader to gauge if we were with them or against them.

The need to distinguish between insiders and outsiders was fueled in part by the ways that outsiders mischaracterized community members. The most glaring mischaracterization of community identity came from a consultant who was hired to research the community for the Corps and to suggest eventual uses for the disposal facility once the project was completed.<sup>4</sup> Although we might consider this consultant's work to be audience analysis, people we spoke with in the community understood it to be "opposition research." The consultant, a Hispanic woman from Texas, concluded that Harbor residents have misunderstood the dredging project, and she recommended targeting the city's Hispanic population to gain support. This divide-and-conquer strategy might be politically shrewd, but given the reaction in the community, the report was neither clever nor strategic. It recommended focusing on the needs of 40% of the community by building soccer fields on top of the disposal facility once the dredging was complete because, according to the consultant, Hispanics play soccer, not golf. In addition, it dismissed the community as poorly informed, suggesting that the information on any risk be kept at an eighth-grade level.

The reaction to this report was predictable and strong. One Hispanic community member wrote publicly, "It's an insult and a slap at the face of the community here.... They take us as a bunch of soccer-playing, baseball-throwing, ignorant fools who know nothing of this project." Such is the obvious danger of relying on stock characterizations and the more pointed danger of using consultants-for-hire. As with members of any community, the citizens of Harbor are proud of their history and of many contemporary aspects of their community. People in Harbor see themselves as hard working. As Barbara, a CEC leader, remarked aloud in one community meeting, "We've got a lot of smart people who live here. We're just poor, we're not dumb!" This reaction demonstrates the importance of understanding communities for any work of this nature and how difficult the task can be. Thus, developing an evidence-driven understanding of this community became a key focus of our work. That is, constructing and maintaining a fluid understanding of the Harbor community was a fundamental requirement of both the research and the action components of the project.

The central issue of community identity in Harbor was politics. Carol, another CEC member and perhaps one of our best sources for community characterizations, talked about the machine politics in the community as almost always being the key variable for understanding Harbor. For Carol, the most powerful community dynamic flowed from perceived political corruption and its ability to control people—whole families—via jobs, special payments, and intimidation. Politics, then, worked at a level "higher" than other powerful community identities, such as race and ethnicity. (Most citizens were Catholic, which was also important, but many felt that religion was caught in the same machine dynamics, that the churches were part of the machine). Carol, of Puerto Rican and European origins and a longtime member of

the community, often noted how remarkable it was that a bunch of Greeks (the old machine; historically, key parts of the machine were ethnically Greek) could control a bunch of Serbs, Croats, Poles, Latinos, and African Americans.<sup>5</sup> Carol attributed the power of this old Greek machine as much to the inability of the other groups (ethnically identified and otherwise) to resist it as to the rigor of its power politics.

Clearly, then, community identity has complex layers, in terms of both outsider-insider and insider dynamics. Citizen groups composed of folks from Harbor have persistently had to deal with identity and organizational maintenance, as the tensions that exist within any complex and diverse community constantly threaten organizational mission and coherence. These dynamics are placed under considerable stress in high-stakes situations such as electing politicians and resisting the federal government's dredging plans. Understanding these internal dynamics was important to us, so we needed to hear the many stories that we heard. We learned to listen carefully, move slowly, and act respectfully. But no matter how important the internal dynamics of community identity were to us, we could never fully grasp them because we were outsiders and therefore on the other side of the insider-outsider line.

Given this context, our possibilities of understanding the community "correctly" were remote. But we plodded through. Our argument here, then, is for the importance of plodding rigorously and thoughtfully and for understanding the resulting constructions of "community" as key project deliver-ables that have both procedural and epistemological value—but that should be understood as constructions of the researcher. These constructions address the community's, the practitioner's (TOSC's, in this case), and the researcher's aims in keeping with the core impetus of action research. With that in mind, we offer here one version of a Harbor community map, which we produced originally for our field notes (see Figure 2).

We constructed the map in Figure 2 in order to help us understand the Harbor community and as a basic action-research practice of keeping "live," persistent community maps (a practice that would also be necessary if the study were located within a corporate organization). This community map is an answer to the question, Who and what is the community in Harbor? This map is meant to communicate two significant issues. First, the community is a collection of organizations, institutions, and individuals (the last not visible in this version of the map). The complexity of community work requires coordinated effort, so people must organize themselves to conduct this work.

### **Figure 2 What Is a Community?**

Some of these organizations are large and highly structured, such as government agencies, while others are more loosely structured, such as neighborhood associations. Second, the community map reveals the lines and divisions that are drawn, particularly between outsiders and insiders. The links between groups form the connective tissue that holds people and projects together. Some groups of people have more formal connections, by way of funding or through their membership in multiple organizations. And some groups are networked by their communication practices. The organization we call CEC is the key community organization in relation to the dredging and storage project because it is at the very center of the communication practices—and therefore the coordinated work—in the community.

As our map shows, we understand this community to be an articulation of groups of people and institutions, arrayed in relation to each other with respect to the dredging project. The nature of these groupings and the relationships between and among these groups is a function of complex identity issues that, in Harbor, we understood in terms of various insider-outsider dynamics. Working in the community or communicating with the community, therefore, is a persistent problem for action researchers concerned with Blythe et al. / Action Research and Wicked Environmental Problems 287 public deliberation. Our understanding of the community helps us to decide which people to speak to, why, and about which issues. It contributed to our ongoing audience analysis and, as we will show in subsequent sections, affected how we communicated.

## The Elusiveness of Effective Communication: Why Genre Matters

As professional and technical communicators, we know that effective communication is difficult to achieve. But our study showed that even attempts that followed best practices in outreach communication—practices intended to be ethical and useful and informed by the experience of researchers and practitioners—could fail. This failure should not be surprising because, as Stratman, Boykin, Holmes, Laufer, and Breen (1995) illustrated regarding the EPA, an organization's sense of best practices can contradict its institutional power and mission. Such contradictions can "reflect deeper ambiguities within the organization itself (p. 13). Our first example of such a failed attempt at outreach communication comes from a June 17, 2003, meeting in Harbor in which the Corps gave a major presentation on dredging alternatives. The Corps had flown in an expert who provided a richly detailed 40-minute presentation on disposal facilities and other issues relevant to the Corps's consideration of these dredging alternatives. His audience was furious. The government board members who sponsored the presentation as part of their regular meeting resented the time taken by the Corps, and some citizens saw it as a deliberate strategy to prevent public input. That is, they believed that the speaker deliberately used too much time so that the board would lack adequate time for a question-and-answer session. This in fact happened.

While the Corps may or may not have intentionally taken too much time in order to preclude questioning, this presentation style is common for the Corps and for many others who make presentations at public meetings. In making public presentations, representatives from expert institutions assume that they know more than their audience does or that audience's comments would be unproductive. They essentially follow a "banking model" of public communication. But public audiences are not ignorant, as we illustrate in our fourth finding. As Barbara told one of us at the break, the presenter "told us everything we knew and nothing that we didn't know." Although some in the audience may have needed a brief reminder of the dredge alternatives, many older citizens at the meeting had seen dredging before, and others had already informed themselves about the alternatives. In short, the presenter misunderstood his audience.

Our second example of failed communication comes straight from the Corps's best-practices handbooks. Although the example occurred before we became involved, we had heard stories about this meeting from a range of stakeholders, none of whom had a positive impression. In this instance, the Corps, with people from the EPA and the state environmental office participating, placed experts around the room, in poster-session style, and invited people to mingle with the experts and ask questions. In theory, this arrangement should have enabled the kind of give-and-take conversation that citizens wanted. Indeed, that is the explicit intent of such conversations—a decen-tered, community-focused, conversation-intensive moment. One EPA official, reflecting on the meeting, noted that this format, as intended, should have worked better: "It would seem that if people actually wanted information—instead of just to stand up and rant at meetings—this is a very good format to learn about this project." Instead, a number of community activists viewed this format as a deliberate attempt to keep citizens from presenting a united front and as a way for government officials to tell different stories to different people in the community—a disinformation strategy. This interpretation was serious because community groups spent a great deal of time and energy ensuring that they had a shared understanding of the issues and communicating that shared understanding. They did so not only as a matter of political efficacy but as a way to learn and keep straight complex science and engineering (e.g., imagine keeping straight the number of parts per billion at which a particular compound is dangerous and the precise ways in which different experts characterized the threat). The meeting ended early because the shouting was about to turn into physical confrontation.

Perhaps the most common rhetorical advice is to know your audience, and instances of writers and speakers not knowing their audience are not difficult to find and not particularly interesting. The two examples we have cited here are not merely cases in which the speakers did not understand their audiences. Rather, these examples are more complicated cases in which the speakers' and participants' expectations clashed regarding the genre of the

meeting. The most important genre of meeting is the public meeting, what McComas (2003) understood to be "among the most common and traditional methods of public participation in the United States" (p. 164). McComas's article is perhaps the best treatment of the public meeting, and in that article, she cited Heberlein's (1976) taxonomy of the public meeting as including the informative meeting (delivering information), the co-optative meeting (allowing citizens to "let off steam"), the ritualistic meeting (merely satisfying legal requirements to hold meetings), and the interactive meeting (enabling genuine conversation between all participants). This way of thinking about the range of public meetings is useful because it allows us to understand the public meeting as a genre, as a form of social action that articulates audiences, purposes, scenes, issues, and particular kinds of performances (see Simmons, 2007, for an in-depth discussion of the public meeting and public deliberation; see also Grabill, 2007; Throgmorton, 1996). In these examples, we mean to suggest not only that the well-intentioned speakers misunderstood their audience but also that the participants we observed came to those meetings with different understandings of the meeting, alternative and sometimes conflicting expectations, and contrary rhetorical purposes and intentions. The elusiveness of effective communication rests in the genre of the meeting as a performance, not precisely in the types of performances that take place at the meeting.

### **What Do We Have Here? Why Stases Matter**

As we worked to understand the complexities of the communities and collectives in Harbor, we also had to sift through competing definitions of the project itself. We found disagreements over how the project should be characterized, how it should be done and whether it should be done at all, which laws were most applicable, and whether or not some actions were justifiable. Such fundamental disagreements were a particular challenge to TOSC because its goal was to help communities work through environmental issues, but they could not work through these issues without first reaching some agreement on the nature of the exigency. In other words, as with the Aspen case documented by Stratman et al. (1995), stases mattered a great deal.

Davis (1996) stated that Hermogenes defined 13 stases. The first two are *conjecture*, questions concerning what should be done or whether anything should be done at all, and *definition*, how the task should be described. We heard minimal disagreement about whether the dredging should be done. For representatives of the Corps, conjecture was not an issue at all. They said that they had a mandate to dredge the canal to ensure navigation—a mandate that they never questioned publicly. Most citizens seemed to agree that the canal should be dredged. (Admittedly, a few citizens questioned whether the canal should be dredged. One person whom we interviewed on February 27, 2004, said that the project lacked a viable goal because the canal no longer needed to be dredged. The industry that once needed the dredge, he claimed, is either gone or leaving.) As a newspaper article reported in 2001, the members of the CEC "repeatedly said they do not oppose dredging the canal." In terms of conjecture, the significant disagreement concerned what to do with the dredged sediments: where and how they would be stored.

More significant than disagreements about conjecture were those about definition, or how the project should be described. Even if most people agreed that dredging should occur, they disagreed over whether the dredging should be navigational or environmental, a distinction we discussed earlier. Others disagreed over Hermogenes's third stasis: *quality*, or whether an act is just or unjust, legal or illegal. Some citizens, especially local academics, claimed that the proposed disposal facility amounted to environmental racism. On November 9-10, 2002, a nearby university held a forum entitled Environmental Justice in Our Communities: Here and Now. The purpose of this forum was to question whether the dredging project complied with President Clinton's order on environmental justice. Many claimed it did not. Although citizens spoke occasionally about the perceived injustice of the disposal facility site, the Corps never mentioned issues of justice or ethics, not even to rebut citizens' claims. For the Corps, the issue has always been to meet the primary goal of navigation and the secondary goal of environmental remediation.

The difficulty reaching agreed upon stases stems from at least two sources. First, in our efforts to code documents, we discovered that people can use the same terms while they retain different frames of reference. In some places, our coding diverged significantly because we could not tell how people were using certain key terms. Our experience complicates Stratman et al.'s (1995) picture of two camps consciously arguing over the way a problem is framed. In our case, sometimes no one was clearly framing the problem. For instance, the definition of *environment* was especially slippery because people often used it to refer to various things. Sometimes they meant nature—as in the flora and fauna that might live near a body of water. Sometimes they meant community—as in maintaining a civil environment in their neighborhoods. Sometimes they meant public health—as in maintaining clean air and potable water. If people are invoking the same term to imply differing definitions, then the task of reaching agreed upon stases becomes all the more difficult. In this way, language practices become part of the politics of public issues.

Second, even if people agree fully on a definition, reaching agreed upon stases is difficult because people often switch unexpectedly from one type of stasis to another. An exchange that occurred at a citizens' meeting on February 4, 2004, revealed this difficulty. During a meeting of the CEC, Barbara told the group about her recent phone conversation with a chemical engineer who had been hired by TOSC to review the Corps's dredging plans. During that conversation, the engineer argued that it did not matter whether the federal government characterized the dredging as an environmental or a navigational project. That is, he claimed that arguments over definition missed the most important issue: A navigational dredging project still had to meet environmental standards. When Barbara shared the engineer's opinion at the meeting, Henry, another member, said that the environmental-versus-navigational issue was a red herring. The real issue, he said, was whether the project should meet standards set by the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). He shifted from a question of definition to one of conflicting laws (Hermogenes's 10th stasis). If the dredging project met CERCLA standards, he believed, it would become a Superfund site, which would mean additional federal money and regulation for the project. Essentially, Henry believed that arguments over definition diverted attention from the fact that the project should be receiving Superfund money and meeting CERCLA standards. The CEC members never resolved their own dispute over this issue during the meeting.

One job of a rhetorician—the action researcher as consultant—might be to help people agree on the stases that inform their various stances. But as our experience shows, such agreement is not easily accomplished. If technical or scientific experts think that a disagreement can be overcome merely by offering technical information, they are missing many other sources of disagreement—over how a project ought to be defined, over which laws are most applicable, over what constitutes an injustice. They may also be stymied by the fact that citizens sometimes cannot agree on how a project should be defined or may shift stases unexpectedly. In other words, the language practices that we understand here as problems of stasis are also integral to the public performances of professional and technical discourse, to how audiences, genres, and communities are understood.

### **How Citizens Pursue Science: Why Invention Matters**

We have been building slowly, inductively, via a series of data-driven examples, toward a more fully elaborated notion of critical action research focused on professional communication and public discourse regarding wicked environmental problems. Because citizens obviously knew more about the dredging project than many of the outsiders expected, another one of our tasks was to understand how citizens learned about the project. When it comes to creating or understanding scientific data, citizens are at a disadvantage, but they respond to that problem in interesting ways. Groups such as the EPA and Corps have at their disposal equipment, methods, and personnel who know how to analyze data. Despite Fals-Borda's (1991) call for simpler, more accessible equipment and methods, some scientific and technological problems require sophisticated tools. Still, that does not mean that citizens in Harbor simply wait for some group to tell them what they "should know." Several of the

citizens with whom we worked have overcome this asymmetrical access to scientific equipment, methods, and personnel through critical reading, sharing knowledge, asking probing questions of outside parties (including TOSC), and even by gathering their own data.

During our visits, we found that several people read significant and varied amounts of scientific information. In a journal that she kept at our request, Barbara revealed her efforts to keep abreast of information relevant to the project. On one day, for instance, she read a report given to her by a "friendly board member" and her "usual three newspapers." Then she called a friend from the CEC "to get the latest news the papers don't carry." On other days, she reported filing clippings that she thought might be relevant to the CEC's efforts or that might be worth sharing at group meetings. She noted reading sources such as government reports, organizational bylaws, minutes of public meetings, and articles from the *Washington Post National Weekly*, the *Hoosier Environmental Council's Fall Monitor*, *Pediatrics*, and *Environmental Health Perspectives*. Although she reported that she seldom used the Internet, she did mention that she intended to use the Environmental Defense Fund Pollution Locator. (Typically, Barbara asked others to check the Internet for her.)

Another local citizen, Greg, also reported reading widely. But he revealed an approach slightly different from Barbara's. During an interview on March 5, 2004, Greg told us that he reads lots of government reports but gives most of his attention to the footnotes. He then finds and reads those citations to make sure that the conclusions and recommendations made in the original document are based on accurate interpretations of the reports mentioned in the footnotes. As he reads, Greg takes careful notes and photocopies pages that he wants to look at again. By doing so, he analyzes the accuracy of documents produced by the Corps and EPA.

For Barbara and Greg, reading is as much a civic obligation as an exercise in personal discovery. Barbara, who is retired, characterized her reading as a kind of duty to her fellow citizens: "I'm the one who does the reading because everyone else is working." In many cases, she writes summaries (usually one- or two-page documents) and sends them to others. She also reports on her reading at the beginning of the monthly CEC meetings. (Others also share what they have read at these meetings.) Barbara's summaries seem to be widely read because others often cite the same data, even the same language, when discussing the Harbor project. Like Barbara, Greg shares the results of his reading with others—sometimes by writing articles for local newspapers and at other times by circulating visually compelling fliers through the community. Unlike Barbara's widely read summaries, which look like they were produced on a typewriter, Greg's fliers reveal his sophisticated production values and access to desktop publishing software. The look of a handout is important to him. If it is well designed, he said, "it will look like it has truth to it."

Although computer use seemed relatively limited in Harbor, we did see at least one example of another citizen, Corey, sharing his reading with the community through a Web site. Corey wrote a long critique of an air-monitoring report produced by the Corps. The following excerpt from that report shows how he put the data in various contexts for lay readers:

NOTE THAT THE ACTUAL RECORDED DATA AS PROVIDED HEREIN IS HIGHER THAN THE MEDIAN DATA. In other words, the actual data is much worse than that data initially found by [us].

Corey attempted to compare the results of a Corps report to the Corps's and EPA's own standards. At other times, Corey added data that he thought was missing:

Data for category 3 are NOT found on the Corps' web site as they do not want this information out to the public, but was taken from a report of the US Public Information Research Group.

Likewise, on another page, he added health data from other sources to help make sense of the Corps's data: "Health data, which is referenced below this table, was **NOT** provided by the

Army Corps of Engineers." In other words, Corey compared data to thresholds that he considered relevant. If he did not trust the threshold given by the Corps, or if he could not find such a threshold given, he looked elsewhere.

As Corey, Barbara, and Greg have shown, some citizens in Harbor are willing to look elsewhere when they find a report to be inadequate or feel they need clarification. Barbara occasionally writes to the authors of reports that she reads. In her journal, for instance, Barbara mentioned calling on a sympathetic reporter from an area newspaper in order to find more information about the Children's Health Act. He sent an article to her. In another case, she reported that she and colleagues wanted to survey neighborhood residents in order to document incidences of cancer. Because they were not sure how to do that, Barbara wrote to the state department of health and also contacted an expert from a university in the state of New York whose name she had seen in an article.

Thus, citizens sometimes engage in their own primary research. When Barbara and several colleagues wanted to survey residents in a Harbor neighborhood in order to document incidences of cancer, they contacted several experts for advice on how to construct such a survey. Someone from the state department of health pointed them toward a state model that they then used as their study design. Armed with that advice, they created and administered the survey by going door to door to 500 homes, getting a 62% response. They claim to have located approximately 40 reported incidents of cancer among the 1,500 people they surveyed.

Much of the inventional work that we were able to see in Harbor is invisible to outsiders. And it is rarely accounted for in communication theories that address public deliberation, environmental communication, or risk communication. Perhaps some of the strongest deliverables we can offer in this report, then, are stories of how citizens keep abreast of technology and science, even though they lack access to research tools and methods, and what those stories can mean for people involved in action research or public deliberation.

## **Conclusion**

Ultimately, we came to understand that the focus of our work in this project was to support the inventional activities of the people with whom we worked—the associates of TOSC and the CEC, the community organization that TOSC (and we) worked with most closely. The claim that effective communication is elusive or that audience analysis, genre, communities, and stasis are important to good communicative practice is not news. What is news, however, is to articulate these claims in particular ways: Rhetorical performances (not limited to specific writing or speech acts) are a more powerful and fluid way to understand the use of professional and technical discourse; these performances are best understood as genres that are nested in complex, but comprehensible, institutional and community dynamics; and, to perform effectively, citizens must be able to invent new knowledge and communicate professionally.

In many ways, we met some of the action goals of this research project. As we developed our own communication strategy, we explicitly sought answers to questions such as these: How is an effective report to lay citizens worded and organized? What does a good meeting look like? What should it do? What relationship does the report have to the meeting? We then developed heuristics that we incorporated into TOSC's practices. For example, a good meeting would

- present "information we can digest." That is, the information presented would be free of terminology that some informants called "techno garble."
- present all sides of an issue. That is, the pros and cons would be presented as fairly as possible so that citizens could decide for themselves.
- lay all the cards on the table. That is, experts and government officials would be completely candid about what they know and do not know (the problem of how to handle uncertainty in wicked contexts) and about what issues would be difficult to know with

certainty even after much study. The explicit message from people in the community was "We'll find out anyway," so experts and officials should be honest up front.

- treat the audience like stakeholders who can influence outcomes.

Given these insights, we worked on new meeting and reporting tactics for TOSC to help it communicate in a way that was (a) different from past communication practices, (b) consistent with TOSC's best practices, yet (c) attentive to the ways in which organizations communicate within the community and prefer to be engaged by outsiders.

We also changed how TOSC wrote reports (through our presence in the writing process and our editorial work as reports neared the final stages), how TOSC distributed reports, and how public meetings were conducted in Harbor. Specifically, we made sure that TOSC reports foregrounded stases relevant to insiders, and, perhaps most important, we changed the way reports were presented to the community. In the past, citizens would be given the report at a meeting, and then the author would give a 30- to 40-minute presentation summarizing the report. We insisted on a new model. Knowing that groups such as CEC would circulate the report (and its own summaries), we asked that TOSC release the report to all stakeholders (including members of the Corps and EPA) 2 weeks in advance of a public meeting. At the meeting, the author was limited to 15 minutes in which to give a summary of the report. Then the citizens, who had been able to read it, would have ample time to ask questions. In other words, we created an event that enabled open-ended discussion based on data generated by one of TOSC's experts.

Readers of this article may well ask whether we were successful. We wish we could provide an unequivocal answer. Because the dredging and storage project is ongoing—has in fact been postponed—we cannot say whether we helped citizens articulate their concerns in a way that would result in the changes they desired. We can say, though, that we succeeded in several ways. For one, we have changed some of TOSC's communication practices—how they organize and distribute written reports and conduct public meetings. For another, we devised and followed a critical research process that served the communicative and inventional needs of the people with whom we worked. Through our work, we helped organize reports and meetings that left citizens expressing satisfaction rather than anger. Perhaps most compelling, while many others were dismissed as "bad neighbors," we found a way to work productively in that community for 3 years.

In terms of providing scientific and technical information, experts hired by TOSC provided answers to questions posed by citizens in Harbor. The experts did research for the citizens. In terms of discovering the best ways to communicate that knowledge, we conducted research with citizens, "helping the client," as Palmer and Killingsworth (2002) put it, "to ask the right questions and then setting out together to discover the best answers" (p. 393). Our experience leads us to claim that critical action research in professional and technical communication can provide valid and robust understandings of complex communication practices and tools for improving those practices. Supporting the work of others is a good ethos for professional communicators, and, we submit, it is a good ethos for professional communication researchers.

## Notes

1. All names of places and people in this article are pseudonyms, except for public institutions.

2. The Harbor project was a highly unusual project for TOSC because of the Corps's involvement, which significantly altered TOSC's typical approach. The Corps is a highly unresponsive and hierarchical agency with little history of public involvement. We found extreme levels of rancor between the Corps and the community and between the EPA and the community and instances of distrust and miscommunication between the agencies.

3. Because of the politically charged nature of the situation in Harbor, our research ethics and related institutional review board (IRB) procedures have been complex. For example, we requested and received permission to collect oral consent from study participants because we believed that individuals would not participate if they had to sign a document. According to our IRB contract, therefore, we are observing strict confidentiality, excluding from the references all citations what would identify the site. Much of this background information comes from local newspapers and interviews we conducted with local journalists, academics, government officials, and citizens. Later in the article, we cite texts written by citizens and experts as well as our own field notes. For more information about specific citations or study documentation and data, please contact us directly.

4. In constructing this example, we drew largely on newspaper reports and details from our own field notes. We also have a copy of the consultant's report. Again, given our ethical and contractual (IRB) commitments with respect to strict confidentiality, we cannot cite these sources in detail here.

5. Soon after this conversation, in the election that unseated the "Greek machine," the politician who became mayor, a Latino, vowed to break the machine. This touched off tensions between Latinos and African Americans in Harbor as power shifted in the community. The old machine did not function without significant support in both the Latino and African American communities, so the machine always crossed lines of race and ethnicity. In many ways, the machine was the most diverse institution in the community.

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### Figure 1

**The canal is a Y-shaped waterway that connects a river (bottom) to the harbor and one of the**

Great Lakes (upper right).

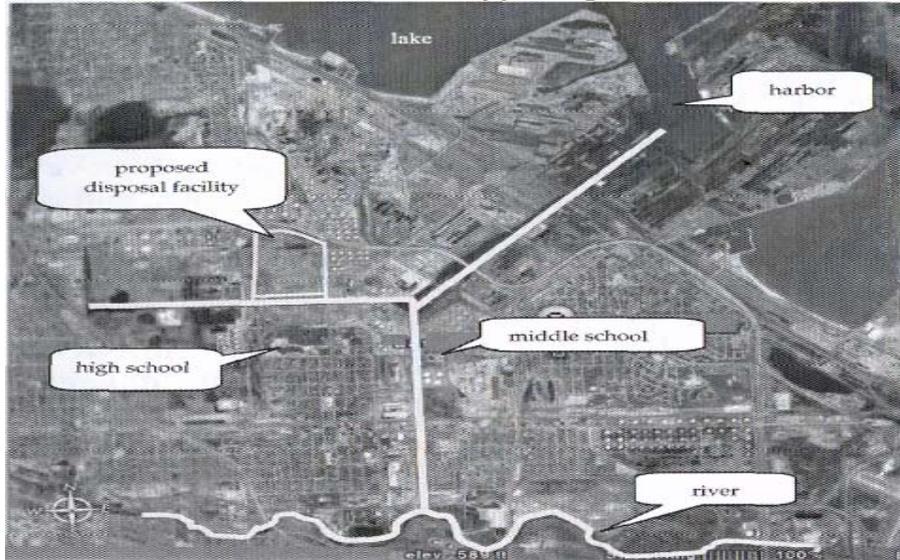
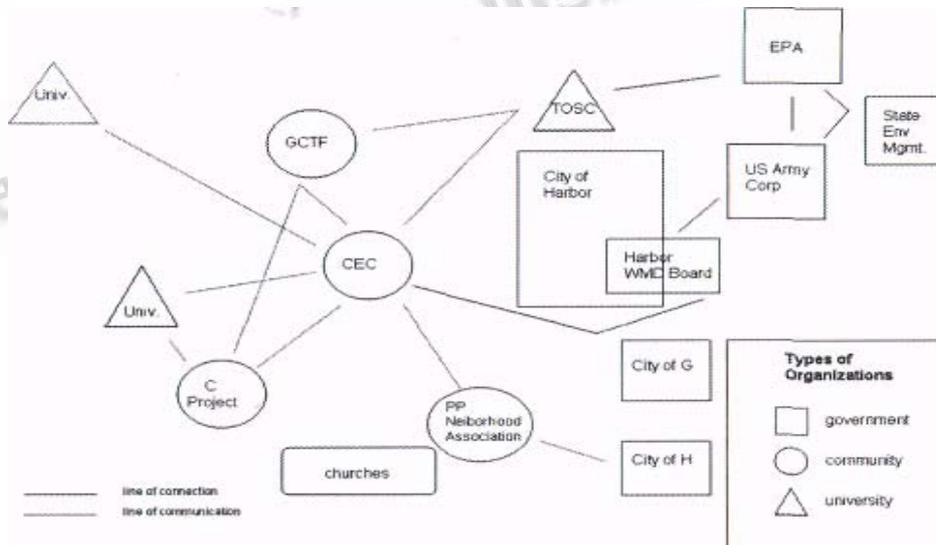


Figura 2  
What Is a Community?



Fonte: Journal of Business and Technical Communication, n. 3, p. 272-298, July 2008.