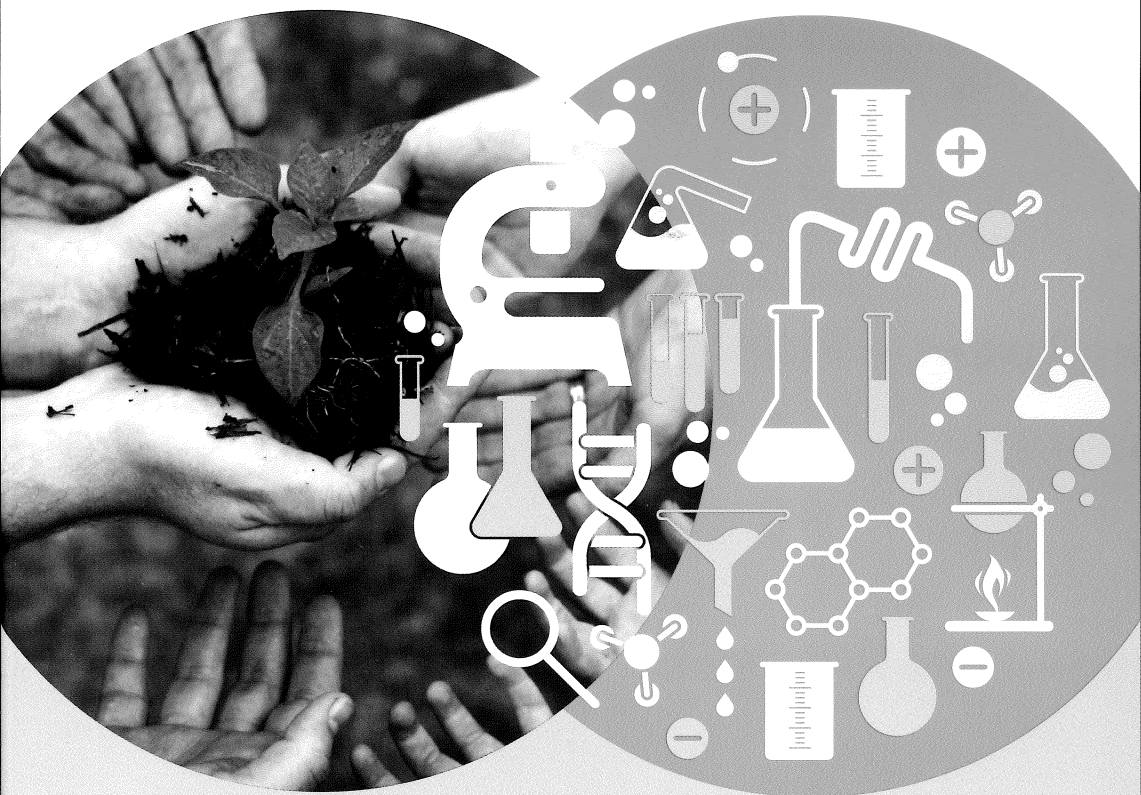


TECHNOSCIENCE AND ENVIRONMENTAL JUSTICE

EXPERT CULTURES IN A GRASSROOTS MOVEMENT



EDITED BY GWEN OTTINGER AND BENJAMIN R. COHEN

AFTERWORD BY KIM FORTUN

Invisible People, Invisible Risks: How Scientific Assessments of Environmental Health Risks Overlook Minorities—and How Community Participation Can Make Them Visible

Maria Powell and Jim Powell, with Ly V. Xiong, Kazoua Moua, Jody Schmitz, Benito Juarez Olivas, and VamMeej Yang

Minorities and lower-income people are more likely to be exposed to a variety of environmental health hazards than white people—indeed, this is the essence of environmental injustice (Bullard 2000; Harris and Harper 1998; Lopez 2002; Mohai and Bryant 1992). Scientific and government institutions play important roles in constructing what we know and do not know about environmental risk disparities, and the ways these “knowns” and “unknowns” in turn shape scientific, political, and public attention to environmental injustices (Kuehn 1996; Stocking 1998; Wynne 2001). Institutional risk-assessment and communication approaches, typically embedded in Western European-based scientific cultures, are often blind to race, class, and cultural risk contexts and inequities, thereby rendering them “invisible” (Harding 1998; Harris and Harper 1998).

History shows that it takes community-based engagement from outside mainstream academic and government institutions to make race, class, and cultural disparities more visible in institutional risk assessments and communications (Cole and Foster 2001; Corburn 2002; Fischer 2000). In this chapter, we describe our work with the Madison Environmental Justice Organization (MEJO) to make these disparities more visible in public health agency risk assessments related to subsistence fish consumption. We describe how knowledge and communication gaps related to fish consumption risks are created and ignored by the same institutions that have power and responsibility for addressing them. We also highlight the obstacles MEJO has faced in bringing these gaps to light in institutional risk assessments, including: societal deference to what is perceived as more “valid” risk assessments of institutional experts, the parallel belief that local knowledge and community-based knowledge about the risks are less “factual” and therefore not valid evidence, and systemic indifference

among institutional and political actors about class, race, and cultural contexts and how they are connected to environmental health risks.

While illustrating these obstacles, our engagement with government and academic institutions also reveals ways to overcome those barriers. By engaging diverse community members with institutional scientists in assessing and communicating fish consumption risks, we are bringing formerly overlooked knowledge and cultural perspectives of diverse people into institutional risk assessments, thereby creating productive ruptures in deeply ingrained institutional mindsets and scientific practices. The experiences of MEJO show that these ruptures, albeit incremental, are creating opportunities to slowly transform power relations among community members, scientists, and governmental institutions in ways that are bringing more attention to environmental health disparities in our community.

Our experiences suggest that institutional scientists can be personally transformed when they interact with people who have cultural backgrounds and experiences unlike their own. These interactions are encouraging some of these scientists to incorporate unique cultural and local knowledge of diverse community members into their technical risk assessments and communication strategies, in the process improving them substantially. Our projects, moreover, have demonstrated ways that power dynamics can be shifted in response to efforts of community activists working through institutional and political processes to push for change. In our case, MEJO has articulated race and class disparities in fish consumption risk assessments, gathered evidence on these disparities, and demanded through our empirical research and in public forums more power and voice in decision making on these issues. This is acting to prompt government scientists to work on improving environmental justice by supporting the evidence and proposals our group put forward and giving them their stamp of approval. Reporting from our perspective as participants in MEJO—in contrast to other cases in this book that analyze the intersection of scientific practice and environmental justice activity from the perspective of university-affiliated social scientists—our chapter documents how theoretically informed practitioners can help create ruptures in status quo scientific research, ruptures from which we hope to see new, more justice-based models in Madison grow.

Background: The Broader Regulatory and Legal Context of Fish Consumption and Environmental Justice

Subsistence fish consumption risks are unlike many environmental justice issues in that they involve risks related to activities people enjoy that can

provide something healthy and necessary—food (as opposed to toxic waste dumps imposed on low-income neighborhoods). In the United States and throughout the world, fishing is important for people from nearly all cultures and racial and ethnic backgrounds (Beehler, McGuinness, and Vena 2003; Harris and Harper 1997; Whaley and Bresette 1994). Unfortunately, fish are contaminated with mercury, polychlorinated biphenyls (PCBs), and many other contaminants associated with reproductive, neurological, immune system, and developmental problems. Potential adverse effects are even more pronounced in children of mothers who eat fish during pregnancy (Buck et al. 2000; Jacobson and Jacobson 1996; Schantz et al. 2001).

Certain minority groups and poor people in the United States are more likely than others to rely on self-caught fish as a food source and therefore are more at risk from exposure to fish toxins (Burger and Gochfield 2006; Harris and Harper 1997; McGraw and Waller 2009; Schantz et al. 2001; Weintraub and Birnbaum 2008). Unfortunately, for a variety of reasons, these groups are also less likely to get the fish advisory information issued by state and local agencies and other organizations (Burger and Gochfield 2006; Powell 2004; Powell et al. 2007; Steenport et al. 2000).

Producing more data on race- and class-based fish consumption and communication disparities has been recognized as a critical environmental justice issue at the federal level for over a decade. President Clinton's 1994 executive order, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," includes specific requirements related to fish consumption:

Section 4-4 (Subsistence Consumption of Fish and Wildlife): In order to assist in identifying the need for ensuring protection of populations with differential patterns of subsistence consumption of fish and wildlife, Federal agencies, whenever practicable and appropriate, shall collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. Federal agencies shall communicate to the public the risks of those consumption patterns. (Clinton 1994)

Recognizing the importance of comprehensive fish consumption information for all populations in order to do appropriate risk assessments and fish advisories, the U.S. Environmental Protection Agency (USEPA) issued the *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories*. This document stresses that "selecting appropriate population exposure data is critical in both risk estimation and in fish advisory program planning" (USEPA 2000b, B-3), and that subsistence angling groups face potentially higher risks because of their higher

consumption rates and “are at greater risk than the general population if their consumption is underestimated” (USEPA 2000b, B-3).

Executive orders and federal agency guidance documents notwithstanding, political priorities, policy decisions, and a plethora of technical and practical issues determine what kinds of monitoring and exposure data are actually gathered (Daughton 2001; Hess 2007; Kuehn 1996). Environmental media (water, air, soils, etc.), fish, and human exposure monitoring are typically responsibilities charged to state and local agencies under federal law. Monitoring is very expensive and time intensive. Unless these agencies have funding—along with political support, staff, and other resources necessary to do it—it will not happen. Unfortunately, the majority of fish and waterways in the United States are not monitored for synthetic toxins and, when they are, only one or two contaminants are usually assessed (Daughton 2001; Rosenbaum 2008).

Fish consumption data are even sparser. In addition, most consumption surveys to date do not include subsistence angling groups and/or racial/ethnic minority groups that are known to consume a lot of fish; most focus on sport anglers through fishing-license records (USEPA 2000b). This lack of data makes it difficult, if not impossible, to adequately assess risk related to fish consumption and to know which fishing groups should be priorities as far as communicating language and culturally appropriate fish advisory information.

As with monitoring fish and environmental media, assessing fish consumption levels often falls to state and local agencies that lack adequate resources and that are already overwhelmed by numerous other responsibilities (also see Hoffmann, chapter 2, this volume). Indeed, the EPA’s fish risk-assessment document cited above suggests that “whenever possible, state agencies should conduct local surveys to obtain information on consumption patterns,” but then qualifies the suggestion by noting that “the time and resources required to conduct onsite surveys . . . can be prohibitive” (USEPA 2000b, B-3). The document cautions, moreover, that surveys based on only those with licenses often underestimate consumption rates in some important fishing subgroups.

The EPA fish risk-assessment document, interestingly, suggests using qualitative, community-based strategies to get information about subgroups that are missing from standard consumption surveys. For example, it recommends that “anecdotal information is vital in directing the search for data on fish consumption patterns” (USEPA 2000b, B-5). For learning about specific locations where ethnic groups fish and/or for better

estimates of consumption occurring via less direct or culturally specific routes (e.g., “informal” selling of fish, eating fish organs not typically consumed by European Americans, specialized cooking methods for ethnic recipes or rituals, etc.), it suggests that information be “acquired through informal discussions with local community groups in areas of potential exposures” (USEPA 2000b, B-6). Moreover, in describing potential strategies to learn about these issues and/or to reach important fishing subgroups, the document notes: “It may be most useful to enlist the help of local agencies or community groups to help access some of the subpopulations at high risk, such as urban-low-income populations or individuals of a particular ethnicity” (USEPA 2000b, B-8).

In sum, while fish consumption disparities are recognized as critical risk-assessment and environmental justice issues by federal agencies, in reality the local and state agencies that are in a place to gather more data to address and reduce these disparities are underfunded, understaffed, and often cannot reach racial and ethnic subsistence groups for a variety of other reasons. (Clinton’s executive order, in other words, is a classic “unfunded mandate.”) The EPA fish risk-assessment document suggests working with community groups to address these important gaps, because they are barriers to comprehensive risk assessments and fish advisory communications.

Our work engaging diverse community members with government agencies in addressing fish consumption risk disparities illustrates some of the concrete challenges in taking the steps mandated by Clinton’s executive order and recommended by the EPA. Further, our projects reveal several deeper and more pernicious obstacles to bringing race and class risk disparities in fish consumption patterns to light—especially when these efforts are initiated by the community, *uninvited* by government agencies and institutions. At the same time, our case illustrates the opportunities and positive transformations that can be produced by creating ruptures in institutional cultures and scientific practices that are unlikely to be created in any other way.

Environmental Contamination and Subsistence Fishing in Madison, Wisconsin

Madison, the state capital of Wisconsin, has a population of about 220,000 people. It is the home of the University of Wisconsin–Madison, several other colleges, state government agencies, and cutting-edge biotech companies. It is a predominantly white, educated, middle- to

upper-class community, and not typically viewed as a city with significant race and class problems. In recent years, however, growing numbers of Latino, Hmong, and African Americans have been moving to the city. These demographic changes have created increasing racial and socioeconomic disparities in Madison. A recent report, for example, states that although Madison residents “are more affluent . . . and better educated than their national counterparts, African American residents do not fully share this prosperity . . . and are significantly worse than the larger community in five leading indicators” (State of Black Madison Coalition 2008, v).

On the environmental front, Madison is renowned as a beautiful and “green” city. It is built around several freshwater lakes, called the Yahara Lakes. The Yahara Lakes have been central themes in the Madison area physically, culturally, and economically since the founding of the city in the mid-1800s, when the Ho Chunk (also called Winnebago) subsisted on abundant wild rice and fish from the lakes. Currently, the lakes are extremely popular for nearly all water sports, and are heavily and visibly fished by thousands of recreational and subsistence anglers from Madison and throughout the region.

In recent decades, however, several environmental problems similar to those of larger urban areas have been growing in Madison as the city’s population has grown. The air quality is deteriorating to the point that Madison is close to being listed as a nonattainment area for particulate matter by the USEPA (USEPA 2006b; USEPA 2008) and asthma rates are among the highest in the nation (Warner 2004). Water quality in the lakes is worsening significantly as Madison grows, with fairly serious eutrophication problems from increased runoff and nutrient inputs.

Founded in this setting, the Madison Environmental Justice Organization (MEJO) is a small nonprofit, multicultural community organization that aims to combat environmental injustices in Madison by organizing the people facing environmental health risks to create capacity and leadership for change. One of MEJO’s focal projects in recent years has been to work collectively with subsistence anglers, their families, and others who are concerned about fish toxins and water pollution to build awareness of fish advisories, and ultimately to reduce toxins in Madison lakes and fish so future generations can eat local fish without worrying about toxins. As part of its activities, MEJO involved people in research and discussion that offered alternatives to the conventional, government agency-related practices of risk assessment described above—creating a contrast between “street science” and “regulatory science”

akin to that documented by Liévanos, London, and Sze (chapter 8, this volume).

MEJO formed when coauthor Maria Powell met Jody Schmitz, the food pantry coordinator at a subsidized housing complex in our neighborhood where many Hmong and other minority families live and regularly fish for food. Powell had recently completed a dissertation on fish consumption risk issues (Powell 2004), and fish contamination was a personal issue for her because she had grown up in Green Bay, Wisconsin, on the Fox River—a Superfund site (due to high levels of PCBs in water and fish). Schmitz was concerned that the people she served in her food pantry were eating a lot of local fish and did not know about fish advisories. Along with Schmitz and Powell, VamMeej Yang (Hmong Outreach Coordinator at the housing complex), Kazoua Moua (UW-Extension Hmong nutrition educator), and coauthor Jim Powell (community organizer) decided to organize to collectively address this issue. The group grew to include a diverse group of anglers and community members (Hmong, African-American, European-American, Chinese-American, and Latino), and we eventually decided to call ourselves MEJO. In 2007, MEJO received a small two-year U.S. EPA environmental justice grant to build community capacity to improve water quality issues through collective organizing, data gathering, and working with public agencies and university scientists. Ly Xiong was hired as the group’s Hmong outreach coordinator.

MEJO’s organizing is not part of any formal research project. Like participatory action research, our work aims to collaborate with community members in addressing community problems in what we decide together is a desirable direction (Gilmore, Krantz, and Ramirez 1986; O’Brien 2001). One key premise of our work is that all the community members we work with bring important knowledge to the organizing; another is that incorporating their perspectives and cultures will lead to more diverse and improved solutions to the issues we address. Each board member has experience and expertise critical to the work we do—including organizing, angling, fish consumption risks, cultural issues, languages, and more.

Minding the Gaps in Fish Toxins, Consumption, and Health Advisories

MEJO has worked to address problems in a community-based manner for Madison’s growing minority populations, for whom fish are often important food sources: MEJO’s surveys, meetings, and focus groups

found that minority and poor anglers in the Madison area are likely to eat more fish than white anglers, making worsening environmental quality a particular threat to these groups. In addition, most of these subsistence anglers are not aware of fish advisories that would warn them about the risks of consuming fish from Madison's polluted waterways. In our work to assess and prevent disproportionate fish consumption risks to Madison subsistence anglers, we have encountered several critical "knowledge gaps" that need to be addressed (Frickel 2008):

- Gaps in data about toxins in Madison lakes' fish, especially the levels and kinds of toxins in particular species of fish
- Gaps in knowledge about fish consumption levels (i.e., what kind and how much fish people eat), body burdens, and potential health effects
- Gaps in communication and in knowledge about who fish advisories are reaching

Like other instances of "undone science" (Hess 2007; Frickel et al. 2010), these gaps are created by a variety of cultural and institutional factors (discussed further below) that ultimately stand as obstacles to environmental justice. Our projects bring together cultural knowledges and experiences to overcome those obstacles. The organization was founded on the belief that the best way to identify and fill risk data and communication gaps most relevant to the community is to involve community members in risk assessments and communications via collective organizing and collaborations with scientists, government, and other key actors (Brown 1992; Fischer 2000).

Madison Fish Toxin Data Gaps

Official agencies have little data on levels of toxins in Madison lake sediments, water, and fish. Figure 6.1 outlines gaps in fish toxin data. These lacunae are somewhat odd, given that Yahara Lakes are often touted as the "most studied in the world" because of the attention they have received from University of Wisconsin water science researchers. Government agencies in Madison and the University of Wisconsin are closely intertwined; many scientists who work in environmental and health-related government agencies have graduate degrees from UW and/or are adjunct faculty there, and many university scientists serve on local, county, and state commissions related to environmental and public health issues. Government agencies in Madison often take their cues about environmental and public health issues from UW scientists and

	Mercury*	PCBs*	PBDEs	PAHs	Lead	Copper	Arsenic	Cadmium	Chlordane	Pesticide(s)	Pharmaceuticals	Other toxins	# of fish tested	# types of fish	Year(s) collected
Y = Data exists for this toxin															
BLANK = No data exists for this toxin															
Lake Monona	Y	Y							Y	Y			139	11	1985-2006
Lake Wingra	Y											Y	21**	5	1986-2004
Sugar River-Lake Belle View	Y	Y							Y	Y			13	4	1988-2004
Badfish Creek	Y	Y	Y#						Y				32	5	1990-2003
Token Creek-Rearing Pond	Y	Y											3	1	2003
Lake Mendota	Y	Y							Y	Y		Y	129	7	1983-2002
Lake Waubesa	Y	Y											69***	7	1976-2002
Yahara River-Downstream of Dunkirk	Y	Y											1	1	2001
Yahara River-Downstream of Lake Kegonsa	Y	Y											7	2	2001
Nevin Hatchery		Y										Y	10	1	2000
Crystal Lake	Y												10	1	1999
Lake Kegonsa	Y	Y											38	7	1976-1991
Yahara River-Below Stoughton	Y	Y			Y+	Y+	Y+	Y+				Y+	6	3	1991
Coliseum Ponds	Y	Y			Y	Y	Y	Y	Y	Y		Y	25	3	1990
Starkweather Creek	Y	Y											7	1	1990
Warner Park Lagoon	Y	Y							Y	Y		Y	8	3	1989
Graber Pond		Y							Y	Y			10	2	1989
Black Earth Creek		Y							Y	Y		Y	9	1	1988
Fish Lake Y	Y												14	3	1988
Grass Lake		Y											99++	1	1985
Nine Springs Creek		Y											17	1	1983
*For many samples, not all fish tested for this toxin													478		Fish tested over a 32-year period
**For 6 fish, only mercury tested															
#Only 2 fish tested for this toxin															= No data exists for this toxin
***For 41 fish, only mercury tested															= 10 or fewer fish ever tested for this body of water
+Only 2 fish tested for these toxins															= 5 or fewer kinds of fish ever tested for this body of water
++Only minnows tested															= Fish last tested before 2000

Figure 6.1

rely on their research to understand these issues—and this is especially true in regard to Madison lakes. Although recently a small group of graduate students studied toxins in sediments in a small area of one Madison lake (see below), we could not locate any University of Wisconsin research done in recent decades on levels of toxins in Madison fish (or people who eat fish).

A common reason offered by government agencies and university researchers for the lack of fish toxin data is that Madison lakes are not contaminated enough to be of concern for fish consumers, and that other areas (such as Superfund sites in Green Bay and Milwaukee) are far worse and should be priorities. However, Madison lakes (like all Wisconsin lakes) have been under fish advisory for mercury since 1983. The relatively few fish tested by the Wisconsin Department of Natural Resources (WIDNR) fall into ranges similar to fish in most United States freshwaters for mercury—0.12 to 0.47 ppm (USEPA 2000b). Madison panfish tend to be at the lower end of this range, while larger fish (bass, walleye, pike) tend to be at the higher end. For most fish in this range, consumers (especially women of childbearing age and children) should to some extent limit consumption to two to four fish per month. Some of the larger fish tested by the DNR had above 0.47 ppm mercury, and at this level, people are advised to eat no more than one fish meal per month.

Levels of PCBs in Madison lake sediments and fish are also well within the range in which people should carefully follow advisories. The Madison fish tested ranged from 0.05 to 0.46 ppm PCBs, and some fish had levels higher than this. The EPA recommends that to avoid “non-cancer endpoints” (immune, reproductive, neurological problems), people should consume no more than half a fish per month with 0.19 to 0.39 ppm PCBs and no fish over 0.39 ppm PCBs. To avoid “cancer endpoints,” the EPA recommends that people eat no fish that contain over 0.097 ppm PCBs, and only half a fish per month in the 0.048 to 0.097 ppm range—which would include all the fish tested in the Madison lakes (USEPA 2000b).

While these limited data suggest that levels of mercury and PCBs in some Madison fish are definitely high enough that fish consumers—especially sensitive populations—should restrict or avoid consumption, so few fish have been tested in the Madison lakes that it is difficult to adequately assess health risks to individuals who regularly eat this fish, or understand the scope of any health effects that might result from this consumption. Most contaminants other than PCBs and mercury have only been monitored in a few fish or are not monitored at all.

Raising some further red flags, a very popular fishing spot for subsistence anglers in the center of Madison, Monona Bay, was identified in 1987 by the DNR as a mercury and PCB “hotspot,” and a later DNR report recommended more comprehensive testing of fish and sediments in that area to better inform fish advisories (WIDNR 2001). A small 2006 University of Wisconsin graduate student team project confirmed that Monona Bay is indeed a “hotspot” with several contaminants, including mercury, PCBs, polycyclic aromatic hydrocarbons (PAHs), arsenic, lead, copper, and zinc at high levels in sediment cores. Yet because there has been almost no testing of fish in Monona Bay, we do not know whether these sediment contaminants are accumulating in fish that anglers and their families consume.

Fish Consumption and Body-Burden Data Gaps

In addition to knowing what levels of contaminants are in fish, as the EPA’s guidance document stresses, risk assessors need to know how much fish people actually eat and what levels of contaminants end up in their bodies. Only one very limited (and now outdated) study attempted to assess fish consumption levels among Madison subsistence fish consumers and subsequent hair mercury levels. In 1989, responding to questions raised by the Yahara Green Action Group, the Madison Department of Public Health (DPH—now a merged city-county department called Public Health Madison Dane County or PHMDC) surveyed 197 people (88 white, 68 Asian, and 41 African American) about their fish consumption levels and tested blood mercury levels of those who were willing.

The DPH study, published in 1991, was framed by the assumption that only very large fish in Madison lakes (like walleyes) would be of any concern—an assumption that was outdated a few years later when the safe tissue limit for mercury was revised from 0.5 to 0.05 ppm (National Research Council 2000). The DPH study was methodologically insufficient on a number of levels. Teenagers were hired and paid a commission to do surveys among “low income and refugees” (not defined), and it was later discovered that they “invented” some results. Only 27 of the survey participants volunteered to give blood for mercury testing, and they were not the participants who consumed the most fish. Based on blood from these 27 volunteers, the analyses found “no clear relationship between mercury blood levels and the number of sport-caught fish meals eaten per month,” although three individuals had elevated levels of mercury in their blood. No race, class, or gender information about the hair sample volunteers was reported.

In conclusion, the DPH report recommended “follow-up testing and investigation on those individuals who exhibited elevated blood mercury” and continued evaluation of levels of mercury and other contaminants in area lakes and fish to “determine the need for future programming for high fish consuming groups.” The recommendations were never followed, and in our experience of the past few years we would sometimes find this flawed study cited by public health officials as the basis for the premise that Madison subsistence anglers face minimal risks.

Communication Gaps: Fish Advisories and Media Coverage

Communication about risks with the people who are most vulnerable to them is a critical component of working toward environmental justice, yet this has not been pursued by Wisconsin state agencies with an eye toward those underrepresented populations. Such communication, though, plays a critical role in technical risk assessments in several ways. In the case of fish consumption, if subsistence anglers are not aware of risks related to eating fish, they are not likely to engage with community organizations or institutions working to understand and address them. Effective, inclusive engagement with anglers from diverse backgrounds, in turn, requires knowing about and respecting their knowledge about the physical, cultural contexts of fishing and fish consumption in their communities. Two-way communication with the most at-risk communities is necessary for accounting for the knowledge and perspectives of marginal populations in the risk-assessment process. It is also necessary for achieving the political solutions to address the risks so as to avoid further perpetuating gaps and disparities in risk assessments and communications.

Environmental and public health agencies in the United States and in the Midwest have issued fish advisories for many years (Tilden et al. 1997). These provide one way to reach fish consumers about risks related to eating fish and to offer advice about how much fish can be safely consumed. Unfortunately, studies indicate that fish consumption advisories tend not to reach the most vulnerable anglers and their families—particularly poor, minority, subsistence anglers (Burger and Gochfield 2006; Powell 2004; Powell et al. 2007; Steenport et al. 2000). These studies argue that one reason official advisories fail is because they are based on one-way communication approaches that do not take into account the diverse cultures, contexts, languages, and perspectives of the fish consumers they are trying to reach.

Language and translation are also important issues. Although both the Wisconsin Department of Health Services (DHS) and the DNR create

fish advisories, only the DHS materials are translated into Hmong and Spanish. The DNR issues 1.6 million fishing licenses annually, but only prints 40,000 fish advisory booklets (all in English) (Schrank 2008). At the time MEJO's projects were initiated, there were no fish advisory signs along local waterways, including very popular shore angling spots in the middle of the city. None of the community members MEJO has worked with to date had seen agency advisories before MEJO brought them to community meetings; many expressed anger about not receiving fish advisories and said they would like translated advisory signs posted at shoreline fishing spots.

Mass media also play important roles building anglers' and the broader community's awareness of fish consumption risks and the political will to address them (Allen 2003; Burger 2000). In part reflecting local institutions' lack of attention to toxins in Madison lakes and fish, these issues have not been priorities for local media. Although declining water quality in Madison lakes has been a frequent theme of local media stories in recent decades, from 1989 to 2008 only 4 percent of 222 articles in the two local daily newspapers that were about the water quality of Madison lakes referred to toxins other than those associated with increasing nutrient loads in the lakes. Interestingly, one article in the early 1990s reported mercury levels in two local lakes as “among the highest in Wisconsin” (Associated Press 1990), while another a decade later reported that “fish [in these lakes] still don't get a clean bill of health” (Balousek 2000). The issue was not reported in the media after that. Mercury policy issues were periodically covered by local print media (186 articles from 1989 to 2008, per Lexis-Nexis database search), but only five articles during this time period connected mercury to locally caught fish and public health. All of those articles, in fact, were reporting on MEJO activities and were prompted by MEJO press releases (Weier 2006; Balousek 2008; Cullen 2008; Schneider 2008a, 2008b). Discussions about contaminants measured in Madison lakes and fish, moreover, have not entered into recent relatively high profile civic dialogs about “cleaning up the lakes”; the focus is on further reducing agricultural and construction runoff.

Participatory Research and the Madison Environmental Justice Organization (MEJO)

MEJO has been working to fill key fish consumption risk data gaps and to address environmental risk injustices by organizing with affected

communities and doing community-based research. We organized community meetings and events to build community awareness of fish consumption, hear anglers' and other community members' perspectives on water quality issues, and engage community members in addressing them with us. In its first two years (2006–2008), MEJO held over thirty group meetings, organized ten “Let’s Talk Fish” meetings, and held eleven public outreach events. MEJO has presented at several conferences, including the 2006 “Finding Solutions to the Global Mercury Crisis,” an international conference in Madison concurrent with the Eighth International Mercury as Global Pollutant conference. MEJO members presented an outdoor workshop, “Minority Angling in Urban America,” at Monona Bay during the conference, where sixty participants (including scientists from both conferences) ate a traditional Hmong fish dinner cooked by community members. Leaders in the group have organized more than ten meetings with MEJO members and public agency representatives and political officials. Our members and student volunteers have surveyed more than 275 people, primarily lower-income and minorities, about fish consumption and advisories in parks, along shorelines, in food pantries, at public meetings and events, and door to door. Of these activities, we elaborate on two—fish consumption surveys and the “Let’s Talk Fish” events noted above—developed to fill risk data gaps and address environmental injustice,

The fish consumption surveys have been built as a participatory community-based data-gathering project. For several years, to fill a key data gap not being filled by institutions, MEJO members and volunteers have surveyed Hmong, Latino, African-American, and other anglers, gathering data about the kinds of fish they catch, buy, and eat, where they fish, how they prepare it, and how much they eat weekly. All of MEJO’s surveys and most outreach materials are translated into Hmong and Spanish. MEJO members survey people in person at community meetings and events, at local food pantries, at local parks, and shoreline fishing locations.

MEJO members completed more than 125 fish consumption surveys, primarily among minority and/or low-income anglers (Powell and Powell 2008). Our data show that the levels of fish consumption among some minority, poor, and subsistence anglers range much higher than advisories recommend. Many minority survey respondents to date, for example, have reported eating fish every day or several times a week (recall that most Madison fish fall within two to four meals per month). Contrary to the assumptions of agency officials, a considerable portion of these

anglers are not strictly eating panfish and other smaller, less contaminated fish. Many report regularly eating bass, carp, catfish, buffalo, walleye, and other larger fish that tend to have higher levels of mercury, PCBs, and other contaminants.

These results illustrated to us how important it is to assess *actual* fish consumption among specific groups and not assess risks based on averages or assumed fish consumption levels. Some groups eat far more than average. If risk assessors do not know the *range* of fish consumption among different anglers, they cannot identify those most at risk, communicate with them about ways to reduce or avoid these risks, or involve them in decisions about how to best address them (Burger and Gochfield 2006; Kuehn 1996).

Public health officials, to our surprise, are asking to see our data. Some have admitted that this is the only data they have on fish consumption in Madison. Further, the results of our data gathering motivated a DHS hair testing project at a community center. In a very small sample (ten people), hair mercury levels above the recommended limit were found in three minority subsistence anglers. MEJO is working with the health department and public health nurses to arrange to have further hair testing done in culturally acceptable ways. Akin to the report-back models pioneered by Rachel Morello-Frosch, Phil Brown, and their team of researchers (chapter 4, this volume) with respect to biomonitoring, MEJO plans to help agencies communicate hair mercury results sensitively and in the appropriate languages.

MEJO’s collective work is also contributing to institutional fish risk assessments in ways beyond providing technical data, which, as the 2000 EPA document recognizes, is not enough to address risks and risk disparities comprehensively or appropriately. At ongoing community meetings, translated into Spanish and Hmong by MEJO members, we exchange stories about fishing and eating fish with anglers and their families. These informal conversations build trust and relationships with these communities, and also provide invaluable knowledge about cultural contexts of fishing and fish consumption. The exchanges are multidirectional; MEJO members from all backgrounds (including European-American) also share their fishing stories and cultures with community attendees.

In “Let’s Talk Fish” meetings, for example, Hmong community members share stories about fishing in the high mountain streams of Laos and their pleasure in coming to Madison and finding many lakes and rivers with good fishing. Recent immigrants describe their adjustment to different styles of fish and fishing in Madison lakes versus high mountain

Laotian streams, and talk about Wisconsin fish that are similar to those caught in Laos. The meetings are also a space to share recipes, cooking styles, fishing stories, favorite fish, and whatever else people want to talk about related to fishing. Meetings include meals and are loud and lively social events, with lots of laughter and many children.

These interactions provide critical insights about cultural traditions and social contexts related to fish consumption that are unknown or overlooked in standard risk assessments about fish consumption among minority and poor communities. Most importantly, insights gained in these conversations further underscore how averages of population behaviors and lifestyles can erase particular needs of underrepresented and marginal populations, countering institutional risk-assessment assumptions that everyone behaves, eats, and communicates in the same manner (or like Midwestern Caucasians). For example, it is common for Hmong to eat the whole fish (sometimes including organs) in stews and soups and in certain cultural ceremonies. This is relevant for risk assessments because of biological considerations with regard to the distribution of contaminants in fish: some fish contaminants are more concentrated in certain parts of the fish than others. For instance, mercury concentrates in muscles and organs while PCBs concentrate in fat and skin. Assuming that people fillet fish and/or remove the skin, as is more common among European-American consumers (and recommended in advisories), likely underestimates the levels of contaminants potentially ingested in a fish meal.

MEJO also learned by talking with Hmong and African-American anglers that favorite types of fish among these groups are not listed on advisories. White bass, a favorite Hmong fish, and catfish, a popular African-American choice, are not listed. These omissions are problematic because white bass can have higher mercury levels, and catfish are likely to have more PCBs than other species. The brochure designers apparently assumed that these species are not frequently consumed and, having limited space, did not include them on advisories. This is a critical gap for people who eat these fish regularly, and would not have been brought to agency's attention without MEJO's work with Hmong and African-American anglers.

Through on-the-ground organizing and action with MEJO, we continue to learn a great deal about the cultural, socioeconomic, and physical-environmental aspects of fishing among different cultures, such as where, when, and why people from different backgrounds fish. Speaking with anglers along the shores of Madison lakes over the years, for

example, MEJO members have learned that many African Americans drive several times a week from the inner city of Milwaukee to fish at publicly accessible spots in downtown Madison. These anglers, some of whom use fishing styles and traditions brought from the South, carry buckets of fish back to Milwaukee in their car trunks to share with friends and family there. Some of the fishers explained that they do not fish in lakes closer to Milwaukee because they are concerned about the racism in these communities. In 2005, for example, an African-American angler and his family were threatened with a gun and racial epithets by the fire chief and a firefighter in a community outside of Milwaukee while fishing there (Doerge 2006; Kane 2005). In addition to the community-building exchanges that resulted from the "Let's Talk Fish" forums, this is one of many stories that frame the cultural views of underrepresented populations; these stories are important for risk assessment because they help risk assessors and communicators understand the sociocultural contexts in which people fish.

Government Institutional Cultures, Scientists' Choices, and Fish Risk Data Gaps

MEJO's participatory methods suggest the possibility of creating knowledge about fish consumption and fish advisories that can address the gaps that currently plague regulatory agency practices. Yet MEJO's research and organizing work have found that understanding and communicating risks to minority and poor subsistence anglers who fish from local lakes have not been priorities for government agencies and academics in Madison, despite the numerous political and scientific resources in this community.

The choices that actors at local and state levels—including individual scientists—make about what environmental health issues to study and act on, given political and funding constraints, are not deliberately ill-intentioned. Rather, they are rooted in long-standing political and socio-cultural values that shape institutional priorities; the government cultures provide the range of options available to the scientists. The individual actors, that is, work within deeper institutional structures of scientific research, with values so pervasive that they are as invisible as the minorities and poor they make invisible. Our work adds to EJ discussions about structural forms of injustice to suggest that institutional and cultural factors shape data and communication gaps in Madison through at least two avenues: (1) the fact that many scientists and key actors within

government and academic institutions are not aware of and/or do not understand race and class disparities in environmental health risks, so they are invisible in their research and risk-assessment and communication strategies (a form of invisibility that resonates with the case Liévanos, London, and Sze -present in chapter 8 of this book when discussing California's Department of Pesticide Regulation); and (2) the dominance of and deference to institutional scientific risk assessments, and parallel discounting of community members' localized, contextual knowledge and experiences related to the risks. Combined, these factors exacerbate data gaps by creating chicken-egg problems: no toxin data, hence no risk, and no risk, so no need to get more data. They also constitute important obstacles to MEJO's efforts to advance participatory, culturally sensitive approaches to risk assessment, as evidenced by the examples discussed below.

Invisibility of Race and Class Contexts

How can very visible minority anglers be so "invisible" to academic and government scientists and officials? Many minorities fish daily from highly visible shoreline spots in Madison, just blocks from government agencies responsible for fish risk assessments and advisories. When asked why there are not more data on fish contaminants or consumption levels among Madison anglers, a common answer from government scientists we found was that "nobody eats very much of the fish" and/or "they only eat the small fish." Yet there is little evidence for these assumptions.

MEJO's interactions with agency and academic actors suggest that the apparent invisibility of these anglers is rooted in deep institutional "blindness" to Madison's race and class disparities, as well as to the diverse cultures and contexts of nonwhite people in the community. Government institutional cultures, we found, do not "see" minorities and poor for reasons that mimic long-standing patterns of institutional racism in the United States.

MEJO's efforts to convince local and state agencies to post shoreline fish advisory signs illustrate the blindness to race and class disparities among institutional risk-assessment professionals. In 2006, for example, MEJO attended a county Lakes & Watershed Commission meeting to ask for advisory signs along Monona Bay. Although we asked for Hmong translation well before the meeting and it is required by law, it was not provided. At the meeting, a Hmong MEJO cofounder testified on behalf of his community, saying that they would like fish advisory signs in

Hmong along Monona Bay, where many Hmong fish. Other MEJO members asked for signs along popular shore fishing spots in English, Hmong, and Spanish. The commission chairperson proposed a working group to develop a protocol for posting signs (Novak 2006).

Months passed, and after repeated MEJO queries, county officials attempted to convene the working group, which was to include several agency public health officials and a MEJO representative. The MEJO representative suggested that some minorities from outside of government agencies be included in the working group, perhaps anglers and/or leaders of minority health groups. She argued that including people of color on the task force would be the best way to bring their perspectives into the discussions about what should be on the signs and where they should be, and would consequently greatly improve fish communications with minority anglers in the future. The commission chairperson, however, was firm, saying that no one else could join the working group because the membership "was set." In the end, the group never met. The chairperson's refusal to diversify the working group suggests that county officials did not understand the contributions of people of color to be valuable or necessary to deliberations over fish advisories.

One year later, a county supervisor, the only person of color on the county board, contacted MEJO after seeing an article about our work in a local minority paper by one of our volunteers. That supervisor expressed interest in submitting a county resolution to install fish advisory signs. With MEJO members, the supervisor cowrote a resolution that described disparities in fish consumption and advisory awareness and required the county to place advisory signs in Spanish, English, and Hmong at popular shore fishing spots. The resolution also required that in developing the signs, agency officials work with environmental justice organizations and communities of color to determine where to post the signs and what should be on them.

The county officials' reception of the resolution further illustrates the problem of invisibility in risk-assessment and communication practices. In this case, shortly after the supervisor introduced the resolution, county agency staff drafted a substitute resolution that removed almost all of the original language (374 of the original 426 words). Their resolution removed the terms *minority*, *low-income*, and *of color*, plus all the text about data gaps and unknowns, and replaced them with text from general state fish advisories. Moreover, the substitute resolution significantly weakened the action items in the original resolution (see appendix I).

Weeks later, at another Watershed Commission meeting, both the original and the substitute resolutions were debated. Several MEJO members testified, including a Mexican-American angler who spoke about Latino cultural perspectives on fishing and lack of awareness about fish advisories in his community. Other MEJO members highlighted studies around the country that demonstrate race and class disparities in fish consumption and advisory awareness.

After hearing these impassioned testimonies, commissioners discussed whether to adopt the substitute amendment or keep the original. During this discussion, a member of the commission who is an emeritus professor, an internationally renowned limnologist, and a local watershed authority said he favored the substitute resolution without the social and environmental justice language because the watershed commission “doesn’t deal with social justice issues . . . we just deal with water quality issues.” The substitute resolution was quickly adopted by the commission without further opportunity for MEJO to comment. Similarly, at a later meeting with public health officials—one at which minority anglers again spoke about disparities in fish advisory outreach and awareness as important ethical and racial justice issues—a high-level state public health official and renowned national expert on fish consumption advisories said he did not want to bring environmental justice into this because it was “just a communication issue.”

Finally, in April 2008, the county board passed the significantly weakened substitute resolution with all race- and class-disparity language and mentions of data gaps removed. The resolution described the installation of signs as a possibility, requesting a report on the issue from staff in three months.

In sum, MEJO’s interactions with agency experts—many of whom are the key actors in government decisions about fish consumption risk-assessment and communication strategies—revealed the agency experts’ limited understandings of the connections between racial and class disparities and environmental health issues. It is notable, for example, that two established white professional agency representatives (senior-level scientists with doctorates) felt comfortable explicitly stating in public meetings that race and class disparities in fish advisory awareness are not relevant for the watershed commission or the public health department, especially with people of color present who testified about their community’s concerns about water pollution and fish toxins, and their lack of awareness of fish advisories. That racial disparities remained invisible to agency experts presented a significant obstacle to

MEJO’s attempts to see the knowledge of minority groups represented in agency decisions.

Dominance of and Deference to Institutionally Sanctioned Scientific Risk Assessments

By working in the space where marginal communities encounter state agency scientific protocols, MEJO’s research and activity highlighted a second structural obstacle to changes in risk-assessment and communication strategies: high trust for and deference to expert assessments among agency decision makers. Further, experts’ status in this arena perpetuated the problem of knowledge gaps, even in light of participatory efforts to fill those gaps. Where institutional scientific experts had not measured fish toxins and consumption and/or had not brought these issues to public attention, decision makers assumed that they must not be problems.

This reliance on scientists to identify risk issues is a common theme in community-based struggles to address environmental risks:

Because the existence of such risks—let alone their origins and consequences—must be deduced by active causal interpretation, they exist in the social world only insofar as there is scientific awareness of them. At every stage in our understanding of such risks, the mobilization of scientific knowledge is central to their description and assessment. This elevates the expertise and status of the knowledge professions to a prime political position in the discourse of risk, leaving little or no room for the layperson. (Fischer 2000, 51)

MEJO’s experience makes it clear that Fischer’s insight applies not only to the way scientists and their official scientific data define fish consumption risks, but also to the role that the *lack* of scientific data plays in risk assessors’ and community organizations’ capacities to understand and address fish consumption risks. Lack of data contributes to the perception that there are minimal risks from eating Madison lakes fish, and then ironically, this perception is a key reason for the low priority placed on getting more data. High deference to institutional scientists’ data on fish risks—perceived as more “valid” than other data—along with reluctance to recognize data gaps in institutional science, play pivotal roles in this chicken-egg feedback cycle (Hoffmann-Riem and Wynne 2002; Smithson 1989).

Specifics in the Dane County fish advisory debates illustrate how scientists’ high status can preserve knowledge gaps and, in turn, justify inaction on environmental health concerns. Omitting statements in the original county resolution related to unknowns about environmental

impacts of pollution on low-income and minority citizens, lack of data collection, and lack of consideration of these populations in determining public policy, for example, reflected authorities' reluctance to acknowledge that they had not researched these issues. Furthermore, changes made in the specific requirements of the resolution suggested not only reluctance to take action on posting signs but also unwillingness to credit conclusions reached by studies other than their own. Instead of requiring, as the original resolution did, that relevant agencies work with environmental justice groups and people of color to post and maintain fish advisory notices, the substitute resolution requires that agencies "*investigate* existing outreach efforts advising anglers in English, Spanish and Hmong" (emphasis added). The agencies were not convinced that there were any race- and class-based disparities in outreach efforts to date, even though MEJO proposed the original resolution *because* their extensive participatory research and outreach efforts had already established that minorities and the poor in Madison are less likely to receive and/or to be aware of fish advisories.

Again, MEJO's evidence in this regard, paralleled by numerous studies around the United States, did not match the institutionally accepted model of proper "scientific" practice; agency scientists felt they needed to verify it themselves with an "investigation" before they could justify the need for signs. This ended up delaying actions to post signs, the clear intent of the original resolution. Ironically, the agency health official charged with investigating existing efforts to communicate with minority anglers found and reported that MEJO had done most of the active, in-person fish advisory outreach to minority angling groups to date, and the only outreach in Hmong and Spanish (Public Health Madison & Dane County 2008).

These interactions illustrate institutional assumptions about who is qualified to define what counts as "valid" risk assessments and who is not, and agency experts' struggle to be in control of how fish risk issues are defined and communicated. Taken together, we saw these devalue the potential contributions of MEJO's participatory research. Furthermore, our interviews with a county official revealed that staff deleted the words *minorities*, *low income*, and *of color* in the resolution and replaced them with general fish advisory text because they felt that "fish advisory information is 'factual,'" while text about race and class disparities is "opinion." In so doing, the staff concealed and made invisible the values underlying their activities. Yet fish advisories, of course, are hardly accepted scientific "facts"; they are just as contingent on values and

politics as other scientific information. Advisories have been debated by scientists for years, vary from state to state and among different government agencies, and have changed considerably over the last couple of decades as more regulatory scientific studies on fish toxins have been completed (Kuehn 1996; Moore 2003).

This is not to say that the race/class disparity text in the original resolution is any more factual than the advisory information that replaced it. It is, rather, to point out the irony that although both the original disparity text and the substitute fish advisory text are based in part on scientific studies, agency staff felt the substitute text was more "factual" than text submitted by MEJO and the county supervisor. Moreover, the experiences, knowledge, and cultural perspectives of the minority anglers who testified in these public meetings from the position of their communities' fishing cultures seemed to carry little weight in the discussions. The fact that these testimonies were not relevant to public officials was disheartening and demoralizing to MEJO members, especially the minorities who testified, and further demonstrates that institutionally sanctioned expert knowledge is considered more valid in fish risk assessments than community members' knowledge and experiences.

In sum, MEJO's membership challenged, and continues to challenge, conventional scientific means for crafting fish advisories while shedding light on the durability of institutional structures to resist those challenges. Indifference to race and class disparities by the public officials that represent agency expertise is less a reflection of purposeful individual indifference and more an indication of the deep deference to perceptions of the more "valid" scientific expertise of institutional scientists. It also brings to the fore the parallel belief that localized knowledge and experiences are less "scientific" and therefore less valid as sources of evidence (Fischer 2000; Gieryn 1999; Harding 1998; Irwin and Wynne 1996). Public officials' discounting of the anglers' testimonies and MEJO's participatory community research, moreover, suggests that officials are not yet convinced that Madison has race and class fish risk disparities, in part because academic and agency scientists have not validated that. In discounting minority anglers' cultural knowledge, agencies overlook essential information for appropriate and relevant risk assessments in minority and poor communities.

There are difficulties in shifting scientific models that our experiences brought to the fore. Seeking to reshape expert models in our grassroots projects has illustrated the frictions and cultural tensions that come with organizing against deeply entrenched institutional models. In one sense,

explicitly recognizing such risk disparities would decentralize institutional scientists' roles in defining and managing fish consumption risks and undermine the premise of universal, abstract, and objective science. Perhaps more importantly, recognition of race- and class-based disparities, and the cultural factors that shape these disparities, would suggest that meaningful participation in risk assessments by minority and poor groups that eat the fish is essential, because they carry with them personal knowledge about their cultures, fish consumption, and advisory awareness in ways that institutionally based agency expert scientists cannot.

Conclusion: MEJO's Community Collective Work Transforming Institutional Risk Assessments

MEJO's ongoing work builds on environmental justice efforts elsewhere (including the many projects described in this book) in which laypeople and community organizations push from the bottom up to bring environmental health risk gaps and disparities to light in institutional risk assessments and policies. Our projects are creating productive ruptures in long-standing institutional scientific practices by bringing diverse people directly into risk-assessment and communication processes that typically privilege institutional scientific experts and that rely on abstract, reductionist approaches that tend to overlook race and class disparities as well as local cultures and knowledge.

MEJO has been slowly bringing the cultural contexts and knowledge of local angling communities to the awareness of institution officials and academic scientists by sharing these contextual factors in part through the various community interactions discussed above. The organization has also held several public events to raise awareness about fish contamination and the need for signs. It has also brought environmental justice in Madison to the public eye by sending out numerous press releases about these efforts, resulting in coverage in the local daily, weekly, and minority newspapers, as well as local TV and radio (Cullen 2008; Novak 2006; Schneider 2008a, 2008b; Weier 2006). The press releases and reports have generated media attention to the fish consumption disparities, increasing broader community and political awareness of these inequities. Such public events and media coverage play important roles in building public and political awareness and dialog about environmental justice issues that are otherwise invisible.

Coordinating these public outreach elements is part of, not distinct from, the work to reformulate scientific processes of risk assessment. All

along, MEJO has facilitated the inclusion of minority anglers, leaders, and other community members in public meetings to share their perspectives directly with agency representatives, politicians, and scientists. Based on public officials' reactions in meetings, it is clear that many of them have not interacted with poor minorities in their professional work before and some are being exposed to race, class, and cultural perspectives they have never considered before. This very exposure at a cultural community level, we argue, is a necessary step toward changing risk-assessment procedures to include the experiences of affected populations.

Although there is no shortage of evidence of resistance to change and deference to entrenched models of risk assessment that will be difficult to transform, MEJO's work also shows signs that its efforts are slowly paying off. There are indeed small signs that these activities are changing the public officials' approaches to addressing these disparities. These include an increasing willingness to accept MEJO's data, collaborate with MEJO in gathering more data, and accept cultural and contextual knowledge of diverse angling communities as valid and important components of risk assessments. MEJO's efforts regarding fish advisory signs along local lakes have also encouraged public and policy discussions about risk and communication disparities. The advisory resolution that ultimately passed, although weakened, requires public agencies to work with MEJO to investigate communication efforts, which will hopefully engender further multicultural dialog about environmental justice in Madison.

MEJO leaders and members are developing working relationships with public officials and knowledge of political processes related to public health assessments, helping them become active participants in these processes. Several MEJO members have gained organizing experience and enough knowledge about fish consumption risks to be effective public communicators of their community's and MEJO's concerns. This in turn has helped MEJO's credibility with other local community organizations of color, and the group is beginning to develop collaborations with these organizations.

Multicultural organizing, of course, is extremely time intensive, as well as politically and culturally challenging. In part because of existing segregation, racism, and lack of access among minority groups in Madison, groups of color have limited power in the community. Anger and tensions about this lack of power and access, and about deep and systemic inequities between minorities and whites, at times create

emotionally charged public and political interactions. Moreover, although MEJO has begun to bring Hmong, Latino, and African-American groups together—an important accomplishment in itself—it has been difficult to facilitate sustained participation by people from different ethnic and racial backgrounds. Cultural and language differences among racial/ethnic groups can be pronounced, and are sometimes barriers to effective collective organizing.

Beyond the essential step for creating increasing awareness of environmental injustices, the case of MEJO illustrates mechanisms that can gradually transform institutional scientific practices—such as creating common meeting forums, working to negotiate language with various stakeholders, diversifying voices in relevant debates—that we hope will provide examples for scientists, scholars, and activists alike. Our work illustrates some ways that risk scientists and communicators can effectively engage with diverse people affected by risks, and incorporate their knowledge into risk assessments—making these assessments not only more equitable and culturally relevant but also more comprehensive and accurate. Risk communications based on these improved assessments, likewise, will be more just and relevant and will hopefully reach people not previously reached because risk assessments rendered them invisible.

Toward those ends, and as a kind of epilogue to this chapter, MEJO released a report in the summer of 2008 based on its fish consumption surveys and focus-group results, outlining fish consumption disparities and recommending that lake-specific advisory signs, in Spanish, Hmong, and English, be permanently installed in most popular shoreline fishing locations (Powell and Powell 2008). The local public health agency in turn released its own report calling for increased outreach efforts and recommended that signs be installed in three languages at the three or four most popular shoreline spots. Although the agency report only adopted some of MEJO's recommendations, and framed the fish consumption and communication issues on its terms, it was a step forward.

The advisory sign project, however, encountered a surprising level of political resistance from natural resource agency leaders who did not want signs posted in city and county parks. MEJO continued to advocate for the signs—and for more than just three or four. In the fall of 2008, MEJO activists persuaded city and county elected officials to add just a few hundred dollars more to the advisory sign budget, which resulted in at least one sign in all of the most heavily fished urban locations. MEJO members designed the signs, making sure species that are eaten by many

shore anglers but missing from advisories (e.g., white bass, catfish, carp) were included, and provided culturally appropriate Spanish and Hmong translations for the signs. The signs were subsequently approved by local and state public health agencies and the state natural resource department. Public health officials worked with city and county parks staff to place the signs where MEJO members recommended they be installed, based on their knowledge of the most popular shoreline fishing locations. It was a small—but hard-won—victory.

In spring 2009, MEJO worked pro bono with the public health department staff to develop a shoreline angler survey in three languages to evaluate the efficacy of the signs (one of the conditions placed on funding the pilot sign project by agency officials who resisted the project). In the summer and fall of 2009, MEJO helped train interviewers and conducted about 150 surveys with shoreline anglers in English, Hmong, Laotian, and Spanish. Public health staff did about 50 more interviews. MEJO's citizen scientist (Maria Powell) analyzed the quantitative and qualitative results and submitted them in a report to the public health agency in December 2009 (Powell, Xiong, and Powell 2009).

The survey results supported previous evidence we and others have gathered on consumption and awareness disparities (e.g., minority shore anglers eat significantly more fish than white anglers and are less aware of advisories)—but also provided useful information on where different kinds of anglers tend to get information about fish and what kinds of information they prefer. The signs are inspiring conversations and questions among shoreline anglers and others who spend time at the lakes about fish consumption risks, causes of water pollution, and ways to get more information and get involved. Most importantly, the interviews showed that shoreline anglers felt the signs were very useful for easily accessible and understandable fish consumption advice. Many anglers suggested that more signs be posted.

From this and prior experiences, our work has shown that while scientists and policymakers can be transformed situationally on specific issues, it takes ongoing diligence on activists' part to ensure that transformations are more than transitory and result in meaningful outcomes over time. In the projects we describe here, for example, we initiated the concerns, brought together the various local and state stakeholders, conducted the research, set forth plans of action, and advocated in public processes and via media over long periods of time to make sure they were carried out. This involved a tense “push and pull” between us and government agencies in which we had to work hard with few resources

to initiate projects and make sure they were carried out. Public health professionals then used our work as “cover” to push decision makers to tackle environmental justice issues that would likely have fizzled out otherwise—or would not have been initiated at all. Of course, agency scientists’ willingness to advocate on these matters helped us in turn. When decision makers listened and acted on our recommendations, it was because health agency leaders were willing to lend their credibility to our efforts. For now, though, MEJO has at least a tentative “place at the table” in community decisions about environmental health and justice. As to whether the evidence we gathered encourages public health or other government agencies to advocate for more signs or further work to address fish consumption risk disparities, as this book went to press the jury was still out.

Acknowledgments

We would like to acknowledge several University of Wisconsin students for their work and creative ideas in helping with several aspects of our projects. In particular, we would like to recognize Caitlin Dunn, Roxanne Felt, Cynthia Lin, Mary Parmer, and Ashley Viste.

Appendix I: Comparison of original fish consumption resolution (left) and substitute offered by county staff (right), and approved by the Dane County Board.

Note: The original language that was removed is struck through.

RES 238, 2007–2008

Posting of Fish Advisory Notices along Dane County Waters

~~Pollution in Wisconsin waterways has caused the State to issue fish advisory warnings regarding toxins to anglers and those who eat locally caught fish from inland Wisconsin waters. Levels of mercury, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), pesticides, and other toxins are high enough in Dane County lake sediments and waters that people~~

SUBSTITUTE 1 TO RES 208, 2007–2008

Posting of Fish Advisory Notices along Dane County Waters

Fishing provides an enjoyable recreational opportunity for many Dane County residents, and fish from local waters are an important food source for many anglers. Certain species of fish contain contaminants at levels that pose potential health risks to people who eat fish frequently. The Wisconsin Department of Natural Resources, with

~~need to limit their consumption of fish caught in these waters because these compounds build up in fish tissue, which humans consume. Yet, fish advisory information is little known or unknown to many anglers.~~

~~Levels of mercury, PCBs and other toxins that concentrate in fish are a known public health hazard. Shoreline anglers catch and consume many pan fish that may have lower toxin levels than larger fish, but when consumed in high quantities they may exceed levels recommended to avoid negative health effects; they also catch and consume larger fish, which tend to have higher concentrations of toxins.~~

~~Public agencies have very little actual data about local fish consumption habits and toxin levels in locally caught fish; and have little interaction with local anglers and their families who eat large amounts of locally caught fish. Women of child-bearing age, pregnant women and children are especially at risk for developmental, congenital and long-term risk from exposure to toxins present in locally caught fish. The environmental impacts of pollution on low-income and minority citizens are often unknown or underestimated because of a lack of data collection, and lack of consideration of these populations in determining public policy.~~

~~The common good and sound public health policy is served by informing anglers and others of potential risks associated with consuming many kinds of locally caught fish.~~

advice and support from the Wisconsin Department of Health and Family Services—Division of Public Health, issues safe eating guidelines to anglers on size and species of fish to keep as well as how often and what quantities to eat, in order to reduce angler exposure to mercury, polychlorinated biphenyls (PCBs), and other contaminants.

For all waters in Wisconsin, WDNR advises that people follow these safe eating guidelines:

Women of childbearing years, nursing mothers and all children under 15 may eat: one meal per week of bluegill, sunfish, crappies, yellow perch, bullheads and inland trout; AND one meal per month of walleye, pike, bass, catfish, and all other species. Do not eat muskies.

Men and women beyond their childbearing years may eat: unlimited amounts of bluegill, sunfish, crappies, yellow perch, bullheads and inland trout; AND one meal per week of walleye, pike, bass, catfish, and all other species; AND one meal per month of muskies.

For Badfish Creek, Lake Mendota, Lake Monona, and the Wisconsin River in Dane County, WDNR also advises that in order to further reduce exposure to PCBs, people should eat no more than one meal per month of carp. For the Wisconsin River, people should also eat no more than one meal per month of Lake Sturgeon. PCBs are generally stored in the fat of fish, so people are advised to reduce PCB levels in fish they eat by trimming

~~NOW, THEREFORE BE IT RESOLVED, that the Dane County Board of Supervisors directs the Dane County Parks Department to post and maintain fish advisory notices at all boat landings and other county owned land where shoreline anglers fish, advising anglers of potential risks associated with consuming locally caught fish. Said notices shall be in English, Spanish, and Hmong in non-technical language understandable to the average person, and shall be posted within 90 days of the effective date of this Resolution.~~

BE IT FURTHER RESOLVED that the Dane County Board of Supervisors requests that the Department of Public Health for Madison and Dane County address this issue and work with the Dane County Lakes and Watershed Commission, and appropriate local and state agencies, as well as environmental justice organizations and affected communities of color, to post and maintain fish advisory notices along all Dane County lakes and waterways.

away the fatty areas and removing the skin before properly cooking their fish.

This fish consumption advisory information is little known or unknown to some anglers.

NOW, THEREFORE BE IT RESOLVED that the Dane County Board of Supervisors requests that the Department of Public Health for the City of Madison and Dane County investigate existing outreach efforts advising anglers in English, Spanish and Hmong and in non-technical language understandable to the average person, of potential health risks associated with consuming locally caught fish.

BE IT FURTHER RESOLVED that the Dane County Board of Supervisors requests that the Department of Public Health for the City of Madison and Dane County work with the Dane County Lakes and Watershed Commission, appropriate local and state agencies, environmental justice organizations and affected communities to recommend the most effective mechanisms for educating local residents about potential health risks associated with consuming locally caught fish. These mechanisms may include signage, educational events, and small group meetings.