

# THE APPLICATION OF COMMUNITY BASED PARTICIPATORY ENVIRONMENTAL RESEARCH (CBPR) ON THE STUDY OF THE QUALITY OF A MAJOR REGIONAL WATER SOURCE

Presentation to Ohio River Basin Consortia for  
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**PUBLIC HEALTH**

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# Purpose

**The Allegheny River Stewardship Project (ARSP) is a Community Based Participatory Research (CBPR) effort by leading researchers, working together with concerned citizens of the Alle-Kiski Valley river communities, to determine the sources and types of river pollutants by monitoring the levels of toxins in fish living in the river, as well as river water and sediment.**

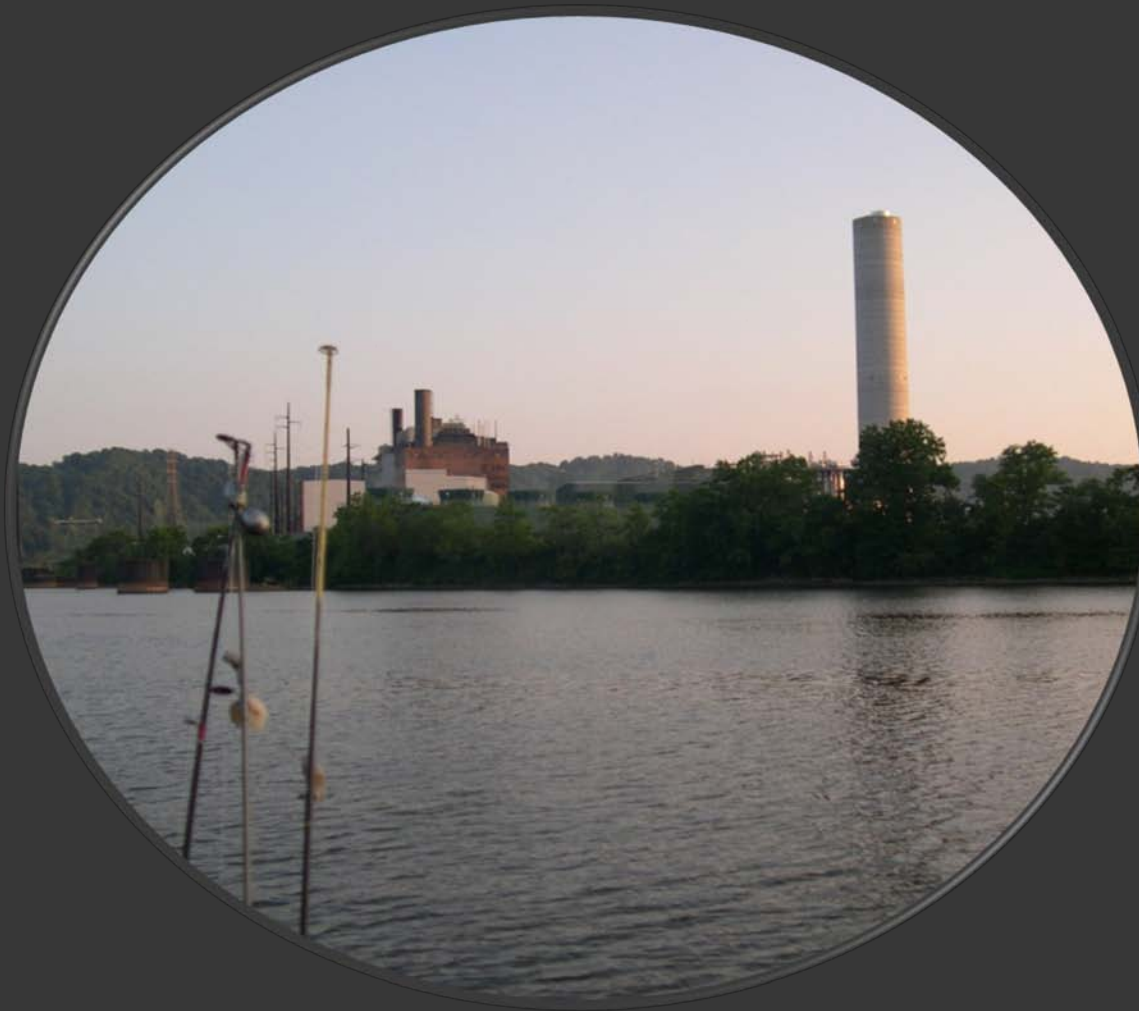
# ARSP PI and Staff with Community Members at Ford City Community Fishing Day



# Objectives

- ⦿ **Engage river community members to become involved in the stewardship of the Allegheny River.**
- ⦿ **Understand the concentrations of important contaminants in river fish species, especially those caught for consumption.**
- ⦿ **Associate contaminants in fish with potential pollution sources.**
- ⦿ **Identify human exposures to these contaminants.**
- ⦿ **Understand the risks to human health and the environment from these contaminants and pollution sources.**
- ⦿ **Obtain and share data with policymakers to provide evidence for the necessary policy change to solve identified problems and**
- ⦿ **Form strategic partnerships with stakeholder groups along the Allegheny River to help insure ongoing stewardship activities.**

# Industry and Recreation coming together on one major river



# Background

- “The NIEHS has been at the forefront of U.S. funding agencies in using community-based participatory research (CBPR) as a tool to advance environmental health sciences (O’Fallon and Deary 2002), thereby addressing social disparities in health.” (Northridge et al. 2000a)
- CBPR in public health is a partnership approach to research that equitably involves, community members, organizational representatives, and researchers in all aspects of the research process, in which all partners contribute expertise and share decision making and responsibilities. (Green et al., 1995 & Israel et al. 1998, 2003).

# Nine Principles of CBPR

- Recognizes community as a unit of identify.
- Builds on strengths and resources within the community.
- Facilitates a collaborative, equitable partnership in all phases of the research, involving an empowering process that attends to social inequalities.
- Fosters co-learning and capacity building among all partners.
- Integrates and achieves a balance between knowledge generation and intervention for mutual benefit of all partners..
- Focuses on the local relevance of public health problems and ecologic perspectives that recognize and attend to the multiple determinants of health
- Involves systems development using a cyclical and iterative process
- Disseminates results to all partners and involves them in the dissemination process
- Involves a long-term process and commitment to sustainability



# Background (con't)

- The ARSP is continuation of the Pittsburgh Three Rivers Fish Consumption CBPR project.



# Assumptions

- **The water released by the over 400 sewer overflows (SOs) in the southwestern Pennsylvania area is hypothesized to contain both pharmaceutical and xenoestrogens which have known effects in aquatic species and may have significant public health implications.**
- **The river water contaminated by SOs is the primary drinking water source for Allegheny County residents potentially exposing large, susceptible population groups.**

# Assumptions

- ⦿ **Bio-magnification of contaminants occurs up the food chain from river bottom deposits and contaminated water to predatory fish.**
- ⦿ **The sediment at the river floor acts as a sink and a source of contaminant dispersion during high water periods.**
- ⦿ **Mercury, arsenic and selenium are of primary interest in fish protein because they are like fingerprints of coal fired power plant pollution.**
- ⦿ **Fish caught in the area are also thought to have bio-accumulated these contaminants and can serve as sentinels for the magnitude of the contamination**

# Assumptions (Con't)

- That communities up and down the rivers of Pittsburgh have an interest in participating in river stewardship.
- That these same communities have knowledge and expertise about the rivers of Pittsburgh that university researchers do not have.
- There are groups of anglers who are subsistence fishers and may not be aware of the extent of bio accumulation of toxins in the fish they consume.

# Methods

- ① A variety of systematic techniques were used to achieve the objectives of the study.
- ① Extensive interaction between a number of diverse groups and organizations was employed throughout the project.



### Allegheny County Health Dept

- Sharing of the boat
- Training of new staff
- Database development when comes in
- Help with PCB report
- Help with grant writing
- Updating strategic water usage

### Fishing Tournaments

- Roaring Run
- Bass masters

### Alle-Kisk Health Foundation

- Scoping Expedition
- School Contacts and Education
- Recruit Volunteers for Fish Sampling
- Publicize in local media

### Environmental Groups

- Crooked Creek Environmental Learning Center
- Three Rivers Aquatic Center
- River Quest
  - Providing Research platform, water and sediment sampling equipment
- Venture Outdoors
  - Providing rod, reels and bait
- Rachel Carson Homestead
  - Providing education
  - Provide volunteers for expedition and sampling

### Schools and Educational Opportunities

- Rachel Carson Homestead
- John Pastorek – Alle-Kiski Health Foundation

### Other Environmental Organizations

- Allegheny Environmental Council
- Army Corp of Engineers
- USGS
- PSU Extension Office at McKean County
- PA DEP

### PA Fish and Boat Commission

- Training on techniques of aging fish for the project
- Historical records
- Samples and training Graduate Students
- Sharing Estrogen data
- Collaborative Field Work on the boat
- Denny Tubbs - Fishing groups for sampling with stacks for rods

### Western PA Conservancy

- GIS Maps and info

### Dept of Environmental Protection

### Scouting Groups

### Analysis of Collected Material/Data

- Dartmouth College
- Univ. of Pitt
- UPCI – Talal

### Media Collaborators

- Don Hopey – PPG
- WQED – OnQ
- WPXI
- WTAE
- City Paper ?
- The Leader Times
- Township Newsletters

## Allegheny River Stewardship Project

# Methods (con't)

- **Information from a systems approach formed the basis of extensive contact with community organizations.**
  - **Community Organizing - consisted in part of three town hall meetings,**
  - **High Visibility in the Community - Numerous presentations on the ARSP to community organizations, schools and various groups as well as radio, television and print media.**
  - **Information Sharing - The internet was an important tool for sharing information with the community as well as providing an expeditious means for volunteer recruitment.**
  - **Needs Assessment - Pollution narrative statements were used extensively throughout the community to assess community needs and concerns related to environmental issues.**

# Methods (con't)

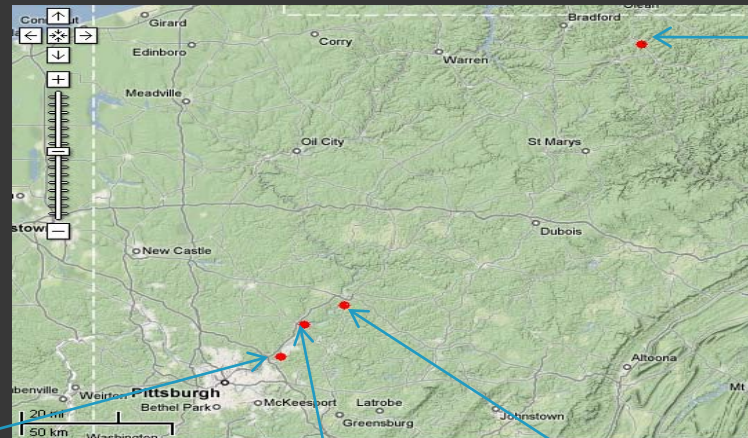


- **Community Observation** - Window walks and participant observation were employed in order to better understand the issues and key locations for each site selected for sampling.
- **Qualitative Interviews** - Focus group and one-on-one interview's such as oral histories with volunteers gathered from community organizing efforts were also employed.
- **Educational Materials** - Written materials on environmental issues were provided to volunteers as well as passerby's at each of the community fishing days.
- **Iterative Process** - Based on community input from pollution narratives, sites for water, sediment and fish sampling were selected.
- **Research Method Highly Visible** - The fish caught were dissected, systematically labeled and frozen.
  - *(These samples are currently under laboratory assessment for heavy metals, estrogenicity assays using MCF-7 cancer cell proliferation, and identification of specific estrogenic compounds. )*



# Results

- One of the largest community based environmental studies in Southwestern Pennsylvania.
- Four major sites which were selected for water, sediment, and fish sampling based on community input gathered from pollution narratives .



Turtlepoint, PA  
(Allegheny Headwater)

Springdale/Cheswick, PA

Freeport, PA

Ford City, PA

# Results (con't)

- **Community volunteers attended the four community fishing days at each of the collection sites.**
  - **Ford City (5/10/08) – 88 volunteers**
  - **Springdale/Cheswick (5/31/08) – 75 volunteers**
  - **Freeport (6/7/08) – 79 volunteers**
  - **Turtlepoint (6/14/08) -**
- **Registered community volunteers permitted ongoing dialogue with researchers resulting in a feedback loop affecting study variables and study parameters.**

# Results (con't)

- **The amount of community information gathered produced knowledge related study results communication as well as inform future initiatives.**
  - **Many people believe the rivers are much cleaner and supporting more aquatic life than the recent past.**
  - **Anglers want to fish and consume fish and often believe there is a long history of fish consumption from the rivers with no adverse affects. It is important to balance the message of bio-accumulation and fish consumption.**
  - **Angling has strong roots in father/son/daughter bonding**
  - **Anglers have a strong tie and interest in preserving and improving river water quality. They are untapped resources.**
  - **New pollution sites and pollution sources were identified.**

# Results (con't)

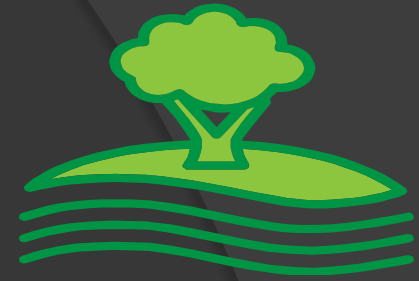


- ⦿ **Anglers as well as people living on or near the rivers of Pittsburgh often think and feel that “others” need to do something to clean up river water. There is a huge need for community capacity building related to environmental concerns.**
- ⦿ **The size, types and number of fish collected are highly indicative of fish generally caught by people living and recreating on this river.**
- ⦿ **Often community members want to do something to improve their environment, especially related to water, but do not know what they can do within their means.**

# Results

- ◎ **Many community members believe policy change is key to environmental cleanup and behavioral change toward the environmental.**
- ◎ **Focus group members have indicated “who” communicates environmental information is important.**
- ◎ **Women are often strong advocates for environmental change.**
- ◎ **Pollution Narratives from high school students revealed high numbers note pollution as trash, litter, garbage, followed closely by air pollution.**

# Conclusions



- ⦿ **There are numerous benefits and challenges to this type of environmental study. The major benefit from this study is the high degree of collaboration and knowledge gained from the community allowing for targeted communication of results as well as ongoing information sharing.**
- ⦿ **This project has also created a the opportunity for ongoing information sharing and support allowing for numerous opportunities for future research, with this study as a foundation.**
- ⦿ **Across the Allegheny Watershed, trust has been built with many community components.**

# Public Health Implications

**Knowledge and pathways have been created which can be beneficial to communicating results from this study which may be important for health behavior changes, as well as environmental policy adjustments.**

# Funding

- Alle-Kiski Health Foundation (\$25,000)
- University of Pittsburgh Cancer Institute-Center for Environmental Oncology
- Highmark Foundation-Healthy People-Healthy Places, DSF Charitable Foundation (\$37,000 )
- The Graduate School of Public Health-Department of Environmental and Occupational Health (\$35,000)
- The Heinz Endowment (\$50,000)