Lessons from a community effort to find institutional support for environmental health research

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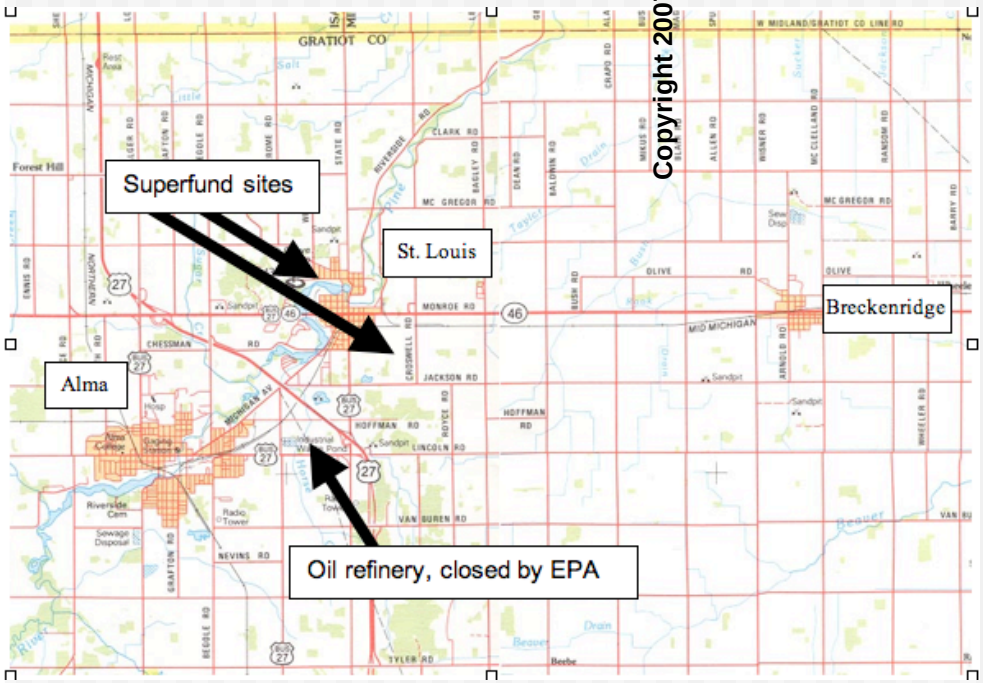


Michigan Chemical/Velsicol St. Louis, MI

Brief History

- Michigan Chemical operated between 1935 - 1978 (becomes Velsicol in the 1960's) Manufactured 78 different chemicals including **DDT**, **PBB**, **TRIS**, **MgO**, produced low level **radioactive waste** in the manufacturing of picture tubes.
- 1950's - 1970's - Many complaints about contamination in Pine River

Brief History (cont.)

- History of Poor Management
- 1973 PBB gets loaded in MgO bags. PBB gets mixed with cattle and livestock feed in Battle Creek, distributed all over Michigan and Mid-West. Enters food chain - discovered in 1974.
- 1974-5: Thousands of cattle, hogs, chickens destroyed. Most of Michigan residents show levels of PBB today.
- Late 1970's: Congressional Hearings, plant shutdown in 1978.

Brief History (cont.)

- 1982: Consent Judgment absolving Velsicol of any liability in Pine River
- 1982: Listed on National Priority List (NPL) as a Superfund Site
- 1986: Plant Site demolished - contaminated fill dumped and whole site capped
- 1985 - 1997: DDT increases in fish population

Brief History (cont.)

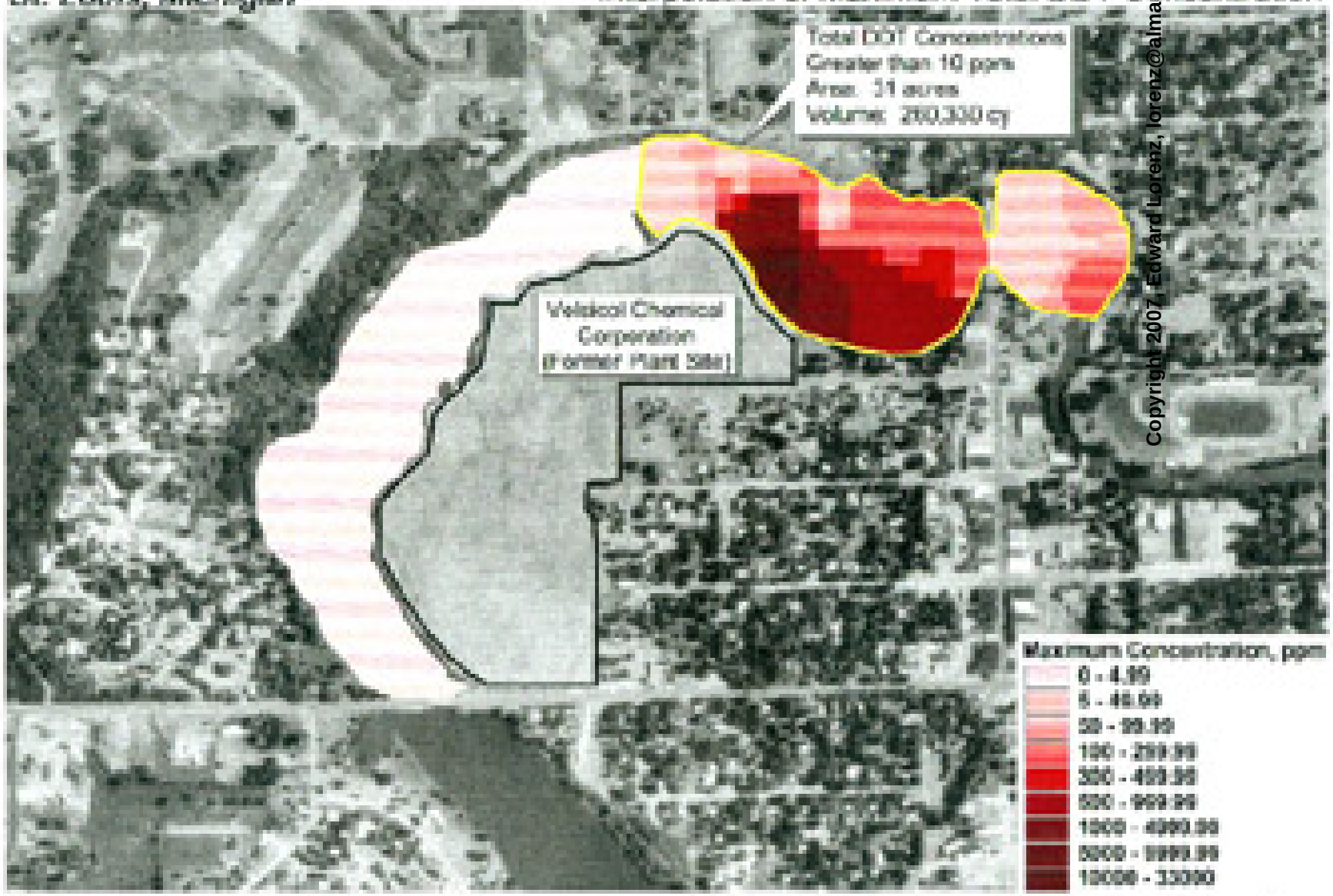
- Fish Studies 1985 - 1997 - DDT levels increasing
- Collection sites upstream and downstream of Superfund site (DDT source)

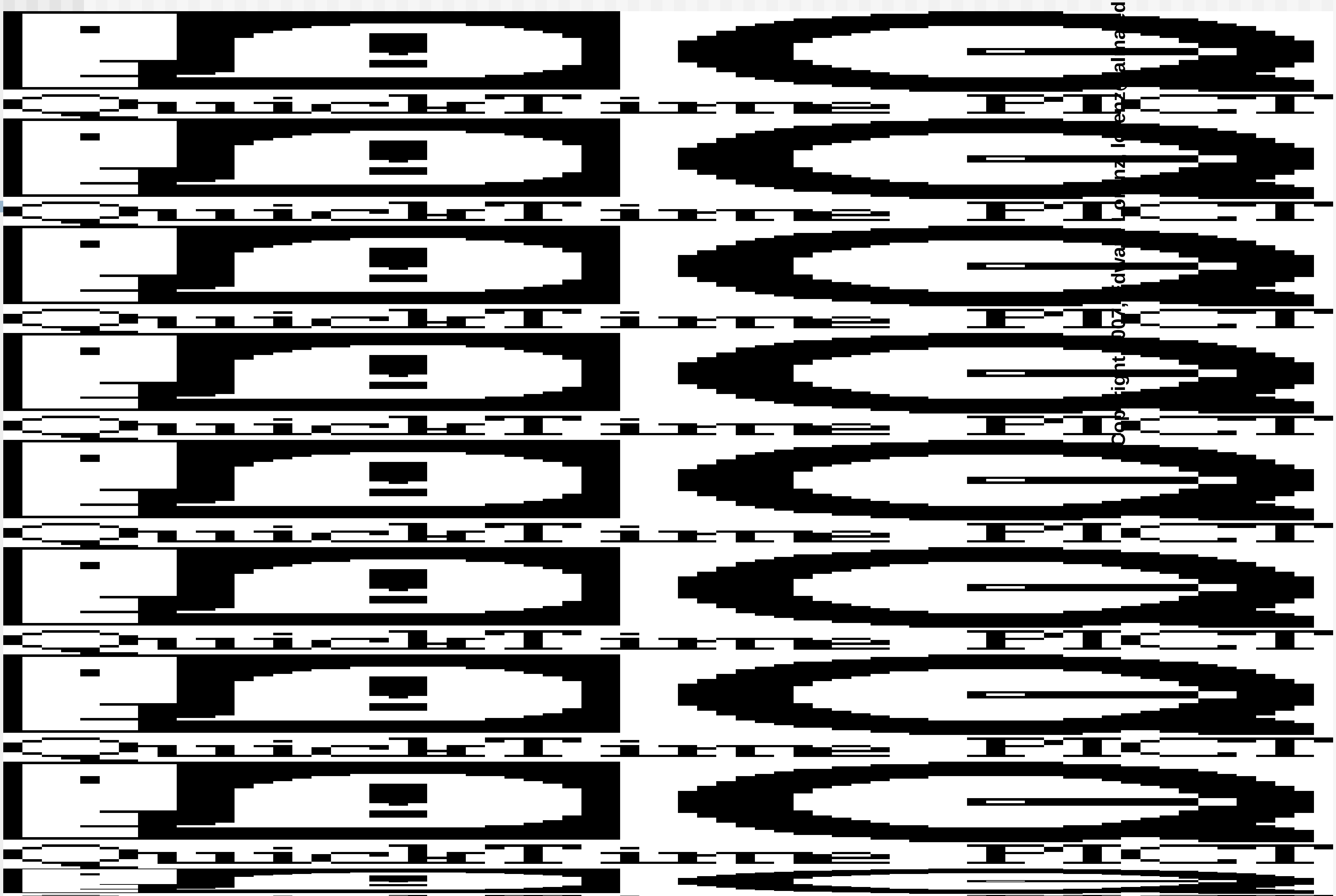
Collection Date	Species	Max. Conc. Total DDT (ppm)	Ave. Conc. Total DDT (ppm)
1985	Carp	18.7	9.7
1989	Carp	39.8	10.5
1994	Carp	47.3	23.3
1995	Carp	43.3	16.1
1997	Carp	90	34.6

* State limit for consumption of fish with DDT Š 5ppm

Velsicol Chemical Corporation
Superfund Site
St. Louis, Michigan

Interpolation of Maximum Total DDT Concentration





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History of State and EPA Relationship with Community

- Memo from MDNR about public meeting
- EPA/DOJ Consent Decree
- State Not Acknowledging Link Between Petroleum in River and Refinery Operations
- State/EPA/DOJ NOT Including Community in Any Major Decisions

Serendipity

- American Chemical Society Meeting in New Orleans, 1999
- Found out about use of blood spots to do historical study of environmental contamination

EPA Risk Assessment--4 Points

NIEHS Grant Proposal, 1999

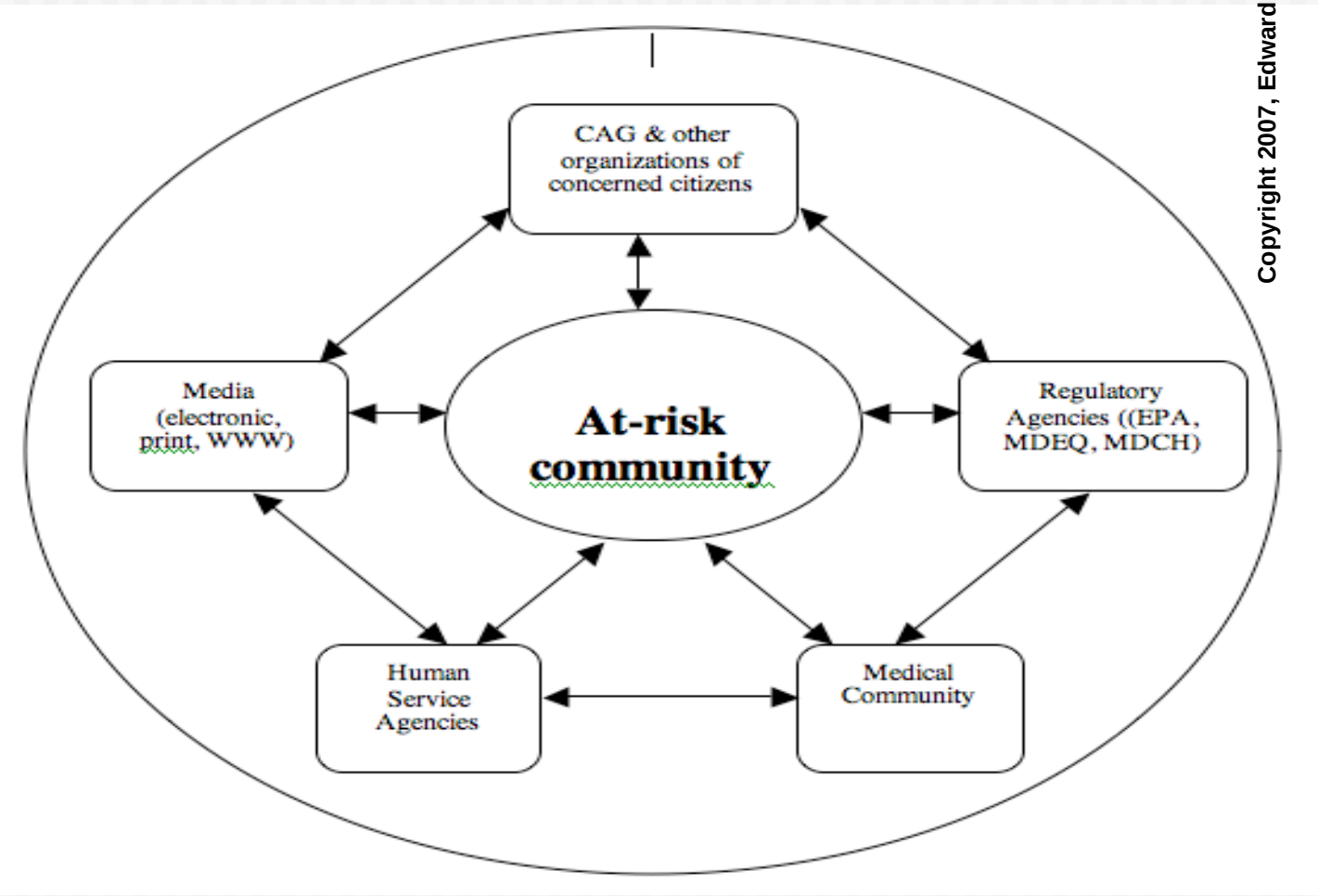
- Human Biomonitoring, Community-Based Prevention and Intervention Research
- Proposed use of blood spot study
- Rejected

NIEHS Grant Proposal, 2001

- Community Participatory in Environmental Health Research
- Addressed weaknesses in epidemiological model of 1999 grant
- Reframed and conceptualized “community participation” and “community risk”
- Rejected

1999 Model of Community Involvement

2001 “Community” Model of Health Risk Perception and Response



Response to NIEHS Rejection

- Appealed to NIEHS
  - Misreading of proposed epidemiological method
  - Pre-emptive dismissal of “community-based” model of participatory ENV health research
- Called on MI congressional delegation
- Grant “reconsidered” and rejected but ATSDR agrees to hold public meetings

Health Forum
Alma College, 2005

- Participants: ATSDR, CDC, SPEA (Indiana University), CAG (PRSCTF), Alma College, local press, community members
- Local experts and residents demanded that available blood spot samples be tested to determine risk
- CDC representative agreed to write protocol for blood spot study and absorb all costs

Blood Spot Protocol

- *Analysis of Environmental Contaminants in Dried Blood Spots: A Pilot Study.* D.B. Barr, et.al., Centers for Disease Control and Prevention, National Center for Environmental Health, Division of Laboratory Sciences, Atlanta, GA

"… to determine the feasibility of measuring the environmental contaminants PBB 153, p,p'-DDT or p,p'-DDE in archived blood spots obtained from newborns in an area of the state of Michigan, where widespread environmental contamination to persistent organic pollutants has occurred."

P-CBSA

- By product of DDT manufacture found in St. Louis city water wells, 2006
- EPA and MDEQ had reassured the community for years that there was not risk of migration from plant site to drinking water
- Intensified community perception of risk

CAG: Pine River Superfund Citizens Task Force

- Provided recognizable, viable entity that the state and federal agencies HAVE to deal with
- More clout with politicians than single person or small community group
- Organized and mobilized local scientific and political expertise (e.g., Alma College)
- Provided means & opportunities to study and publicize site(s) involved in the cleanup
- Provided the community with a VOICE

Crises of Legitimacy:

- Lack of trust in existing authority
- Lack of common definitions of situations and problems

Nohrstedt, Stig A., “Communicative action in the risk-society: Public relations strategies, the media and nuclear power.” In Anders Hansen, *The mass media and environmental issues,* Leicester University Press, 1993, 81-104.

First-order Crisis of Legitimacy: Conflict over Means

- Core issue is “mechanical solidarity” (Durkheim)
  - Who is the authoritative actor?
  - What measures are appropriate?
  - What is the correct definition of the situation?
  - Who is a credible source of info?

(cont.)

- Fundamental relationships (technical and social) between citizens/authorities are produced and reproduced through public communication (actions, events, reports, PR, advocacy, research protocols, crisis management, etc.)

Second-order Legitimacy Crisis: Conflict over Ends

- Core issue is “organic solidarity” (Durkheim)
  - Lack of consensus about values to be realized & legitimate means of evaluating the quality of social life
  - Mistrust of goals rather than procedures
  - Widens value gaps between “experts” and the “public”

Effects of Mechanical and Organic Conflicts

- Little or not confidence that risks will be shared equally or managed effectively
- Lowering or loss of common value base for determining what is a just and good society
- Mistrust and misunderstanding of scientific and government authorities
- “Governing” isn’t perceived as the legitimate attempt by fair and concerned people to apply just rules; there are no mechanical or organic foundations on which to base trust in procedures/means and ends/goals are not shared

The Blood Spots

- Use of Innovative Protocol: Viability of Archived Spots
- Multiple Aims: Determination of Viability, Detection and Action
- Most Recent Developments: The Results are in (but being held in secret until authorities decide the community has a right to know the results ;-)

Lessons Learned

- Community Persistence Is Necessary
- Local Expertise Is Necessary
  - Scientific/technical & political/cultural
  - Community (see model) must actually participate
- Local knowledge and vernacular discourse matters
- Technical and cultural constructs of “risk” affect process and outcomes

DDT Conference
Alma College: March 14, 2008

- State of current DDT research
- Health benefits v. health risk
- Regulation v. deregulation
- Cosponsored by Alma College, Pine River Superfund Citizen Task Force, & Society for Environmental Toxicology & Chemistry

Conflicted "Rationality"

- Technical Rationality
  - Trust: Scientific Method
  - Appeals: authority & Expertise
  - Analysis: narrow & reductionistic
  - Risks: depersonalized
  - Emphasis on statistical variation & probability
  - Appeal to consistency & universality
  - Risk Impacts that can't be articulated are irrelevant
- Cultural Rationality
  - Trust: political culture & democratic process
  - Appeals: folk wisdom, peer groups, tradition
  - Analysis: broad, analogic, historical
  - Risk: personalized
  - Emphasis on family & community
  - Focus on particularity, not consistency
  - Unanticipated/unarticulated risks are relevant

Technical Model of Risk Communication

Communication process

- One-way (expert to layperson)

Knowledge

- Scientific, technological, quantitative

Objectives

- To translate/inform
- To change risky behavior
- To reassure concerned groups

Cultural Model of Risk Communication

Communication Process

- Collaborative (citizen-expert-agency)

Knowledge

- Science + local, cultural knowledge/experience

Objectives

- To inform by recognizing social contexts of risk
- To To change risky behavior when in the best interests of affected groups
- To involve affected groups in judgments of acceptable and unacceptable risks