

# THE PCB COMMUNITY RESOURCE GUIDE



Understand the language of PCBs.  
Find the information you need.



Hudson River Sloop CLEARWATER, Inc.

# **THE PCB COMMUNITY RESOURCE GUIDE**

*by*

**Andre Mele**

**Christina Lepage**

**Daphne Ross**

supported by:

**The W. Alton Jones Foundation**



**Hudson River Sloop CLEARWATER, Inc.**  
**112 Little Market Street**  
**Poughkeepsie NY 12601**  
**914-454-7673**  
**[www.clearwater.org](http://www.clearwater.org)**

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## Introduction

### **Purpose:**

This document is intended to help ordinary citizens - including homeowners, parents, students, elected officials, business people, professionals, and journalists — gain access to the mountains of evidence that point toward the dangers of living in the nation's largest, non-government, toxic waste site: the Hudson Valley.



### **Background:**

From 1947 to 1977 two General Electric capacitor plants at Fort Edwards and Hudson Falls discharged over one million pounds of polychlorinated biphenyls (PCBs), a group of synthetic, oil-like chemicals of a chlorinated hydrocarbon family, into the Hudson River. Another 7 million pounds remain in Hudson Valley municipal landfills, remnant deposits, GE plant sites and unregulated dumps.

Due to PCB contamination of the Hudson River, 200 miles of this American Heritage River have been placed on the federal government's National Priority List of hazardous waste sites, qualifying it for a detailed assessment of risks to public health and the environment, and possible cleanup.

This Superfund designation has prompted the US Environmental Protection Agency (EPA) to embark on a lengthy and exhaustive assessment of the Hudson's toxic contamination. The issue has haunted this region for over twenty years, and finally a resolution may be imminent.

But while decision makers drag their feet, and General Electric's team of scientists and public relations experts continue to obscure the facts, the river ecosystem and the citizens who love and use it, suffer.

GE has waged a vigorous campaign since the early 1970s to avoid cleaning up their PCBs. Despite a battery of laws at both federal and state levels, GE has managed to escape its liability for removing PCBs from the Hudson River. Meanwhile thousands of Hudson Valley residents, many of them too marginalized to have encountered the health advisories against eating Hudson River fish, are feeding their families contaminated fish. Hundreds of thousands are drinking water from the Hudson, which contains trace amounts of the poisonous chemical.

Recently, we learned that millions of people in the Hudson Valley are exposed daily through inhalation, as PCBs evaporate out of the river and are transported into the air and atmosphere. Indeed, scientists now believe that all people on the planet have PCBs in their bodies, and that atmospheric transport is the means of distribution.



### **The Problem:**

PCBs are classified as a “probable human carcinogen”, and can cause learning disabilities, low birthweight, as well as hormonal and developmental disruptions.

After more than 20 years of conflict in boardrooms, conferences, public hearings, and the media, the citizens of the Hudson Valley are experiencing PCB fatigue. The issue is so long-lived and complex that the average person can no longer keep up with either the science or the policy developments. Most of us can't even understand PCB terminology.

Poll after poll has indicated that an overwhelming majority of area residents favor a cleanup. But the question of how to clean up has remained an obdurate sticking point. General Electric, the polluter, has waged a campaign of its own, paying tens of millions of dollars to commission research projects with preordained outcomes — what some call ‘junk science.’ The products of GE’s research are intended to simultaneously evade responsibility for a cleanup and to confuse the public just enough to cause doubt, thereby eroding public resolve.

That we are still talking about PCBs more than two decades after they were discovered causing lesions on Hudson River fish is a sad testament to the success of GE’s strategy.

### **About the resources:**

We invite everyone to explore the resources that are listed in this document. No one person, of course, will have the time to study and absorb it all. Many of the difficulties encountered by agencies and organizations trying to affect the outcome of the PCB conflict have been due to the sheer volume of evidence and information.

While the volume of information may be daunting, we urge members of the public to skim these pages because in preparing them we discovered that there is a story being told by the titles alone.

How can so much research and discovery have produced so much confusion and doubt? With so many studies indicating damage to humans and lab animals, how can we remain in denial, assuming that nothing is happening in our bodies? With so much evidence stacked up against GE, how can we assign a shred of credibility to their claims that the whole scientific world is wrong, and that they alone are right?

### **How to find the resources:**

Wherever possible we have listed the publisher, journal, or organization from which a resource may be obtained.

Many of the resources listed in these pages are quite accessible: they can be acquired over the worldwide web, at college or local libraries using computer search services, along with interlibrary loan. Most area universities maintain science libraries, in which resources may be found.

A few phone calls will often produce free copies of reports. Clearwater’s PCB video, available from the Clearwater

office and most Hudson Valley libraries, offers many references. The PCB Slide Show on Clearwater's web site is an easily accessed overview of the issue. Check the factsheets on our website, [www.clearwater.org](http://www.clearwater.org).

Since new reports and articles are constantly being issued, we expect this guide to be out of date almost immediately. One of the goals of this guide is to help citizens learn how and where to keep a watchful eye out for new developments.



### **What can I do?**

We are grateful for your interest in the PCB crisis, arguably the largest and most enduring public policy legacy from the postwar era of toxic chemical waste. With your help, we may be able to resolve the conflict in a way that does not sacrifice human health or the health of ecosystems we all depend on.

The year of this report's publication, 2000, is to be the year of a landmark decision by EPA, reached after more than ten years and a dozen postponements. Even if EPA calls for a comprehensive cleanup, however, the story won't end because GE will almost certainly appeal, and may even sue. If EPA fails, for political or other reasons, to issue a decision that will protect human and ecosystem health, the environmental community will almost certainly respond.

The first concrete action that citizens must take is research: to become educated, to the fullest extent possible, about issues that threaten our community health and welfare. Once we form an opinion, we must make ourselves heard. This year 2000 may be the most important time of all to organize or participate fully in public hearings and

community meetings. This year may also be the time in which EPA is the most responsive to phone calls or letters demanding that GE be held accountable for dumping millions of pounds of toxic chemicals into our communities, and our bodies.

We urge you to take these simple steps, now more than ever, because our silence will be taken as tacit agreement with General Electric's position that PCBs are harmless and should be left in the ecosystem. This guide should give you everything you need to become an effective part of the process.

EPA Address;  
Jeanne Fox  
Region 2 Administrator  
U.S. Environmental Protection Agency  
290 Broadway  
NY NY 10007  
212-637-3672

## The Language of PCBs

*Many of these terms have much broader definitions; they are given here with an emphasis on their PCB content. They should not, however, be viewed as being exclusive to PCBs.*

**1242, 1260, etc.** These numbers, and others beginning with the “12” prefix, are Aroclor blends (PCB types). The second pair of numbers refers to the proportion of chlorine, thus a 1242 is less highly-chlorinated than a 1260.

**ACSH.** The American Council on Science and Health is a group formed by the chemical industry for the purpose of presenting a credible-seeming sponsor for pro-industry responses to public health issues.

**aerosol.** Material that is in the air, but not in a gaseous phase. Think of microscopic particles of the liquid, so light that they can be borne aloft on air currents and thermals. Aerosols are available for widespread atmospheric dispersion.

**American Heritage River.** In the summer of 1998, President Clinton announced that the Hudson River had been chosen as one of 14 American Heritage Rivers. This designation was sponsored by Governor George Pataki, and enjoyed widespread support among state agencies and independent groups alike. The designation has been described as “making the Hudson one of America’s sacred places.”

**anomaly.** “A deviation or departure from the normal or common order” (American Heritage Dictionary). General Electric has used this term to describe conditions at the Thompson Island Pool which appear to contradict the company’s intentions

**Aroclors.** Monsanto’s trade name for PCBs. Monsanto was the principal manufacturer of PCBs in the United States. Companies such as GE did not manufacture PCBs, but more commonly refined them to suit specific applications.

**atmospheric deposition.** The process by which contaminants borne in the air are brought to ground by rainfall, condensation, temperature variations, or other natural means.

**atmospheric transport.** The process in which particles, aerosols, and gaseous contaminants are borne aloft and moved along with atmospheric currents.

**ATSDR.** American Toxic Substances and Disease Registry (Federal).

**background levels.** A person's body burden is not known to be high or low unless it is compared against the norm — the background level. There are no unexposed populations left on the planet, so the background level is a specific number referring to an average person's body burden. PCB background levels in the U.S. are 1.5 parts-per-billion in blood.

**bias.** “A preference or inclination, especially one that inhibits impartial judgment.”

**bioaccumulation.** The process by which PCBs and other persistent toxins are taken up by an organism and stored in its tissue. These toxins accumulate because they are fat soluble and cannot leave the body. Water soluble compounds are easily excreted from the body.

**biodegradation.** A process in which strains of bacteria consume or chemically alter a material so as to reduce it to a simpler and sometimes less harmful state.

**biomagnification.** The process by which a toxic compound increases in concentration as it moves up the food web. This occurs by bioaccumulation.

**bioremediation.** Use of natural or artificially-enhanced biodegradation processes, generally in living organisms, under natural or controlled circumstances, to break down harmful contaminants.

**body burden.** Often used to describe concentrations of contaminants found in a person or other organism; also refers to total amount of the contaminant in that person or organism as calculated from contaminant levels in fat, tissue, or fluid samples such as blood.

**bulk water.** The predominant mass of water in a water body of concern. Differentiated from surface water, pore water (between grains of sediment), etc.

**capacitor.** A component of electrical circuitry that has the ability to briefly store and release a charge.

**carcinogenic.** Having the ability to cause the development of cancerous cells.

**CERCLA.** The Comprehensive Environmental Response, Liability, and Compensation Act, popularly known as Superfund, governs the toxic waste cleanup process and also determines natural resource damages, including mechanisms for collecting the appropriate funds from entities which caused the pollution.

**cohort.** The population from which samples are taken during a research project.

**concentration.** The amount of a toxin or other substance in sediment, air, water, plant, or animal, expressed as a ratio of toxin-to-host medium., e.g. mg/kg. Usually measured in parts per thousand, million, billion, or trillion.

**congener.** A variety of a substance or a member of a family of substances, e.g., PCBs. There are 209 different molecular arrangements of PCBs, each a different congener.

**congener-specific analysis.** PCB analysis that is selective enough to detect each of many different congeners. The more congeners that are identified during analysis, the more complete an analysis will be. With enough congeners, it is possible to conduct “fingerprinting” of PCBs, so that reasonable conclusions can be drawn about the source of the contaminant. This is of special interest during research on atmospheric transport, as scientists can look at PCBs in polar bears or Inuit mothers’ breast milk, for instance, perform congener-specific analysis, and examine patterns of air movement to develop a theory of PCB migrations and dispersion.

**consent order.** A voluntary agreement to forestall prosecution, entered into by both the polluter and the agency responsible for compelling the polluter to clean up contamination. General Electric, for instance, has been cleaning up the plants that polluted the Hudson River, in Hudson Falls and Fort Edward, NY, under the terms of several consent orders demanded by DEC based on relevant environmental laws.

**contaminated.** Refers to the presence of a foreign or hazardous material in a host medium.

**coplanar.** Being or operating in the same plane. A coplanar molecule can lie flat against a receptor, and thereby may exhibit toxicity characteristics closer to dioxin, the most toxic compound mankind has made.

**corporate responsibility.** Presently a company and its board of directors recognizes only its responsibility to increase dividends to the shareholders. The new movement for corporate responsibility declares that a company also has responsibility towards the people affected by the company actions or inactions.

**DEC.** The New York State Department of Environmental Conservation. Also NYSDEC.

**dechlorination.** The loss of one or more chlorine atoms that were attached to the PCB molecule.

**decontamination.** An emerging field of several different technologies being developed by a number of different corporations, which remove contaminants from polluted soils.

**dermal.** Through or of the skin. PCBs can enter the body through dermal contact.

**dichlorinated.** PCBs that have only two chlorine atoms on the molecule. Dichlorinated and monochlorinated PCBs are moderately water-soluble, unlike the more highly-chlorinated versions.

**dielectric fluid.** A fluid that will not conduct electricity but can sustain an electric field, i.e. rubber.

**discharge.** Also **releases, emissions, dumping.** The transfer of a waste or process contaminant from controlled circumstances inside a manufacturing facility to the uncontrolled environment, such as through a pipe into a stream or river.

**dispersion.** The process in which a pollutant, such as PCBs, becomes mobile, either through the influence of wind, water, or human intervention, and becomes progressively more widely distributed through the environment.

**dose-response.** Usually described as a curve on a graph, the relationship of an animal or human's response (symptom or other indication of effect) to varying amounts of a given pollutant becomes the basis for determining what safe levels, if any, can be tolerated in the environment, workplace, or home.

**dredging.** The physical removal of bottom sediment, rocks, or debris from a body of water. There are many different technologies for accomplishing this removal, the most

basic being a clamshell bucket on a crane, and the most sophisticated being computer-driven suction pumps that remove material with virtually no resuspension.

**endocrine disruption.** The disturbance of an animal or human's hormonal systems through uptake of chemical substances that either block or substitute for the normal functioning of hormones. There are many hormones produced in the body which regulate most of our developmental and behavioral functions. Hormones determine a fetus's growth rate and organ development, and hormones control our sexual functions, and affect our immune system, among many other key aspects of our growth and viability. Since hormones normally work in very small doses — in the very low parts-per-billion range — exposure to endocrine-disrupting chemicals need not be very great to have an effect. Many of the effects noted in laboratory experiments have been serious, often subtle, and they frequently have not followed a classic dose-response curve.

**EPA.** The United States Environmental Protection Agency. EPA is responsible for administering the requirements of the CERCLA statute.

**epidemiology.** The study of epidemics and epidemic diseases; also the procedures used to study such epidemics, which can be applied to study widespread health impacts from toxic pollutants in the environment.

**exposure.** Contact with a pollutant or toxin. Chronic exposure is the result of long-term contact; acute exposure is contact in a relatively short time period.

**fate.** The fate of a pollutant is the scientist's description of the eventual locations of the contaminant after dispersal and degradation, have been at work.

**FDA.** The United States Food and Drug Administration. FDA sets the allowable PCBs threshold for safe consumption of fish. That threshold was set a number of years ago at 2 parts-per-million PCBs, which is not protective against most effects of PCBs.

**fish advisories.** Also known as health advisories. In response to the FDA's concerns about consumption of fish containing PCBs and other harmful contaminants, the New York State Departments of Health and Environmental Conservation (DOH and DEC) collaborate on the production, printing, and distribution of a document that cautions

against such consumption. Clearwater issues its own advisory, a simplified one-page version of the DOH/DEC document, in English and Spanish. Many states have fish advisories against eating particular types of fish which are contaminated with particular toxic chemicals.

**FOIA.** Freedom of Information Act. One of the bedrock “sunshine” laws, FOIA and its state clones such as New York’s FOIL, are based on the belief that the public deserves access to all documents and transactions conducted by government agencies. FOIA is routinely used as a tool by polluters such as General Electric to drain limited agency resources, and by environmentalists to stay abreast of both agency and polluter activities.

**food chain (food web).** The nutritional structure of ecosystems, in which simpler, faster breeding organisms, such as phytoplankton, feed organisms of increasing complexity, such as zooplankton, which in turn feed small fish, which in turn feed larger fish, which feed the top carnivores, such as humans, eagles, osprey, etc.

**furans.** Often seen with prefixes such as dibenzo-, furans are byproducts created when PCBs are subjected to extreme heat, e.g., during an accidental transformer explosion or fire, or during incineration. Furans are far more toxic than PCBs.

**gas chromatograph.** The GC, as it is called by scientists, is the principal laboratory instrument used to detect PCBs and other contaminants in flesh, fluids, soils, etc. Like any other technology, the GC has been refined over the years to provide greater accuracy and levels of detection that now reach into the very low parts-per-trillion range.

**GE.** General Electric, the corporation responsible for dumping more than a million pounds of PCBs directly into the Hudson River, and another 8 million pounds into landfills and geologic substrates in the Glens Falls, NY, area. GE has 75 other Superfund sites, and an unknown number of additional toxic waste sites, such as the Housatonic River in Pittsfield, MA, where homes, churches, playgrounds, and schoolyards were given heavily-contaminated “clean” fill by the company. GE is one of the world’s largest and most profitable corporations, with a uniquely aggressive management style embedded in the corporate culture. General Electric’s Chief Executive Officer (CEO), Jack Welch, a widely-emulated manager, is the subject of a recent unflattering book entitled “At Any Cost.”

**groundwater.** Water below the surface of the ground.

Usually patterns of flow in groundwater are of critical interest in determining the dispersion flows of contaminants in water that may have infiltrated a landfill, or as in the case of Hudson Falls, NY, where contaminants were discharged through neglect directly into groundwater-containing geologic formations.

**hydrophobic.** Having a strong tendency to avoid or repel water.

**implementation.** Making it happen. Implementation of a consent order, for instance, means the carrying-out of specific work directives contained in the consent order.

**legally discharged.** Much of the pollution that has been distributed in the environment was released legally, as the polluters are fond of pointing out. Prior to the early 1970's there were few, if any, restrictions on industrial waste discharges, so any and all pollution, however flagrant, was technically legal. As environmental laws began to appear in the 1970's, the medium of control over plant emissions was the permit process, and most permits were initially awarded for existing levels of releases — again, legal. This issue has been a bone of contention for many polluters who believe that Superfund (CERCLA), which assigns responsibility for a cleanup regardless of a discharge's legality, is fundamentally unjust. Environmentalists counter by explaining that pushing pollutants downstream — “externalizing” costs that should have remained within the company — contributed greatly to profits. Why should taxpayers pay to clean up a mess that made a profit for the corporation? In any event, General Electric violated its permits so often, so egregiously, that its discharges can hardly be called “legal”.

**load (loading).** The total quantity of a contaminant within a host medium.

**model.** A scenario based on mathematical equations developed from observations of real-world behavior. For instance, a key modelling effort in the PCBs Reassessment conducted by EPA from 1989 through the present day has been to develop a model that can predict the flows of PCBs from sediment and other sources, through the Hudson River ecosystem, into fish, and thereby into people. Models are tested by choosing a startpoint sometime in the past, running the model, and comparing the results to known conditions today. If the model “predicts” what

has actually happened within a predetermined range of accuracy, it is assumed to be capable of predicting the future as well.

**monochlorinated.** PCBs with a single chlorine atom attached to the molecule. See *dichlorinated*.

**Monte Carlo.** A form of statistical analysis. The purpose of statistical analysis is to determine if the results (numbers) are meaningful or just the product of chance.

**NAS.** The National Academy of Sciences, a prestigious group of scientists.

**neurotoxin, neurotoxicity.** Refers to brain and nervous system damage. PCBs have been shown to actually destroy nerve cells in the laboratory.

**no action.** One alternative form of remedial action (see below) provided for in the language of Superfund. “No action” means exactly that—doing nothing.

**NRDA.** Natural Resource Damage Assessment (most frequently expressed as NRD). In Superfund there are two courses of action that the public can use to obtain justice in pollution cases. The first simply deals with cleanup — identifying the polluter, characterizing the pollution, determining the best cleanup plan, getting the money from the polluter, and supervising the cleanup. NRD, the second, is a mechanism for compensating the public for damage done to natural resources, whether geologic, aquatic, atmospheric, or biological. Federal Natural Resource Trustees — comprised of representatives from the National Oceanographic and Atmospheric Administration (NOAA), US Fish and Wildlife Service (USFWS), and the state environmental agency — evaluate the damage caused by the pollution event and agree on a means of compensation, whether in cash or in environmental services, such as land preservation, wetlands restoration, etc.

**NRD Coalition.** A group of industrial polluters, including GE and oil giant ARCO, who are spending millions on intensive lobbying in Washington. Their goal is to change CERCLA, and particularly the NRD component, so that natural resources damage assessments, which have the potential to run several billions of dollars, are capped at just a few million.

**organic.** In the debate over chemical pollutants, the term “organic” specifically refers to chemicals containing mostly carbon. Most chemical pollutants are petroleum derivatives, and are carbon-based. Animal and plant tissue, from which petroleum was formed, are carbon-based as well.

**parts per million ( — thousand, — billion, — trillion).** Terms used to describe the ratio, or proportion (concentration), of a material within a host entity. The “parts” refer to the material or contaminant of concern, such as PCBs, and the “per million,” for example, refers to units of the host, which might be the flesh or blood of a fish. The material can be salt, and the host a river, such as the Hudson or PCBs in an owl’s brain. PCBs in the Hudson River bulk water are measured in parts-per-trillion (20-40 ppt). PCBs in human blood are measured in parts-per-billion (background levels in the US average 1.5 ppb). Groundwater samples beneath the Hudson Falls GE plant have measured over 700,000 ppm — over 70% pure PCBs.

**pathway.** A route or mechanism of exposure. Fish consumption is the principal pathway for human uptake of PCBs in the lower Hudson Valley.

**PCB.** Polychlorinated biphenyl. An amber oily liquid. The PCB molecule is formed of two strongly-linked carbon rings with attached chlorine atoms. In its manufactured form, PCBs oil is hydrophobic, and will not dissolve in water. In fact, at the molecular or microscopic particle level it will emerge from water and enter the atmosphere in preference to remaining waterbound. As PCBs weather (see below), some of the chlorine atoms are lost. When one or two are left, the molecule will dissolve in water, which makes it highly mobile. PCBs come in some 209 congeners, and are classified by EPA as “probable human carcinogens.” Studies done by General Electric scientists have proven that all PCBs cause cancer in laboratory animals. Laboratory animals are our best predictors of human responses.

**peer review.** A process by which the scientific community conducts reality-checks of articles intended for publication. These articles generally describe research studies conducted by scientists or groups of scientists. In the case of the PCB Reassessment, peer review is being done to ensure that research and modelling conducted by EPA and its contractors are sound and defensible.

Environmentalists also believe that General Electric has demanded, and inserted into the process, an expanded form of peer review as a means to delay EPA's ability to reach a decision. The Hudson River PCB Reassessment is the only Superfund project among hundreds to be undergoing such extensive peer review.

**persistent.** A persistent chemical is one that is degraded in the environment either very slowly or essentially not at all.

**plume.** A trail of contaminated groundwater starting from a point of origin, such as a landfill or industrial site, and spreading outward. The shape and direction of the plume are determined by drilling wells and sampling the water in those wells, or by sampling water found in existing residential wells.

**polychlorinated biphenyl.** PCB (see above).

**POPs.** Persistent organic pollutants. An acronym developed by the environmental community, describing a family of pollutants such as PCBs, furans, dioxins, and many pesticides.

**pore water.** Water found between the grains of river bottom sediment. Pore water in the upper Hudson River is often more highly-contaminated with PCBs than bulk water (see above) because it is close to the contaminant deposits.

**ppb.** Abbreviation for parts-per-billion (see above).

**ppm.** Abbreviation for parts-per-million (see above).

**ppt.** Abbreviation for parts-per-thousand. Sometimes used as parts-per-trillion (see above).

**precautionary principle.** An ethically-defined framework for dealing with issues that have not been fully captured by science or law. The Precautionary Principle sets forth the idea that society must suspend or curtail activities that exhibit a reasonable possibility of causing harm to humans or the environment until all the data are in and a more concrete policy can be adopted.

**pre-natal.** Literally, before birth. Refers to the embryonic and fetal states, and the complex relationships between the mother and the developing fetus.

**PRP.** The potentially responsible party to a CERCLA action, i.e., a polluter.

**Pyranol.** Another trade name for PCBs, generally used by GE in its company literature.

**qualitative.** An evaluation or description that relies upon the power of narrative, ethics, or logic rather than on numerical data. Qualitative argument suffers from a perceived vulnerability to opinions that are strongly-held regardless of provable fact. Nevertheless, there are times when a concept — such as endocrine disruption — is important enough to warrant discussion even before scientific consensus is reached, at which times a qualitative discussion is used to present the known or suggested pros and cons.

**quantitative.** An evaluation or description that is based upon numerical data gleaned in the course of research that follows the scientific method..

**Reassessment.** When EPA reopened the original investigation of the Hudson River PCBs problem that had resulted in a “no-action” decision in 1985, the new inquiry was referred to as the PCB Reassessment. It is also known as the RI/FS (see below).

**recovery well.** A well that is drilled into the geological substrates around a known or suspected toxic waste source for the purpose of removing contaminated groundwater. In sufficient numbers, recovery wells can create an area of low pressure underground, which can draw back and ultimately eliminate an outward-spreading plume of contaminants. A large array of recovery wells at the Hudson Falls GE plant, for instance, has reduced the flow of PCBs from the bedrock formation beneath the plant into the Hudson River.

**reference dose.** A key element of formal risk assessment calculations. It is an estimate of the daily exposure of humans to a toxic chemical that is likely to have no bad effects after a lifetime of exposure at that level.

**remedial, remediation.** A reference to the cleaning up, destruction of, or stabilization of a toxic or hazardous material deposit.

**responsiveness summary.** An agency’s summary of public comments received in the course of the public process that includes issuing key reports and action decisions. Includes the agency’s reasons for incorporating or not incorporating the comments in its decision process.

**resuspension.** When grains of silt or sediment are mixed in the water column, i.e., not settled to the bottom, they are said to be “in suspension.” When bottom sediments are disturbed, as they can be when a boat passes by, when fish fan the bottom with their fins, when dredging occurs, or during high-water events, the silt that is lifted off the bottom by water turbulence is said to be resuspended. Resuspension becomes an issue when the bottom sediments are contaminated because the contaminant can be dispersed into the environment, possibly posing a hazard to wildlife or humans. Polluters such as GE claim that sediments on the bottom are dormant and not subject to resuspension unless dredged for removal. Environmentalists, and most scientists, dispute GE’s contention because sediments are constantly being resuspended in nature and modern dredging technologies have all but eliminated sediment resuspension.

**RI/FS.** Remedial Investigation / Feasibility Study. EPA’s formal name for the PCBs Reassessment. A process of scientific review, modeling of outcomes under different remedial alternatives, and decision.

**risk assessment.** A standardized process by which toxic and hazardous material exposure-induced cancer risks to humans and certain wildlife species are calculated and quantified.

**risk slope factor.** A measure of a given toxic or hazardous substance’s power to cause cancer. The slope factor becomes a key number in the risk assessment equation.

**river mile.** The distance of a given point from the Battery, the southern tip of Manhattan. River miles are used to identify and describe the locations of PCBs hotspots and other features of the Hudson River PCBs landscape.

**ROD.** Record of Decision. Near the conclusion of an RI/FS, EPA issues a Proposed Plan, containing EPA’s study conclusions and recommended remediation, which is followed by a period of public comment, a responsiveness summary, and then the Record of Decision itself. The ROD is a document that legally binds a PRP to a specific course of remedial action at risk of significant fines or other penalties.

**sample.** A representative unit from a site gathered in the field during the course of research. A sample might be a bottom sediment core, a blood sample, a container of water, or a quantity of air, taken for analysis.

**scope of work.** A document in which an agency outlines the methods and sequences it will use during the course of an investigation or research program. A “scope” is typically offered to the public for comment.

**sediment inventory.** Describes the quantity and distribution of a contaminant that is contained within a sediment, such as the bottom of a river.

**special interest group.** An entity that pursues political influence for the primary purpose of significant monetary or legal gain. Distinct from a *public* interest group, for which the driving force is a benefit to the public, such as improved health or education. The fact that a public interest group relies upon donations for its survival and effectiveness does not equate it with the primarily profit-oriented actions of a special interest group.

**statistically significant.** The most basic task of statistical analysis is to describe the difference between two or more data sets quantitatively. In cases where the difference falls below certain levels referred to as confidence intervals, it is deemed not statistically significant, and scientific protocol holds that such a difference be described as “no difference” — even though there may be a small numerical difference. When the difference is larger than the formulaic threshold of confidence, it can then be described as statistically significant. Statistical analysis is used to decide whether that difference is due to random chance or to a real difference between the groups.

**subsistence fishers.** Persons who fish for food out of necessity, or out of cultural preference.

**Superfund.** The popular term for CERCLA (see above).

**transformer.** An electrical appliance built for the purpose of stepping power down from typically high generation or transmission voltages to the lower voltages needed by household or mechanical equipment. Until 1976, almost all transformers built in the US were filled with PCBs, and even today there are old transformers still in use.

**transport.** Movement, either within a system, such as atmospheric transport, or from system to system, such as from a dissolved state, to the atmosphere, and then to earth again as atmospheric deposition.

**TSCA.** The Toxic Substances Control Act. Sets and regulates standards for handling, transporting, disposal, and destruction of toxic materials. TSCA standards also govern the design and performance specifications for landfills and incinerators that handle toxic substances.

**uptake.** The consumption by an organism of a substance under consideration. The principal pathway for *uptake* of PCBs by human beings is fish consumption.

**volatilization.** The process by which PCBs or other chemicals become suspended in air.

**water column.** The depth of a body of water, from its surface to its bottom.

**weathered.** Refers to alterations in the molecular structure of a material, such as a PCB congener, that have occurred as a result of bacterial action, physical abrasion, exposure to ultraviolet radiation, heat, extreme cold, through metabolic processes in biological organisms, etc.

## Section I: Scientific Reports and Articles

References are listed here by ascending date order — earliest to present — in order to provide a comprehensive timeline of scientific research on PCBs.

### Information on the EPA Hudson River PCBs Reassessment Project

The Environmental Protection Agency (EPA) has a website with much information: [www.epa.gov/hudson](http://www.epa.gov/hudson)

There are also EPA Document Repositories. Look for the documents labeled GE. The EPA website states the Hudson River PCBs Reassessment documents are at the following locations:

**Adriance Memorial Library**  
93 Market Street  
Poughkeepsie, NY  
12601

**Saratoga County EMC\*\***  
50 West High Street  
Ballston Spa, NY  
12020

**Catskill Public Library**  
1 Franklin Street  
Catskill, NY 12414

**Saratoga Springs Public Library\*\***  
49 Henry Street  
Saratoga Springs,  
NY 12866

**County Clerk's Office**  
Washington County  
Office Building  
Upper Broadway  
Fort Edward, NY  
12828

**Sojourner Truth Library\*\***  
SUNY/ New Paltz  
Gov. Doc. Section  
New Paltz, NY 12561

**Crandall Library**  
City Park  
Glens Falls, NY  
12801

**Troy Public Library**  
100 Second Street  
Troy, NY 12180

**Cornell Cooperative Extension**  
New York Sea Grant  
Institute  
74 John Street  
Kingston, NY 12401

**White Plains Public Library**  
100 Martine Avenue  
White Plains, NY  
10601

**NY State Library**  
CEC Empire State  
Plaza  
Albany, NY 12230

**USEPA Region 2**  
Superfund Records  
Center  
290 Broadway, 18th fl.  
New York, NY 10007

\*\* Locations have CD-ROM availability.

**NYSDEC**  
Div.of Hazardous  
Waste Remediation  
50 Wolf Road  
Albany, NY 12233

*The following "satellite" repositories also have CD-ROM availability, but do not have all of the Reassessment documents:*

**Marist College**  
290 North Road  
Poughkeepsie, NY  
1260

**Rensselaer Polytechnic Institute**  
R.G. Folsom Library  
Troy, NY 12180-3590

**University Library**  
SUNY/ Albany  
1400 Washington  
Avenue  
Albany, NY 12222  
(Government Documents Section)

## PCBs and Human Health

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- “In PCB Fight, It’s the Nun Vs. the C.E.O.”** by Elizabeth Kolbert. In *The New York Times*. May 25, 1998
- “Toxic Chemicals From 70’s Still Pollute Hudson, Study Says”** by Andrew C. Revkin In *The New York Times*. July 24, 1998.
- “Recovery Faces Perilous Waters: After A Dramatic Comeback, a Difficult Future”** by Paul Zielbauer. In *The Albany Times Union*. September 20, 1998.
- Numerous new articles about the PCB issue continue to be published. Check your local library for recent updates.*

## **Section VI: On the Internet**

**Agency for Toxic Substances and Disease Registry: PCB Fact Sheet**

<http://atsdr1.atsdr.cdc.gov:8080/tfacts17.html>

**Arctic Monitoring and Assessment Programme (AMAP)**  
[www.grida.no/amap/amap.htm](http://www.grida.no/amap/amap.htm)

**Atlantic States Marine Fisheries Commission: Research on Atlantic Striped Bass**  
<http://139.70.40.46/asmfc/atstbass.htm>

**Blue Whales in the St. Lawrence Seaway: Analysis of Organochlorine Contamination**  
<http://whale.wheelock.edu/bwcontaminants/welcome.html#PCB>

**CARC - Northern Perspectives. 21(4). Winter 1993-94.**  
"Arctic Contaminant Distribution" by S. Pfirman, K. Crane, P. deFur  
<http://www.carc.org/pubs/v21no4/contamin.htm>

**CARC - Northern Perspectives. 23(1). Spring 1995.**  
"Marine Conservation in the Canadian Arctic: A Regional Overview" by H. Welch  
[www.carc.org/pubs/v23no1/marine3.htm](http://www.carc.org/pubs/v23no1/marine3.htm), 1995.

**Chlorine Chemistry Council: A Review of Chlorine Related Research**  
<http://www.c3.org/aol/library/environfactors.html>

**Consumer Law Page**  
"Fetal Brain Damage, Developmental Delays and Intellectual Impairment as a Result of Exposure to Polychlorinated Biphenyl (PCB) in Pregnancy" by Richard Alexander, Esq.  
<http://consumerlawpage.com/nographics/article/braindam.shtml>

**Environmental Defense Fund**  
[www.edf.org](http://www.edf.org)

**Environmental Protection Agency**  
[www.epa.gov](http://www.epa.gov)  
There are specific sites within the EPA's website which discuss PCBs and related issues  
[www.epa.gov/OST/Rules/polybiph.html](http://www.epa.gov/OST/Rules/polybiph.html)  
[www.epa.gov/OWOW/info/PubList/monitoring/html/024.html](http://www.epa.gov/OWOW/info/PubList/monitoring/html/024.html)  
[www.epa.gov/superfund/oerr/sfguide/index.htm](http://www.epa.gov/superfund/oerr/sfguide/index.htm)

[www.epa.gov/r02earth/superfund/faqs.htm](http://www.epa.gov/r02earth/superfund/faqs.htm)  
[www.epa.gov/HUDSON](http://www.epa.gov/HUDSON)

**Environmental Research Foundation: Rachel's  
Environment and Health Weekly**  
<http://www.rachel.org>

**Archive of Rachel's Newsletters**  
<http://www.monitor.net/rachel>

**Greenpeace International Toxic Campaign**  
<http://www.greenpeace.org/ctox.html>

**Hudson River Sloop Clearwater Inc.**  
<http://www.clearwater.org>  
PCB Home Page

**Daily InSCIght: Polar Bears and PCBs.**  
[www.apnet.com/inscight/06241998/graphb.htm](http://www.apnet.com/inscight/06241998/graphb.htm)

**Institute for River Research: Genotoxicity of PCBs**  
<http://www.edict.com/research/irripaps.htm>  
**National Academy of Science**  
<http://www.nas.edu>

**New York State Department of Environmental Conservation**  
<http://www.dec.state.ny.us>

**Office of the New York State Attorney General: Hudson  
River Restoration**  
<http://www.oag.state.ny.us/environment/HUDSON/HUDSON.html>

**Our Stolen Future Website**  
<http://www.osf-facts.org>

**Synopsis of the book, Our Stolen Future; many scientific  
referenced weblinks for additional research.**

**Pesticide Action Network**  
<http://www.panna.org/panna/>

**Physicians for Social Responsibility and the International  
POPs Elimination Network (IPEN)**  
<http://www.psr.org/pops.htm>

**Professor Per Larsson Website**  
<http://www.ecotox.lu.se/staff/pl/pl.html>  
Focuses on PCB research.

**Public Interest Research Group**  
<http://www.pirg.org>

**Remedial Action Program Information Center (RAPIC): PCB contaminated soils**

<http://www.em.doe.gov/rapic/pcb.html>

**The W. Alton Jones Foundation**

<http://www.wajones.org>

Click “Links” button, or “Learn about the organizations we support.”

**United Nations Environmental Programme: Persistent Organic Pollutants**

<http://irptc.unep.ch/pops/>

**World Wildlife Fund**

**Global Toxics Initiative Site**

<http://www.worldwildlife.org/toxics>

**World Wildlife Fund Canada**

**Hot Hormone Disruptors Website**

[www.wwfcanada.org/hormone-disruptors/link.htm](http://www.wwfcanada.org/hormone-disruptors/link.htm)

## **Section VII: PCB FAQs**

**(Frequently asked questions about PCBs).**

### **Is the Hudson River really better now?**

Yes — no thanks to GE. All those birds and fish in their ads would be dead today if GE had won its fight to defeat the Clean Water Act and the State Pollution Discharge and Elimination System.

### **Is the Hudson really healing itself?**

Not when it comes to PCBs. PCBs don't disappear, they just go somewhere else. Every day, and especially every time it rains, PCBs go downstream to permeate the ecosystem of the tidal Hudson, including the region's people. PCBs even enter the ocean, and go as far as the Arctic Circle.

### **Will dredging make the river worse, as GE claims?**

No. Many advances have been made in the last 15 years, and suction removal has been successfully employed at a number of other Superfund sites around the country — often, in fact, allowing fish consumption advisories to be lifted after just 2 or 3 years. Remedial dredging of underwater toxic wastes is a success story.

### **GE says 50 upriver towns have passed resolutions opposing a river cleanup. Why are these towns taking such an activist position?**

It is impossible to understate GE's influence in the region between the capital district and Glens Falls. Even though the company's employment is a mere shadow of what it once was, as GE becomes a leader in globalization, sending its jobs overseas to cheaper labor and fewer environmental regulations, it still enjoys a loyal following of long-term politicians and employees. Even so, GE's claim is misleading, because many towns did not pass any resolution. GE used county government resolutions as a quick-and-dirty route to claiming that all the towns in a given county had passed resolutions. Even some of the towns that did pass resolutions are beginning to rething it. The Town of Ballston recently wrote a letter to GE requesting that their town no longer be used in GE's advertising.

### **What about downriver towns?**

Outside the shadow of GE's crumbling factories, communities are strongly in favor of a cleanup. 40 towns have passed resolutions in favor of a cleanup, and many more are planning to do so.

**Where does the business community stand on this issue?**

Ask the Fort Edward Chamber of Commerce. Despite having its annual funding from the Town revoked, it has insisted on maintaining a pro-cleanup posture. Businessmen understand the bottom line — a cleanup will provide many jobs and help return the upstate region to economic vitality.

**Was GE's dumping of PCBs legal, as they always claim?**

Not always. For years the state DEC had been trying to get GE to reduce its staggering discharges, but GE threatened to leave the state, taking its 55,000 jobs with it, and made DEC's position politically untenable. GE had permits to pollute — but frequently violated them.

**Will the upstate economy be devastated by a cleanup, as GE claims?**

No way! If EPA calls for a cleanup of the PCB hot spots, GE will have to spend between \$500 million and a billion dollars in the area. According to economists, each dollar spent in a community has a “multiplier effect” of 8 dollars. The cleanup could employ hundreds of area residents, and bring billions of dollars into area businesses.

**GE says it has spent \$165 million cleaning up the river. Is this true?**

It has spent millions — but only on its own property, and only after the DEC forced it to with Consent Orders. Also included in that number are lawyers, lobbyists, and PR agency fees for the fight against a cleanup. Watch for this number to start rising as the costs of GE's \$2 million-per-week ad campaign are included.

**According to GE, PCBs don't hurt people. Is that true?**

No. GE paid a chemical-industry-funded research group to hire private detectives to find every GE employee who worked at or near the PCB plants in Hudson Falls and Fort Edward. Many worked there as little as 90 days, many less than a year. The study included thousands of people who never went anywhere near PCBs. If every worker who came in contact with PCBs died of cancer, the mortality would not have been “statistically significant.” The study did not look at the incidence of cancer; just mortality. Every single former GE employee could have been battling cancer for twenty years with no impact whatsoever on this GE-funded study.

**Won't it be destructive to dredge the whole river?**

The whole river does not need dredging. In fact, only a few "hot spots" must be dredged, with minimal impact even on the local biota.

**Would a big cleanup be financed by my tax dollars?**

No. The law stipulates that the polluter must pay. Why else would GE be fighting the cleanup so vigorously?

**Why don't we hear more about health problems from PCBs?**

GE has arranged its research to prove there is no health problem from PCBs. The NYS Department of Health has steadfastly refused to undertake epidemiological work, and like most agencies is highly politicized. Many homes in Fort Edward and Hudson Falls had badly contaminated drinking water wells, but GE bought the homes and insisted on a contract clause forbidding the owners from discussing the matter any further. Stories of widespread mortality and cancer told by longtime GE residents, including media interviews, have been ignored. Researchers working for the NYS Department of Health were "relocated" after attempting to secure funding for a study of blood samples in capital district residents. Only recently have the first small studies of Hudson Valley fish consumers been released, with shocking results.

**Where does Congress stand on this issue?**

With only one exception, all the Members who represent districts along the river have signed bipartisan letters supporting the EPA's work and urging a river cleanup. The only Member who has not signed is John Sweeney (R-Half Moon), who took over retiring Rep. Gerald Solomon — now a GE lobbyist.

**If we do what GE says, when will the fish be safe to eat again?**

50 years!

**What are the weekly costs of GE's advertising campaign 2000?**

The campaign started in the region north of Albany, in six newspapers and numerous radio and TV markets. Best estimates put the total weekly costs then at about \$1,000,000. By October the advertising had spread all the way south to New York City, representing a weekly cost between \$3,000,000 and \$5,000,000.

**How much will GE spend on the entire campaign?**

From \$50,000,000 to \$75,000,000.

**Is the campaign working?**

Yes. GE expanded its support base dramatically over what it would have been without the campaign. GE retained the firm Fieldwork.com to conduct “push polls” — focus groups and interviews that emulated legitimate survey techniques but distorted the information content to build a constituency for the GE anti-remediation position. Each interviewee was paid, and shown fallacious, misleading “facts,” then asked about their opinions. These biased interviews have provided the justification for expanding the ad campaign.

**Are the people in the GE ads regular folks like you and me?**

Several of them are familiar figures who have been seen for many years in the company of salaried GE staffers. Others have been paid, so we assume that all have been paid, or at least offered compensation, to appear. Ironically, one of the “plain folks” who shows up in the ads runs a marina which cannot be dredged because of PCBs, and is almost certainly suffering because many larger boats can no longer traverse the Champlain Canal, which cannot be dredged.

**GE says it has spent \$165 million “cleaning up the river.” Is that true?**

No. The only places GE has cleaned that could be construed as riverine are one small spot directly in front of an old discharge pipe and the sopping-up of PCBs oozing out of bedrock in exposed river-bottom just below the Hudson Falls dam. 99% of GE’s money has gone into lobbying, political influence-peddling, and state-ordered cleanups on its own upland properties.

**GE says that PCB levels have fallen to 90%. Isn’t that good?**

It depends on your perspective. PCB levels in “bulk” water have fallen on average since 1977 because these persistent toxins have simply moved downstream, into fish, birds, plants, the air, and our bodies. The simple fact that many PCBs have left the immediate environment of the upper Hudson is not necessarily good news because the pollution hasn’t disappeared. It has simply gone somewhere else. We must remember that PCBs are not gone. Because tons of PCBs remain in the river bottom, every time the river is swollen with rain a slug of PCBs goes down river, sometimes forcing communities such as Waterford to close their drinking water intake valves. The good news is that GE, at the point of a regulatory gun, has been forced to clean up PCB deposits underground that were still emitting fresh PCBs into the river as recently as last year.

**GE apologists such as Rep. John Sweeney say the only want the best science. Isn't EPA looking at the science too?**

Absolutely. EPA has put together the largest data base on Hudson River PCBs in the world. Virtually every study ever conducted on Hudson River PCBs has been read and evaluated. The largest body of new research on PCBs has been commissioned by EPA. EPA is even using GE's data, so any conclusions reached by EPA have included GE's own research. Everyone knows that there is more than enough data to reach defensible conclusions about cleaning up the river. GE has learned that science can be invoked as a tool for delaying regulatory action. GE has also learned that if they can delay regulatory action indefinitely, it is tantamount to a victory.

**Where does Governor Pataki stand on PCBs?**

The Governor is very proprietary about the Hudson, and has made it the showpiece of his environmental work. In a recent letter he strongly urged Carol Browner, EPA Administrator, to stand firm behind the schedule of the PCB Reassessment, which calls for a preliminary decision in December 2000. The Governor has never taken a stance for or against remedial dredging that we are aware of, nor has he issued any negative public statements about GE. Nevertheless, his insistence on an end to delays is a clear blow against GE's agenda.

**What can I do to help ensure that the river gets cleaned up?**

Write a simple note asking for the PCBs to be taken out of the river, and send it to :

Carol Browner, Administrator  
1101A USEPA Headquarters  
Ariel Rios Building  
1200 Pennsylvania Ave. NW  
Washington, DC 20460

...or email her at: [browner.carol@epa.gov](mailto:browner.carol@epa.gov)

## **Principal Findings in the Key U.S. Environmental Protection Agency (EPA) Phase 2 Reports for the Hudson River PCB Site Reassessment**

**Data Evaluation & Interpretation Report (2/97)**

**Low Resolution Sediment Coring Report (7/98)**

**Baseline Modeling Report (5/99)**

**Ecological Risk Assessment (8/99)**

**Human Health Risk Assessment (8/99)**

### **DATA EVALUATION AND INTERPRETATION REPORT**

1. The area of the site upstream of the Thompson Island Dam represents the primary source of PCBs to the freshwater Hudson. This includes the GE Hudson Falls and Ft. Edward facilities, the Remnant Deposit area and the sediments of the Thompson Island Pool.
2. PCBs from the Thompson Island Pool dominate the water column load from the Thompson Island Dam to Kingston during low flow conditions (typically 10 months of the year).
3. PCBs from the Thompson Island Pool originate from the sediments within the Thompson Island Pool.
4. Sediments will not be naturally “remediated” via dechlorination. The extent of dechlorination is limited, resulting in probably less than a 10 percent mass loss from the original concentrations.

### **LOW RESOLUTION SEDIMENT CORING REPORT**

1. There was little evidence found of widespread burial of PCB-contaminated sediment by clean sediment in the Thompson Island Pool. Burial is seen at some locations, but more core sites showed loss of PCBs than showed PCB gain or burial.
2. From 1984 to 1994, there has been a net loss of approximately 40 percent of PCBs from highly contaminated sediments in the Thompson Island Pool.

3. From 1976-1978 to 1994, between the Thompson Island Dam and the Federal Dam at Troy, there has been a net loss of PCBs in hot spot sediments.
4. The amount of PCBs in Hot Spot 28 calculated from the low resolution coring data is considerably greater than previous estimates. This apparent “gain” in inventory is attributed to significant underestimates in previous studies rather than actual deposition of PCBs in Hot Spot 28.

## **BASELINE MODELING REPORT**

1. The future projection for PCB concentrations in the water column is determined by inputs from the sediment. Although the constant upstream PCB load in the forecast simulations contributes to the PCB concentration in the water column, the shape of the response curve is set by the sediment-to-water PCB fluxes.

Predicted PCB concentrations in the surface sediments are not controlled by PCB loads generated above Fort Edward. Sediment PCB concentrations are controlled primarily by sediment-to-water flux and exchange between deep and surface sediments.

Water column PCB concentrations are influenced by upstream PCB loadings, with the relative degree of influence increasing with time, due to declining PCB concentrations in the surficial sediments.

2. A 100-year peak flow event would not be expected to have substantial impacts on the recovery rate of the upper Hudson River.

The models predict that approximately 60 kg. (130 lbs.) of PCBs would be lost from the Thompson Island Pool in response to a 100-year peak flow (47,330 cubic feet per second)

Long-term, summer average PCB concentrations in the water column with and without the 100-year peak flow are virtually indistinguishable one year after the event. (Note that this does not account for potential impacts from PCBs that moved into the Lower Hudson River.)

3. Although there has been net deposition of sediment in the Thompson Island Pool (as well as the entire upper Hudson), there have been losses of PCBs from the sediment. In other words, net deposition does not mean that PCBs will be unavailable to the water column.

4. There is a contribution of PCBs from that sediment that is not dependent on the flow of the river. Some of the processes that may cause non-flow dependent resuspension are: wind driven dispersion, bioturbation by benthic organisms, bioturbation by demersal fish, mechanical scour by propwash, boats and floating debris, and uprooting of macrophytes by flow, wind, or biological action. Such a non-flow dependent load is important because the model calibration suggests that approximately 80 percent of the total PCB transport down the river from 1991 to 1997 took place during low-flow periods.
5. Largemouth bass average values will not achieve target levels of 1.1 ppm or 0.2 ppm within the 21-year forecast period.
6. Forecasts suggest that for river mile 189, average yellow perch values will not achieve the lower target values and the 95th percentile values will not be reached within the forecast period.
7. Within the 21-year forecast period, no other target levels will be achieved for average brown bullhead at river mile 168, and none of the target levels are achieved at river mile 189.
8. For all locations and species modeled, predicted average body burdens did not fall below 0.5 ppm within the 21-year forecast period.

## **ECOLOGICAL RISK ASSESSMENT**

1. Fish in the Hudson River are at risk from exposure to PCBs; fish that eat other fish (i.e., which are higher on the food chain), such as the largemouth bass and striped bass, are especially at risk. PCBs may adversely affect fish survival, growth, and reproduction.
2. Birds and mammals that feed on insects with an aquatic stage spent in the Hudson River, such as the tree swallow and little brown bat, are at risk from PCB exposure. PCBs may adversely affect the survival, growth, and reproduction of these species.
3. Waterfowl feeding on animals and plants in the Hudson River are at risk from PCB exposure. PCBs may adversely affect avian survival, growth, and reproduction.
4. Birds and mammals that eat PCB-contaminated fish from the Hudson River, such as the bald eagle, belted king-

fisher, great blue heron, mink, and river otter, are at risk. PCBs may adversely affect the survival, growth, and reproduction of these species.

5. Omnivorous animals, such as the raccoon, that derive some of their food from the Hudson River are at risk from PCB exposure. PCBs may adversely affect the survival, growth, and reproduction of these species.
6. Fragile populations of threatened and endangered species, represented by the bald eagle and shortnose sturgeon, are particularly susceptible to adverse effects from PCB exposure.
7. PCB concentrations in water and sediments in the Hudson River generally exceed standards and criteria and guidelines established to be protective of the environment. Animals that use areas along the river designated as significant tidal habitats may be adversely affected by the PCBs.
8. The risks to fish and wildlife are greatest in the Upper Hudson River (in particular the Thompson Island Pool) and decrease in relation to PCB concentrations downriver. Based on modeled future PCB concentrations, many species are expected to be at considerable risk through 2018 (the entire forecast period)

## **HUMAN HEALTH RISK ASSESSMENT: UPPER HUDSON RIVER**

1. Eating fish is the primary pathway for humans to be exposed to PCBs from the Hudson.
2. Under the Reasonably Maximally Exposed (RME) scenario for eating fish, the calculated risk is one additional case of cancer for every 1,000 people exposed. This excess cancer risk is 1,000 times higher than the USEPA's goal of protection and ten times higher than the highest risk level allowed under Superfund law.
3. For non-cancer health effects, the RME scenario for eating fish from the Upper Hudson results in a level of exposure to PCBs that is more than 100 times higher than the USEPA's reference level (Hazard Index) of one.
4. Under the baseline conditions, the point estimate RME cancer risks and non-cancer hazards would be above USEPA's generally acceptable levels for a 40-year exposure period beginning in 1999.

5. Risks from being exposed to PCBs in the river through skin contact with contaminated sediments and river water, incidental ingestion of sediments, and inhalation of PCBs in air are generally within or below USEPA's levels of concern.

## *Hudson River Sloop*



**CLEARWATER**