EPA United States Environmental Protection Agency
Water

Office of Science and Technology (WH-551)
Washington, DC 20460

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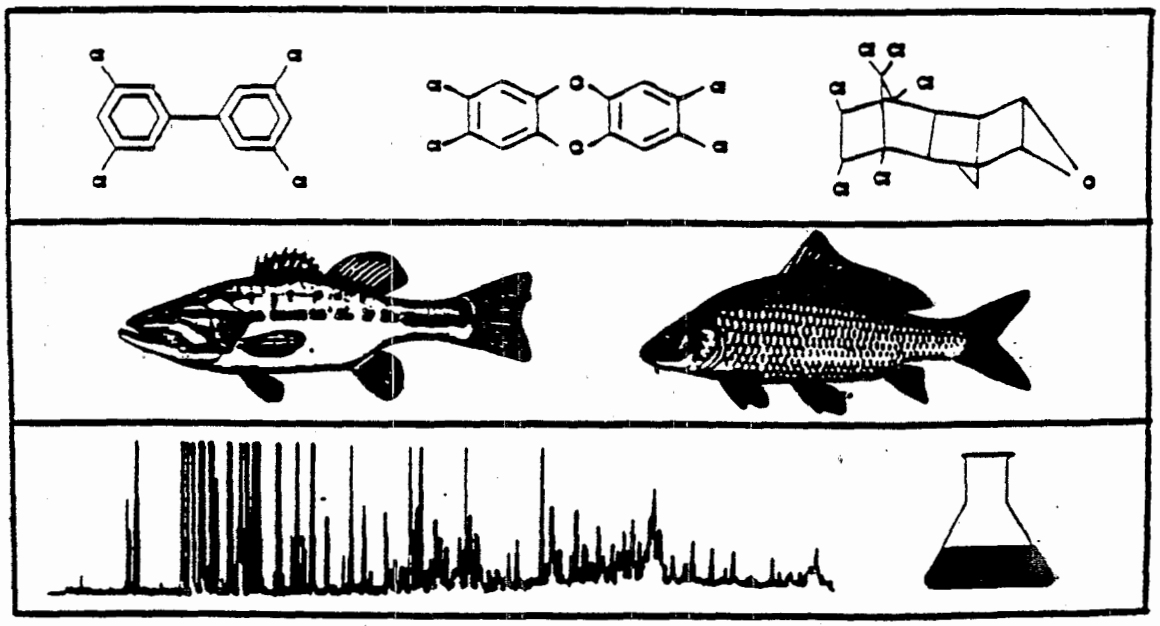
January 1993

Press Package

EPA National Study of Chemical Residues in Fish



November 1992

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DEPUTY ASSISTANT ADMINISTRATOR'S STATEMENT

Today, the United States Environmental Protection Agency is releasing a summary of the National Study of Chemical Residues in Fish, a screening study the Agency conducted in cooperation with State environmental officials.

Some pollutants bioaccumulate in fish that live in polluted waters. This study shows that some very persistent pollutants can be found in fish at many sites where pollution is a problem. The study does not address commercial fishing and for those of us who get most of our fish from commercial markets, there is no evidence here that presents any cause for concern. However, if a person ate a diet of two four-ounce fillets of fish per month from the most contaminated sites over a seventy-year lifetime there could be a lifetime cancer risk of greater than one-in-ten-thousand. This is a conservative upper-bound estimate based on limited data.

Of the higher risk sites found (46 of the 388 examined), most are contaminated with PCBs and some are contaminated with dieldrin. Both of these chemicals have essentially been banned in the U.S. but they are highly persistent in the environment and have accumulated in the bottom sediments of our waters in polluted areas, entering the ecological food chain from those sediments. Needed fish consumption bans or advisories have been issued by states at the sites of concern. All fishers should pay attention to these bans and advisories. Persons especially at risk are avid recreational fishers and subsistence fishers in polluted areas since they may consume more fish than the average consumer and more of their fish could come from polluted water. Pregnant women and nursing mothers may also be especially sensitive to the pollutants found. If a fisher is not sure whether a ban or advisory is in effect in a certain area, he or she should contact State health officials for further information.

Again, this was a screening study and did not provide enough samples at any site to make definitive local risk findings. The data has been released as it became available over the last four years and this report is simply the first published summary of all of the data. Much of the data has already been reported by the press, especially in the local areas of concern.

Background

This report is based on samples of fish tissue the agency collected between 1986 and 1989, primarily from sites expected to show some contamination. From 1988 to 1990, the agency released the raw data collected in this national study as soon as it completed the laboratory analyses and quality assurance checks. Much of the information in the study has already been the basis for various press reports on toxic pollutants in fish over the last several years. With the release of today's report, the final written interpretation of the data becomes available.

The National Study of Chemical Residues in Fish was a follow-on effort to the 1986 National Dioxin Study which found dioxin in fish tissue taken from some sites had reached potential levels of concern. The Agency conducted this study to further evaluate the presence of dioxin and dioxin-like compounds in fish, and to assess the extent to which other toxic

pollutants may be accumulating in fish. In 1990, the Agency released a summary of the dioxin data in this report as part of its comprehensive Dioxin-in-Paper Integrated Risk Assessment. Hank Habicht, EPA Deputy Administrator, briefed the press on the dioxin data at that time.

The report being released today on the National Study of Chemical Residues in Fish includes all of the data from samples of both bottom-feeding fish and game fish collected at 388 sites around the country between 1986 and 1989. Of these sites, 314 were selected because of the presence of possible dischargers of bioaccumulative pollutants, including industrial, agricultural or urban runoff sources. The remaining 74 sites were selected to provide an indication of background levels of these chemicals. Both whole-body fish and fish fillet samples were analyzed for a total of 60 bioaccumulative chemicals, including 15 dioxin and furan compounds, 10 polychlorinated biphenyls (PCBs), 21 pesticides and herbicides, mercury, biphenyl, and 12 other organic compounds.

Prevalence of These Chemicals in the Environment

With regard to the presence of chemicals of concern (as opposed to actual or projected health risks associated with such presence), the study found DDE (a breakdown product of DDT), PCBs and mercury present at the highest concentrations in these fish-tissue samples.

Specifically, the study found that:

1. 22 of the 60 tested chemicals were detectable in fish tissue samples at more than half of the sites;

2. DDE, a breakdown product of DDT, was found at almost every site;

3. Total PCBs, mercury, and biphenyl were detected at more than 90% of the sites;

4. Seven of the 15 dioxin/furan compounds were found at more than half of the sites; and

5. Fifteen of the other 45 compounds were detected at very low levels at more than half of the sites.

Correlations Between Sources and Pollutants

EPA could not identify a correlation between specific sources and most of the pollutants analyzed. However, as previously announced in 1990, pulp and paper mills using chlorine appear to be the dominant source category of certain types of dioxin and furan (2,3,7,8 TCDD and 2,3,7,8 TCDF) found in these fish samples collected between 1986 and 1989.

Human Health Risks and Follow-on Actions to Reduce Risk

Presence of pollutants does not necessarily mean that a health or environmental risk exists. Therefore, wherever it was possible to do so, EPA evaluated the levels of pollutants found, the hazards associated with those levels and the ways people might be exposed to the pollutants. This process allowed us to evaluate whether there were risks to human health from the pollutants of concern at 110 of the sites in the study.

1. Two pollutants, PCBs and dieldrin, were found at levels with estimated upper-bound human health cancer risks equal to or greater than one in ten thousand for the average fish-eating population (persons eating two four-ounce fillets of freshwater or estuarine fish per month). PCBs were found at these levels at 42 sites and dieldrin was found at these levels at 6 sites. Our estimate of risk is quite conservative for average fish-eaters since most people would not be expected to eat a steady diet of fish caught at contaminated sites.

2. Risks for dioxins and furans were not estimated in this study because EPA is currently reassessing the health effects associated with dioxin. However, risks for dioxins and furans were estimated and released in 1990 based on EPA's 1984 risk assessment. The study being released today reports the concentrations of these chemicals found in fish tissue.

3. Other pollutants which could cause health problems were not detected in high enough concentrations to pose a human health concern for the average fish-eating population.

4. Insufficient samples were taken to predict risk at some sites. Insufficient information is available on hazards of some pollutants to predict risk associated with them. Therefore, risk projections are included for only 110 of the sites in the survey.

The Agency has released the data from this study to the States, industries, and to other interested parties since 1988 as analyses were completed. The States have used this information to focus their monitoring activities, to set fishing advisories and bans, and to limit discharges from many sources. Industry has used the data to plan and implement pollution control programs. States have issued fishing bans or fishing advisories at 41 of the 46 sites where consumption of fish could pose a human health problem under certain circumstances. Additional monitoring at the remaining five sites has not indicated the need for advisories to date.

Partly in response to this study, some industry dischargers have taken significant steps to reduce discharges of toxic pollutants. In particular, many pulp and paper mills have made a substantial investment to change their operating practices to reduce discharges of dioxins and furans. This industry is planning more monitoring at the 104 chlorine-bleaching mills to quantify reductions of dioxin in their effluent.

EPA is also taking a variety of actions to improve our ability to assess toxic pollutant contamination and to assist the States as they implement abatement, control and public information programs. These actions include:

1. Establishing a task force to assist the States in determining fish contaminant levels of concern;

2. Requiring States to adopt water quality standards for toxic pollutants of concern;

3. Developing pollution prevention and control strategies for inclusion in enforceable permits issued to sources of bioaccumulative toxic pollutants;

4. Developing a Sediment Management Strategy to guide our programs to prevent and remediate contaminated sediments, a source of fish contamination; and

5. Developing guidance on fish sampling and analysis to promote consistent and defensible risk assessments in the future.

In addition, the Water Resources Development Act of 1992 requires EPA to conduct a comprehensive national survey of data on sediment quality in the United States. It also requires EPA to identify locations where pollutants in sediment pose a threat to the quality of drinking water supplies, fisheries resources, and marine habitats and it requires EPA to conduct a continuing program to assess sediment quality and its impacts.

SUMMARY

Today's study found contamination of fish at some of the targeted contaminated sites, but did not find high-risk concentrations of pollutants in fish throughout the country. The information gathered from this study **cannot** be used to evaluate the quality of fish on supermarket shelves.

It is important to emphasize too, that this study contains little, if any, information that has not been released before. These data have already been used by State and local governments to implement fish consumption advisories and prevention and remediation actions in many of the high-risk areas. We are encouraged that their efforts, as well as EPA's efforts, have reduced public exposure to toxic chemicals in these areas.

There is a word of caution, however. Avid recreational fishers and, in particular, subsistence fishers should be aware that fish taken from some waterways may contain elevated levels of pollutants that could be harmful to human health. It is particularly important that these persons be attentive to -- and observe -- restrictions on consumption suggested in State fishing bans or advisories.

I will be pleased to answer any questions that you might have.

United States
Environmental Protection
Agency

Communications, Education,
And Public Affairs
(A-107)

EPA

Note to Correspondents

WEDNESDAY, NOVEMBER 18, 1992

EPA's Deputy Assistant Administrator for Water, Martha Prothro, will hold a press briefing tomorrow to release a study of chemical residues in fish taken from polluted waters.

EPA previously released all of the fish tissue concentrations measured for the studyaas they became available at different times since 1986. This is the first time those data have been compiled in one document. The study does not address the overall quality of commercial fishing.

The study is a compilation of data on fish samples collected between 1986 and 1989 at 388 sites and analyzed for 60 pollutants. Most of the sites (314) were targeted areas located near both point and non-point sources of pollution such as pulp and paper mills, Superfund sites, industrial complexes and urban and agricultural runoff. At 46 sites, contaminants were found at levels that could present health concerns for regular consumers of fish caught below the sites.

Industry, states and EPA have been taking action to reduce pollutant discharges since the study was undertaken. Over the past several years, states have issued fishing advisories and/or bans at 41 of the 46 sites of concern. Recent monitoring at the other five sites shows no need for advisories.

The briefing will be held tomorrow, November 19, at 11:00 a.m. in room 642, East Tower, U.S. EPA, 401 M. St.a S.W., Washington, D.C. Copies of the study will be available at the briefing.

For more information, contact Sean McElheny at 202-260-1387.

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R-242

EPA United States Environmental Protection Agency
Water

Office of Science and Technology (WH-551)
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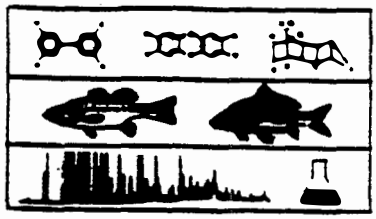
National Study of Chemical Residues In Fish Fact Sheet



What is the study?

The National Study of Chemical Residues in Fish (NSCRF, formerly the National Bioaccumulation Study, or NBS) is a one-time screening investigation to determine the prevalence and sources of selected bioaccumulative pollutants in fish. Fish samples were collected at 388 sites nationwide (Figure 1, below) and analyzed for 60 pollutants including PCBs, dioxins, furans, and mercury.

The sites sampled included 314 "targeted" sites thought to be influenced by various point and nonpoint pollutant sources. Targeted sites included pulp and paper mills (chlorine and non-chlorine), wood preserving operations, certain refineries, Superfund sites, publicly-owned treatment works (POTWs), sites near industrial complexes, and sites that could be influenced by runoff from urban or agricultural areas. Other sites included 35 background locations and 39 USGS sites to provide national coverage.

Why was the study performed?

The study began in 1986 as an outgrowth of EPA's National Dioxin Study, a nationwide investigation of 2,3,7,8 tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD) contamination of soil, water, sediment, air and fish. Some of the highest concentrations of 2,3,7,8 TCDD were detected in fish. The Agency initiated the National Study of Chemical Residues in Fish to investigate whether there may be other toxic pollutants bioaccumulating in fish. The NSCRF is also part of EPA's response to a petition from the Environmental Defense Fund (EDF) and the National Wildlife Federation (NWF). This petition requests EPA to conduct an aquatic monitoring survey of the occurrence of dioxins and furans.

Figure 1
Location of Bioaccumulation Study Sampling Sites

Who performed the study?

EPA Regions and State personnel were involved in the selection of sites and sample collection. An EPA Work Group provided continuing review of the study and the final draft was sent to 62 reviewers and seven experts outside EPA for a final round of comments.

The samples were analyzed by the EPA laboratory at Duluth for 60 compounds, including 10 PCBs 15 dioxins/furans, 21 pesticides/herbicides, mercury, biphenyl, and 12 other organic compounds. Chemicals were selected for analysis based on the potential of the compound to bioaccumulate in fish, the potential for human health effects, the persistence of the chemical in the environment, and existence of analytical methods for detecting the compound in fish tissue.

When was the study performed?

The study was initiated in 1986. Fish samples were collected beginning in 1986 and continuing through 1989. Most of the samples were collected in 1987. Laboratory analyses were conducted between 1987 and 1990. States received the data as soon as QA/QC was completed on each sample. The data analyses and report preparation were conducted between 1988 and 1990.

What did the study find?

Of the 60 compounds studied, the most frequently detected pollutant was DDE found at over 98 percent of all sites sampled (Table 1). This compound is a metabolic breakdown product of DDT which was a widely used pesticide and is extremely persistent in the environment. Other compounds detected at more than 90 percent of the sites are mercury, total PCBs and biphenyl. PCBs were detected at the highest concentration with a maximum value of 124,000 parts per billion (ppb), and an average concentration of 1,890 ppb.

Seven of the 15 dioxin/furan compounds and 15 of the other 45 compounds were detected at over 50 percent

of the sites . The two most frequently detected dioxin and furan compounds were both found at 89 percent of the sites. The dioxin compound considered to be the most toxic, 2,3,7,8 TCDD, was found at 70 percent of the sites at a maximum concentration of 204 parts per trillion (ppt) and an average concentration of 6.8 ppt.

Statistical analyses of various source categories show that pulp and paper mills using chlorine appear to be the dominant (statistically significant) source category of 2,3,7,8 TCDD and 2,3,7,8 TCDF found in fish tissue. For the other dioxins/furans, the statistical correlation tests showed no dominant source category. Based on a simple comparison of median fish tissue concentrations, however, highest concentrations for penta-furans occurred near Superfund sites, highest for hexa-furans occurred near refinery/other industry sites, and highest for penta-and hexa-dioxins occurred near paper mills using chlorine. Using the same statistical correlation tests as for dioxins/furans, no single dominant source category was identified for the other 45 chemicals. However, a number of observations can be drawn from the data. For example, while the median PCB concentration was below detection at the 20 background sites where PCBs were sampled, PCB values ranged from 213 to 525 ppb for industrial urban sites, paper mills using chlorine, refinery/other industry sites, non-chlorine paper mills and Superfund sites.

Cancer risks were estimated for 106 targeted and 4 background sites having fillet data. Using EPA assumptions (ie., upper-bound cancer potency factors, 6.5 grams/day consumption rate), PCBs are the only chemical to exceed a health risk at one in a thousand (Table 2). The cancer risk exceeded the 10^{-4} risk level (one in ten thousand) at 42 sites for PCBs and at 6 sites for dieldrin. PCB use was restricted in 1982 and dieldrin use was banned in 1985. Risks for dioxins and furans were not estimated because of the ongoing dioxin risk assessment.

What do the results mean to us?

EPA projects upper bound cancer risks to exceed one in ten thousand at 46 sites where fish are contaminated by high levels of PCBs and/or dieldrin. Three of these sites had risks above this level for more than one of these compounds. States have adopted fish bans or advisories at 41 of the 46 sites where consumption of fish could be a human health problem. Additional monitoring at the remaining 5 sites has not indicated the need for advisories to date.

General Questions and Answers

- Has EPA provided outside review of the report and peer review of the site selection process and analytical methods?

Sites were selected by EPA regional or state staff based on proximity to point/nonpoint sources. Many of the sites were targeted because of known dioxin contamination.

The NSCRF report was sent to 62 agency personnel and seven experts outside of the Agency for review. We believe that technical comments have been addressed. Analytical methods were developed by EPA's Duluth Lab and reviewed by national experts at Wright State University and Columbia Research Laboratory and found to be adequate for purposes of this study.

- Has EPA proposed stringent enough follow-up actions?

Steps EPA will take for PCBs and dieldrin are outlined below. In all cases, States are in the best position to address site-specific problems and EPA will continue to help them do so.

- Have states been provided with sufficient time to review the report prior to its public release?

States have had access to fish contamination data for several years. Additionally, the states will be provided advance copies of the report.

What should EPA do next?

Measures are being taken by EPA to protect human health and affected aquatic ecosystems. Such work includes:

- Formation of a Task Force to develop a federal action plan to assist states in monitoring fish and developing advisories.
- Adoption of water quality standards by states for pollutants of concern and approval/disapproval by EPA.
- Establishment of a national protocol for a consistent risk-based approach for issuing advisories.
- Development of EPA's sediment management strategy to prevent and remediate this source of fish contamination.
- Development of pollution prevention and control strategies for point and nonpoint sources of these pollutants.

Study Limitations

The risks presented in this report represent a national screening assessment and not a detailed local assessment of risks to specific populations. Such detailed risk assessments would consider the number of people exposed and incorporate local consumption rates and patterns. Furthermore, a detailed assessment would require a greater number of fish samples per site than collected for this screening study. Additionally, this study does not address all the bioaccumulative pollutants that may be present in surface waters.

TABLE 1
Summary of Prevalence and Concentration for Bioaccumulative Compounds

Chemical	Percent of Sites Detected	Concentration			Concentration in Background Sites (Mean)
		Max	Mean	Median	
		Units in pg/g or ppt by wet weight			
Dioxins					
1,2,3,4,6,7,8 HpCDD	89	249	10.5	2.83	1.61
2,3,7,8 TCDD	70	204	6.89	1.38	0.56
1,2,3,6,7,8 HxCDD	69	101	4.30	1.32	0.39[3]
1,2,3,7,8 PeCDD	54	54.0	2.38	0.93	0.77
1,2,3,7,8,9 HxCDD	38	24.8	1.16	0.69	0.39[3]
1,2,3,4,7,8 HxCDD	32	37.6	1.67	1.24	0.39[3]
Furans					
2,3,7,8 TCDF	89	404	13.6	2.97	1.61
2,3,4,7,8 PeCDF	64	56.4	3.06	0.75	0.50
1,2,3,4,6,7,8 HpCDF	54	58.3	1.91	0.72	0.3
1,2,3,7,8 PeCDF	47	120.0	1171	0.45	0.43
1,2,3,4,7,8 HxCDF	42	45.3	2.35	1.42	0.22[4]
2,3,4,6,7,8 HxCDF	32	19.3	1.24	0.98	0.22[4]
1,2,3,6,7,8 HxCDF	21	30.9	1.74	1.42	0.22[4]
1,2,3,4,7,8,9 HpCDF	4	2.57	1.24	1.30	ND
1,2,3,7,8,9 HxCDF	1	0.96	1.22	1.38	0.22[4]
TEC[1]	N/A	213	11.1	2.80	0.59
		Units in ng/g or ppb by wet weight			
Other Chemicals[2]					
DDE	99	14000	295	58.3	56.28
Mercury	92	1800	260	170	0.34
Biphenyl	94	131	2.7	0.64	0.42
Total PCBs	91	124000	1890	209	46.9
Nonachlor, trans	77	477	31.2	9.22	5.68[5]
Chlordane, cis	64	378	2110	3.66	5.20[6]
Pentachloroanisole	64	647	10.8	0.92	0.59
Chlordane, trans	61	310	16.7	2.68	5.20[6]
Dieldrin	60	450	28.1	4.16	14.31
Alpha-BHC	55	44.4	2.41	0.72	0.72
1,2,4 Trichlorobenzene	53	265	3.10	0.14	0.17
Hexachlorobenzene	46	913	5.80	ND	0.60
Gamma-BHC	42	83.3	2.70	ND	0.14
1,2,3 Trichlorobenzene	43	69.0	1.27	ND	0.15
Mirex	38	225	3.86	ND	0.70
Nonachlor, cis	35	127	8.77	ND	5.68[5]
Oxychlordane	27	243	4.75	ND	0.50
Chlorpyrifos	26	344	4.09	ND	0.40
Pentachlorobenzene	22	125	1.18	ND	0.03
Heptachlor Epoxide	16	63.2	2.19	ND	1.60
Dicofol	16	74.3	0.98	ND	0.27
1,2,3,4 Tetrachlorobenzene	13	76.7	0.47	ND	0.03
Trifluralin	12	458	5.98	ND	10.8
1,3,5 Trichlorobenzene	11	14.9	0.12	ND	0.02
Endrin	11	162	1.69	ND	2.00
1,2,3,5 TECB	9	28.3	0.34	ND	0.01
Octachlorostyrene	9	138	1.71	ND	ND
1,2,4,5 TECB	9	28.3	0.33	ND	0.01
Methoxychlor	7	393	1.32	ND	ND
Isopropalin	4	37.5	0.46	ND	ND
Nitrogen	3	17.9	0.17	ND	ND
Hexachlorobutadiene	3	164	0.57	ND	ND
Heptachlor	2	76.2	0.35	ND	ND
Perthane	1	5.12	0.03	ND	ND
Pentachloronitrobenzene	1	15.5	0.09	ND	ND
Diphenyl Disulfide	1	3.24	0.02	ND	ND

[1] TEC represents the sum of toxicity-weighted concentrations of all dioxins and furans relative to 2,3,7,8 TCDD.

[2] The number of compounds shown here is 36; the difference is the result of grouping 3 individual PCB compounds with 1 to 10 chlorines. Five of the PCBs were found at concentrations above 50 percent; the remainder were found between 3 and 35 percent.

[3] Mean concentration of 1,2,3,6,7,8 HxCDD; 1,2,3,7,8,9 HxCDD; and 1,2,3,4,7,8, HxCDD.

[4] Mean concentration of 1,2,3,4,7,8 HxCDF; 2,3,4,6,7,8 HxCDF; 1,2,3,6,7,8 HxCDF; and 1,2,3,7,8,9 HxCDF.

[5] Mean concentration of nonachlor, trans and nonachlor, cis.

[6] Mean concentration of chlordane, cis and chlordane, trans.

TABLE 2
Number of Sites with Estimated Upper-Bound Risks

TARGETED SITES

Chemical	No. of Sites with Fillet Data	RISK LEVEL (Cumulative) $>10^{-6}$ (>1 in 1,000,000)	$>10^{-5}$ (>1 in 100,00)	$>10^{-4}$ (>1 in 10,000)	10^{-3} (>1 in 1,000)
PCBs	106	89	79	42	10
Dieldrin	106	53	31	6	0
Combined Chlordane	106	44	10	0	0
DDE	106	40	10	0	0
Heptachlor Epoxide	106	9	2	0	0
Alpha-BHC	106	11	1	0	0
Mirex	106	8	2	0	0
HCB	106	5	0	0	0
Gamma-BHC	106	0	0	0	0
Heptachlor	106	0	0	0	0
Dicofol	106	0	0	0	0
Hexachlorobutadiene	106	0	0	0	0
Pentachloroanisole	106	0	0	0	0
Trifluralin	106	0	0	0	0

BACKGROUND SITES

Chemical	No. of Sites with Fillet Data	RISK LEVEL (Cumulative) $>10^{-6}$ (>1 in 1,000,000)	$>10^{-5}$ (>1 in 100,000)	$>10^{-4}$ (>1 in 10,000)	(>1 in 1,000)
PCBs	4	1	1	0	0
DDE	4	1	0	0	0

Basis: 1) Used EPA (i.e., upper bound) cancer potency factors.
2) Used consumption rate of 6.5 grams/day.
3) Used average fillet concentrations at the few sites with multiple samples.

Combined chlordane is the sum of cis- and trans-chlordane isomers, cis- and trans-nonachlor isomers, and oxychlordane.

SITES WITH ESTIMATED RISK GREATER THAN 10^{-4} (1 in 10,000)

WITH ADVISORIES OR BANS

EPA Region	Waterbody	City
Region 2	Hudson R.	Fort Miller, NY
	Lake Ontario	Olcott, NY
	Grass R.	Massena, NY
	Lake Ontario	Rochester, NY
	Niagara R.	N. Tonawanda, NY
	Eighteen Mile Creek	Olcott, NY
	Oswego Harbor	Oswego, NY
	Hudson R.	Peekskill, NY
	Niagara R. Delta	Porter, NY
	Oswegatchie R.	Newton Falls, NY
	Passaic R.	Newark, NJ
	Arthur Kill R.	Carteret, NJ
	Newark Bay	Elizabeth, NJ
Region 3	Red Lion Creek	Tybouts Corner, DE
	Baltimore Harbor	Baltimore, MD
	Little Valley Creek	Paoli, PA
	Delaware R.	Torresdale, PA
	N. Br. Susquehanna R.	Ransom, PA
	Susquehanna R.	Pittson, PA
	Schuylkill R.	Philadelphia, PA
	Delaware R.	Eddystone, PA
	Kanawha R.	Winfield, WV
	Ohio R.	Wheeling, WV
Region 4	Coosa R.	State Line, AL
	Chattahoochee R.	Austell, GA
	Mud Cr.	Russellville, KY
	Nonconnah Creek	Memphis, TN
Region 5	Waukegan Harbor	Waukegan, IL

EPA Region	Waterbody	City
	Mississippi R.	East St. Louis, IL
	Mississippi R.	Quincy, IL
	Kalamazoo R.	Saugatuck, MI
	Escanaba R.	Escanaba, MI
	Rouge R.	River Rouge, MI
	Muskegon Lake	Muskegon, MI
	Mississippi R.	Red Wing, MN
	Milwaukee R.	Milwaukee, WI
	Sheboygan R.	Kohler, WI
	Wisconsin R.	U. Pentenwell Flow, WI
Region 6	Calcasieu R.	Moss Lake, LA
	Neches R. (tidal)	Port Arthur, TX
Region 7	Missouri River	Lexington, MO

ADDITIONAL MONITORING ONLY (NO ADVISORIES OR BANS NEEDED)

EPA Region	Waterbody	Location
Region 3	Roanoke R.	Brookneal, VA
	S. Br. Elizabeth River	Norfolk, VA
Region 5	Fox R.	Geneva, IL
Region 9	Blanco Drain	Salinas, CA
Region 10	Owyhee River	Owyhee, OR

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