SITE REVIEW AND UPDATE

HUDSON RIVER PCBS

GLENS FALLS, WARREN COUNTY, NEW YORK

CERCLIS NO. NYD980763841

REVISED
March 31, 1994

Prepared By

New York State Department of Health

Under a Cooperative Agreement With

U.S. Department of Health & Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

SUMMARY OF BACKGROUND AND HISTORY

The Hudson River PCB (polychlorinated biphenyl) site is a National Priorities List (NPL) site consisting of the Hudson River between Hudson Falls in Washington County and Troy in Rensselaer County, New York (Attachment A--Figure 1). Site contamination (PCBs) in the river does extend south of Troy and is found in striped bass taken from marine waters. The General Electric Company (GE) discharged PCBs into the Hudson River from about 1950 until 1977 from two capacitor plants in Fort Edward and Hudson Falls. The type of PCBs discharged to the river changed over time from Aroclor 1254 to Aroclor 1242 to Aroclor 1016, with the majority of the discharge being Aroclor 1242. The PCB discharges to the river decreased significantly in 1973 when GE instituted a pollution abatement program. GE stopped using PCBs in 1977.

Much of these PCBs were deposited in the sediments behind the old Fort Edward dam. Niagara Mohawk removed this dam in 1973, allowing the contaminated sediments (including about one million pounds of PCBs) to be swept downstream. The dispersal of these PCBs contaminated media in the river, including surface water, sediments and fish. Removal of the dam also caused siltation and flooding in the area of Roger's Island. The channels around Roger's Island were dredged in the late 1970's. All of this spoil material was deposited either in the old or new Moreau dredge spoil site. The New York State Department of Transportation (NYS DOT) maintains the shipping canal in the upper Hudson. However, NYS DOT has not dredged the channel since 1980 because of concern over PCBs in the sediment.

Several community water systems south of Hudson Falls use the Hudson River as the primary source of drinking water. They are Waterford (V), Green Island (V), Rhinebeck (V), Port Ewen Water District, City of Poughkeepsie, Castle Point Veterans Hospital (in the Town of Fishkill, Dutchess County) and the Highland Water District. Additionally, a new water plant is under construction for the Hyde Park fire and water district in the Town of Hyde Park, Dutchess County with the Hudson River being the primary source of water. Water samples were taken at Waterford, Rhinebeck, and Poughkeepsie during the period 1972 to 1974 and again in 1975. Both raw and filtered water samples usually contained PCBs at low levels; the highest level detected was 3 micrograms per liter (mcg/L) at Waterford.

In 1976, all fishing was banned in the upper Hudson River, north of the Troy dam to Hudson Falls, and the commercial striped bass fishery in the Hudson River was closed by the State in 1976 because of the extremely high PCB levels in the fish (over 500 parts per million (ppm) in some species). Additionally, in 1976, the New York State Department of Health (NYS DOH) issued a health advisory for fish taken from the Hudson River below the Federal Dam at Troy. The advisory has been and continues to be updated as more data

become available. The current advisory for this portion of the Hudson River recommends that women of childbearing age, infants and children under the age of 15 not eat any fish from these waters. Other individuals are advised not to eat American eel, white perch, carp, goldfish and white catfish and striped bass taken above the Tappan Zee Bridge and to eat no more than one meal per month of walleye, rainbow smelt, largemouth bass, smallmouth bass, Atlantic needlefish, bluefish, northern pike and tiger muskellunge from these waters as well as striped bass taken below the Tappan Zee Bridge. (See Attachment B)

In 1981, the NYS DOH announced a consumption advisory for wild waterfowl taken from the state, including the Hudson River area, because they contain elevated levels of PCBs. In 1986, this advisory was expanded to include recommendations on selecting specific water fowl. This advisory recommends not eating mergansers and limiting consumption of other waterfowl species to two meals per month. It also advises that wood ducks or Canada geese are the least contaminated species, with dabbler ducks and then diving ducks having increasingly higher contamination levels. The advisory recommends removing skin and fat from waterfowl before cooking and discarding stuffing after cooking.

US EPA conducted a Remedial Investigation/Feasibility Study (RI/FS) and a Record of Decision was issued in 1984 calling for no action on the river sediments, capping of the remnant deposits and evaluation of the drinking water supply in Waterford.

In 1985, NYS DOH announced a statewide consumption advisory for snapping turtles, based on elevated PCB levels in the fat, liver, eggs and, to a lesser extent, muscle of snapping turtles, most of which were obtained from the Hudson River. This advisory recommends that women of childbearing age, infants and children under the age of 15 not eat snapping turtle meat, soup or stew. These individuals are advised to discard snapping turtle fat, liver and eggs prior to cooking the meat or preparing stew.

In February 1987, NYS DOH updated a cancer incidence investigation for Waterford, New York, for the years 1970 through 1980. The earlier investigation was conducted because the public was concerned about chemicals in the drinking water during the 1971-1983 period. The investigation showed an excess of lymphomas in young males and cancer of the pancreas in older males. Neither of these sites was elevated in females. Cervical cancer was elevated in females of all ages. The cancer cases occurring during the 1970-1980 time period were judged not to be related to the drinking water because of the long latency between the first exposure to a carcinogen and the clinical recognition and diagnosis of cancer.

The updated cancer incidence for the Town and Village of Waterford during 1981-1984 showed an excess of oral cancers in males. None of the other specific cancer sites in either males or females had

numbers of observed cases that were significantly different from the expected numbers. In this investigation, the cancers of the oral cavity occurred mostly among males, and all but one case occurred over age 45. Four of the cases were cigarette smokers at the time of diagnosis, three were former smokers and the remaining case was a non-smoker. In the 1970-1980 study, elevated rates of male lymphomas, male pancreatic cancer and female cervical cancer were found. These excesses did not persist in the updated 1981-1984 study.

A health assessment was completed by the Agency for Toxic Substances and Disease Registry (ATSDR) in April of 1989. The most significant route of human exposure to PCBs identified in the 1989 health assessment was the ingestion of contaminated fish. Other potential pathways included: 1) direct contact with PCB-contaminated sediments and bankside deposits; 2) inhalation of PCBs in ambient air and PCB-contaminated dusts generated from the remnant deposits; 3) consumption of local wildlife, livestock and agricultural products which may be contaminated with PCBs; 4) inhalation, incidental ingestion and dermal contact associated with recreational use of the Hudson River; and, 5) inhalation of PCB-contaminated air at the former Hudson River dredged sediment disposal sites. ATSDR concluded that the Hudson River PCB site is a potential public health concern because of the potential for exposure to PCBs in fish, river sediments and water in the Hudson River. ATSDR recommended the following:

1) workers involved with remediation activities at the site should follow all appropriate regulations and guidelines for protection of worker health and safety;

2) air monitoring should be conducted at potential human exposure points during dredging of PCB-contaminated sediments; and

3) a survey of wildlife and livestock consumption patterns should evaluate the potential for human exposure to PCBs in potentially contaminated food sources.

In the 1989 health assessment, ATSDR identified the potential for public water supplies which obtain potable water from the Hudson River and groundwater supply wells near the river to become contaminated with PCBs. The data were inadequate to evaluate if surface water recharges adjacent groundwater aquifers.

CURRENT SITE CONDITIONS

Site conditions have not significantly changed since 1989. Representatives of the NYS DOH have visited the site numerous times since 1989, most recently in December of 1993.

PCB Source

In 1990, GE capped the remnant sites, one of the possible sources of PCBs above Roger's Island. The remnants are areas of former river bottom which were exposed when the Fort Edward dam was removed. The monitoring of river water, fish and microinvertebrates during the capping indicated that there was a source of PCBs upstream of the remnant sites. In September 1991, the PCB concentrations in the river water rose dramatically into the micrograms per liter (mcg/L) range. The 1992 fish concentrations also rose to higher levels.

During the past two years, GE sampling has pinpointed the source. The PCB loading appears to start at the Baker's Falls dam, which is located immediately in front of the GE Hudson Falls capacitor plant. GE's data indicate that the PCB concentration rises from nondetectable to over 1 mcg/L at this point in the river water. The concentration approximately doubles from the Baker's Falls area to Roger's Island, although this may be a sampling artifact.

The shoreline immediately in front of the GE plant is dominated by Baker's Falls, an 80-foot drop in the river level with cliffs along the shoreline. A mill dating from the 1800s, but abandoned at least 50 years ago, stands along the eastern shore, beneath the GE plant and along the falls. The PCBs appear to be flowing from the GE plant through the mill to the river. Sampling has also indicated a PCB source at the outfall of the GE Ft. Edward plant. Access to the mill and its raceways is restricted.

The mill contains three raceways through which river water is directed. The lower raceway is on the side of the mill nearest the river. The raceway receives water directly from the river through a partially closed intake, directs it along the length of the building, and then discharges the water out four windows in front of the building. The upper raceway receives water through a gate structure in the Baker's Falls dam, carries it through an open part of the raceway, into the mill building. The water flows through a failed gate structure into the mill proper, down several stories into the central raceway and out a central tunnel into the river.

The PCBs seem primarily associated with the upper raceway and central tunnel. In April 1993, the gates into the upper raceway were closed. Fifteen seeps which contained water or oil were discovered in the bedrock inner wall of the upper raceway. One of these oil seeps contained 94% PCBs. GE has also collected sediment samples from the lower raceway; these samples contained up to 5% PCBs. GE has also identified 97 pipes on the GE/mill property and will be investigating those further. GE has sealed the upper raceway and the central tunnel and is collecting and treating all of the seeps in these areas. As a result of these actions, PCB concentrations in the river have decreased about 50% since the 1980's. The closure of the lower raceway and planned removal of

the main outfall pipe at Hudson Falls as well as the remediation of the outfall pipe at the Fort Edward plant should minimize the PCB levels in the water column of the Hudson River.

Roger's Island

In October 1992, NYS DOH reported the results from its soil sampling of Roger's Island. Twenty-five soil samples and five Hudson River sediment samples were collected from locations along Roger's Island. These samples were collected from five different areas: the south shore; the river sediment; the north shore; the interior; and "other soil".

South Shore: The south shore consists of all the shoreline susceptible to flooding south of Route 197. Four samples were taken, and the average of these samples is 100 ppm of PCBs.

The samples from the south shore had higher PCB concentrations than the other samples. The most likely source of these PCBs is contaminated sediment which was deposited on the south shore from flooding of the Hudson River. The sample results vary widely and range from 4.5 ppm to 384 ppm.

River Sediments: Five samples were collected from sediment (about 10 feet from the shore) in the Hudson River on all sides of the island. The average of these samples is 4.0 ppm of PCB's.

The river sediment samples (10 feet from shore) showed lower levels of PCBs than the south shore samples. Based on work by other researchers, the levels of PCBs in these samples are similar to those in recently deposited sediments, in this stretch of the river.

North Shore: The north shore area is the shoreline which is susceptible to flooding north of Route 197, between Riverside Street and the river, and along the shoreline of the Town Park. Nine surface samples were collected in this area and the average is 2.7 ppm of PCBs.

The samples from the north shore contain lower levels of PCBs than the south shore, and are similar to the levels in the river sediment samples. PCBs were most likely deposited on the north shore from flooding of the Hudson River. These results suggest that the deposition of sediment in the area was different than on the south shore. A difference in sediment deposition may be caused by the change in the speed of the river's current along the east channel.

Interior: The interior of the island is all the areas which are not susceptible to flooding. Seven surface samples were collected in this area and the average of the samples is 0.21 ppm of PCBs.

The interior samples contained lower levels of PCBs than the shoreline samples. The history of this area is different than the shoreline. It is not susceptible to flooding like the north and south shores, and the PCB contaminated sediments are not likely to have been deposited here from the river.

"Other Soil": The "other soil" is soil which does not have an obvious source of PCBs. Two samples were taken from the slate dust on the ball field and two samples from the bottom of a pit in a archeological dig. The average of these samples is 0.011 ppm of PCBs.

Drinking Water Supply Sampling

Water from the Waterford supply system was sampled on October 10, 1992. Raw water results showed two Aroclors (1016/1242 and 1254) at 0.12 mcg/L and 0.05 mcg/L, respectively. PCBs were not detected in finished water (detection limit 0.05 mcg/L). Samples were also collected from the Waterford supply system on January 11, 1993. Results of raw and finished water were found to be less than 0.05 mcg/L for all five Aroclors.

CURRENT ISSUES

The US EPA is presently reassessing the 1984 ROD to evaluate whether the sediments of the upper Hudson River should be remediated. The PCB loads to the sediments, fish and water column in all sections of the river will be assessed and EPA will conduct health risk and ecological assessments. This reassessment is expected to be completed in 1994.

The NYS DEC is collecting data to evaluate whether or not 40 miles of the upper Hudson River should be dredged and dredging spoils placed in a new hazardous waste landfill. The final decision on the dredging will be made after the US EPA's reassessment.

The most significant potential exposure route of concern is consumption of PCB-contaminated fish from the river. While all fishing is banned in the upper Hudson and commercial fishing of striped bass is banned in the lower Hudson, sportsfish are still taken from the lower Hudson River.

One community concern is the closure of the striped bass fishery in the lower Hudson. This commercial fishery was closed at the same time as the upper Hudson recreational fishery. Some people feel that dredging the upper Hudson would eventually lead to lower PCB levels in striped bass so that the commercial fishery could be reopened.

Recently, an anglers survey was completed by the Hudson River Sloop Clearwater, Inc. in Poughkeepsie, New York. This survey evaluated the adherence to fish consumption health advisories among Hudson

River anglers. Fishing bans and health advisories are not completely effective in minimizing exposure to PCBs through consumption of Hudson River fish. NYS DOH is working with the NYS DEC to increase awareness about the advisory among Hudson River anglers. Versions of the NYS DOH health advisories, specific to the lower Hudson River, New York Harbor and marine waters are being developed by NYS DOH. The NYS DOH and NYS DEC are planning to distribute these versions to anglers who fish in these areas.

CONCLUSIONS

The original 1989 health assessment stated that this site is a potential health concern because of the risk to human health resulting from possible exposure to PCBs through consumption of fish at concentrations that may result in adverse health effects. This concern is still valid. Based on current public health assessment guidance and available information, the Hudson River PCB site poses a public health hazard. The assessment also raised concerns about exposure through other media, such a direct contact with contaminated river sediments and bank deposits. The 1989 health assessment made recommendations about a wildlife consumption survey. The NYS DOH had effectively addressed this issue earlier by issuing consumption advisories for ducks, snapping turtles, and fish.

Further assessment of the site (i.e., a public health assessment or health consultation) may be indicated after the completion of US EPA's health risk and ecological assessment of the site.

RECOMMENDATIONS

The ongoing investigation into the source of PCBs at the GE Hudson Falls plant site should continue. Eliminating this source should help to reduce exposures from eating contaminated fish. Fish should continue to be monitored and the health advisory modified as necessary.

ATSDR and the NYS DOH should evaluate the US EPA health risk and ecological assessments of the site to determine the need for further assessment of the site (i.e., public health assessment or health consultation).

The data and information developed in the Site Review and Update for the Hudson River PCB site in upstate New York, has been evaluated by ATSDR's Health Activities Recommendation Panel (HARP) to determine appropriate follow-up actions. The Panel has determined that health actions are indicated because of human exposure to PCBs. Specifically, the Panel determined that a review of health statistics and community health education are indicated. The NYS DOH has performed two evaluations of cancer incidence in the Town of Waterford; however, the Panel determined that an evaluation of reproductive outcomes in the Town is also indicated.

In addition, the Panel determined that a review of a recently released angler's survey was needed. However, NYS DOH had reviewed this angler's survey and determined that additional health education among Hudson River anglers is needed. Additionally, NYS DOH is evaluating the effectiveness of the fishing advisory for the lower Hudson River, New York Harbor and marine waters. Additional community health education efforts may be needed to inform those who still fish in the Hudson River of the health risks posed by PCB exposure to contaminated fish. Additional review by the HARP may be necessary after the NYS DOH reviews US EPA's health risk and ecological assessments.

PUBLIC HEALTH ACTIONS

The Public Health Action Plan (PHAP) for the Hudson River PCB site contains a description of actions to be taken by ATSDR and/or the NYS DOH at and near the site, following completion of this Site Review and Update. For those actions already taken at the site, please refer to the Summary of Background and History section of this Site Review and Update. The purpose of the PHAP is to ensure that this Site Review and Update not only identifies public health hazards, but provides a plan of action designed to mitigate and prevent adverse human health effects resulting from past, present and/or future exposures to hazardous substances at or near the site. Included, is a commitment on the part of ATSDR and/or the NYS DOH to follow-up on this plan to ensure that it is implemented.

The public health actions planned for the Hudson River PCB site are as follows:

1. ATSDR and NYS DOH will coordinate with the appropriate environmental agencies to develop plans to implement the recommendations contained in this Site Review and Update.

2. ATSDR will provide an annual follow-up to this PHAP, outlining the actions completed and those in progress. This report will be placed in repositories that contain copies of this Site Review and Update, and will be provided to persons who request it.

3. NYS DOH will request that the cancer incidence investigation for the Town of Waterford be updated. NYS DOH will evaluate adverse reproductive outcomes for the Town of Waterford.

4. NYS DOH will review US EPA's health risk and ecological assessment, once it is completed.

5. NYS DOH will continue community health education to the affected populations, including annual reviews and updates to the state fish and game consumption advisories, as needed.

6. NYS DOH will work with NYS DEC to distribute updated versions of the NYS DOH Health Advisories to anglers who fish in the Hudson River, New York Harbor and marine waters.

ATSDR will re-evaluate and expand the Public Health Action Plan when needed. New environmental, toxicological, or health outcome data, or the results of implementing the above proposed actions may determine the need for additional actions at this site.

CERTIFICATION

This Site Review and Update for the Hudson River PCB site was prepared by the under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the Site Review and Update was initiated.

Technical Project Officer, SPS, RPB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Site Review and Update and concurs with its findings.

Division Director, DHAC, ATSDR

DOCUMENTS REVIEWED

1. ATSDR Health Assessment for Hudson River PCB NPL site, April 17, 1989.

2. Ft. Edward Dam PCB Remnant Deposit Containment Environmental Monitoring Program, Report of 1989 results (February 1990), Report of 1990 result (January 1992), Report of 1991 results (March 1992) and Report of 1992 results (various letter communications).

3. Hudson River Sloop Clearwater, Inc. Hudson River Angler Survey - A Report on the Adherence to Fish Consumption Health Advisories Among Hudson River Anglers; March 1993.

4. NYS DOH. Cancer Surveillance Program. Incidence of Cancer in the Town and Village of Waterford (Saratoga County), New York; February 1987.

5. NYS DOH. Fact Sheet: Roger's Island--Update; October 1992.

6. US EPA Hudson River PCB Reassessment RI/FS, Phase I Report, August 1991.

7. USEPA Hudson River PCB Reassessment RI/FS Responsiveness Summary for the Phase I Report, July, 1992.

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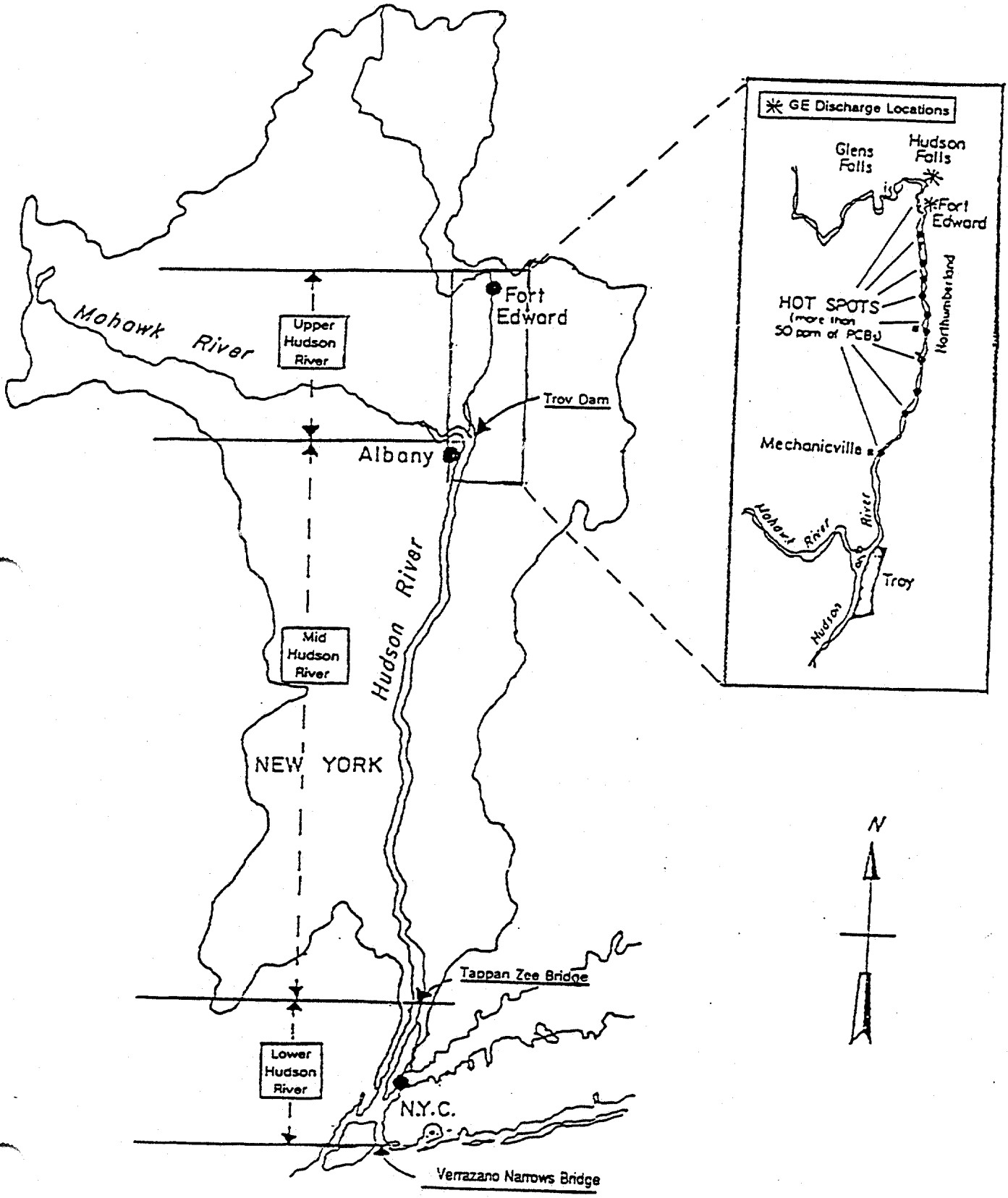
APPENDIX A

FIGURE 1

Figure 1: Hudson River PCB Site
(Adapted from: Hudson River Sloop Clearwater, Inc.; March 1993).



APPENDIX B

NEW YORK STATE DEPARTMENT OF HEALTH
1993-1994 HEALTH ADVISORIES: CHEMICALS IN SPORTFISH OR GAME

Health Advisory

CHEMICALS IN SPORTFISH AND GAME

1994 – 1995

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Center for Environmental Health 2 University Place Albany, New York 12203-3399

ERRATA

1. The advisory for the Hudson River from the "Bridge at Catskill south to and including the New York Harbor area" should read "All species except American shad, **Atlantic sturgeon**, blueback herring, bluegill, pumpkinseed, and yellow perch, Eat no more than one meal per month".

2. The following are corrected addresses/telephone numbers for New York State Department of Environmental Conservation Regional Offices:

Region 4
1150 N. Westcott Rd.
Schenectady, NY 12306
(518) 357-2234

Region 5
Route 86
Ray Brook, NY 12977
(518) 897-1200

Region 6
State Office Bldg.
Watertown, NY 13601
(315) 785-2239

Region 9
270 Michigan Ave.
Buffalo, NY 14203
(716) 851-7000

cap/94182PRO0587

1994-1995 Health Advisories: Chemicals in Sportfish or Game

Summary

The New York State Department of Environmental Conservation (DEC) routinely monitors contaminant levels in fish and wildlife. The New York State Department of Health (DOH) issues advisories on eating sportfish and wildlife because some of these foods contain chemicals at levels which may be harmful to your health. The health advisories are: (1) general advice on sportfish taken from waters in New York State; (2) advice on sportfish from specific waterbodies; and (3) advice on wildlife. The advisories are developed and updated yearly.

Background

Fish and wildlife are nutritious and good to eat. But some fish may take in contaminants from the water they live in and the food they eat. Wildlife, too, may take in contaminants from their food and water. Some of these contaminants build up in fish and wildlife--and you--over time. These contaminants could harm people, so it is important to keep your exposure to these contaminants as low as possible. This advisory helps you plan what fish and wildlife to keep as well as how often and how much to eat. This advisory is not intended to discourage you from eating fish or wildlife, but should be used as a guide to minimize your exposure to contaminants.

Health Benefits

When properly prepared, fish provide a diet high in protein and low in saturated fats. Almost any kind of fish may have real health benefits when it replaces a high-fat source of protein in the diet. You can get the health benefits of fish and reduce unwanted contaminants by following this advisory.

Contaminants in Fish and Wildlife

Long-lasting contaminants, such as PCBs, DDT and mercury, build up in your body over time. It may take months or years of regularly eating contaminated fish to build up amounts which are a health concern. Health problems which <u>may</u> result from the contaminants found in fish range from small changes in health that are hard to detect to birth defects and cancer. Mothers who eat highly contaminated fish and wildlife for many years before becoming pregnant may have children who are slower to develop and learn. The meal advice in this advisory is intended to protect children from these potential developmental problems. Adults are less likely to have health problems at the low levels that affect children.

Some contaminants cause cancer in animals. Your risk of cancer from eating contaminated fish and wildlife cannot be predicted with certainty. Cancer currently affects about one in every three people; primarily due to smoking, diet and hereditary risk factors. Exposure to contaminants in the fish and wildlife you eat may not increase your cancer risk at all. If you follow this advisory over your lifetime, you will minimize your exposure and reduce whatever cancer risk is associated with these contaminants.

The federal government establishes standards for chemical residues in food. When establishing these standards for fish, the federal government assumes that people eat about one-half pound of fish each month. The contaminant levels are measured in a skin-on fillet which has not been trimmed; this sample is used in determining whether or not the fish exceeds standards. Fish and wildlife cannot be legally sold if they contain a contaminant at a level greater than its standard. When sportfish from a waterbody contain contaminants at levels greater than the federal standards, the DOH issues a specific advisory.

General Advisory

The general health advisory for sportfish is that you eat no more than one meal (one-half pound) per week of fish taken from the state's

freshwaters, the Hudson River estuary, or the New York City harbor area (the New York waters of the Hudson River including Upper and Lower Bays, Arthur Kill, Kill Van Kull, Harlem River, and the East River to the Throgs Neck Bridge). This general advisory is to protect against eating large amounts of fish that haven't been tested or contain unidentified contaminants. The general advisory does not apply to fish taken from marine waters. Ocean fish, although less tested, are generally less contaminated than freshwater fish. In addition, fish that live further out from shore may be less contaminated than those that live close to the shore.

Specific Freshwater Advisories

Over 50 waterbodies in New York have fish with contaminant levels that are greater than federal standards and have their own advisories. The DOH recommendations suggest either limiting or avoiding eating a specific kind of fish from a particular body of water. In some cases, enough information is available to issue advisories based on the length of the fish. Older (larger) fish are often more contaminated than younger (smaller) fish.

Health advice is also given for infants, children under the age of fifteen and women of childbearing age. The DOH recommends that they not eat any fish species from the specific waterbodies listed in the advisory. The reason for this specific advice is that chemicals may have a greater impact on developing organs in young children or in the fetus. They also build up in women's bodies and are often passed on in mother's milk. Waters which have specific advisories have at least one species of fish with an elevated contaminant level, which means that a contamination source is in or near the water.

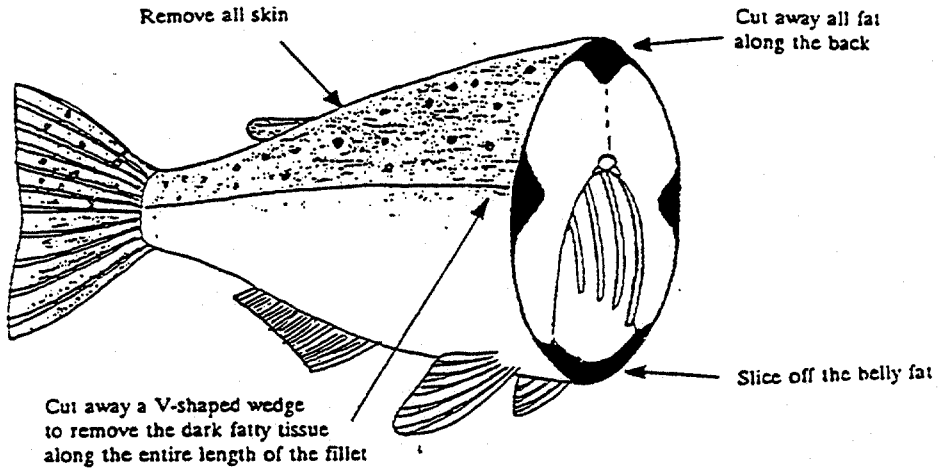
People who regularly eat sportfish, women of childbearing age and children, are particularly susceptible to contaminants that build up over time. If you fall into one of these categories, you should consider if you need to space fish meals out according to the advisory table that follows. Your body can get rid of some contaminants, such as mercury, over time. Spacing the meals out helps prevent some of the contaminants from building up to harmful levels in the body.

Women beyond their childbearing years and men face fewer health risks from contaminants such as mercury. However, if you are in this group you should also follow the advisory to reduce your total exposure to contaminants. For these groups, it is the **total** number of meals that you eat during the year that becomes important and many of those meals can be eaten during a few months of the year. If most of the fish you eat are from the "One Meal a Week" category, you should not exceed 52 meals per year. Likewise, if most of the fish you eat are in the "One Meal a Month" category, you should not exceed 12 meals per year. Remember, eating one meal of fish from the "One Meal a Month" group is comparable to eating four meals from the "One Meal a Week" group.

The primary contaminants (mercury, cadmium, PCBs, chlordane, dioxin, DDT and mirex) are listed next to each advisory. You should review the advisories together if you eat fish from more than one waterbody. For example, if you eat a meal of Saw Mill River carp, you should not eat American eel from Kinderhook Lake for the rest of that month since both of these fish species have eat no more than one meal per month advisories and both are based on PCB contamination.

Marine Waters

The DOH issues specific advisories for marine waters. These apply to striped bass, bluefish, and American eels and are the only marine fish advisories in effect. Striped bass, bluefish, and eels have specific habits or characteristics which make them more likely to have contaminants than other marine species.



An advisory has been issued for striped bass because of PCB contamination. Saltwater fish are generally less contaminated than freshwater fish. However, fish like striped bass which spend time in Hudson River waters can be contaminated at levels above food standards. The advisory for striped bass is divided into three geographical areas. For striped bass taken from the Hudson River from the Federal Dam at Troy south to the bridge at Catskill, the DOH recommends against any consumption. For striped bass from the Hudson River from the bridge at Catskill south to and including the lower New York Harbor and Long Island Sound west of Wading River, the advisory is to eat no more than one meal per month. The general advisory applies to striped bass from eastern Long Island Sound, the Peconic/Gardiners Bays and Long Island South Shore waters. Women of childbearing age, infants and children under fifteen should not eat striped bass from the Hudson River, lower New York Harbor, or western Long Island Sound.

The DOH has extended the general advisory to bluefish and American eels. They are contaminated with PCBs, although to a lesser extent than striped bass from the Hudson River, New York Harbor, and western Long Island Sound. The recommendation for bluefish and American eels caught in New York State's marine waters is to eat no more than one meal (one-half pound) per week, with additional recommendations to not eat American eels from the Harlem or East Rivers and eat no more than one meal per month of American eels from the Hudson River or New York City harbor area.

Cleaning and Cooking Your Fish

Many contaminants are found at higher levels in the fat of fish. You can reduce the amount of these contaminants in a fish meal by properly trimming, skinning and cooking your catch. Remove the skin and trim all the fat from the areas shown on the DIAGRAM ABOVE: the belly flap, the line along the sides, the fat along the back and under the skin.

Cooking does not destroy contaminants in fish, but heat from cooking melts some of the fat in fish and allows some of the contaminated fat to drip away. Broil, grill or bake the trimmed, skinned fish on a rack so that the fat drips away. Do not use drippings to prepare sauces or gravies.

These precautions will not reduce the amount of mercury or other metals. Mercury is distributed throughout a fish's muscle tissue (the part you eat), rather than in the fat and skin. Therefore, the only way to reduce mercury intake is to reduce the amount of contaminated fish you eat.

Other Advisories

The DOH also issues special advisories for crabs in the Hudson River due to cadmium and PCB contamination and for snapping turtles and waterfowl statewide because they contain PCBs and other contaminants. Cooking methods are recommended that minimize the

amount of contaminants which would be eaten. The complete advisory is at the end of this brochure.

The health implications of eating deformed or cancerous fish are unknown. Any obviously diseased fish (marked by tumors, lesions or other abnormal condition of the fish skin, meat or internal organs) should be discarded.

Shellfish

All foods of animal origin, such as meat, poultry, seafood and dairy products, should be thoroughly cooked before eaten. The DOH specifically recommends that the public not eat raw or partially cooked clams or oysters. This advice is not because of chemical contamination. Raw or partially cooked shellfish illegally harvested from waters contaminated with sewage have been linked to gastrointestinal illness and hepatitis A, caused by bacteria or viruses.

Should I Be Concerned About Medical-type Waste and Garbage Affecting Fish?

The wash-up of medical-type waste and garbage on New York and Long Island beaches has not affected the sanitary condition of marine fish, lobster and crabs. Furthermore, fish do not carry the AIDS virus. Consumers need not worry about eating these foods because of these problems. Good sanitary practices should be followed when preparing any fish. Fish should be kept iced or refrigerated until cleaned and filleted and then refrigerated until cooked. Hands, utensils, and work surfaces should be washed before and after handling any raw food, including fish. Seafood should be cooked to an internal temperature of 140°F.

What Can I Do To Reduce My Exposure To Chemical Contaminants From Fish?

Fish is an important source of protein and is low in saturated fat. Naturally-occurring fish oils lower plasma cholesterol and triglycerides, thereby decreasing the risk of coronary heart disease. Increasing fish consumption is useful in reducing dietary fat and controlling weight. By eating a diet which includes food from a variety of protein sources, an individual is more likely to have a diet which is adequate in all nutrients.

Although eating fish has some health benefits, fish with high contaminant levels should be avoided. When deciding whether or not to eat fish which may be contaminated, the benefits of eating those fish can be weighed against the risks. For young women, eating contaminated fish is a health concern not only for herself but also to any unborn or nursing child, since the chemicals may reach the fetus and can be passed on in breastmilk. For an older person with heart disease the risks, especially of long-term health effects, may not be as great a concern when compared to the benefits of reducing the risks of heart disease.

Everyone can benefit from eating the fish they catch and can minimize their contaminant intake by following these general recommendations:

1. Choose uncontaminated species from waterbodies which are not listed in the DOH advisories.

2. Use a method of filleting the fish which will reduce the skin, fatty material and dark meat. These parts of the fish contain many of the contaminants.

3. Choose smaller fish, consistent with DEC regulations, within a species since they may have lower contaminant levels. Older (larger) fish within a species may be more contaminated because they have had more time to accumulate contaminants in their bodies.

4. For shellfish, such as crab and lobster, do not eat the soft green substance found in the body section (mustard, tomalley, liver or hepatopancreas). This part of the shellfish has been found to contain high levels of chemical contaminants, including PCBs and heavy metals.

5. Cooking methods such as broiling, poaching, boiling and baking, which allow contaminants from the fatty portions of fish to drain out, are preferable. Pan frying is not recommended. The cooking liquids of fish from contaminated waters should be avoided since these liquids may retain contaminants.

1994-1995 Health Advisories

The following recommendations are based on contaminant levels in fish and wildlife. To minimize potential adverse health impacts, the DOH recommends:

- **Eat no more than one meal (one-half pound) per week** of fish from the state's freshwaters, the Hudson River estuary, or the New York City harbor area including Upper and Lower Bays, Arthur Kill, Kill Van Kull, East River to the Throgs Neck Bridge and Harlem River, except as recommended below.
- **Women of childbearing age, infants and children under the age of 15 should not eat** any fish species from waters listed below.
- **Follow trimming and cooking advice.**
- Observe the following restrictions on eating fish from these waters and their tributaries to the first barrier impassable by fish.

Water (County)	Species	Recommendations	Chemical(s) of Concern
Barge Canal: Tonawanda Creek, Lockport to Niagara River (Erie & Niagara) [5]	Carp	Eat no more than one meal per month	PCB
Belmont Lake (Suffolk) [52]	Carp	Eat no more than one meal per month	Chlordane, PCB
Big Moose Lake (Herkimer) [30]	Yellow perch	Eat no more than one meal per month.	Mercury
Buffalo River and Harbor (Erie) [7]	Carp	Eat none	PCB
Canadice Lake (Ontario) [10]	Lake or brown trout over 21"	Eat none	PCB
Canandaigua Lake (Ontario & Yates) [12]	Lake trout over 24"	Eat no more than one meal per month	PCB
Carry Falls Reservoir (St. Lawrence) [21]	Walleye	Eat no more than one meal per month	Mercury
Cayuga Creek (Niagara) [3]	All species	Eat none	Dioxin
Delaware Park Lake (Erie) [6]	Carp	Eat no more than one meal per month	PCB
East River (NYC) [46]	American eel	Eat none	PCB
Eighteen Mile Creek (Niagara) [4]	All species	Eat none	PCB

Waters with changes from the 1993-94 Health Advisories are **underlined.**
Numbers in brackets refer to map on page 10.

Water (County)	Species	Recommendations	Chemical(s) of Concern
Ferris Lake [33] (Hamilton)	Yellow perch over 12"	Eat none	Mercury
	Smaller yellow perch	Eat no more than one meal per month	Mercury
Fourth Lake (Herkimer & Hamilton) [32]	Lake trout	Eat none	DDT
Francis Lake (Lewis) [24]	Yellow perch	Eat no more than one meal per month	Mercury
Gill Creek: Mouth to Hyde Park Lake Dam (Niagara) [2]	All species	Eat none	PCB, Dioxin
Grasse River: Mouth to Massena Power Canal (St. Lawrence) [37]	All species	Eat none	PCB
Halfmoon Lake (Lewis) [23]	Yellow perch	Eat no more than one meal per month	Mercury
Hall's Pond (Nassau) [48]	Carp, goldfish	Eat none	Chlordane
Harlem River (NYC) [44]	American eel	Eat none	PCB
Hoosic River (Rensselaer) [38]	Brown and rainbow trout	Eat no more than one meal per month	PCB
Hudson River: [42]			
Hudson Falls to Troy Dam	All species	No fishing	PCB
Troy Dam south to bridge at Catskill	All species except American shad	Eat none	PCB
Bridge at Catskill south to and including the New York Harbor area	All species except American shad, blueback herring, bluegill, pumpkinseed, and yellow perch	Eat no more than one meal per month	PCB
	Blue crab	Eat no more than 6 crabs per week	Cadmium, PCB
	--hepatopancreas (mustard, tomalley, or liver)	Eat none	Cadmium, PCB
	--cooking liquid	Discard	Cadmium, PCB

Waters with changes from the 1993-94 Health Advisories are **underlined.**
Numbers in brackets refer to map on page 10.

Water (County)	Species	Recommendations	Chemical(s) of Concern
Indian Lake (Lewis) [18]	All species	Eat no more than one meal per month	Mercury
Irondequoit Bay [9]	Carp	Eat none	PCB, Mirex
Keuka Lake (Yates & Steuben) [16]	Lake trout over 25"	Eat no more than one meal per month	DDT
Kinderhook Lake (Columbia) [41]	American eel	Eat no more than one meal per month	PCB
Koppers Pond (Chemung) [11]	Carp	Eat no more than one meal per month	PCB
Lake Champlain: [35]			
Whole Lake	Lake trout over 25", Walleye over 19"	Eat no more than one meal per month	PCB, Mercury
Bay within Cumberland Head to Valcour Island	American eel, brown bullhead	Eat no more than one meal per month	PCB
Lake Ontario & Niagara River Below the falls [8]	American eel, channel catfish, carp, lake trout, chinook salmon, coho salmon over 21", rainbow trout over 25", brown trout over 20"	Eat none	PCB, Mirex, Dioxin
	White sucker, smaller coho salmon, rainbow and brown trout	Eat no more than one meal per month	PCB, Mirex, Dioxin
West of Point Breeze	White perch	Eat none	PCB, Mirex, Dioxin
East of Point Breeze	White perch	Eat no more than one meal per month	PCB, Mirex, Dioxin
Loft's Pond (Nassau) [50]	Carp, goldfish	Eat no more than one meal per month	Chlordane
Long Pond (Lewis) [22]	Splake over 12"	Eat none	Mercury
Upper Massapequa Reservoir (Nassau) [51]	White perch	Eat no more than one meal per month	Chlordane
Massena Power Canal (St. Lawrence) [31]	Smallmouth bass	Eat no more than one meal per month	PCB

Waters with changes from the 1993-94 Health Advisories are **underlined.**
Numbers in brackets refer to map on page 10.

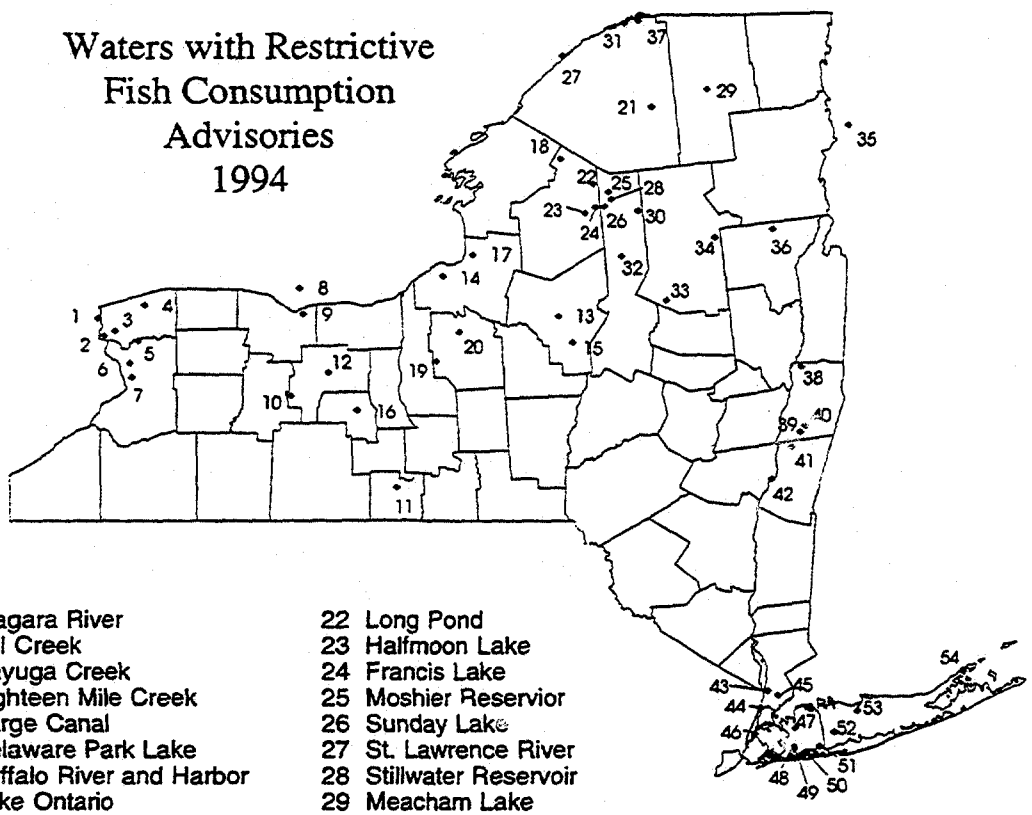
Water (County)	Species	Recommendations	Chemical(s) of Concern
Meacham Lake (Franklin) [29]	Yellow perch over 12"	Eat none	Mercury
	Smaller yellow perch	Eat no more than one meal per month	Mercury
Mohawk River: Between Oriskany and West Canada Creeks [15]	Carp	Eat none	PCB
Moshier Reservoir (Herkimer) [25]	Yellow perch	Eat no more than one meal per month	Mercury
Nassau Lake (Rensselaer) [39]	All species	Eat none	PCB
Niagara River: [1]			
Above the falls	Carp	Eat no more than one meal per month	PCB
Below the falls (also see Lake Ontario)	White Perch	Eat none	PCB, Mirex, Dioxin
	Smallmouth bass	Eat no more than one meal per month	PCB, Mirex, Dioxin
Onondaga Lake (Onondaga) [20]	All species	Eat none	Mercury
Oswego River: Oswego power dam to upper dam at Fulton (Oswego) [14]	Channel catfish	Eat no more than one meal per month	PCB
Round Pond: Town of Long Lake (Hamilton) [34]	Yellow perch over 12"	Eat no more than one meal per month	Mercury
St. James Pond (Suffolk) [53]	All species	Eat no more than one meal per month	Chlordane, DDT
St. Lawrence River: [27]			
Whole River	American eel, channel catfish, lake trout, carp, chinook salmon, coho salmon over 21", rainbow trout over 25", brown trout over 20"	Eat none	PCB, Mirex, Dioxin
	White perch, smaller Coho salmon, rainbow and brown trout	Eat no more than one meal per month	PCB, Mirex, Dioxin

Waters with changes from the 1993-94 Health Advisories are **underlined.**
Numbers in brackets refer to map on page 10.

Water (County)	Species	Recommendations	Chemical(s) of Concern
St. Lawrence River - con't. Bay at St. Lawrence - Franklin Co. line	All species	Eat none	PCB
Salmon River: Mouth to Salmon Reservoir (Oswego) (also see Lake Ontario) [17]	Smallmouth bass	Eat none	PCB
Saw Mill River [43]	American eel	Eat no more than one meal per month	PCB
Schroon Lake (Warren & Essex) [36]	Lake trout over 27"	Eat no more than one meal per month	PCB
Sheldrake River (Westchester) [45]	American eel	Eat none	Chlordane, PCB
Skaneateles Creek: From dam at Skaneateles to Seneca River (Onondaga) [19]	Brown trout over 10"	Eat no more than one meal per month	PCB
Smith Pond-Roosevelt Park (Nassau) [49]	American eel	Eat none	Chlordane
	Carp, goldfish	Eat no more than one meal per month	Chlordane
Spring Pond (Suffolk) [54]	Carp, goldfish	Eat none	Chlordane
Stillwater Reservoir (Herkimer) [28]	Splake	Eat no more than one meal per month	Mercury
Sunday Lake (Herkimer) [26]	Yellow perch	Eat no more than one meal per month	Mercury
Threemile Creek (Oneida) [13]	White sucker	Eat no more than one meal per month	PCB
Valatie Kill: Between County Rt. 18 and Nassau Lake (Rensselaer) [40]	All species	Eat none	PCB
Whitney Park Pond (Nassau) [47]	Carp, goldfish	Eat no more than one meal per month	PCB

Waters with changes from the 1993-94 Health Advisories are **underlined**
Numbers in brackets refer to map on page 10.

Waters with Restrictive Fish Consumption Advisories 1994



1 Niagara River
2 Gill Creek
3 Cayuga Creek
4 Eighteen Mile Creek
5 Barge Canal
6 Delaware Park Lake
7 Buffalo River and Harbor
8 Lake Ontario
9 Irondequoit Bay
10 Canadice Lake
11 Koppers Pond
12 Canandaigua Lake
13 Threemile Creek
14 Oswego River
15 Mohawk River
16 Keuka Lake
17 Salmon River
18 Indian Lake
19 Skaneateles Creek
20 Onondaga Lake
21 Carry Falls Reservoir
22 Long Pond
23 Halfmoon Lake
24 Francis Lake
25 Moshier Reservior
26 Sunday Lake
27 St. Lawrence River
28 Stillwater Reservoir
29 Meacham Lake
30 Big Moose Lake
31 Massena Power Canal
32 Fourth Lake
33 Ferris Lake
34 Round Pond
35 Lake Champlain
36 Schroon Lake
37 Grasse River
38 Hoosic River
39 Nassau Lake
40 Valatie Kill
41 Kinderhook Lake
42 Hudson River
43 Saw Mill River
44 Harlem River
45 Sheldrake River
46 East River
47 Whitney Park Pond
48 Hall's Pond
49 Smith Pond (Roosevelt Park)
50 Loft's Pond
51 Upper Massapequa Reservoir
52 Belmont Lake
53 St. James Pond
54 Spring Pond

Additional Advice

Marine Waters - The general advisory (eat no more than one meal per week) applies to bluefish and American eels but not to other fish from Long Island Sound, Peconic/Gardiners Bays, Jamaica Bay and other Long Island South Shore waters. (Contaminant of concern--PCB)

Marine Striped Bass - Eat no more than one meal (one-half pound) per month of striped bass taken from New York Harbor or Long Island Sound west of Wading River. Eat no more than one meal (one-half pound) per week of striped bass taken from Eastern Long Island Sound, the Peconic/Gardiners Bays and Long Island South Shore waters. The legal minimum length of marine striped bass is 36". (Contaminant of concern--PCB)

Marine Crabs and Lobsters - The hepatopancreas (mustard, tomalley or liver) of crabs and lobsters should not be eaten because it has high contaminant levels. (Contaminants of concern--cadmium, PCB)

Hudson River Shad - The advisory for women of childbearing age, infants, and children under the age of 15 is EAT NONE for all fish (including American shad) from the lower Hudson River because of PCB contamination. However, shad have lower PCB levels than other species. A few meals of Hudson River shad meat and roe, especially using cooking and trimming methods that minimize PCB content, would not pose an unacceptable health risk for women of childbearing age and children assuming this is their only significant exposure to PCBs.

Snapping turtles - Snapping turtles retain contaminants in their fat, liver, eggs and, to a lesser extent, muscle. If you choose to consume snapping turtles, carefully trim away all fat and discard the fat, liver and eggs prior to cooking the meat or preparing soup to reduce exposure. Women of childbearing age, infants, and children under the age of 15 should avoid eating snapping turtles or soups made with their meat. (Contaminant of concern--PCB)

Waterfowl - Mergansers are the most heavily contaminated waterfowl species and should not be eaten. Other waterfowl should be skinned and all fat removed before cooking; stuffing should be discarded after cooking; limit eating to two meals per month. Monitoring data indicate that wood ducks and Canada geese are less contaminated than other waterfowl species with dabbler ducks and then diving ducks having increasingly higher contaminant levels. (Contaminants of concern--PCB, mirex, chlordane, DDT)

Additional Information

New York State Department of Health

For more information on **health effects** from exposure to chemical contaminants, contact:

Environmental Health Information: 1-800-458-1158 (toll-free from New York State telephones). These calls are taken from 8:00-4:30, and after hours callers can record a message. Out of state callers should dial 518/458-6409.

New York State Department of Environmental Conservation

For more information on **fishing**, contact:

Regional Offices

Region 1
SUNY Campus, Bldg. 40
Stony Brook, NY 11794
(516) 444-0441

Region 2
47-40 21st St.
Long Island City, NY 11101
(718) 482-4922

Region 3
21 South Putt Corners Rd.
New Paltz, NY 12561
(914) 255-5453

Region 4
2176 Guilderland Ave.
Schenectady, NY 12306
(518) 382-0680

Region 5
Route 86
Ray Brook, NY 12977
(518) 891-1370

Region 6
State Office Bldg.
Watertown, NY 13601
(315) 785-2513

Region 7
615 Erie Blvd. West
Syracuse, NY 13204
(315) 426-7400

Region 8
Routes 5 and 20
Avon, NY 14414
(716) 226-2466

Region 9
600 Delaware Ave.
Buffalo, NY 14202
(716) 851-7000

For information on **contaminant levels**, contact:

Bureau of Environmental Protection
50 Wolf Road
Albany, NY 12233
(518) 457-6178

Prepared by:
New York State Department of Health
Division of Environmental Health Assessment
#40820042
Revised April 28, 1994

Health Advisory
Chemicals in Sportfish and Game

We always look for ways to improve our environmental risk communication, and we value your suggestions. Please mail this form back to us if you have any comments.

Was the advisory helpful in explaining:

- the problem?

- the risk and benefits of eating sportfish?

Was anything missing? If so, what?

Was it understandable?

Suggestions for improvement:

Thank you for your suggestions.

Please fold this page in thirds, staple and mail to:

New York State Department of Health
Bureau of Toxic Substance Assessment
2 University Place, Room 240
Albany, New York 12203-3399

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Bureau of Toxic Substance Assessment
2 University Place, Room 240
Albany, New York 12203-3399