

New York State Department of Health



Chemicals in Sportfish and Game

2005-06 Health Advisories

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These advisories are also available from the New York State Department of Health Web site at:
<http://www.health.state.ny.us/nysdoh/fish/fish.htm>

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BTSA@health.state.ny.us.

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2005-2006 Health Advisories: Chemicals in Sportfish and Game

Purpose and Rationale

The New York State Department of Health (DOH) issues advisories on eating sportfish and game because some of these foods contain chemicals at levels that may be harmful to your health. These advisories are for sportfish and game that people take and are not for fish and game sold in markets. The health advisories are (1) general advice on sportfish taken from waters in New York State; (2) advice on sportfish caught in specific New York State waterbodies; and (3) advice on eating New York State game. The advisory tells you how to minimize your exposure to contaminants in sportfish and game and reduce whatever health risks are associated with them. The advisories are updated yearly.

Fish and game are nutritious and good to eat. But some fish may take in contaminants from the water they live in and the food they eat. Game, too, may take in contaminants from their food and water. Some of these contaminants build up in fish and game--and in people--over time. These contaminants could harm people, so it is important to keep your exposure to these contaminants as low as possible.

The decision to eat sportfish or game that you take is not regulated by government. Instead, state governments issue advice (advisories) on eating these foods. In New York State, these advisories are primarily based on information that the Department of Environmental Conservation (DEC) gathers on contaminant levels in fish and game. DEC collects fish samples each year from different water bodies. In a typical year, DEC collects approximately 2000 fish from more than 50 locations/waters and analyzes these fish for various contaminants. Sampling focuses on water bodies with known or suspected contamination, water bodies susceptible to mercury contamination, popular fishing waters and waters where trends in fish contamination are being monitored. Also, testing focuses on those species that are most likely to be caught and eaten by sport anglers. DEC also tests some game species (e.g., waterfowl, snapping

turtles) that accumulate chemical contaminants. DOH annually reviews the new DEC testing results for fish and game to determine if an advisory should be issued or revised for a given water body or fish or game species. In this review, DOH compares testing data to federal marketplace standards (when available) for a contaminant and considers other factors such as potential human exposures and health risks; location, type and number of samples, etc.

These advisories are intended to help you decide whether to eat fish and game or select fish and game with lower contaminant levels so you can minimize your exposure. When properly prepared, fish provide a diet high in protein and low in saturated fats. Fish may have real health benefits if 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 the advisories.

The federal government sets standards for chemicals in food that is sold commercially, including fish. When setting the standard for contaminants in food, the U.S. Food and Drug Administration (FDA) balances "providing an adequate degree of public health protection and avoiding excessive losses of food to American consumers." FDA also issues advisories on eating fish from the marketplace for women who are pregnant or planning to become pregnant, nursing mothers and young children.

Contaminants in Fish and Game

Long-lasting contaminants, such as PCBs, DDT and cadmium, build up in your body over time. Health problems that may result from the contaminants found in fish or game range from small changes in health that are hard to detect to birth defects and cancer. Mothers who eat highly contaminated fish and game before becoming pregnant may have increased risk of having children who are slower to develop and learn. This advisory is also intended to protect children from these potential developmental problems. Women beyond their childbearing years and men face fewer health risks from

contaminants than children do. People in this last group should follow the advisory to reduce other types of health risks.

Some contaminants cause cancer in animals. We cannot predict with certainty your risks of cancer from eating contaminated fish or game. Cancer currently affects about one in every three people, primarily due to smoking, diet and hereditary risk factors. Exposure to some contaminants in the fish and game 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.

When the federal government sets standards for fish, it generally assumes that people eat about a half-pound of fish each month. The contaminant levels are measured in a skin-on fillet that has not been trimmed; this sample is used in determining whether or not the fish exceeds standards. Fish 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, DOH issues a specific advisory.

More information about the chemicals that have led to advisories in New York State sportfish and game and potential health effects can be found on page 22.

Advice on Contaminants in Fish

General Advisory for Eating Sportfish

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 and some marine waters at the mouth of the Hudson River. These include the

General Advisory - eat no more than one meal (one-half pound) per week of fish taken from the state's freshwaters and some marine waters at the mouth of the Hudson River.

New York waters of the Hudson River, Upper Bay of New York Harbor (north of Verrazano Narrows Bridge), Arthur Kill, Kill Van Kull, Newark Bay, Harlem River and the East River to the Throgs Neck Bridge (see map on

page 20). We issue this advice because:

- some chemicals are commonly found in New York State fish (mercury and PCBs for example),

- fish from all waters have not been tested and
- fish may contain unidentified contaminants.

Specific Advisories for Freshwater, the Hudson River and the Upper Bay of New York Harbor

Fish from more than 110 waterbodies in New York have contaminant levels that are greater than federal standards. For these waters, DOH recommends either limiting or not eating a specific kind of fish (see pages 8 to 17). 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.

When eating fish from waters where cadmium or mercury are listed as primary contaminants, it is important to space out fish meals according to the specific advisory for that waterbody. For example, if you eat a meal of yellow perch from Moshier Reservoir, you should not eat any more fish with the same mercury advisory for the rest of that month. However, for other contaminants (such as PCBs), the total number of meals that you eat during the year is 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 PER WEEK category, you should not exceed 52 meals per year. Likewise, if most of the fish you eat are in the ONE MEAL PER MONTH category, you should not exceed 12 meals per year.

Advisories for Women, Infants and Children

DOH offers health advice for infants, children under the age of 15 and women of childbearing age. DOH recommends that

these groups not eat any fish from the specific waterbodies listed in the advisory. The reason for this specific advice is that chemicals may have

Women, infants and children should not eat any fish from listed waters.

a greater effect 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 that have specific advisories have at least one species of fish with an elevated contaminant level, which

means that other fish species may also be affected.

DEC has completed much of a large study that will increase our knowledge about mercury in fish from New York State waters.

Preliminary information about mercury levels in the Adirondack and Catskill Mountain regions suggest that larger, older individuals of chain pickerel, northern pike, smallmouth and largemouth bass, walleye and yellow perch often have relatively high levels of mercury in their flesh, higher levels than similar fish from other regions in the state. Because of this, infants, children under 15 and women of child-bearing age should avoid these fish from Adirondack and Catskill Mountain waters. Consult the box below:

Regional Advice for Women and Children Adirondack and Catskill Waters
<p>Lower Mercury Levels – Eat no more than one meal per week:</p> <p>Brook, brown and rainbow trout Bullhead Bluegill/sunfish Rock bass Crappie Yellow perch less than 10 inches</p>
<p>Higher Mercury Levels – EAT NONE:</p> <p>Northern pike Pickerel Walleye Largemouth and smallmouth bass Yellow perch longer than 10 inches</p>

In addition, due to concerns about mercury contamination, the U.S. Food and Drug Administration (FDA) advises pregnant women, women who may become pregnant, nursing mothers and young children to eat no shark, swordfish, king mackerel or tilefish. FDA notes that seafood can be an important part of a healthy diet, and advises pregnant women, women who may become pregnant and nursing mothers to eat up to 12 ounces per week of a variety of other kinds of fish. FDA also recommends that parents follow these same recommendations when feeding fish and shellfish to their young children, but serve smaller portions. The full FDA advisory, including answers to frequently asked questions about mercury in fish and shellfish, can be found at:

<http://www.cfsan.fda.gov/~dms/admehg3.html>

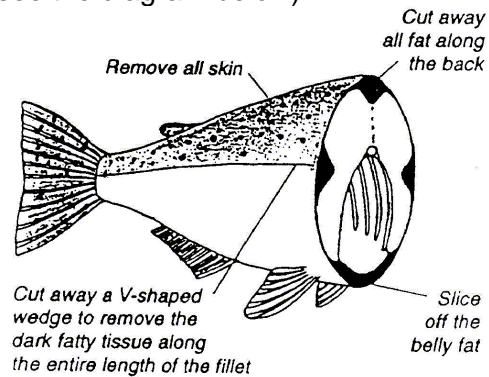
For further information about the risks of mercury in fish and shellfish call the U.S. Food and Drug Administration's consumer information line toll-free at 1-888-INFO-FDA.

Spacing Fish Meals

The contaminants that led to the advisory (mercury, cadmium, PCBs, chlordane, dioxin, DDT and mirex) are listed next to each advisory. If you eat fish from more than one water body with these advisories, you should limit consumption from all of the waters you fish. For example, if you eat a meal of Koppers Pond 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.

Cleaning and Cooking Your Fish

PCBs, dioxin, Mirex, DDT and chlordane 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 belly flap, the line along the sides, the fat along the back and under the skin (see the diagram below).



Cooking or soaking fish cannot eliminate the contaminants,

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 are particularly valuable when preparing fish from waters with advisories due to PCBs, dioxin, Mirex, DDT and chlordane; see pages 8 through 17. 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. The only way to reduce mercury intake is to eat less contaminated fish.

Reducing Exposure to Chemical Contaminants From Fish

Fish are an important source of protein and are 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 that includes food from a variety of protein sources, an individual is more likely to have a diet that 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 that 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 themselves but also for any unborn or nursing child, since the chemicals may reach the unborn babies and can be passed on in mother's milk. For an older person with heart disease, the risks, especially of long-term health effects, may not be as great a concern 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 sportfish from waterbodies that are not listed on pages 8 through 17 and follow the advice in this booklet.
2. When preparing sportfish, use a method of filleting the fish that will reduce the skin, fatty material and dark meat. These parts of the fish contain many of the contaminants.
3. When deciding which sportfish to eat, 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. Do not eat the soft green tissue (mustard, tomalley, liver or hepato-pancreas) found in the body section of crab and lobster. This tissue contains high levels of chemical contaminants, including PCBs and heavy metals.
5. When eating sportfish, use cooking methods (broiling, poaching, boiling and baking) which allow contaminants from the fatty portions of fish to drain out. Pan-frying is not recommended. The cooking liquids and fat drippings of fish from contaminated waters should be discarded since these liquids contain contaminants.
6. Anglers who want to enjoy the fun of fishing but who wish to eliminate the potential risks associated with eating contaminated sportfish may want to consider "catch and release" fishing. Refer to the DEC *New York State Fishing Regulations Guide* for suggestions on catch and release fishing techniques.

DOH Advisories for Marine Waters

Besides the Hudson River Estuary and the Upper Bay of New York Harbor, DOH also issues specific advisories for the New York waters of Long Island Sound, Block Island Sound, Peconic/Gardiners Bays, the Lower Bay of New York Harbor, Raritan Bay, Jamaica Bay and other Long Island south shore waters (see maps on pages 20 and 21). These apply to striped bass, bluefish and American eels and are the only advisories that apply to these waters. Ocean fish, although tested less often, are generally less contaminated than freshwater fish. However, striped bass, bluefish and eels have specific habits or characteristics that make them more likely to

Don't eat crab or lobster tomalley (hepatopancreas)

have contaminants than other marine species (see page 21).

DOH strongly recommends that you not eat the soft green substance (mustard, tomalley, liver or hepatopancreas) found in the body section of crabs and lobsters from any waters, because cadmium, PCBs and other contaminants concentrate there. Because contaminants in this substance are transferred to cooking liquid, you should also discard crab or lobster cooking liquid.

Advice on Contaminants in Game

DOH also issues advisories about eating some game. These are on page 21 of this booklet and include advisories for eating snapping turtles and waterfowl statewide because they contain PCBs and other contaminants. Because these contaminants concentrate in fat, you can minimize your exposure by not eating fat from these game and by following the cooking and eating advice on page 3.

Other Fish and Game Advice

Lead in Fishing Tackle and Bullets

Lead can cause health problems when it builds up in the body. Because the fetus and young child are at the greatest risk, it is particularly important for pregnant women, women of childbearing age and young children to minimize their lead exposures. Lead poisoning can slow a child's physical growth and mental development and can cause behavior and other nervous system problems, reproductive problems, kidney and liver damage, blindness and even death in both adults and children. Fishing tackle (especially sinkers and jig heads), bullets and shot often contain lead. To reduce exposure to the lead in these products, you should:

- Keep all lead objects away from young children (young children often put their hands and objects in their mouth).
- Wash hands with soap and water after holding or using lead sinkers and jig heads or reloading lead bullets or shot.
- Never put lead sinkers in your mouth. This includes biting down on lead sinkers.
- Never eat, drink, or smoke immediately after handling lead sinkers, bullets or shot; wash hands first.
- Take proper precautions when melting lead and pouring sinkers or bullets at home. Use jacketed bullets (a jacketed bullet is a bullet enveloped in a casing of another material such as copper) and shotgun shells with plastic wads.

Consider non-lead alternatives:

- DEC encourages anglers to use non-lead alternatives for sinkers and jig heads to reduce the risk of lead poisoning to birds. New York State law prohibits the sale of

lead fishing sinkers (including "split shot") weighing one-half ounce or less. More information is provided on the DEC website:

http://www.dec.state.ny.us/website/dfwmr/fish/respangl.html#non_toxic.

- The use of lead shot for waterfowl hunting is prohibited in New York State, and waterfowl hunters are required to use DEC-approved non-lead shot alternatives. You may want to consider using non-lead shot alternatives to hunt other small game as well. Remove all bullets, slugs, shot, lead fragments and affected meat (including feathers, fur, debris, etc.) from game when preparing it for consumption. Studies indicate that lead shot can contaminate game meat. Thus, people who eat game harvested with lead shot may be exposed to lead. More information on lead shot alternatives is provided on the DEC website at

<http://www.dec.state.ny.us/website/dfwmr/wildlife/guide/migbregs.html#ntshot>.

Studies have shown that people can be exposed to lead from shooting at indoor and outdoor firing ranges. For additional information on how to minimize your exposure to lead, call 1-800-458-1158, ext. 27900 (toll free).

Good Sanitary Practices - Bacteria, Viruses and Parasites in Fish and Game

Fish and game and other meats can be contaminated with bacteria, viruses or parasites that can cause illness. You should harvest fish and game that act and look healthy, and follow good sanitary practices when preparing them. We recommend that you wear rubber or plastic protective gloves while filleting, field dressing, skinning or butchering. We also recommend that you remove intestines soon after harvest, don't eat intestines and avoid direct contact with intestinal contents. Hands, utensils and work surfaces should be washed before and after handling any raw food, including fish and game meat. Fish and game should be kept cool (with ice or refrigerated below 45°F or 7°C) until filleted or butchered and then should be refrigerated or frozen. Some hunters prefer to hang big game for several days before butchering; this should not be done unless the game can be kept at temperatures consistently

below 45°F. Fish and other seafood should be cooked to an internal temperature (in the thickest part) of 140°F (60°C); game birds and other types of wild game meat should be cooked to an internal temperature (in the thickest part) of 165°F (74°C).

Advice on Eating Raw or Partially Cooked Fish, Shellfish and Other Meats

Foods of animal origin, such as pork, poultry, beef, dairy products, eggs, fish and shellfish, can be contaminated with bacteria, viruses or parasites that can cause illness. Persons at high risk (for example, those who are immunocompromised, suffer from liver disease or other chronic diseases) can be more susceptible to and more severely affected by these infectious diseases. This is why we recommend that all of these foods be thoroughly cooked before eating. Government agencies and the food industry strive to minimize contamination of raw animal foods and provide healthful food products.

Call DEC at (631) 444-0475 for information on shellfish regulations, including areas in which clam, oyster and mussel collection are permitted. DEC routinely tests clam, oyster and mussel beds for bacteria. Based on these tests, an area may be closed to clam, oyster and mussel harvesting. You can check the DEC website at <http://www.dec.state.ny.us/website/dfwmr/marine/shellfish/index.html> for general information on shellfish harvest. Call DEC at (631) 444-0480 for the latest information on emergency closures.

Deformed or Abnormal Fish

The health implications of eating deformed or abnormal 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.

Botulism in Fish and Waterfowl

In recent years, large numbers of some species of Lake Erie fish and waterfowl have been found dead, sick and dying, many of them as a result of botulism poisoning. The botulism poison is produced by *Clostridium botulinum*, a bacterium that is common in the environment and can produce harmful levels of botulism poison under some conditions. This poison has been found in some of the affected fish and waterfowl. The botulism poison can

cause illness and death if eaten by humans or animals. Cooking may not destroy the botulism poison. This problem may also occur in other waters, and we don't know whether all or only some fish and waterfowl species can be affected. DEC continues to monitor and investigate this problem.

No human cases of botulism poisoning have been linked to these events. However, as a precaution, do not eat any fish or game if they are found dead or dying, act abnormally or seem sick. If you must handle dead or dying fish, birds or other animals, cover your hands with disposable rubber or plastic protective gloves or a plastic bag.

Rabies and Chronic Wasting Disease (CWD)

Rabies and Chronic Wasting Disease (CWD) are two diseases that can cause abnormal behavior in deer. Rabies can be found in any mammal (especially raccoons, bats, skunks and foxes) and is found only occasionally in New York State deer. Chronic Wasting Disease (CWD) is a disease of deer and elk. In 2005, CWD was found for the first time in captive white-tailed deer in New York State. This disease has been present for several years in some deer or elk from several Western and mid-Western states and some Canadian provinces.

Rabies is a viral infection which causes a rapidly progressive disease of the animal's nervous system that leads to paralysis and death, usually within several days after signs of the disease first appear. Rabid deer may seem to lose their normal fear of humans, appear to have injured hind legs, salivate excessively, or be found laying on the ground struggling. Rabies can be transmitted from infected mammals to humans by exposure to infected tissues, particularly nervous tissue and saliva. Treatment can prevent rabies from developing in exposed humans. Rabies is almost always fatal in exposed humans who develop the disease. Thorough cooking will inactivate the rabies virus (see "Good Sanitary Practices" on page 5 of this booklet), but meat from infected game should not be eaten. Hunters should be aware that deer with rabies might have symptoms similar to CWD.

CWD is a brain infection of deer and elk that leads to loss of body functions, poor body condition and abnormal behavior such as staggering or very poor posture. It eventually

leads to the death of the animal. CWD appears to be caused by abnormal, infectious proteins called prions. There is currently no evidence that CWD is linked to disease in people. Cooking does not destroy the CWD prion.

The following precautions are recommended to minimize the risk of transmission of infectious diseases when handling or processing animals:

- Do not handle or eat deer or other game that appear sick, act strangely, or are found dead.
- Wear rubber or latex gloves when field dressing game.
- Avoid handling or cutting through the skull or spinal cord. Use separate dedicated knives, saws and cutting boards to butcher deer, particularly if you cut through the spinal cord or skull (such as when removing antlers). Do not use regular kitchen utensils. Wash thoroughly with soap and water any knives, butchering tools, work surfaces, hands and any other part of the body that has been exposed to animal tissue, blood, urine or feces. Equipment should then be rinsed with boiling (212 degree Fahrenheit) water or sanitized with a chemical sanitizer.
- As an additional precaution against CWD, you can soak cleaned knives and tools for one hour in a fresh solution of household chlorine bleach (unscented) mixed with an equal amount of water (e.g., 1 quart bleach with 1 quart of water), air dry, then rinse with clean water. Wipe down cleaned counters and other surfaces with the bleach solution and allow them to air dry.

Warning: When handling bleach, wear rubber or latex gloves and avoid getting bleach in eyes or on skin or clothing. If bleach contacts eyes, skin, or clothing, immediately wash affected area with water and remove affected clothing. Make sure that enough fresh air is available because bleach may cause eye, nose, or throat irritation.

- Should you decide to take the skull cap (e.g., with antlers), make sure to thoroughly clean the skull cap, utensils and work surfaces with bleach solution, as described above.
- Avoid handling the brain and spinal tissues or fluids, saliva and mouth parts of game animals. If these tissues or fluids are handled, wash hands thoroughly with soap and water. If these tissues or fluids make contact with a person's eyes, nose, mouth, or fresh open breaks in a person's skin, contact the local health department to see if rabies exposure may have occurred and whether the animal should be tested for rabies.
- If possible, request that the meat from your deer be processed separately, without adding other hunters' deer meat.

The brain, spinal cord and other nervous tissue, spleen, pancreas, eyes, tonsils, and lymph nodes of game may have CWD prions, and additional organs (liver, kidney, heart and salivary glands) may pose a risk of infection for a number of diseases. Normal field dressing will eliminate most of these organs and tissues. Lymph nodes can be eliminated by boning out the meat and carefully trimming the fat and connective tissue. Although no current evidence links CWD to human health, out of an abundance of caution, we recommend that people not consume a known or suspect CWD positive animal.

For additional information about CWD and rabies, visit the NYS Department of Health Website at:

<http://www.nyhealth.gov/nysdoh/zoonoses/zoonoses.htm>.

For an update on CWD testing in New York State and for information on wild deer, visit the NYS Department of Environmental Conservation Website at:

<http://www.dec.state.ny.us/website/dfwmr/wildlife/deer/cwd.html>.

For information on captive deer, visit the NYS Department of Agriculture and Markets Website at:

<http://www.agmkt.state.ny.us/AI/cwd.html>

2005-2006 Health Advisories

The following recommendations are based on contaminant levels in fish and game. 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, Upper Bay of New York Harbor (north of the Verrazano Narrows Bridge), Arthur Kill, Kill Van Kull, Newark Bay, 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.**
- **Advice for other marine waters is on page 21.**
- **The following advisories apply to New York State portions of listed waters. If you fish in portions of waters in another state, consult that state's fish advisories, available from state health or environmental agencies, or on the internet at: <http://epa.gov/waterscience/fish/states.htm>**

Water (County)	Species	Recommendations	Chemical(s) of Concern
Amawalk Reservoir [94] (Westchester)	Largemouth and smallmouth bass over 16"	Eat no more than one meal per month	Mercury
Arthur Kill [101] (Richmond)	See Hudson River (south of Catskill)		
Ashokan Reservoir [39] (Ulster)	Smallmouth bass over 16" and walleye	Eat no more than one meal per month	Mercury
Barge Canal [4] Tonawanda Creek, Lockport to Niagara River (Erie & Niagara)	Carp	Eat no more than one meal per month	PCBs
Beaver Lake [79] (Lewis)	Chain pickerel	Eat no more than one meal per month	Mercury
Big Moose Lake [74] (Herkimer)	Yellow perch over 9 inches	Eat no more than one meal per month	Mercury
Bog Brook Reservoir [48] (Putnam)	Walleye over 21 inches	Eat no more than one meal per month	Mercury
Boyds Corner Reservoir [46] (Putnam)	Largemouth bass over 16" and walleye	Eat no more than one meal per month	Mercury
<u>Breakneck Pond</u> [93] (Rockland)	Largemouth bass over 15"	Eat no more than one meal per month	Mercury
Buffalo River/Harbor [6] (Erie)	Carp	Eat none	PCBs

Waters with changes from the 2004-2005 Health Advisories are **underlined**.
Numbers in brackets refer to map on page 18 or 19.

Water (County)	Species	Recommendations	Chemical(s) of Concern
<u>Canada Lake</u> [21] (Fulton)	Smallmouth bass over 15" and chain pickerel	Eat no more than one meal per month	Mercury
<u>Canadice Lake</u> [9] (Ontario)	Lake trout over 25" and brown trout	Eat no more than one meal per month	PCBs
Cannonsville Reservoir [36] (Delaware)	Smallmouth bass over 15" and yellow perch	Eat no more than one meal per month	Mercury
Carry Falls Reservoir [59] (St. Lawrence)	Walleye	Eat no more than one meal per month	Mercury
Cayuga Creek [2] (Niagara)	All species	Eat none	Dioxin
<u>Chase Lake</u> [22] (Fulton)	Yellow perch over 9"	Eat no more than one meal per month	Mercury
Chenango River [34]	Walleye over 22"	Eat no more than one meal per month	Mercury
<u>Chodikey Lake</u> [40] (Ulster)	Largemouth bass over 15"	Eat no more than one meal per month	Mercury
Cranberry Lake [60] (St. Lawrence)	Smallmouth bass	Eat no more than one meal per month	Mercury
<u>Crane Pond</u> [62] (Essex)	Smallmouth bass over 15"	Eat no more than one meal per month	Mercury
Cross River Reservoir [96] (Westchester)	Largemouth and smallmouth bass over 16"	Eat no more than one meal per month	Mercury
Dart Lake [75] (Herkimer)	Yellow perch over 10"	Eat no more than one meal per month	Mercury
Delaware Park Lake [5] (Erie)	Carp	Eat no more than one meal per month	PCBs
Diverting Reservoir [50] (Putnam)	Walleye	Eat no more than one meal per month	Mercury
<u>Dunham Reservoir</u> [26] (Rensselaer)	Walleye	Eat none	Mercury
	Smallmouth bass	Eat no more than one meal per month	Mercury
East Branch Reservoir [49] (Putnam)	Walleye	Eat no more than one meal per month	Mercury
East River [100] (NYC)	American eel	Eat none	PCBs
	Atlantic needlefish, bluefish, striped bass and white perch	Eat no more than one meal per month	PCBs
<u>East Stoner Lake</u> (20))	See Middle Stoner Lake		

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Please note the special advice for **women of childbearing age, infants and children under the age of 15** on page 8

Water (County)	Species	Recommendations	Chemical(s) of Concern
Effley Falls Reservoir [85](Lewis)	Chain pickerel and smallmouth bass	Eat no more than one meal per month	Mercury
Eighteen Mile Creek [3] (Niagara)	All species	Eat none	PCBs
<u>Elmer Falls Reservoir</u> [86] (Lewis)	Smallmouth bass	Eat no more than one meal per month	Mercury
Ferris Lake [19] (Hamilton)	Yellow perch over 12"	Eat none	Mercury
	Smaller yellow perch	Eat no more than one meal per month	Mercury
Forked Lake [71] (Hamilton)	Largemouth and smallmouth bass	Eat no more than one meal per month	Mercury
Fourth Lake [67] (Herkimer & Hamilton)	Lake trout	Eat none	DDT
Francis Lake [80] (Lewis)	Yellow perch over 9" and chain pickerel	Eat no more than one meal per month	Mercury
Franklin Falls Flow (Pond) [55] (Essex and Franklin)	Walleye	Eat none	Mercury
Freeport Reservoir [112] (Nassau)	Carp	Eat no more than one meal per month	Chlordane
Goodyear Lake [32] (Otsego)	Walleye over 22"	Eat no more than one meal per month	Mercury
Grant Park Pond [107] (Nassau)	Carp	Eat no more than one meal per month	PCBs
Grasse River [51] Mouth to Massena Power Canal (St. Lawrence)	All species	Eat none	PCBs
Halfmoon Lake [81] (Lewis)	Yellow perch	Eat no more than one meal per month	Mercury
Hall's Pond [108] (Nassau)	Carp and goldfish	Eat none	Chlordane
Harlem River [99] (NYC)	American eel	Eat none	PCBs
	Atlantic needlefish, bluefish, striped bass and white perch	Eat no more than one meal per month	PCBs
Herrick Hollow Creek [37] (Delaware)	Brook trout	Eat no more than one meal per month	PCBs
High Falls Pond [87] (Lewis)	Smallmouth bass over 15"	Eat no more than one meal per month	Mercury

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Water (County)	Species	Recommendations	Chemical(s) of Concern
Hoosic River [25] (Rensselaer)	Brown trout over 14"	Eat no more than one meal per month	PCBs
Hudson River [24]			
-Corinth Dam to Dam at Route 9 Bridge in South Glens Falls	Smallmouth bass over 14"	Eat no more than one meal per month	Mercury
-Sherman Island Dam downstream to Feeder Dam at South Glens Falls	Carp	Eat no more than one meal per month	PCBs
-Dam at Route 9 Bridge in South Glens Falls to Troy Dam	All species	Eat none	PCBs
-Troy Dam south to bridge at Catskill	All species except Alewife, American shad, blueback herring, rock bass and yellow perch	Eat none	PCBs
	Alewife, blueback herring, rock bass and yellow perch	Eat no more than one meal per month	PCBs
	American shad (general advisory)	Eat no more than one meal per week	PCBs
-Bridge at Catskill south to and including the Upper Bay of New York Harbor (north of Verrazano Narrows Bridge), Arthur Kill and Kill Van Kull	Gizzard shad	Eat none	PCBs
	American eel, Atlantic needlefish, bluefish, brown bullhead, carp, channel catfish, goldfish, largemouth bass, smallmouth bass, rainbow smelt, striped bass, walleye, white catfish and white perch	Eat no more than one meal per month	PCBs
	Blue crab	Eat no more than six crabs per week	PCBs, Cadmium
	-hepatopancreas	Eat none	Cadmium, PCBs
	-cooking liquid	Discard	Cadmium, PCBs
-Dobbs Ferry south to Greystone	American eel	Eat none	PCBs
	Other species	See advisories for Hudson River south of Catskill	
Indian Lake [88] (Lewis)	All species	Eat no more than one meal per month	Mercury
Irondequoit Bay [8] (Monroe)	Carp	Eat none	PCBs, Mirex

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Water (County)	Species	Recommendations	Chemical(s) of Concern
Keuka Lake [10] (Yates & Steuben)	Lake trout over 25"	Eat no more than one meal per month	DDT
Kill Van Kull [102] (Richmond)	See Hudson River (south of Catskill)		PCBs
Kinderhook Lake [29] (Columbia)	American eel	Eat no more than one meal per month	PCBs
Kings Flow [64] (Hamilton)	Smallmouth bass over 15"	Eat no more than one meal per month	Mercury
Koppers Pond [11] (Chemung)	Carp	Eat no more than one meal per month	PCBs
Lake Capri [115] (Suffolk)	American eel and carp	Eat no more than one meal per month	Chlordane, Cadmium
Lake Champlain [54] -Whole Lake	Lake trout over 25" and walleye over 19"	Eat no more than one meal per month	PCBs, Mercury
-Bay within Cumberland Head to Crab Island	Brown bullhead	Eat none	PCBs
	American eel and yellow perch	Eat no more than one meal per month	PCBs
Lake Durant and Rock Pond , Town of Indian Lake [70] (Hamilton)	Largemouth bass over 15"	Eat no more than one meal per month	Mercury
Lake Eaton [68] (Hamilton)	Yellow perch over 10"	Eat no more than one meal per month	Mercury
Lake Ontario [7] Including Niagara River below Niagara Falls (see Niagara River for additional advice)	American eel, channel catfish, carp, lake trout over 25", brown trout over 20" and chinook salmon	Eat none	PCBs, Mirex, Dioxin
	White sucker, rainbow trout, smaller lake trout, smaller brown trout and coho salmon over 25"	Eat no more than one meal per month	PCBs, Mirex, Dioxin
-West of Point Breeze	White perch	Eat none	PCBs, Mirex, Dioxin
-East of Point Breeze	White perch	Eat no more than one meal per month	PCBs, Mirex, Dioxin
Loch Sheldrake [43] (Sullivan)	Walleye	Eat no more than one meal per month	Mercury
Loft's Pond [110] (Nassau)	Carp and goldfish	Eat no more than one meal per month	Chlordane
Long Pond, Town of Croghan [82] (Lewis)	Splake over 12"	Eat none	Mercury

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Please note the special advice for **women of childbearing age, infants and children under the age of 15** on page 8

Water (County)	Species	Recommendations	Chemical(s) of Concern
Lower and Upper Sister Lakes [72] (Hamilton)	Yellow perch over 10"	Eat none	Mercury
Upper Massapequa Reservoir [114] (Nassau)	White perch	Eat no more than one meal per month	Chlordane
Massena Power Canal [52] (St. Lawrence)	Smallmouth bass	Eat no more than one meal per month	PCBs
<u>Meacham Lake</u> [56] (Franklin)	Yellow perch over 12" and smallmouth bass	Eat none	Mercury
	Northern pike and smaller yellow perch	Eat no more than one meal per month	Mercury
<u>Middle Stoner Lake (or East Stoner Lake)</u> [20] (Fulton)	Smallmouth bass over 15"	Eat no more than one meal per month	Mercury
Mohawk River [15] Between Oriskany and West Canada Creeks (Oneida & Herkimer)	Carp	Eat none	PCBs
	Largemouth bass and tiger muskellunge	Eat no more than one meal per month	PCBs
<u>Moshier Reservoir</u> [76] (Herkimer)	Smallmouth bass and yellow perch	Eat no more than one meal per month	Mercury
Nassau Lake [28] (Rensselaer)	All species	Eat none	PCBs
Neversink Reservoir [42] (Sullivan)	Brown trout over 24" and smallmouth bass	Eat no more than one meal per month	Mercury
New York Harbor [104]	See Hudson River (south of Catskill) and marine waters' advice on page 21		PCBs
Newark Bay [103] (Richmond)	See Hudson River (south of Catskill)		PCBs
Niagara River [1]			
-Above Niagara Falls	Carp	Eat no more than one meal per month	PCBs
-Below Niagara Falls (also see Lake Ontario)	White perch	Eat none	PCBs, Mirex, Dioxin
	Smallmouth bass	Eat no more than one meal per month	PCBs, Mirex, Dioxin

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Water (County)	Species	Recommendations	Chemical(s) of Concern
North Lake [66], Town of Ohio (Herkimer)	Yellow perch	Eat no more than one meal per month	Mercury
<u>North-South Lake</u> [30] (Greene)	Largemouth bass over 15"	Eat no more than one meal per month	Mercury
Onondaga Lake [13] (Onondaga)	Walleye	Eat none	Mercury
	Carp, channel catfish and white perch	Eat no more than one meal per month	Dioxin, PCBs, Mercury
	All other species	Eat no more than one meal per month	Mercury
Oswego River [92] Oswego power dam to upper dam at Fulton (Oswego)	Channel catfish	Eat no more than one meal per month	PCBs
Pepacton Reservoir [38] (Delaware)	Brown trout over 24", smallmouth bass over 15" and yellow perch	Eat no more than one meal per month	Mercury
Polliwog Pond [57] (Franklin)	Smallmouth bass	Eat no more than one meal per month	Mercury
<u>Red Lake</u> [89] (Jefferson)	Walleye	Eat no more than one meal per month	Mercury
Ridders Pond [106] (Nassau)	Goldfish	Eat none	Chlordane
<u>Rio Reservoir</u> [45] (Orange & Sullivan)	Smallmouth bass over 15"	Eat no more than one meal per month	Mercury
Rock Pond and Lake Durant [70], Town of Indian Lake (Hamilton)	Largemouth bass over 15"	Eat no more than one meal per month	Mercury
Rondout Reservoir [41] (Sullivan & Ulster)	Smallmouth bass over 16"	Eat no more than one meal per month	Mercury
Round Pond [65] Town of Long Lake (Hamilton)	Yellow perch over 12'	Eat no more than one meal per month	Mercury
<u>Russian Lake</u> [73] (Hamilton)	Yellow perch over 9"	Eat no more than one meal per month	Mercury
St. James Pond [116] (Suffolk)	All species	Eat no more than one meal per month	Chlordane, DDT

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Water (County)	Species	Recommendations	Chemical(s) of Concern
St. Lawrence River [53] Whole river	American eel, channel catfish, lake trout over 25", carp, brown trout over 20" and chinook salmon	Eat none	PCBs, Mirex, Dioxin
	White perch, white sucker, rainbow trout, smaller lake trout, smaller brown trout and coho salmon over 25"	Eat no more than one meal per month	PCBs, Mirex, Dioxin
Bay at St. Lawrence/ Franklin Co. line	All species	Eat none	PCBs
Salmon River [91] Mouth to Salmon Reservoir (Oswego) (also see Lake Ontario)	Smallmouth bass	Eat no more than one meal per month	PCBs, Mirex
Salmon River Reservoir [90] (Oswego)	Largemouth and smallmouth bass	Eat no more than one meal per month	Mercury
Sand Lake [18], Town of Arietta (Hamilton)	Chain pickerel	Eat no more than one meal per month	Mercury
Sauquoit Creek [16] Between Old Silk Mill Dam (near New Hartford/Paris town line) and Mohawk River (Oneida)	Brown trout	Eat none	PCBs
Saw Mill River [97] (Westchester)	American eel	Eat no more than one meal per month	Chlordane
Schoharie Reservoir [31] (Delaware, Greene and Schoharie)	Smallmouth bass over 15" and walleye over 18"	Eat none	Mercury
	Smaller smallmouth bass and walleye	Eat no more than one meal per month	Mercury
Schroon Lake [63] (Warren & Essex)	Lake trout over 27", yellow perch over 13" and smallmouth bass	Eat no more than one meal per month	PCBs, Mercury
Sheldrake River [98] (Westchester)	American eel	Eat none	Chlordane, Dieldrin
	Goldfish	Eat no more than one meal per month	Chlordane

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Water (County)	Species	Recommendations	Chemical(s) of Concern
Skaneateles Creek [12] From dam at Skaneateles to Seneca River (Onondaga)	Brown trout over 10"	Eat no more than one meal per month	PCBs
Smith Pond – Rockville Centre [109] (Nassau)	White perch	Eat no more than one meal per month	Chlordane
Smith Pond – Roosevelt Park [111] (Nassau)	American eel	Eat none	Chlordane
	Carp and goldfish	Eat no more than one meal per month	Chlordane
Soft Maple Dam Pond [84] and Soft Maple Reservoir [83] (Lewis)	Rock bass and smallmouth bass	Eat no more than one meal per month	Mercury
South Pond [69], Town of Long Lake (Hamilton)	Yellow perch over 10"	Eat no more than one meal per month	Mercury
Spring Pond – Middle Island [117] (Suffolk)	Carp and goldfish	Eat none	Chlordane
Spy Lake [17] (Hamilton)	Smallmouth bass over 15"	Eat no more than one meal per month	Mercury
Stillwater Reservoir [77] (Herkimer)	Yellow perch over 9", smallmouth bass and splake	Eat no more than one meal per month	Mercury
Sunday Lake [78] (Herkimer)	Chain pickerel	Eat none	Mercury
	Yellow perch	Eat no more than one meal per month	Mercury
Susquehanna River [35]	Walleye over 22"	Eat no more than one meal per month	Mercury
Swinging Bridge Reservoir [44] (Sullivan)	Walleye	Eat no more than one meal per month	Mercury
Threemile Creek [14] (Oneida)	White sucker	Eat no more than one meal per month	PCBs
Titicus Reservoir [95] (Westchester)	White perch	Eat no more than one meal per month	Mercury
Tupper Lake [61] (Franklin & St. Lawrence)	Smallmouth bass and walleye	Eat no more than one meal per month	Mercury
Unadilla River [33]	Walleye over 22"	Eat no more than one meal per month	Mercury
Upper and Lower Sister Lakes [72] (Hamilton)	Yellow perch over 10"	Eat none	Mercury
Upper Twin Pond [113] (Nassau)	American eel	Eat no more than one meal per month	Chlordane

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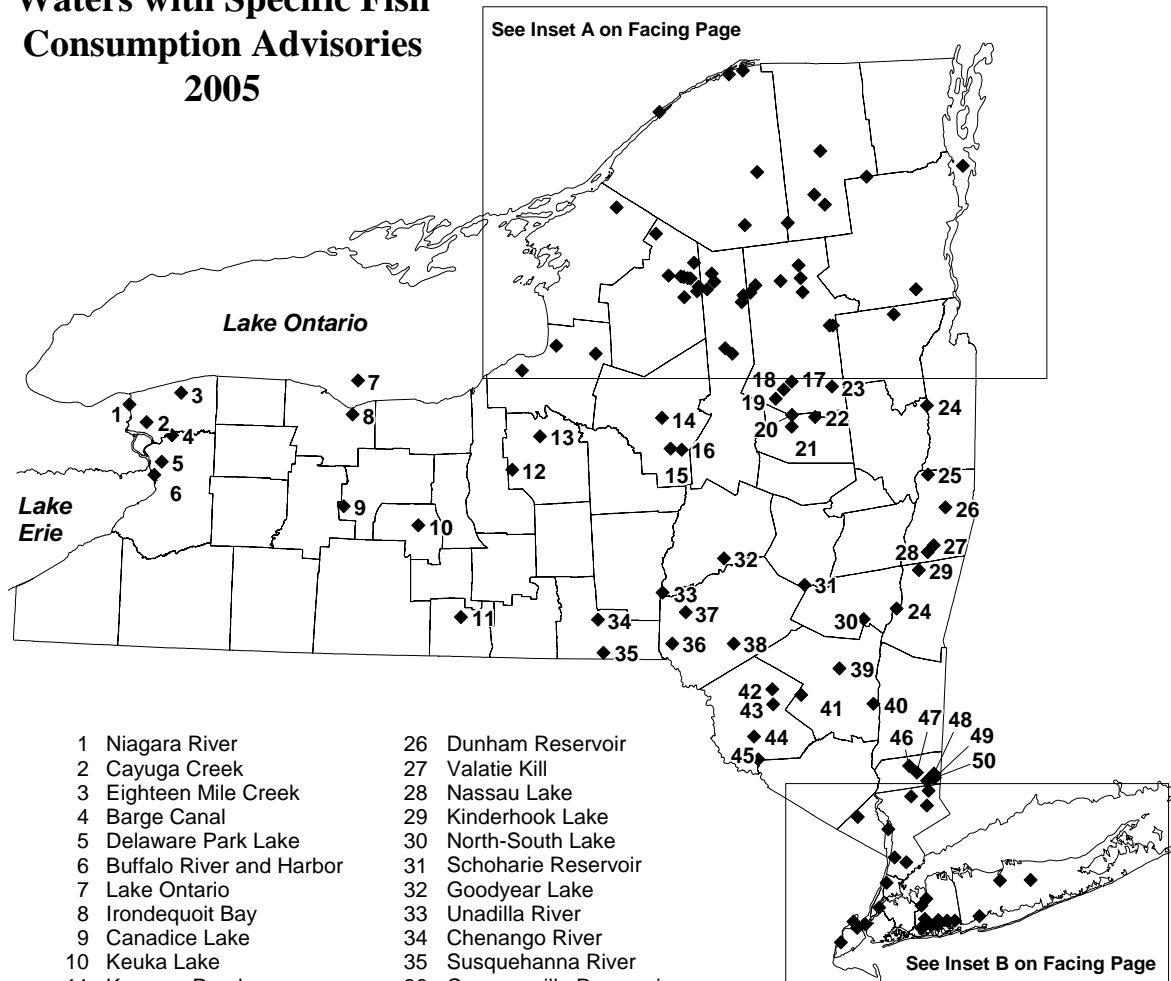
Water (County)	Species	Recommendations	Chemical(s) of Concern
Valatie Kill [27] Between County Rt. 18 and Nassau Lake (Rensselaer)	All species	Eat none	PCBs
Weller Pond [58] (Franklin)	Northern pike	Eat no more than one meal per month	Mercury
West Branch Reservoir [47] (Putnam)	Walleye	Eat no more than one meal per month	Mercury
Whitney Park Pond [105] (Nassau)	Carp and goldfish	Eat no more than one meal per month	Chlordane
Willis Lake [23] (Hamilton)	Smallmouth bass	Eat no more than one meal per month	Mercury

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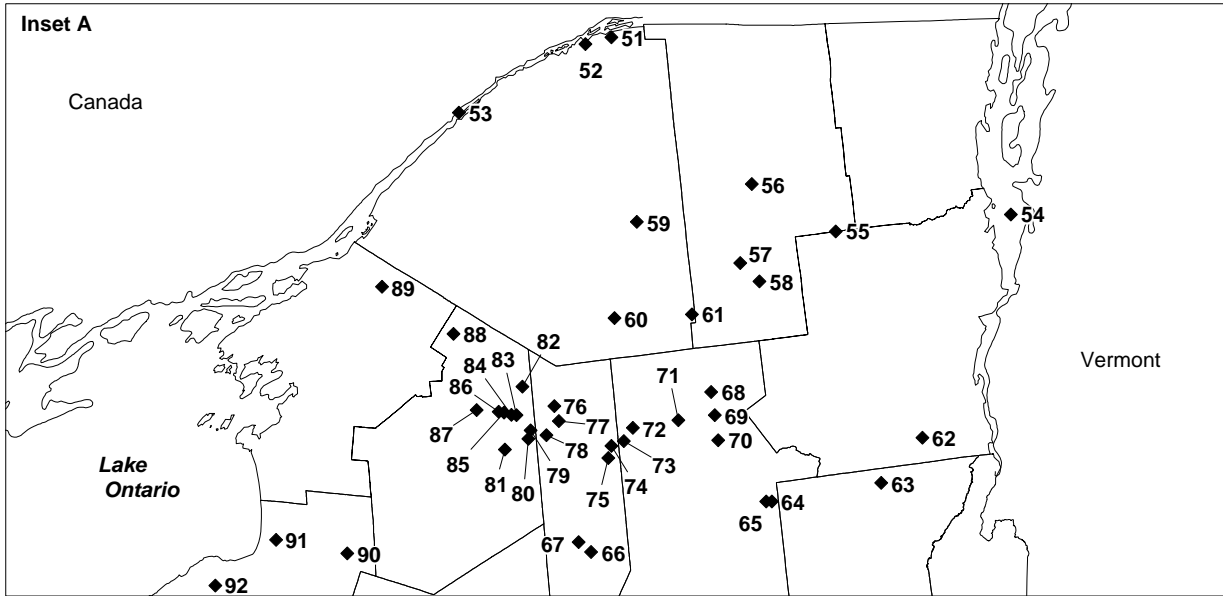
Numbers in brackets refer to map on page 18 or 19.

Please note the special advice for **women of childbearing age, infants and children under the age of 15** on page 8

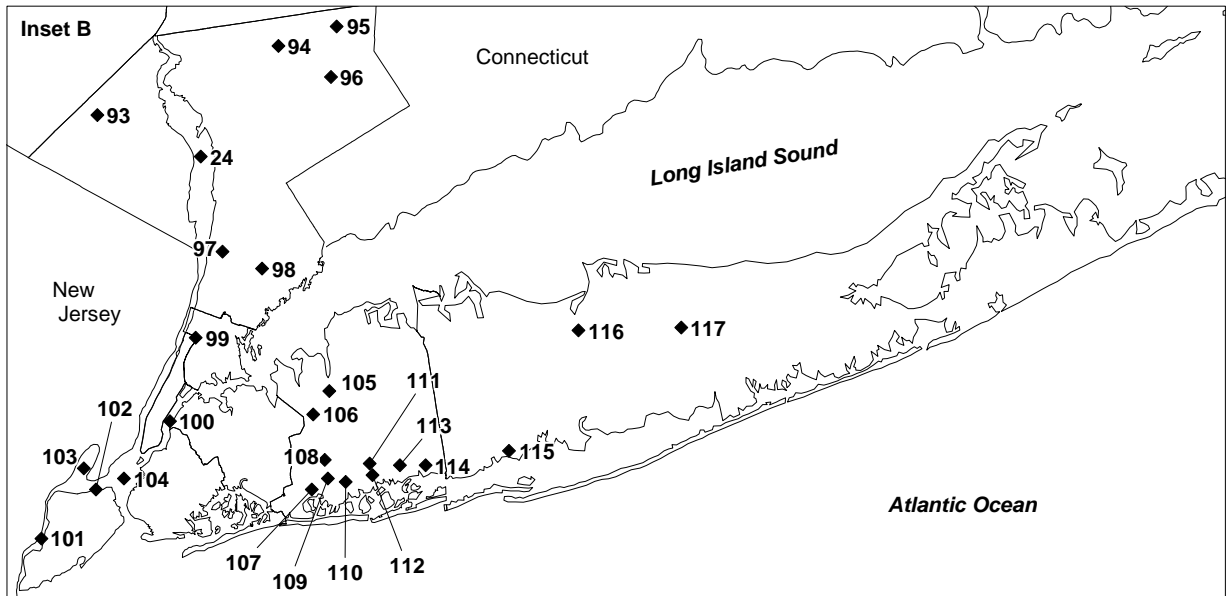
Waters with Specific Fish Consumption Advisories 2005



- | | |
|----------------------------|------------------------------|
| 1 Niagara River | 26 Dunham Reservoir |
| 2 Cayuga Creek | 27 Valatie Kill |
| 3 Eighteen Mile Creek | 28 Nassau Lake |
| 4 Barge Canal | 29 Kinderhook Lake |
| 5 Delaware Park Lake | 30 North-South Lake |
| 6 Buffalo River and Harbor | 31 Schoharie Reservoir |
| 7 Lake Ontario | 32 Goodyear Lake |
| 8 Irondequoit Bay | 33 Unadilla River |
| 9 Canadice Lake | 34 Chenango River |
| 10 Keuka Lake | 35 Susquehanna River |
| 11 Koppers Pond | 36 Cannonsville Reservoir |
| 12 Skaneateles Creek | 37 Herrick Hollow Creek |
| 13 Onondaga Lake | 38 Pepacton Reservoir |
| 14 Three Mile Creek | 39 Ashokan Reservoir |
| 15 Mohawk River | 40 Chodikee Lake |
| 16 Sauquoit Creek | 41 Rondout Reservoir |
| 17 Spy Lake | 42 Neversink Reservoir |
| 18 Sand Lake | 43 Loch Sheldrake |
| 19 Ferris Lake | 44 Swinging Bridge Reservoir |
| 20 Middle Stoner Lake | 45 Rio Reservoir |
| 21 Canada Lake | 46 Boyds Corner Reservoir |
| 22 Chase Lake | 47 West Branch Reservoir |
| 23 Willis Lake | 48 Bog Brook Reservoir |
| 24 Hudson River | 49 East Branch Reservoir |
| 25 Hoosic River | 50 Diverting Reservoir |

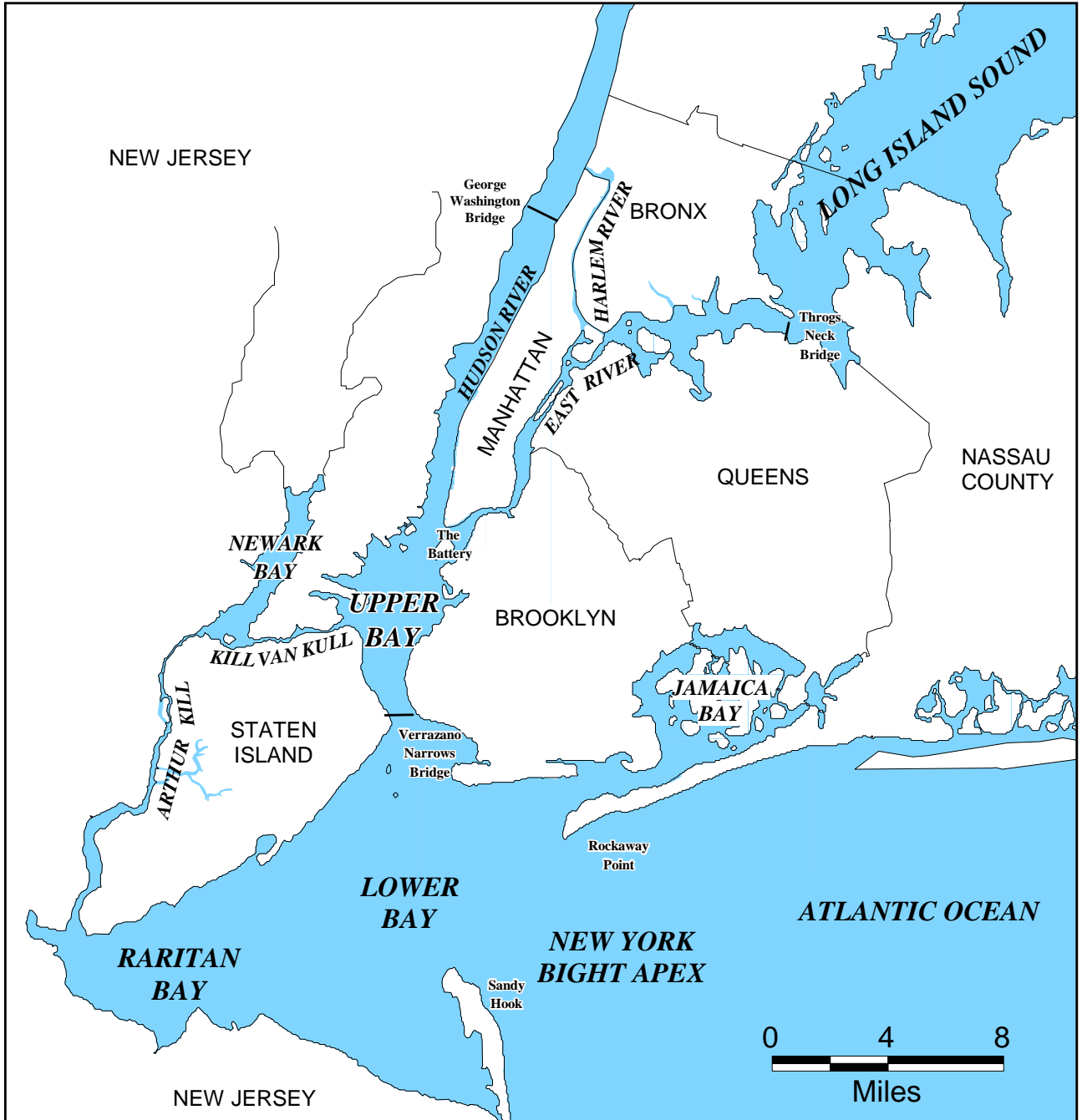


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|--------------------------|---------------------------------|-------------------------|---------------------------|
| 51 Grasse River | 62 Crane Pond | 73 Russian Lake | 84 Soft Maple Dam Pond |
| 52 Massena Power Canal | 63 Schroon Lake | 74 Big Moose Lake | 85 Effley Falls Reservoir |
| 53 St. Lawrence River | 64 Kings Flow | 75 Dart Lake | 86 Elmer Falls Reservoir |
| 54 Lake Champlain | 65 Round Pond | 76 Moshier Reservoir | 87 High Falls Pond |
| 55 Franklin Falls Pond | 66 North Lake | 77 Stillwater Reservoir | 88 Indian Lake |
| 56 Meacham Lake | 67 Fourth Lake | 78 Sunday Lake | 89 Red Lake |
| 57 Polliwog Pond | 68 Lake Eaton | 79 Beaver Lake | 90 Salmon River Reservoir |
| 58 Weller Pond | 69 South Pond | 80 Francis Lake | 91 Salmon River |
| 59 Carry Falls Reservoir | 70 Rock Pond and Lake Durant | 81 Halfmoon Lake | 92 Oswego River |
| 60 Cranberry Lake | 71 Forked Lake | 82 Long Pond (Croghan) | |
| 61 Tupper Lake | 72 Upper and Lower Sister Lakes | 83 Soft Maple Reservoir | |



- | | | |
|--------------------------|-----------------------------------|---------------------------------|
| 24 Hudson River | 101 Arthur Kill | 110 Loft's Pond |
| 93 Breakneck Pond | 102 Kill Van Kull | 111 Smith Pond (Roosevelt Park) |
| 94 Amawalk Reservoir | 103 Newark Bay | 112 Freeport Reservoir |
| 95 Titicus Reservoir | 104 New York Harbor | 113 Upper Twin Pond |
| 96 Cross River Reservoir | 105 Whitney Park Pond | 114 Upper Massapequa Reservoir |
| 97 Saw Mill River | 106 Ridders Pond | 115 Lake Capri |
| 98 Sheldrake River | 107 Grant Park Pond | 116 St. James Pond |
| 99 Harlem River | 108 Hall's Pond | 117 Spring Pond (Middle Island) |
| 100 East River | 109 Smith Pond (Rockville Centre) | |

Map of New York City Harbor Region



Additional Advice

Advisories for Lake Erie - Due to PCBs, women of childbearing age, infants and children under 15 are advised to eat no more than one meal per week of chinook salmon less than 19 inches, burbot, freshwater drum, lake whitefish, rock bass and yellow perch and to EAT NO MORE THAN ONE MEAL PER MONTH of all other fish from Lake Erie. Other people should eat no more than one meal per week of any Lake Erie fish species.

Marine Bluefish and Eels - The general advisory {Eat no more than one meal (one-half pound) per week} applies to bluefish and American eels but not to most other fish (see Marine Striped Bass below) from Long Island Sound, Block Island Sound, Peconic/Gardiners Bays, the Lower Bay of New York Harbor, Raritan Bay, Jamaica Bay and other Long Island south shore waters. (Contaminant - PCBs)

Marine Striped Bass - Women of childbearing age and children under the age of 15 should eat no striped bass from Upper and Lower Bays of New York Harbor, Raritan Bay or Long Island Sound west of Wading River. Other people should EAT NO MORE THAN ONE MEAL PER MONTH of striped bass from these waters. Everyone should eat no more than one meal per week of striped bass taken from Jamaica Bay, Eastern Long Island Sound, Block Island Sound, Peconic/Gardiners Bay or Long Island south shore waters. (Contaminant - PCBs)

Crabs and Lobsters - The hepatopancreas (sometimes called mustard, tomalley or liver) of crabs and lobsters should not be eaten because it has high contaminant levels. Because contaminants in the hepatopancreas are transferred to cooking liquid, crab or lobster

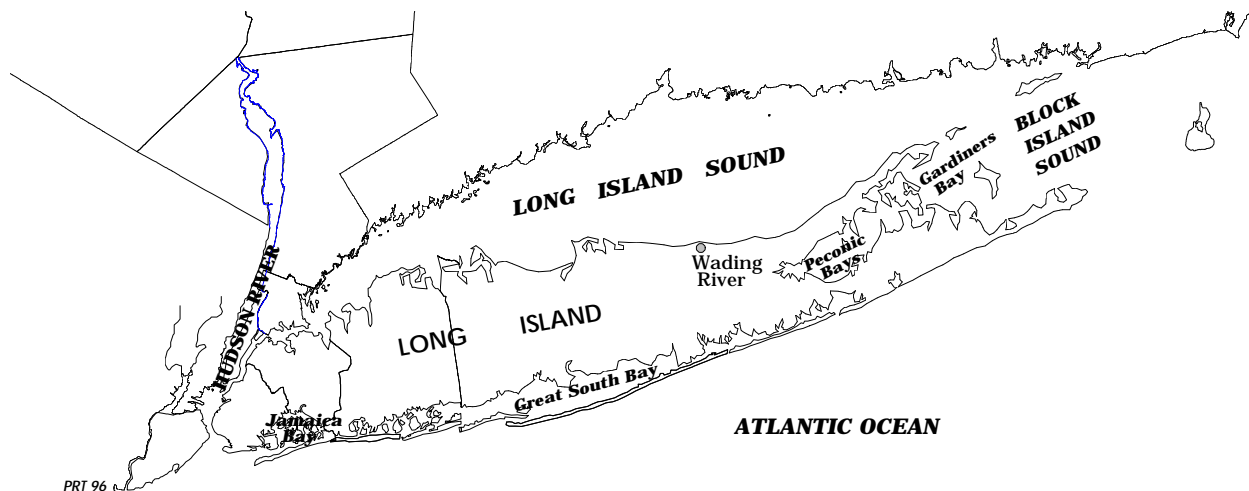
cooking liquid should also be discarded. (Contaminants - PCBs, cadmium, dioxin).

Hudson River American Shad - The advisory for women of childbearing age, infants and children under 15 is EAT NONE for all fish from the lower Hudson River because of PCB contamination. American shad have lower PCB levels than other species. A few meals of Hudson River American shad meat and roe, especially using cooking and trimming methods to 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, you can reduce your exposure by carefully trimming away all fat and discarding the fat, liver and eggs prior to cooking the meat or preparing soup. Women of childbearing age, infants and children under the age of 15 should AVOID EATING snapping turtles or soups made with their meat. (Contaminant - PCBs)

Wild Waterfowl - Mergansers are the most heavily contaminated waterfowl species and should NOT BE EATEN. EAT NO MORE THAN TWO MEALS PER MONTH of other wild waterfowl; you should skin them and remove all fat before cooking, and discard stuffing after cooking. Wood ducks and Canada geese are less contaminated than other wild waterfowl species and diving ducks are more contaminated than dabbling ducks. (Contaminants of concern - PCBs, mirex, chlordane, DDT)

Map of New York Marine Waters



Information on Chemicals in Sportfish and Game

The following paragraphs give some basic information on chemicals in sportfish and game in New York State. Most of our knowledge of potential health effects comes from high dose animal studies or worker exposures. Chemicals that cause adverse health effects in humans and laboratory animals after high levels of exposure may increase the risk of adverse effects in humans exposed to lower levels for long periods of time. Following the suggestions in the advisory will minimize your exposure and health risks from contaminants in fish.

Chlordane

Chlordane is a man-made pesticide that was used widely to control agricultural and home/garden pests until most uses were banned in the United States during the mid-1970s. In New York State, chlordane was used for the underground control of termites until that use was banned in 1985. Chlordane generally got into bodies of water after improper waste disposal or run-off from treated areas. Chlordane builds up in the fatty tissues of fish, birds and mammals. Since chlordane is present in the fatty tissues of fish, exposure to chlordane from fish can be reduced by cleaning and cooking practices (see page 3).

People exposed to large amounts of chlordane may have nervous system damage. Exposure to high levels of chlordane damages the nervous system and liver of laboratory animals. Some animals exposed before birth and while nursing developed behavioral effects later. Chlordane causes cancer in laboratory animals exposed to high levels over their lifetimes. Whether chlordane causes cancer in humans is unknown.

DDT (also includes DDE and DDD)

DDT is a man-made pesticide that was used widely to control insects on agricultural crops and biting insects, such as mosquitos and black flies. Its use was banned in New York in 1971 and throughout the United States in 1973. DDT generally got into

bodies of water after improper waste disposal, direct spraying of water bodies or run-off from treated areas.

In the environment, DDT breaks down into DDE and DDD, chemicals that are very similar to DDT. These chemicals build up in the fatty tissues of fish, birds and mammals; and exposure from fish can be reduced by cleaning and cooking practices (see page 3).

People who accidentally ingested large amounts of DDT had effects on the nervous system that went away once the exposure stopped. A study in humans showed that increasing concentrations of DDE in human breast milk were associated with reductions in the duration of lactation. An additional study in humans found that as the DDE levels in the blood of pregnant women increased, the chances of having a pre-term baby also increased. Exposure of laboratory animals to high levels of DDT damages the liver and can cause reproductive, developmental and nervous system effects. DDT causes cancer in laboratory animals exposed to high levels over their lifetimes. Whether DDT causes cancer in humans is unknown.

Mirex

Mirex is a man-made chemical that was used as a pesticide to control fire ants until its use was banned in the United States in the late 1970s. It was also used as a flame retardant in plastics, rubber, paint, paper and electrical goods until the early 1970s. Mirex generally got into bodies of water after improper waste disposal or run-off from treated areas. Mirex builds up in the fatty tissues of fish, birds and mammals. Since mirex is present in the fatty tissues of fish, exposure to mirex from fish can be reduced by cleaning and cooking practices (see page 3).

Laboratory animals exposed to mirex had damage to the eyes, nervous system, reproductive system, liver, thyroid and kidneys. Mirex causes cancer in laboratory animals exposed to high levels over their lifetimes. Whether mirex causes cancer in humans is unknown.

PCBs

PCBs (polychlorinated biphenyls) are a family of man-made chemicals that were used in many commercial and electrical products until their manufacture was banned in the mid-1970s. Some electrical equipment still in use contains PCBs. In this country, most PCBs were sold as mixtures called Aroclors. PCBs build up in fatty tissues of fish, birds and mammals. Since PCBs are present in the fatty tissues of fish, exposure to PCBs from fish can be reduced by cleaning and cooking practices (see page 3).

Industrial workers who were exposed to large amounts of PCBs and other chemicals in air (and perhaps through their skin) experienced skin, eye and respiratory tract irritation and mild changes in the functioning of their livers. Less frequently, workers exposed to high levels reported headache, digestive disturbances, and showed liver problems.

Some studies of pregnant women suggest a link between a mother's increased exposure to PCBs and other chemicals from eating contaminated fish or from other environmental sources and slight effects on her child's birthweight, short-term memory, and learning. Studies suggest that women who ate fish containing PCBs (and other contaminants) have slightly shorter menstrual cycles and take a longer time to become pregnant than women who did not eat contaminated fish. A study of older adults (49 to 86 years old) who ate fish containing PCBs (and other contaminants) suggests that PCB exposure is associated with lower scores on several measures of memory and learning. Although some of the studies did control for the possible effects of other chemical contaminants, the role of these chemicals in causing the observed effects is not fully understood.

Studies of workers exposed to PCBs in air (and perhaps through their skin) raise concerns that PCBs may cause cancer in people, but results are inconsistent. The data are inadequate to prove that PCB exposures cause cancer in humans.

PCBs affect the skin, liver, and the nervous, immune and reproductive systems of animals exposed to high levels. PCBs also reduce the birth weight and change the behavior of offspring born to animals exposed before, during, and after pregnancy. Some

types of PCBs cause birth defects in offspring born to animals exposed during pregnancy. Some types of PCBs also cause cancer in laboratory animals exposed over their lifetime.

PCDDs and PCDFs

Polychlorinated dibenzo-p-dioxins (also known as PCDDs or dioxins) and chlorinated dibenzofurans (also known as PCDFs or furans) are two closely related families of chemical compounds. Some dioxins and furans are produced as unwanted by-products in chemical manufacturing processes, such as in making some herbicides and disinfectants. They are also in the smoke or ash from motor vehicles, municipal waste incinerators, wood fires and residential trash burning. Some dioxins and furans are environmentally and biologically persistent. They are highly soluble in fats and are stored in the fatty tissue of fish and other animals. Since dioxins and furans are present in fatty tissues of fish, exposure to dioxins and furans from fish can be reduced by cleaning and cooking practices (see page 3).

Dioxins and furans are thought to produce similar health effects. TCDD (2,3,7,8-tetra-chlorodibenzo-p-dioxin) is the most potent of the dioxins and furans, and much of what we know about the toxicity of dioxins and furans comes from studies of TCDD.

Many studies have looked at how exposure to high levels of dioxins and furans can affect human health. Most of these studies examined workers exposed during the manufacture of chemicals, including pesticides, contaminated with dioxins. Other studies have looked at people exposed during the use of pesticides contaminated with dioxins or at people exposed to dioxins and/or furans after an industrial accident.

The most obvious health effect in people exposed to large amounts of dioxins is chloracne (a severe acne-like skin disease). Other effects that are clearly caused by dioxins are other types of skin diseases and changes in the blood levels of reproductive hormones and of enzymes indicating changes in liver function. Other effects have been reported, but the evidence for these effects is not strong enough to clearly indicate

that they were caused by dioxins. These include increases in cardiovascular disease, diabetes or altered glucose (sugar) metabolism, reproductive effects, nervous system effects, thyroid function changes and immunological and respiratory system effects. Several studies showed a positive association between a person's risk of getting cancer (all type of cancers combined) and working in a plant where products contaminated with dioxins were manufactured, but the evidence is not strong enough to conclude the cancers were caused by dioxins and not some other factor or combination of factors.

Several studies have looked at the effects of dioxins and furans on the health of children. Children of Japanese and Taiwanese women who ingested rice oil highly contaminated with furans and other dioxin-like compounds showed developmental effects that ranged from very mild to very severe. Scientists in Europe have reported associations between a mother's exposures to dioxins and furans and effects on her child's mental and motor skills, immune system, play behavior, and hormone levels. However, the study has limitations and the effects may have been associated with other factors and not with the dioxins and furans.

In laboratory animals, TCDD has damaged the liver, skin, blood and the gastrointestinal, immune, reproductive and nervous systems. It also affects prenatal development in animals whose mothers were exposed to TCDD. TCDD causes cancer in animals exposed to high levels over their lifetime.

Mercury

Mercury is a metal and some forms of it occur naturally in the environment. The metallic, or elemental form is a silvery, odorless liquid that can evaporate at room temperature to form odorless, colorless mercury vapor. Most of the mercury that accumulates in the fleshy part of fish is in an organic (carbon-containing) form called methylmercury. Greater amounts of methylmercury are found in older fish that tend to eat other fish and organisms. Methylmercury is found throughout the part of the fish that is eaten; therefore cleaning and

cooking methods that may reduce exposure to other contaminants are NOT effective for reducing exposure to mercury.

Exposure to high levels of metallic, inorganic or organic mercury can damage the nervous system and kidneys. People who ate fish that contained large amounts of methylmercury had permanent damage to the brain, kidneys and fetus. Exposure to methylmercury is more of a concern for children and unborn babies because their nervous systems are still developing and the nervous system is a target organ for mercury. To address this concern, two separate long-term studies are underway in the Seychelles and Faroe Islands to look for health effects among children in populations that eat large amounts of seafood containing low levels of methylmercury. In these studies, the children's health is assessed as they grow. To date, results from the two studies are contradictory. The Seychelles Islands study shows no adverse effects, while the Faroe Islands study shows an association between mercury exposure and problems with memory, attention and language development. Interpreting the Faroe Islands study results is complicated because that population is also exposed to PCBs from the marine mammals that they eat. Both studies are ongoing and will continue to evaluate the children's health as they grow.

Cadmium

Cadmium is a naturally-occurring metal found in some forms at low levels in soil and water. Cadmium is used in many industrial operations and in consumer products such as paints, plastics and batteries. Cadmium can be found in food items and in tobacco. Vegetables, fruits and cereals are the greatest source of cadmium. Cadmium can also be found in fish and shellfish from waters containing cadmium.

Eating food or drinking beverages containing high levels of cadmium can cause nausea, vomiting, stomach upset, cramps and diarrhea. Because cadmium leaves the body slowly, it can accumulate in the body, mainly in the kidneys, with continuing exposure. Some people with long-term exposure had kidney, bone and blood damage.

Contacts for Additional Information

New York State Department of Health

For more information on **health effects** from exposure to chemical contaminants or to provide comments on the format or content of this report contact:

Environmental Health Information: 1-800-458-1158, extension 27815 (toll-free). Calls are taken from 8:00AM-4:30PM, Monday through Friday. After hours, leave a voice mail message. The full advisories are also available from the Internet: <http://www.nyhealth.gov/nysdoh/fish/fish.htm> or can be requested by e-mail: BTSA@health.state.ny.us

New York State Department of Environmental Conservation

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

Region 1

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Bldg. 40 SUNY
Stony Brook, NY 11790
(631) 444-0280

Region 4

65561 State Hwy. 10
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Stamford, NY 12167-9503
(607) 652-7366

Region 7

1285 Fisher Avenue
Cortland, NY 13045-1090
(607) 753-3095, ext.213

Region 2

1 Hunter Point Plaza
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Region 5

1115 State Rt. 86
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Region 8

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Region 3

21 South Putt Corners Road
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Region 6

317 Washington St.
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Region 9

270 Michigan Avenue
Buffalo, NY 14203-2999
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For more information on **fishing marine waters**, contact:

Bureau of Finfish and Crustaceans
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(631) 444-0435

For information on **contaminant levels** in fish and shellfish and wildlife, contact:

Division of Fish and Wildlife
625 Broadway, Fifth Floor
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