Overview

- Our ‘Problem’
- Our Audience
- Our Campaign
  - Out with the old...
  - In with the NEW!
Michigan’s Eat Safe Fish Program

- First advisory issued in 1970
Michigan’s Eat Safe Fish Program

- **Industry**
  - **Mercury** (coal-fired industries)
  - **PCBs** (used in transformers and capacitors, new use banned in the late '70s)
  - **Dioxin** (chlorine manufacturers, industrial incineration practices)

- **Other**
  - **PFOS** (perfluorooctane sulfonate; fire-fighting foams, Teflon)
  - **Selenium** (naturally occurring, mining)
  - **DDT** (insecticide, banned in the early '70s)
  - **Toxaphene** (insecticide, banned in the '90s)
The Chemicals: Bioaccumulative

1. There are many ways chemicals end up in lakes and rivers, including wind and rain run-off.

2. The chemicals sink to the bottom of the lake or river, where they settle in the sediment.

3. Small creatures, called macroinvertebrates, eat these chemicals as they dig in the sediment for food.

4. The macroinvertebrates are eaten by minnows, minnows by medium-sized fish, and those fish are eaten by large fish - each collecting and storing some of the chemicals in their bodies.

5. This is why larger fish, predator fish and longer-living fish are likely to have more chemicals in their bodies than smaller, younger fish. Check the *Michigan Fish Advisory* to find safe fish.
The Chemicals: Persistent

In 1970, a factory puts out a lot of persistent chemicals through its smoke stacks.

In 2011, the factory has pollution control devices on its smoke stacks, but the chemicals put out in past years still remain behind.
Bioaccumulative & Persistent
Bioaccumulative & Persistent
Bioaccumulative & Persistent

10 MONTHS
To reach “regular” levels of Mercury found in the general population

50 YEARS
To fall back to the “regular” levels of PCBs found in the general population
Health Effects

**PCBs and Dioxins**
- Linked to the development of cancer
- Linked to the development of diabetes
- Can harm fertility
- Can harm thyroid function
- Can harm brain development in fetuses and children
- Can harm the immune system

**Mercury**
- Can harm brain development in fetuses and children
- Can harm heart function in older adults
- Can harm the immune system

<table>
<thead>
<tr>
<th>Amount of Exposure</th>
<th>Who You Are</th>
</tr>
</thead>
<tbody>
<tr>
<td>How Contaminated</td>
<td>Age</td>
</tr>
<tr>
<td>How Often Eaten</td>
<td>Health</td>
</tr>
<tr>
<td>How Much Eaten</td>
<td>Genetics</td>
</tr>
</tbody>
</table>

No way to know if potential future health problems were caused by these chemicals.
Our Outreach Strategy

- People who eat a lot of fish
- People who don’t eat a lot of fish,
  - but fish in Areas of Concern,
  - or have pre-existing health conditions,
  - or are planning on having kids in the near future
- Kids
History of Outreach
Intro to Brochures

**eat safe fish in Michigan**
Learn about eating safe, local, and healthful fish from our Great Lakes State.

**buy safe fish**
Mercury Guidelines for Store-bought & Restaurant Fish

[Images of brochures for eating and buying safe fish]
Restaurant & Store-bought Fish
Eating Safe Fish
You’ve heard that eating fish is healthy for you and your family.

- Fish are a great low-fat source of protein.
- Fish are brain food.
- Some fish have heart-healthy omega-3s.

But you’ve also probably heard that some fish have mercury in them. And mercury is bad for your health - no matter what age you are.

Mercury is unhealthy. Fish are good for you.

You want to make the healthy choice for you and your family, but what is the right choice? Should you eat fish or not? Which fish are safe?

Luckily, making the right choice and the healthy choice is now as easy as counting to eight!

Mercury in Fish
- Mercury is found in the muscle of the fish, which is the filet that we eat. You can’t remove mercury from fish like you can other chemicals.
- Choosing fish to eat that are low in mercury is the only way to avoid getting too much in your body.

Health Problems
Mercury can cause health problems in people of all ages.
- Too much mercury can cause problems with the nervous system and kids’ brain growth.
- Too much mercury can harm heart function.
- Too much mercury also limits your body’s ability to fight off sickness.

What is ‘MI Serving’?
MI Serving depends on who you are:
- For an adult, MI Serving is: 8 ounces of cooked fish - size of an adult’s hand (large oval)
- For a child, MI Serving is: 2-4 ounces of cooked fish - size of the palm on an adult’s hand (small circle/rectangle)

You might eat more than one MI Serving in a meal. That’s OK, just keep track so you know!

Eat 8! Eat Great!
The FDA has tested for mercury in a variety of fish and shellfish that are available for sale in the United States.
Using the FDA test results for mercury in fish, MDCH created Eat 8!
Eat 8! can help you choose fish lower in mercury and higher in heart-healthy omega-3 fatty acids.
Eat 8! is safe for everyone to use, even pregnant women and kids!

How to Use Eat 8!
1. Look on the back of this sheet and find the fish you plan to eat. The lower the points, the lower the amount of mercury in the fish.
2. Estimate how many ‘MI Servings’ you are going to eat. One adult’s MI Serving of fish is a filet about the size of their hand (8 ounces of cooked fish). A child’s MI Serving is about the size of the palm of an adult’s hand (2-4 ounces).
3. Add up the points. For example, one dinner, you have 16 ounces of salmon (2 MI Servings) for 2 points. The next week, you have one MI Serving (8 ounces) of halibut for 4 points. That’s 6 points, so far, for the month.
4. Keep track of your ‘MI Serving’ points during the month. Eat no more than 8 points total of fish each month.

You can be sure you’re not getting too much mercury in your body when you use Eat 8! to choose your meals.

Questions?
1-800-648-6642
www.michigan.gov/estalefish
Eat 8!
A Guide to Help You Choose Fish Low in Mercury from Restaurants and Grocery Stores

Other Resources
Sustainable & Planet-Friendly Fish
Shedd Aquarium Right Bite
http://bit.ly/3f1GgWm
Monterey Bay Aquarium Seafood Watch
http://bit.ly/2kaPS or 1-877-229-5990

Cooking & Food Safety
Farm-Raised Fish Regulations (FDA)
http://bit.ly/2oL5w or 1-202-402-2300
Fresh & Frozen Seafood - Selecting & Serving It Safely (FDA)
http://bit.ly/1F1741 or 1-866-723-3366
Hooked on Fish: Recipes from the Great Lakes State Cookbook (MDCH)
http://bit.ly/1iCg or 1-800-648-6942

Local Fish, Local Guide
If you are eating fish caught in Michigan or any of the Great Lakes, please call MDCH to request the Eat Safe Fish Guide for the region the fish is from. The regional Guide lists Michigan fish that have been tested for mercury and other harmful chemicals, like PCBs and dioxins.

Catching fish • Buying fish • Eating fish
For more information on safe fish, call MDCH at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

www.michigan.gov/eatsafefish
Eat Safe Fish: Translations

Learn about eating safe, local, and healthful fish from our Great Lakes State.

www.michigan.gov/eatsafefish
Eat Safe Fish in Michigan

What are ‘safe’ fish?
Safe fish are fish that are low in chemicals. If you use the Eat Safe Fish Guide when you choose fish to catch and eat, you will protect yourself and your family from chemicals that could someday make you sick.

If there are chemicals in the fish, why should I still eat it?
Fish have a lot of great health benefits.

- Fish can be a great low-fat source of protein.
- Fish are brain food.
- Some fish have heart-healthy omega-3s.

Plus, fishing is a fun way to get outside and enjoy Michigan’s 11,000 lakes, rivers, and streams!

If you follow the 3Cs and go after fish that have fewer chemicals in them, you’ll get a lot of health benefits and have very little risk.

Why are there chemicals in some fish?

There are many ways chemicals end up in lakes and rivers, including wind and rain run-off. The chemicals sink to the bottom of the lake or river, where they settle in the sediment.

PCBs, dioxins, and mercury are the most common chemicals found in filets of Michigan fish.

These chemicals are persistent and bioaccumulative. This means the chemicals not only stay in the environment, they also build up in living things.

Because of this, they have become part of the food chain for fish, as you can see in the picture above.

Some chemicals, like PCBs and dioxins, build up in the fat of the fish. Mercury builds up in the muscle, or filet, of the fish.

If you choose fish lower in mercury and follow the 3Cs, you can keep chemicals from building up in your body, too.

You can’t see or taste these chemicals. They do not change how clear or dirty the water looks. The only way to know if these chemicals are in the fish is by testing for them in a laboratory.

The Eat Safe Fish Guide can help you find fish species that have been tested for chemicals by the MDCH Lab. The Guide can help you and your family choose fish that are safer to eat.
Eat Safe Fish in Michigan

Get to know the 3Cs

1. **Choose**
   - This quiz will help you find the best way for you to choose your fish.
   - Read each sentence and mark 'T' for true or 'F' for false.
   - I only eat fish caught in Michigan a few times each year.
   - I’m 15 years old or older.
   - I DON’T plan on having children in the next several years.
   - I DON’T have health problems, like cancer or diabetes.
   - I DON’T eat fish from a lake or river that has posted signs with "Do Not Eat" guidelines from MDCH.

   **If ALL are TRUE for you:**
   - You’re at lower risk from chemicals in fish. The S.A.F.E. tips will help you choose fish to eat once in awhile without worry!

   **If ONE or MORE are FALSE:**
   - You might be at higher risk. The Eat Safe Fish Guide will lead you to fish that are safer to eat on a regular basis.
   - The Eat Safe Fish Guide:
     - lists fish species that have had fillets tested for chemicals by MDCH.
     - protects people who eat Michigan fish often.
     - protects anyone who has health problems, is young, is pregnant, or is planning on having children in the future.

   **S** Smaller fish are better.
   - They tend to have fewer chemicals.

   **a** Avoid large predator fish & bottom- feeders.
   - Always check the Eat Safe Fish Guide before eating these fish.

   **f** Fat should be removed.
   - Some chemicals are stored in the fat of the fish.

   **e** Eat fish that have been broiled or grilled on a rack.
   - More fat can drip away during cooking.

2. **Clean**
   - Cut away the fat along the back.
   - Cut away the fatty area along the side.
   - Cut away the belly fat.

3. **Cook**
   - Even after trimming away the fat that you can see on the fish, some fat will still be hidden inside the fish fillets.
     - Poke holes in the skin or remove it completely so that fat can drip away from the fish filet as it cooks.
     - Cook your fish on a grill or on a broiler pan in the oven. Any fat left can now drip away from the fish through the grates.

   - Some chemicals, like PCBs and dioxins, collect in the fat of the fish.

   - When cleaning the fish, trim away any of the fat you can see. Remove and throw away the organs, too.

   - Careful cleaning can remove a lot of the chemicals from the fish.

   **You can’t remove mercury from fish by cleaning and cooking. Always choose your fish wisely!**

Need a Guide? Call MDCH at 1-800-645-6942 or visit www.michigan.gov/eatsafefish.
The 3Cs: Choose

This quiz will help you find the best way for you to choose your fish. Read each sentence and mark 'T' for true or 'F' for false.

- I only eat fish caught in Michigan a few times each year.
- I'm 15 years old or older.
- I DON'T plan on having children in the next several years.
- I DON'T have health problems, like cancer or diabetes.
- I DON'T eat fish from a lake or river that has posted signs with "Do Not Eat" guidelines from MDCH.

☑ protects people who eat Michigan fish often.
☑ protects anyone who has health problems, is young, is pregnant, or is planning on having children in the future.

Need a Guide? Call MDCH at 1-800-642-6942 or visit www.michigan.gov/eatsafefish.
2011-2012 MI Fish Advisory

2011-2012
MICHIGAN FISH ADVISORY
A Family Guide to Eating Michigan Fish

Michigan Department of Community Health
Division of Environmental Health
1-800-648-6942
Visit us on the web at www.michigan.gov/eatsafefish
Michigan Department of Community Health’s

Eat Safe Fish Guide

Some fish contain chemicals that can harm your health. To help you choose fish that are safer to eat from Michigan’s lakes and rivers, MDCH tests fish filets from around the state. The Eat Safe Fish Guide lists the results of these tests.

Other Regional Eat Safe Fish Guides

Call 1-800-648-6942 or visit www.michigan.gov/eatsafefish to get a free copy of the Eat Safe Fish Guides for other regions in Michigan.
Eat Safe Fish Guide

- Is NOT regulatory
- Is like a nutrition label – you can choose to use it, or not
- Data included is only from fish filet analysis
- Is free by request to those who want specific guidelines about what is safe to eat

1-800-648-6942
### St. Clair County

**Map of St. Clair County, Michigan**

Filets of fish from Lake Huron, Lake St. Clair, the Pine River, and the St. Clair River have been tested for chemicals. For all other lakes and rivers in this county, and for any species not listed below, see page 9.

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### Lake St. Clair

(if you’re fishing within 2 miles of the outlet of the large-Revere Canals, see p. 33)

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Chemicals of Concern</th>
<th>Size of Fish (length in inches)</th>
<th>MI Servings per Month*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluegill</td>
<td>PCBs</td>
<td>Any</td>
<td>8</td>
</tr>
<tr>
<td>Carp</td>
<td>PCBs</td>
<td>Any</td>
<td>Limited</td>
</tr>
<tr>
<td>Catfish</td>
<td>Dioxins</td>
<td>Any</td>
<td>Limited</td>
</tr>
<tr>
<td>Black Crappie</td>
<td>Mercury</td>
<td>Under 9”</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 9”</td>
<td>4</td>
</tr>
<tr>
<td>Freshwater Drum</td>
<td>PCBs &amp; Mercury</td>
<td>Any</td>
<td>2</td>
</tr>
<tr>
<td>Largemouth Bass</td>
<td>PCBs &amp; Mercury</td>
<td>Under 20”</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 20”</td>
<td>1</td>
</tr>
<tr>
<td>Muskie</td>
<td>Mercury</td>
<td>Any</td>
<td>Do Not Eat</td>
</tr>
<tr>
<td>Northern Pike</td>
<td>Mercury</td>
<td>Any</td>
<td>2</td>
</tr>
<tr>
<td>Rock Bass</td>
<td>PCBs</td>
<td>Any</td>
<td>2</td>
</tr>
</tbody>
</table>

(continued on the next page)

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### Pine River

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Chemicals of Concern</th>
<th>Size of Fish (length in inches)</th>
<th>MI Servings per Month*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carp</td>
<td>PCBs</td>
<td>Any</td>
<td>1</td>
</tr>
</tbody>
</table>

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### St. Clair River

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Chemicals of Concern</th>
<th>Size of Fish (length in inches)</th>
<th>MI Servings per Month*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carp</td>
<td>PCBs</td>
<td>Any</td>
<td>6 Per Year</td>
</tr>
<tr>
<td>Freshwater Drum</td>
<td>PCBs &amp; Mercury</td>
<td>Any</td>
<td>2</td>
</tr>
<tr>
<td>Walleye</td>
<td>PCBs &amp; Dioxins</td>
<td>Any</td>
<td>6 Per Year</td>
</tr>
</tbody>
</table>

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When fishing in the river near Lake Huron or Lake St. Clair, please check the lake guidelines, too.

### Lake St. Clair (continued from page 51)

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Chemicals of Concern</th>
<th>Size of Fish (length in inches)</th>
<th>MI Servings per Month*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallmouth Bass</td>
<td>PCBs &amp; Mercury</td>
<td>Under 20”</td>
<td>2</td>
</tr>
<tr>
<td>Sunfish</td>
<td>PCBs</td>
<td>Over 20”</td>
<td>1</td>
</tr>
<tr>
<td>Sturgeon</td>
<td>PCBs</td>
<td>Any</td>
<td>Limited</td>
</tr>
<tr>
<td>Walleye</td>
<td>PCBs &amp; Dioxins</td>
<td>Any</td>
<td>Limited</td>
</tr>
<tr>
<td>White (Silver) Bass</td>
<td>PCBs</td>
<td>Any</td>
<td>Limited</td>
</tr>
<tr>
<td>White Crappie</td>
<td>Mercury</td>
<td>Under 9”</td>
<td>6</td>
</tr>
<tr>
<td>Yellow Perch</td>
<td>Mercury</td>
<td>Over 9”</td>
<td>4</td>
</tr>
</tbody>
</table>

See which fish are safe to eat from Lake Huron on Page 17.
Limited v Do Not Eat

Special MI Serving Categories

If you:
- are under the age of 15,
  - or -
- have health problems, like cancer or diabetes,
  - or -
- are planning on having children in the next several years, currently pregnant, or breastfeeding,

MDCH suggests you **avoid eating all fish listed as “Limited”** because of higher levels of chemicals.

If NONE of the above apply to you, it is usually OK to eat fish listed as “Limited” **1 or 2 times each year.**

**No one should eat fish listed as Do Not Eat, regardless of age or health.**

When these fish were tested, MDCH found very high levels of chemicals. Eating even one meal of these fish could possibly lead to health problems in the future, regardless of age or health.
Choosing Safer Fish

The guidelines in the ESF Guide are set to be safe for everyone. This includes children, pregnant or breastfeeding women, and people who have health problems, like cancer or diabetes.

But the ESF Guide is also for healthy adults who want to avoid getting too many chemicals in their bodies. Chemicals like PCBs and dioxins are linked to cancer, diabetes, and other illnesses. Mercury can cause damage to your brain and nerves. MDCH uses chemical limits in the ESF Guide that will protect everyone who eats fish.

Based on body weight
Meals ≠ servings

My Michigan, MI Serving Size

- 8 ounces of fish = size of an adult’s hand (large oval)
- 4 ounces of fish = size of the palm of an adult’s hand (small circle)
- 2 ounces of fish = size of half a palm of an adult’s hand (rectangle)

How much is MI Serving?

<table>
<thead>
<tr>
<th>Weight of Person</th>
<th>MI Serving Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 pounds</td>
<td>2 ounces</td>
</tr>
<tr>
<td>90 pounds</td>
<td>4 ounces</td>
</tr>
<tr>
<td>180 pounds</td>
<td>8 ounces</td>
</tr>
</tbody>
</table>

For every 20 pounds less than the weight listed in the table, subtract 1 ounce of fish.
For example, a 70 pound child’s MI Serving size is 3 ounces of fish.
90 pounds - 20 pounds = 70 pounds
4 ounces - 1 ounce = a MI Serving size of 3 ounces

For every 20 pounds more than the weight listed in the table, add 1 ounce of fish.
For example, a 110 pound person’s MI Serving size is 5 ounces of fish.
90 pounds + 20 pounds = 110 pounds
4 ounces + 1 ounce = a MI Serving size of 5 ounces

Are you pregnant?
Fish is good for you and your baby! Use your pre-pregnancy weight to find your MI Serving size. It is best to avoid eating fish labeled as “Limited” if you’re pregnant or breastfeeding.
# 2011-2012 MI Fish Advisory

<table>
<thead>
<tr>
<th>Water body</th>
<th>Type of fish</th>
<th>Chemical(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Clair River</td>
<td>Carp</td>
<td>Mercury, PCBs</td>
</tr>
<tr>
<td></td>
<td>Freshwater Drum</td>
<td>Mercury, PCBs</td>
</tr>
<tr>
<td></td>
<td>Gizzard Shad</td>
<td>Mercury, PCBs</td>
</tr>
<tr>
<td></td>
<td>Walleye</td>
<td>Mercury, PCBs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length (inches)</th>
<th>General Population</th>
<th>Women &amp; Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
<tr>
<td>8-10</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
<tr>
<td>10-12</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
<tr>
<td>12-14</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
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<tr>
<td>14-16</td>
<td>▲ ▲ ▲ ▲ ▲</td>
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<tr>
<td>16-22</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
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<tr>
<td>22-26</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
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<tr>
<td>26-30</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
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<tr>
<td>30+</td>
<td>▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
</tbody>
</table>

No eating restrictions.
- One meal per week.
- Six meals per year.
- Do not eat these fish.
### St. Clair River

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<tr>
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</thead>
<tbody>
<tr>
<td>Carp</td>
<td>PCBs</td>
<td>Any</td>
<td>6 Per Year²x</td>
</tr>
<tr>
<td>Freshwater Drum</td>
<td>PCBs &amp; Mercury</td>
<td>Any</td>
<td>2</td>
</tr>
<tr>
<td>Walleye</td>
<td>PCBs &amp; Dioxins</td>
<td>Any</td>
<td>6 Per Year²x</td>
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When fishing in the river near Lake Huron or Lake St Clair, please check the lake guidelines, too.
# 2011-2012 MI Fish Advisory

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<td>▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
<tr>
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<td>Mercury, PCBs</td>
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<td>▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
<tr>
<td></td>
<td>Gizzard Shad</td>
<td>Mercury, PCBs</td>
<td>▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
<tr>
<td></td>
<td>Walleye</td>
<td>Mercury, PCBs</td>
<td>▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲</td>
<td>▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲</td>
</tr>
</tbody>
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- ▲: No eating restrictions.
- ▼: One meal per week.
- ■: Six meals per year.
- ◆: Do not eat these fish.

**Length (inches):**
- 0-5
- 6-8
- 9-10
- 11-12
- 13-14
- 15-16
- 17-18
- 19-20
- 21-22
- 23-24
- 25-26
- 27-28
- 29-30
- 30+
Why the Differences?

- Doubling the meal size is NO LONGER automatically included.
  
  - Previous guidelines assumed everyone was trimming and cooking appropriately
  - Assumption removed from NEW guidelines
Why the Differences?

- Single guideline based on meal size/body weight
- Updated screening values based on peer-reviewed EPA reference doses
- New methods analyzing data:
  - Old data or small samples
  - Standardized comparison methods for all chemicals
    - Using regression and 95% Upper Confidence Limit (UCL) on the mean to determine MI Serving category
  - Transparent, defensible, and consistent
MDCH Fish Consumption Guidelines Guidance Document is available at www.michigan.gov/eatsafefish
How It’s Made…The ESF Guide
How It’s Made...The ESF Guide
How It’s Made...The ESF Guide
How It’s Made...The ESF Guide
Chemical
- Mercury
- PCBs
- DDT
- Chlordane
- Toxaphene

Range of Yrs
95% UCL or Linear Regression (> 0.6)

Michigan Department of Community Health

Existing MDCH Advisory: St. Clair River – Women and children should not eat more than 1 meal of walleye per month due to elevated concentrations of PCBs and mercury.

Lake St. Clair – Women and children should not eat more than 1 meal per week of walleye less than 22 inches or more than 1 meal per month of walleye greater than 22 inches due to elevated concentrations of PCBs and mercury.

Detroit River and Lake Erie: Women and children should not eat more than 1 meal of walleye per month due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 6 meals per year of walleye from the St. Clair River, Lake St. Clair, the Detroit River, or Lake Erie due to elevated concentrations of PCBs and dioxin. Mercury would cause an advisory.
### Data Sheets

- **Chemical**
  - Mercury

- **Range of Yrs**
  - 95% UCL or Regression $> 0.6$

- **Relationship between length and chemicals**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Linear Regression</th>
<th>Exponential Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>$R^2 = 0.699$</td>
<td>$R^2 = 0.648$</td>
</tr>
</tbody>
</table>

#### Organics Analysis:

<table>
<thead>
<tr>
<th>Range of Years Used</th>
<th>N (All)</th>
<th>Overall Min Length</th>
<th>Legal Min (Inches)</th>
<th>Range of Legal Sized Samples</th>
<th>Meal Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earliest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most Recent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Datasets available:**
  - McCollum Lake

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Sample Size (Legal)</th>
<th>Mean (ppm)</th>
<th>Min. Conc. (ppm)</th>
<th>Max Conc. (ppm)</th>
<th>95% UCL (ppm)</th>
<th>Meal Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>DDT</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Chlordane</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Toxaphene</td>
<td>--</td>
<td>--</td>
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</tr>
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- **Chemical**

<table>
<thead>
<tr>
<th>Linear Regression</th>
<th>Exponential Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>PCB</td>
<td>--</td>
</tr>
<tr>
<td>DDT</td>
<td>--</td>
</tr>
<tr>
<td>Chlordane</td>
<td>--</td>
</tr>
<tr>
<td>Toxaphene</td>
<td>--</td>
</tr>
</tbody>
</table>

- **Final meal category based on UCL:** 1

---

**Existing MDCH Advisory:** McCollum Lake largemouth bass are covered by the statewide mercury advisory.

**Recommendation:** No one should eat more than 1 meal per month of McCollum Lake largemouth or smallmouth bass smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. Length break was applied at the upper end of the regression as the sample range was limited.

<table>
<thead>
<tr>
<th>Length (Inches)</th>
<th>Hg Regression Equation Estimate (ppm)</th>
<th>Meal Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.34</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>0.46</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>0.59</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>0.71</td>
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<tr>
<td>20</td>
<td>0.84</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>0.96</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>1.08</td>
<td>1</td>
</tr>
</tbody>
</table>

*Shaded area denotes extrapolated estimates*
Oscoda/Alcona, McCollum Lake, Oscoda/Alcona Co., Largemouth Bass

\[ y = 0.0623x - 0.4105 \]
\[ R^2 = 0.699 \]
Free ESF Outreach Materials

eat safe fish in Michigan

Learn about eating safe, local, and healthful fish from our Great Lakes State.

www.michigan.gov/eatsafefish
Free ESF Outreach Materials
Learn to Filet a Fish

- Translated
  - Spanish
  - Arabic
  - Hmong
  - Vietnamese
  - Simplified Chinese

1. Make the first cut behind the gill cover. Cut only until the knife touches the backbone. Do not cut through it.

2. Turn the fish and run the knife along the backbone and dorsal fin. Cut deep enough to bounce the knife along the top of the rib cage.

3. When the knife blade no longer contacts the rib cage, push the knife through the width of the fish. The blade will exit on the bottom near the vent. Continue cutting along the bone until the filet is cut off at the tail.

4. Remove the skin from the filet by inserting the knife at the tail and cutting the meat from the skin. Hold the filet in position by pressing down on the skin, with your thumb. Remove any remaining visible fat from your fish filet at this time, too.

Note: If you are grilling your fish, you may want to leave the skin on. Just be sure to poke holes in the skin so any fat inside the filet can drip away. Some chemicals collect in the fat of fish. Reduce the chemicals by up to half by removing the fat and cooking your filet on a grate or grill so more fat can drip away. Mercury can’t be removed like this, though, so choose wisely.

Learn more: www.michigan.gov/eatsafefish or 1-800-648-6942
Free ESF Outreach Materials

Enjoy Your Catch! Eat Safe Fish!

All of these words are about fishing and choosing safe fish to eat. How many can you find?

BLUEGILL
PERCH
CRAPPIE
ROCK BASS
PUMPKINSEED
CHOICE
CLEAN
COOK
FILET

Hook
Bobber
Fishing
Angler
Life Jacket
Bait
Pole
Scale
Fin
Auger

Penny the Penguin used the Eat Safe Fish Guide to find fish that are safe for her to eat from Lake Icy. She has a list to share with you. Can you help Penny catch the fish that are safe for her to eat? Draw a line from her list to the fish in the lake that matches it. Watch out for the fish not on her list - they might try to trick you!

Penny's Lake Icy Safe Fish List

Bluegill
Perch

Michigan Department of Community Health
Other Fact Sheets

- Quick Start to Safer Fish
- Hooked on Fish Cookbook
- Be Heart-Healthy, Eat More Fish!
- Eating Safe Fish in Areas of Concern
- Fish Tumors in Areas of Concern

Available by request and at

www.michigan.gov/eatsafefish
Area-Specific Outreach

Michigan Department of Community Health

Eat Safe Fish!

Eat Safe Fish! Love your watershed!

www.mi.gov/eatsafefish

Torch Lake
Deer Lake
Menominee River
St Marys River
Manistique River
White Lake
Saginaw River/Bay
Muskegon Lake
St Clair River
Kalamazoo River
Clinton River
Detroit River
Rouge River
Raisin River

Michigan Department of Community Health
Area-Specific Outreach
Questions?

Michelle Bruneau
Michigan Department of Community Health
bruneaum@michigan.gov
517-335-8984
The 3Cs: Choose

This quiz will help you find the best way for you to choose your fish. Read each sentence and mark ‘T’ for true or ‘F’ for false.

- I only eat fish caught in Michigan a few times each year. T
- I’m 15 years old or older. T
- I DON’T plan on having children in the next several years. T
- I DON’T have health problems, like cancer or diabetes. T
- I DON’T eat fish from a lake or river that has posted signs with “Do Not Eat” guidelines from MDCH. T

Smaller
They tend to be low in mercury.

Avoid lake bottom-feeders. Always check the Eat Safe Fish Guide before eating these fish.

Fat should be removed. Some chemicals are stored in the fat of the fish.

Eat fish that have been broiled or grilled on a rack. More fat can drip away during cooking.

Protects people who eat Michigan fish often.

Protects anyone who has health problems, is young, is pregnant, or is planning on having children in the future.

Need a Guide? Call MDCH at 1-800-648-6942 or visit www.michigan.gov/eatsafefish.
The 3Cs: Choose

If **ALL** are **TRUE** for you:

You’re at lower risk from chemicals in fish. The S.A.F.E. tips will help you choose fish to eat once in a while without worry!

- **S**maller fish are better. They tend to have fewer chemicals.
- **a**void large predator fish & bottom-feeders. Always check the Eat Safe Fish Guide before eating these fish.
- **f**at should be removed. Some chemicals are stored in the fat of the fish.
- **e**at fish that have been broiled or grilled on a rack. More fat can drip away during cooking.

If **ONE** or **MORE** are **FALSE**:

You might be at higher risk. The Eat Safe Fish Guide will lead you to fish that are safer to eat on a regular basis.

- The Eat Safe Fish Guide:
  - lists fish species that have had filets tested for chemicals by MDCH.
  - protects people who eat Michigan fish often.
  - protects anyone who has health problems, is young, is pregnant, or is planning on having children in the future.

Need a Guide? Call MDCH at 1-800-648-6942 or visit [www.michigan.gov/eatsafefish](http://www.michigan.gov/eatsafefish).
The 3Cs: Clean

1. Choose

2. Clean

- Cut away the fat along the back
- Cut away the fatty area along the side
- Cut away the belly fat

Some chemicals, like PCBs and dioxins, collect in the fat of the fish.

- When cleaning the fish, trim away any of the fat you can see. Remove and throw away the organs, too.

Careful cleaning can remove a lot of the chemicals from the fish.

3. Cook
The 3Cs: Cook

Get to know the

1. Choose

2. Cook

3. Safe

Cook

Even after trimming away the fat that you can see on the fish, some fat will still be hidden inside the fish filets.

☐ Poke holes in the skin or remove it completely so that fat can drip away from the fish filet as it cooks.

☐ Cook your fish on a grill or on a broiler pan in the oven. Any fat left can now drip away from the fish through the grates.

If you cook your fish like this, you can get rid of even more of the chemicals that can be in the filet...except mercury, of course!
Eat Safe Fish in Michigan

Get to know the 3Cs

1. Choose
2. Clean
3. Cook

You can't remove mercury from fish by cleaning and cooking. Always choose your fish wisely!

The S.A.F.E. tips will help you choose fish to eat once in a while without worry!

- Smaller fish are better. They tend to have fewer chemicals.
- Avoid large predator fish & bottom-feeders. Always check the Eat Safe Fish Guide before eating these fish.
- Fat should be removed. Some chemicals are stored in the fat of the fish.
- Eat fish that have been broiled or grilled on a rack. More fat can drip away during cooking.

Need a Guide? Call MDCH at 1-800-648-6942 or visit www.michigan.gov/eatsafefish.

By choosing the right fish and then cleaning and cooking it the right way, you can reduce some of the chemicals in the fish by nearly half!

Even after trimming away the fat that you can see on the fish, some fat will still be hidden inside the fish filets.

You’re at lower risk from chemicals in fish. The S.A.F.E. tips will help you choose fish to eat once in a while without worry!

- The Eat Safe Fish Guide will lead you to fish that you can eat on a regular basis.
- Some chemicals, like PCBs and dioxins, collect in the fat of the fish.
- When cleaning the fish, trim away any of the fat you can see. Remove and throw away the organs, too.

Careful cleaning can remove a lot of the chemicals from the fish.

If you cook your fish like this, you can get rid of even more of the chemicals that can be in the filet...except mercury, of course!
### Data Sheets

- **Chemical**
  - Mercury
- **Range of Yrs**
- **95% UCL or Regression >0.6**
- **Relationship between length and chemicals**
- **Not certain the relationship will hold beyond 20”**

### Table: Hg Analysis

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Sample Size (Legal)</th>
<th>Mean (ppm)</th>
<th>N (All)</th>
<th>Overall Min Length</th>
<th>Legal Min (Inches)</th>
<th>Range of Legal Sized Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>10</td>
<td>0.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Linear Regression
- Mercury: $R^2 = 0.699$

#### Exponential Regression
- Mercury: $R^2 = 0.648$

### Table: Organics Analysis

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Sample Size (Legal)</th>
<th>Mean (ppm)</th>
<th>N (All)</th>
<th>Overall Min Length</th>
<th>Legal Min (Inches)</th>
<th>Range of Legal Sized Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DDT</td>
<td>--</td>
<td>--</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Chlor dane</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxaphene</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Linear Regression
- PCB: $R^2 = --$
- DDT: $R^2 = --$
- Chlor dane: $R^2 = --$
- Toxaphene: $R^2 = --$

#### Exponential Regression
- PCB: $R^2 = --$
- DDT: $R^2 = --$
- Chlor dane: $R^2 = --$
- Toxaphene: $R^2 = --$

### Existing MDCH Advisory:

McCollum Lake largemouth bass are covered by the statewide mercury advisory.

### Recommendation:

No one should eat more than 1 meal per month of McCollum Lake largemouth or smallmouth bass smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. Length break was applied at the upper end of the regression as the sample range was limited.
### Data Sheets

- Chemical
  - Mercury
  - PCBs
  - DDT
  - Chlordane
  - Toxaphene
- Range of Yrs
- 95% UCL or Regression
- >0.6

### Freshwater Drum

<table>
<thead>
<tr>
<th></th>
<th>St. Clair River</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hg Analysis:</strong></td>
<td></td>
</tr>
<tr>
<td>Range of Years Used</td>
<td>1986, 1994</td>
</tr>
<tr>
<td>N (All)</td>
<td></td>
</tr>
<tr>
<td>Overall Min Length</td>
<td>12.6</td>
</tr>
<tr>
<td>Legal Min (Inches)</td>
<td></td>
</tr>
<tr>
<td>Range of Legal Sized Samples</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>12.6</td>
<td>17.7</td>
</tr>
<tr>
<td>Datasets available:</td>
<td>1986, 1994</td>
</tr>
</tbody>
</table>

#### Chemicals

- **Mercury**
  - Sample Size (Legal): 11
  - Linear Regression: R² = 0.000
  - Exponential Regression: R² = 0.003

### Organics Analysis:

<table>
<thead>
<tr>
<th></th>
<th>St. Clair River</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organics Analysis:</strong></td>
<td></td>
</tr>
<tr>
<td>Range of Years Used</td>
<td>1994, 1994</td>
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<tr>
<td>N (All)</td>
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<tr>
<td>Overall Min Length</td>
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<tr>
<td>Legal Min (Inches)</td>
<td></td>
</tr>
<tr>
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<td></td>
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<td>Min</td>
<td>Max</td>
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<td>12.6</td>
<td>17.7</td>
</tr>
<tr>
<td>Datasets available:</td>
<td>1986, 1994</td>
</tr>
</tbody>
</table>

#### Chemicals

- **PCB**
  - Sample Size (Legal): 10
  - Linear Regression: R² = 0.505
  - Exponential Regression: R² = 0.209
- **DDT**
  - Sample Size (Legal): 10
  - Linear Regression: R² = 0.307
  - Exponential Regression: R² = 0.339
- **Chlordane**
  - Sample Size (Legal): 10
  - Linear Regression: R² = 0.738
  - Exponential Regression: R² = 0.512
- **Toxaphene**
  - Sample Size (Legal): ND
  - Linear Regression: --
  - Exponential Regression: --

**Existing MDCH Advisory:** Women and children should not eat more than 1 meal per month of St. Clair River freshwater drum larger than 14 inches due to elevated concentrations of mercury and PCBs.

**Recommendation:** No one should eat more than 2 meals per month of St. Clair River freshwater drum due to PCBs. Based on DEQ’s Fish Contaminant Monitoring Program, PCB concentrations ≥ 15 years old are expected to have declined allowing one meal category less restrictive advice for PCBs and mercury.
### Data Sheets

- Chemical
  - Mercury
  - PCBs
  - DDT
  - Chlordane
  - Toxaphene
- Range of Yrs
- 95% UCL or Regression >0.6

### Chemical

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Sample Size (Legal)</th>
<th>Linear Regression</th>
<th>Exponential Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>11</td>
<td>R² 0.000</td>
<td>R² 0.003</td>
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### Organics Analysis

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<th>Sample Size (Legal)</th>
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<th>Exponential Regression</th>
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<tbody>
<tr>
<td>PCB</td>
<td>10</td>
<td>R² 0.505</td>
<td>R² 0.209</td>
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<tr>
<td>DDT</td>
<td>10</td>
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<tr>
<td>Toxaphene</td>
<td>10</td>
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</tr>
</tbody>
</table>

**Final meal category based on UCL**: 1∗

### Freshwater Drum

<table>
<thead>
<tr>
<th>Range of Years Used</th>
<th>N (All)</th>
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<th>Legal Min (Inches)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Earliest</td>
<td>Most Recent</td>
<td>11</td>
<td>12.6</td>
<td>na</td>
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<tr>
<td>1986</td>
<td>1994</td>
<td>15</td>
<td>0.15</td>
<td>0.42</td>
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Datasets available: 1986, 1994

### St. Clair River

<table>
<thead>
<tr>
<th>Range of Years Used</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Earliest</td>
<td>Most Recent</td>
<td>10</td>
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<td>1994</td>
<td>1994</td>
<td>15</td>
<td>0.025</td>
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Datasets available: 1986, 1994

- **Existing MDCH Advisory**: Women and children should not eat more than 1 meal per month of St. Clair River freshwater drum larger than 14 inches due to elevated concentrations of mercury and PCBs.

- **Recommendation**: No one should eat more than 2 meals per month of St. Clair River freshwater drum due to PCBs. Based on DEQ’s Fish Contaminant Monitoring Program, PCB concentrations ≥ 15 years old are expected to have declined allowing one meal category less restrictive advice for PCBs and mercury.

**Note**: Chlordane regression was driven by one point and was not used.