

Can You Eat That Striped Bass From the Hudson?

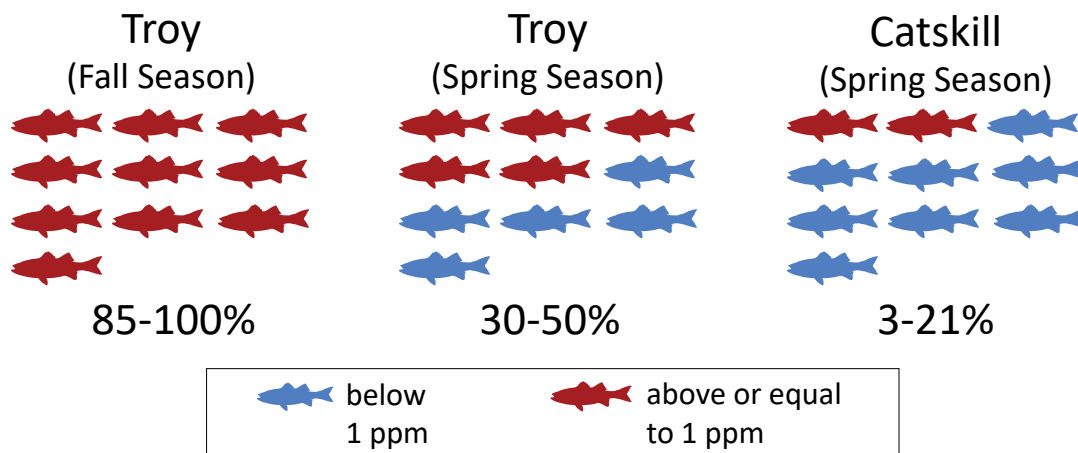
Striped bass are one of the most well-known fish in the entire Hudson River, prized by generations of fishermen. Most anglers consider striped bass “ocean fish,” believing they spend only a short portion of their lives in the Hudson River during their annual spring spawning run. This is why they think that striped bass are not contaminated with **PCBs (polychlorinated biphenyls)**, compared to other Hudson River fish.



The truth is that some striped bass stay in the Hudson, especially between Troy and Catskill, for much longer than their spawning run. The results of testing over many decades show that these striped bass have PCB levels often three to four times higher than other striped bass found south of the Rip Van Winkle Bridge in Catskill. Researchers have followed the movement of striped bass in the river by tagging them and discovered there is a “resident population” that stays in the Hudson River all year round. How do you know if the striped bass you catch is one of those resident fish? The answer is - you don’t!

For this reason, the NYS Department of Health (NYS DOH) has a “do not eat” advisory on recreationally caught striped bass between Troy and Catskill and other restrictions south of Catskill (see page 3). This advisory has been in effect for more than 20 years.

What are the chances of catching a striped bass with more than 1 part per million (ppm) of PCBs?



This graphic represents the percentage of striped bass that exceed 1 **ppm (part per million)** of PCBs sampled in the Hudson River at Troy and Catskill in any given year between 2007 and 2015. One ppm is a health protective guideline used by NYS DOH for setting PCB based fish advisories. Check out the rest of this packet for more details and a “deeper dive” into the data.

Each year, the New York State Department of Environmental Conservation (NYS DEC) collects fish and analyzes them for chemical contamination, and the New York State Department of Health (NYS DOH) reviews the data and sets consumption advice. For a complete listing of fish consumption advice for New York State, visit: www.health.ny.gov/fish.

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Your Health and Eating Fish with PCBs

Anglers often fish from a limited set of waters and tend to return to their favorite fishing locations. When fish in those waters have higher contaminant levels, those who eat them can have higher contaminant exposures.

Striped bass anglers who fish between Troy and the Rip Van Winkle Bridge in Catskill have a much higher chance of catching a striped bass with PCB levels well above the recommended NYS DOH guidelines. This means people who regularly eat fish from this section of the river could be exposed to more PCBs than people who regularly eat fish from lower reaches of the Hudson River, like Catskill and Kingston.

While you may not notice a change in your health after eating one fish meal with high levels of PCBs, PCBs can remain in the body. The “half-life” of many PCBs in the human body is around 10-15+ years, meaning that if you eat a fish meal with PCBs today, half of those PCBs will likely still be in your body 10-15 years later.

Long-term exposure could increase the risk for reproductive health effects (such as changes in sperm quality and longer time to pregnancy), birth defects and possibly cancer. For more in-depth information about how PCBs can affect human health, see the additional resources section on the back page.

We encourage anglers to follow the NYS DOH advice to get the benefits of eating fish while protecting against the harmful effects of chemicals that may be present.

Advice on Eating Striped Bass

Hudson River, New York City, and Long Island



Hudson River

Location	Men over 15 and Women over 50	Women under 50 and Children under 15
From Federal Dam at Troy to Rip Van Winkle Bridge at Catskill	DON'T EAT	DON'T EAT
From Rip Van Winkle Bridge at Catskill to NYC Battery	Up to 1 meal/month	DON'T EAT

NYC Area Waters

Location	Men over 15 and Women over 50	Women under 50 and Children under 15
East River to Throgs Neck Bridge, Harlem River, Raritan Bay, west of Wolfe's Pond Park, Upper New York Bay north of Verrazano Narrows Bridge	Up to 1 meal/month	DON'T EAT
Arthur Kill, Kill Van Kull & Newark Bay	DON'T EAT	DON'T EAT
Atlantic Ocean, Jamaica Bay, Long Island Sound, Lower New York Bay south of Verrazano Narrows Bridge, Raritan Bay east of Wolfe's Pond Park (and other Long Island waters)	Up to 4 meals/month	Up to 1 meal/month

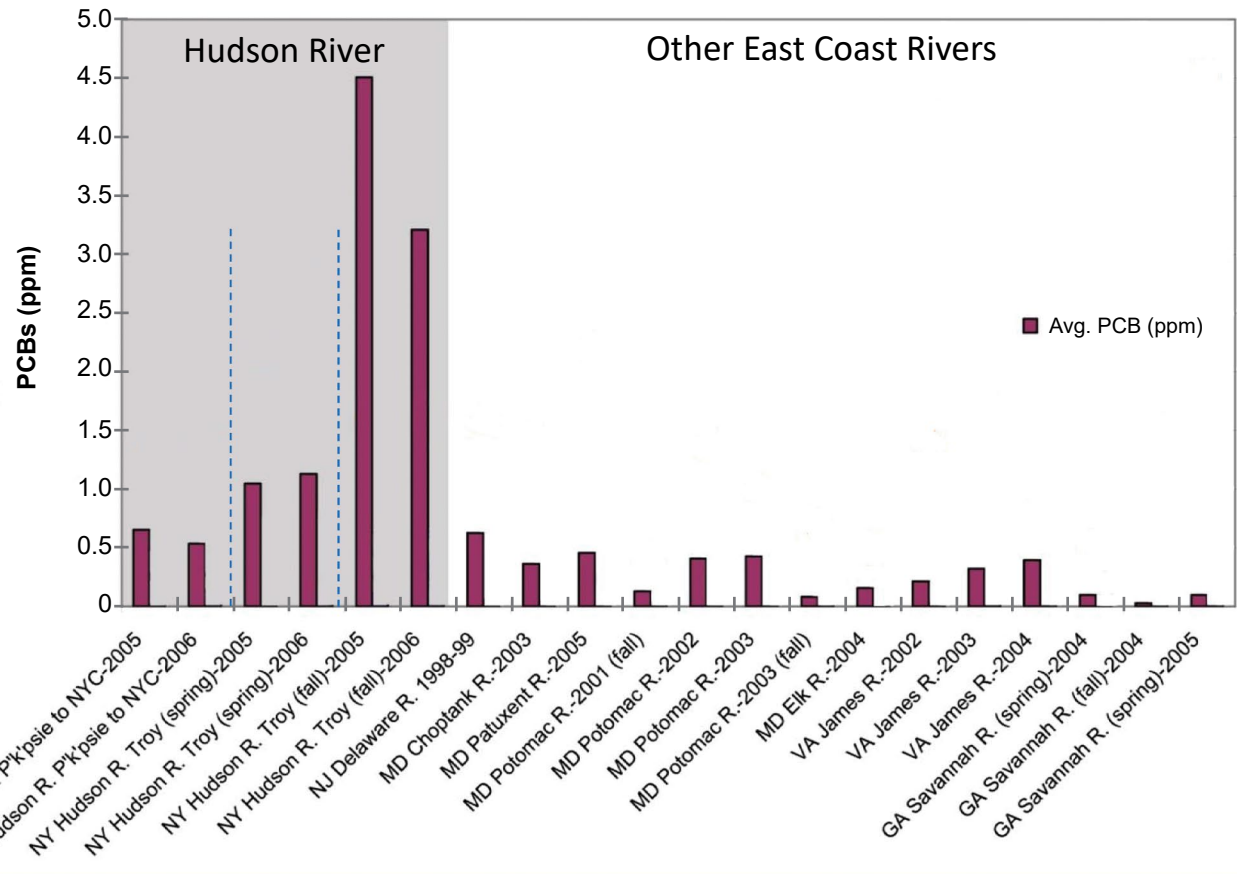
* For a more detailed map of NYC waters, please visit: www.health.ny.gov/fish/NYC

Hudson River Striped Bass PCB Levels Higher Than Other Waters

At a Glance

- PCB levels in striped bass from the Hudson River are much higher than other East Coast Rivers.
- As shown in this graph, average levels of PCBs in striped bass sampled in Troy during the spring are almost double those found further south from Poughkeepsie to New York City.
- These data show why no one should eat striped bass caught between the Federal Dam in Troy and the Rip Van Winkle Bridge in Catskill. PCB levels in striped bass are lower downstream of Catskill (for example, Poughkeepsie).

Average Striped Bass PCBs in the Hudson River vs. Other East Coast Rivers



Adapted from Figure 2-3 of the Interstate Workgroup on Evaluating Atlantic Coastal Advisories for Recreationally Caught Striped Bass and Bluefish based on PCBs - 10/1/2008. Fish were caught in spring or early summer unless otherwise noted. A link to this paper is provided on the back page.

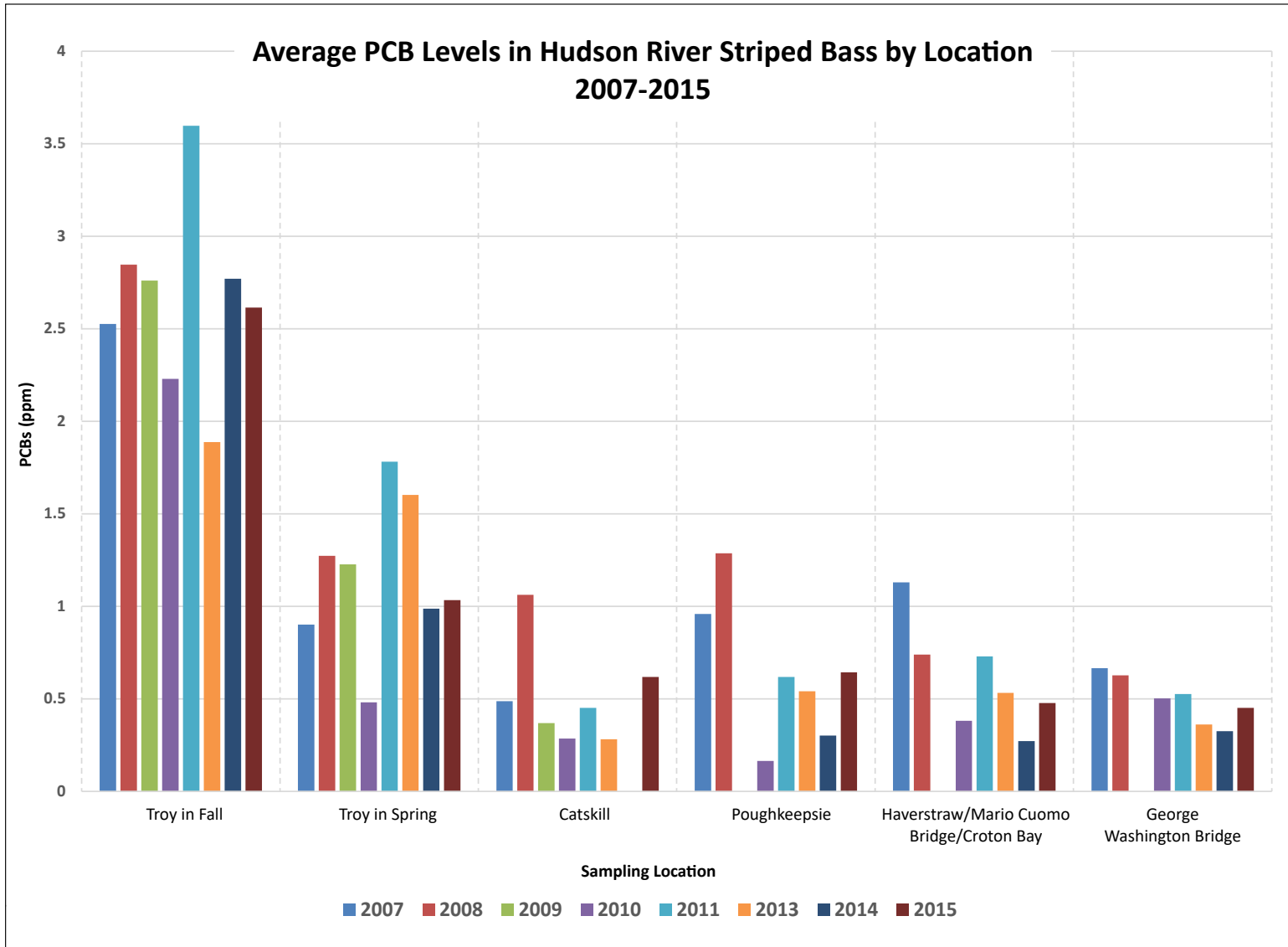
Hudson River striped bass PCB levels are shown at left with the grey background. The Hudson River data is from 2005 and 2006 but these levels are still representative of PCB levels in striped bass today. The data from the other waters is from 1998-2005 as noted.

Between Poughkeepsie and NYC the (first two bars from left), the average PCB levels in striped bass are similar to those found in other East Coast rivers with PCB contamination. Levels shown for Troy (third and fourth bar from left) are almost double those found lower in the Hudson River, and striped bass collected in the fall from Troy (fifth and sixth bars from left) have total PCB levels seven to nine times higher than those found further south during the spring.

More Recent Data: Average Striped Bass PCB Levels Consistent Over a Decade

At a Glance

- Troy striped bass PCB levels remain consistently high; levels are lower south of Catskill.
- The average PCB levels in this graph are similar to the 2005 and 2006 data shown on page 4.
- PCB levels in fish can vary a lot by location even within a single year. These fluctuations can be caused by many environmental factors, including access to food (which affects fat levels in fish) and weather-related factors (flooding, storms, and temperature).
- The same NYS DOH striped bass advisory for the Hudson River has been in effect for more than 20 years.



Data provided by the New York State Department of Environmental Conservation

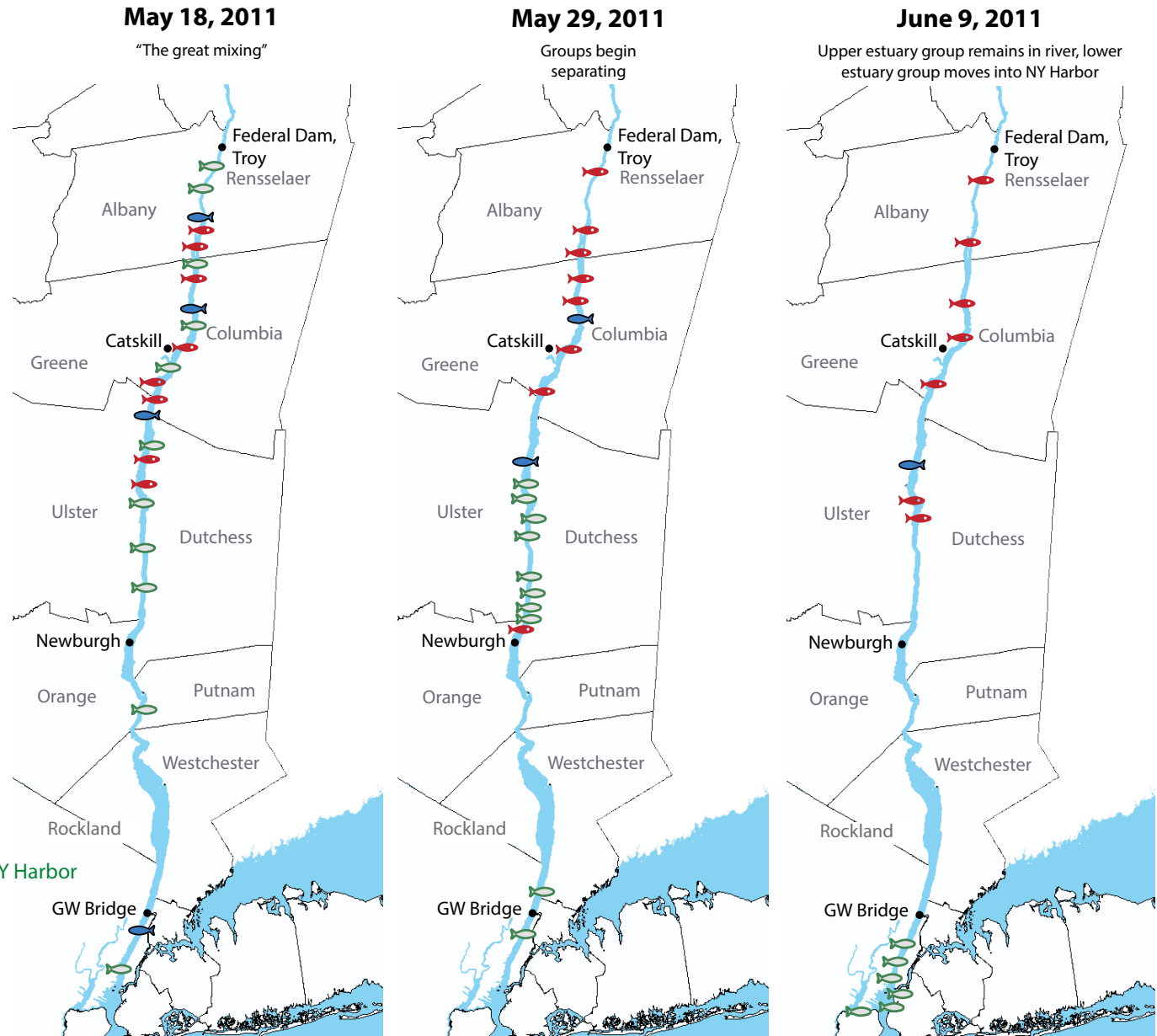
This graph shows Hudson River striped bass average PCB data from 2007-2015 organized by location from north to south. PCB levels are the highest in striped bass caught in the fall (Oct/Nov) near Troy. NYS DOH continues to evaluate Hudson River fish PCB levels on an annual basis as data from the NYS DEC become available.

Tagging Study Shows Some Striped Bass Stay in Hudson River

At a Glance

- Recent studies have shown a “resident” population of striped bass (in red) that stay in the Hudson River for longer than previously thought.
- These “resident fish” mix in with the spring run between Troy and Catskill and can have very high PCB levels (see graphs on pages 7-9).
- PCB data from striped bass collected in the fall support this idea of a resident group staying in the river.

Migration Studies: Striped Bass Habitat Use and Migrations in the Hudson River Estuary



- = **Upper Estuary Group (red fish)**
 - Primarily stays in Hudson River System
 - Tagged in Fall 2009 in Upper Estuary
- = **Lower Estuary Group (green fish)**
 - Spawns in upper estuary then returns to NY Harbor
 - Tagged in Fall 2009 in Lower Estuary
- = **Ocean Group (blue fish)**
 - Primarily comes into Hudson to spawn
 - Tagged in Spring 2010 in Upper Estuary

This study used acoustic telemetry (a type of tagging) to track striped bass before, during and after their spawning run. Shown here are three snapshots of the different groups of fish in May and June during and after the spawning season. See key at left for color coding. Links to this study and an animation of fish movement are provided on the back page of this packet.

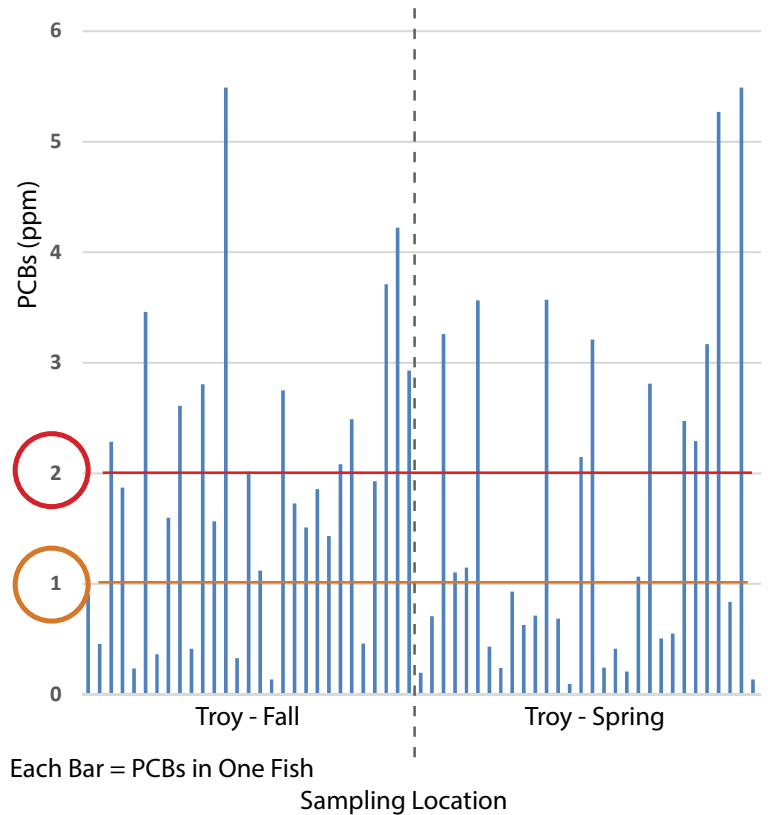
Different PCB Levels, Different Advice

At a Glance

- Regardless of the time of year, especially in Troy, you could catch a fish with PCB levels greater than 1 ppm (parts per million). Since you can't know what the levels of PCBs are in your specific fish, we recommend following the NYS DOH advice to reduce your risk.
- To help put these PCB levels into perspective for this packet, generally, a "don't eat" advisory for everyone may be issued when fish average over **2 ppm** PCBs.
- When sampled fish average between **1 ppm** and **2 ppm** PCBs, a "don't eat" advisory for women of childbearing age and children and 1 meal/month advisory for men and older women may be issued.
- However, NYS DOH doesn't just use numerical guidelines to set fish advice. Other factors are considered such as number of fish sampled, years of available data, and balancing the benefits of fish consumption versus the risks of exposure.
- For more information on how we set advisories, visit: www.health.ny.gov/fish/background.htm.
- For more information on health effects, see the resources listed on the back page of this packet.

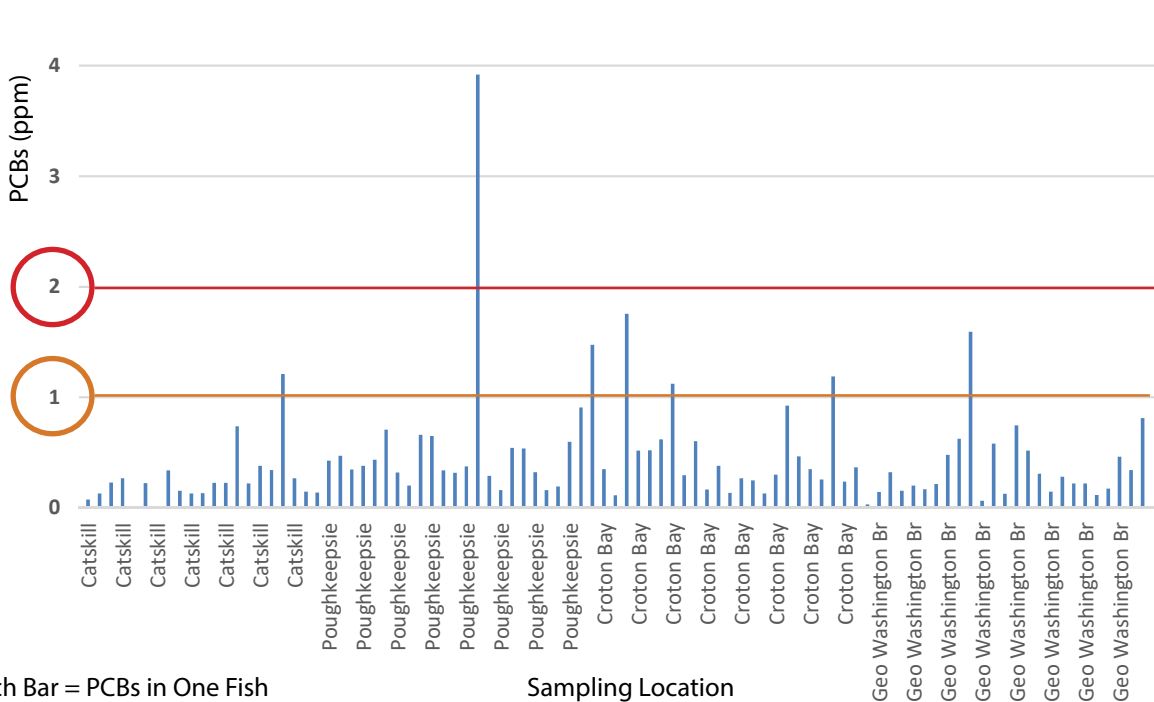
PCBs in Individual Striped Bass, 2013 Troy (Fall and Spring)

Advisory = everyone DON'T EAT



PCBs in Individual Striped Bass, 2013 Catskill to NYC (Spring)

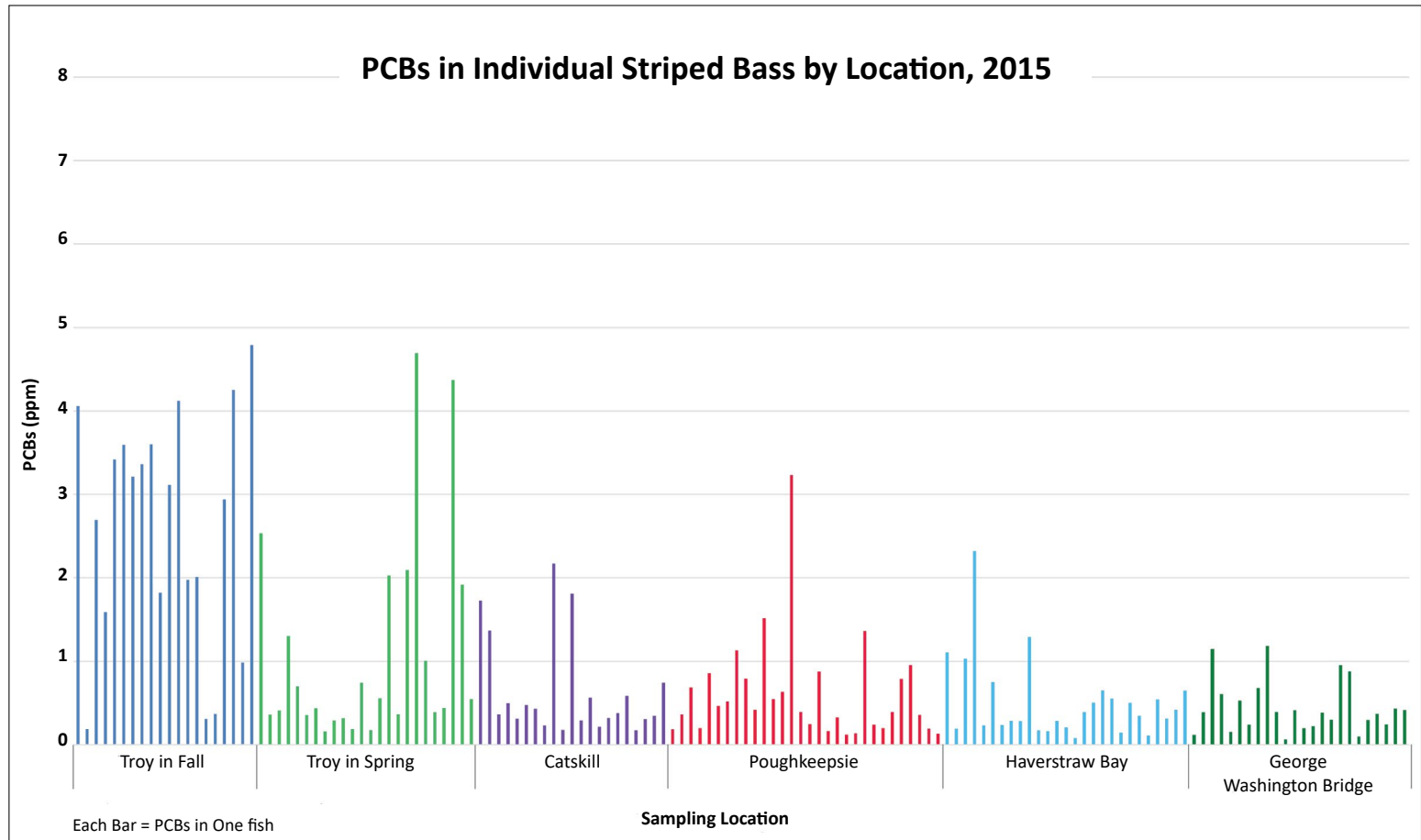
Advisory = Men over 15 and Women over 50 can eat up to 1 meal/month



What is Your Chance of Catching a High PCB Striped Bass?

At a Glance

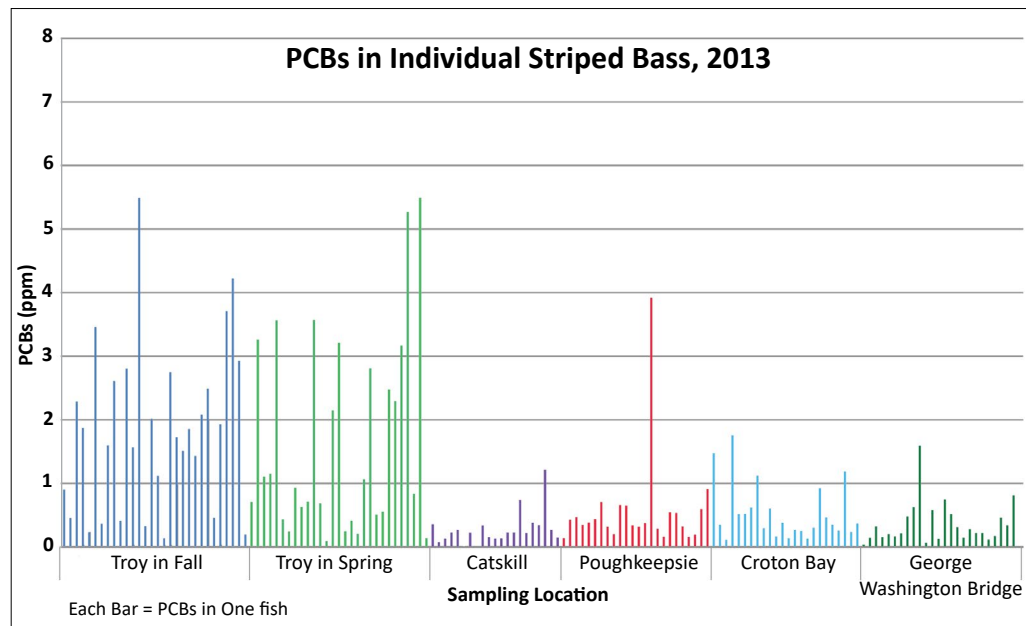
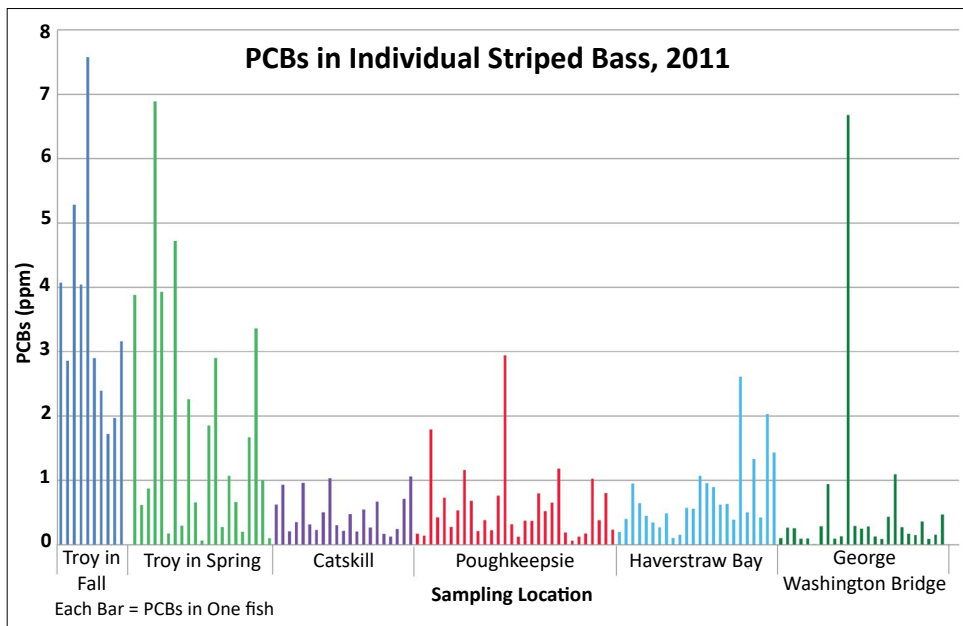
- All along the Hudson River, striped bass can contain very high levels of PCBs.
- In general, there is less chance of catching a high PCB fish south of Catskill.
- This pattern persists year after year (see two additional years on page 9).
- Fish sampled in this graph and the graphs on page 9 were representative of fish generally over 18 inches.
- PCB levels shown are only from the edible portion of the fish (fillet, skin, and dark belly meat - fish are not “blended whole”).
- For more information about how NYS DEC processes fish samples see the link for *Of Time, PCBs and the Fish of the Hudson River* on the back page.



Each bar on this graph represents the PCB levels in one fish that was sampled. In this example and on the following page, you can see that it is possible to get a high PCB fish in any of these locations. The likelihood is much higher if you are fishing north of Catskill.

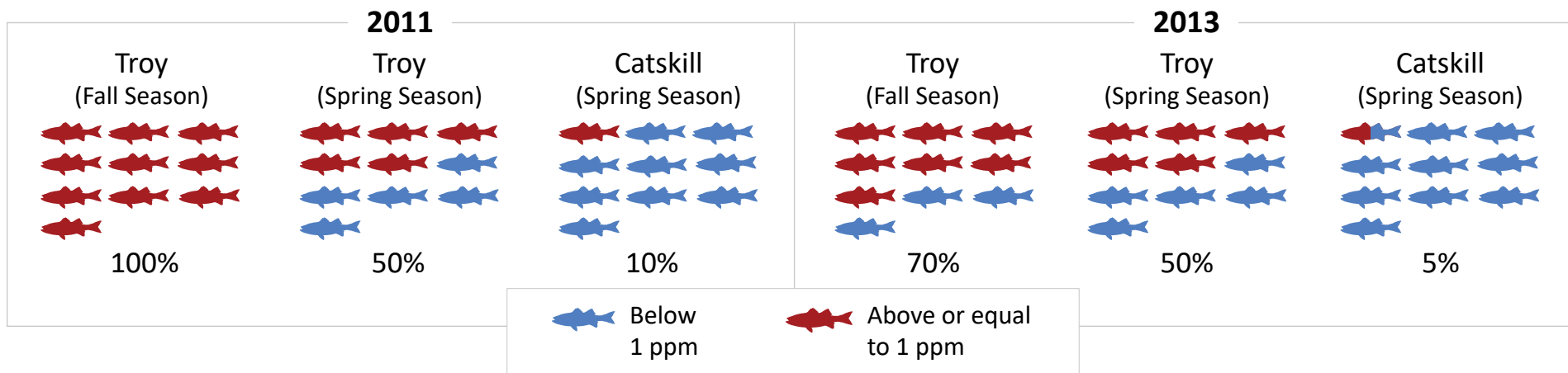
The data presented in this graph is for fish between 17.4 and 38.7 inches (only 1 out of 146 fish was under 18 inches), and the average length was 25.4 inches.

What is Your Chance of Catching a High PCB Striped Bass? Pattern Persists Year After Year



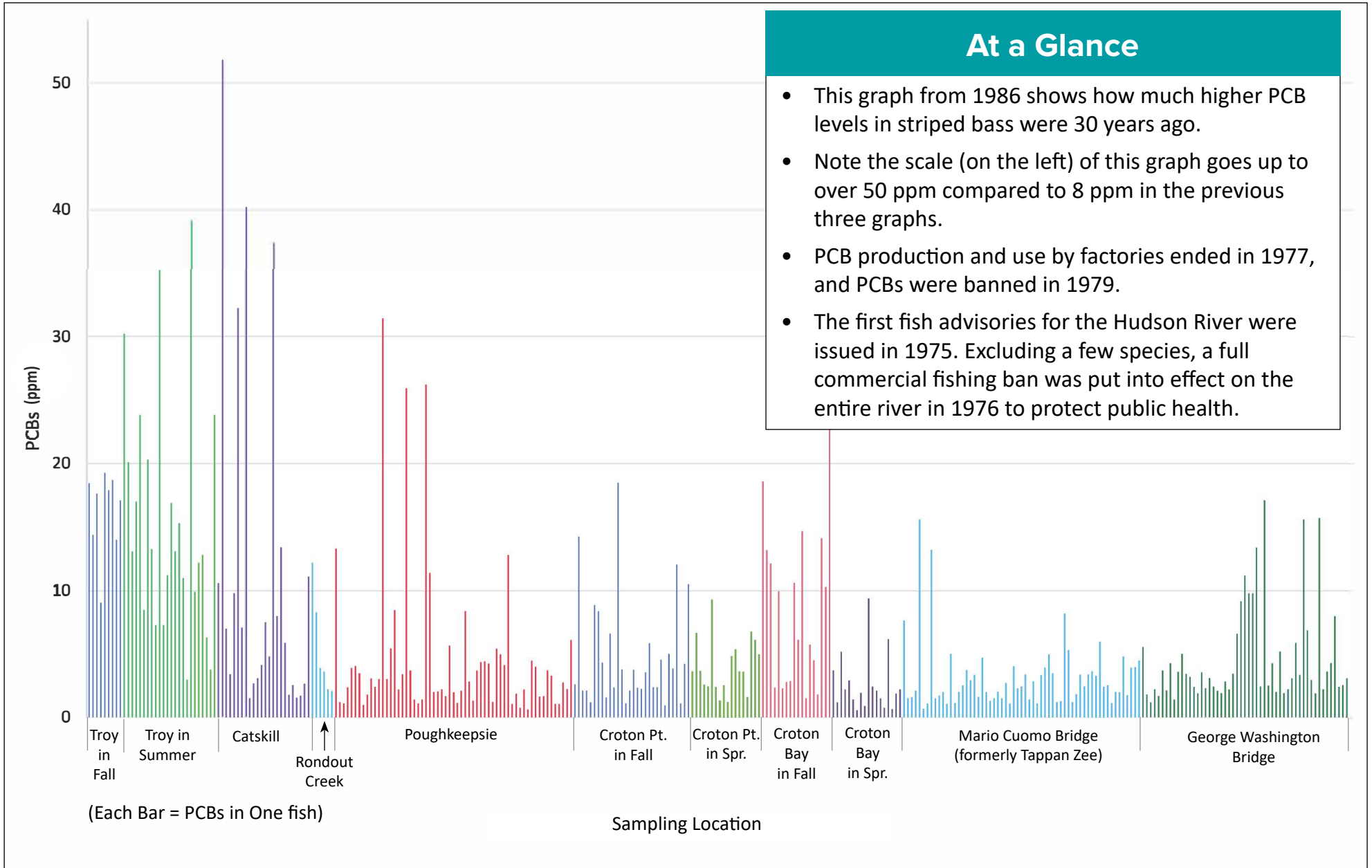
Data provided by the New York State Department of Environmental Conservation

What are the chances (out of ten) of catching a striped bass with over 1 ppm PCBs in different parts of the river?



In 2011, the fish sampled were between 17.8 and 35.0 inches (only 3 out of 131 fish were under 18 inches), and average length was 25.0 inches. In 2013, the fish sampled were between 17.8 and 38.5 inches (only 3 out of 153 fish were under 18 inches), and average length was 25.4 inches. For more information about how NYS DEC processes fish samples for PCBs, see the link for *Of Time, PCBs and the Fish of the Hudson River* on the back page of this packet.

Snapshot of Past Levels - Total PCBs in Hudson River Striped Bass Spring and Fall 1986

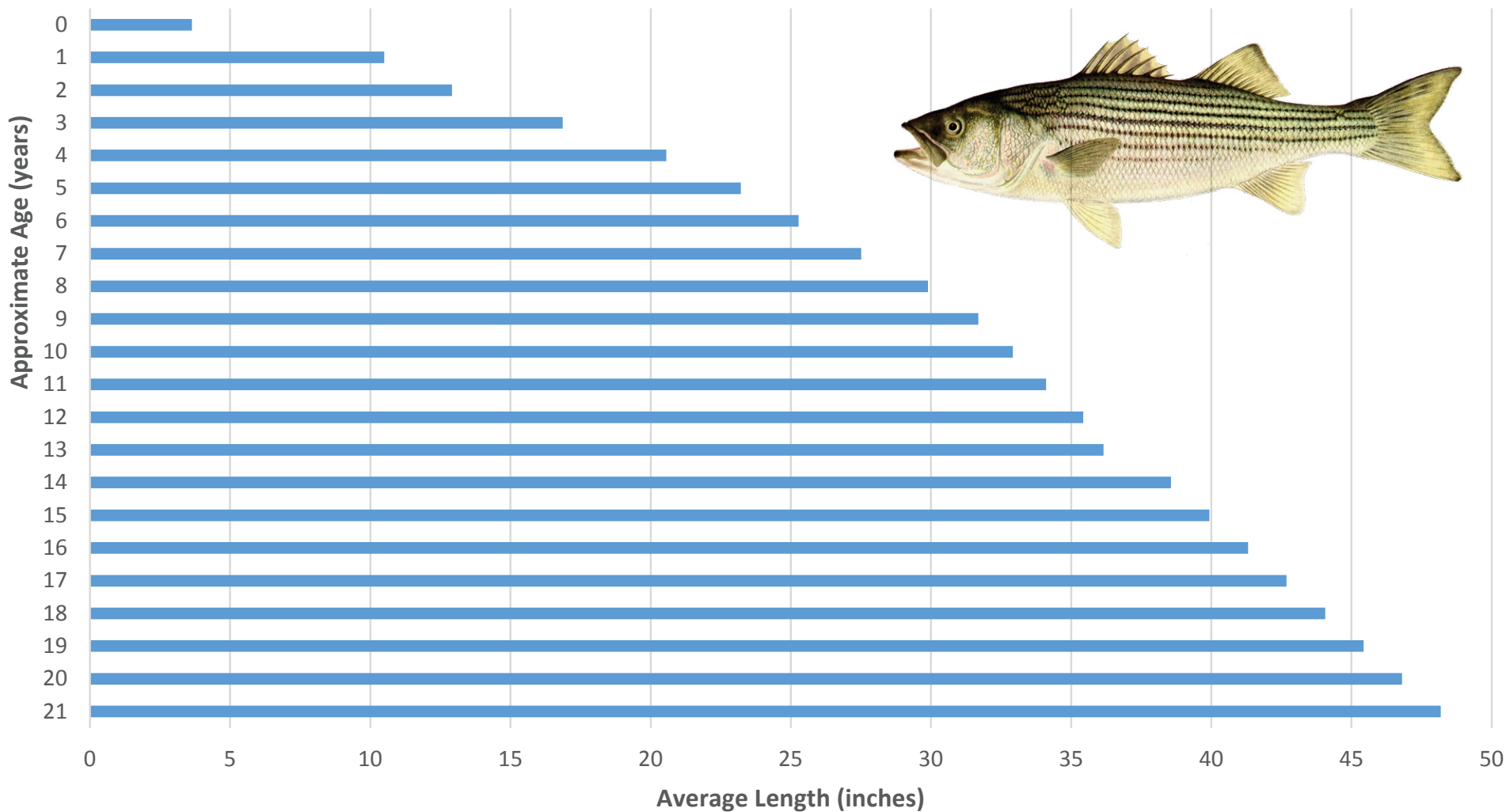


Data provided by the New York State Department of Environmental Conservation

By Popular Request: *How Old is My Fish? Striped Bass Average Length at Age*

At a Glance

- While this chart can't tell you if your fish has high PCB levels, it can help you age your fish by length.



Data provided by the NYS Department of Environmental Conservation, Hudson River Fisheries Unit

More Information

Hudson River Fish Advisory Outreach Program

New York State Department of Health

HRFA@health.ny.gov

518-402-7530

www.health.ny.gov/fish

www.health.ny.gov/hudsonriverfish

Additional Resources

NYS Fish Advisory Resources

NYS health advice on eating fish you catch: www.health.ny.gov/fish

How NYS DOH sets advisories: www.health.ny.gov/fish/background.htm

Tips for reducing contaminants in a fish meal: www.health.ny.gov/fish/tips.htm

Health Effects of PCBs

Overview of PCBs and health: www.atsdr.cdc.gov/toxfaqs/tf.asp?id=140&tid=26

More information on cancer and non-cancer health effects of PCBs:

www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs#healtheffects

In-depth review of PCB human health studies and summary of conclusions:

www.atsdr.cdc.gov/csem/csem.asp?csem=30&po=10

Research on Hudson River Striped Bass Migrations

Animation of migration study and ongoing projects by David Secor:

<http://fishconnectivity.cbl.umces.edu/research/hudson-river-estuary-studies>

Partial migration of striped bass: revisiting the contingent hypothesis

Gahagan, B.I., D.A. Fox, and D.H. Secor.

Marine Ecology Progress Series. Vol. 525: 185–197, 2015

<http://www.int-res.com/abstracts/meps/v525/p185-197/>

PCB levels in East Coast Striped Bass and Bluefish (2008)

Interstate Workgroup on Evaluating Atlantic Coastal Advisories for Recreationally Caught Striped Bass and Bluefish based on PCBs - 10/1/2008:

www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/documents/9-08final.pdf

Older but comprehensive report of PCB levels found in striped bass along the east coast. This paper is the source of the graph comparing Hudson River striped bass PCB levels to other east coast striped bass on page 4 of this packet. There is a discussion of (older) PCB levels in different protein sources (comparing meat and fish) found on pp 162-168 of the linked pdf.

Temporal Trends and History of PCBs in Hudson River Fish

Of Time, PCBs and the Fish of the Hudson River:

NYS DEC, Division of Fish, Wildlife and Marine Resources, 2005.

Also includes information about fillet and lab procedures in Appendix 1.

https://www.dec.ny.gov/docs/remediation_hudson_pdf/hrpcbtrndrpt.pdf