Mercury in the Bay-Delta Aquatic Food Web

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Mercury 101
Bay-Delta Striped Bass

Consistent with legacy influence
1998:
First Systematic Delta Survey

• High concentrations in the north and south not too surprising
• Surprisingly low concentrations in the Central Delta
• This pattern has generally persisted over the years
• The mechanism is not totally clear
• Largemouth bass an excellent indicator species
Timeline Since 1998

• 2007: Advisory for Central and South Delta
• 2008: Advisory for Sacramento River and Northern Delta
• 2011: Methylmercury TMDL adopted
• 2011: Surface Water Ambient Monitoring Program fish sampling
• 2016: Delta Regional Monitoring Program begins fish and water monitoring
Statewide Monitoring Begins in 2007

From “My Water Quality” Portal
http://www.mywaterquality.ca.gov/index.html
Current Status in the Delta Region

Most Recent Average Mercury Concentration in Largemouth Bass* (2004-2016)

Concentration categories based on OEHHA thresholds (in ppm) for protection of the less sensitive population: women over 45 years and men

- 0.44 – 1.31 1 serving/wk
- 0.22 – 0.44 2 servings/wk
- < 0.22 3 servings/wk

Lake/Reservoir  River/Stream

* Concentrations standardized for bass at a length of 350 mm

From “My Water Quality” Portal
http://www.mywaterquality.ca.gov/index.html
Largemouth Bass Near Sacramento

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (mi)</th>
<th>Species</th>
<th>Mercury (ppm ww)</th>
<th>Sample Year</th>
<th>Prep Code</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>American River at Discovery Park</td>
<td>1</td>
<td>Largemouth Bass</td>
<td>0.46</td>
<td>2011</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Sacramento River at Veterans Bridge</td>
<td>9</td>
<td>Largemouth Bass</td>
<td>0.68</td>
<td>2005</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Beach Lake</td>
<td>10</td>
<td>Largemouth Bass</td>
<td>0.1</td>
<td>2015</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Sacramento River at RM44</td>
<td>11</td>
<td>Largemouth Bass</td>
<td>0.23</td>
<td>2007</td>
<td>Skin off</td>
<td>Average of Individuals</td>
</tr>
<tr>
<td>Toe Drain</td>
<td>13</td>
<td>Largemouth Bass</td>
<td>0.41</td>
<td>2007</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Cross Canal</td>
<td>15</td>
<td>Largemouth Bass</td>
<td>0.36</td>
<td>2006</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Sacramento River Near Yerona Marina, Village Resort AKA Joes Place</td>
<td>15</td>
<td>Largemouth Bass</td>
<td>0.39</td>
<td>2006</td>
<td>Skin off</td>
<td>Average of Individuals</td>
</tr>
<tr>
<td>American River at Hazel Ave and Nimbus Dam</td>
<td>15</td>
<td>Largemouth Bass</td>
<td>0.73</td>
<td>2005</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Lake Natoma</td>
<td>17</td>
<td>Largemouth Bass</td>
<td>0.54</td>
<td>2007</td>
<td>Skin off</td>
<td>Average of 350 mm Standardized Size</td>
</tr>
<tr>
<td>Sacramento River at Knights Landing</td>
<td>19</td>
<td>Largemouth Bass</td>
<td>0.41</td>
<td>2006</td>
<td>Skin off</td>
<td>Average of Individuals</td>
</tr>
</tbody>
</table>

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http://www.mywaterquality.ca.gov/index.html
Few time series exist for the Delta

For most of these (e.g., Sacramento at Freeport):
- sampling inconsistencies over the years
- no sign of trend over the past 16 years

New!

One exception - San Joaquin at Vernalis:
- data suggest a major decline
- additional monitoring needed to confirm this decrease
A guide to eating fish caught in the Sacramento River and Northern Delta
Includes all waterbodies in the Delta north of Highway 12

Women 18 - 45 and children 1 - 17

![Fish illustrations]

- American shad 
- Rainbow trout
- Steelhead trout* 
- Chinook (king) salmon 
- Asiatic clam

Low = High in Omega-3s
* It is only legal to keep hatchery steelhead and only in select waters, see www.wildlife.ca.gov/Regulations

![Fish illustrations]

- Carp or goldfish
- Crappie
- Sucker
- Bluegill or other sunfish
- Catfish
- Hardhead
- Crayfish
- Hitch
- Bass
- Pikeminnow
- White sturgeon

Men over 17 and women over 45 can safely eat more fish

- 7 servings a week OR
- 3 servings a week OR
- 2 servings a week of striped bass OR
- 1 serving a week of bass, pikeminnow, or white sturgeon

What is a serving?

For Adults For Children
The recommended serving of fish is about the size and thickness of your hand. Give children smaller servings.

Why eat fish?
Eating fish is good for your health. Fish have Omega-3s that can reduce your risk for heart disease and improve how the brain develops in unborn babies and children.

What is the concern?
Some fish have high levels of mercury and PCBs. Mercury can harm the brain especially in unborn babies and children. PCBs can cause cancer.

2 servings a week OR
7 servings a week of clams

OR

1 serving per week

Do not eat

California Office of Environmental Health Hazard Assessment • www.oehha.ca.gov/fish.html • (916) 327-7319 or (510) 622-3170
A guide to eating fish caught in the Central and South Delta
Includes all waterbodies in the Delta south of Highway 12 (except the Sacramento River and the San Joaquin River south of Stockton)

Women 18 - 45 and children 1 - 17

Men over 17 and women over 45 can safely eat more fish

- 7 servings a week OR
- 5 servings a week of crayfish or catfish OR
- 2 servings a week OR
- 2 servings a week of striped bass OR
- 1 serving a week of sturgeon

Do not eat any fish or shellfish from the Port of Stockton.

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