

# OEHHA's Fish Advisory Program

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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

PFAS IN SAN FRANCISCO BAY FISH

FEBRUARY 4, 2022





The Office of Environmental Health Hazard Assessment (OEHHA) issues consumption advisories for recreationally-caught fish from water bodies throughout California, including state waters of the Pacific Ocean.

Fish advisories:

- •are guidelines that recommend how often you can safely eat fish that you catch from no consumption to 7 meals per week.
- use the best available science to balance the benefits and risks of eating fish.
- are based on thorough data review and best professional judgement.
- consider local/cultural practices, regulations, local fishing pressure, and environmental justice.



#### **Fish Advisories**

#### Good Catch California is the OEHHA fish advisory program.

We provide advice so that you can make healthy choices about eating the fish you catch.

Fish Advisories are guidelines that recommend how often you can safely eat fish caught from water bodies in California. The Office of Environmental Health Hazard Assessment (OEHHA) offers over 100 site-specific advisories for lakes, rivers, bays, reservoirs, and the coast. For water bodies without site-specific advice, look for the appropriate statewide advisory below.

OEHHA provides two sets of guidelines for eating fish, one for each of the following populations:

- Women 18-49 years and children 1-17 years
- Women 50 years and older and men 18 years and older

#### General Information

- Fish Advisory Fact Sheet (PDF) English | Spanish (Español)
- How to Follow Advisories
- Women & Children
- General Tips

#### Statewide Advisories

- Statewide Advisory for Eating Fish from California's Lakes and Reservoirs without site-specific advice
- Statewide Advisory for Eating Fish from California Coastal Locations without site-specific advice
- Advisory for Fish that Migrate



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How to Use the Fish Advisories How to read and use the safe fishing advisories for California waterbodies issued by OEHHA.





OEHHA provides two sets of guidelines for eating fish, one for each of the following populations:

• Women 18-49 years and children 1-17 years ("Sensitive population")



 Women 50+ years and men 18+ years ("General population")







# OEHHA has two types of Advisories:

- 1) Site-specific advisories (132 and counting)
- Require at least 3 species and 9 fish per species
  - Legal size to take
  - Adult size for species without legal size limits
- Use a measure of central tendency for each species (usually the mean concentration)
- Consider the range of concentrations



#### San Francisco Bay Advisory





#### 2) Statewide advisories

#### Statewide Advisory for Eating Fish from California's Coastal Locations without Site-specific Advice

 Provides consumption advice for 36 species based on levels of mercury and/or PCBs

Statewide Advisory for Eating Fish from California's Lakes and Reservoirs without Site-specific Advice

• Provides consumption advice for 14 species based on levels of mercury and/or PCBs

Advisory for Fish that Migrate

• Provides consumption advice for 5 species based on levels of mercury and/or PCBs







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# **Current Fish Consumption Advisories**

Risk Driver*	Percent of Advisories
Mercury	97
PCBs	40
Selenium	8
DDTs	5
Dieldrin	4
PBDEs	1

\*Consumption advice is based on the chemical with the lowest allowable number of servings per week ("risk driver"). More than one risk driver may affect advice in a single advisory.

Total number of advisories – 135







#### San Francisco Bay

- Fish Advisory Posters in the following languages
  - Simplified and Traditional Chinese
  - Japanese
  - Khmer
  - Korean
  - Laotian
  - Russian
  - Samoan
  - Spanish
  - Tagalog
  - Vietnamese
- Brochures
- Fact Sheets
- Technical Report



#### San Francisco Bay Advisory

























OEHHA 02042022





















## • Fish samples are collected

- The Safe to Eat Workgroup (STEW) arranges the collection for the majority of fish samples used in advisory development
- Additional samples are collected by water utilities, FERC (Federal Energy Regulation Commission) relicensing, and other GOs and NGOs







• Fish samples are generally analyzed at Moss Landing Marine Laboratories and/or contracted to other certified laboratories







 Most fish contaminant data are uploaded to the California Environmental Data Exchange Network (CEDEN) and retrieved by OEHHA for use in fish advisory development.







• Data that meet our criteria (minimum length, sample size, and quality) are reviewed, analyzed, and interpreted before a final data set is confirmed and used to calculate a **tissue concentration** for each chemical in each species at a water body.







# **Tissue concentrations** are compared to **Advisory Tissue Levels (ATLs)** that have been developed for each chemical.

### ATLs:

- provide a number of recommended servings (0-7 per week) based on the range of contaminant concentrations found in fish.
- are designed to encourage consumption of fish that can be eaten in quantities likely to provide health benefits (8 ounces per week or 32 grams per day, prior to cooking).
- are designed to discourage consumption of fish that should not be eaten in amounts recommended for improving overall health.
- are not "bright lines" but part of a complex decision-making process.
- can be based on cancer or non-cancer endpoints.



# How does OEHHA develop ATLs?

- ATLs are developed using risk assessment equations for cancer and non-cancer endpoints.
- The following terms use default assumptions for both equations:
  - Body weight (BW) assumed adult body weight of 70 kg (154 lbs);
  - Consumption Rate (CR) corresponding to 1 7 eight ounce servings per week;
  - Cooking Reduction Factor (CRF) a factor of 0.7 is used to account for the loss of organic contaminants during cooking.

DEVELOPMENT OF FISH CONTAMINANT GOALS AND ADVISORY TISSUE LEVELS (ATLs) FOR COMMON CONTAMINANTS IN CALIFORNIA SPORT FISH:

CHLORDANE, DDTs, DIELDRIN, METHYLMERCURY, PCBs, SELENIUM, AND TOXAPHENE

June 2008 (Updated ATL Table November, 2017)

Arnold Schwarzenegger Governor State of California

Linda Adams Agency Secretary California Environmental Protection Agency

Joan E. Denton, Ph.D. Director Office of Environmental Health Hazard Assessment



# Advisory Tissue Level (ATL) Equations: Non-cancer

## **Reference Dose (RfD)**

- Chemical specific dose
- Adverse health effects are not likely to occur below this concentration





# Advisory Tissue Level (ATL) Equations: Cancer

## **Cancer Slope Factor (CSF)**

• Cancer risk from lifetime exposure

Exposure Durations (ED)

• 30 years of exposure

Averaging Time (AT)

• 70 year average lifetime

Risk Level (RL)

• 1 in 10,000 (1 x 10<sup>-4</sup>) is used to balance benefits and risks of eating fish.

$$ATLs = \frac{RL \times BW}{CSF \times (ED/AT) \times CR \times CRF}$$





## ATLs have been developed for:

#### Natural elements

- Mercury a global contaminant and legacy of California's gold and mercury mining.
- Selenium –a micro-nutrient that can be redistributed and concentrated as a result of human activity. Industrial chemicals
  - Polychlorinated biphenyls (PCBs) banned in the 1970s; still pervasive in some areas.
  - Polybrominated diphenyl ethers (PBDEs) flame retardants; some forms are no longer produced.

<u>Pesticides</u>

- DDTs banned in the 1970s; still present in some environments.
- Dieldrin banned in the 1970s; still present in some environments.
- Chlordane\* banned in the 1970s.
- Toxaphene\* banned in 1988.

\*These chemicals are not currently found at levels of concern in California sport fish.



Contaminant	Consumption Frequency Categories (8-ounce servings/week) and ATLs (in ppb)								
Containinant	7	6	5	4	3	2	1	0	
Chlordanes	≤ 80	>80-90	>90-110	>110-140	>140-190	>190-280	>280-560	>560	
DDTs	≤ 220	>220-260	>260-310	>310-390	>390-520	>520-1,000	>1,000-2,100	>2,100	
Dieldrin	≤ 7	>7-8	>8-9	>9-11	>11-15	>15-23	>23-46	>46	
Mercury (Women 18-49 and childrer 1-17)	≤ 31	>31-36	>36-44	>44-55	>55-70	>70-150	>150-440	>440	
Mercury (Women 50+ and men 18+)	≤ 94	>94-109	>109-130	>130-160	>160-220	>220-440	>440-1,310	>1,310	
PBDEs	≤ 45	>45-52	>52-63	>63-78	>78-100	>100-210	>210-630	>630	
PCBs	≤ 9	>9-10	>10-13	>13-16	>16-21	>21-42	>42-120	>120	
Selenium	≤ 1000	>1,000-1200	>1,200-1,400	>1,400-1,800	>1,800-2,500	>2,500-4,900	>4,900-15,000	>15,000	
Toxaphene	≤ 87	>87-100	>100-120	>120-150	>150-200	>200-300	>300-610	>610	



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# Multiple Chemical Exposure

- Some chemicals, such as mercury and PCBs, are known to have similar adverse effects, and in such cases may be assessed using multiple chemical exposure methodology
- If two or more chemicals with similar adverse effects are present in fish tissue, multiple chemical exposure methodology is employed. This may result in advising fewer servings per week than would be the case for the presence of one chemical alone, in a similar concentration.





• A final report and posters are developed and posted at: <u>https://oehha.ca.gov/fish/advisories</u>













## Eat the Good Fish, Avoid the Bad Fish, Choose the Right Fish.

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www.oehha.ca.gov/fish