

CA Fish Consumption Guidance, Monitoring & WACAP Results

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SNSCC Workshop



Overview

- OEHHA's role advisories & monitoring
 - Fish consumption advisories/SEG
 - » Communication/messages
 - Sampling
- State monitoring
 - Historic
 - SWAMP/BOG/Monitoring Council
 - Other
- Statewide “conditions”
- Comparison to WACAP monitoring
- Comparison to WACAP results

OEHHA's Roles

- OEHHA's mission:
 - Protect public health through scientific evaluation
- Mandate Fish Section:
 - Issue state fish consumption advisories
 - Recommendations on other water quality issues
- Protecting public health includes consideration of benefits of fish consumption in advisories/safe eating guidelines
- Generate & aggregate data
- Evaluate data -- interpret results
- Communicate health information

OEHHA Framework for Fish Consumption Advisories

- Protocol/evaluation tools
 - Klasing and Brodberg, 2008
 - » <http://www.oehha.ca.gov/fish/gtislsv/index.html>
 - Advisory Tissue Levels
 - » Step in OEHHA's advisory protocol
 - » Balance risk and benefit
 - Fish Contaminant Goals
 - » Criteria like
 - » Potential for inter-agency use

Advisory Tissue Levels

- 70 kg BW
- 30 year exposure/70 year life-time
- Cooking reduction factor for OCs
- 1 in 10,000 additional cancer risks
- Average Hazard Quotient of “1”
- 0, 1, 2, 3 servings per week categories for advisories/safe eating guidelines

TABLE 2. ADVISORY TISSUE LEVELS (ATLS) FOR SELECTED FISH CONTAMINANTS BASED ON CANCER OR NON-CANCER RISK USING AN 8-OUNCE SERVING SIZE (PRIOR TO COOKING) (ppb, wet weight)

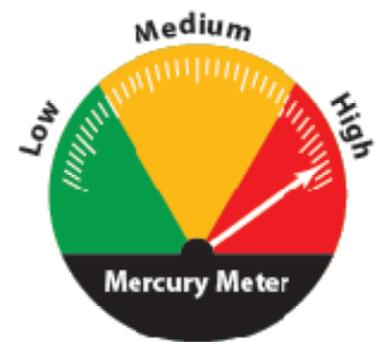
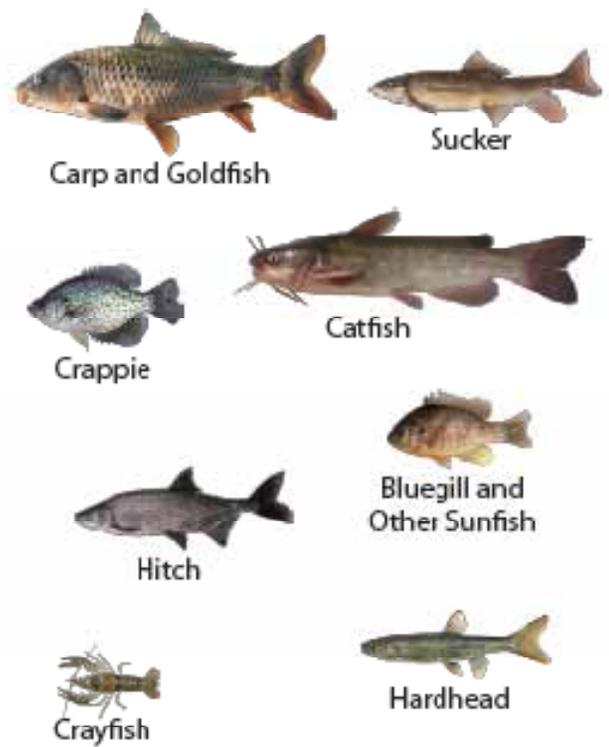
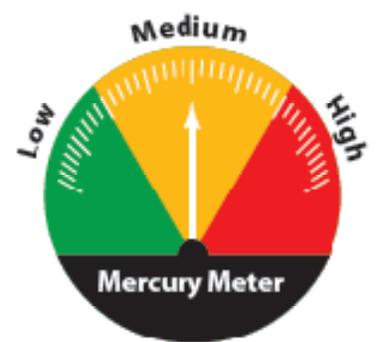
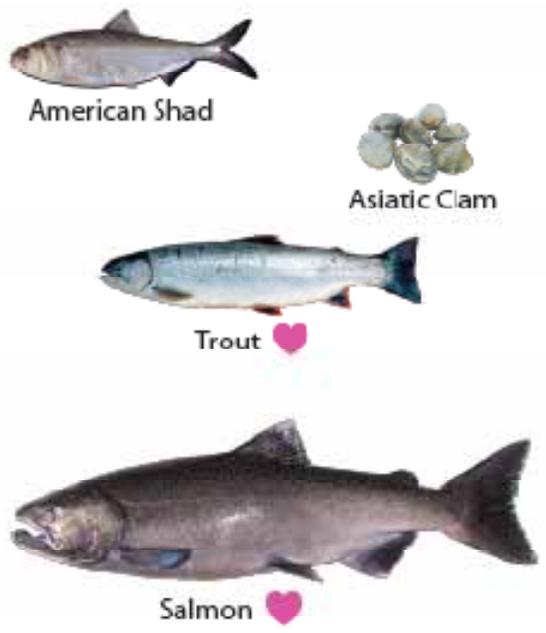
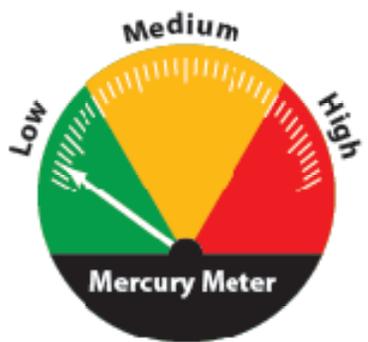
Contaminant	Three 8-ounce Servings* a Week	Two 8-ounce Servings* a Week	One 8-ounce Servings* a Week	No Consumption
Chlordane ^c	≤190	>190-280	>280-560	>560
DDTs ^{nc**}	≤520	>520-1,000	>1,000-2,100	>2,100
Dieldrin ^c	≤15	>15-23	>23-46	>46
Methylmercury (Women aged 18-45 years and children aged 1-17 years) ^{nc}	≤70	>70-150	>150-440	>440
Methylmercury (Women over 45 years and men) ^{nc}	≤220	>220-440	>440-1,310	>1,310
PCBs ^{nc}	≤21	>21-42	>42-120	>120
Selenium ^{nc}	≤2500	>2500-4,900	>4,900-15,000	>15,000
Toxaphene ^c	≤200	>200-300	>300-610	>610

Changes to Advisories based on Advisory Tissue Levels

- Expands the traditional risk paradigm to incorporate benefits
- Drops the one serving per month meal frequency category
- Provides advice for 1, 2 or 3 servings per week (more, if appropriate)
- Uses new graphic design for ease of communication
- Focuses more on the benefits of fish consumption

A guide to eating fish caught in the Sacramento River and Northern Delta

For women ages 18 - 45, especially those who are pregnant or breastfeeding, and children ages 1 - 17



♡ = High in Omega-3s

Safe to eat Safe to eat Do not eat

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

- Safe to eat 7 servings per week
- Safe to eat 3 servings per week
- Safe to eat 1 serving per week (limit striped bass and sturgeon to 2 servings per month)

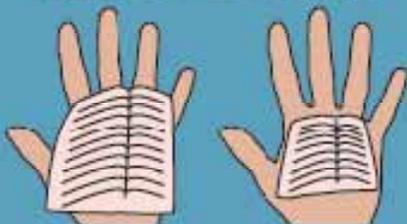
Why eat fish?

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 that can negatively affect how the brain develops in unborn babies and children.

What is a serving?



For Adults For Children

The recommended serving of fish is about the size and thickness of your hand. Give

Fish buying guidelines for women 18 – 45 and children 1 – 17

Do not eat fish caught in the Sacramento River or Northern Delta in the same week that you eat fish bought in a store or restaurant. For fish that you buy:

- Safe to eat 2 servings per week of low mercury fish such as salmon ♡, pollock, catfish, tilapia, shrimp, anchovies ♡, sardines ♡, trout ♡, and canned chunk-light tuna



OR

- Safe to eat 1 serving per week of medium-mercury fish such as canned albacore (white) tuna



- Do not eat shark, swordfish, tilefish, or king mackerel



Guide to Eating Fish Caught in the Sacramento River and Northern Delta



This advisory is for the Sacramento River and all water bodies in the Delta

California Office of Environmental Health Hazard Assessment

<http://www.oehha.ca.gov/fish.html>
(916) 327-7319 or (510) 622-3170

Fish Contaminant Goals

- 70 kg BW
- 30 year exposure/70 year life-time
- Cooking reduction factor for OCs
- 1 in 1,000,000 additional cancer risks
- Hazard Quotient of “1”
- 1 servings per week single “criterion” value (32 g/day consumption)

**TABLE 1. FISH CONTAMINANT GOALS (FCGS) FOR SELECTED FISH
CONTAMINANTS BASED ON CANCER AND NON-CANCER RISK* USING
AN 8-OUNCE/WEEK (PRIOR TO COOKING) CONSUMPTION RATE
(32 G/DAY)****

	FCGs (ppb, wet weight)
Contaminant Cancer Slope Factor (mg/kg/day)⁻¹	
Chlordane (1.3)	5.6
DDTs (0.34)	21
Dieldrin (16)	0.46
PCBs (2)	3.6
Toxaphene (1.2)	6.1
Contaminant Reference Dose (mg/kg-day)	
Chlordane (3.3x10 ⁻⁵)	100
DDTs (5x10 ⁻⁴)	1600
Dieldrin (5x10 ⁻⁵)	160
Methylmercury (1x10 ⁻⁴) ^S	220
PCBs (2x10 ⁻⁵)	63
Selenium (5x10 ⁻³)	7400
Toxaphene (3.5x10 ⁻⁴)	1100

Communication

- OEHHA Web Fish pages
- Brochures, fact sheets, reports
 - Water bodies, regions
 - Chemicals: mercury, PCBs
 - General guidelines
 - Commercial seafood
- DFG Sportfishing Regulation Books
- Dept Public Health, County Environ & Public Health Agencies
- Community Based Organizations, Clinics & Stakeholder Groups

General Guidelines

- Fishing Practices: Chemical levels can vary from place to place. Your overall exposure to chemicals is likely to be lower if you fish at a variety of places, rather than at one location that might have high contamination levels
- Fish Species: Some fish species have higher chemical levels than others in the same location. If possible, eat smaller amounts of several different types of fish rather than a large amount of one type that may be high in contaminants.
- Fish Size: Smaller fish of a species will usually have lower chemical levels than larger fish in the same location because some of the chemicals may become more concentrated in larger, older fish. It is advisable to eat smaller fish (of legal size) more often than larger fish.
- Fish Preparation and Consumption: Eat only the fillet portions. Do not eat the guts and liver because chemicals usually concentrate in those parts.

OEHHA Sampling & Coordination

- 1987 SoCal fish contaminant study
- 1997 reservoir study
- No statewide program focused on sampling for human health evaluations
- Interact with samplers
 - SWRCB, Regional Boards, USEPA, NOAA, USGS, UC researchers, Regional Monitoring Programs, CALFED studies, FERC studies, DTSC, RPs, etc.
- Guide collection applicable data
 - Locations, fish, sample size, chemicals analyzed, methods, etc.
- Sport Fish Sampling & Analysis Protocol
 - <http://www.oehha.ca.gov/fish/pdf/fishsampling121406.pdf>

Monitoring: Historic

- 1969 SCCWRP formed to monitor SoCal Bight
- 1971 agency consortium monitored Hg
- 1976 Toxic Substances Monitoring Program & Mussel Watch
- 1987 OEHHA Coastal Fish
- 1994 San Francisco Bay (BPTCP)
 - Became Regional Monitoring Program
- 1999-2003 Coastal Fish Contamination Program
- Sacramento River Watershed Program
- CALFED studies

Monitoring: Recent

- Surface Water Ambient Monitoring Program (SWAMP)
 - Lakes Survey 2007-08
 - Coastal Survey 2009-10
 - River/stream Survey 2011
 - Repeat 5 year cycle
- SF Bay RMP continues
- SCCWRP continues
- Regional programs in Central Valley
- Monitoring Council

Statewide Conditions

Advisories

Water Bodies with Safe Eating Guidelines for Fish Consumption

Office of Environmental Health Hazard Assessment

Advisories in Northern Sierra Nevada Foothill Counties (1)



Advisory Chemical

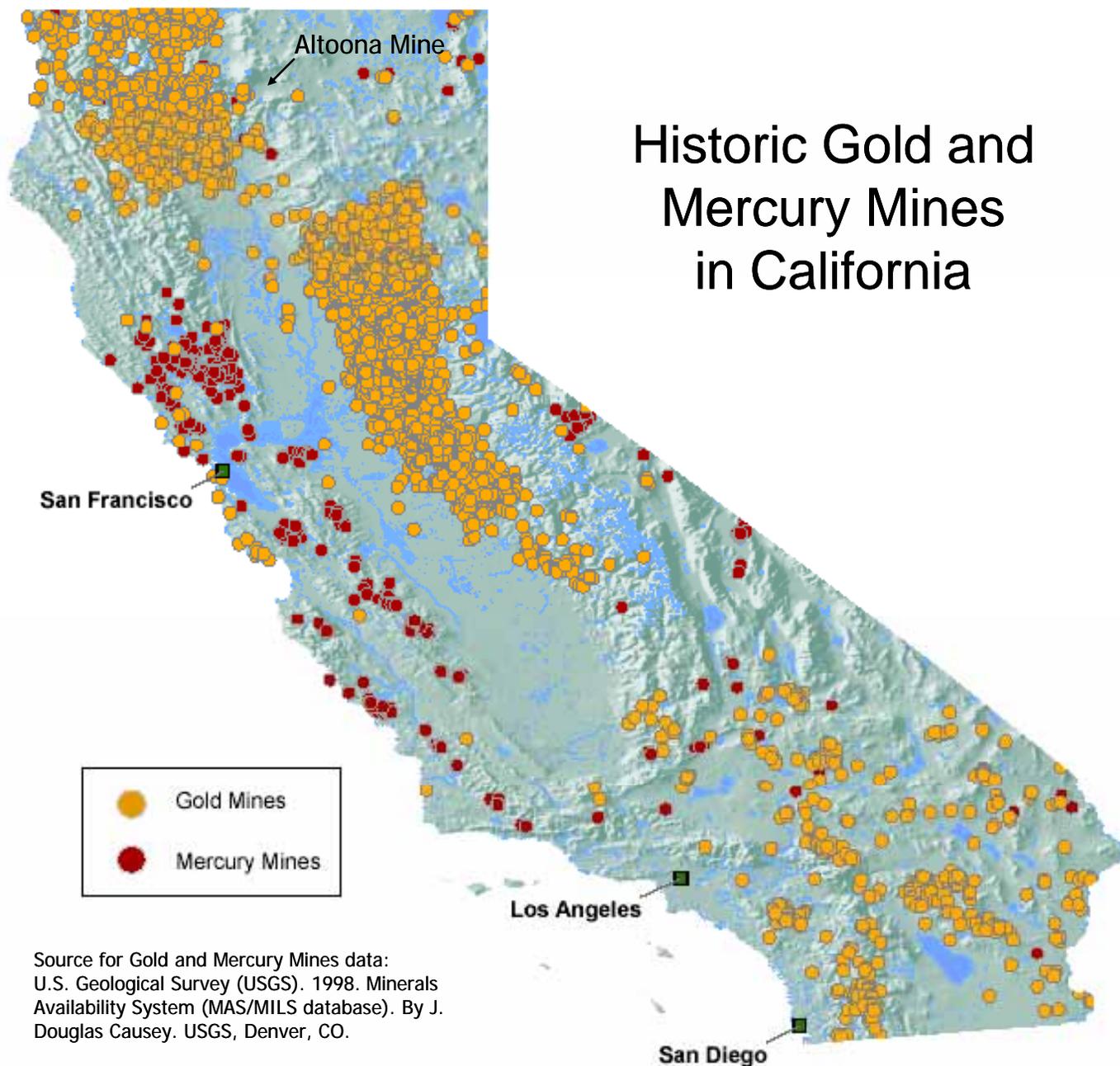
- (1) = mercury
- (2) = PCBs
- (3) = DDT
- (4) = dieldrin

Freshwater Advisories in San Francisco Bay Area Counties (1)



OEHHA, March 2009

Historic Gold and Mercury Mines in California



Source for Gold and Mercury Mines data:
U.S. Geological Survey (USGS). 1998. Minerals
Availability System (MAS/MILS database). By J.
Douglas Causey. USGS, Denver, CO.

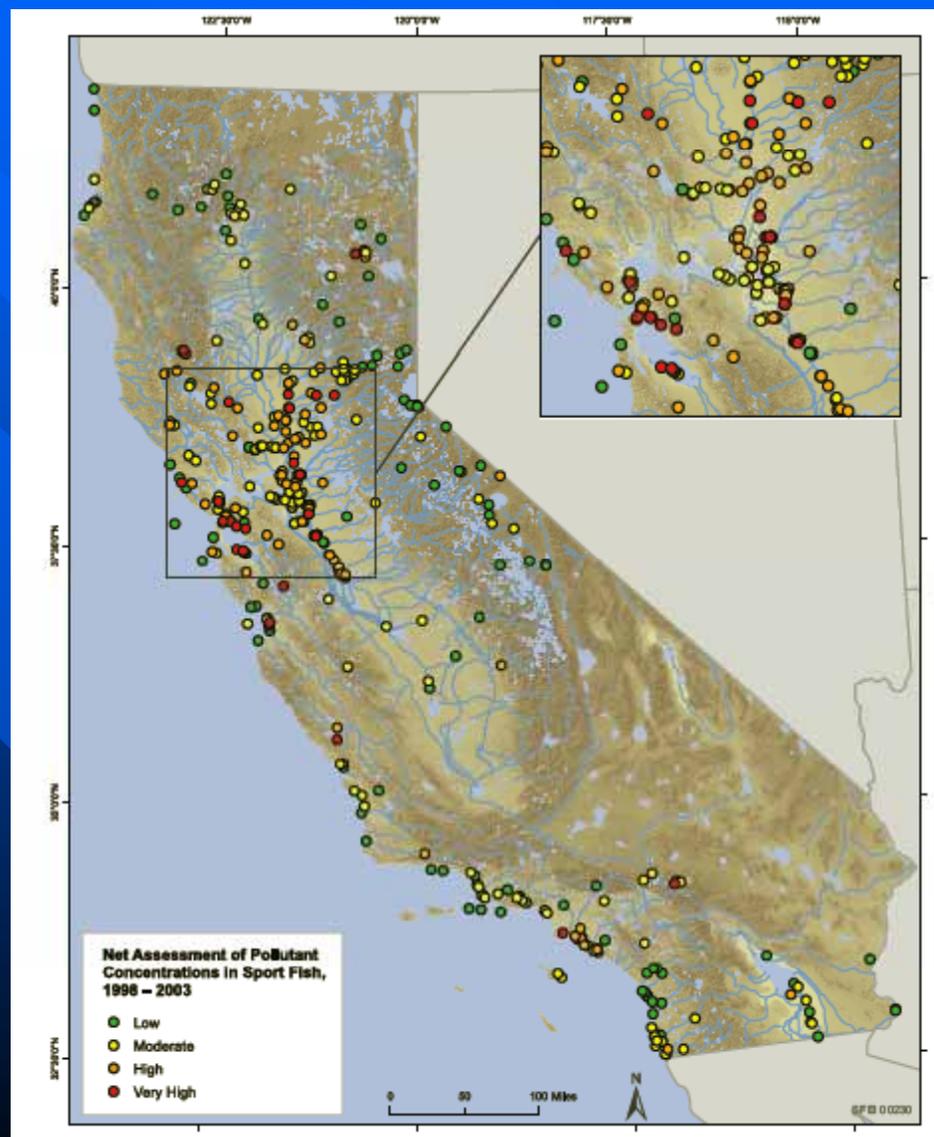
Historic Concentrations in Fish

Bioaccumulation Of
Pollutants In California
Waters: A Review Of
Historic Data And
Assessment Of Impacts
On Fishing And Aquatic
Life

http://www.swrcb.ca.gov/water_issues/programs/swamp/bop.shtml

Pesticide & PCBs
concentrations declining

Mercury concentrations
unchanged



Statewide Condition:

See SWAMP Report to be published May 2009:
“Contaminants in fish from California Lakes and Reservoirs”

- Study design: 2 year study
 - Target sampling 200 popular fishing lakes
 - Random sampling 50 lakes
 - Indicator fish species
 - Analyze OCs, mercury, selenium, PBDEs
- First year results in this report
 - 150 lakes
 - Comparison to OEHHA thresholds
 - Hetch Hetchy a random lake

Contrast OEHHA & WACAP Studies

- Study design different
 - CA water bodies vs nationwide
 - For advisories vs status/trends screen
- Fillet vs whole body fish
- 4 servings vs 2.3 or 19 per month
- Cancer risk 10^{-4} vs 10^{-5}
- Mean levels vs mean and individual
- Incorporate benefits vs risk-based

OEHHA Assessment SNSCC Results

- Contaminant levels very low
- Exposure is likely to be very low
- Not at levels warranting advisories
- Health concern is very low
 - Health concerns are based on chronic exposures (unlikely scenario here)
- Collaborate on public messages