

Making Healthy Fish Choices: **Women, Infants & Children**

CIEA, CDPH & NAHC 2015

The background of the slide features a light teal gradient. In the lower half, there are several stylized, concentric circular ripples in a slightly darker teal color, resembling water droplets or fish scales. One ripple is positioned in the upper right, while three larger ones are arranged in a row across the bottom.

Mercury in the Human Body

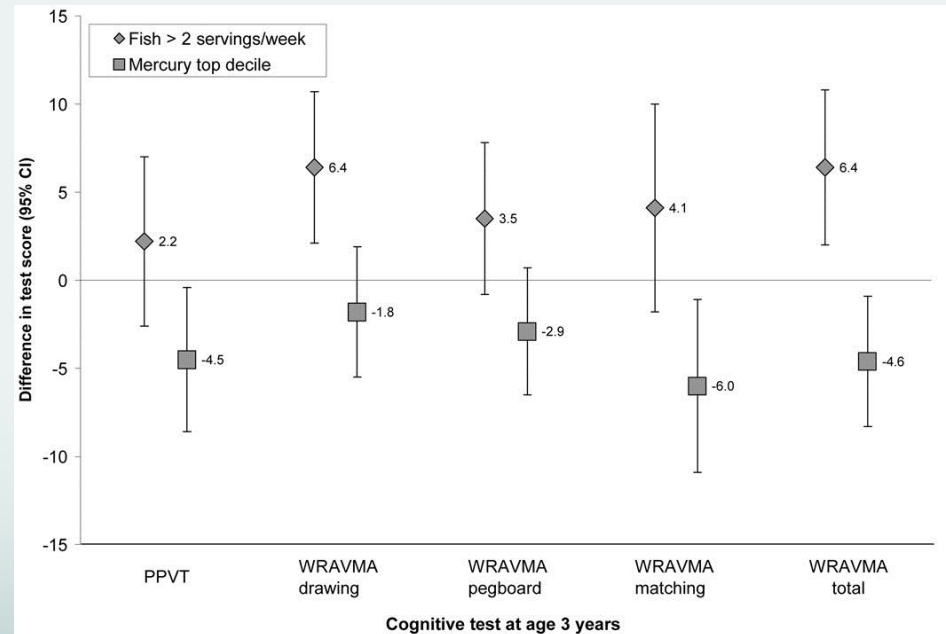


- **In pregnant women MeHg easily crosses into the placenta & binds to red blood cells & other fetal tissues** (Clarkson 1997, Davis 1994, Peterson 1999)
- **Chemical form matters: Metallic Hg, Organic Hg (MeHg) or vapor**
- **In Utero by birth cord blood is double that of the mothers.** Studies show this 1:2 ratio could be much greater (Bjerregaard & Hansen 2000, Hansen 1990, Bahter 2000, Weiss 1994)
- **MeHg accumulates in the brain, kidneys, heart & muscle tissue, it is neurotoxic & cytotoxic** (NAS 2000)
- **Hg takes a year to leave the body In the central nervous system** (Because of half-life) (Clarkson 1997, Davis et al. 1994, Peterson 1999)
- **Hg not excreted in utero** is excreted in feces, urine & sweat (Clarkson 1997, Mahaffey 1998, Goldman & Shannon 2001, Budtz-Jorgensen 2004, Oken 2008)
- **Affects likely permanent** birth through teen



New Evidence Oken 2008

- Mothers who ate more than 2 servings a week = increase in child's cognitive development at age 3
- Mother ate no fish = mid cognitive development & lower than those whose mothers had eaten 2 meals per week
- Mother ate more than 2 servings of high mercury fish = even lowest cognitive development



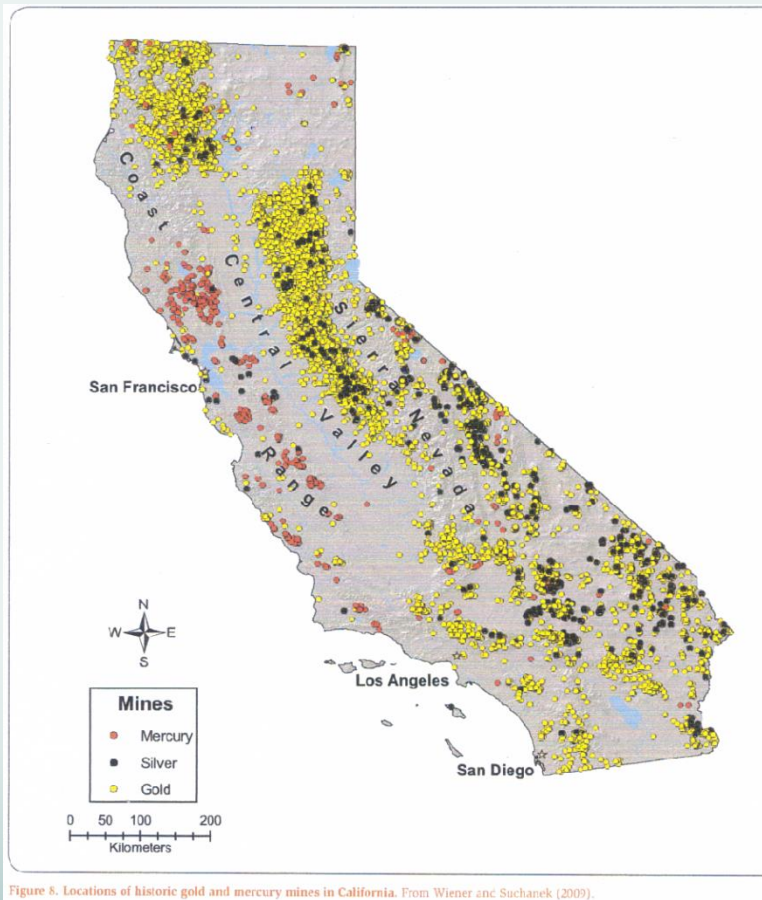
(Oken et al. 2008)

Primary Sources of Mercury

In California:

- **#1: Gold Rush - Mercury, Gold & Silver Mines**
- **Energy:** coal-power plants
- **Industry:** petroleum & refineries, cement kilns & chloralkali plants
- **Non-point sources:** vehicles that combust fossil fuels, dental offices, medical devices, crematoriums, landfills, waste combustion & incineration
- **Improper disposal of mercury-laden products:** mercury thermometers, florescent bulbs, etc.
- **Natural Sources:** cinnabar, forest fires & volcanic activities

Mercury: Toxic Legacy of the Gold Rush



(Alpers 2006 / Wiener and Schanek 2009 / BLM 2008)

- In only 20 years of Gold Rush: 26 million lbs. of mercury used California.
- 10-30% lost in standard operations = est. lost into environment 13million lbs.
- 1 gram (2 thermometers) can poison small lake & all fish.
- Cleanup est. \$1 million for one small mine
- Est. \$50 billion to clean AZ, CA, NV

Dietary Guidelines for Americans

Women who are pregnant or breastfeeding:

- Consume 8 to 12 ounces of seafood per week from a **variety of seafood types**.
- Due to their high methylmercury content, **limit white (albacore) tuna to 6 ounces per week** and
- do not eat the following four types of fish: tilefish, shark, swordfish, and king mackerel.
- If pregnant, **take an iron supplement**, as recommended by an obstetrician or other health care provider.

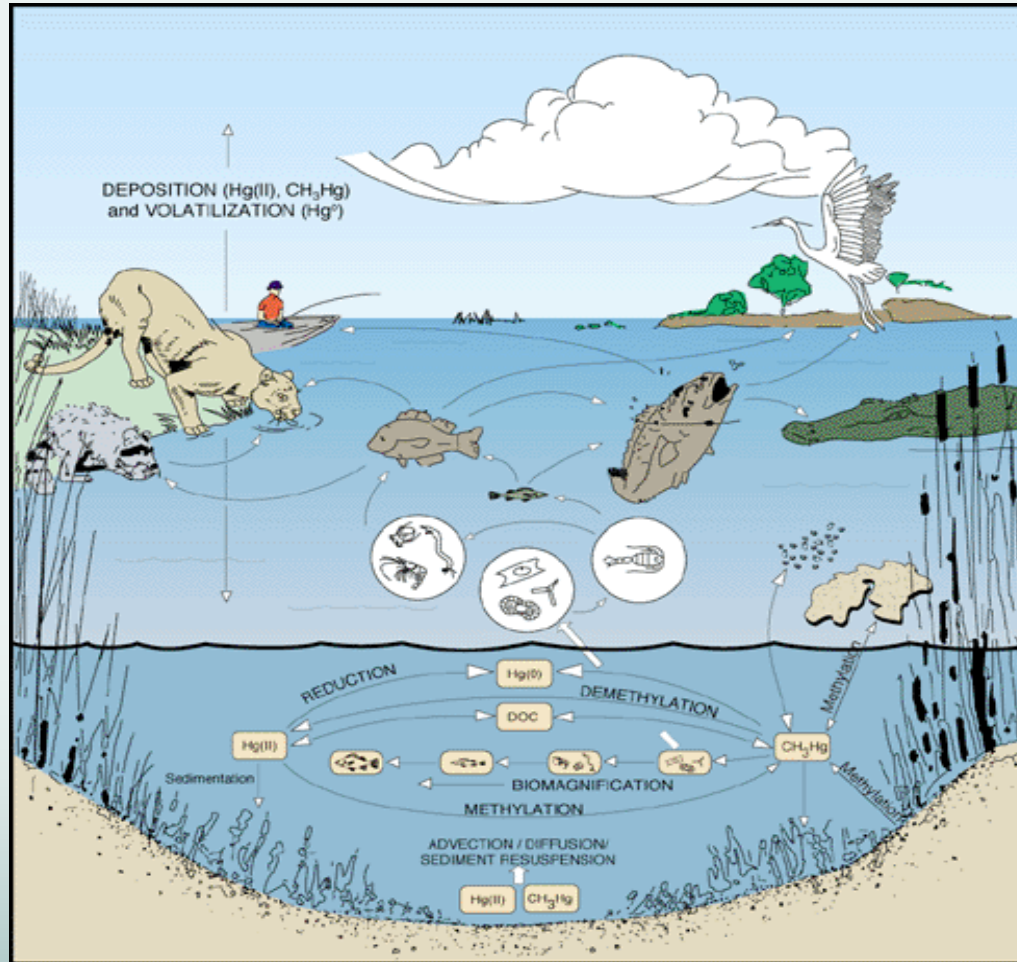
(US Dept. of Agriculture, US Dept. of Health and Human Services, www.usdietaryguidelines.gov)

- **Iron assists the body to retain Omega3 fatty acids**

Mercury in the Food Chain

74% of CA lakes & reservoirs advisories likely

Of those 21% of CA lakes may contain at least one fish specie unfit for pregnant women or small children



(Davis et al. 2009, updated 2010 & Scudder et al. 2009)

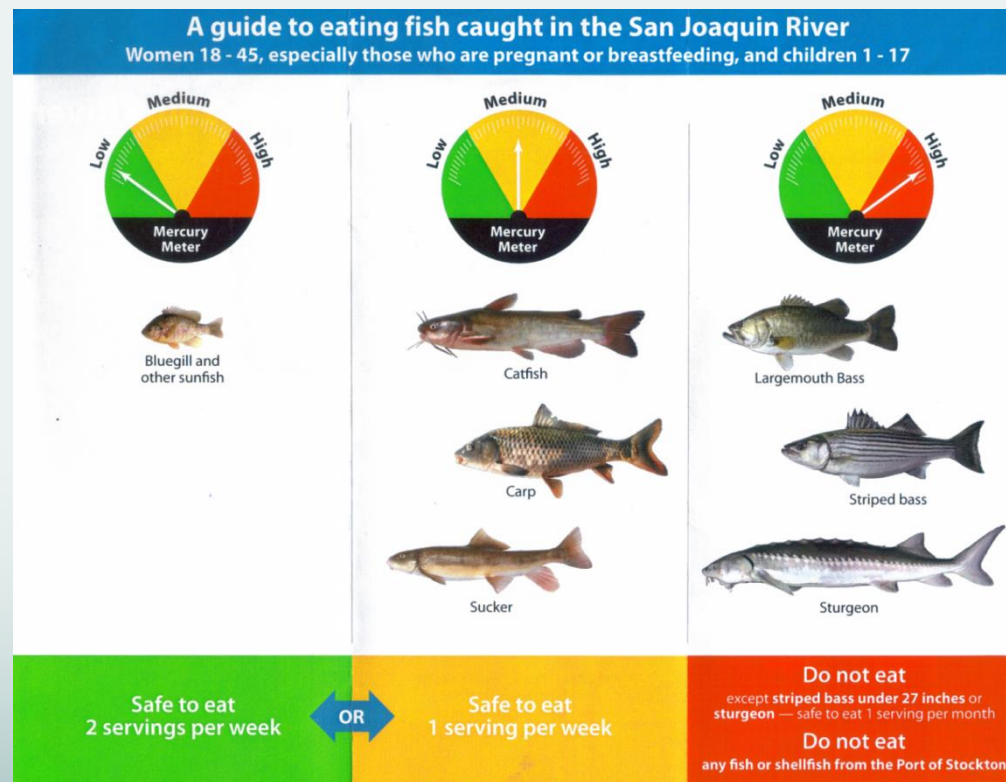
27% of US streams impaired by US EPA standards

Large predatory fish have most mercury

Who is at the top of the food chain?

Safe Eating Guidelines - OEHHA

There are over 50 fish consumption advisories in California due to mercury impairments. <http://www.oehha.ca.gov/fish.html>



(OEHHA, 2010, Guide to Eating Fish Caught in the San Joaquin South Bay Delta)

Wild Salmon!

- **River Caught Wild Salmon:** Low in PCBs & Mercury because of natural lifecycle
- **Land-locked Salmon:** High in Mercury
- **Farmed &/or GMO Salmon:** High in Mercury, PCBs & environmentally bad idea
- **High in Omega-3 fatty acids** = Healthy benefits for your heart, muscle tissues & blood (Omega-3/DHA) (OEHHA 2009, updated 2010)
- Many cultures enjoy complete protein sets
Ex: Salmon, Acorns & Seaweed are a complete protein



“Eating Fish Safely”

- Avoid large predatory fish
- Mercury in muscle of the entire fish
- If pregnant stop eating certain fish
follow advice for pregnant women 1 year
before pregnancy
- Balance health benefits (omega3-fatty acids)
vs. negative effects (hg) consider Oken study
- Check local advisories - if there are none it
doesn't mean the location has been tested & is safe
- Do math based on weekly amounts. EPA RfD is 0.1 μg
(microgram) mercury per kg per body weight per day.



CIEA Materials use the more protective EPA standard