



Fish Monitoring and Fish Consumption Guidelines

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Alaska Environmental Health Association
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Sources of Environmental Contaminants

• Local

- Natural Geologic sources, forest fires
- Cities and Industrial production
- Military Sites
- Resource Extraction- mines, oil exploration



• Long Range Transport

- Atmospheric
- Ocean Currents
- Animal migration
- Commercial transport



Fish Monitoring Program:

- **General Survey of Alaskan Fishes:**

- Commercial , Subsistence, Recreational species
- Collaborative Effort for sample collection
 - Federal and State agencies, commercial, recreational and subsistence fish harvest

- **Selected coastal sites:**

- Remote communities and villages
- Adjacent to anthropogenic activities
 - cities, discharges/runoff
- Historic mining sites



Evaluate Alaskan fish and invertebrates:

- Measure contaminant levels in skinless fillet and whole fish from freshwater, estuaries and marine environments



- Data are used to:
 - Determine if there are any areas, species, or contaminants that warrant more in-depth sampling and evaluation.
 - Provide Alaskan residents with information to make an informed dietary decision based on Risks and Benefits of eating Alaskan Fish
- **2014** Updated Fish Consumption Advice for Alaskans

Target Analytes

- Heavy Metals:

- Mercury: Total Mercury, Methyl-Mercury
- Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Selenium

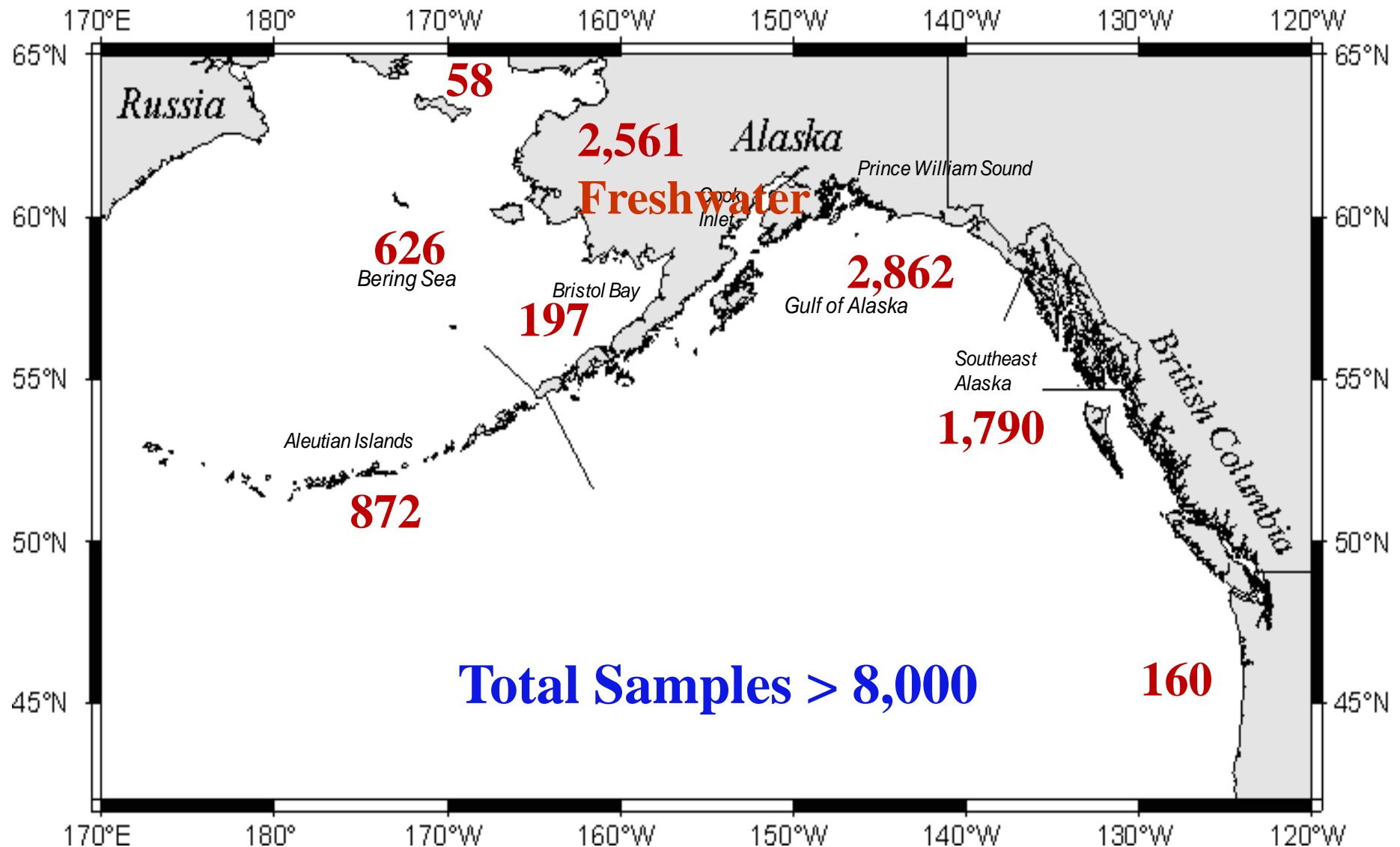
- Organochlorine Compounds:

- PCBs
- Dioxins and Furans
- Pesticides (Organochlorine Pesticides)

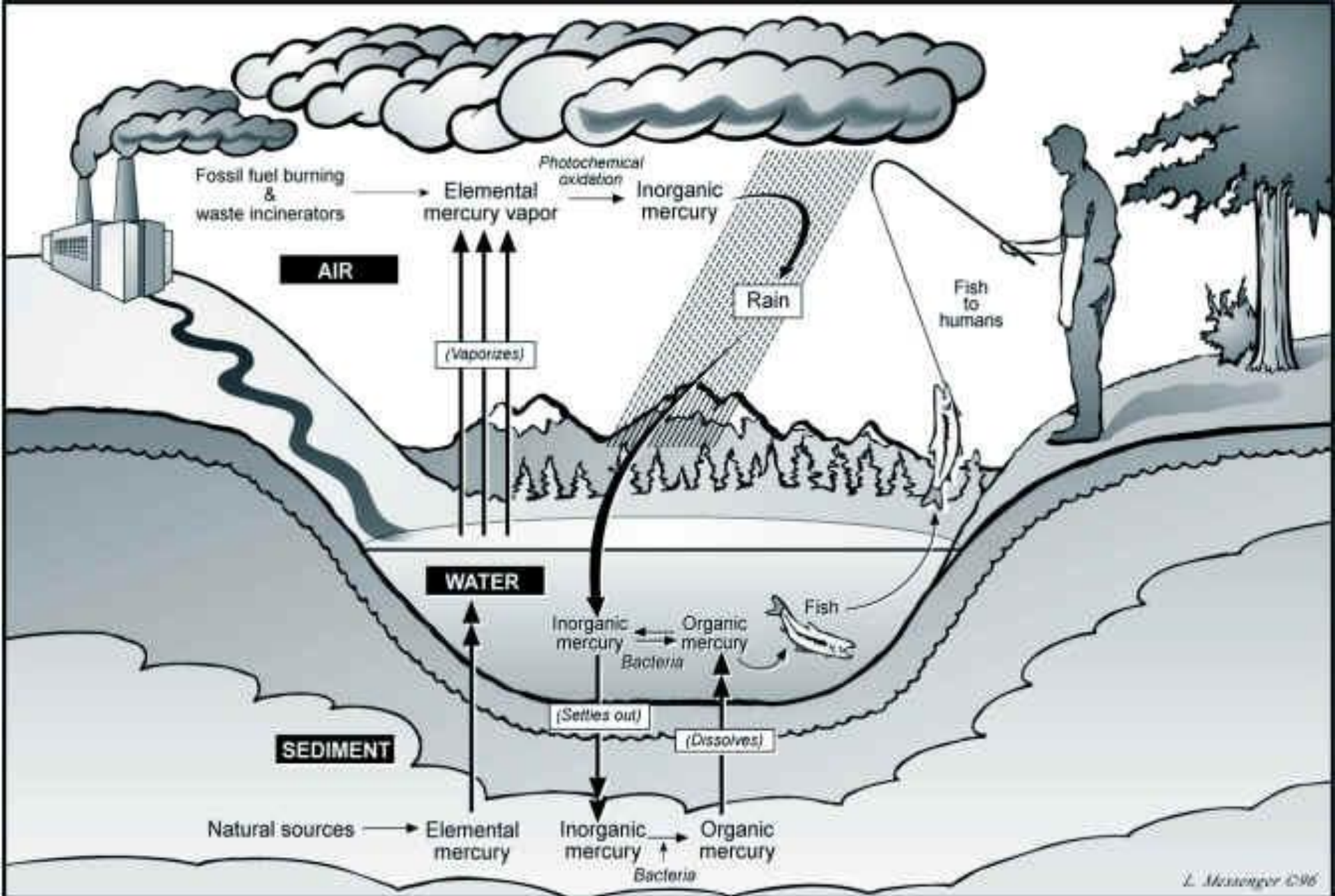
- Emerging Contaminants:

- Brominated Fire Retardants (PBDE)
- Poly-Fluorinated Compounds (PFC, PFOS, PFOA)
- Pharmaceuticals, personal care products

Areas Fish Were Collected for the ADEC Fish Monitoring Program



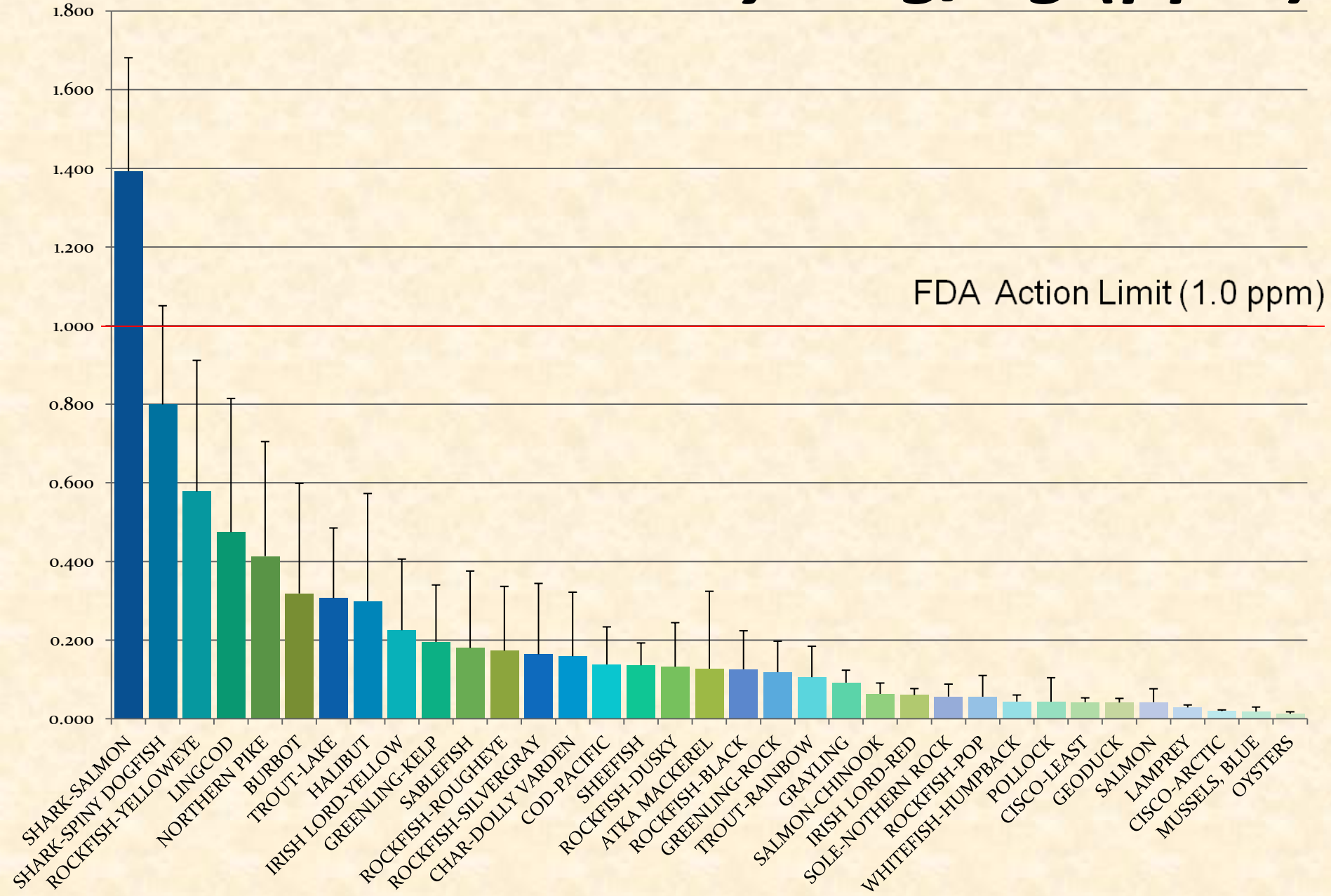
Number of Fish Samples per Region



L. Messenger 1996

Mercury Cycle

Mean Total Mercury: mg/kg (ppm)



Alaska Fish Consumption Guidelines

- In 2014 updated the Acceptable Daily Intake for mercury in fish
 - 8,000+ fish monitoring data points
 - Review of recent studies on neurodevelopmental, diabetes, and cardiovascular endpoints
- Recognized the importance of fish for nutrition, economics, sports, culture, community, religion, and identity
- Large amounts of fish consumed by Alaskans

Fish Consumption

Risks

- Contaminants
 - Mercury
 - Persistent Organic Pollutants
 - Other metals



Benefits

- Omegas-3 fatty acids
- Protein
- Selenium
- Numerous other nutrients
- Sport
- Culture
- Subsistence

Most Susceptible: Fetuses and Children



Developing nervous systems

1. Mom eats fish containing mercury. Mercury can reach fetus
2. Mercury can be neurotoxic
3. Too much mercury can lead to adverse neurodevelopmental effects in offspring

Message

- Guidelines are ONLY for children and women who are pregnant, or plan on becoming pregnant
- Stress benefits, but communicate some caution from small number of fish (e.g., large halibut, shark)



Statewide guidelines incorporate fish species consumed by most Alaskans



Guidelines for Alaska Women and Children

Mix and match your fish meals for up to:

**12 POINTS
PER WEEK**

Note: A **meal size** is 6 ounces uncooked weight (or roughly the size of a deck of cards).

Alaska fish is rich in nutrients and good for you. State health officials recommend that everyone eat fish at least twice per week. However, all fish contain some mercury, a toxic metal that can harm the developing nervous systems of unborn babies and children. Because of this, women who are or can become pregnant, nursing mothers and children should follow these guidelines to limit their mercury intake. Everyone else can eat as much seafood as they like.

**0
Points**

Unrestricted amounts

Arctic Cisco	Pacific Ocean Perch
Big Skate	Rainbow Trout
Black Rockfish	Rougeye Rockfish
Broad Whitefish	Sablefish
Dolly Varden	Salmon, Chinook (King)
Dusky Rockfish	Salmon, Chum
Grayling	Salmon, Pink
Halibut <40 pounds	Salmon, Red (Sockeye)
Humpback Whitefish	Salmon, Silver (Coho)
Least Cisco	Sheefish
Lingcod <35 inches	Walleye Pollock
Pacific Cod	

**3
Points**

Halibut 40–80 pounds
Lake Trout
Lingcod 35–40 inches

**4
Points**

Halibut 80–140 pounds
Lingcod 40–45 inches
Longnose Skate

**6
Points**

Yelloweye Rockfish
Halibut 140–220 pounds

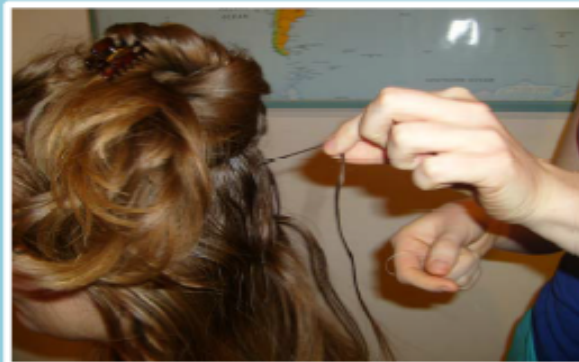
**12
Points**

Halibut >220 pounds
Lingcod >45 inches
Salmon Shark
Spiny Dogfish

Alaska Hair Mercury Biomonitoring Program

Have you ever wondered how much mercury is in your body?

If yes, then ask your provider about the Hair Mercury Biomonitoring Program



Quick, Free and Painless

- Testing takes 5 minutes
- A small lock of 50 hairs is taken from the middle back of your head
- Results are mailed confidentially to you in about 1 month

Who can participate?

- Women aged 15-45
- Pregnant women of all ages

Why should I participate?

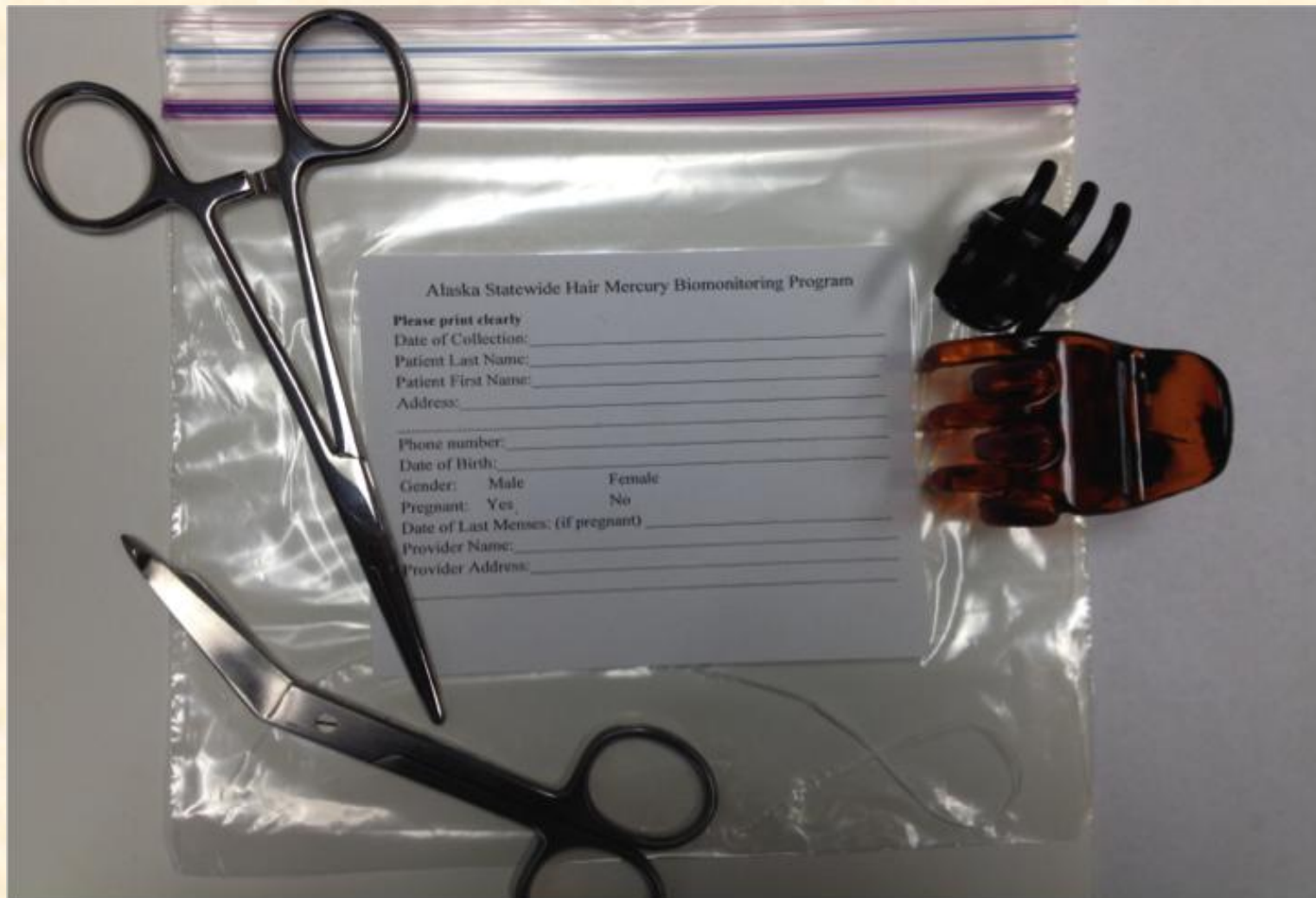
- High mercury levels can harm a developing fetus
- Knowing your mercury level can help you make health decisions for yourself and your child (if you are or plan to become pregnant)



For more information:
www.epi.hss.state.ak.us/
(907) 269-8000



Simple Sample Test Kit





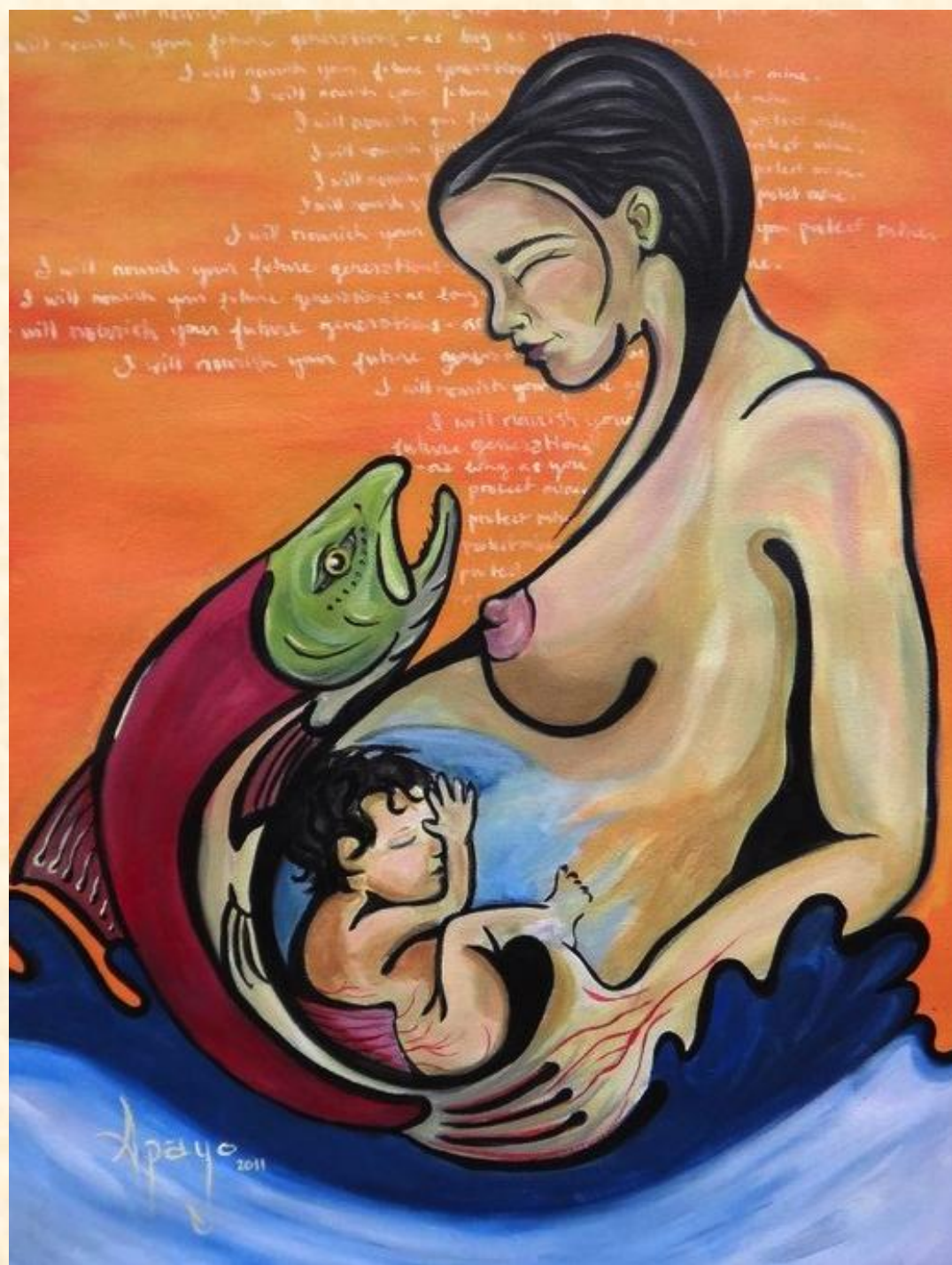
Slip dental floss loop around hair and tighten knot approximately 1.5 inches from scalp.
Diameter of hair sample = 3–4 mm

Follow-up

1. Samples sent to the Alaska State Public Health Laboratory in a pre-addressed envelope. Patients receive the results by mail within approximately a month of sample submission.
2. The Department of Health and Social Services performs follow-up activities to investigate hair mercury levels ≥ 5 ppm, and assists in devising strategies to reduce further exposure.

Our Agreement:
I will nourish your
future generations
-as long as you
protect mine.

Apayo Moore, Alaska
Artist and
Fisherwoman



Contacts

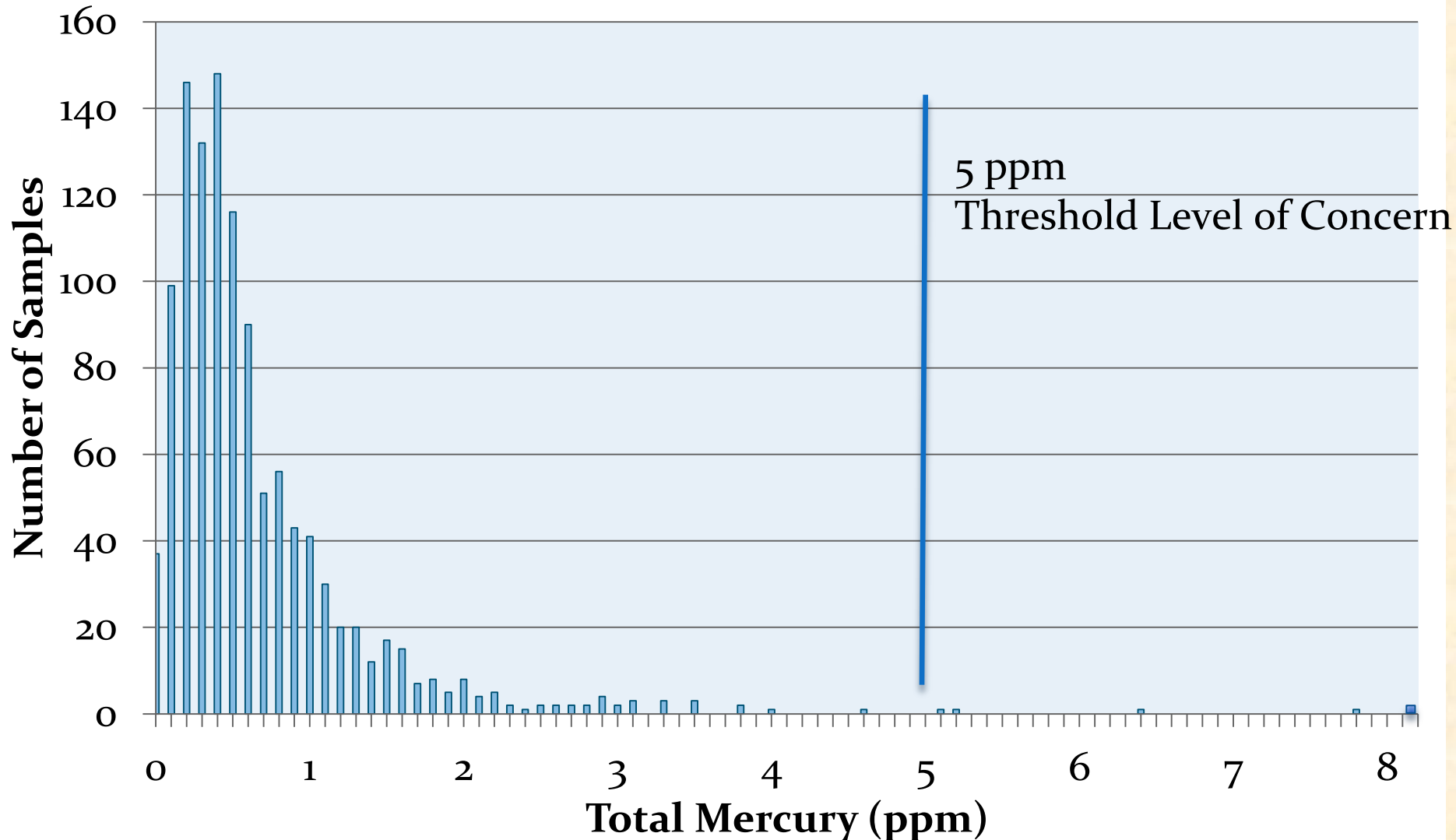
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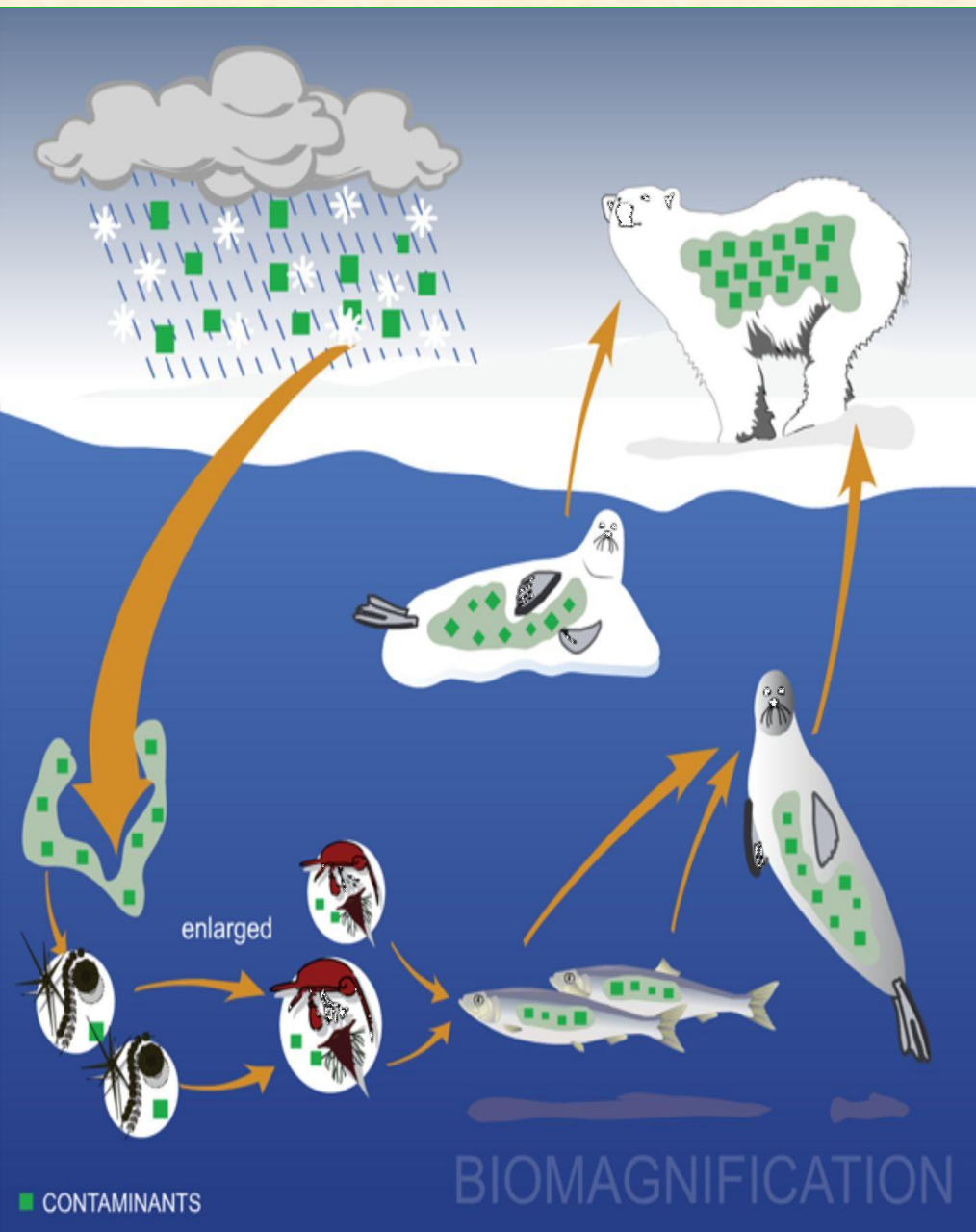
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Hair Mercury Concentrations among Women (age, 15-45 y) — 2002–2014



Bioaccumulation/Biomagnification



Bioaccumulation – increase in the concentration of a compound over time as the animal gets older/larger. Chemical accumulates faster than the animal can eliminate it.

Biomagnification – increase in the concentration of a substance or chemical up the trophic feeding level