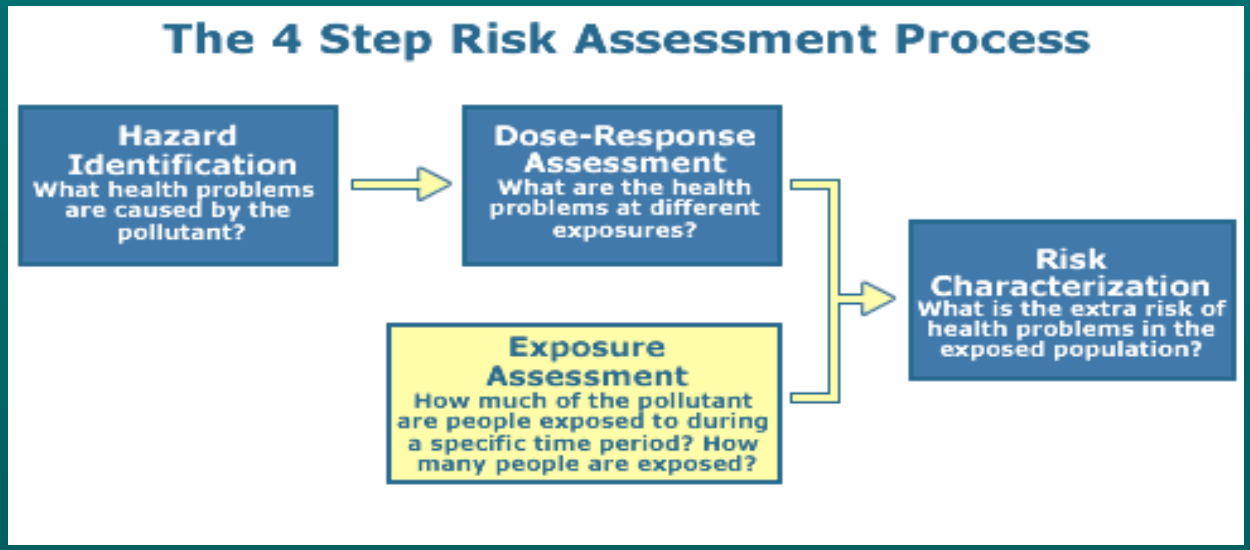
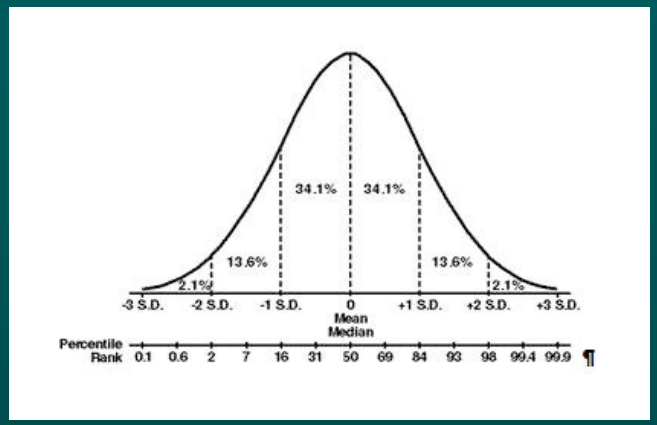
Risk-Based Paradigm



Exposure =

$$\frac{\text{Concentration x Intake x Duration x Frequency}}{\text{Body Weight}}$$

The Tribal Context: Fundamentally Different



Tribes are not merely another "subpopulation" differentiated by their different exposures, susceptibilities, or vulnerabilities

Tribes are not simply the "upper tail" of a distribution of the general population

Examples of Fish Consumption Rates

Amt Eaten (grams per day)	Rationale
17.5 gpd	EPA Office of Water Quality proposed national rate - officially still at 6.5 gpd in EPA Office of Water
48.5 gpd	EPA & FDA recommend eating 12 oz fish per week
63.2 gpd	CRITFC mean for fish consumers; about 1 pound/week
72.9 gpd	Tulalip and Squaxin Island mean seafood consumption
142 gpd	EPA recommendation for subsistence fishers for WQS
165.5 gpd	EPA recommendation for women of child-bearing age
389 gpd	CRITFC 99th percentile minus 4 – 13 “outliers”
540 gpd	CTUIR current traditional subsistence use rates
620 gpd	Boldt Decision cited 500 lbs per capita – Columbia River
796 gpd	Suquamish 95th percentile total consumption rate
1000 gpd	Walker est. of pre-dam rates for Columbia Plateau tribes

Contemporary Consumption Rates and Practices Distorted Due to Suppression Effects

"A 'suppression effect' occurs when a fish consumption rate (FCR) for a given population, group, or tribe reflects a current level of consumption that is artificially diminished from an appropriate baseline level of consumption for that population, group, or tribe. The more robust baseline level of consumption is suppressed, inasmuch as it does not get captured by the FCR."

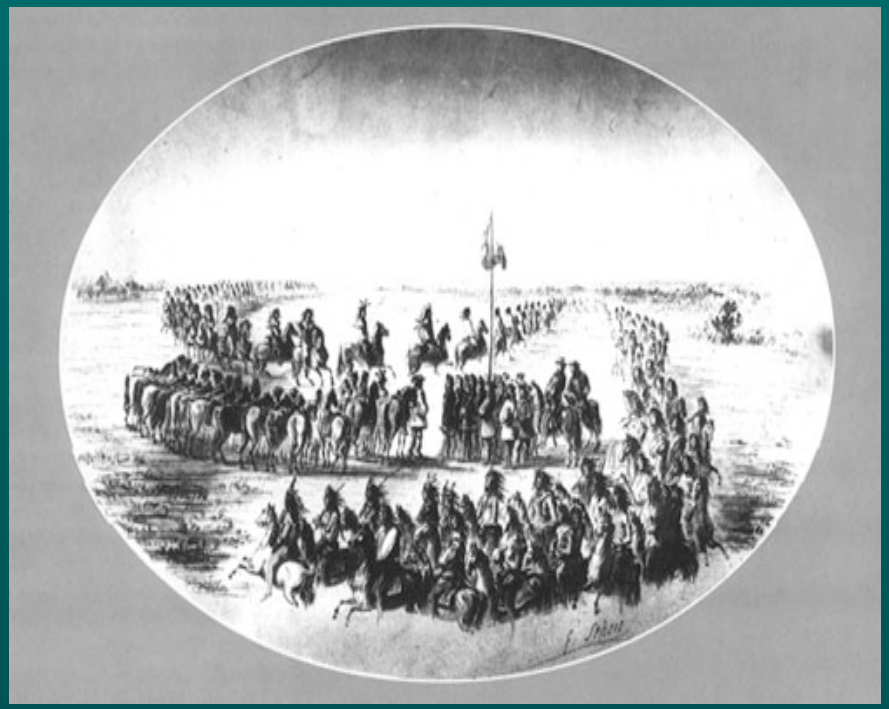
National Environmental Justice Advisory Council,
Fish Consumption and Environmental Justice, 43-45 (2004)

Suppression Effects

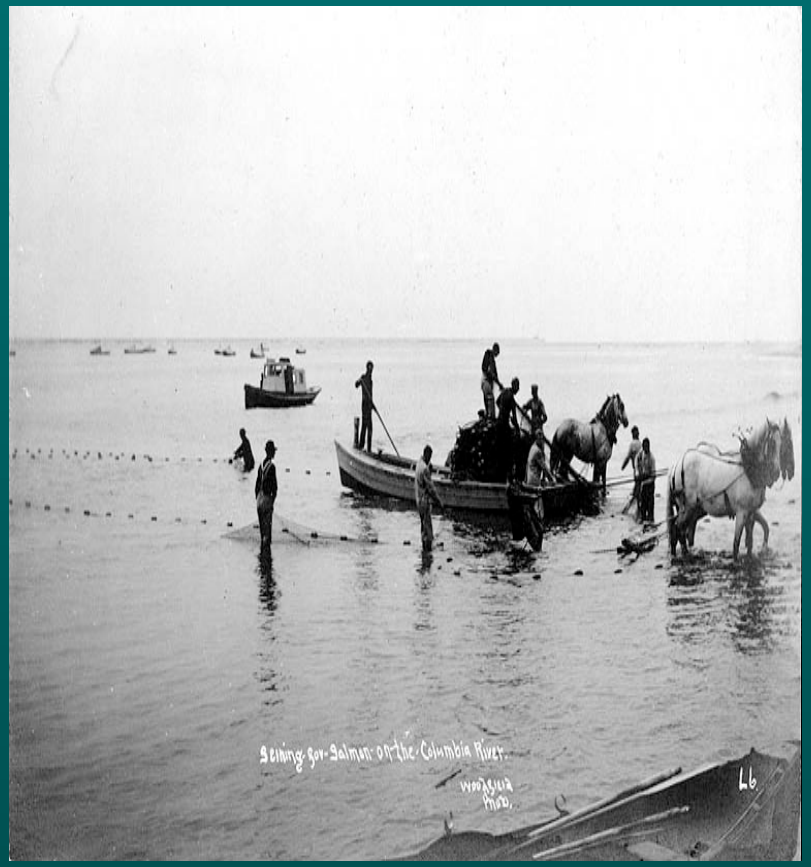
63.2 g/day [CRITFC; mean] versus 620 g/day [*U.S. v. Washington*]

Baseline for Suppression Effects: General Population versus Fishing Tribes

?



Causes of Suppression Effects: General Population versus Fishing Tribes



Conventional Approaches, Assumptions, Methods: Inappropriate and Inaccurate

$$z_i = \frac{\left(x_i - \bar{x}\right)}{s}$$

where

$$s = \sqrt{\frac{\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2}{n-1}}$$

EPA's Risk Assessment Guidance for Superfund

Exposure Assessment

"Generally, Superfund exposure assessments are concerned with present and future exposures."

EPA, *Risk Assessment Guidance, Volume I (Part A), at 6.1*

OSWER Directive: Land Use in the CERCLA Remedy Selection Process

- "Remedial action alternatives developed during the RI/FS should reflect the *reasonably anticipated* future use or uses" of lands and resources at site
- Early discussions, consultation to "focus on community's desired future uses"
- Use of information gleaned to formulate "*realistic assumptions* regarding future land use"

Reasonably Anticipated . . .

"[R]esource degrading activities [such] as the building of stream-blocking culverts could not have been anticipated by the Tribes, who themselves had cultural practices that mitigated negative impacts of fishing on the salmon stocks"

Subproceeding 01-01, Order at 11

Treaty with the Walla Walla, Cayuse, and Umatilla (1855)