



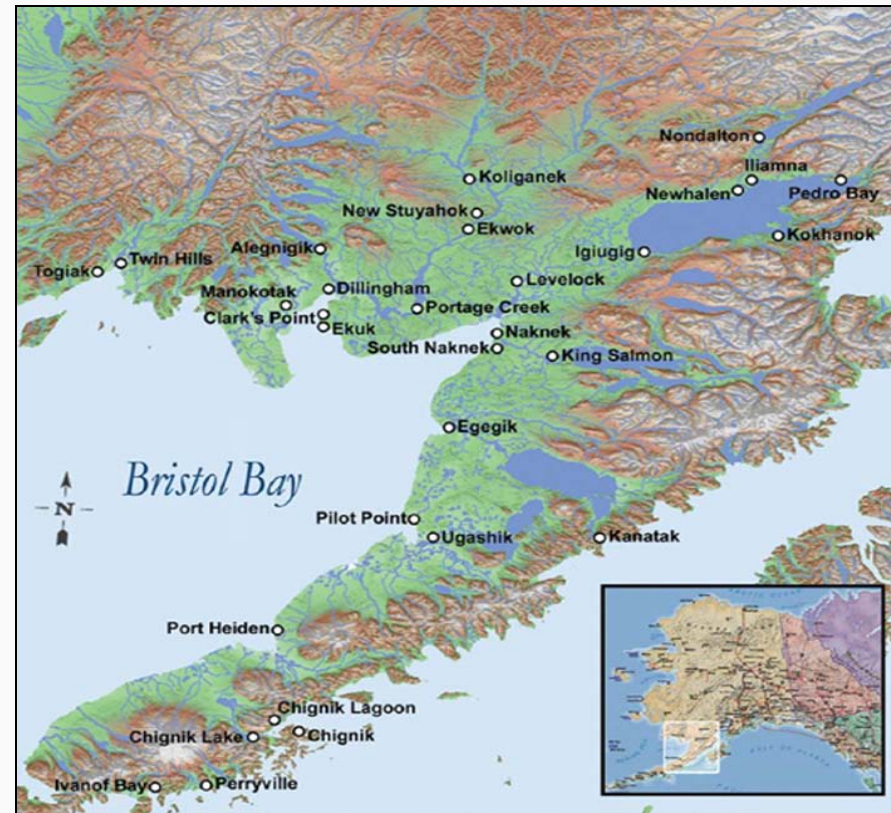
Bristol Bay Watershed Assessment

**Bristol Bay Native Corporation
December 6-8, 2011**



Presentation will cover....

- EPA's role
- About the watershed assessment
- What has been accomplished so far
- What is happening right now
- What happens next



Why is EPA involved?



- Nine Bristol Bay Tribes, BBNC, other tribal organizations and many groups and individuals, who were concerned about the proposed Pebble Mine, asked EPA to use our authority under Section 404(c)* of the Clean Water Act
- Two Bristol Bay Tribes, other tribal organizations, the Governor, and a few others including Pebble Limited Partnership asked us to let the standard NEPA/404 review process proceed
- After carefully considering all of the requests EPA decided to conduct a watershed assessment to provide a **scientific** basis for any future decisions

**Section 404(c) authorizes EPA to restrict, prohibit, deny, or withdraw the use of an area as a disposal site for dredged or fill material if the discharge will have unacceptable adverse effects on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas.*

Purpose of the Assessment



- To inform a decision on whether there is sufficient information regarding potential unacceptable adverse effects from large-scale mining
- To inform development of potential restrictions

Questions for the Assessment



Is the Bristol Bay salmon fishery the one-of-a-kind, world class fishery that it is depicted to be?

What are the potential impacts to Bristol Bay's salmon fishery from large-scale development activities such as hard rock mining?

Are there technologies or practices that will mitigate these impacts?

The Assessment is **NOT**:



A regulatory decision. The assessment results may be used by regulatory decision makers in the future.

An assessment of ALL potential impacts from development. This assessment focuses on impacts related to the discharge of dredged and fill material to water. There are other regulatory processes (NEPA, Air Permitting) which will address other potential impacts.

A field investigation. The assessment will use available information and data, with the exception of some additional traditional ecological knowledge collection.

The Assessment is:



Based on science. The project team has requested available data from all sources, including agencies, tribes, corporations, landowners, claimholders and the community in order to complete a robust and objective assessment.

Being conducted in an open and transparent manner. EPA management and staff have made trips to the region to see first hand what is being studied and talk with those affected.

Focused by endpoints, geography and timeframe.

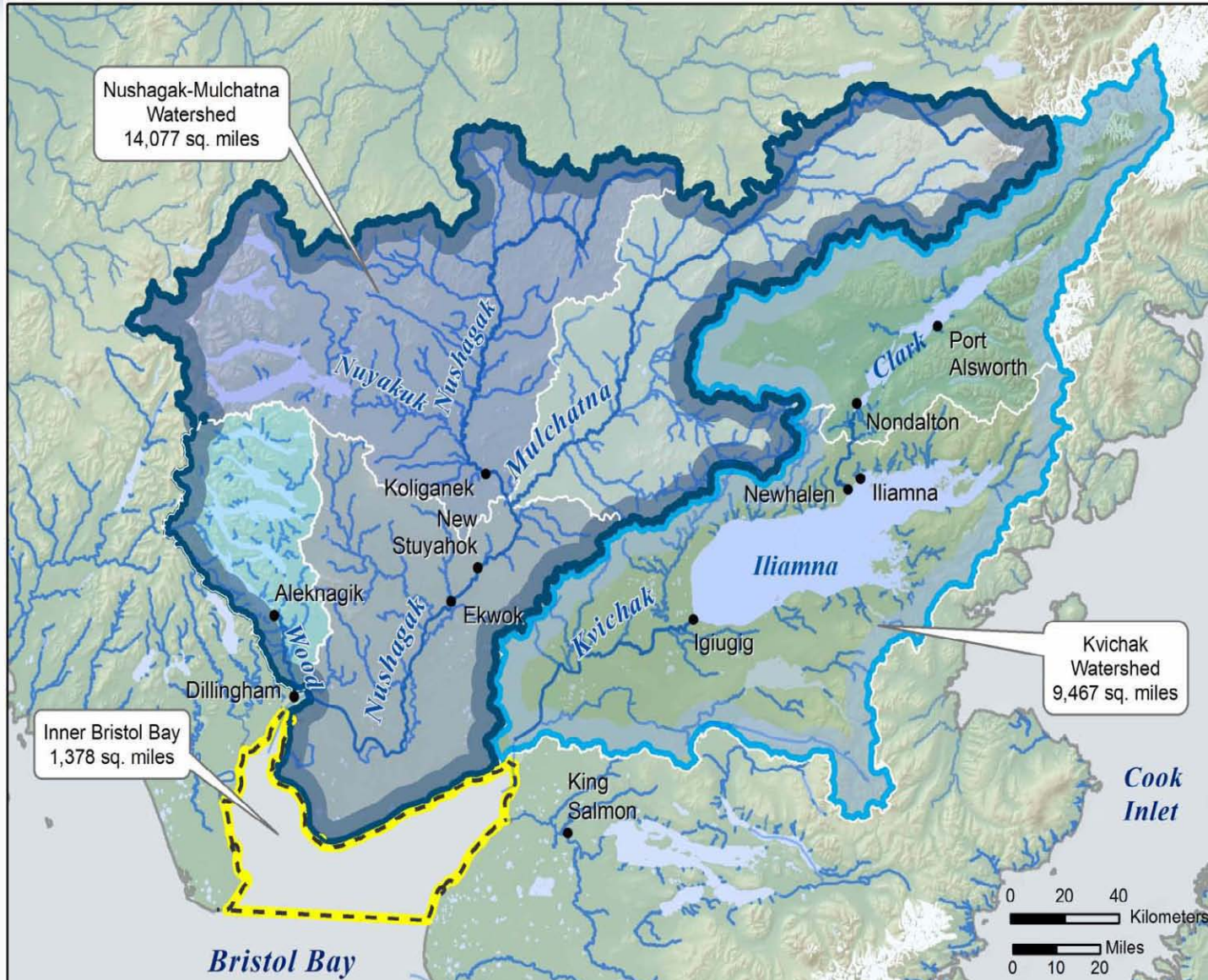
Assessment Endpoints



The endpoint is the **salmon fishery** and associated impacts on wildlife, human health and welfare (including subsistence and recreation)



Assessment Area



Nushagak-Mulchatna Watershed
14,077 sq. miles

Kvichak Watershed
9,467 sq. miles

Inner Bristol Bay
1,378 sq. miles

Bristol Bay

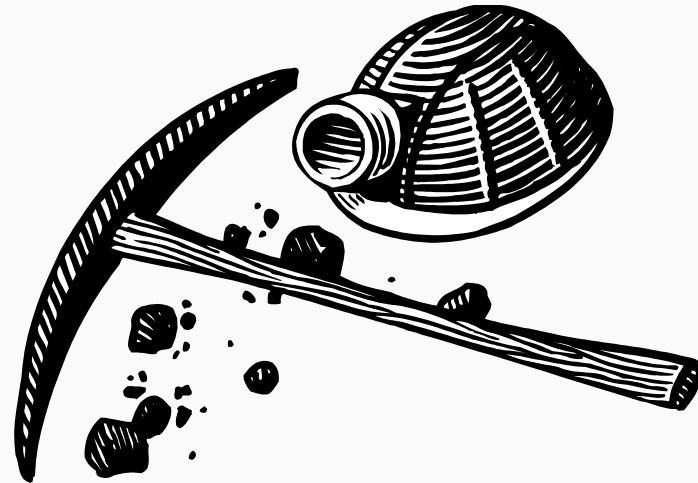
Cook Inlet



Assessment Time Frame



**The mining life-cycle
(including exploration,
construction, mining
operation, closure, and
long-term maintenance)**





Project Team and Stakeholders

- EPA's Team includes scientists, technical and support staff from EPA Region 10, EPA's Office of Research and Development, EPA contractors, and other federal agencies.
- Intergovernmental Technical Team of representatives from federal and state agencies and from Tribal Governments.
- Government to Government Consultation with Tribes
- Interested public, including individuals and groups

What has been done so far



Outreach

- Community meetings in Ekwok, Iliamna, Nondalton, Newhalen, Koliganek, Kokhanok, New Stuyahok, Dillingham and Anchorage
- Presentations at conferences and meetings
- Intergovernmental Technical Team (IGTT)
- Hundreds of letters and petitions
- More than 14,000 e-mails
- Media and congressional interest
- Website and listserv



Characterized Current Conditions

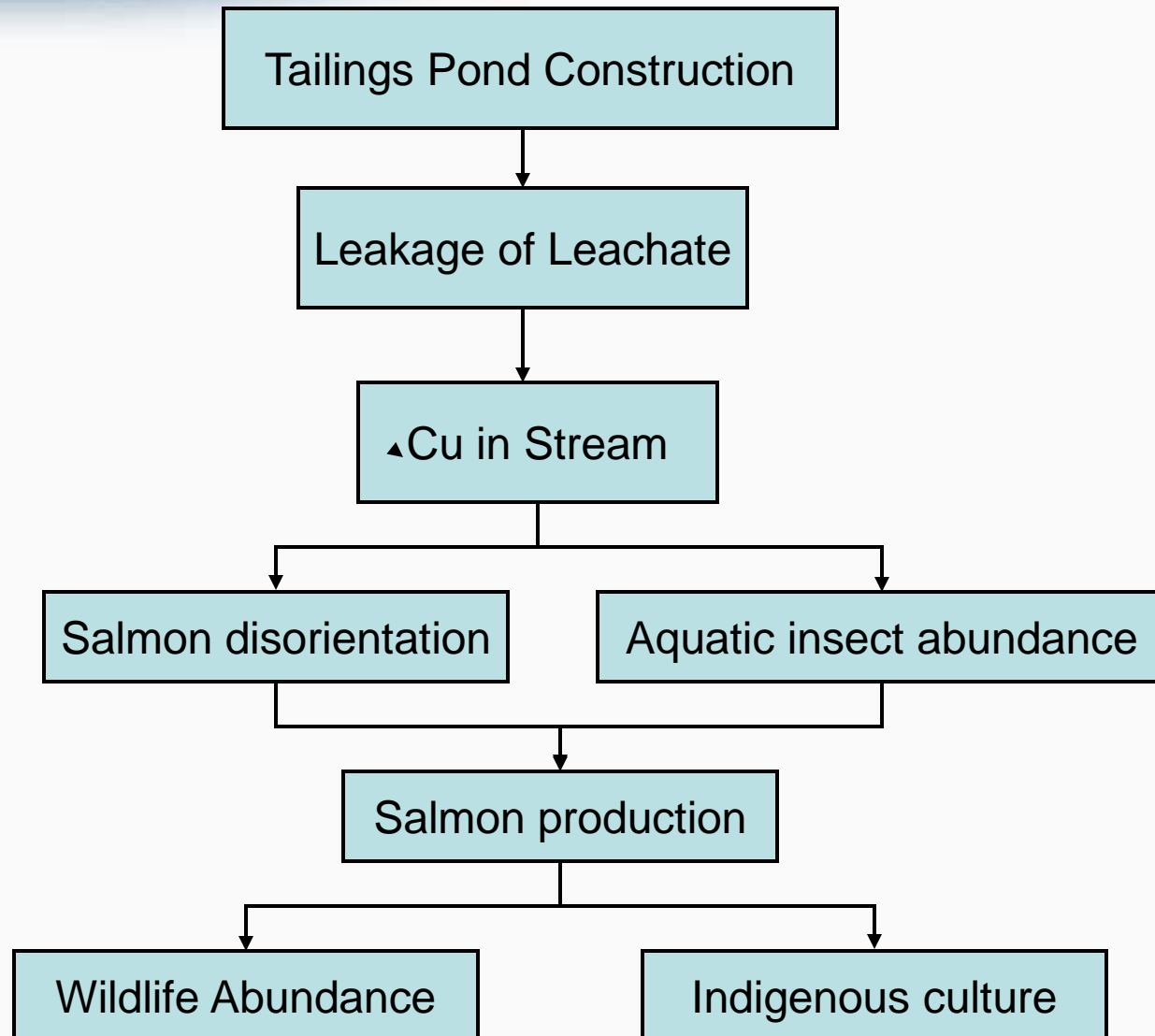
- **Salmon**
 - **Other Fish**
 - **Wildlife**
 - **Indigenous Culture**
 - **Economy**
- **Condition**
 - Descriptive
 - **Status**
 - How distinctive?
 - **Causes**
 - Why distinctive?

What has been done so far



Developed Conceptual Models:

Models:
This is an example of a simple conceptual model





Conceptual Models for Bristol Bay:

- Mine construction and operation – potential habitat effects
- Mine construction and operation – potential water quality effects
- Post mine closure – potential habitat and water quality effects
- Accidents and catastrophic failure
- Potential fish mediated effects on indigenous cultures.

What has been done so far



Traditional Ecological Knowledge Study

- Conducted 54 interviews in these villages:

Iliamna

Dillingham

Newhalen

New Stuyahok

Nondalton

Koliganek

- Hope to do interviews in 3 more villages
- Messages quite consistent

Elder Interviews



- Question: “What is the importance of salmon in the lives of the people of the Bristol Bay villages?”
- Semi-structured interviews
- Recorded in Yup’ik or Dena’ina if desired*
- Not a “survey” not a “hearing”





Developing a Plausible Mining Scenario

- Mine open pit and block cave
- Waste rock (overburden and sub-economic ore)
- Ore processing
- Tailings
- Concentrate transport (pipeline)
- Water supply and disposal
- Support facilities (housing, equipment maintenance etc.)
- Roads
- Power lines or onsite generation
- Not secondary development



Completing the Risk Assessment

- Exposures
- Responses as functions of Exposures
- Combined Effects
 - Habitat loss
 - Habitat modification
 - Toxicity
- Cumulative Impacts
 - Qualitative assessment including secondary development



Some preliminary information from the characterization work being completed for the watershed assessment*

- Salmon
- Cultural

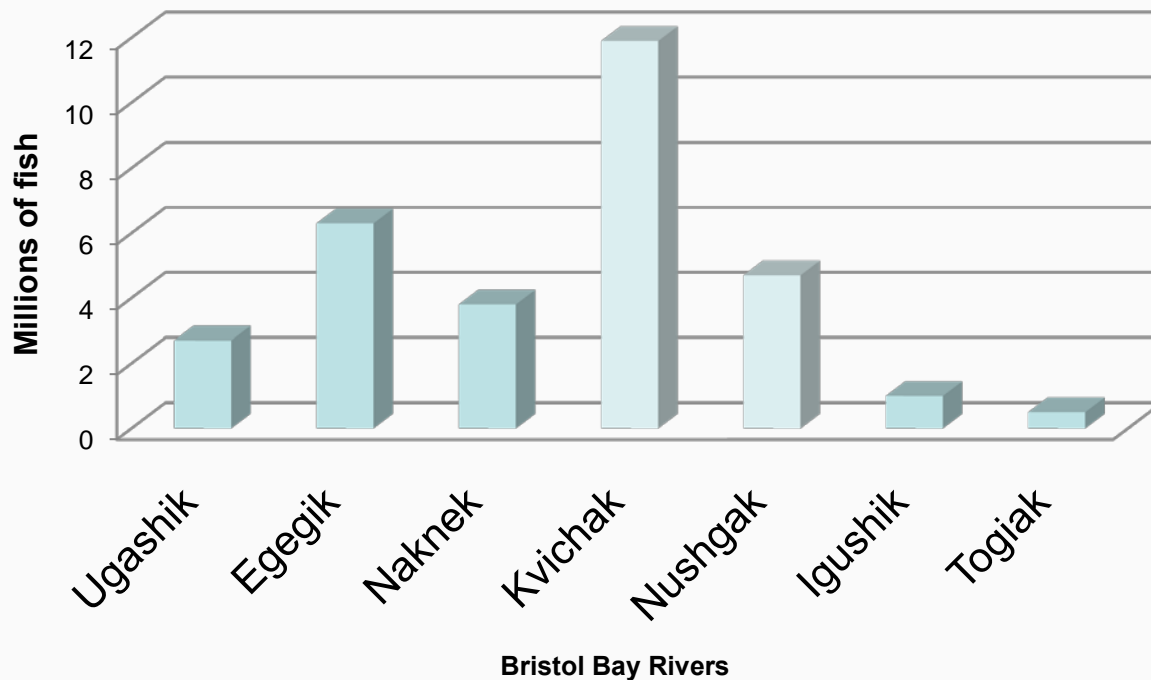
*This information is still under review by EPA to make sure that the assessment will be supportable, objective and complete.

Sockeye Salmon Fishery

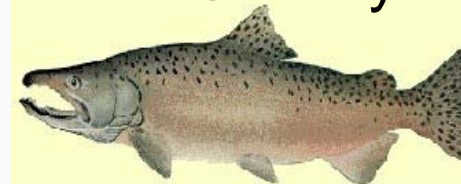


Average run 1956 - 2010

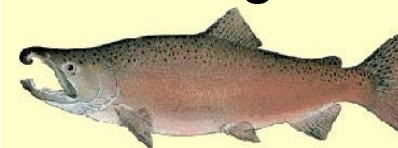
Bristol Bay Sockeye Runs = 30,997,285



Sockeye



King



Coho



Chum

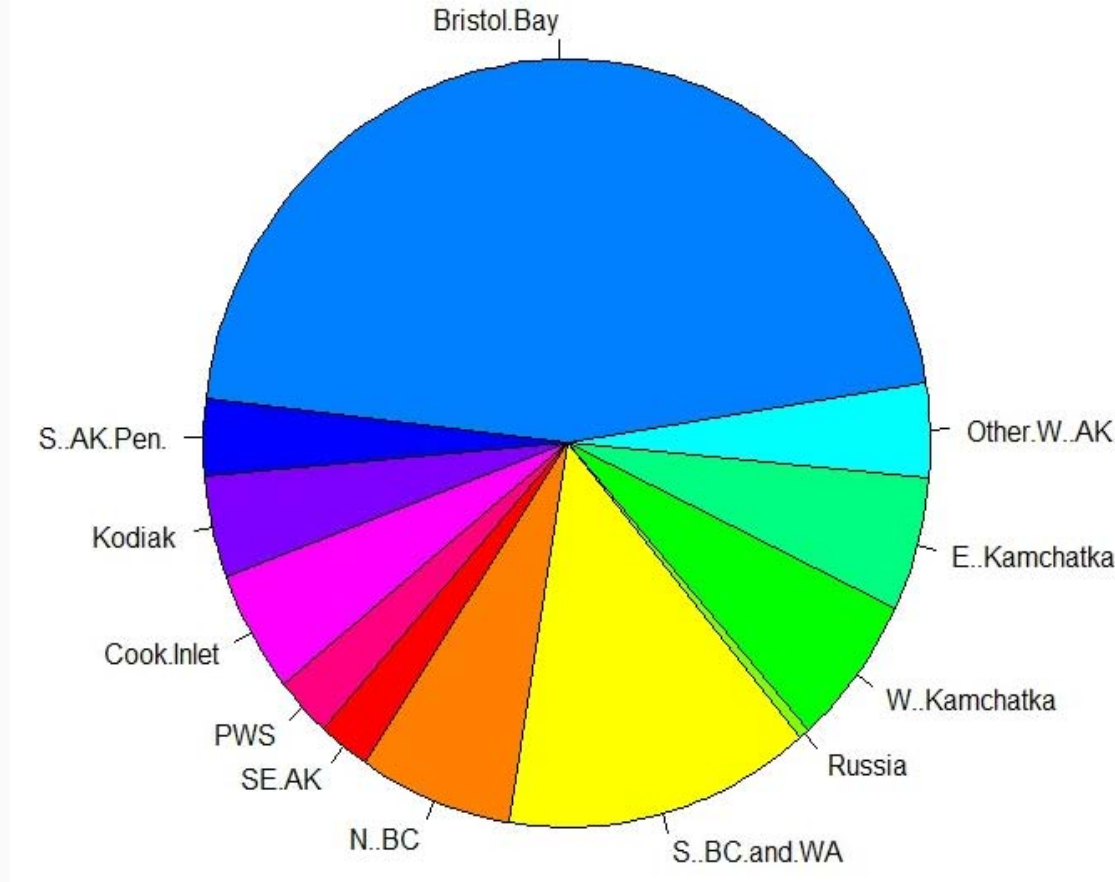


Pink

Sockeye Salmon Fishery



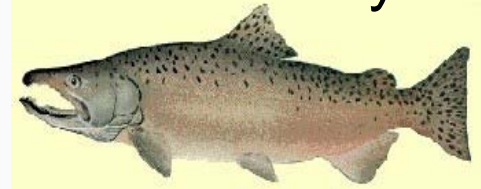
Yes, Bristol Bay is a one-of-a-kind fishery on a global scale.



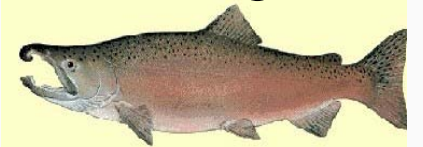
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Sockeye



King



Coho



Chum

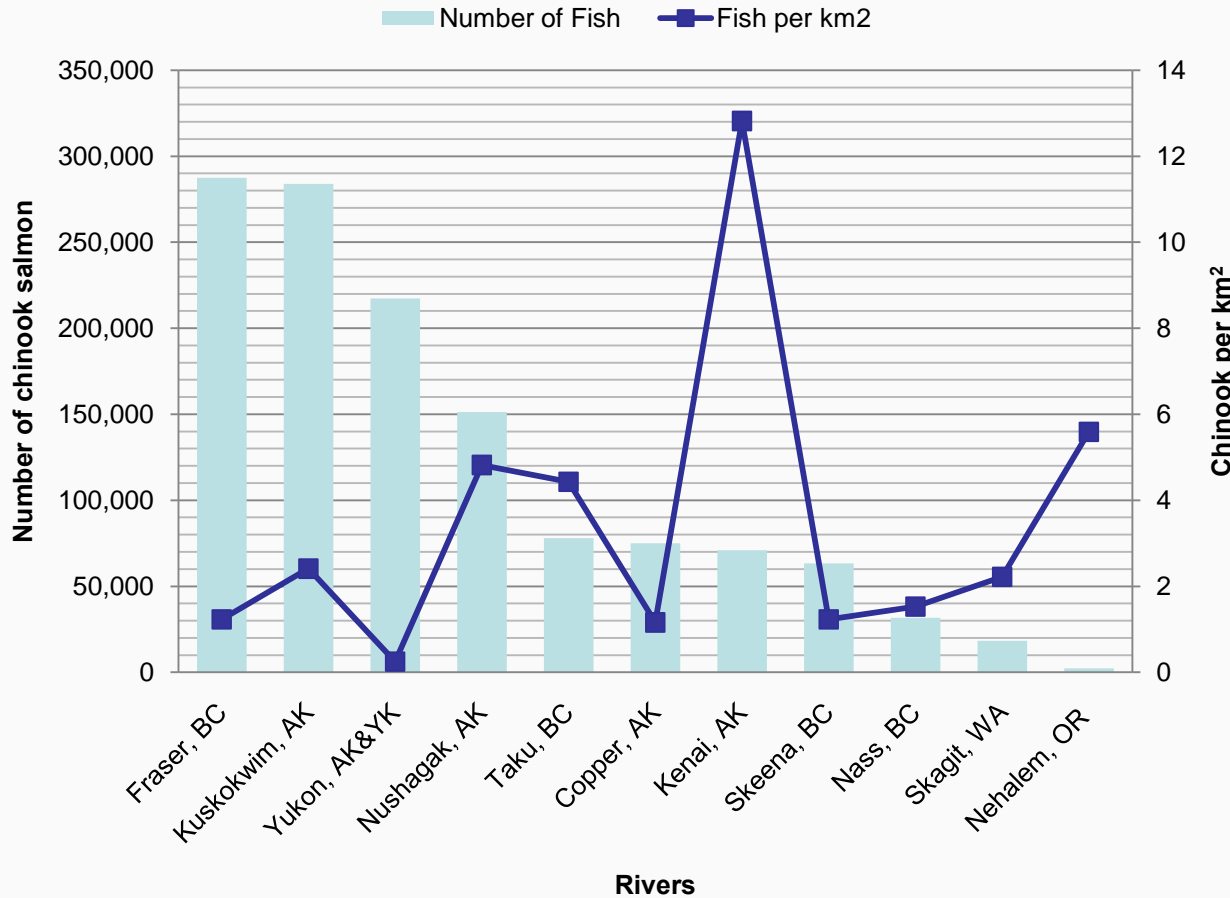


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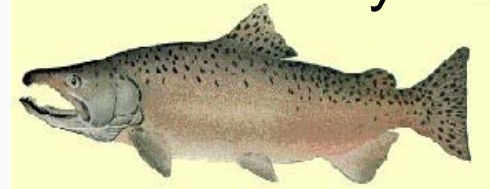
Chinook (King) Salmon Fishery



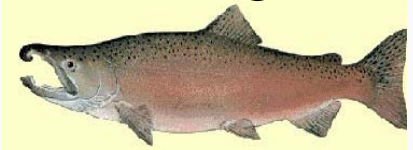
Largest Chinook (King) Salmon Runs in North America



Sockeye



King



Coho



Chum



Pink

Why does Bristol Bay produce so many salmon?



- Confluence of climate, topography and geology to provide habitat
 - Ample precipitation – 44 inches at the Pebble Deposit
 - Topography not too steep and not too flat
 - Glacial history provides
 - Good substrate (permeable land surface and river beds)
 - Strong groundwater/surface water interchange
 - Many large lakes
 - Limited human development/impact



Diverse habitat among many rivers and lakes results in many discrete populations and a robust metapopulation (“portfolio effect”) producing less variance for the fishery.

Indigenous Culture: Condition?



- Cultures are healthy and the population is growing
- Subsistence fishing and hunting, of numerous species of fish, mammals and birds dependent on the river and lake system, continues to provide native people with up to 80% of their protein, and up to and in some cases surpassing 300 pounds of food per person.
- Through social systems, the local people manage the commons sustainably through traditional practices which ensures a continuous harvest in perpetuity.

Indigenous Culture – Status?



Bristol Bay, including the Nushagak and Kvichak watersheds, hosts one of the few remaining vital, viable and sustainable indigenous cultures relying on wild salmon in the U.S. and perhaps the world.

Indigenous Culture – Cause?



- Culture has not been broken or significantly modified by western contact. There are strong links to the past.
- The Bristol Bay Watershed ecosystem is intact with clean water, very large salmon stocks and other abundant wild foods.
- The indigenous people of southwest Alaska continue to be the majority population.

What happens next



Schedule

| | |
|------------------------|--|
| January 2012 | Public Input on Scientific Peer Reviewer |
| Late April 2012 | Draft Watershed Assessment Available |
| Early May 2012 | EPA Public Comment Meetings |
| Late May 2012 | Scientific Peer Review Panel Open Meeting |
| Fall 2012 | Final Watershed Assessment |

For More Information

- www.epa.gov/region10/bristolbay
- Sign up for E-mail updates (listserv)
- Contact:
 - Rick Parkin, Management Lead 206-553-8574
 - Tami Fordham, Tribal Coordinator 907-271-1484
 - Judy Smith, Community Outreach 503-326-6994
- E-mail the project team: **R10BristolBay@epa.gov**

We value your input



What are your questions and comments?

What are the reasons you oppose or support large-scale development?

It is important for us to hear many perspectives in order to make informed decisions

