

# *Economic Self-Determination and Commercialization of Subsistence Marine Resources of Alaska Natives*

*8<sup>th</sup> Meeting of the UN Open-ended Informal Consultative Process  
on Oceans and the Law of the Sea*

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## **Alaska Marine and Forest Products**

- Modern utilization for commercial purposes based principally on the enduring wisdom of Alaska Natives
  - Subsistence foods and traditional medicines
- In local industries these products typically marketed as:
  - Specialty wild food/menu items, jams/jellies, and confections
  - Teas and health-oriented beverage ingredients
  - Hand-crafted medicinals and tonics
  - Boutique cosmetics and personal care products
  - Home environment enhancing products
- Beyond established commercial fisheries, new opportunity must derive from *sustainable* resources and supply chains for emerging large, high-value markets

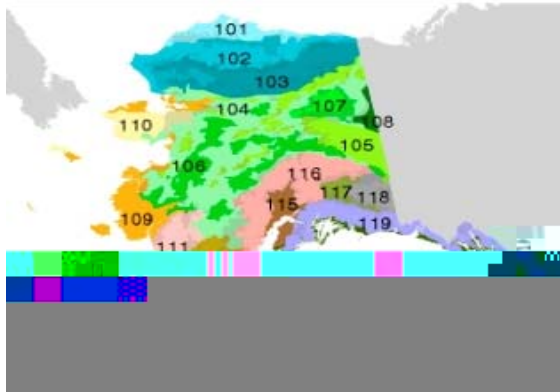
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- Develop Alaska's exceptional wilderness and marine

## Biodiversity Sources of Alaska

- Inherent biodiversity in 20 USGS ecoregions
  - 6+ climatic zones (12 with maritime features)
  - Every major geologic period represented
  - Pre-ice age, unglaciated tracts; 10,000 extant glaciers
  - 89 volcanoes with hotspots and boiling mudpots



- Enormous metal and mineral deposits
- 2 old-growth rainforest stands (33 MM acres)
- 5 tundra types and bogs
- Sea level to 20,300 feet
- 33,000 miles of coastline



## Alaska's Unique Environment

- Vast Alaska wilderness and marine environments provide rich sources of novel commercial products
- Result from extreme environmental stresses
  - Unusual species and novel molecules emerge through biochemical/genetic adaptation to harsh conditions
- Biotic
  - Herbivory (mammals, birds, insects), microbial pathogens
- Abiotic
  - Photoperiod length / UV exposure (60 days to 200 days)
  - Nutrient-poor soils, high levels of metals (e.g. arsenic)
  - Precipitation (150mm to 2500mm; 6 in. to 150 in.)
  - Temperature (-63°C to 35°C; -82°F to 95°F)
    - **Most organisms are psychrophilic or cold-adapted**

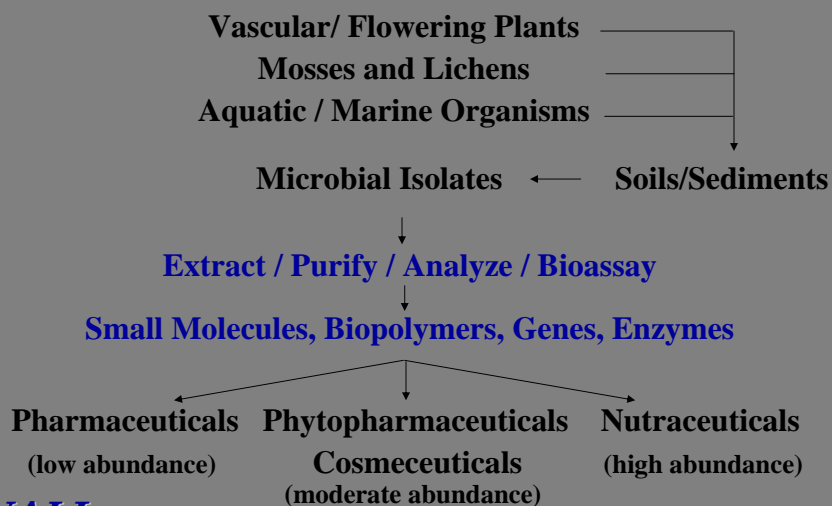
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## Discovery Strategies

- Random Bioprospecting
  - Small quantities of soils, sediments, coastline samples
    - Cultivable microbes and nucleic acid recovery from uncultivable organisms that yield enzymes/biocatalysts
    - Exclusively for pharmaceutical discovery
- Targeted Bioprospecting
  - Focused collections of small amounts of plants, soils, sediments, etc. directed by chemotaxonomy, chemical ecology (abiotic/biotic stress), extreme conditions
    - Principally for pharmaceutical discovery or cosmeceuticals
- Ethnopharmacology
  - Alaska Native traditional medicine and subsistence diets offer hundreds of plant, fungal, animal, and marine candidates for product R&D

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## Maximum Fieldwork Output

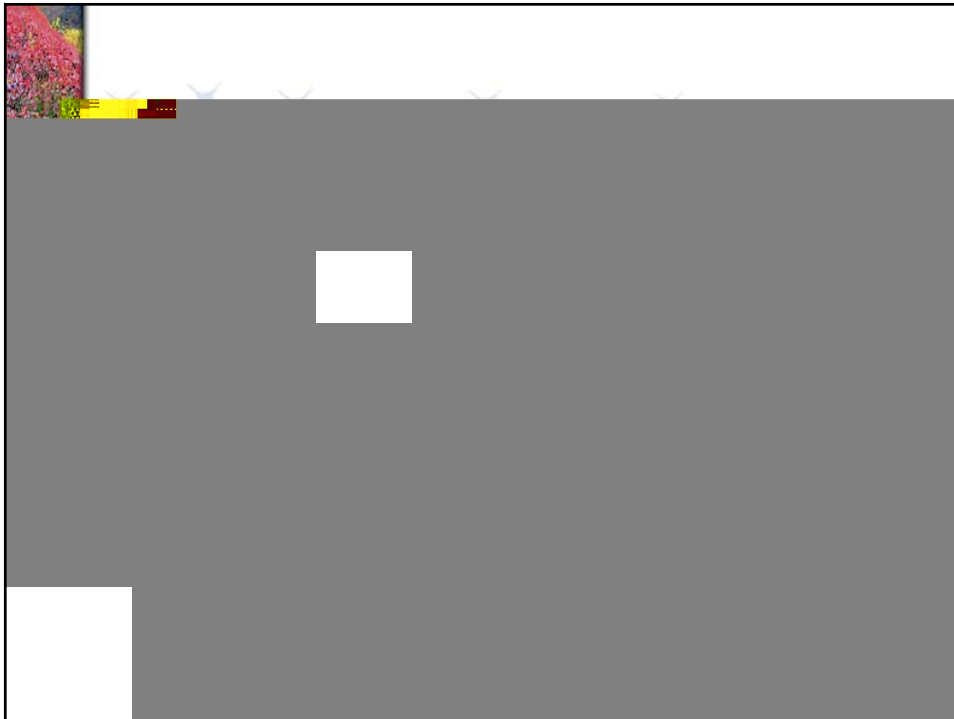


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## Alaska Native Claims Settlement Act

- Alaska Natives extinguished sovereign rights to land and resources for \$962.5 million in 1971
- ANCSA prevented formation of reservations after

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## “Fair Treatment” Agreement

- Denali’s version of the “Fair Trade” Agreement
  - New initiative introduced for consideration in May, 2007
  - Targeted to accommodate diverse needs and expectations of Alaska Native organizations
  - Engage Federal and State agencies / landholders in active management beyond established protection laws – *for responsible commercialization* – of biodiversity and high-

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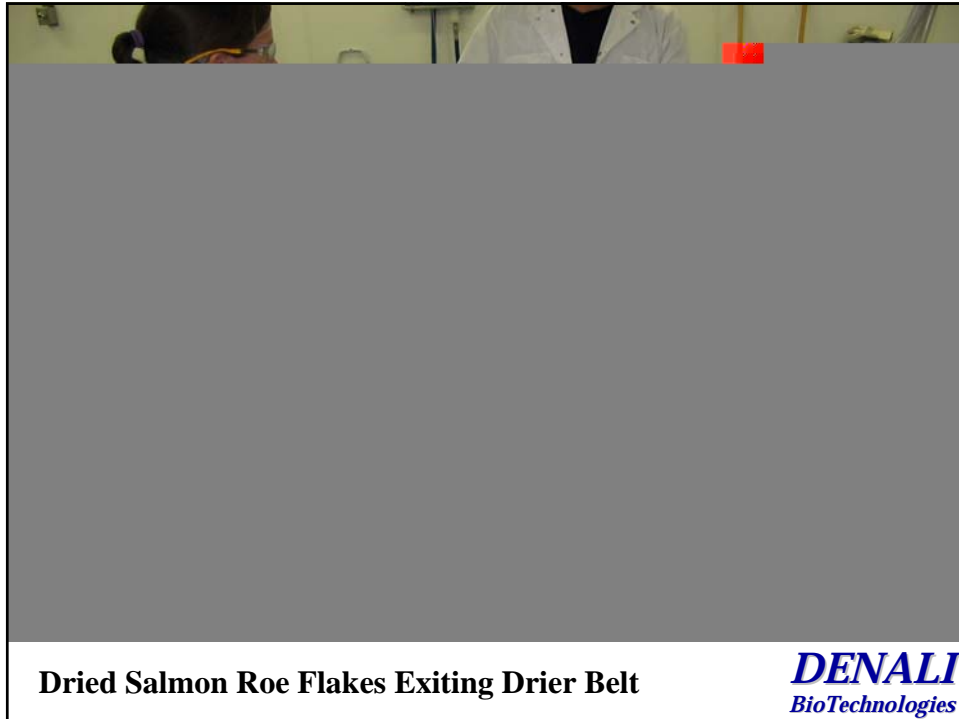


## "Fair Treatment" Agreement

- Compensation criteria:
  - "Passive" access to land
    - Royalty on profits from commercialized product (0.5 - 2%)
  - "Guided" access to land


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Dried Salmon Roe Flakes Exiting Drier Belt

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## Marine Mammal PUFA Project

- Key observations and drivers:
  - Alaska Natives who consume high quantities of marine mammal fat (coastal populations) do not suffer from high rates of central nervous system (CNS) disease or depression
  - Interior populations tend to be more prone to depression
- To find the reason, seal oil prepared in a traditional manner as food is under analysis for novel essential polyunsaturated fatty acids (PUFA)
  - Many novel PUFA in addition to EPA and DHA
  - Compare / contrast to common salmon PUFA
- Enzymatically convert common salmon PUFA to novel seal PUFA, separate, and screen for CNS effects

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## Future Challenges

- Sustainability of marine and non-timber resources
  - Identify those appropriate for desired market
    - Nutraceuticals demand abundant resources and harvest volume
    - Cosmeceuticals consume far less resources (~10% of above)
    - Pharmaceuticals require very limited harvest and footprint
- Protect high intrinsic resource value during processing
- Supply chains
  - Determine fair prices for harvest
    - Critical for ability to compete in marketplace
  - Develop efficient logistical, transport and storage strategies
    - Minimize spoilage/waste and control shipping costs
- Establish priority villages for commercial partnerships

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## Contact Information

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