The Role of the Bering Sea Sub-Network (BSSN) to Map Subsistence Use and Explore Climate Change Impacts and Adaptations

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Wakefield Symposium, Anchorage
Sept. 16, 2011
Objective

• The purpose of this presentation/paper is to introduce an innovative subsistence mapping technique and to demonstrate its utility in decision-making and research.

1. Introduce BSSN
2. Introduce Mapping Methodology
3. Demonstrate utility with an example from the Bering Strait
Bering Sea Sub-Network (BSSN)

To improve understanding of environmental changes occurring in the Bering Sea enabling scientist, communities and governments predict, plan and respond to these changes.

- **Victoria Gofman**, M.A. Aleut International Association (PI)
- **Lilian Alessa**, Ph.D. University of Alaska RAM (PI)
- **Patricia Cochran**, Alaska Native Science Commission (Co-PI)
- **Andy Kliskey**, PhD University of Alaska RAM (Co-PI)

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Community-Based Research

Communities are partners in the research

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Three Datasets

- **Quantitative**
  - SPSS statistical software
- **Qualitative**
  - Nvivo 9
- **Spatial**
  - ESRI GIS
Mapping Component

• Impacts from Climate Change are likely to lead to an increase in development interests and activity

• Maps of culturally, environmentally and socially vulnerable areas are needed to advocate for local interests and reduce potential conflicts and impacts
The spatial data

- Directed sampling, consensus of high harvesters
- Surveys administered by CRAs with paper maps as part of the survey
Density Mapping in GIS

- Reveals general patterns, spatial trends
- Fits a smooth surface over point values
- Calculations are based on the quadratic kernel function
This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. Species included in this analysis are walrus, seal, salmon, trout and smelt. This map includes input from 33 residents of Togiak, Alaska.
This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. Species included in this analysis are walrus, seal, salmon, trout and smelt. This map includes input from 35 residents of Togiak, Alaska.
Subsistence Harvest Areas September 2009 - August 2010

Fall
Winter
Spring
Summer

This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. Species included in this analysis are walrus, seal, salmon, trout and smallt. This map includes input from 73 residents of Togiak, Alaska.
This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. Species included in this analysis are walrus, seal, salmon, trout and smelt. This map includes input from 58 residents of Togiak, Alaska.
Subsistence Harvest Areas September 2009 - August 2010

Walrus
Seal
Salmon
Trout
Smelt

This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. This map includes input from 11 residents of Togiak, Alaska.
Subsistence Harvest Areas September 2009 - August 2010

Walrus
Seal
Salmon
Trout
Smelt

This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. This map includes input from 34 residents of Togiak, Alaska.
Subsistence Harvest Areas September 2009 - August 2010

Walrus
Seal
Salmon
Trout
Smelt

This map was created by the Aleut International Association as part of the Bering Sea Sub-Network, community-based research, funded by the National Science Foundation. This map includes input from 61 residents of Togiak, Alaska.
Subsistence Harvest Areas September 2009 - August 2010

Walrus
Seal
Salmon
Trout
Smelt

Area Density

low
medium
high

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Subsistence Mapping

Map 7 - Overlapping Polygon Example
Barrow, Kaktovik, and Nuiqsut

Map 8 - Subsistence Harvest Areas for Bowhead Whale from March 2009 to February 2010 in Gambell, Alaska

Map Legend:
- High
- Moderate
- Low
- None

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- ‘Regional analyses of traditional marine use patterns (spatial and seasonal) for application in the development of strategies and measures to reduce potential conflicts and impacts of multiple users of Arctic waterways.’

- ‘There is insufficient information to identify with any precision the likely effects of marine shipping for most Arctic communities.’
http://aleut-international.org
Thank you.
Questions?