



The Division of Subsistence, ADF&G: An Overview of Context, Research Methods, and Findings



**James A. Fall
Division of Subsistence,
Alaska Department
of Fish & Game**

**NPFMC Social Science
Planning Team Workshop**

Anchorage, Alaska

May 8, 2018

Division of Subsistence: Responsibilities

- Alaska Statute 16.05.094 lists “duties”
 1. Research and data compilation
 2. Data reporting and education
 3. Application of study findings



Subsistence fishing and processing,
Chignik Lake

The Division's "Mission Statement"

"To scientifically quantify, evaluate, and report information about customary and traditional uses of Alaska fish and wildlife resources."



**Documentation of harvest areas,
Kuskokwim River**



**Processing king salmon at a fish camp on
Cook Inlet, near Tyonek**

Types of research projects



- Goal: “holistic” understanding of mixed economy and way of life
 - Community “baseline” studies (focus on one year)
 - Special topic research
 - Local and Traditional Knowledge (TEK/LTK)
 - Harvest monitoring (multi-year)
 - Multiple methods: quantitative and qualitative
-
- Most projects are partnerships
 - Multiple funding sources
 - Guided by ethical principles

Ethical Principles



- Alaska Federation of Natives
- Office of Polar Programs, National Science Foundation
- State confidentiality statute
- ✓ Informed consent
- ✓ Anonymity
- ✓ Community approval
- ✓ Community review
- ✓ Study findings provided to communities



Methods: developing a project in Togiak



Methods: Local assistant training in Noatak



Methods: conducting surveys in Emmonak



Methods: Project Review Meeting in Chignik Lake



Comprehensive Household Surveys

LNG - Comprehensive Subsistence Survey, 2014

HARVESTS: SALMON HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for salmon? Y N
2. During the last year (between January 1, 2014 and December 31, 2014) did you, or members of your household USE or TRY TO HARVEST salmon? Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.
IF the answer is YES, continue on this page ...

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD HARVESTED in 2014, including with a rod and reel. INCLUDE salmon you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch. Do not include fish caught and released.

Read names below	In 2014 did members of your household ...					In 2014 HOW MANY _____ DID YOUR HOUSEHOLD HARVEST WITH					# of those used just for dog food?	
	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?	SET GILL NET	SEINE NET	FISH WHEEL	ROD & REEL	OTHER GEAR (specify type)		UNITS
(circle)						(number harvested by each gear type)					(amount / type specify unit)	
CHINOOK (KING) SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
113000000												
CHUM (DOG) SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
111000000												
SOCKEYE (RED) SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
115000000												
PINK SALMON (HUMPIES)	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
114000000												
COHO SALMON (SILVERS)	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
112000000												
LANDLOCKED SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
116000000												
UNKNOWN SALMON	Y	N	Y	N	Y	N	Y	N	Y	N	/	IND.
119000000												

These columns should include ALL the salmon HARVESTED by members of this household in 2014.

ASSESSMENTS: SALMON 110000000

Between January 1, 2014 and December 31, 2014...

To conclude our salmon section, I am going to ask a few general questions about salmon.

- Last year...
... did your household use LESS, SAME, or MORE salmon than in recent years? X L S M
IF LESS or MORE ... X = do not use
WHY was your use different? _____ 1
_____ 2
- Last year...
... did your household GET ENOUGH salmon? Y N
If NO...
What KIND of salmon did you need? _____
- How would you describe the impact to your household of not getting enough salmon last year? ... not noticeable? ... minor? ... major? ... Severe?
(0) (1) (2) (3)

SALMON: 04 NANWALEK: 129

- Provide “snapshot” of patterns in a community in a study year
- Administered in person
- Modular
- All: demography, harvests, cash economy, evaluations of change
- Other (e.g.): networks, food security, expenses
- Mapping and ethnographic components

COMPREHENSIVE SUBSISTENCE SURVEY

AKSSF ALASKA
PENINSULA

SAND POINT, ALASKA

From April 1, 2016 to March 31, 2017

printed: 2017-03-16

This survey is used to estimate subsistence harvests and to describe the role of subsistence in the local economy of your community. We will publish a short summary report that will be available to community members. We share this information with the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Park Service. We work with the Federal Regional Advisory Councils and with local Fish and Game Advisory Committees to better manage subsistence, and to implement federal and state subsistence priorities.

We will NOT identify your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. Even if you agree to be surveyed, you may stop at any time.

HOUSEHOLD ID:		
COMMUNITY ID:	299	299
INTERVIEWER #1:		
INTERVIEWER #2:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
DATA CODED BY:		
DATA ENTERED BY:		
SUPERVISOR:		



photo by Lisa Hutchinson-Scarborough

PAULOFF HARBOR VILLAGE
PO BOX 97
SAND POINT, AK 99661
907-383-6075

**QAGAN TAYAGUNGIN TRIBE
OF SAND POINT VILLAGE**
PO BOX 447
SAND POINT, AK 99661
907-383-5616

NATIVE VILLAGE OF UNGA
PO BOX 508
SAND POINT, AK 99661
907-383-5553

KATHERINE REEDY
DEPARTMENT OF ANTHROPOLOGY
IDAHO STATE UNIVERSITY
721 S. 8TH AVE. STOP 8005
POCATELLO, ID 83201-5745
208-282-6137

ALASKA DEPARTMENT OF FISH & GAME
DIVISION OF SUBSISTENCE
333 RASPBERRY ROAD
ANCHORAGE, AK 99518-1565
907-263-2353

Conversion Factors



- Calculating food value: numbers of animals to usable/edible weights
- Round (whole) to usable (edible) weight
- Determining recovery rates
- Applications: food security, dietary studies, contamination, risk assessments, damage assessment
- See Naves and Fall 2017 in Arctic 70(1):86-100



Technical Paper Series

- Over 450 titles; also Special Publications Series
- On line at: <http://www.adfg.alaska.gov/sf/publications/>

Technical Paper No. 422

Alaska Subsistence Harvest of Birds and Eggs, 2015, Alaska Migratory Bird Co-Management Council

Liliana C. Naves



September 2016

Alaska Department of Fish and Game
Division of Subsistence



Alaska Migratory Bird
Co-Management Council



Technical Paper No. 421

Harvest and Use of Wild Resources in Northway, Alaska, 2014, with special attention to nonsalmon fish

by
Anna R. Godduhn
and
Marylynn L. Kostick

November 2016

Alaska Department of Fish and Game

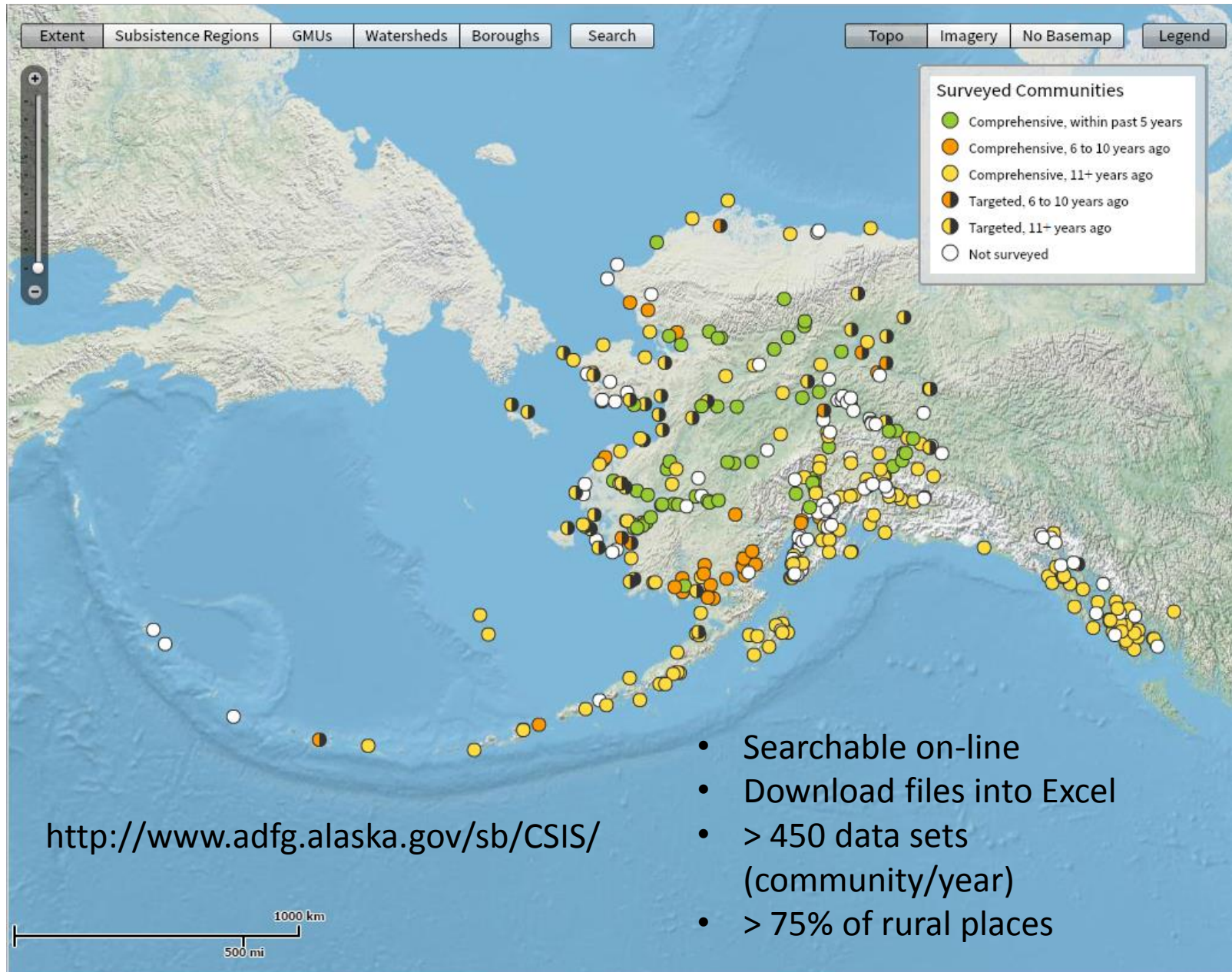
Division of Subsistence



Community Subsistence Information System or “CSIS”

- Online at <http://www.adfg.alaska.gov/sb/CSIS/>
- Searchable by resource, area, or community
- Export data into Excel file
- Data in CSIS for 87.5% of rural places (231 of 264)
- Number of comprehensive data sets in CSIS = ~515 (study community/year combinations)
- Number of CDP/year estimates = ~563
- Also includes category-focused projects (e.g. marine mammals only, land mammals only)

Community Subsistence Information System

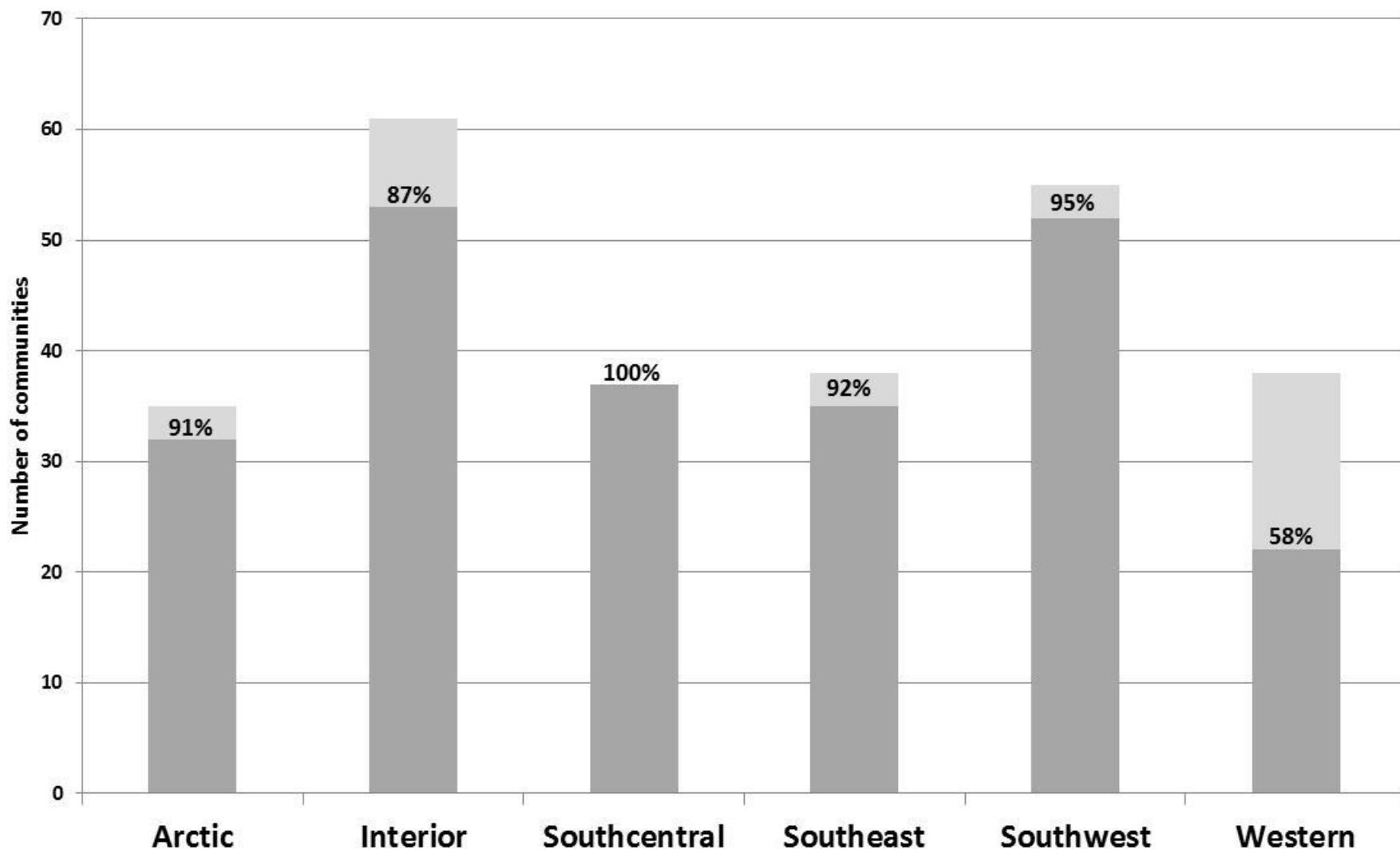


Special CSIS reports

- “Overview of Availability of Comprehensive Harvest Survey Data for Alaska Communities” (July 2017)
- “Estimated Harvests of Fish, Wildlife, and Wild Plant Resources by Alaska Region and Census Areas, 2014”
- Find these at CSIS homepage, “Special Topics Reports/Downloadable Special Reports”:
<http://www.adfg.alaska.gov/sb/CSIS/>

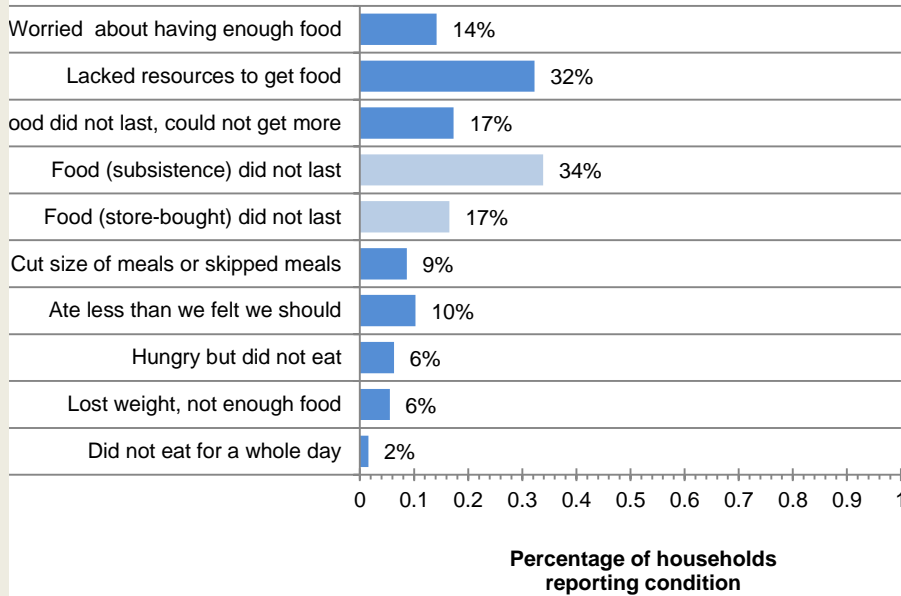
Number of Alaska communities for which comprehensive harvest data available in the CSIS by region

■ Communities represented ■ Communities not represented



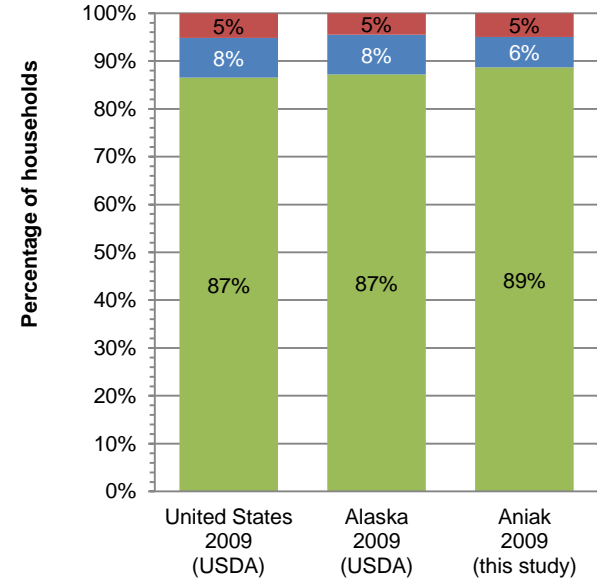
Food Security

A - FOOD INSECURE CONDITIONS



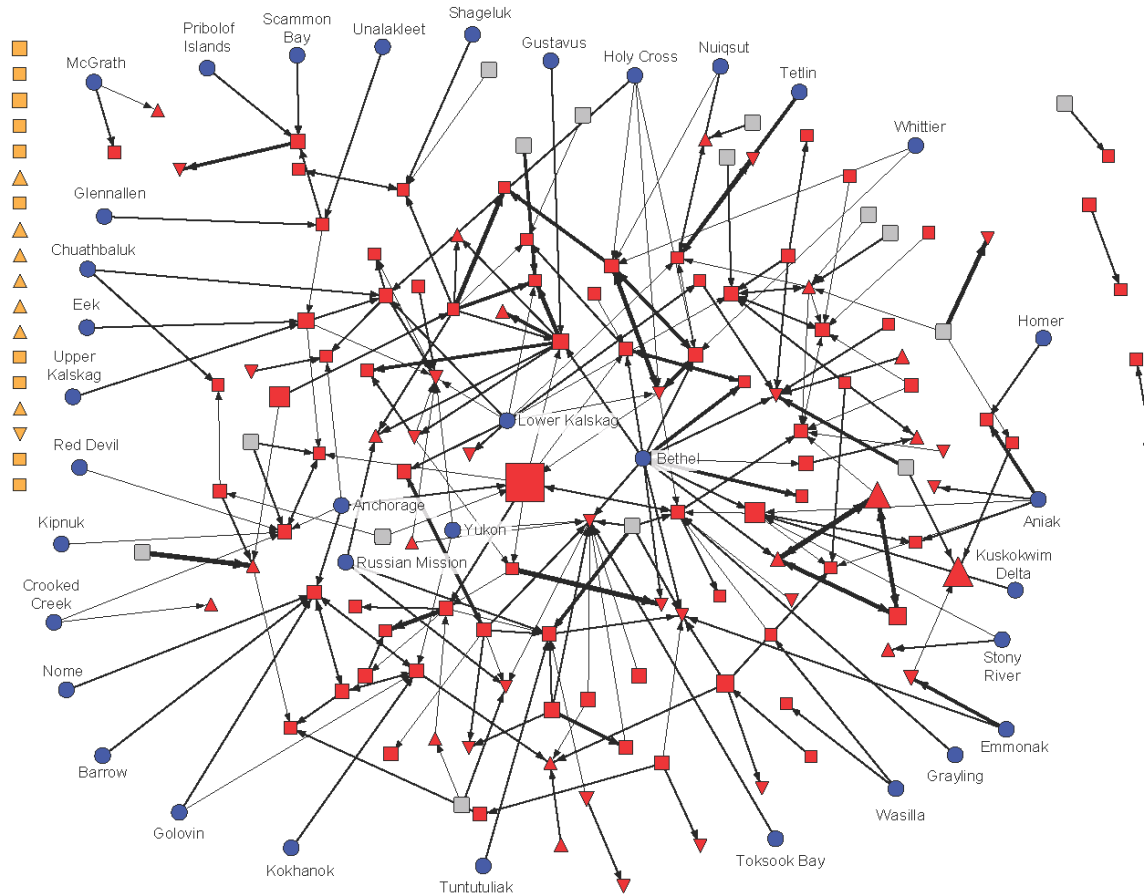
- Responses used to calculate households' food security category
- Responses to additional questions asked in this study

B - FOOD SECURITY CATEGORIES



- INSECURE - very low food security
- INSECURE - low food security
- SECURE - high & marginal food security

Sharing Network Analysis



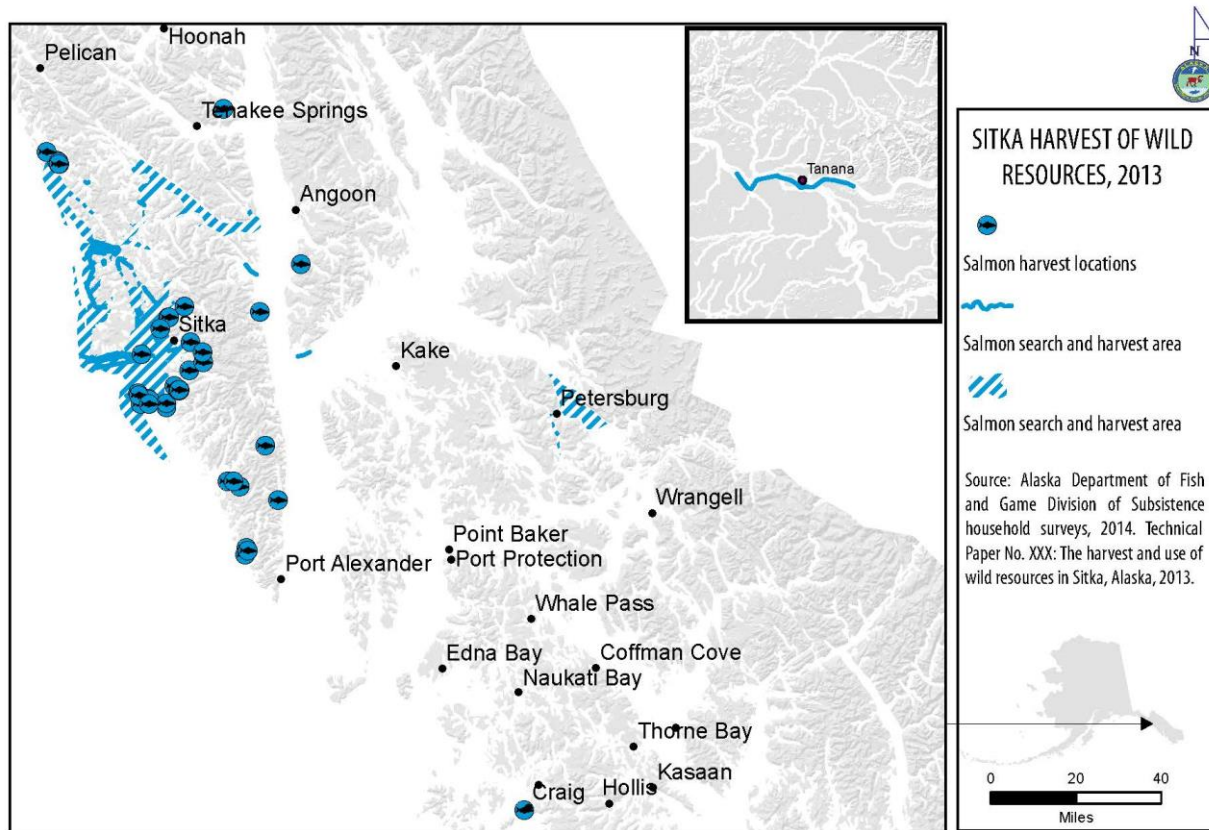
LEGEND

- Survey household, male & female heads^a
- ▲ Survey household, single male head^a
- ▼ Survey household, single female head^a
- Other household in study community
- Unknown household (usually in another community)
- Flows of wild foods from source harvesting or processing households to consuming (surveyed) households, as reported by the surveyed households^b
- Flows of wild foods from source harvesting or processing households to consuming (surveyed) households, as reported by the surveyed households^b
- Flows of wild foods from source harvesting or processing households to consuming (surveyed) households, as reported by the surveyed households^b
- Flows of wild foods from source harvesting or processing households to consuming (surveyed) households, as reported by the surveyed households^b
- Household that reported no harvesting or processing by members of another household or community

^a SYMBOLS are scaled to show surveyed households' total wild food harvests in edible pounds. Surveyed households with many sources of wild foods appear near the center of the figure. Households with fewer sources appear around the edges.

^b LINES are scaled to show the number of households named as wild food harvesters or processors by surveyed households. Arrows point from source households or communities to surveyed households. Households' own production is not shown.

Documenting Hunting, Fishing, and Gathering Areas through Maps



Harvest assessment: best practices



Salmon harvest assessment workshop,
Kotzebue, Alaska, November 2002

- Harvest Assessment Conference, 1995
- Joint ADF&G/AITC project: 2000 - 2003
- Working group
- 10 regional workshops
- Guiding principles and recommendations
- Final reports available

Salmon Harvest Calendar

June 2012

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY



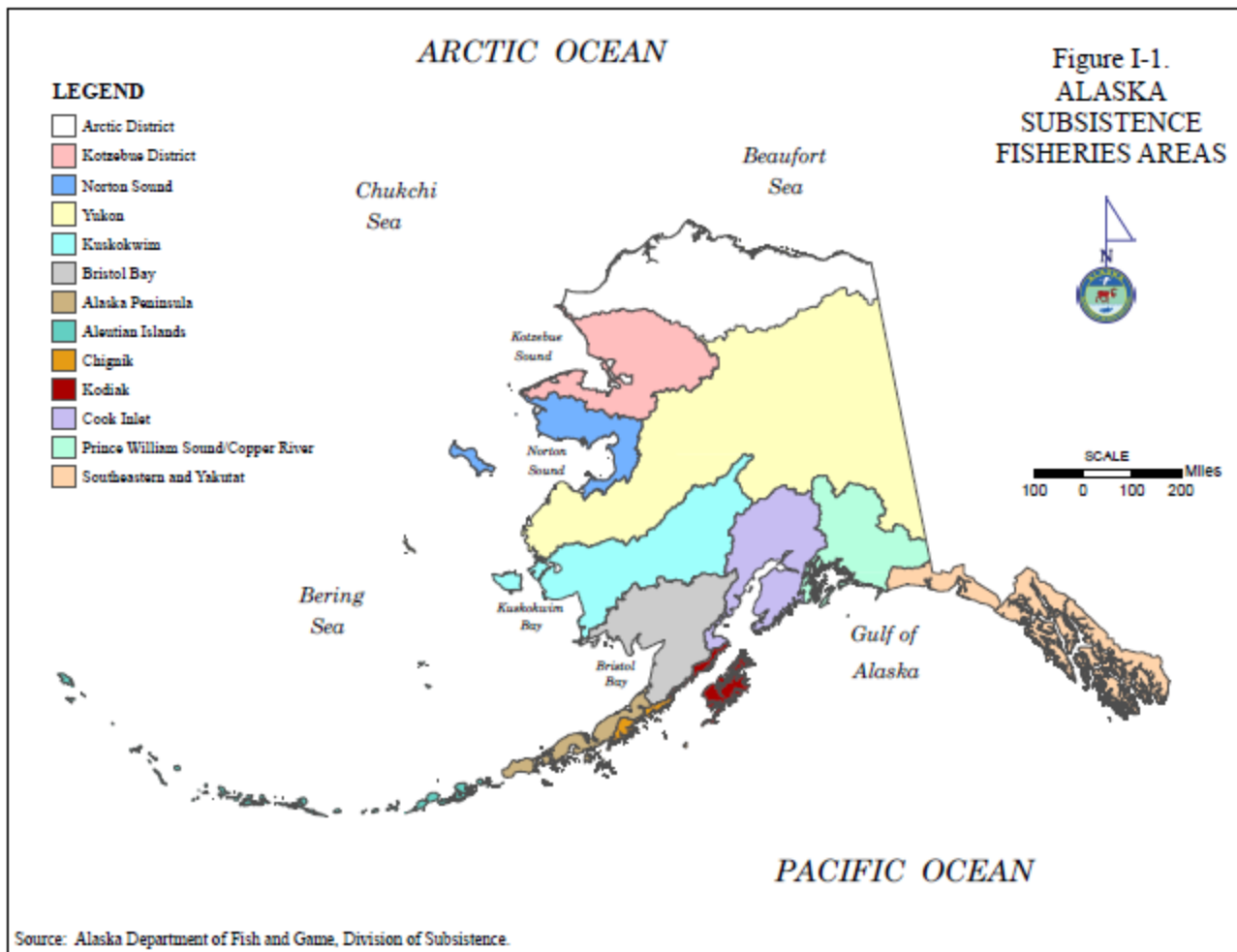
SUNDAY				MONDAY				TUESDAY				WEDNESDAY				THURSDAY				FRIDAY		SATURDAY	
																				1	2		
																				King _____	King _____		
																				Chum _____	Chum _____		
																				Sockeye _____	Sockeye _____		
																				Coho _____	Coho _____		
3				4				5				6				7				8		9	
King _____				King _____				King _____				King _____				King _____				King _____		King _____	
Chum _____				Chum _____				Chum _____				Chum _____				Chum _____				Chum _____		Chum _____	
Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____		Sockeye _____	
Coho _____				Coho _____				Coho _____				Coho _____				Coho _____				Coho _____		Coho _____	
10				11				12				13				14				15		16	
King _____				King _____				King _____				King _____				King _____				King _____		King _____	
Chum _____				Chum _____				Chum _____				Chum _____				Chum _____				Chum _____		Chum _____	
Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____		Sockeye _____	
Coho _____				Coho _____				Coho _____				Coho _____				Coho _____				Coho _____		Coho _____	
17				18				19				20				21				22		23	
King _____				King _____				King _____				King _____				King _____				King _____		King _____	
Chum _____				Chum _____				Chum _____				Chum _____				Chum _____				Chum _____		Chum _____	
Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____		Sockeye _____	
Coho _____				Coho _____				Coho _____				Coho _____				Coho _____				Coho _____		Coho _____	
24				25				26				27				28				29		30	
King _____				King _____				King _____				King _____				King _____				King _____		King _____	
Chum _____				Chum _____				Chum _____				Chum _____				Chum _____				Chum _____		Chum _____	
Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____				Sockeye _____		Sockeye _____	
Coho _____				Coho _____				Coho _____				Coho _____				Coho _____				Coho _____		Coho _____	



Fish camp

Annual Subsistence Fisheries Report

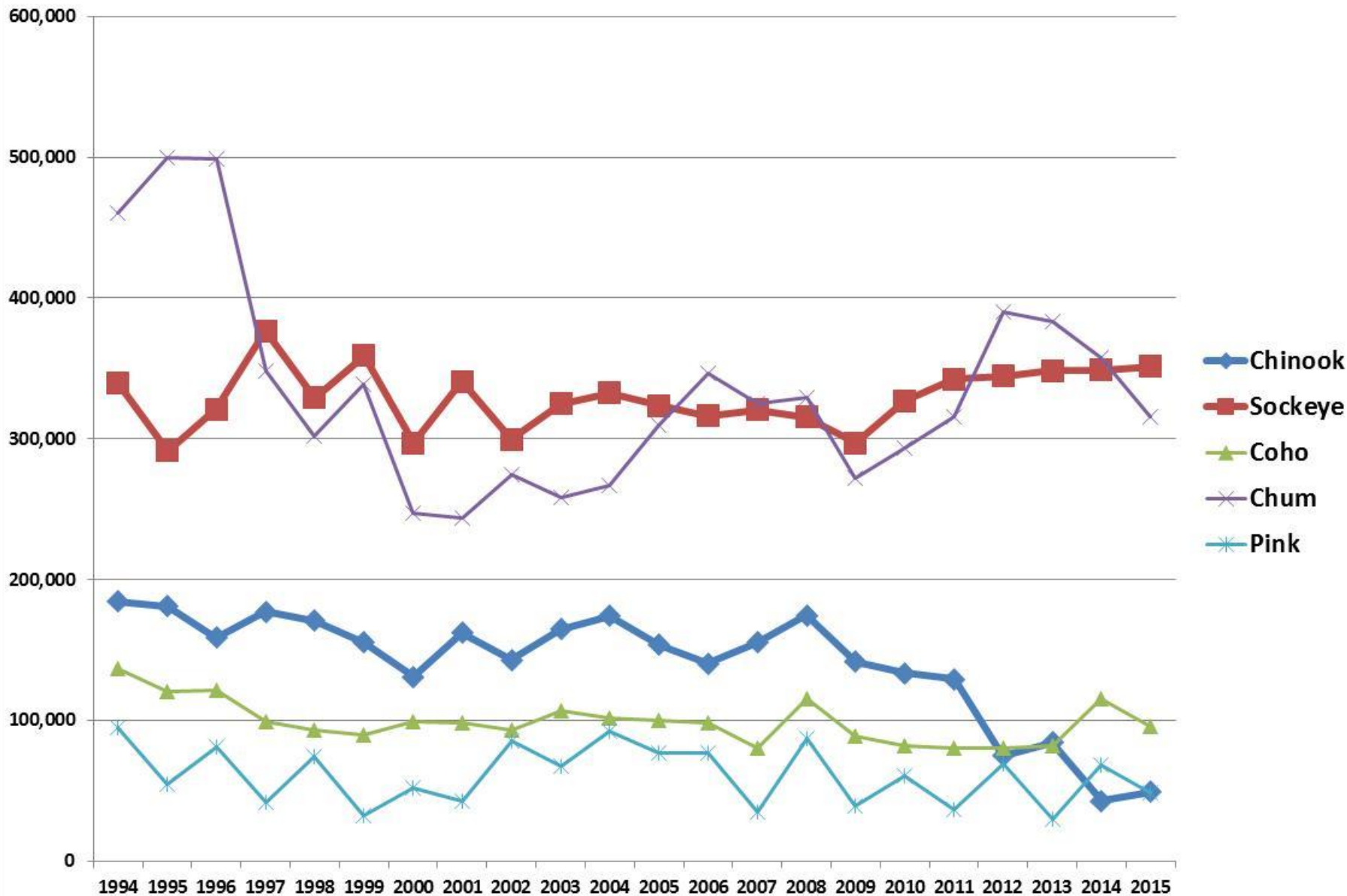
- Draws from all annual harvest monitoring programs
- Organized in data base by management area and by community
- Part of the *Technical Paper Series*



Alaska Subsistence and Personal Use Salmon Harvests, 1994 - 2015

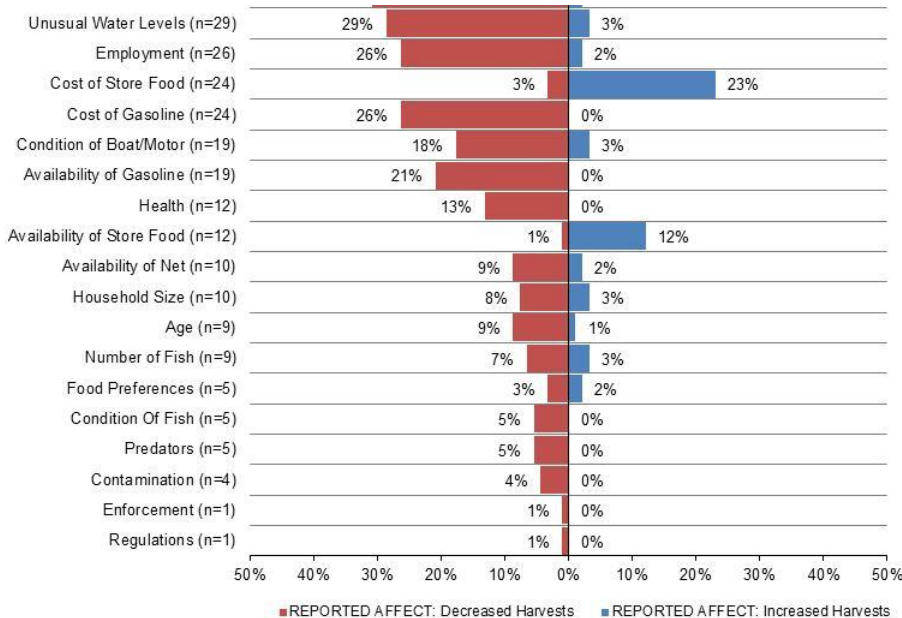
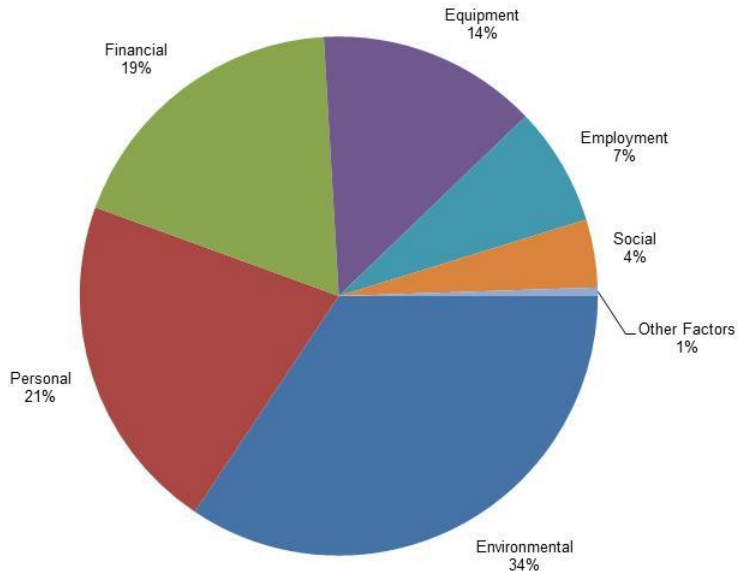


Subsistence Salmon Harvests by Species, 1994 - 2015



“Patterns and Trends” Projects

- Time series of household harvests
- Household interviews
- Declining chum harvests
- Higher sheefish and Dolly Varden harvests
- Range of explanations
- See TPs 294, 366



Categories of factors reported as affecting fish harvests, 6 NW Alaska communities, 1994-2004

Migratory Birds Harvest Monitoring Project



- Amendment to MBTA
- Subsistence regulations, 2003
- Alaska Migratory Bird Co-Management Council: AMBCC
- Annual harvest monitoring project
- Annual reports
- On-line at:

http://www.adfg.alaska.gov/index.cfm?adfg=subsistence.migratorybird_cmc





AMBCC Subsistence Migratory Bird Household Harvest Survey Western Alaska Harvest Report - **SPRING**

Y-K Delta, Bering Strait-Norton Sound, NW Arctic, Bristol Bay (except South AK Peninsula)

Did the household harvest birds or eggs from **April 1 to June 30?** YES NO

Village: _____ Household ID: _____ Harvest Year: _____ Date: ___/___/___

American wigeon
birds _____



Teal
birds _____



Mallard
birds _____



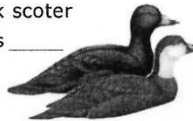
Northern pintail
birds _____



Northern shoveler
birds _____



Black scoter
birds _____



Surf scoter
birds _____



White-winged scoter
birds _____



Bufflehead
birds _____



Goldeneye
birds _____



Canvasback
birds _____



Scaup
birds _____



Common eider
birds _____



King eider
birds _____



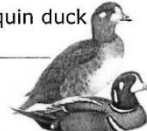
Spectacled eider
birds _____



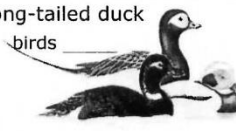
Steller's eider
birds _____



Harlequin duck
birds _____



Long-tailed duck
birds _____



Merganser
birds _____



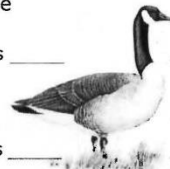
Unknown duck
birds _____



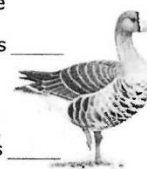
Black brant
birds _____



Cackling/Canada
goose
birds _____



Greater white-fronted
goose
birds _____



Emperor goose
birds _____



Snow goose
birds _____





AMBCC Subsistence Migratory Bird Household Harvest Survey
Bird Identification Guide - Interior Alaska
Upper Copper River and Interior Alaska

Wigeon



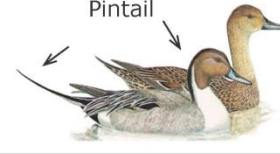
Teal



Mallard



Pintail



Shoveler



Black Scoter



Surf Scoter



White-winged Scoter



Bufflehead



Goldeneye



Canvasback



Scaup



Harlequin



Long-tailed Duck



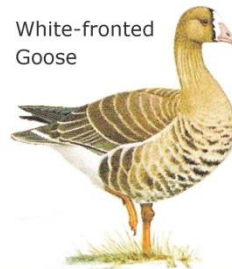
Merganser



Cackling/Canada Goose



White-fronted Goose



Snow Goose



Harbor Seal/Sea Lion Harvest Assessment Project

- 1992: RFP from NMFS; estimate total annual subsistence take of harbor seals and sea lions
- ADF&G lead, 1992 to 2001
- RuralCAP and IPCoMM as early partners
- Transition to ANHSC lead, 1997 - 2002
- Study years 1992 – 2008 except 1999
- 4 partial surveys: 2011, 2012, 2014, 2017
- Surveys in western AK (TPs 242, 255, 257)

Harbor Seal and Sea Lion Harvest Assessments: Research Methods

- Study communities (~63) and regions (9)
- Obtained harvest data from separate St. Paul harvest monitoring program from 2001 - 2008
- Several sampling strategies
- Local research assistants hired and trained
- Retrospective recall surveys, mostly in people's homes
- Information collected: harvest, struck and lost, age category, sex, month; also assessment questions
- Analysis: estimates for each community
- Reporting: 16 annual reports; 2 partial supplements
- LTK study: Whiskers! Database; TP249
- Methodological study: TP 254

SEA LION

2014 MARINE MAMMAL SURVEY

DID YOU OR MEMBERS OF YOUR HOUSEHOLD HUNT OR USE SEA LIONS IN 2014? YES ____ NO ____
 (IF YES, PLEASE COMPLETE THE FOLLOWING QUESTIONS:) (IF NO, THAT COMPLETES THIS SURVEY. THANK YOU.)

During 2014, did you or your household:

1. Use sea lions (meat, hides, or oil)?
2. Hunt sea lions? If yes, go to 2a and 2b.....
3. Kill and retrieve sea lions?
4. Receive sea lions from other households or communities? .
5. Give away sea lions to other households or communities? . .

Yes	No

2a. How many Sea Lion hunters in your household? (____)

2b. If you hunted outside your region, where did you hunt? _____

IF YES TO QUESTION 2 OR 3 ABOVE, GO TO QUESTION 6. IF NO, THIS COMPLETES THE SURVEY. THANK YOU FOR YOUR COOPERATION.

6. How many sea lions did your household kill and retrieve? [Enter total number in box.] _____
7. In which months were they killed and retrieved? How many in (January, etc.)? [Enter the numbers by month.]

SEA LIONS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
TOTAL														

8. Of the sea lions killed and retrieved in (January, etc.), how many were male, female, and how many were pups, juveniles, or adults? [Enter the numbers by month]

SEA LIONS (Detail)	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
ADULT	MALE													
	FEMALE													
	UNKNOWN													
JUVENILE	MALE													
	FEMALE													
	UNKNOWN													
PUP	MALE													
	FEMALE													
	UNKNOWN													
UNKNOWN AGE	MALE													
	FEMALE													
	UNKNOWN													

9. How many sea lions were struck and lost by your household? [Enter number in total box.] _____
10. In which months were they struck and lost? [Enter numbers by month.]

SEA LIONS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	TOTAL
STRUCK AND LOST														

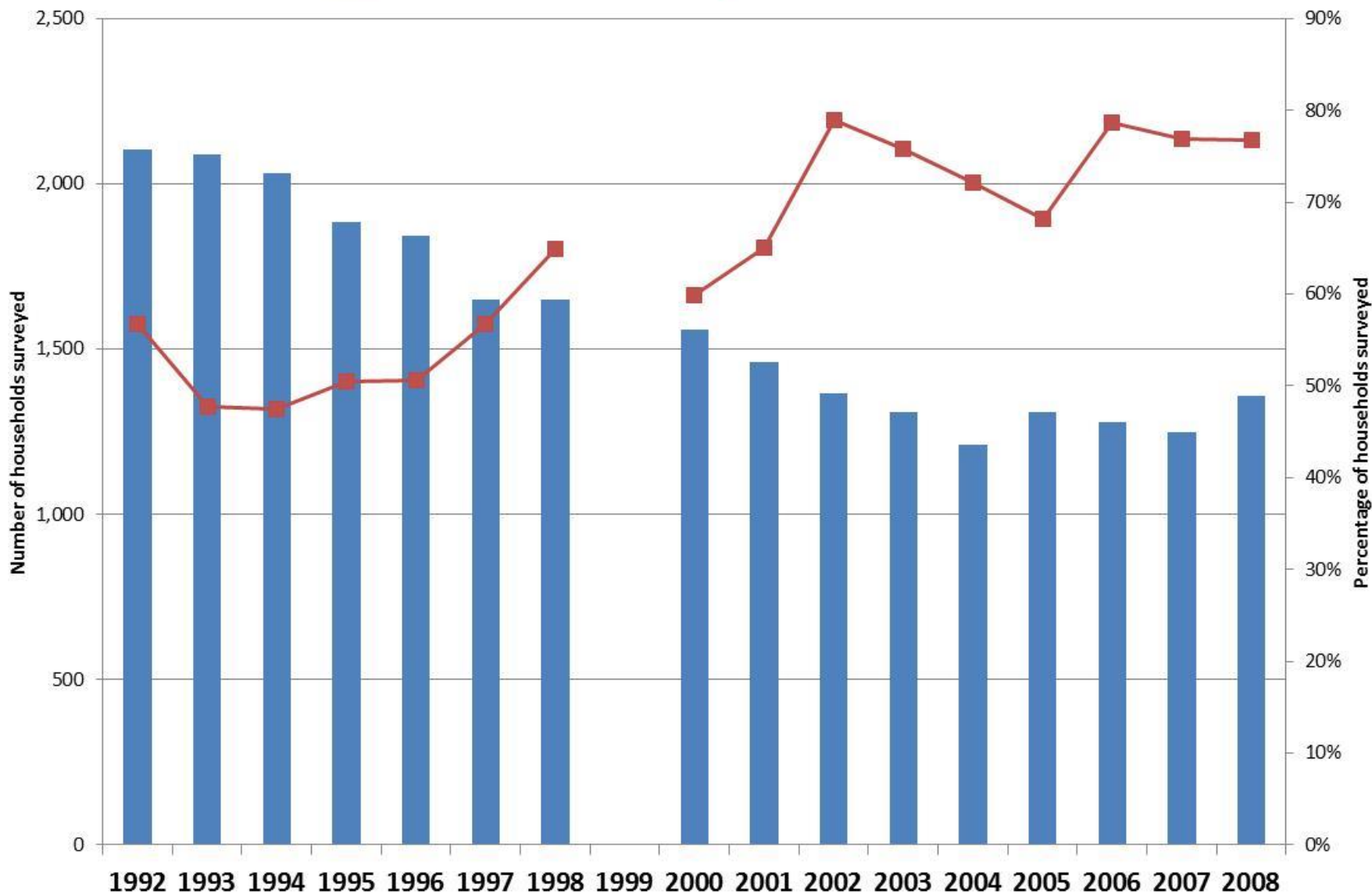
Supplemental Question: **THANK YOU FOR YOUR COOPERATION**

During 2014, did you observe any changes to sea lion numbers in your area: Increase ____ Decease ____ No Change ____
 During 2014, what was the condition of the sea lions you harvested? _____

Community: _____ (____) HHID: (____) List: Hunter Random Interviewer: _____ Date: _____

Sample Achievement, Harbor Seal/Sea Lion Harvest Assessment Project

Number of households surveyed Percentage of households surveyed



Kvichak Salmon Ethnography



Participant Observation

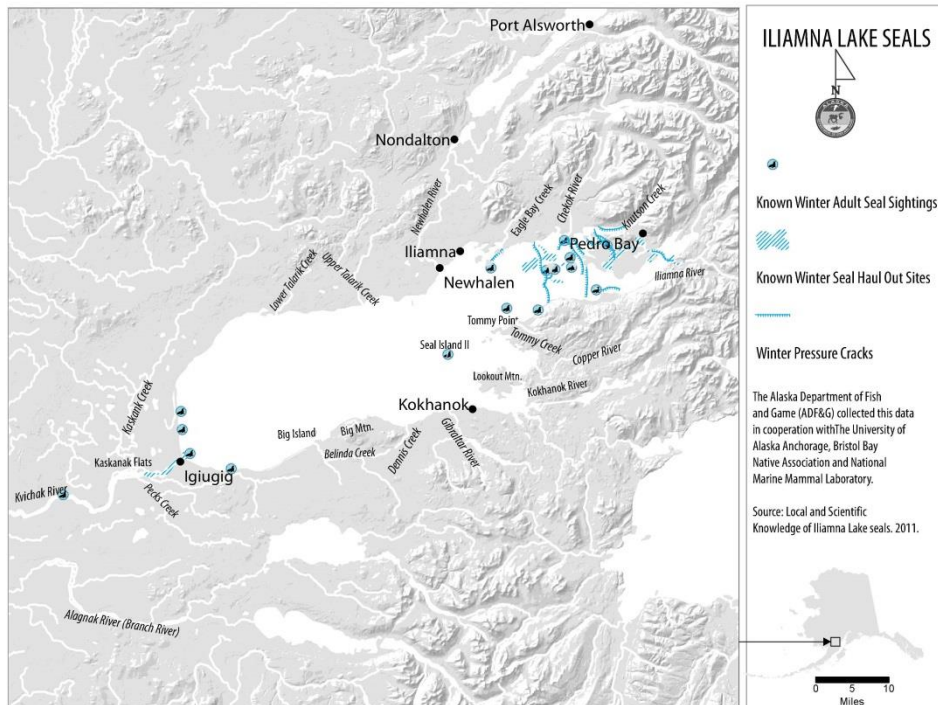


- Key to ethnographic research
- Enhances understanding of harvest assessment projects



TEK/LTK: Iliamna Lake Freshwater Seals Project

- Freshwater seals: with UA, NMFS, BBNA
- Multi-disciplinary approach
- TP 416



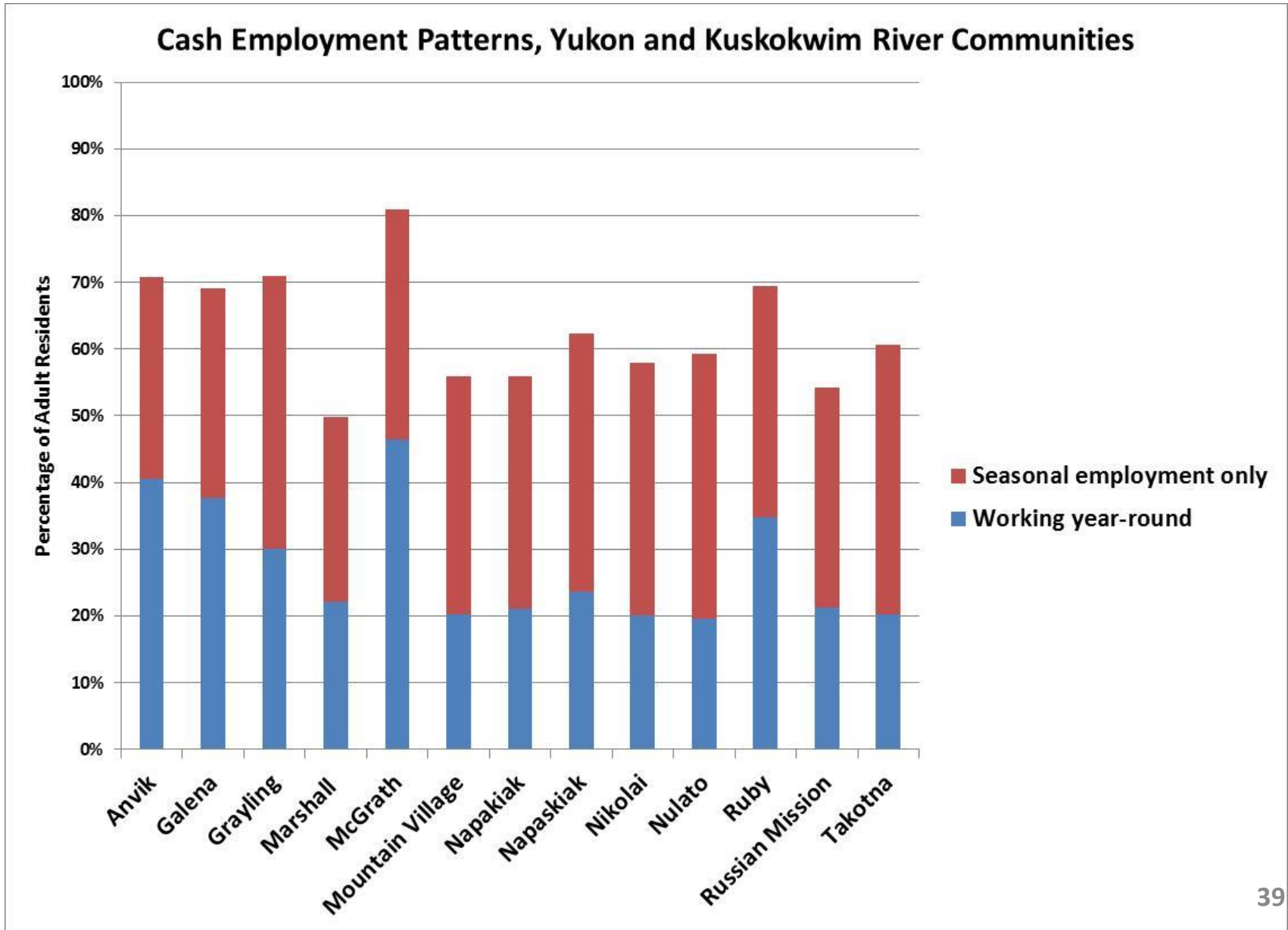
Findings: Rural Alaska's mixed economy



- Two interrelated sectors: cash and subsistence
- Features of “remote rural economy” (Goldsmith 2007)
- Cash sector = less stable/less reliable;
- Subsistence sector = more stable/reliable

Top: subsistence waterfowl hunting, Yukon River; Bottom: salmon for winter, Chignik Lake

Cash sector: limited cash employment



Subsistence sector of mixed economy



- High levels of subsistence food production
- Diverse harvests
- Domestic mode of production
- Specialization and efficiency
- Patterned seasonal round
- Traditional harvest areas
- Non-market sharing and distribution networks

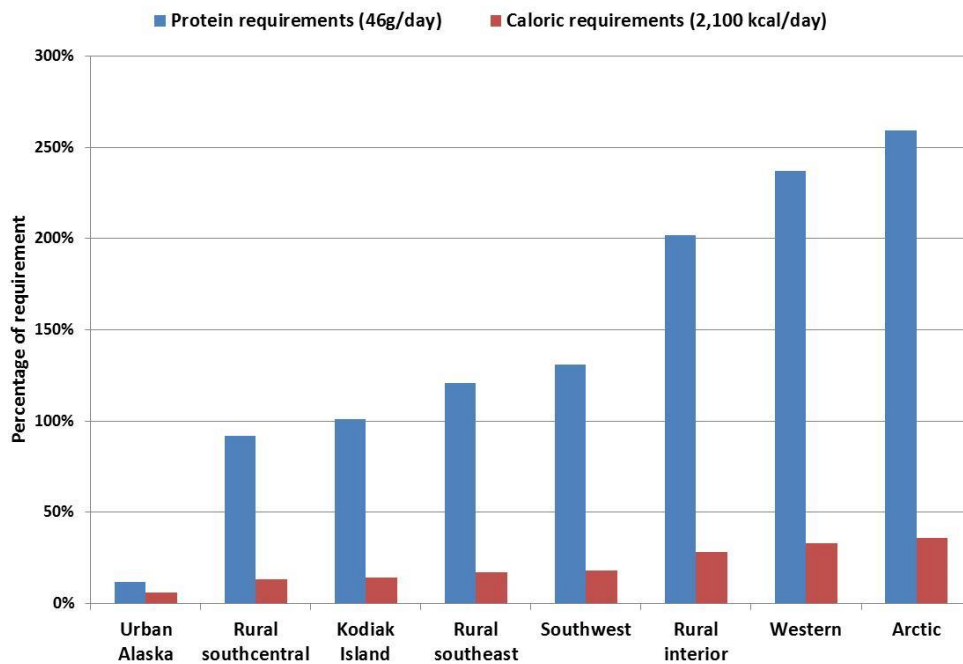


Top: king salmon fishing in Cook Inlet; Bottom: putting up salmon, Nikolai, upper Kuskokwim River

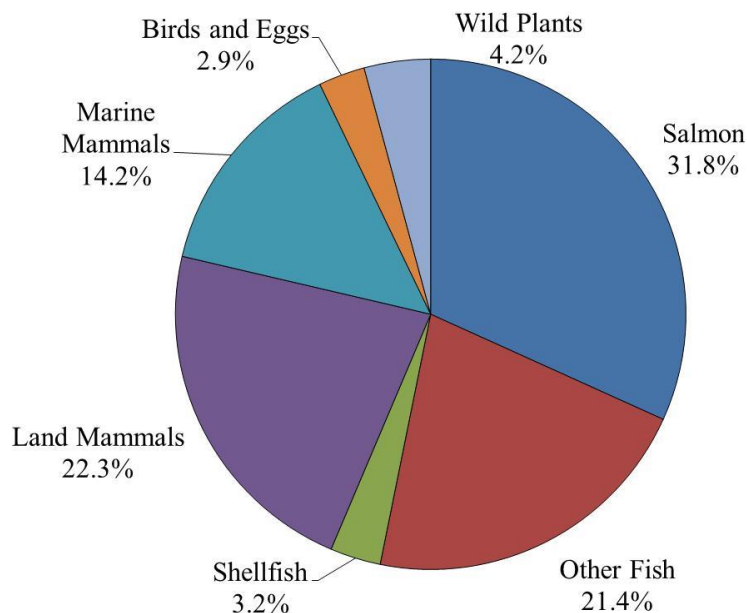
Subsistence food production

- Rural Alaska harvest = 275 lb per person; 34 million lb of food
- Provides 176% of daily protein requirements
- Provides 25% of daily caloric requirements
- Diverse harvests

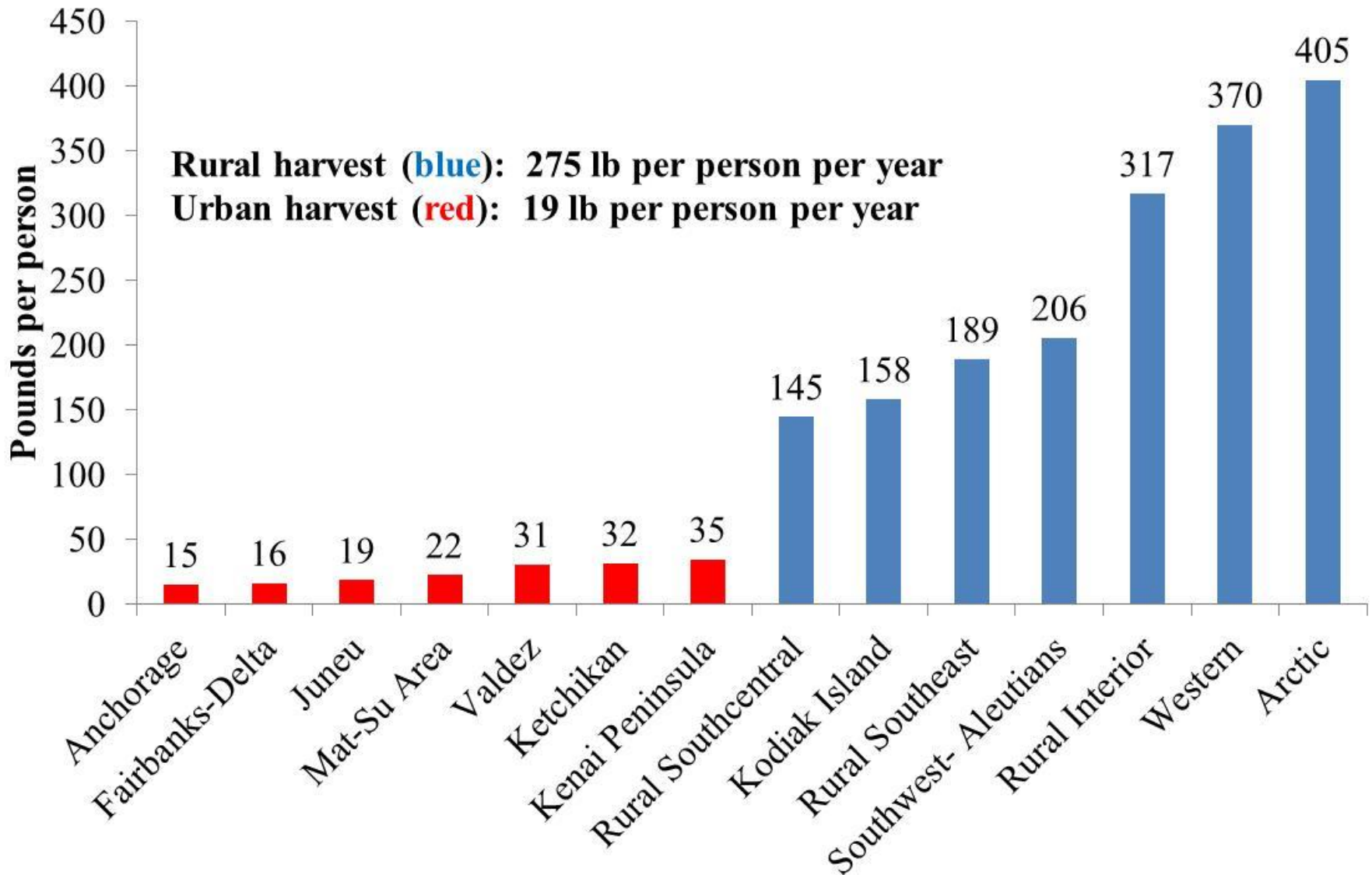
Nutritional contribution of wild food harvests by Alaska region 2014



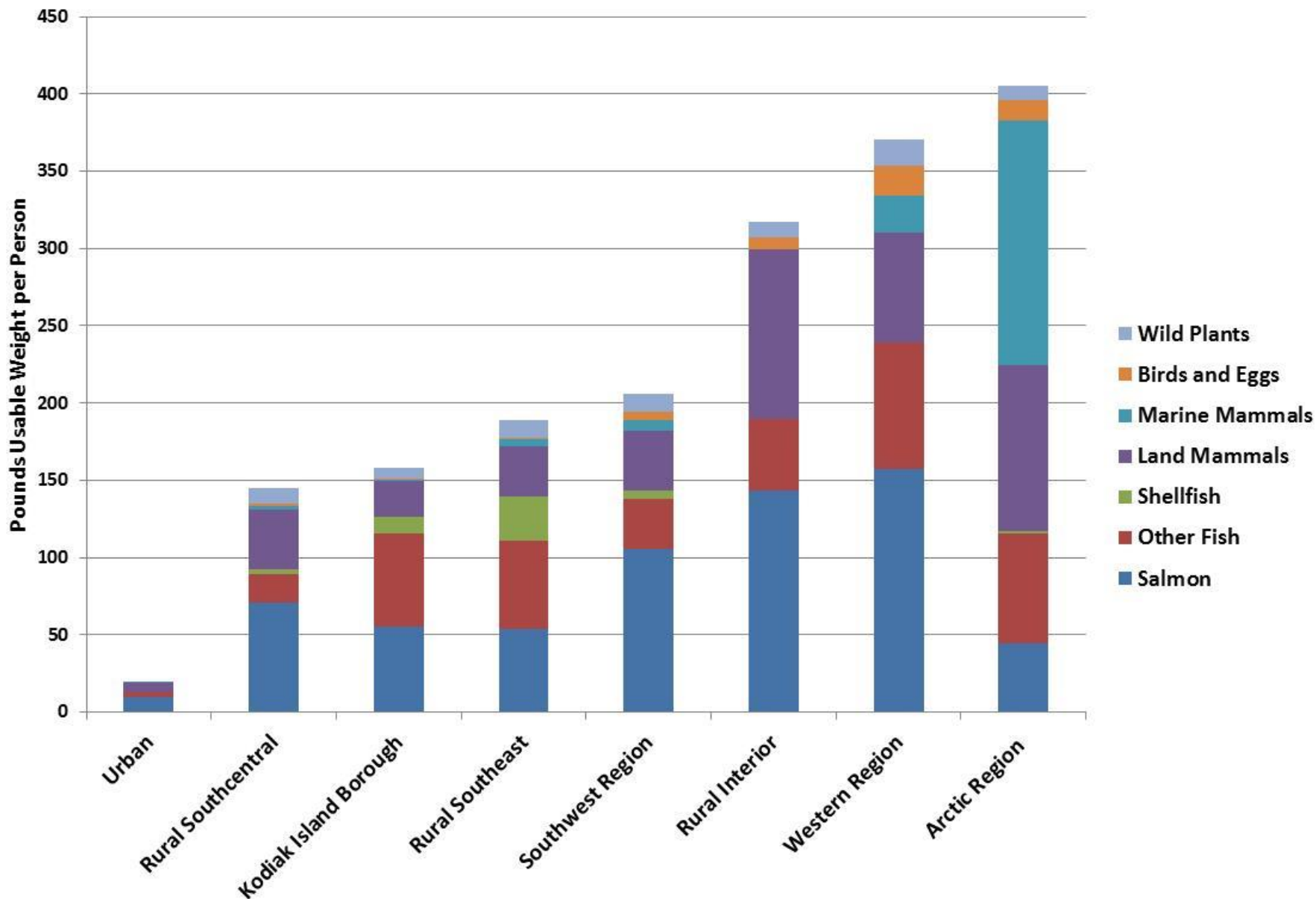
Composition of wild food harvest by rural Alaska residents, 2014



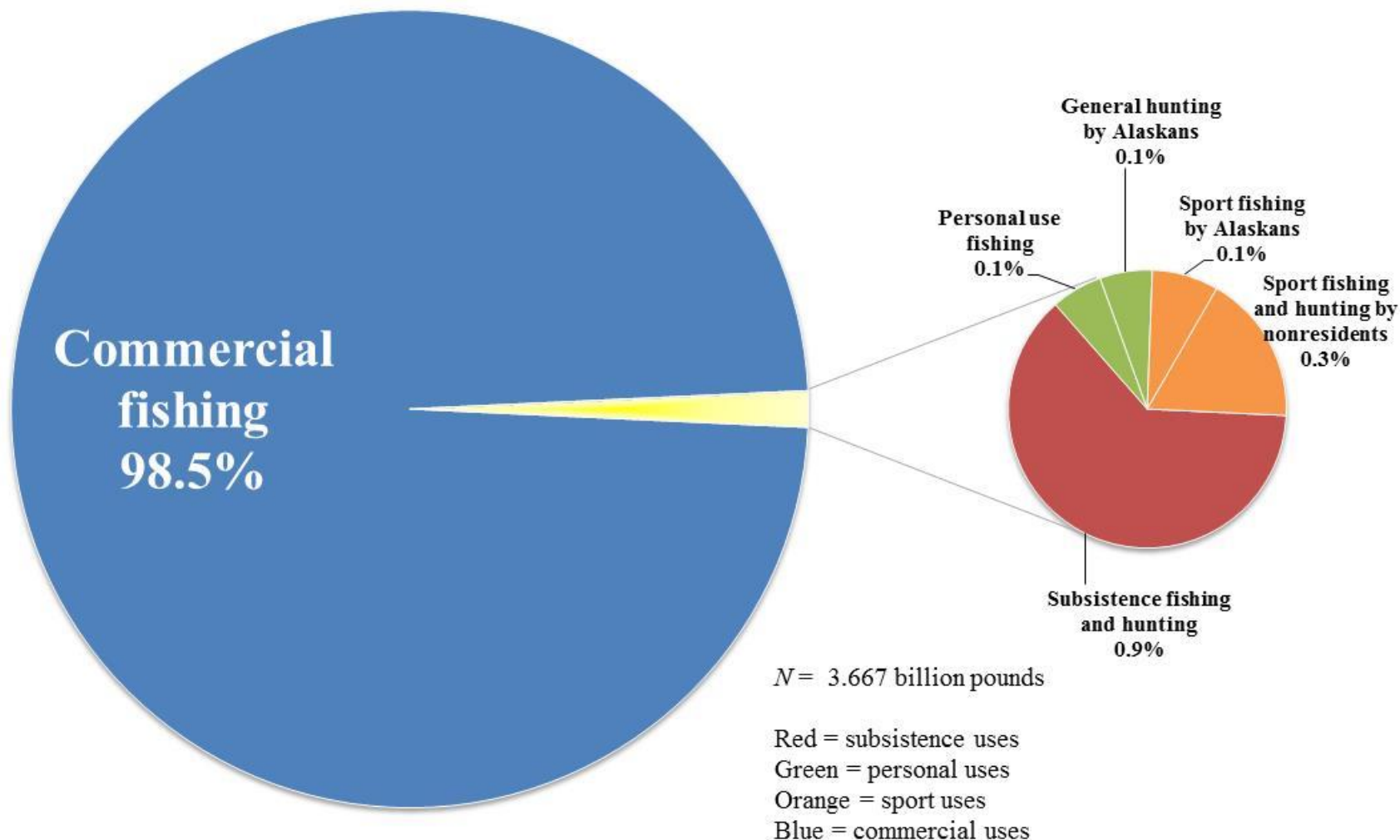
Wild food harvests in Alaska by area, 2014 (pounds usable weight per person per year)



Harvests of Wild Resources by Category and Area, Lbs per Capita, 2014



Who harvests fish and game? Resource harvests by use in Alaska



Labor: domestic mode of production



- Nuclear & extended families work together
- Resemble economic firms (efficiency)
- Self-limiting harvest goals
- Context for instruction in skills, values, and traditional knowledge



Top: processing spring duck harvest at Nondalton
Bottom: drifting for king salmon, Kaltag, Yukon River

Skills, values, oral traditions



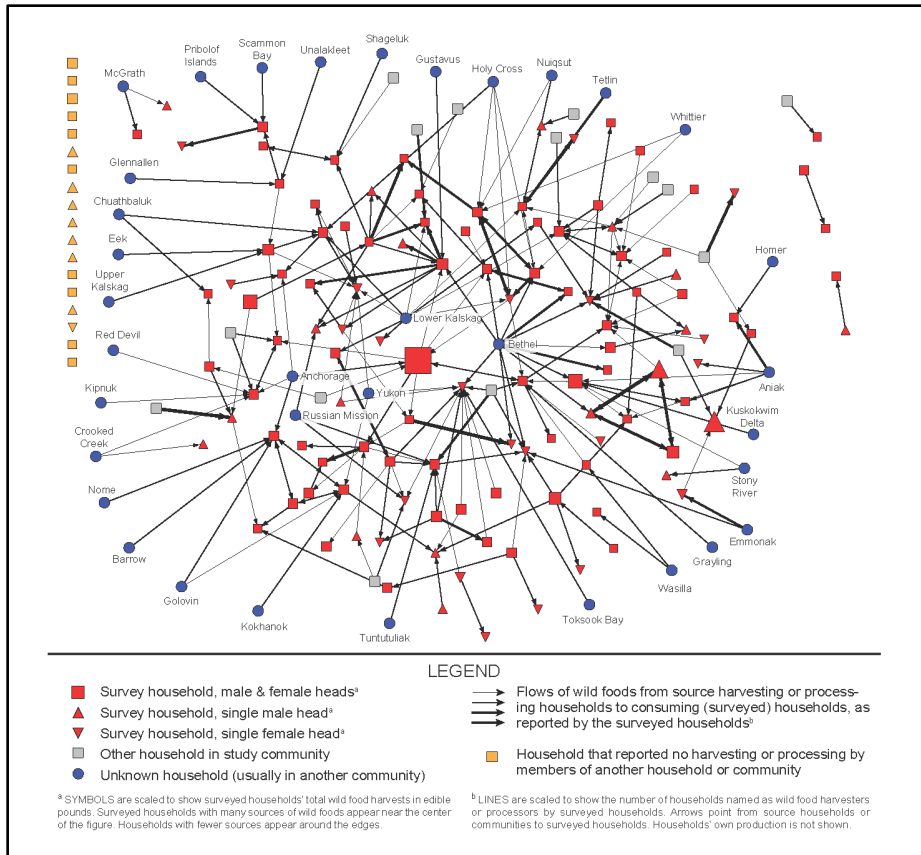
- Learned in the context of subsistence activities
- Learning across generations
- Values such as non-waste, respect, and sharing



Top: helping to put up salmon, Nondalton; Bottom: sharing salmon, Chignik Lake

Noncommercial (non-market) distribution and exchange

- Sharing
- Barter
- Customary trade
- Kinship and partnership networks
- Link families and communities

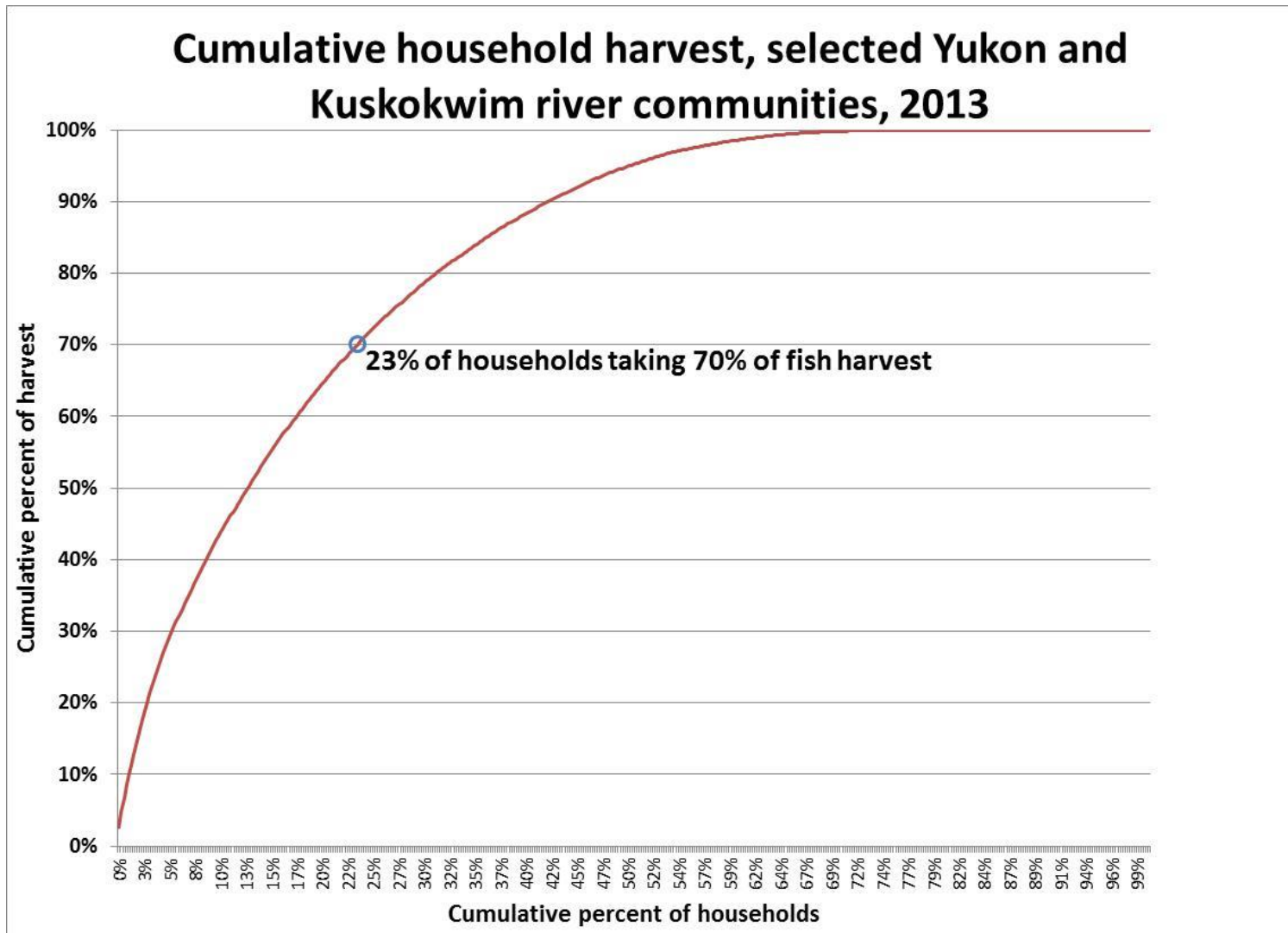


A sharing network, Kuskokwim River village

Distribution of Round Island walrus harvest at Togiak

Harvest specialization

- “30/70 rule” and the “super-household”
- Correlations with high levels of harvests



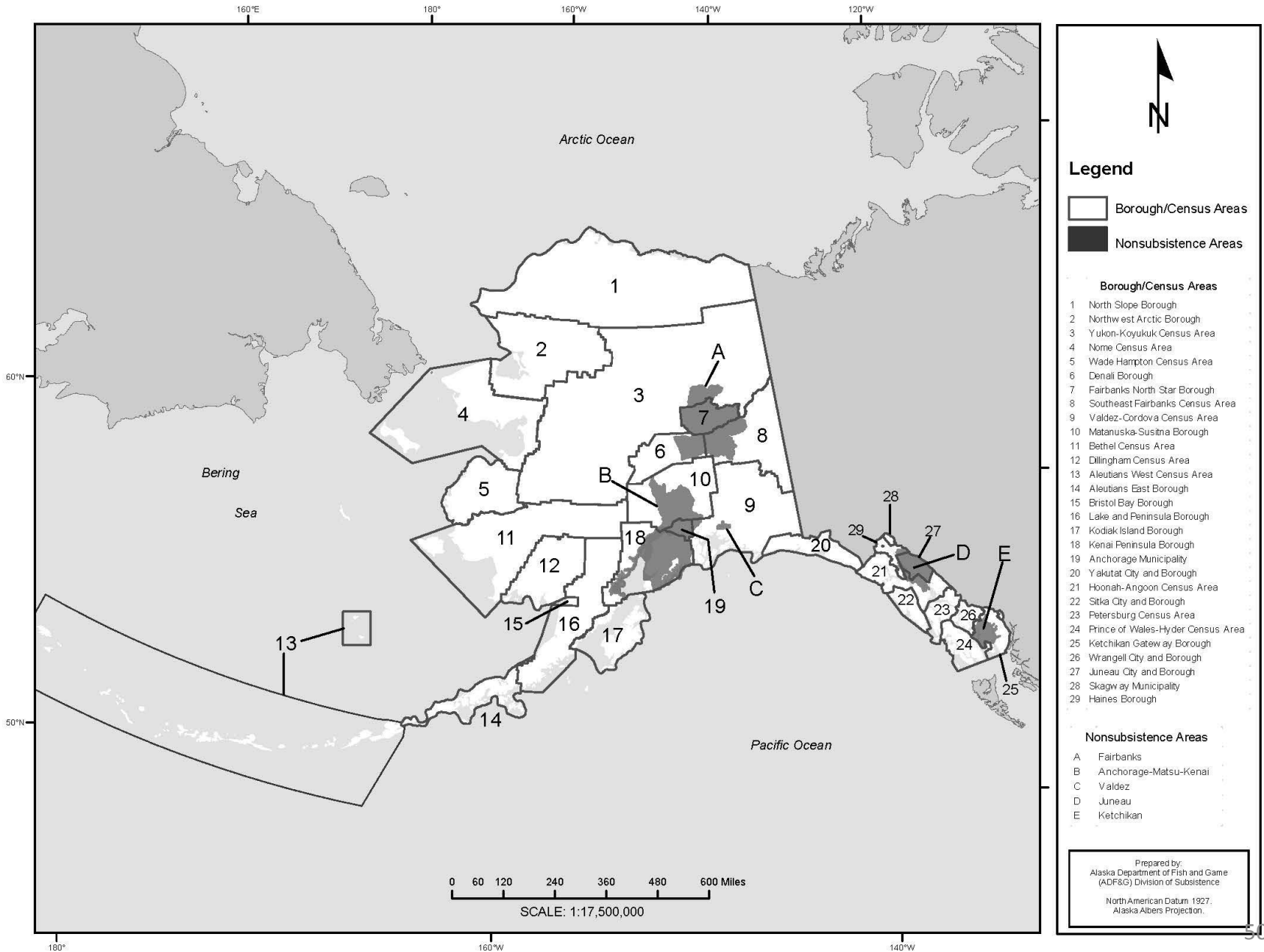
Applications of study findings

- Obligations at Board of Game and Board of Fisheries
- C&T Determinations
- ANS Findings
- Regulations that provide reasonable opportunity
- Obligations to Joint Board: nonsubsistence area findings
- Role at the NPFMC
- Informing resource development projects
- Health impacts assessment
- Other applications

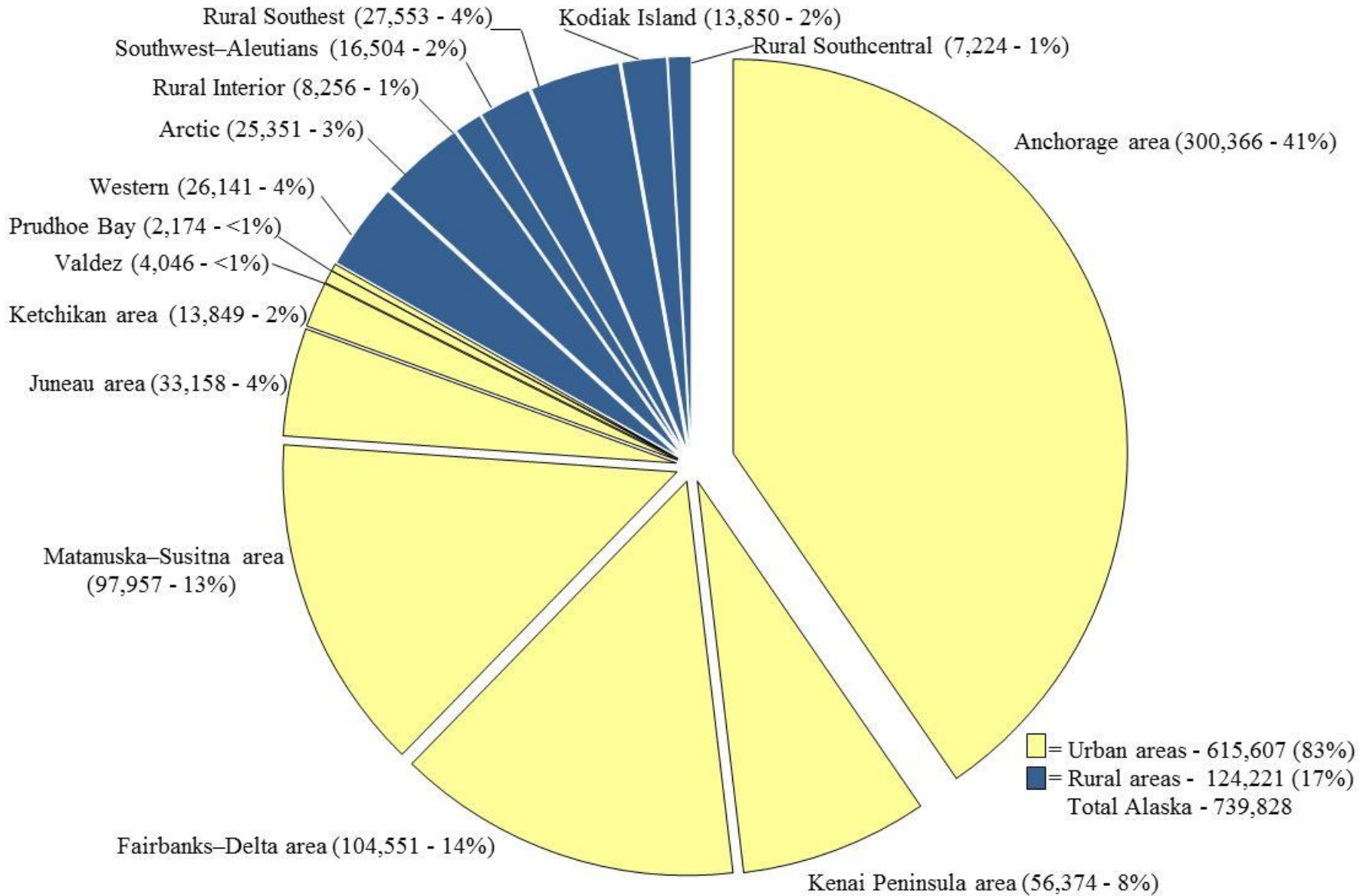


**A smokehouse full of sockeye salmon,
Nondalton**

Alaska Subsistence and Non-subsistence Areas



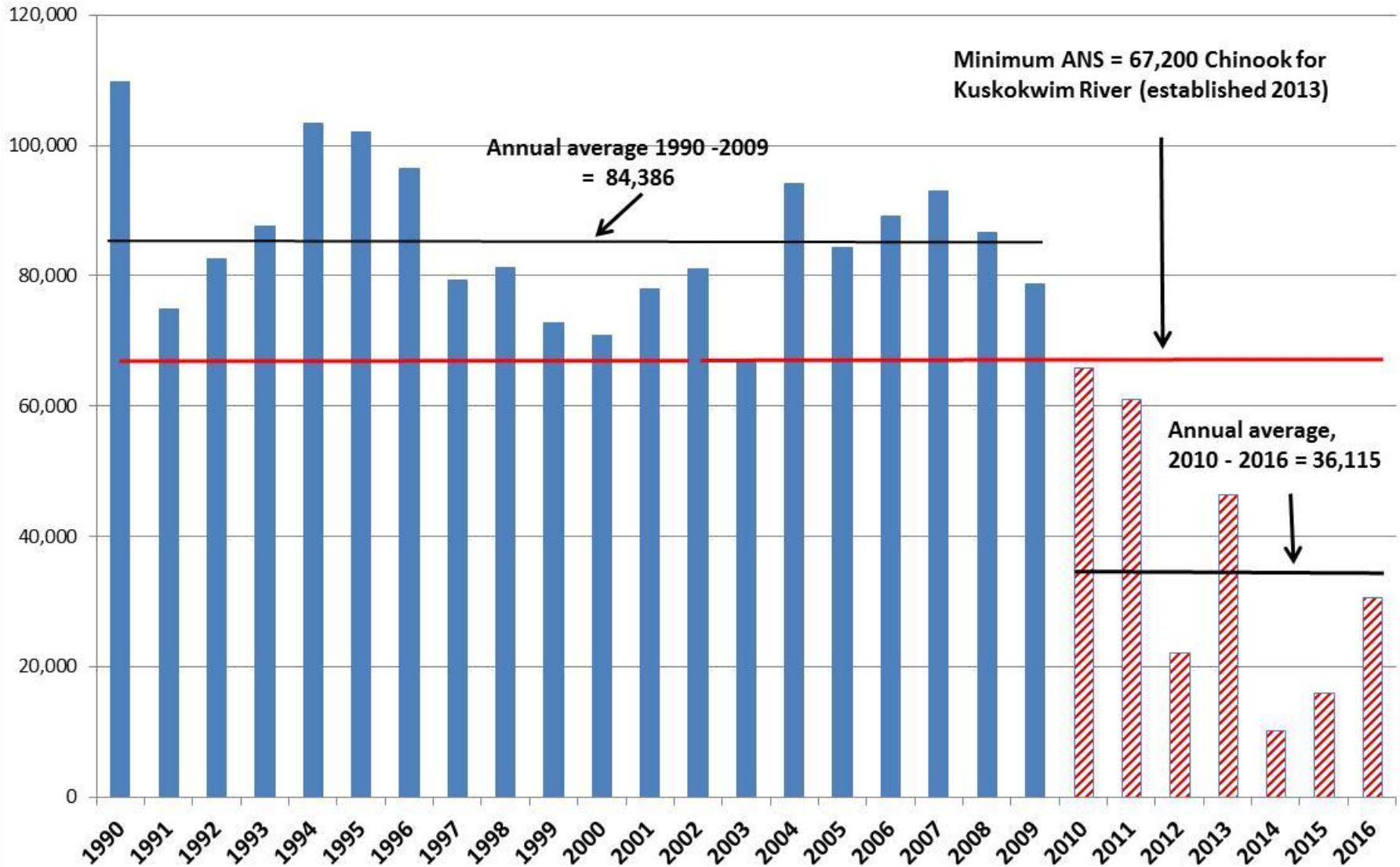
Alaska's population by area, 2016



Amount Reasonably Necessary for Subsistence: “ANS”

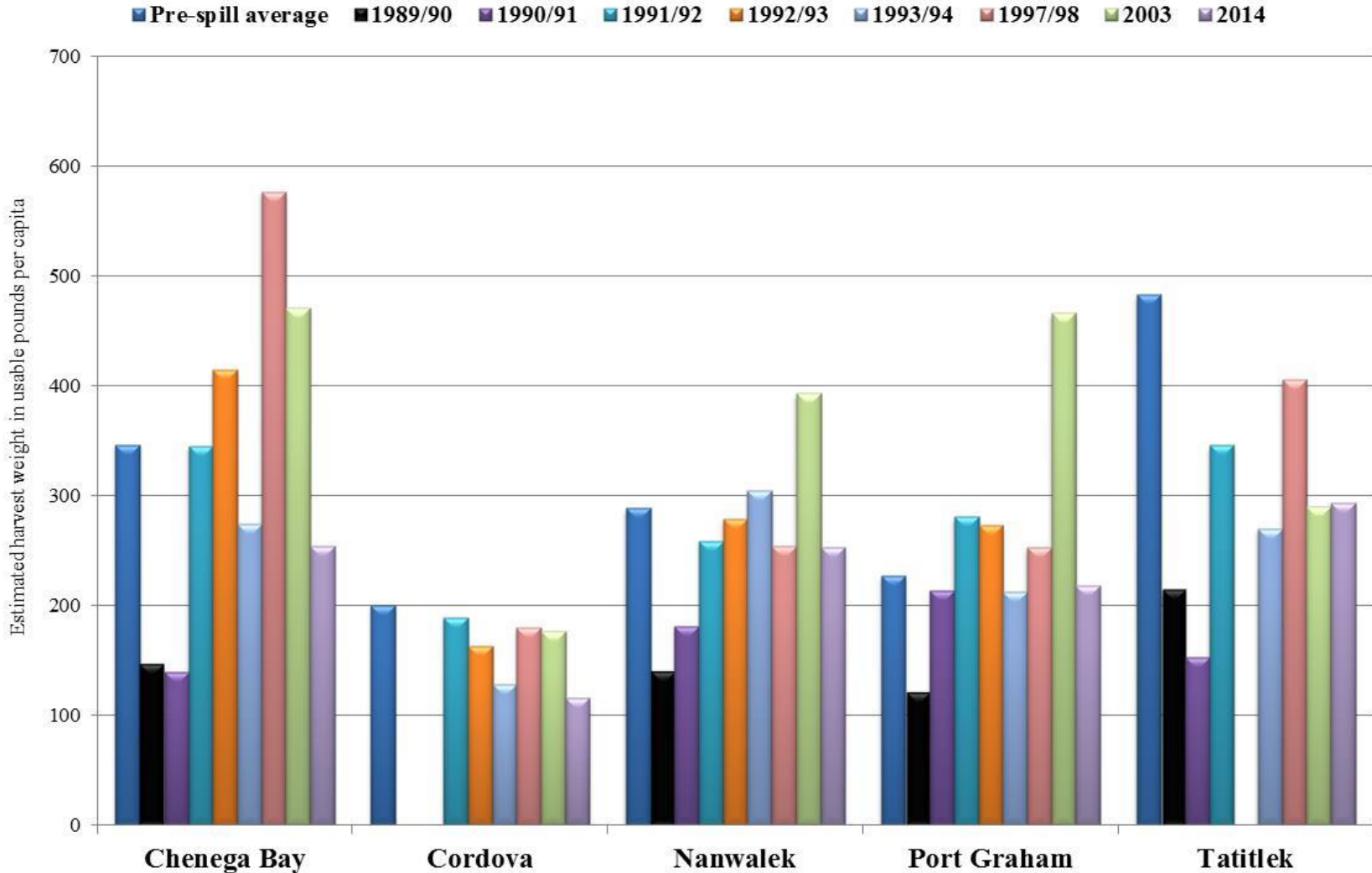
- Required by Alaska statute (AS 16.05.258(b))
- Established in regulations by the Alaska Board of Fisheries (BOF)
- ANS might provide a range for all salmon, or be specific for stocks
- Provides reference to assess annual harvests and trends

Kuskokwim River Chinook Salmon Subsistence Harvests 1990 - 2016



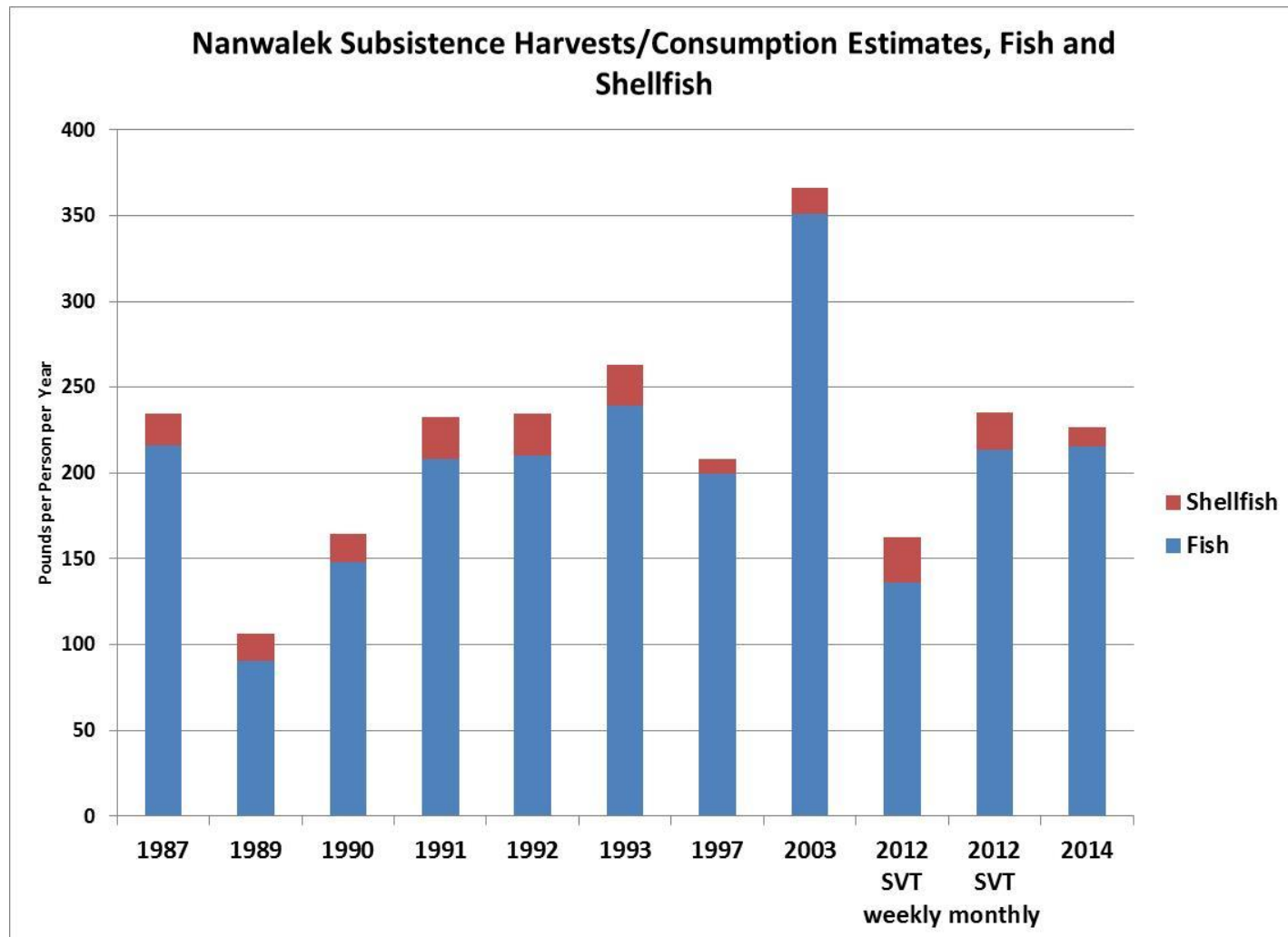
Impact Assessment: *Exxon Valdez* Oil Spill

Estimated Harvests, Pounds Usable Weight per Person, Selected EVOS-Area Communities



Wild foods consumption

- Harvest vs “consumption”
- Water quality standards review
- Comparison with Seldovia Tribe’s study
- TP 261 for methodological discussion



Restoring the Round Island Walrus Hunt



- Role of TEK and key respondent research
- *Qayassiq*
- Round Island Sanctuary
- Research: TP 212
- The Board of Game Process
- A Co-Managed Hunt
- See Cultural Survival Quarterly 1998 (Vol. 22, Issue 3)

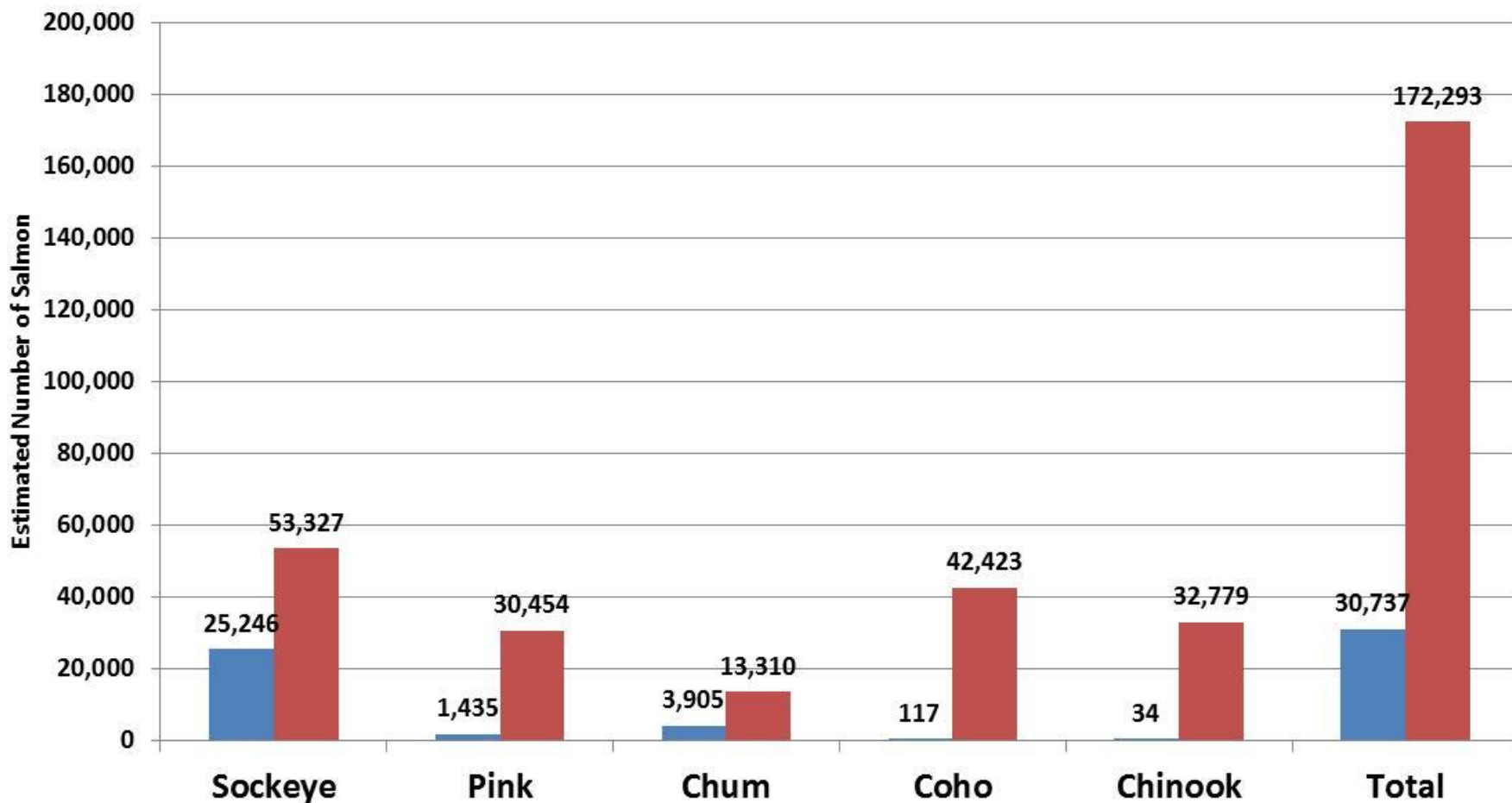
Subsistence harvests of walrus by Togiak hunters at Round Island, Bristol Bay

Some Data Limitations

- Uneven temporal coverage
- Uneven areal coverage
- Uneven participation in permit systems and/or surveys
- Potential recall bias
- Potential strategic bias
- Incomplete documentation of sources of salmon (e.g. rod and reel, “home pack”)

"Subsistence" Salmon Harvest Estimates, Rural Southeast Alaska, 1987

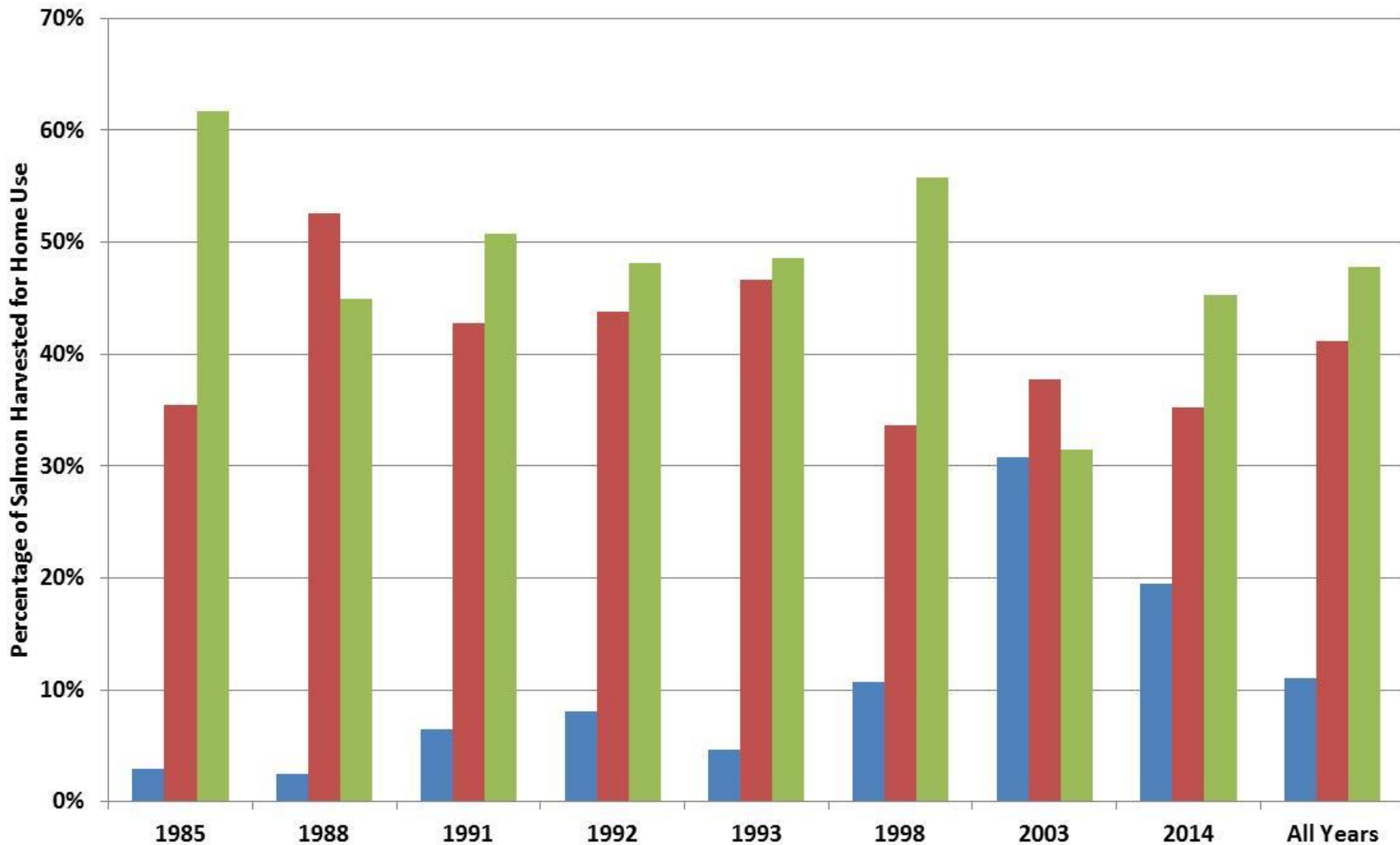
■ Permit Calendar System ■ Household Interviews



Source: Wolfe, Robert J., ADF&G. "Monitoring Subsistence Salmon Harvests in Alaska." Presentation at the "Understanding Harvest Assessment in the North" Conference, Girdwood, Alaska; April 1995

Sources of Salmon Harvested for Home Use, Cordova

■ Subsistence Nets ■ Rod and Reel ■ Removal from Commercial Harvests



Average annual salmon harvest over the 8 study years = 24,846 salmon

Conclusions



- State and federal regulations recognize the importance of subsistence harvests
- Significant investment has been made in describing and monitoring subsistence harvests and uses
- Subsistence has been the most reliable sector of rural Alaska's mixed economy
- Strong economic, social, cultural, & spiritual significance
- Access to a variety of wild resources is necessary to support food security in resilient, sustainable communities

For more information:



- ADF&G website:
<http://www.adfg.alaska.gov/index.cfm?adfg=subsistence.main>
- CSIS (Community Subsistence Information System)
- Technical Paper Series
- 2014 Subsistence Update