THE ECONOMIC GEOGRAPHY OF SALMON

A conceptual framework and preliminary characterization of the spatial distribution of economic values associated with salmon in the Mat-Su Basin, Alaska

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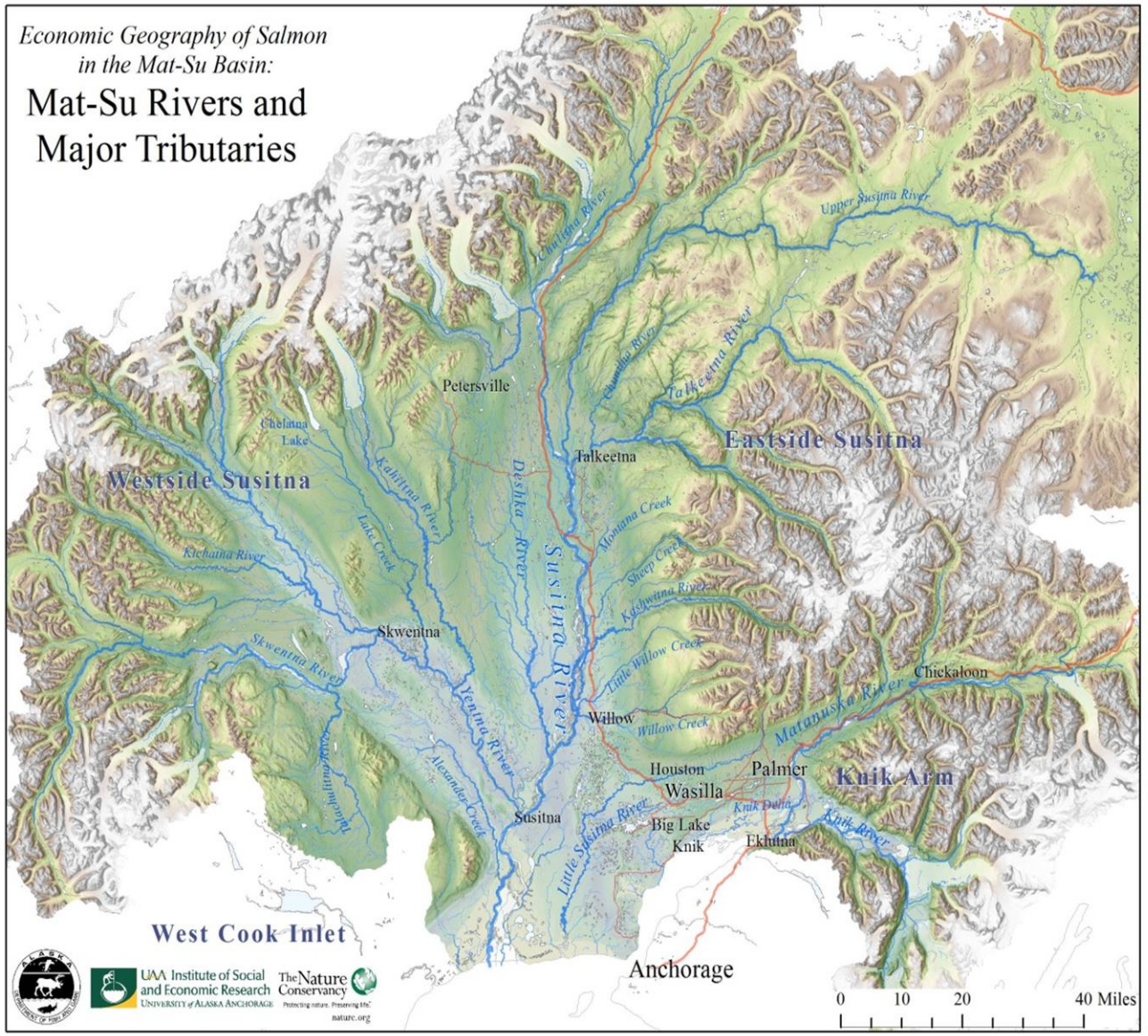

Economic Geography of Salmon
in the Mat-Su Basin:
Mat-Su Rivers and
Major Tributaries
Westside Susitna
Eastside Susitna
Knik Arm
West Cook Inlet
Petersville
Talkeetna
Skwentna
Willow
Houston
Wasilla
Palmer
Chickaloon
Susitna
Big Lake
Knik
Eklutna
Anchorage
Chelatna Lake
Kahiltna River
Lake Creek
Kichatna River
Skwentna River
Yentna River
Alexander Creek
Deshka River
Susitna River
Little Susitna River
Chulitna River
Upper Susitna River
Talkeetna River
Chunilna River
Montana Creek
Sheep Creek
Kashwitna River
Little Willow Creek
Willow Creek
Matanuska River
Knik Delta
Knik River
UAA Institute of Social and Economic Research
University of Alaska Anchorage
The Nature Conservancy
nature.org
0 10 20 40 Miles

Research Questions

1. What is the spatial distribution of participation and harvest in salmon fisheries across the Mat-Su Basin?
2. To what extent can we associate available economic data with spatially-explicit data on participation and harvest of salmon in commercial, sport, and subsistence fisheries?
3. Can we relate specific estimates of jobs and income on specific salmon populations in the Mat-Su?

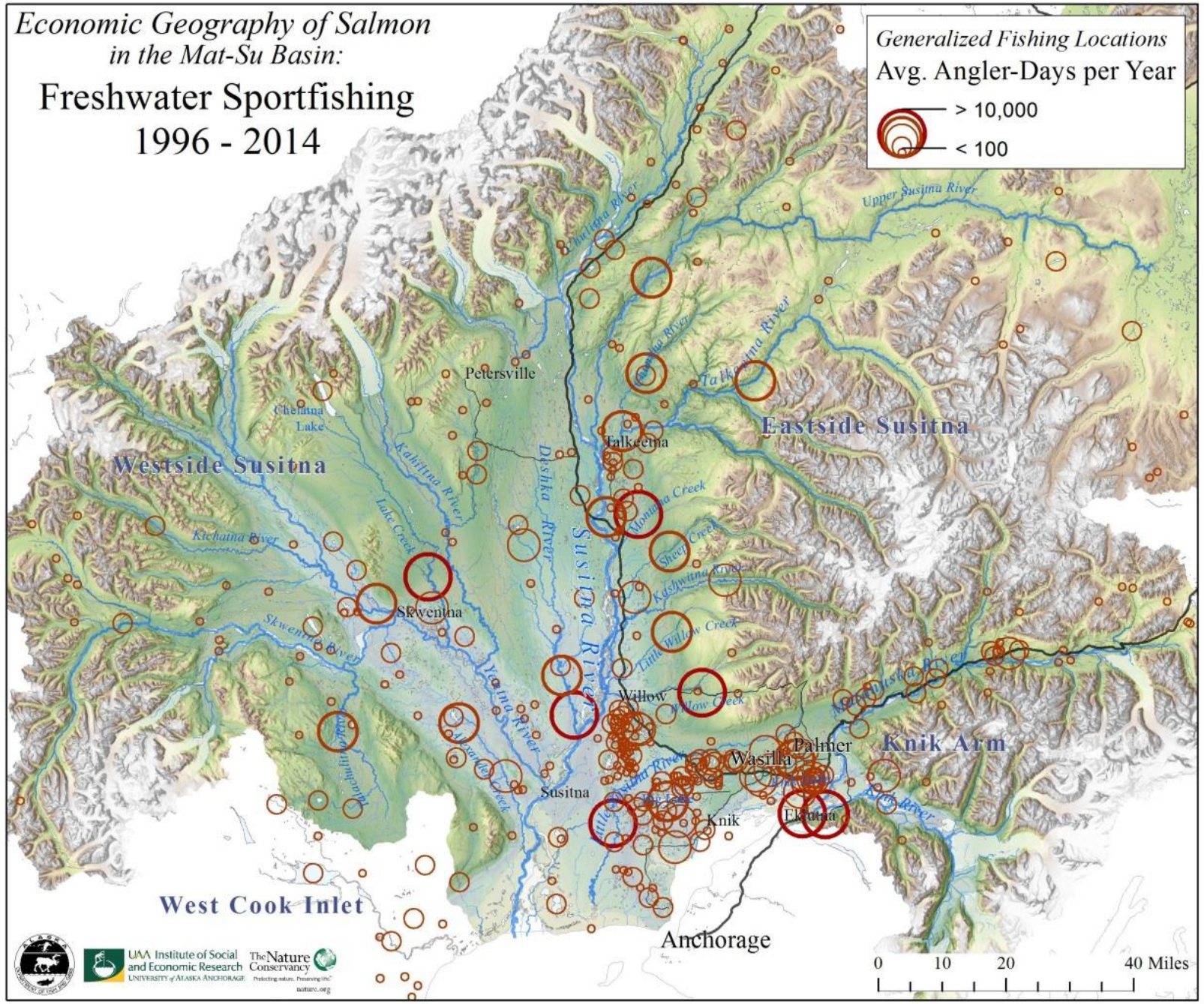
Data Sources

- Evaluation of Freshwater Sportfish *Statewide Harvest Survey*
- Survey of sport fishing operations in the Mat-Su
- Commercial fisheries data
  - Commercial Fisheries Entry Commission
  - Division of Commercial Fisheries
- Subsistence harvest and map data
- Key respondent interviews with commercial and sport fishers

Results

- Tabular economic analysis
- Spatial analysis

Montana Creek, Susitna River Basin



Sport Fish Harvester Survey: Locations digitized using the anadromous waters catalogue

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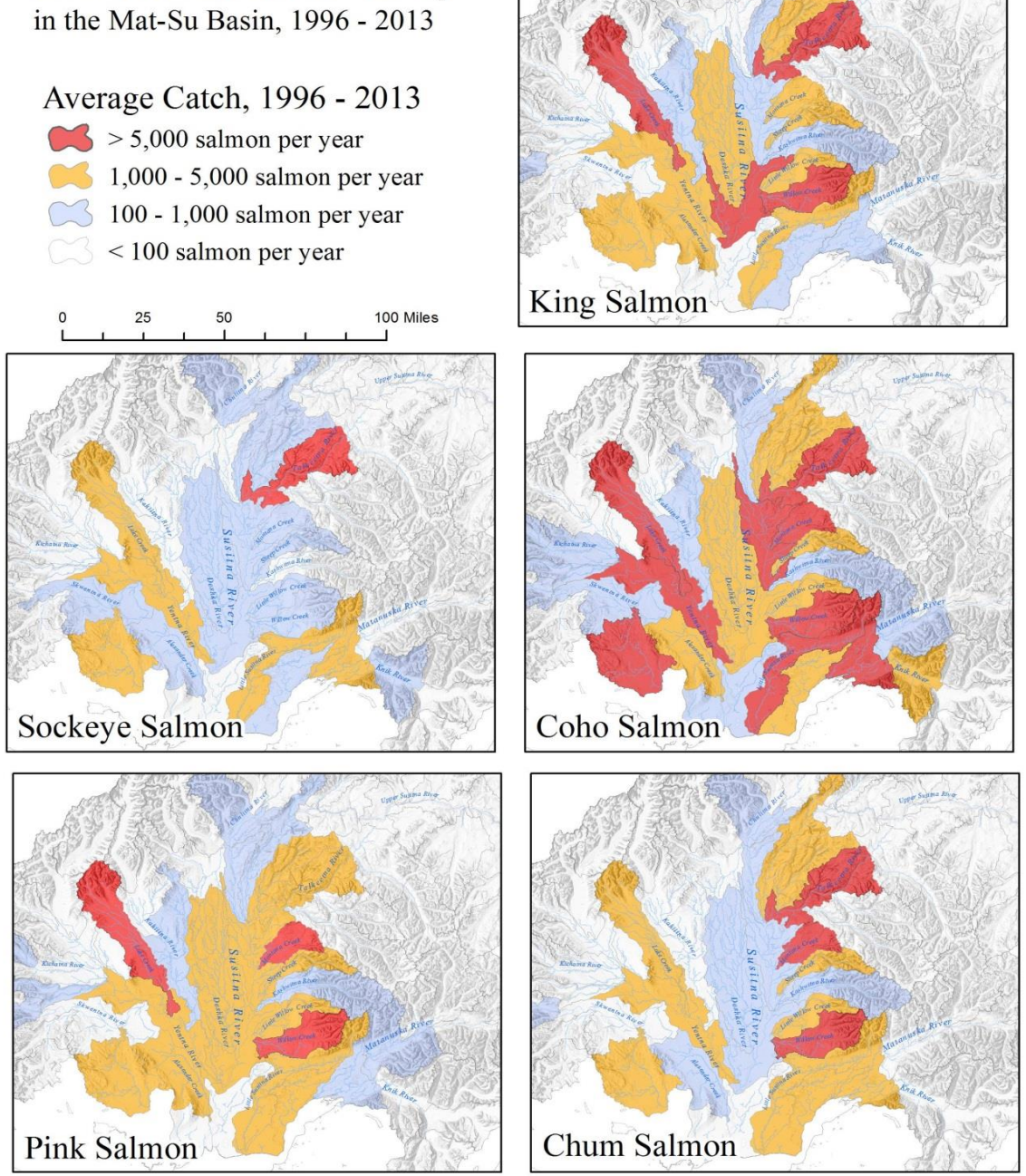
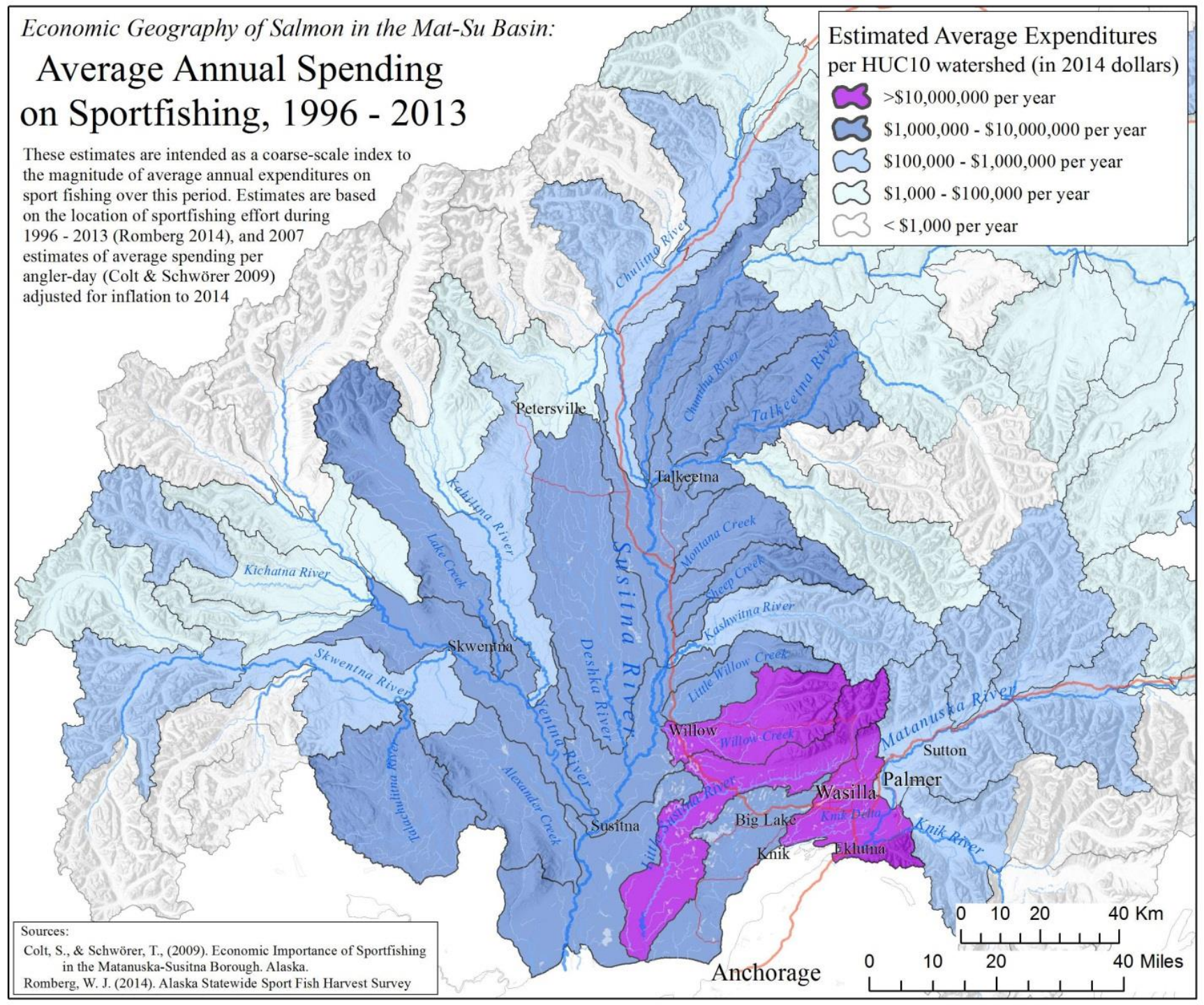
Sport Fish Harvester Survey: Average Annual Catch by Huc10 Watershed, 1996-2013





Correlation of Sport Fish Harvester Survey and available economic data

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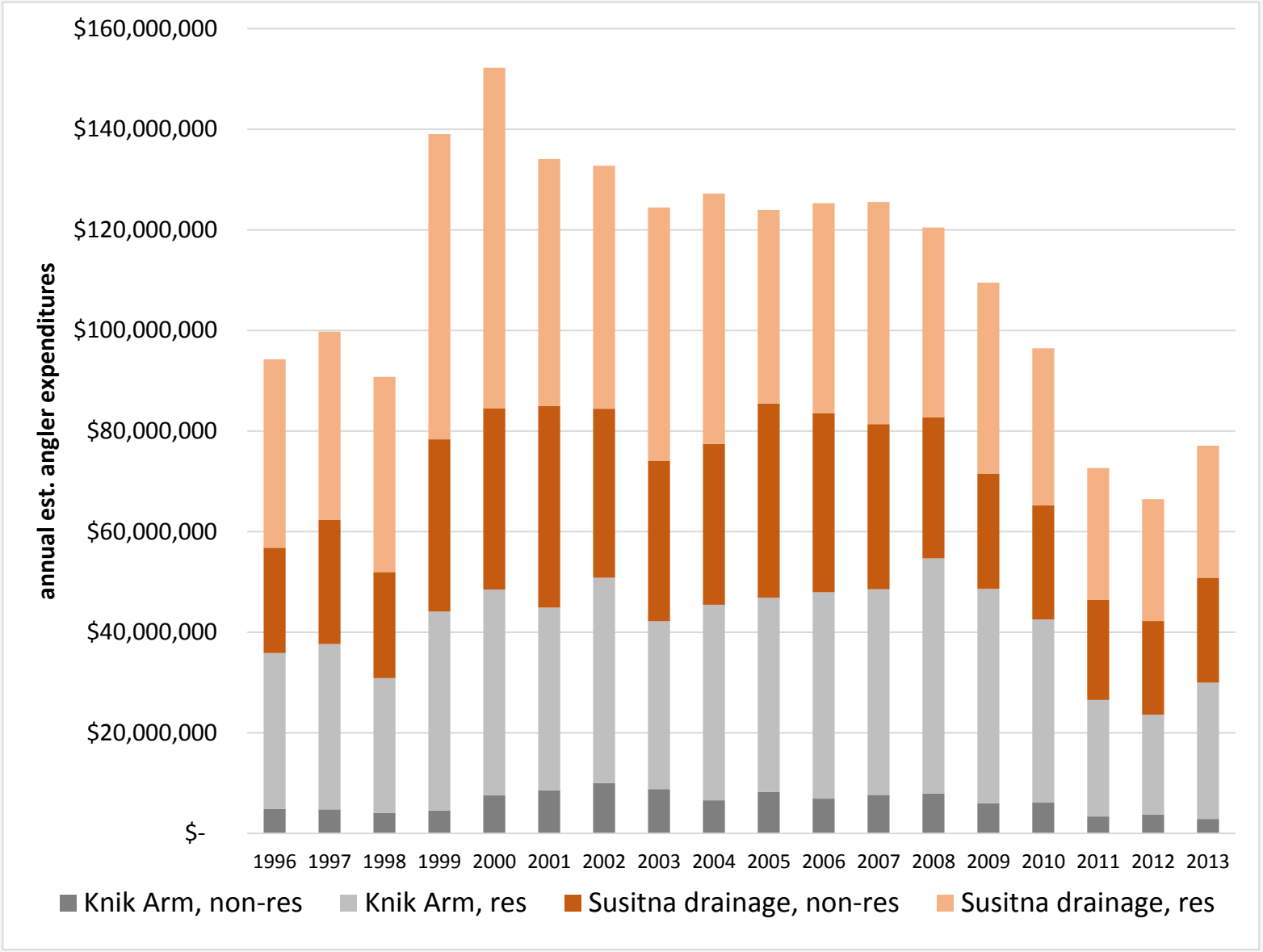
Correlation of Sport Fish Harvester Survey and available economic data: Annual estimated angler spending associated with angler effort

Annual sport fish earnings in the Mat-Su:

- $31 to $64 million
- 900 to 1900 jobs annually

Annual consumer spending on sport fish in the Mat-Su:

- $66 to $163 million annually



Operator Survey: Types of services provided by sport fishing operators in the Mat-Su

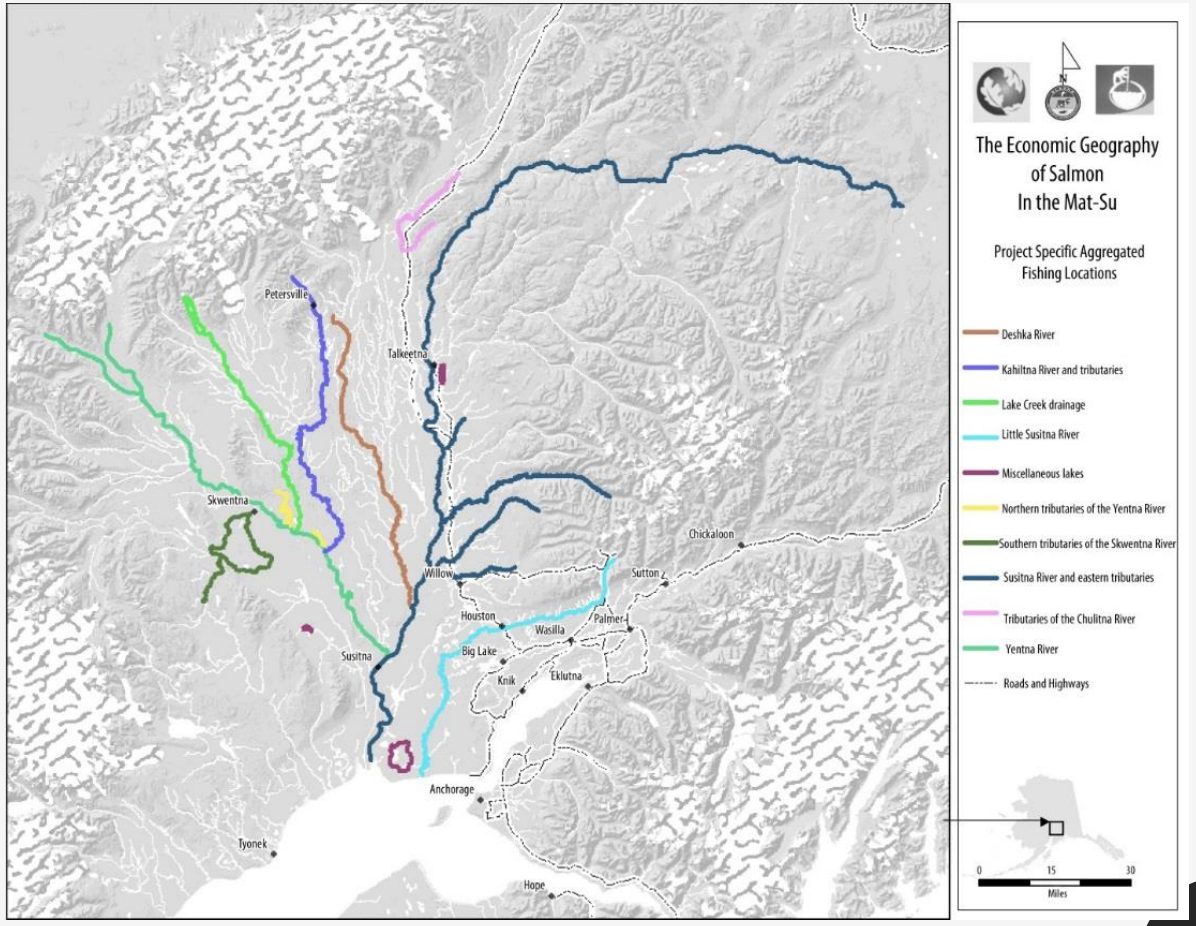
Services Provided	Number of Responses	Estimated Total for Industry	Proportion of Industry
Camping	4	7	16%
Guiding	23	41	95%
Lodging	8	17	40%
Retail Items	10	19	44%
Transportation	18	32	75%
Airplane Transportation	11	20	50%
Operating Outside Alaska	3	5	11%
Non-Alaska owners	3	8	19%

Note: Individual response rates for each question were used to extrapolate estimates for the entire industry since respondents had the option to omit any question. It was assumed that the responses given represented the fraction of the industry represented by the response rate, and using that assumption, estimates were calculated for the industry level. Source: ISER

Operator Survey: Most important fishing locations in the Mat-Su

Most Important Locations	Number of Responses	Total for Industry	Proportion of Industry
Deshka River	5	9	21%
Lake Creek	5	9	21%
Little Susitna	3	6	14%
Other	10	19	44%

Note: Locations are designated "most important" based on share of revenue to respondents. Totals for industry may not add up to 43 because one or more respondents indicated location(s) that were equally important based on share of revenue. Source: ISER



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Operator Survey: Most important species to sport fishing operators in the Mat-Su

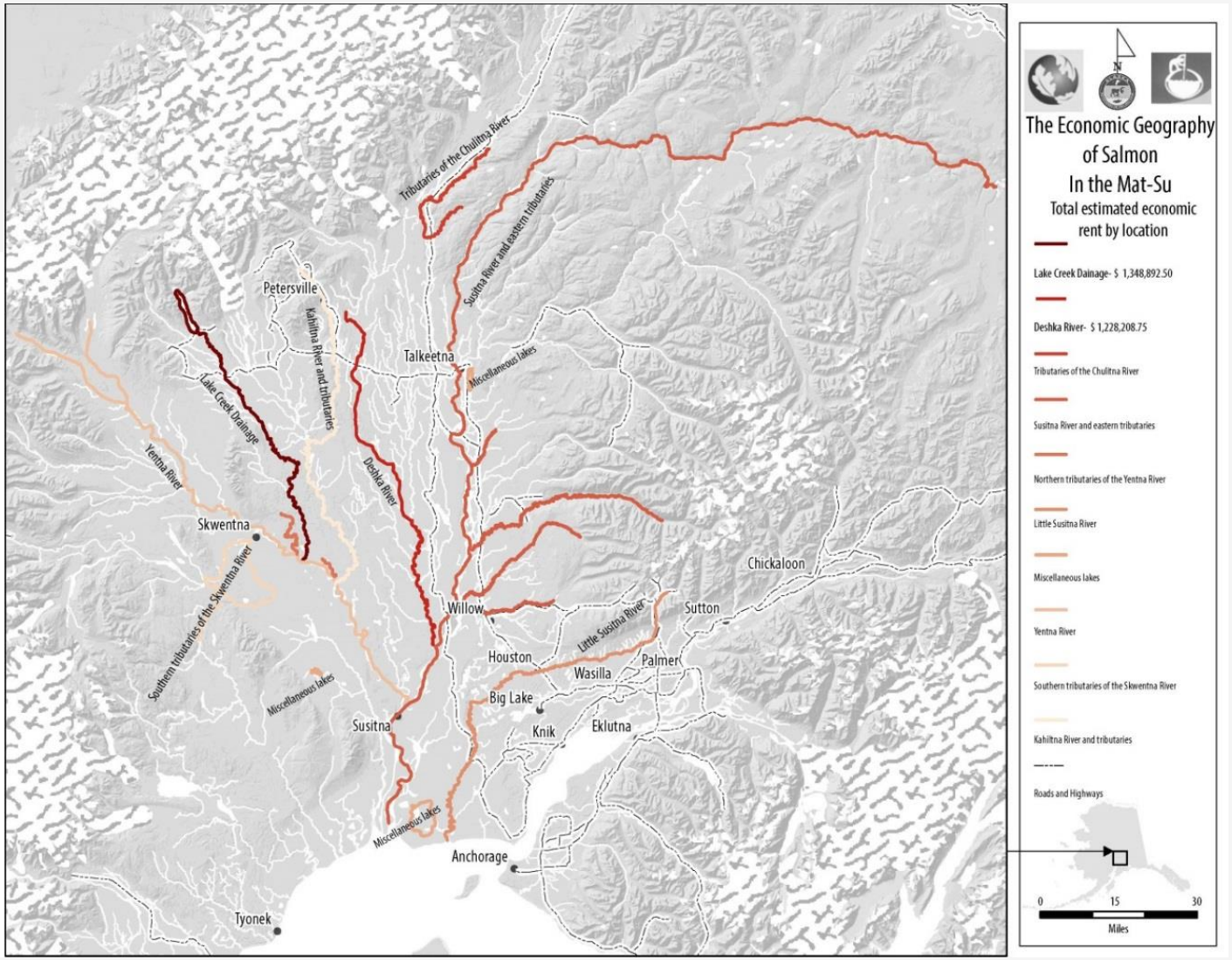
Most Important Species	Number of Responses	Total for Industry	Proportion of Industry
King Salmon	10	19	42%
Coho Salmon	6	11	24%
Rainbow Trout	6	11	24%
Pike	2	4	9%

Note: In this case, "most important" indicates that a species was ranked number one for the location that brought in the most revenue for a respondent. Totals for industry may not add up to 43 because one or more respondents indicated location(s) and/or species that were equally important based on share of revenue. None of the respondents indicated sockeye salmon as their number one most important species in the location that contributed most to their revenues. Source: ISER

Conclusions: Total estimated economic rent by location

Location	%	Producer Surplus
Lake Creek Drainage	33.51%	$401,137
Talkeetna River and Tributaries	15.52%	$185,785
Deshka River	13.25%	$158,611
Yentna River	11.30%	$135,268
Miscellaneous Lakes	9.58%	$114,679
Southern Tributaries of the Skwentna River	8.46%	$101,272
Kahiltna River and Tributaries	2.72%	$32,560
Susitna River and Eastern Tributaries	2.55%	$30,525
Little Susitna River	2.15%	$25,737
Northern Tributaries of the Yentna River	0.80%	$9,577
Tributaries of the Chulitna River	0.17%	$2,035
Total	100%	$1,197,066

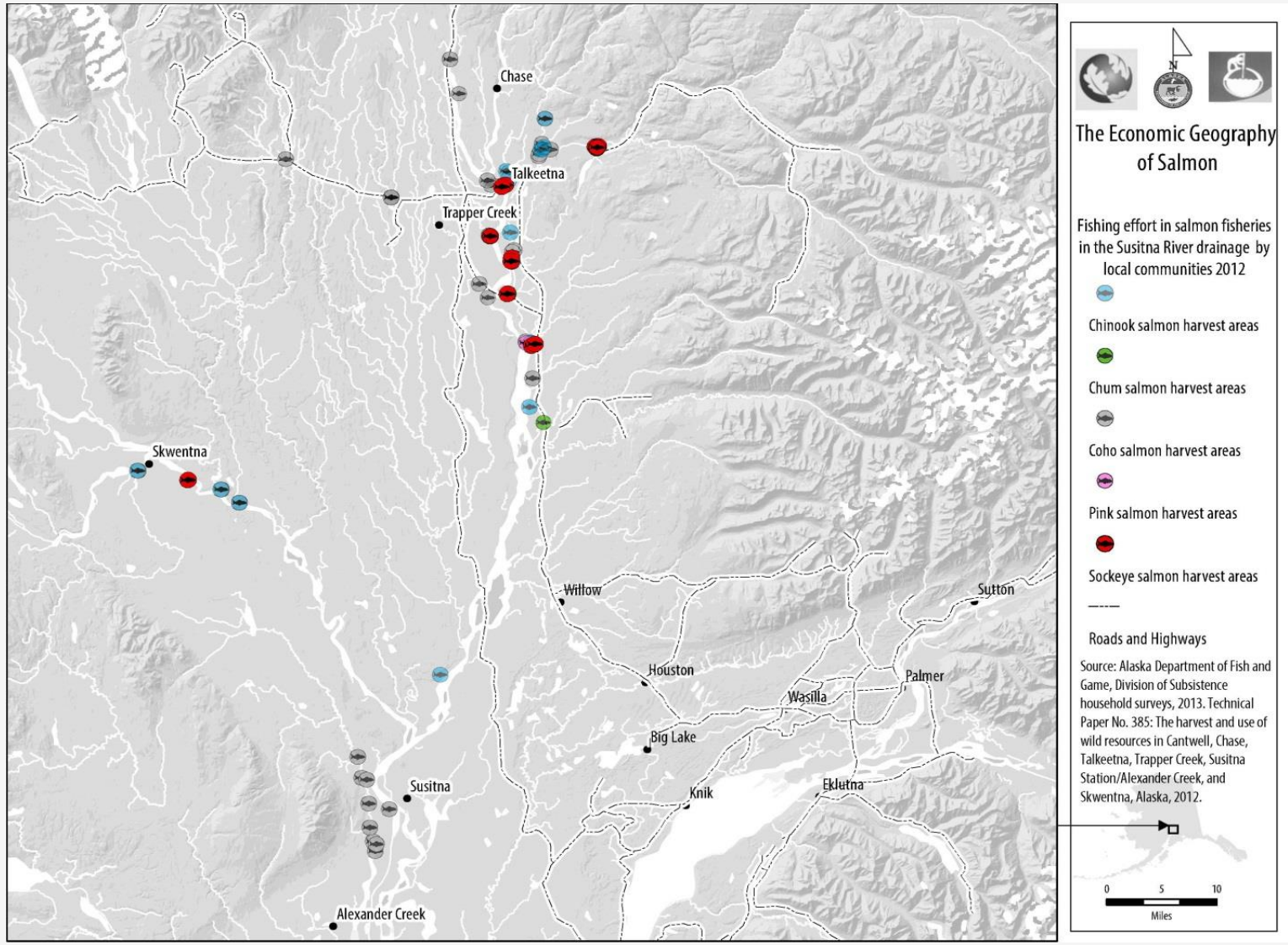
Note: Rent was apportioned to each location based on the proportion of guided angler days in each location. A weight for Little Susitna River was determined based on the proportion of revenues to the Little Susitna River indicated in the survey. Weights were then normalized.



Commercial Fisheries Data: Estimated ex-vessel value in Cook inlet sockeye salmon fisheries

Year	Total Cook Inlet ex-vessel value	Permit holder earnings who are Mat-Su residents [a)]	Estimated mean ex-vessel value of Mat-Su "born" sockeye salmon [b)]
2004	$ 21,982,320	$ 550,613	n/a
2005	$ 30,843,280	$ 785,416	$425,086
2006	$ 13,124,620	n/a	$259,096
2007	$ 22,591,000	n/a	$1,597,026
2008	$ 20,272,140	$ 784,891	$901,740
2009	$ 17,825,720	$ 819,507	$1,074,308
2010	$ 29,901,350	$ 1,456,719	$2,153,295
2011	$ 51,426,720	$ 2,143,254	$2,786,860
2012	$ 32,582,820	$ 1,613,125	n/a

Harvest Assessment Survey: Estimated harvests of salmon by communities, sport and subsistence harvest, 2012



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Salmon as Food Security

"People fish for salmon to keep them to eat, I see people catch and release trout and grayling, but not salmon."

"Salmon fishing around Talkeetna is a great way for us to supplement expensive groceries. We can catch and keep three sockeye a day, and let's say they go out a dozen times throughout the summer, that's a lot of fish to eat for the winter."

Fishing near Talkeetna, Susitna River Basin

Conclusion

Sector	Jobs and wages	Consumer surplus	Consumer spending[c]	Producer surplus	Producer spending	Producer Gross Income
Mat-Su related portion of Cook Inlet commercial salmon	64 permit holders earning $0.6 - $2.1 million [e(a)]	Not avail.[b]	Not avail.	Not avail.	Not avail.	$0.4 - $2.8 million[d]
Mat-Su Sport Fishing	900 to 1900 jobs earning $31 - $64 million[f]	$14.2 million[a]	$63 - 163 million[b]	$1.2 million	$5.8 million[g]	$6.6 million[f]

a) Measure from 1987 related to fishing conditions found at that time, adjusted for inflation. Only measures Little Susitna River chinook and coho, East Susitna roadside streams chinook and coho, Lake Creek all species, and West Susitna streams chinook and coho.

b) Spending related to all species, not just salmon.

c) Includes multiplier effect

d) Ex-vessel value of Mat-Su born sockeye salmon harvested in Upper Cook Inlet salmon fisheries.

e) (a) Annual ex-vessel value of fish caught in last ten years in Cook Inlet salmon fisheries by permit holders who are residents of the Mat-Su. Does not include multiplier effects.

f) Estimated 2014 revenue (gross income) of fishing lodges and sport fishing guide services

g) Total cost related to fishing lodges and sport fishing guide services

h) Would estimate what all consumers of Mat-Su born salmon would be willing to pay per lbs of salmon over and above of what they actually pay.