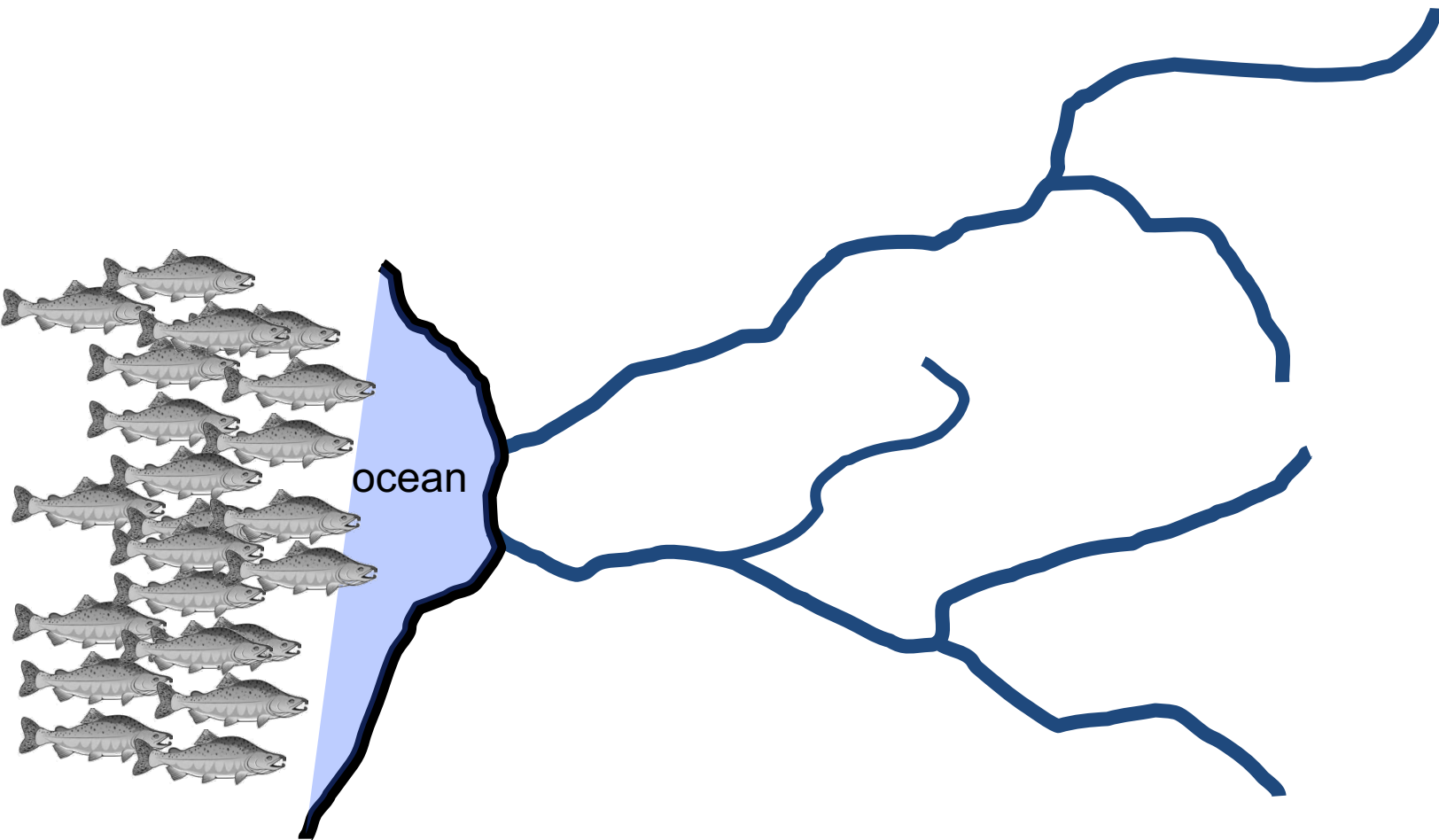


Where did commercially-caught coho salmon in Cook Inlet originate: Genetic stock identification sheds some light

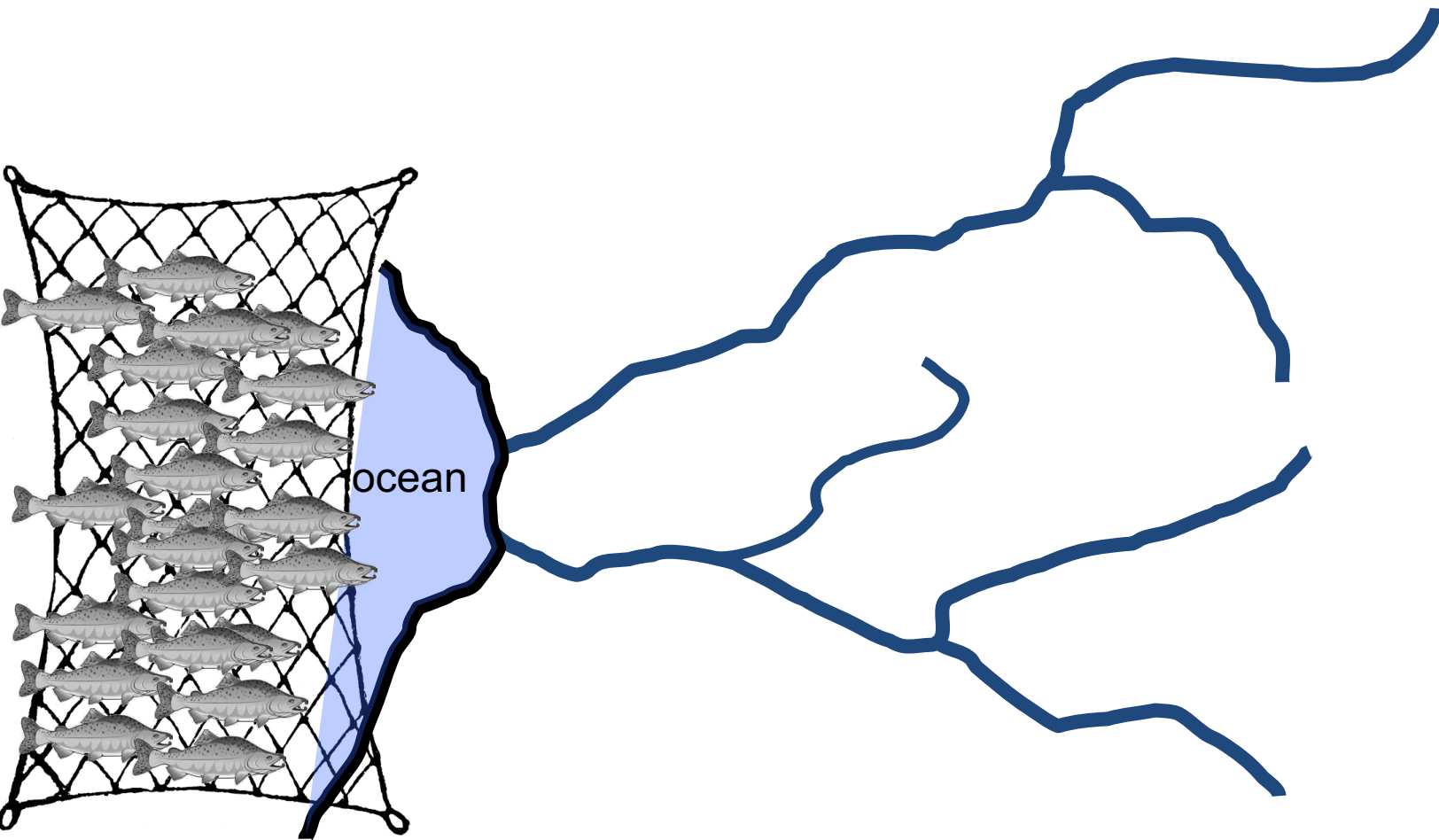
Andrew Barclay
Gene Conservation Lab



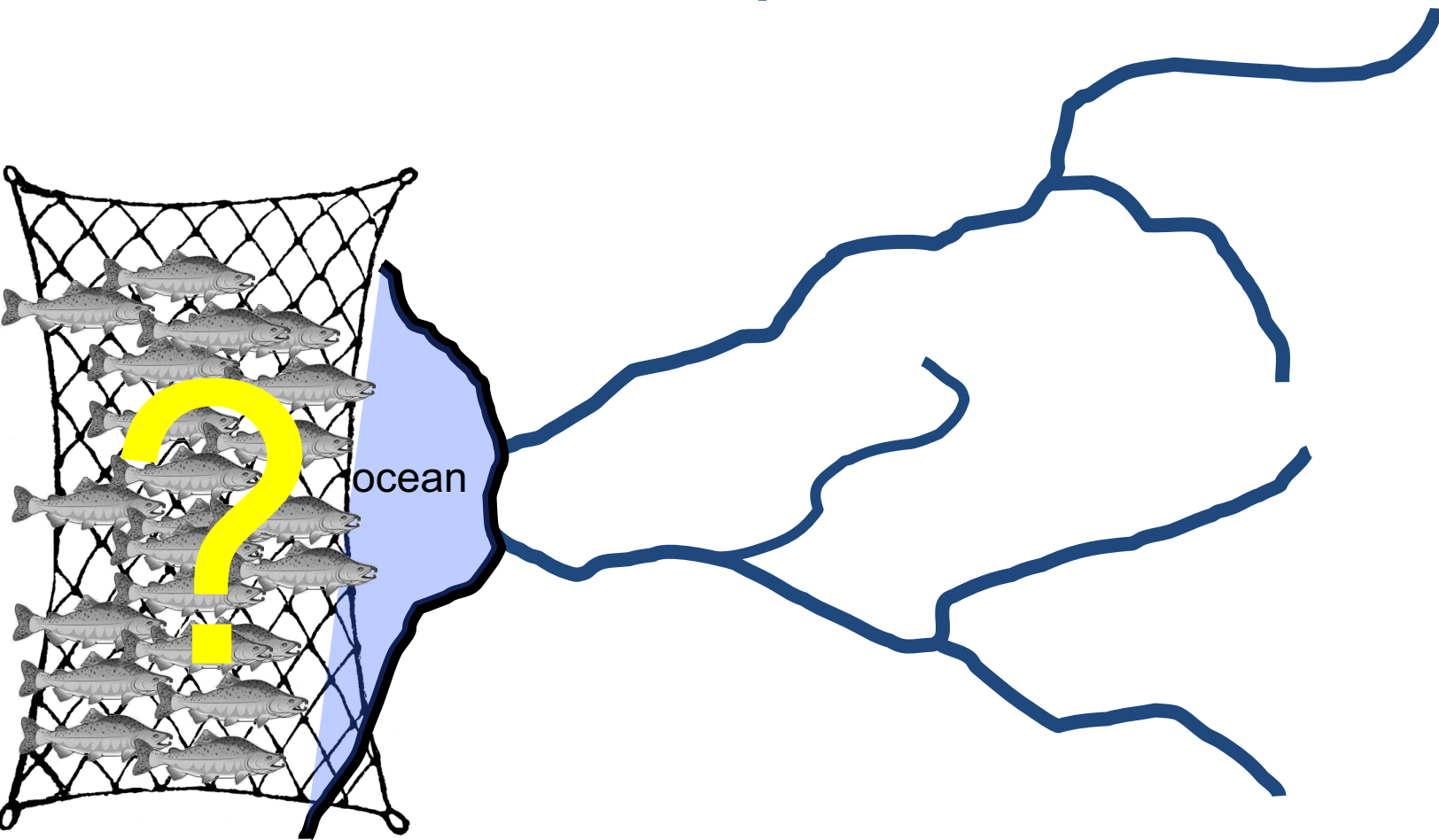
Many salmon stocks are present in marine waters of Cook Inlet



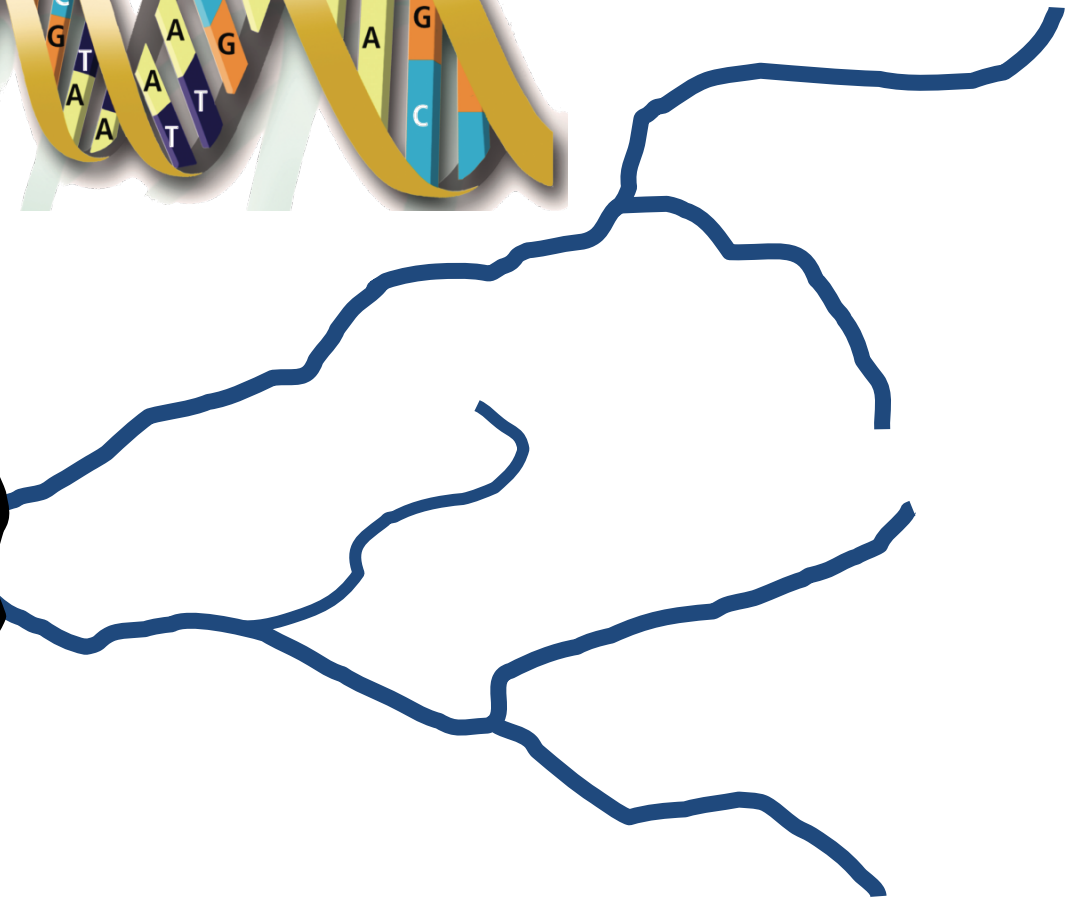
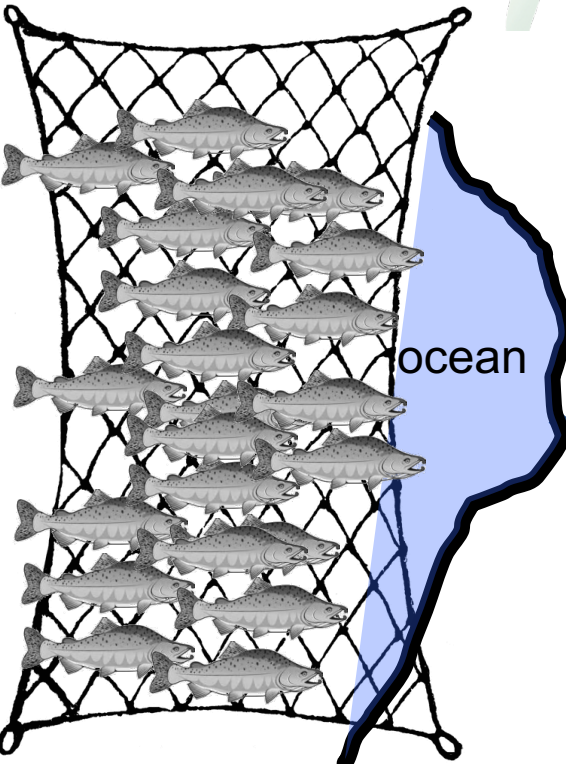
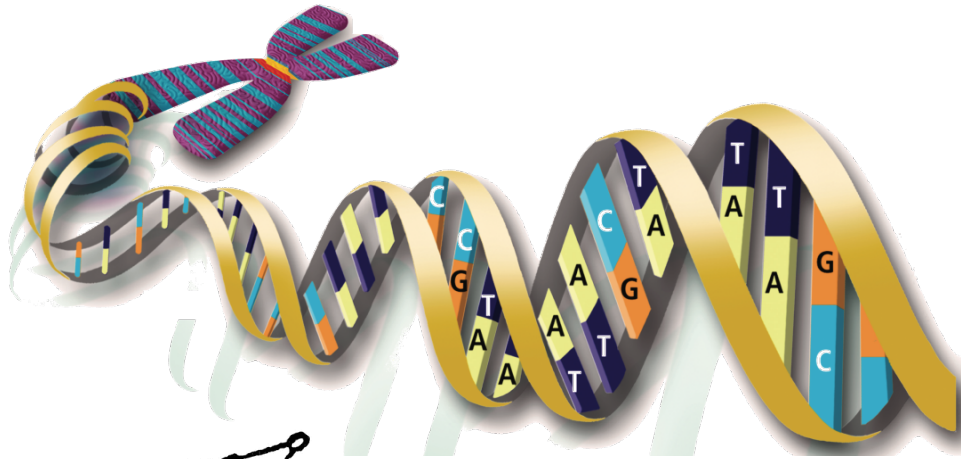
Commercial harvests are mixtures of stocks



How can we estimate the composition?

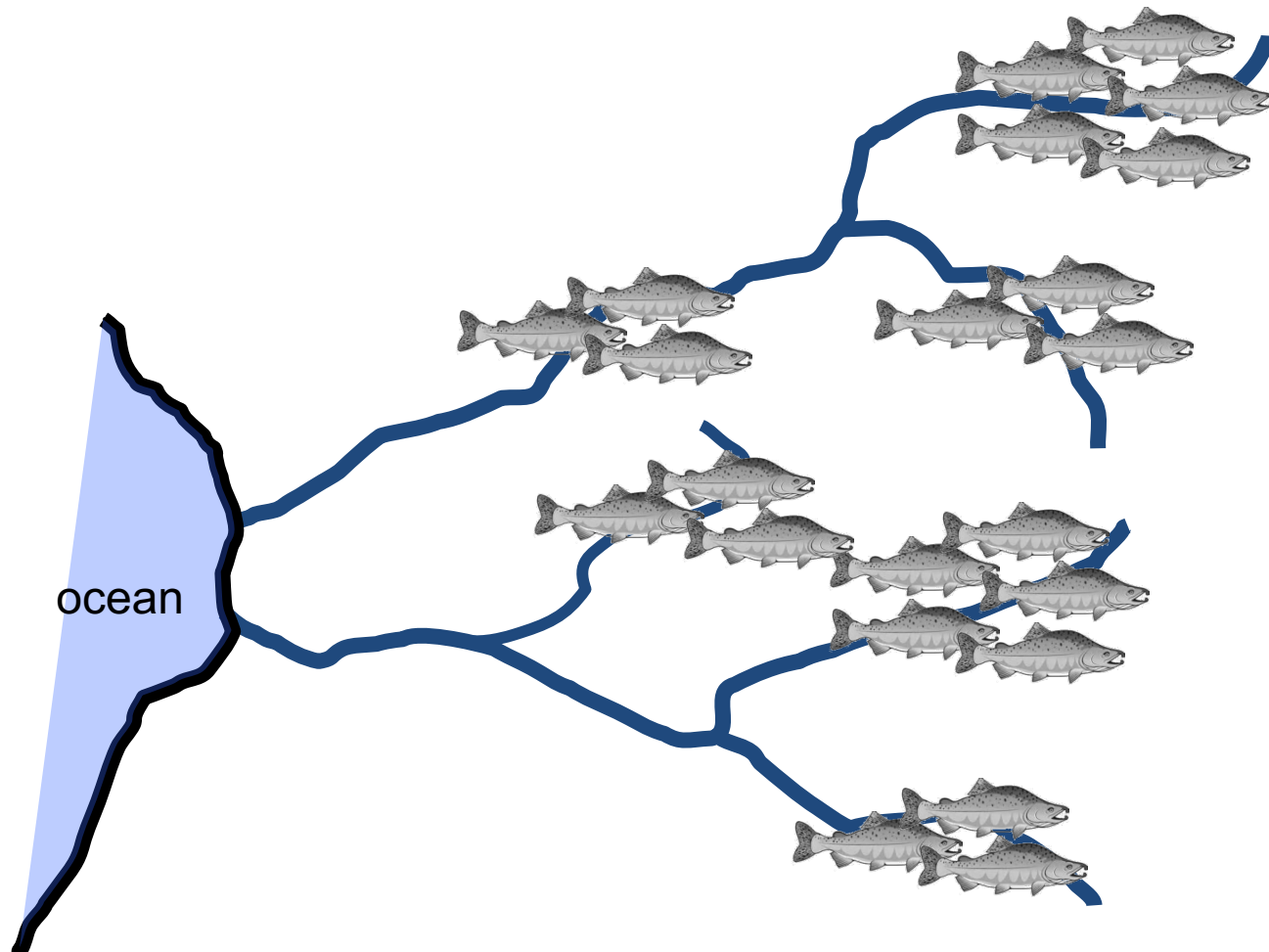


One way to do this... GENETICS!



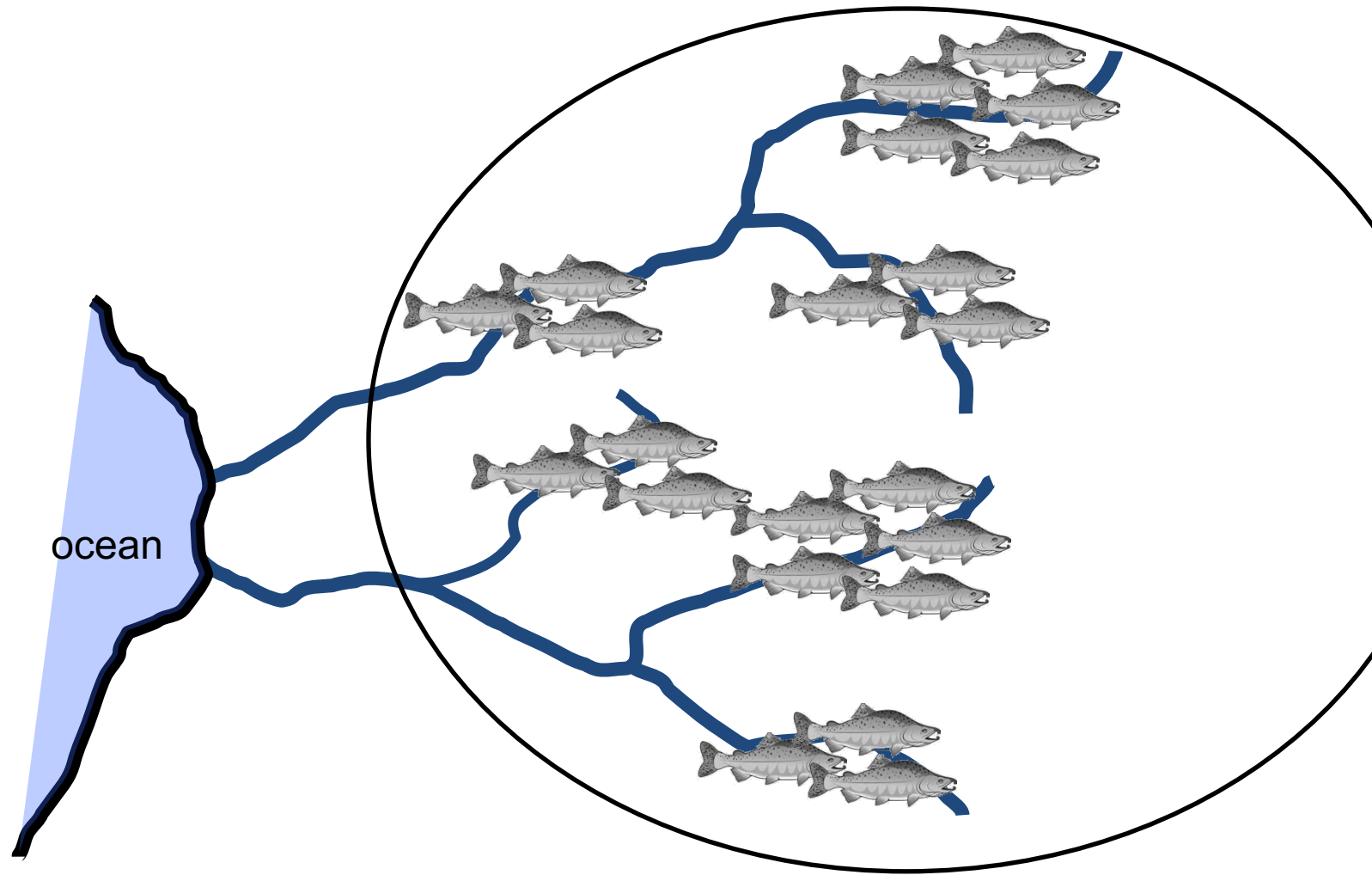
Genetic stock identification

Genetically characterize stocks



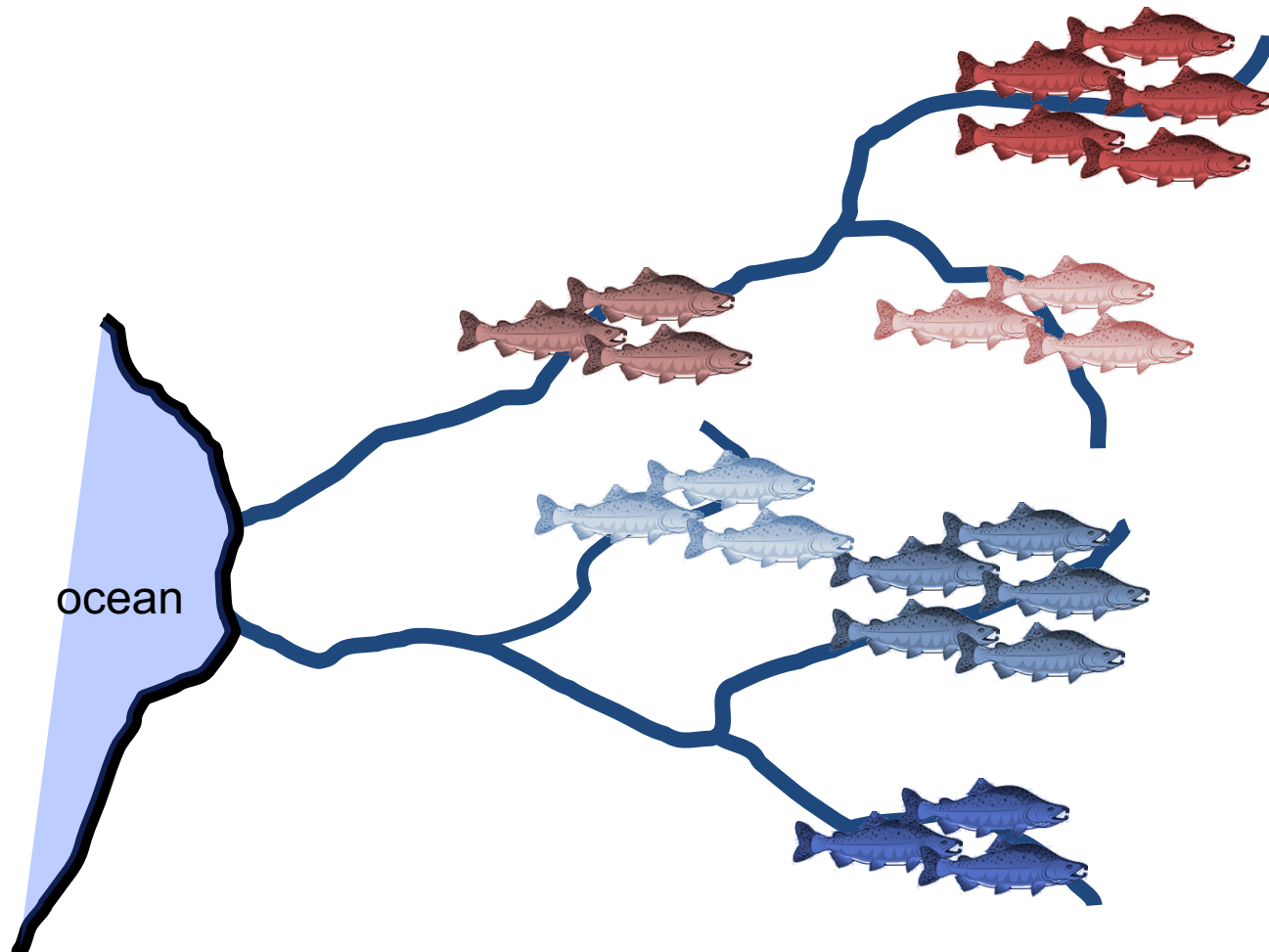
Genetic stock identification

Genetically characterize stocks



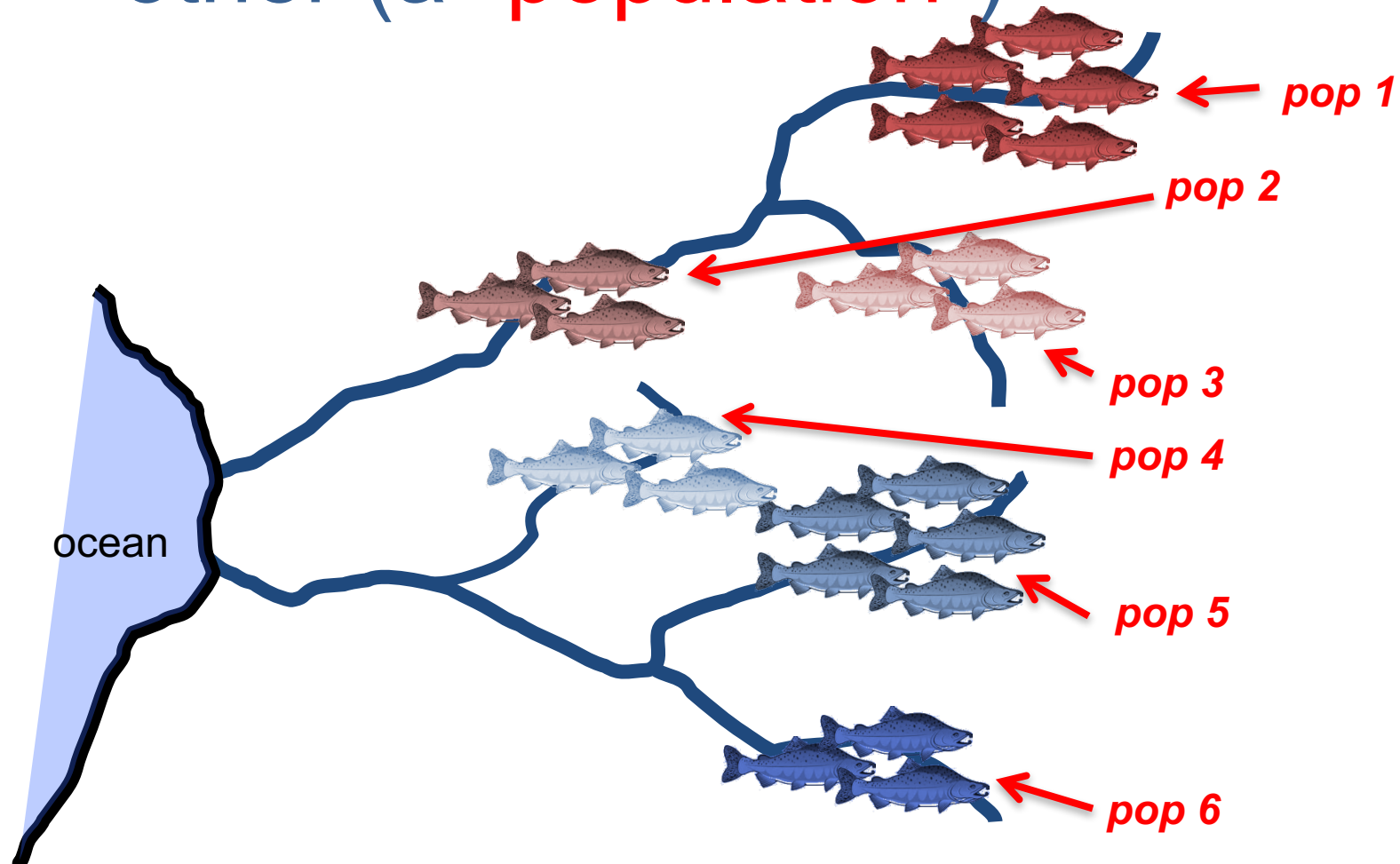
Genetic stock identification

Genetically characterize stocks



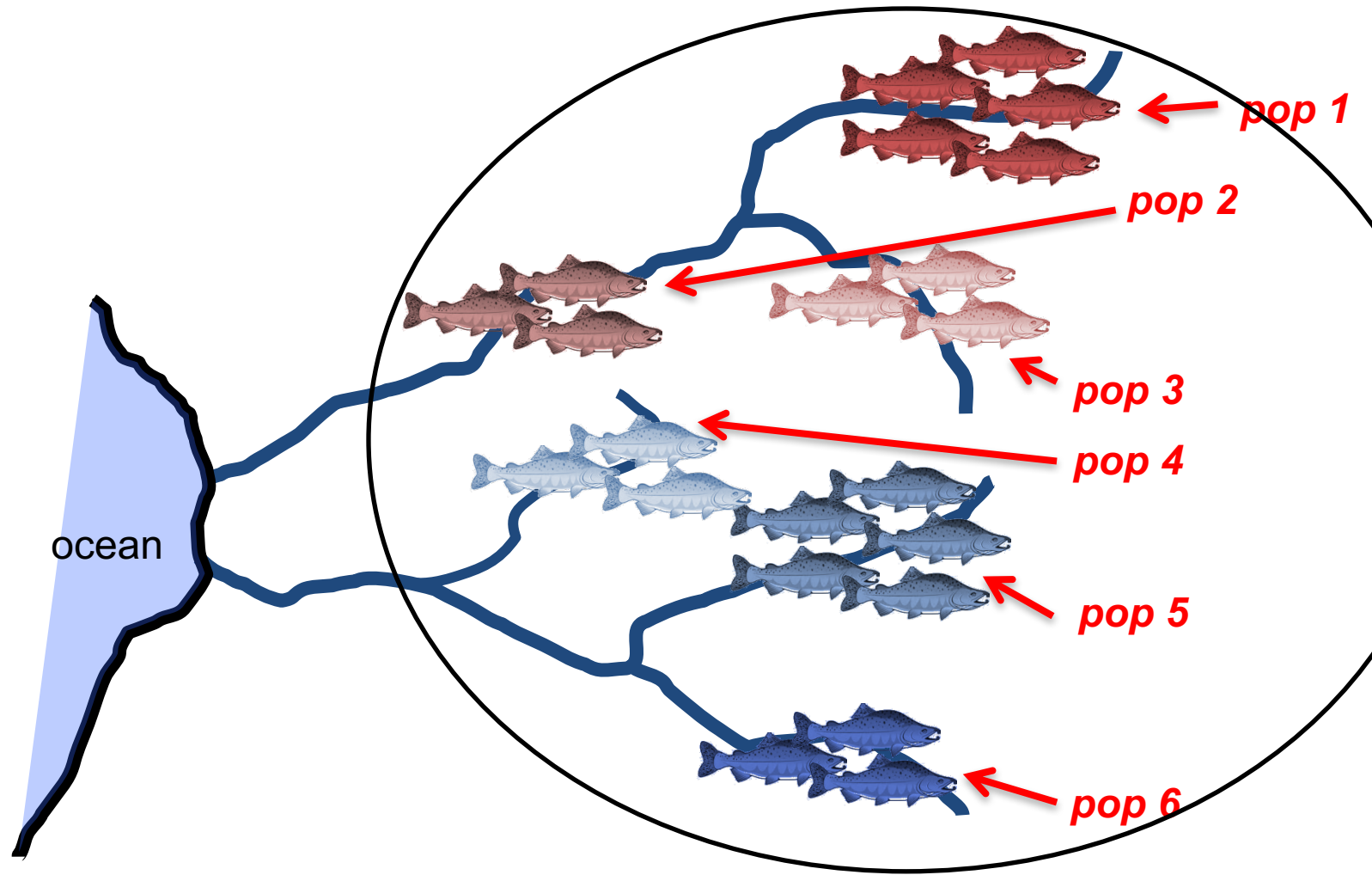
Genetic stock identification

Fish are similar to each other (a “**population**”)



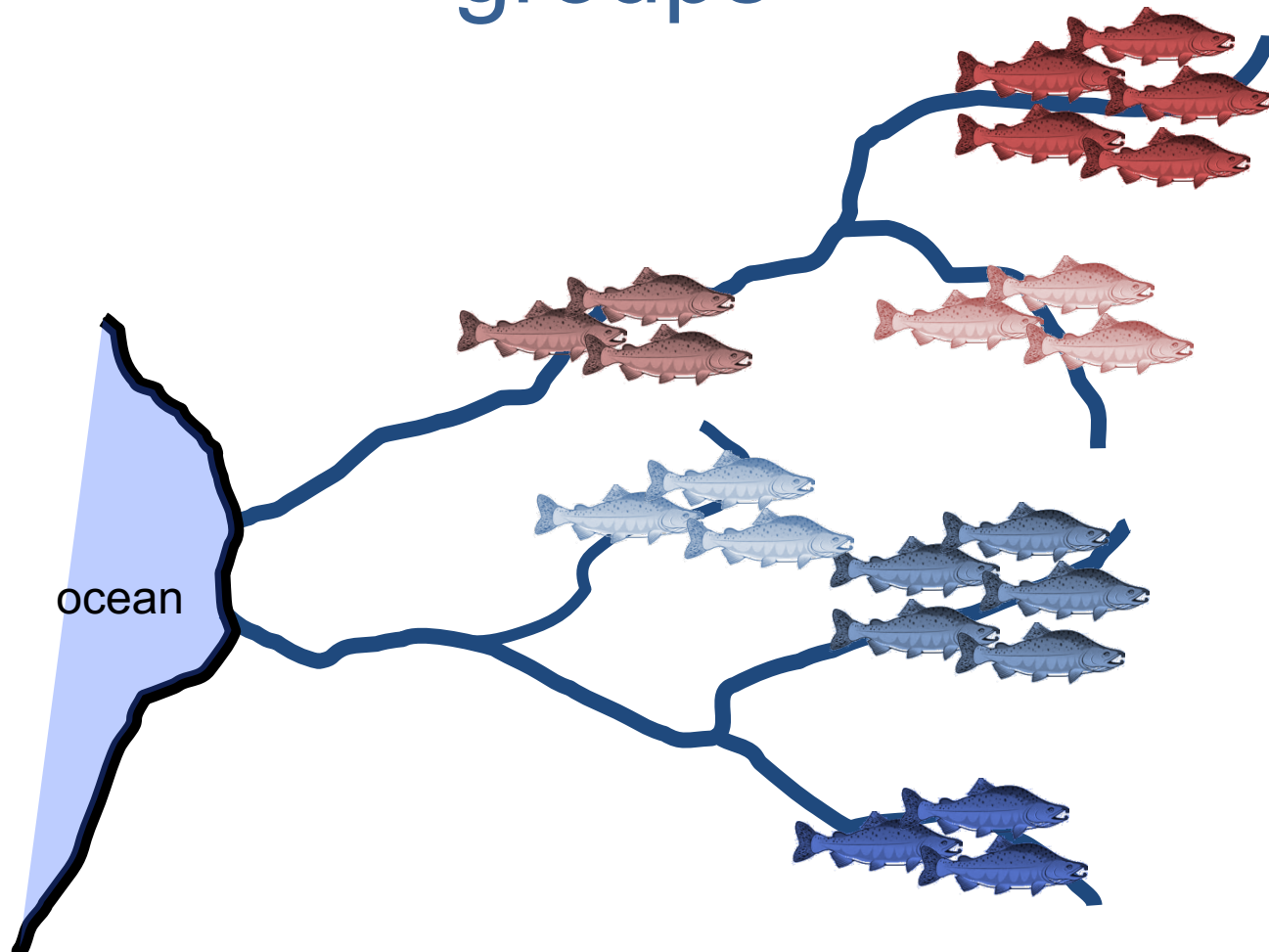
Genetic stock identification

Genetic baseline



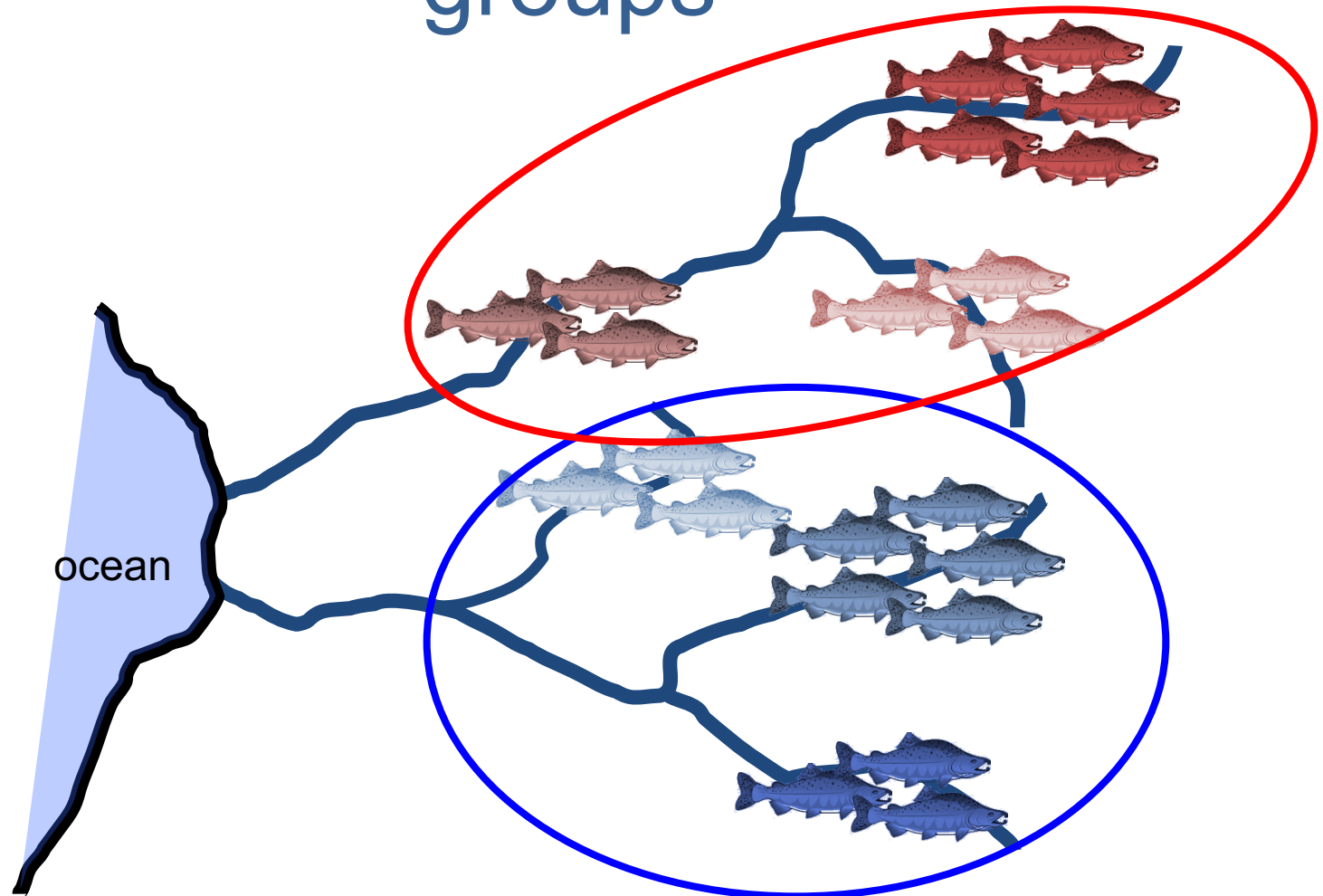
Genetic stock identification

Test for identifiable population groups



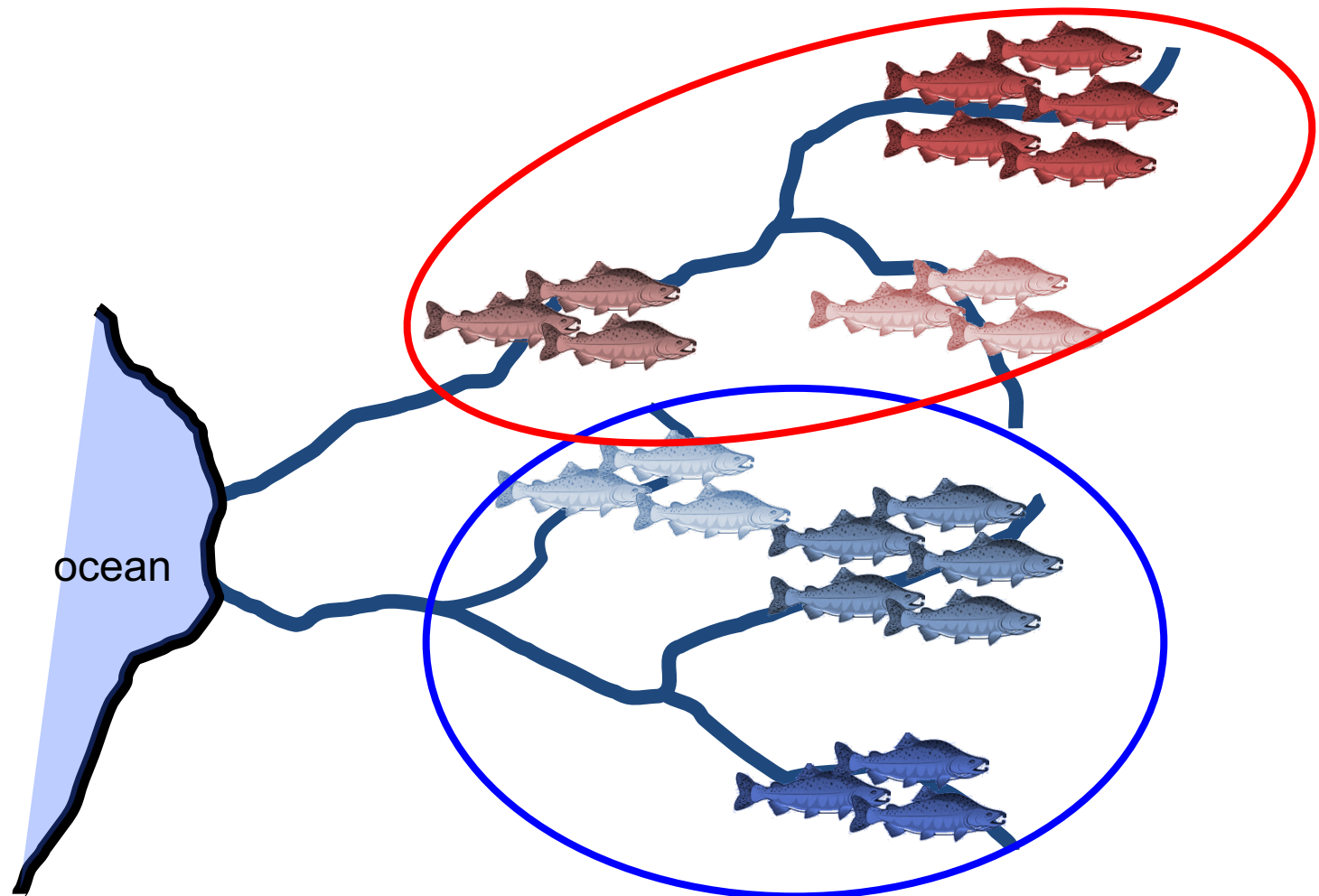
Genetic stock identification

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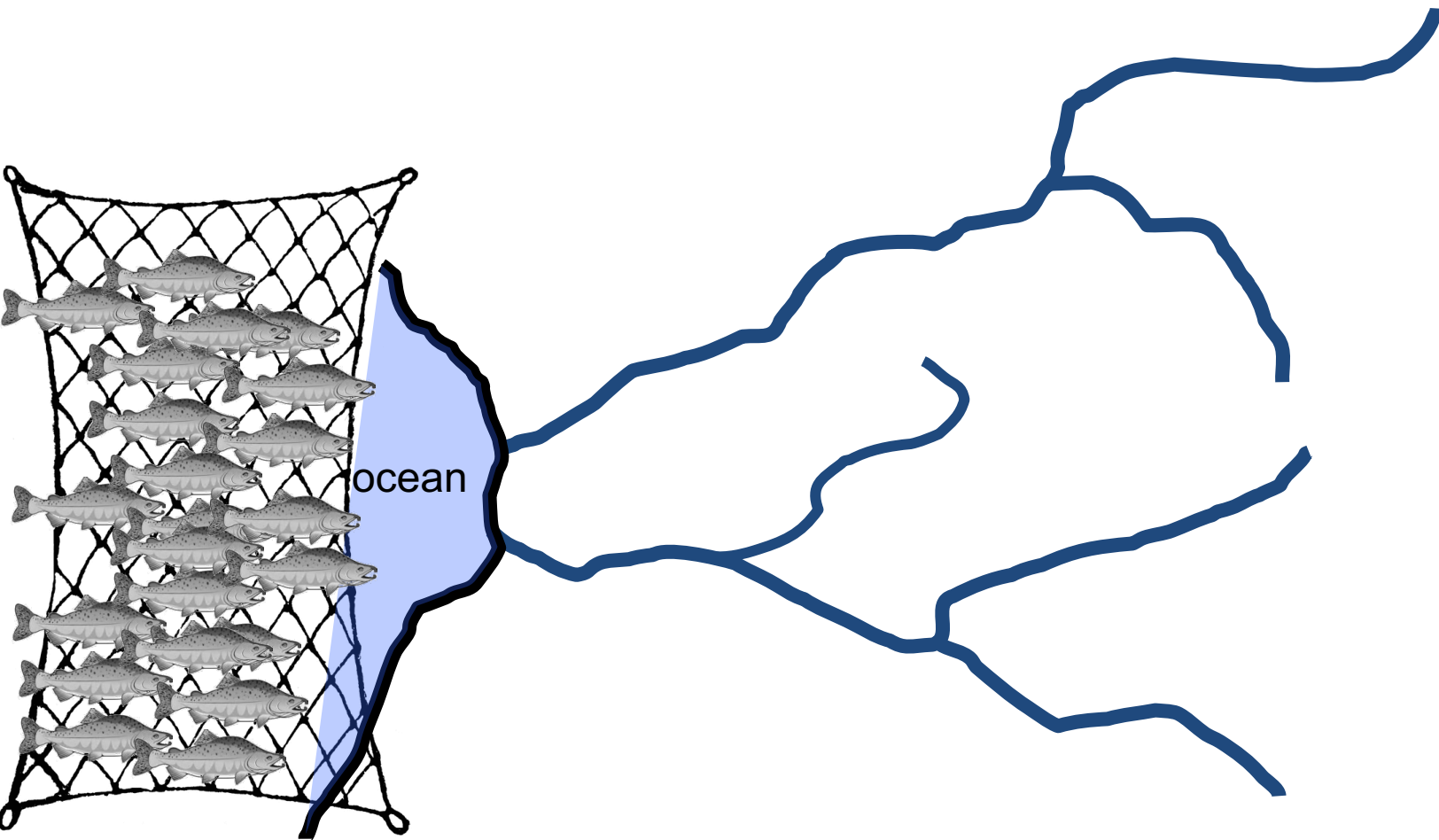
Genetic stock identification

Reporting groups (a.k.a. “stocks”)



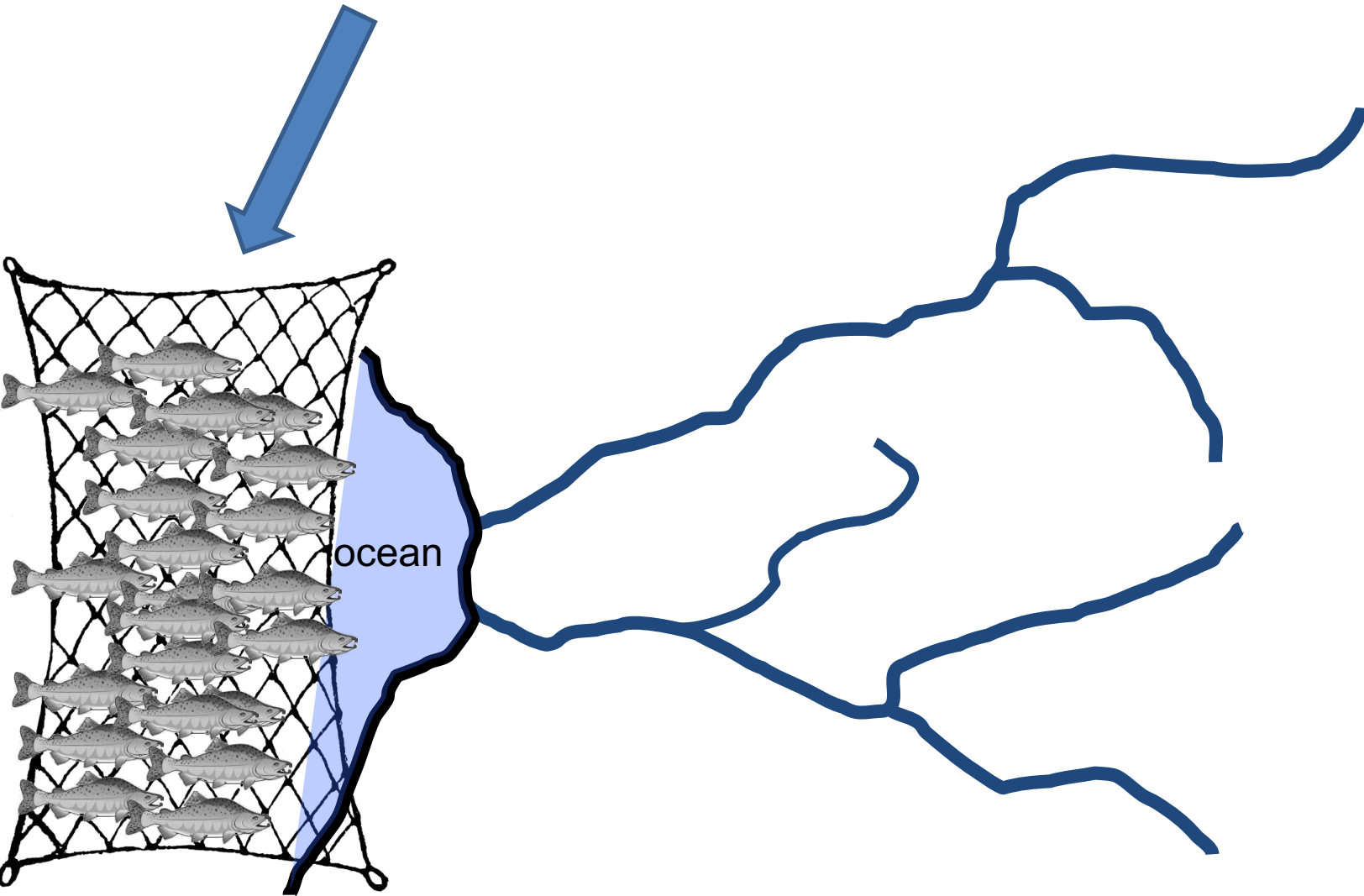
Genetic stock identification

Collect tissue samples



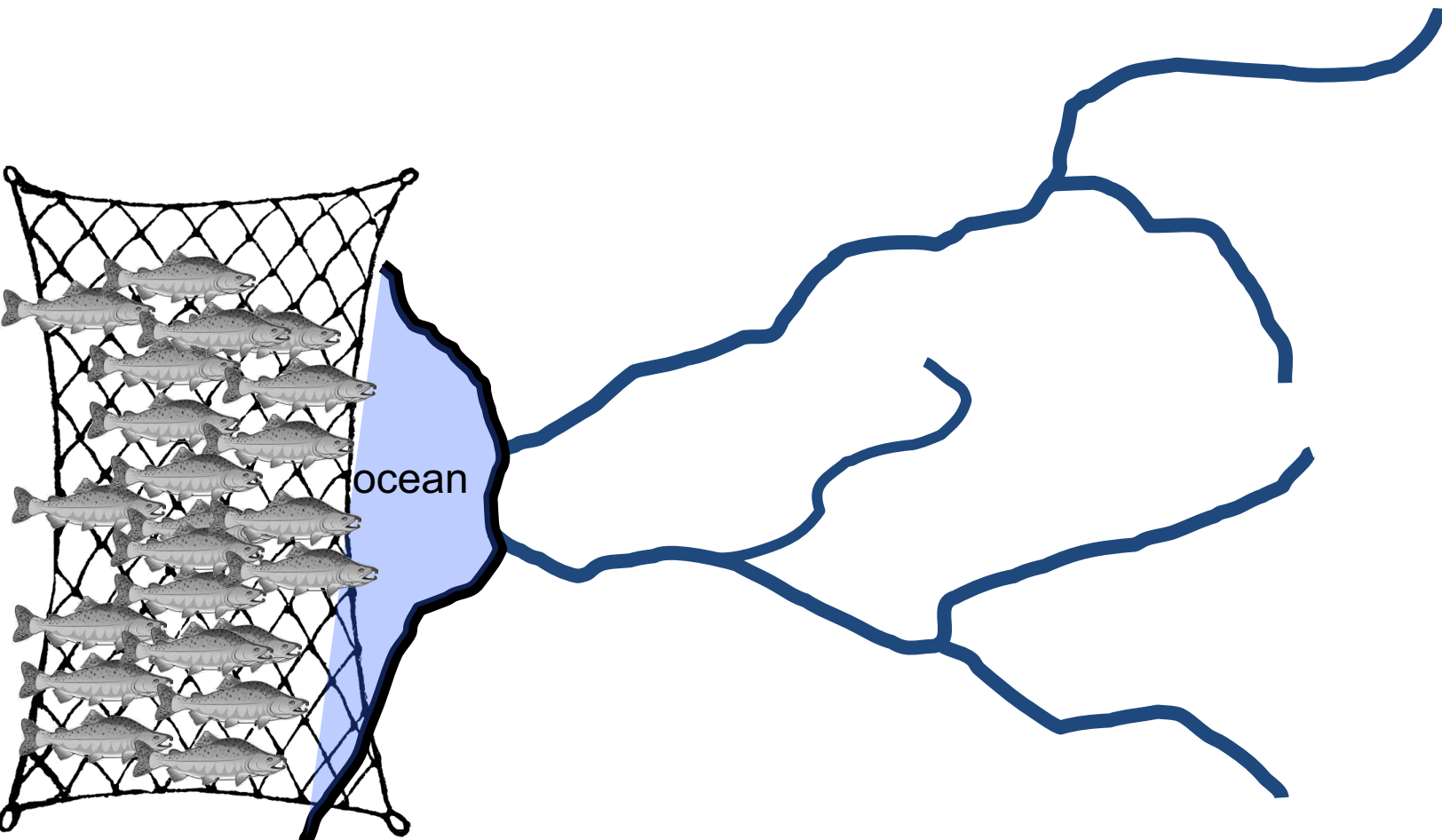
Genetic stock identification

Collect tissue samples



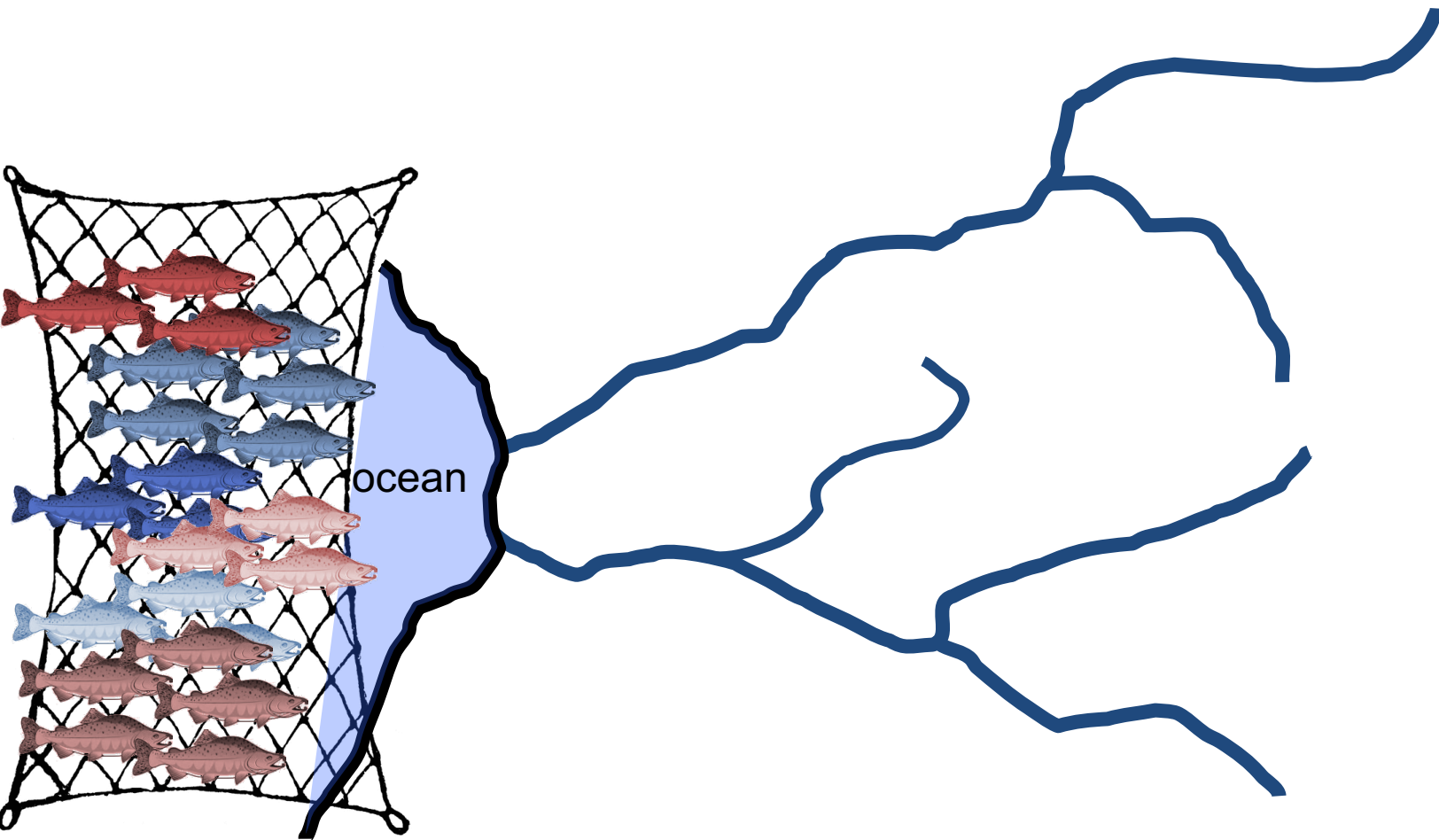
Genetic stock identification

Compare fishery sample data to
baseline data



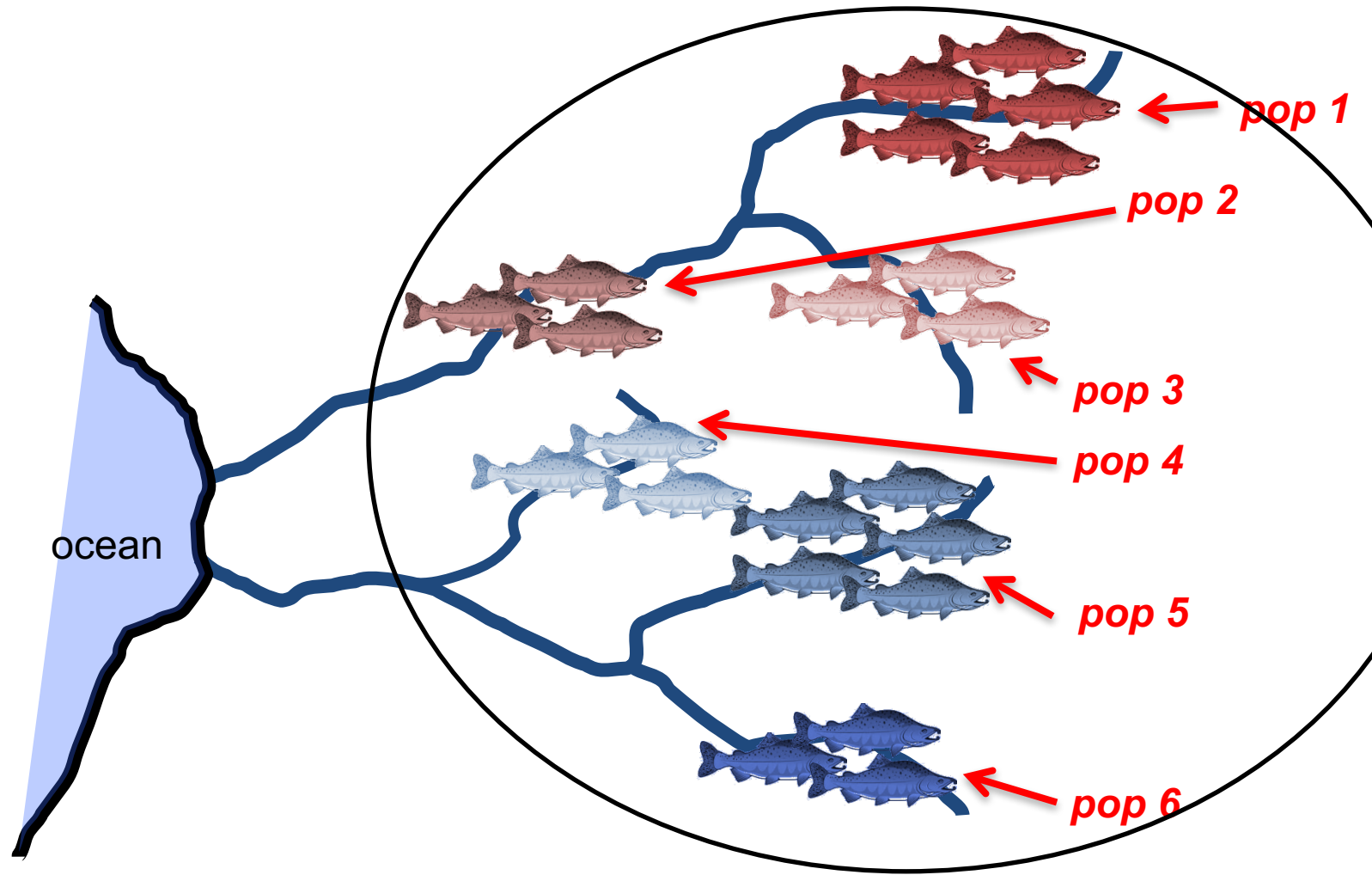
Genetic stock identification

Estimate the stock composition



Genetic stock identification

Genetic baseline



Building a Cook Inlet baseline



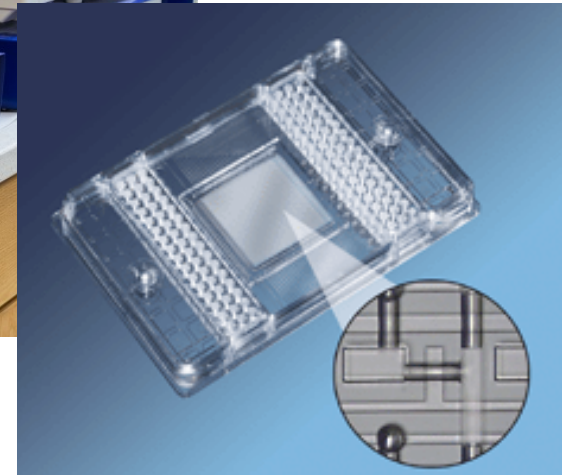
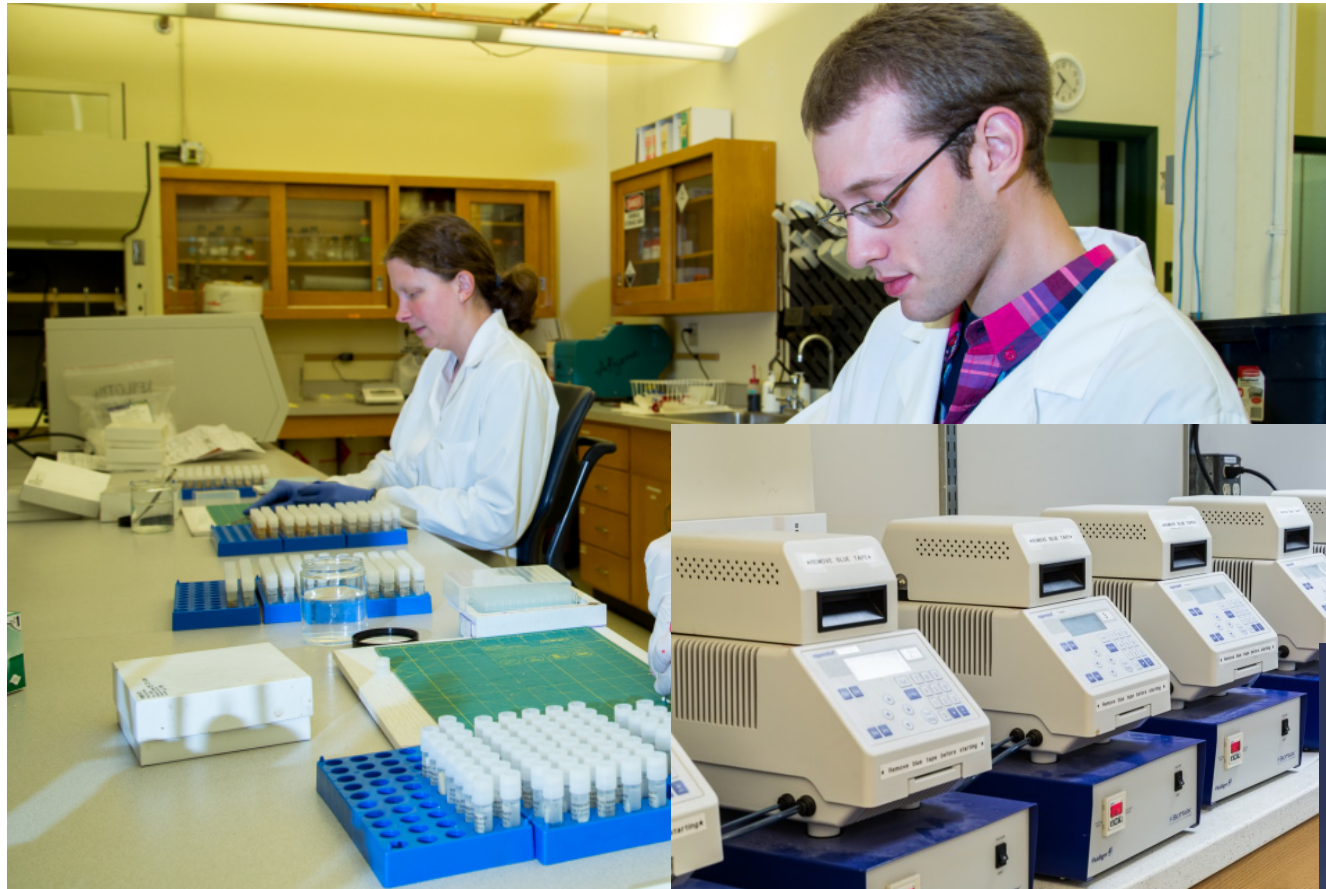
Building a Cook Inlet baseline



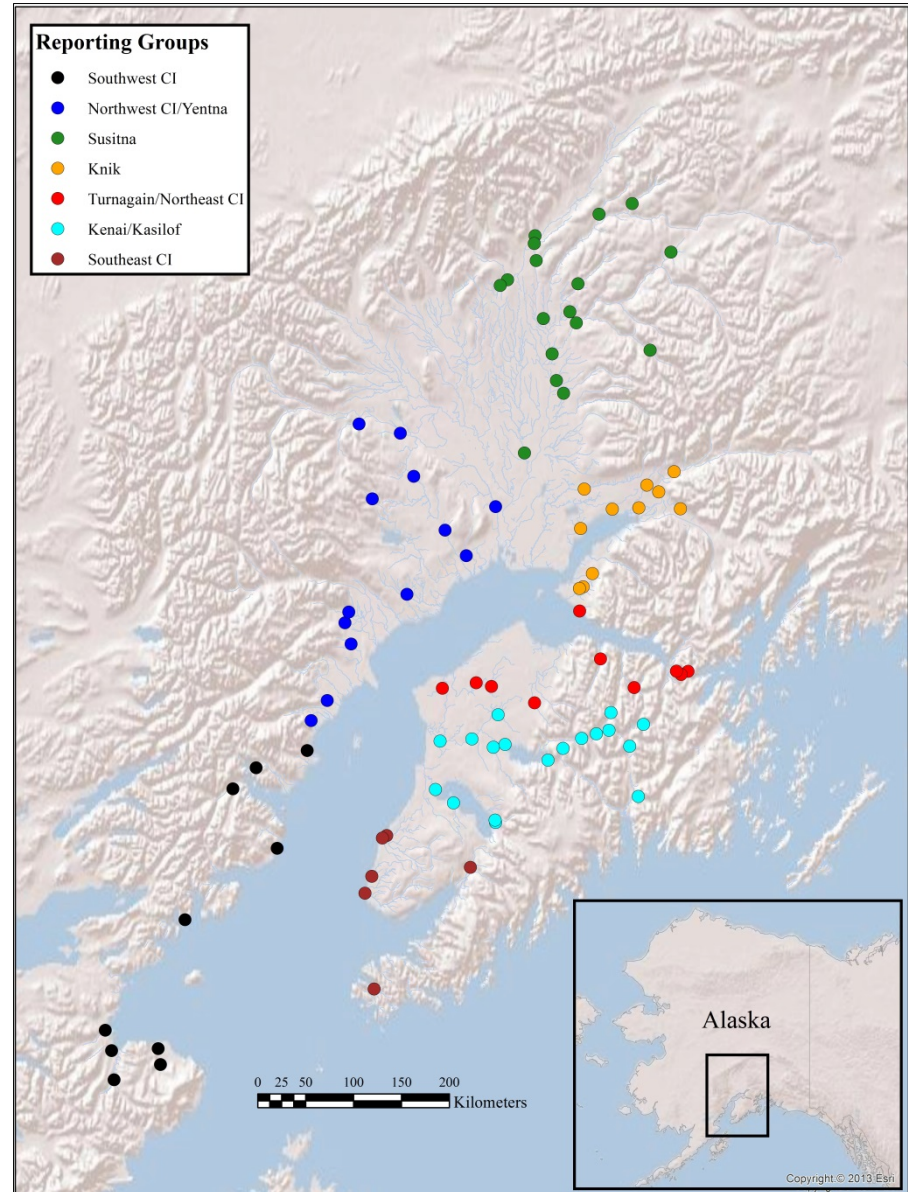
Building a Cook Inlet baseline



Building a Cook Inlet baseline

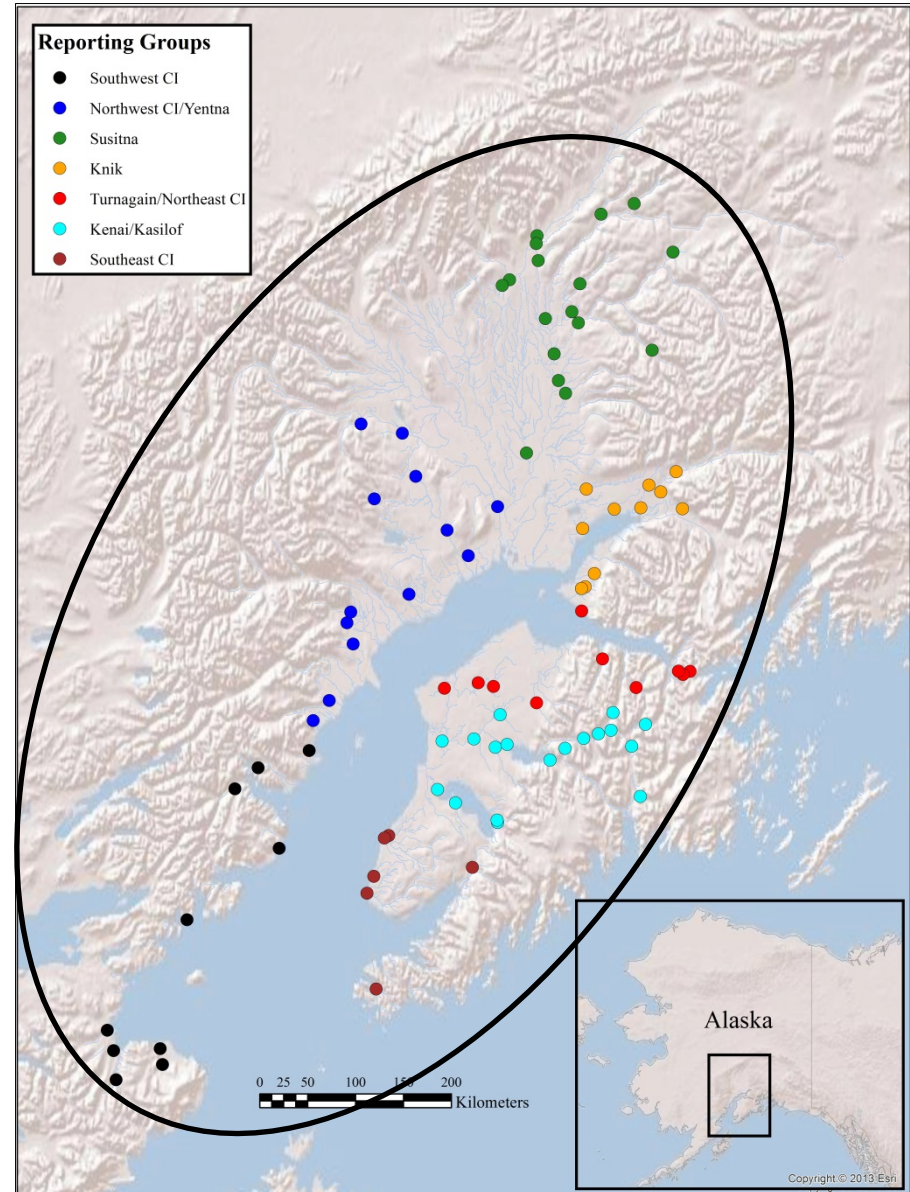


Cook Inlet baseline



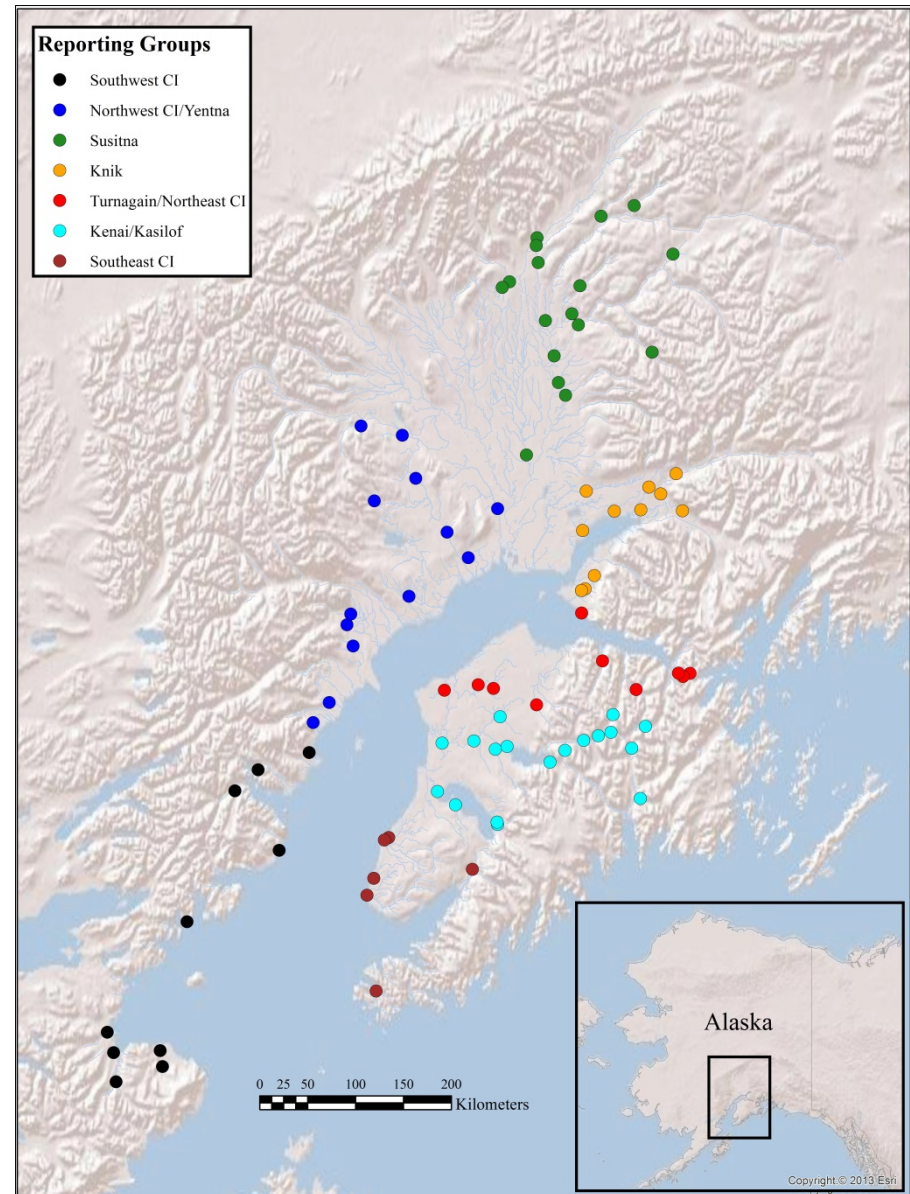
Cook Inlet baseline

- 84 populations



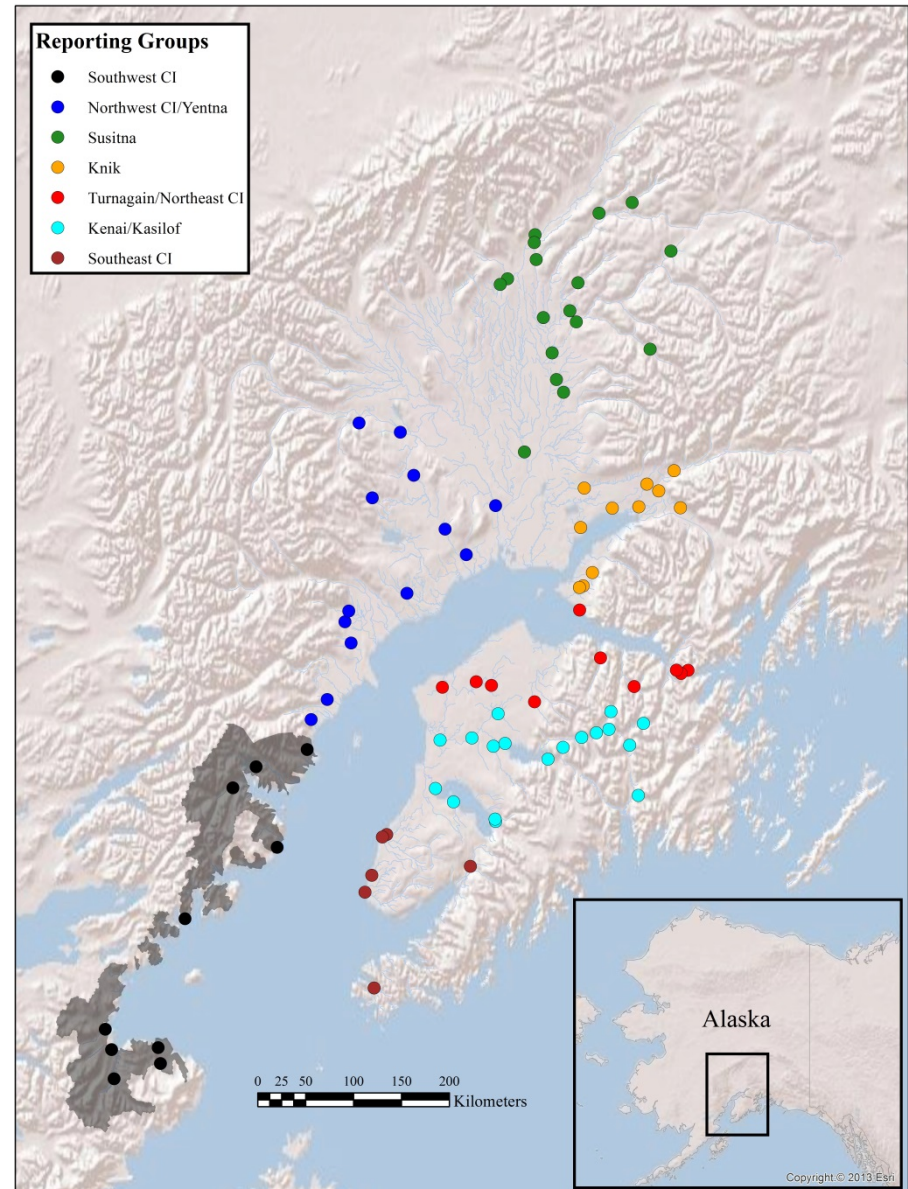
Cook Inlet baseline

- 84 populations
- 7 reporting groups identified



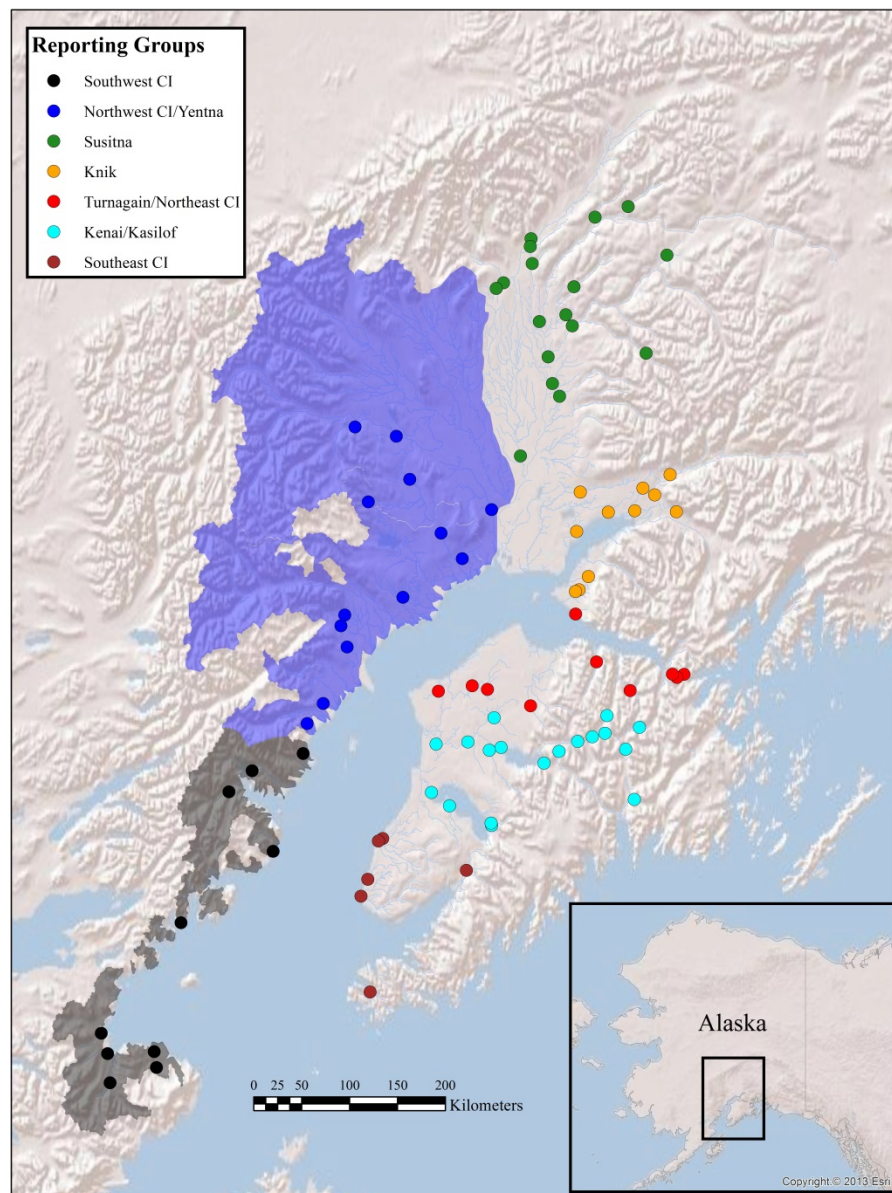
Cook Inlet baseline

- 84 populations
- 7 reporting groups identified
 - Southwest CI



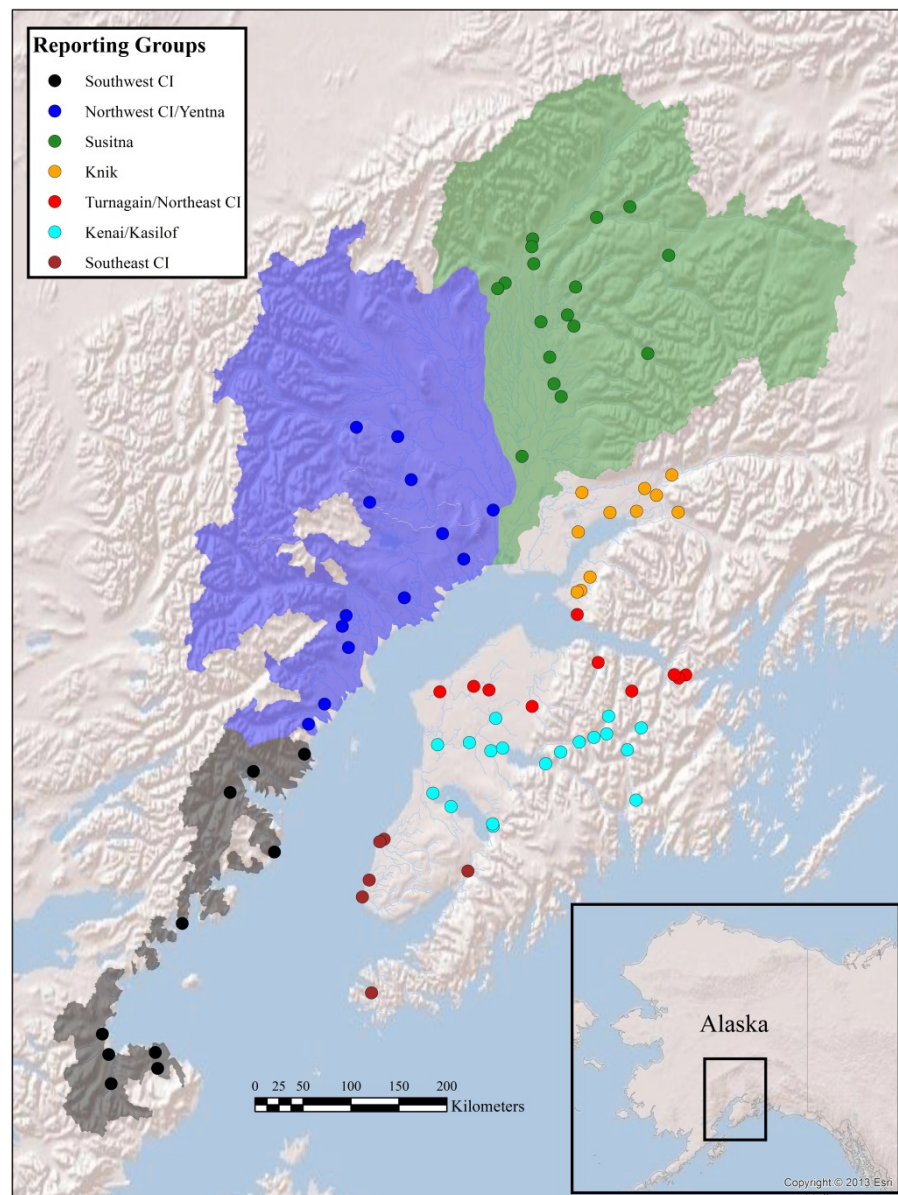
Cook Inlet baseline

- 84 populations
- 7 reporting groups identified
 - Southwest CI
 - Northwest CI/Yentna



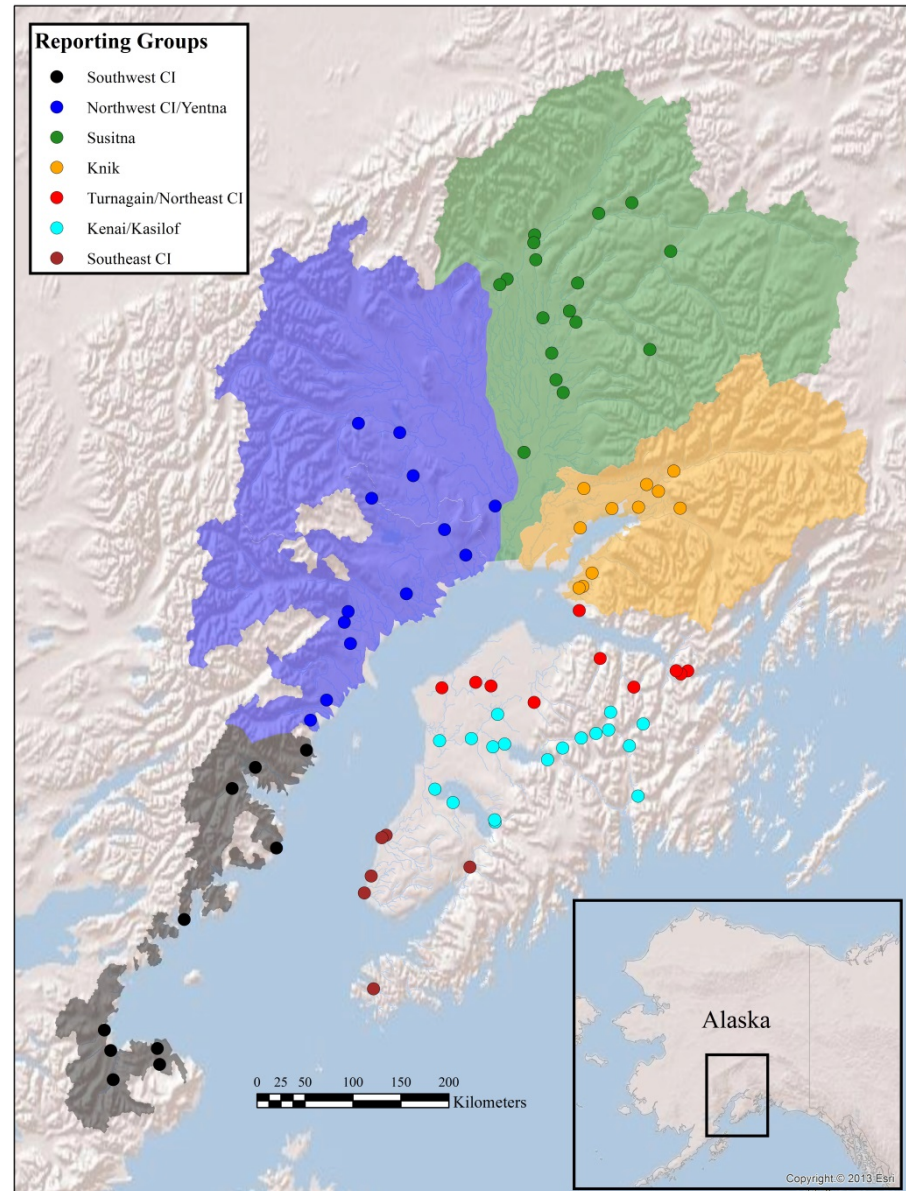
Cook Inlet baseline

- 84 populations
- 7 reporting groups identified
 - Southwest CI
 - Northwest CI/Yentna
 - Susitna



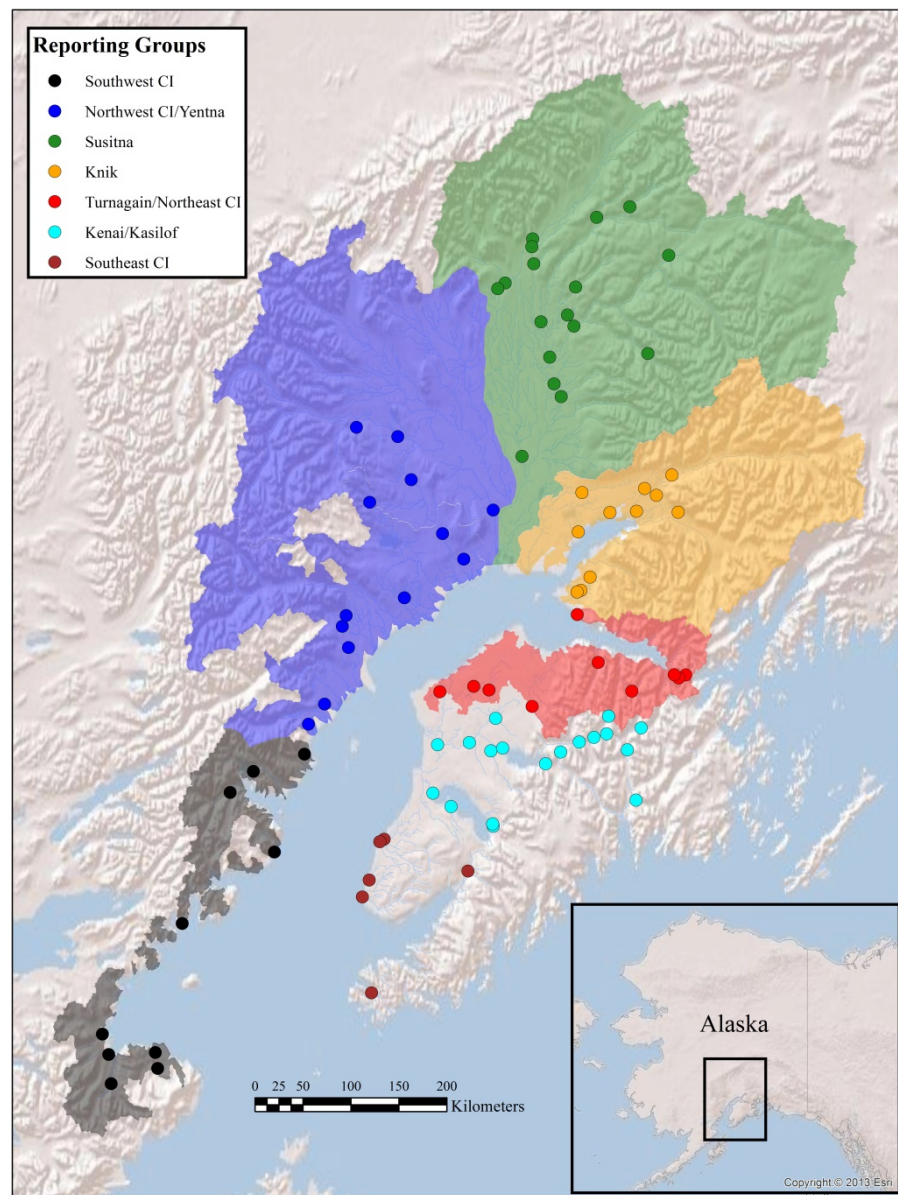
Cook Inlet baseline

- 84 populations
- 7 reporting groups identified
 - Southwest CI
 - Northwest CI/Yentna
 - Susitna
 - Knik
 - Turnagain/Northeast CI
 - Kenai/Kasilof
 - Southeast CI



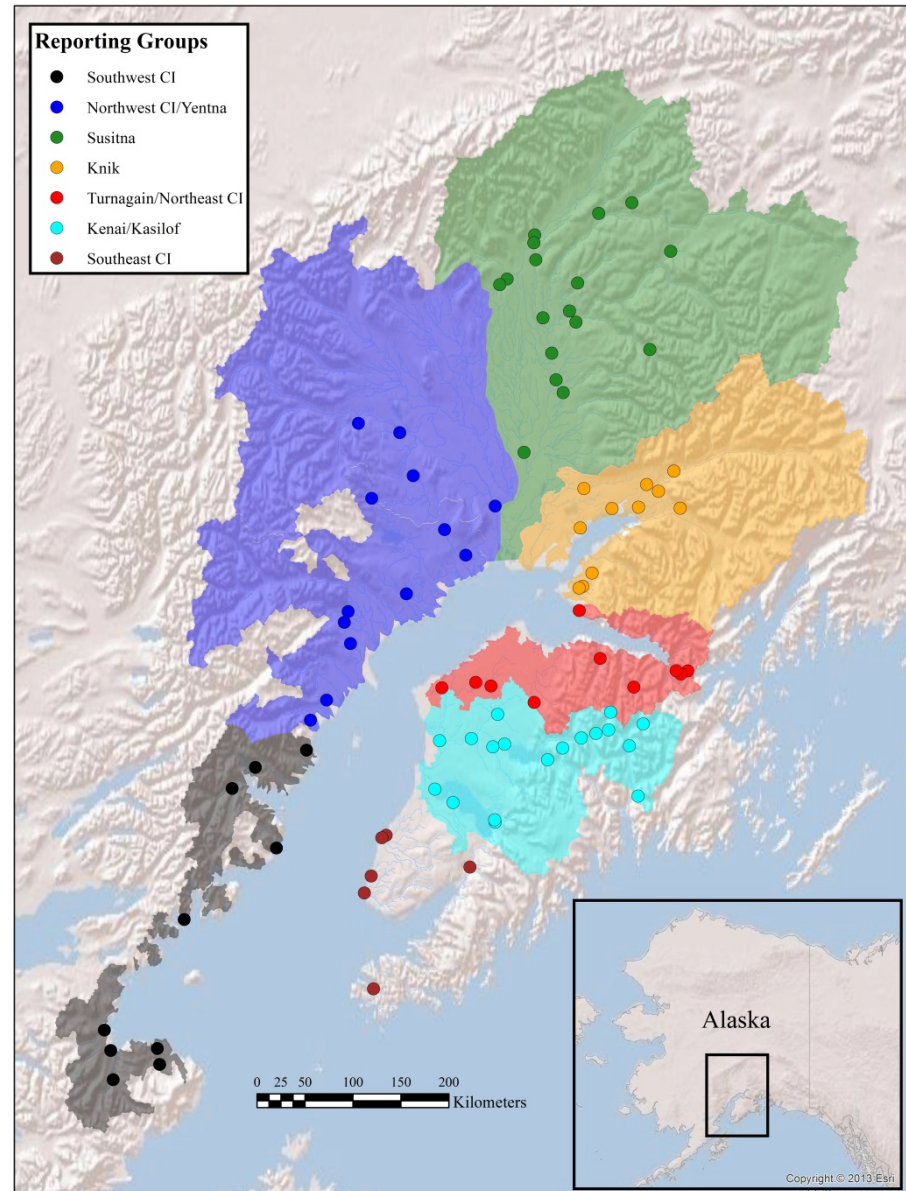
Cook Inlet baseline

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 - Susitna
 - Knik
 - Turnagain/Northeast CI



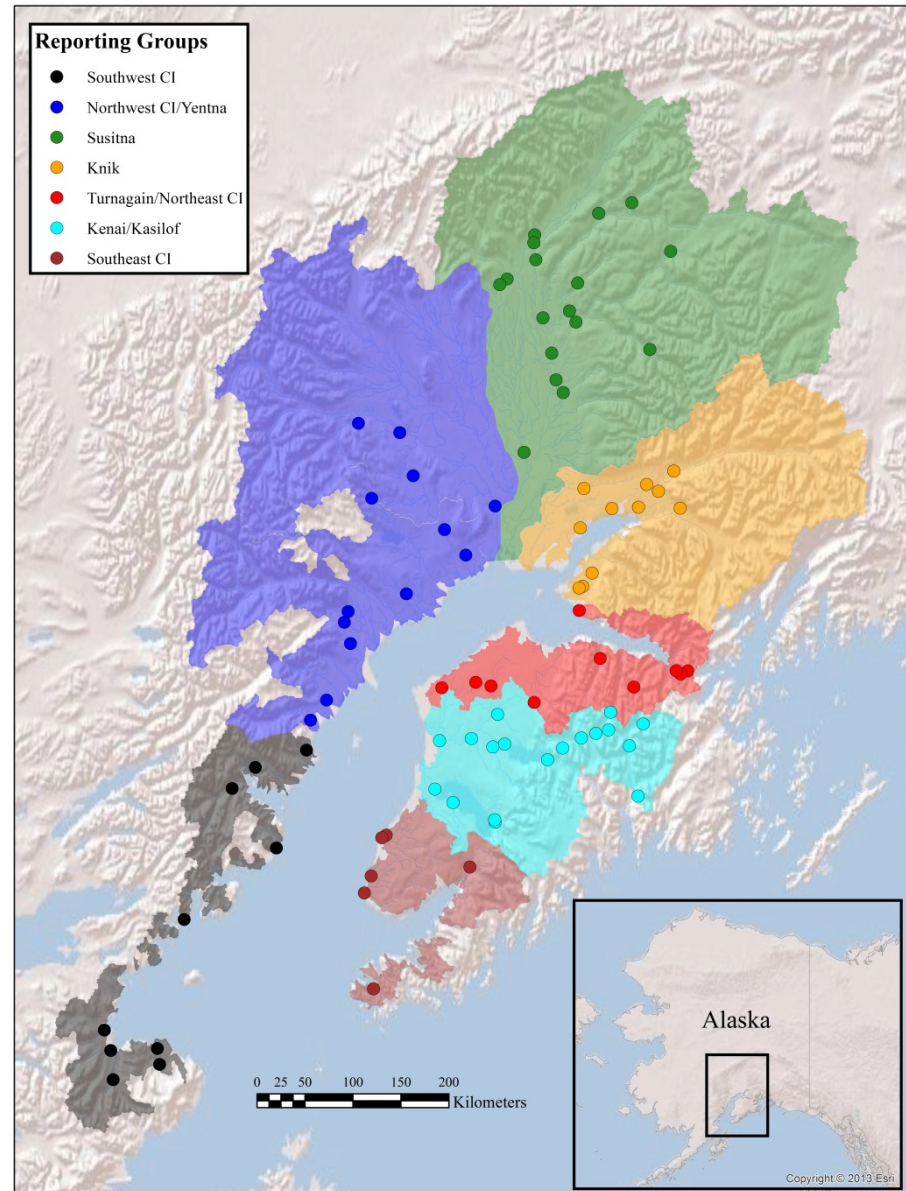
Cook Inlet baseline

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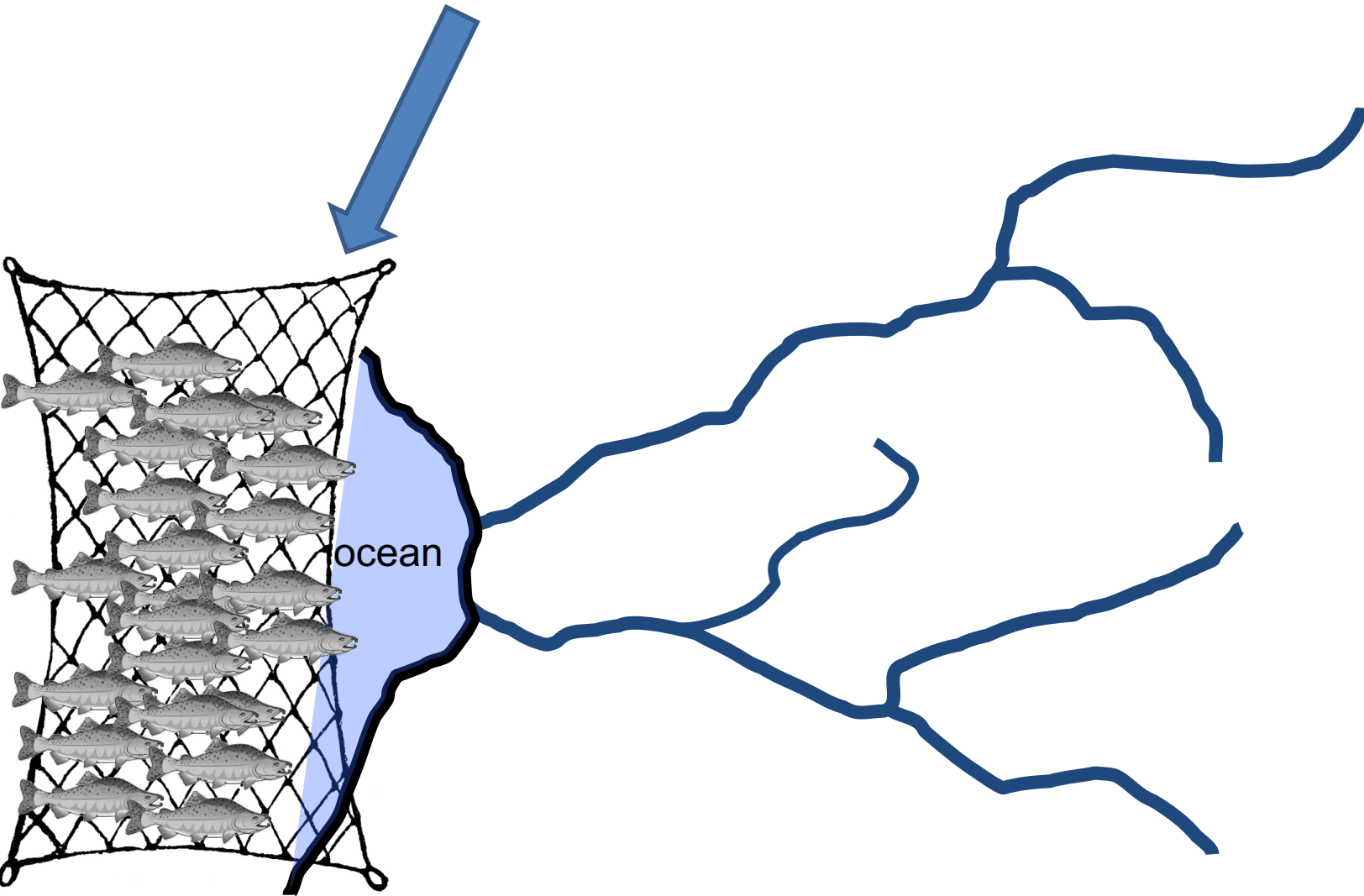
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 - Knik
 - Turnagain/Northeast CI
 - Kenai/Kasilof
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Genetic stock identification

Fishery samples



2016 commercial harvest



2016 commercial harvest

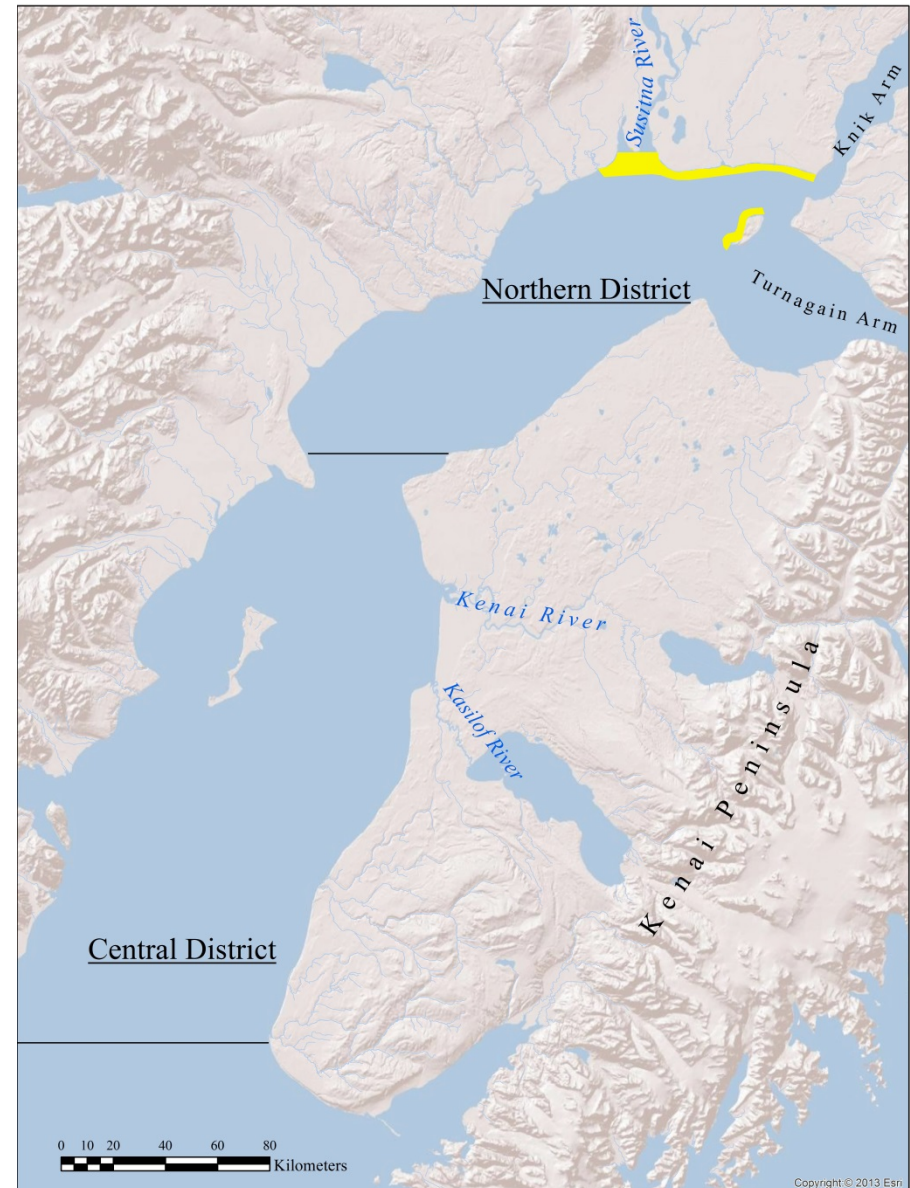


2016 commercial harvest



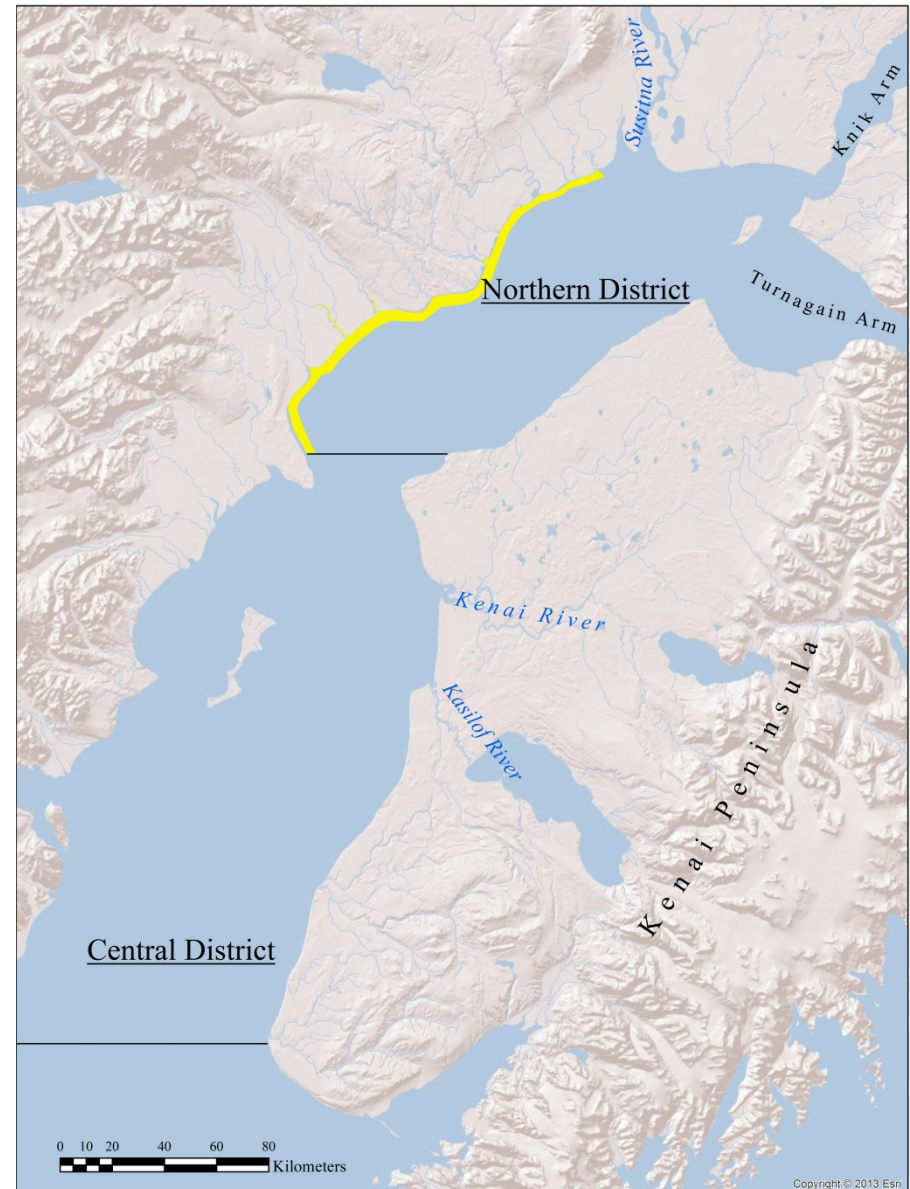
2016 GSI strata

- Northern District
 - General Subdistrict set (north)



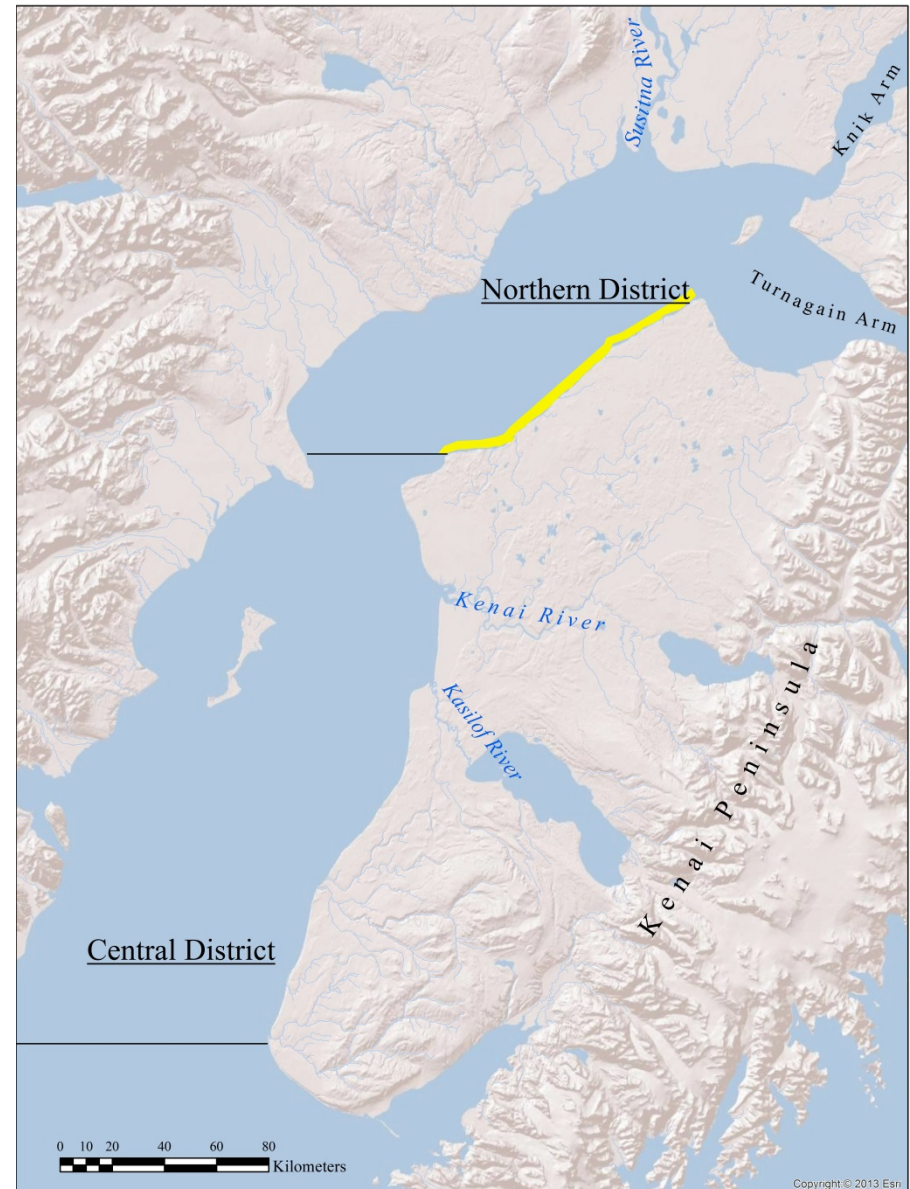
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)



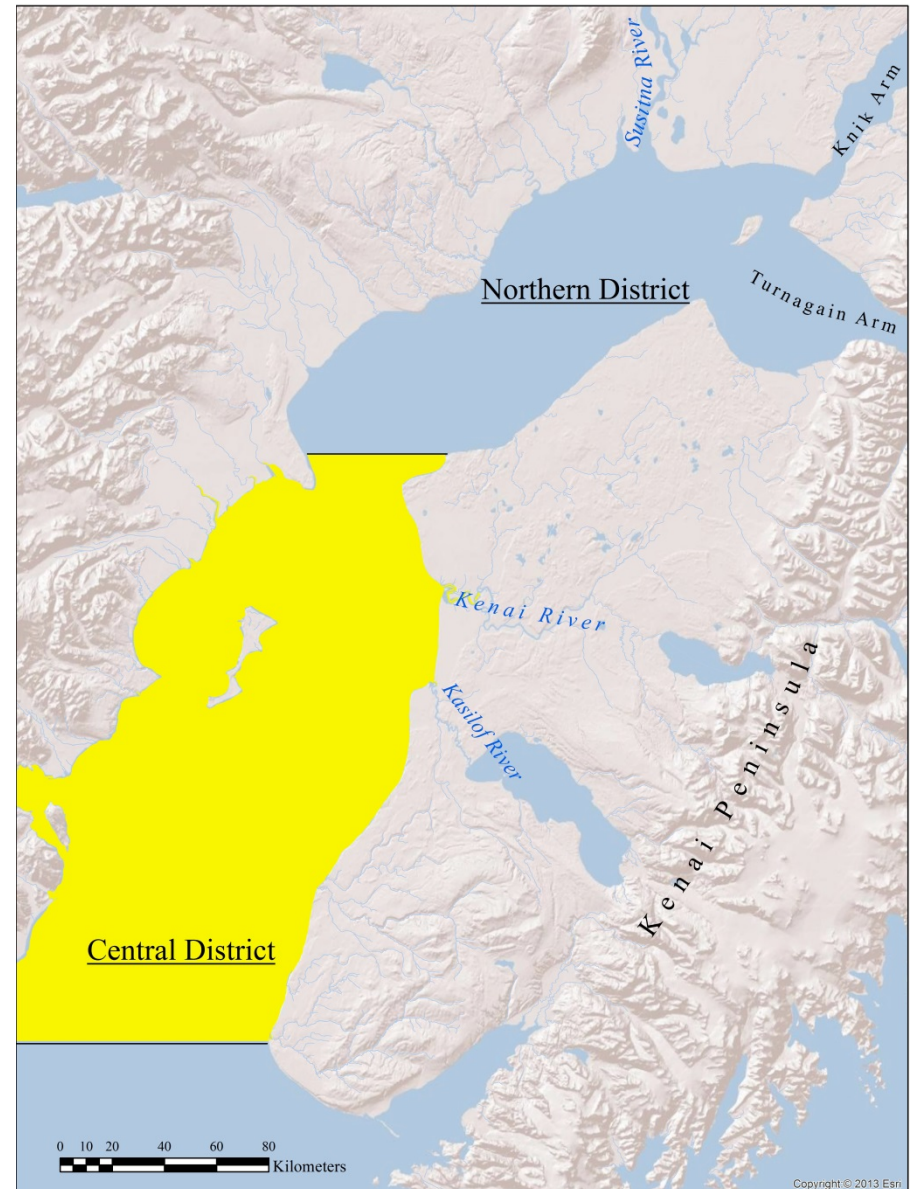
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set



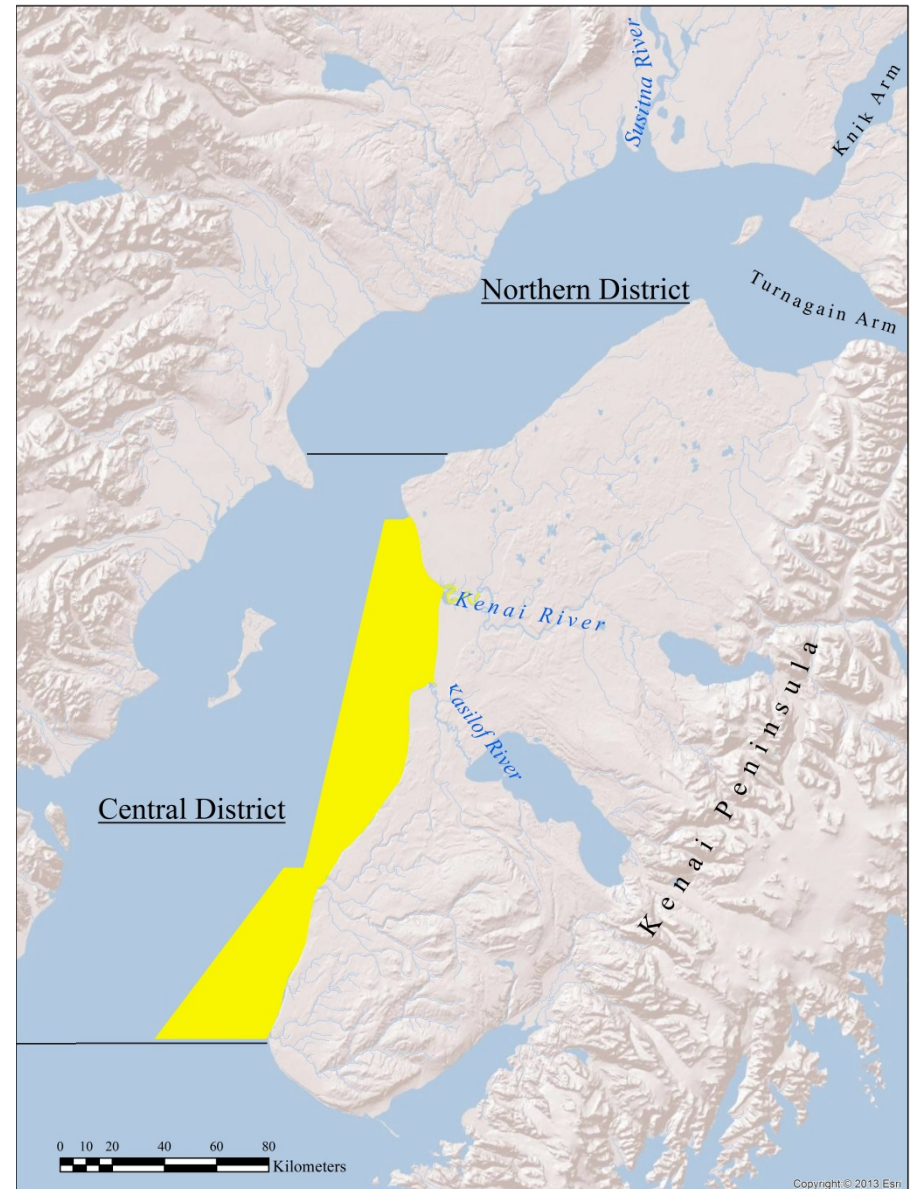
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District
 - Drift



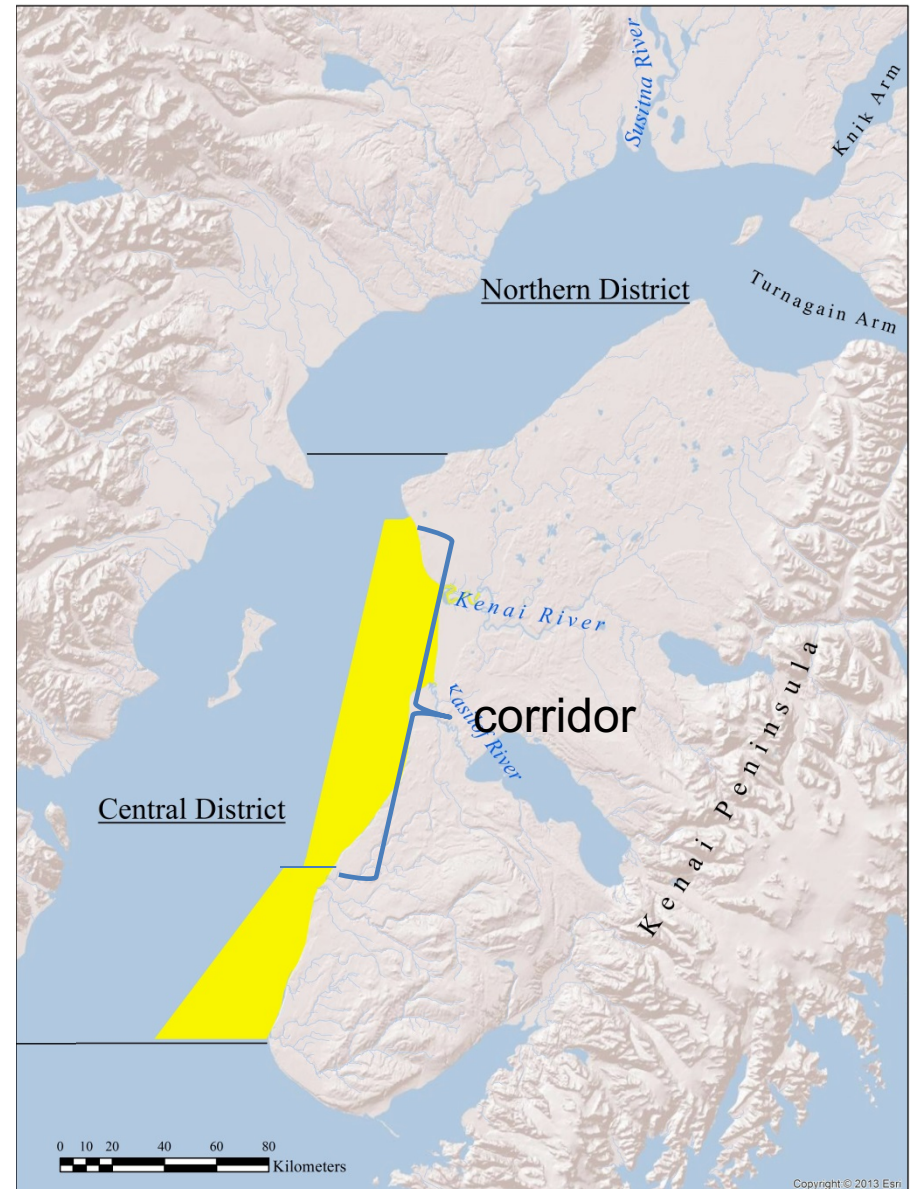
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District
 - Drift
 - Drift (corridor-only)



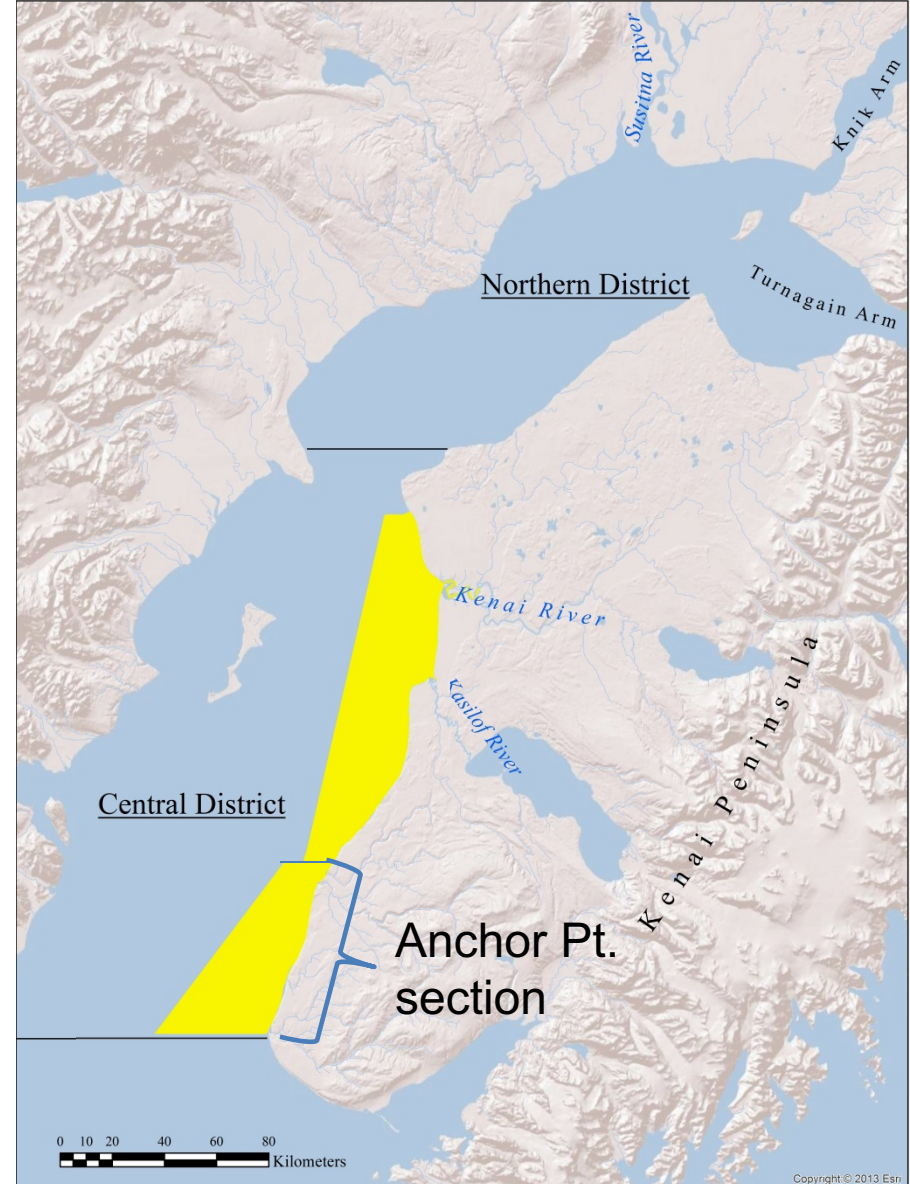
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District
 - Drift
 - Drift (corridor-only)



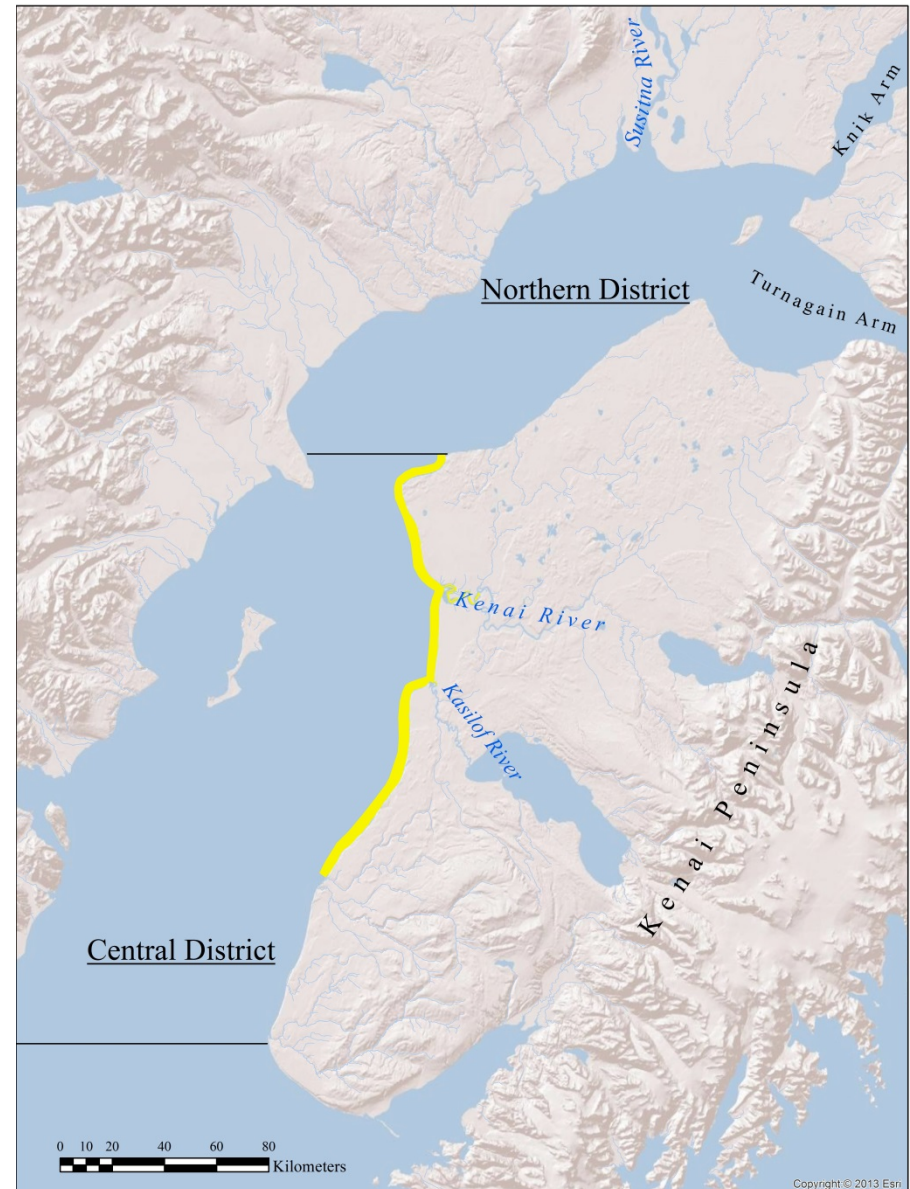
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District
 - Drift
 - Drift (corridor-only)



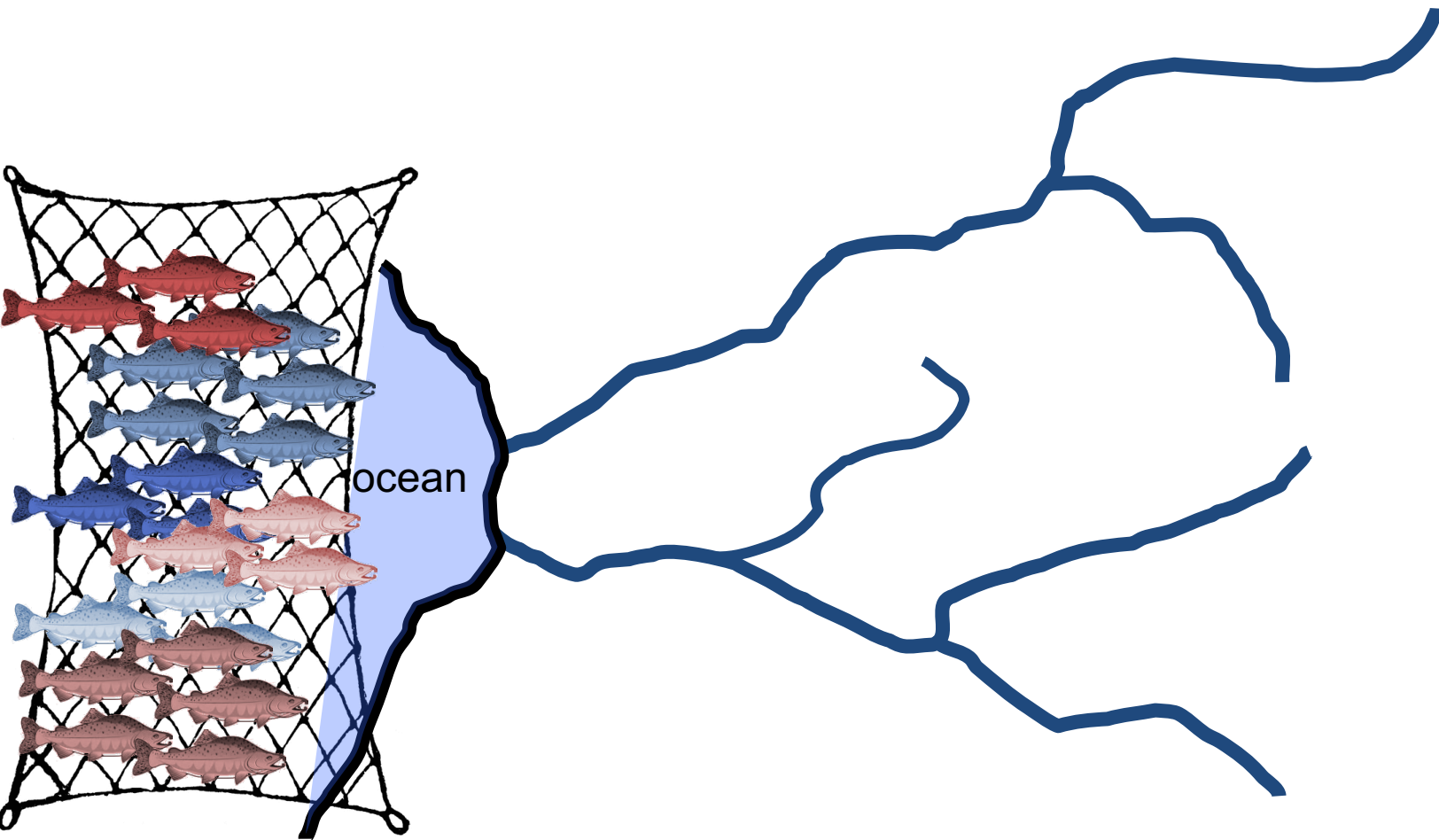
2016 GSI strata

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District
 - Drift
 - Drift (corridor-only)
 - Upper Subdistrict set

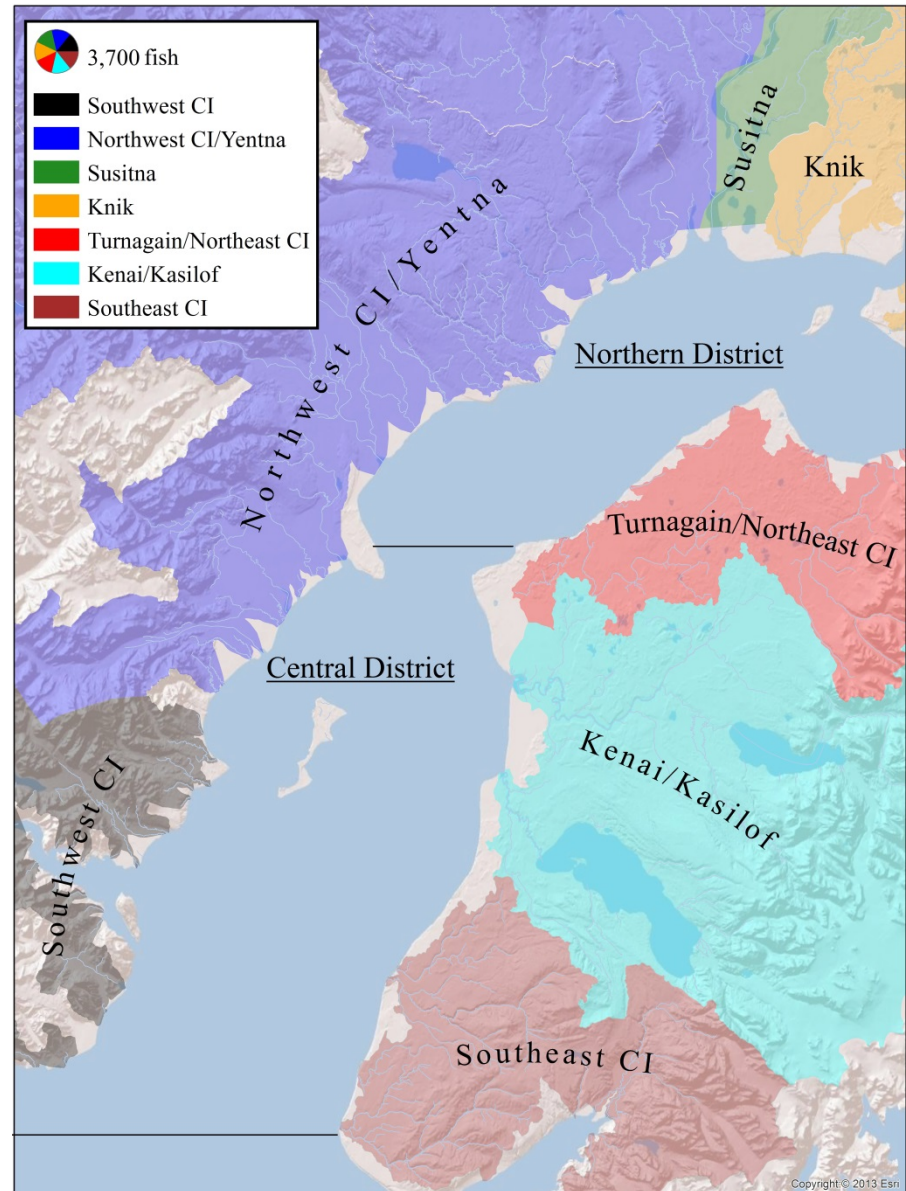


Genetic stock identification

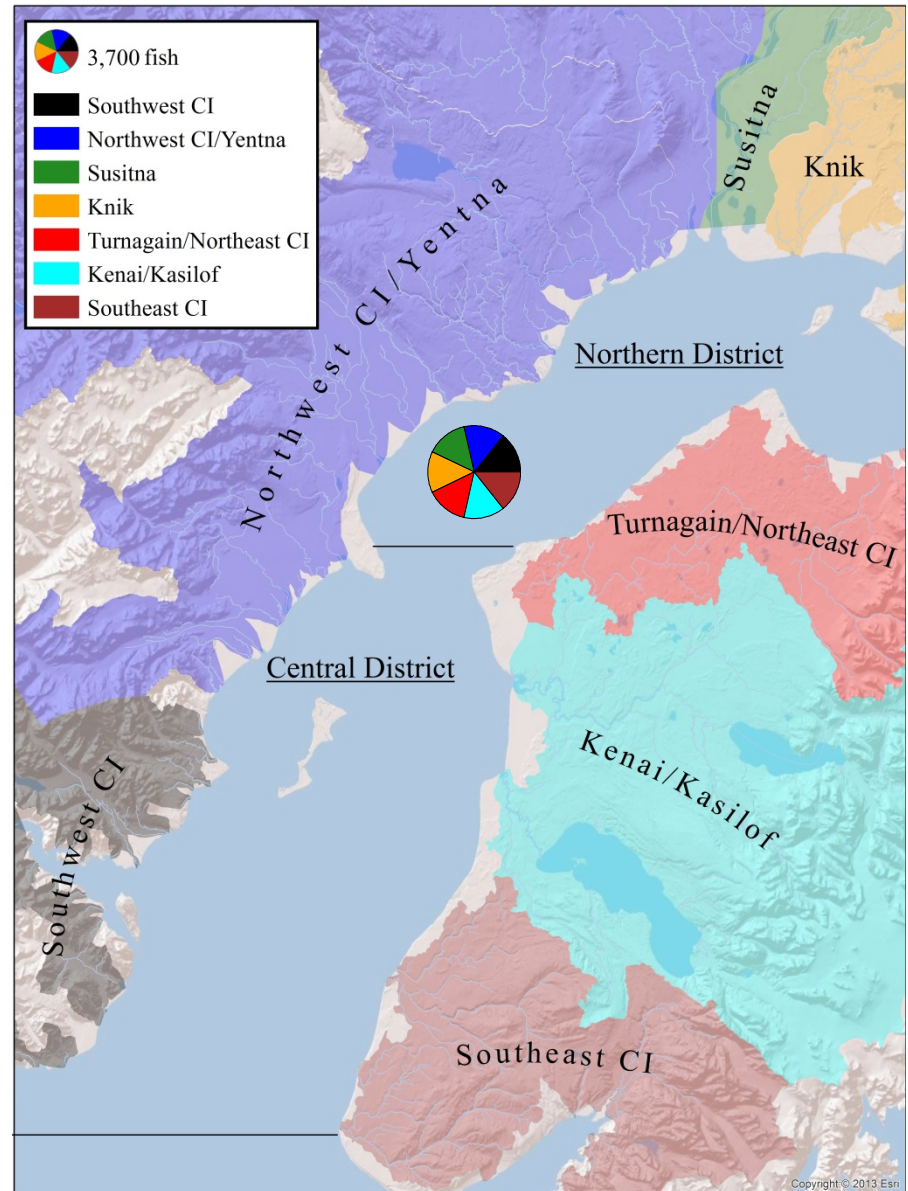
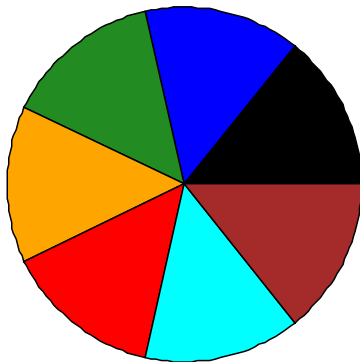
Estimates



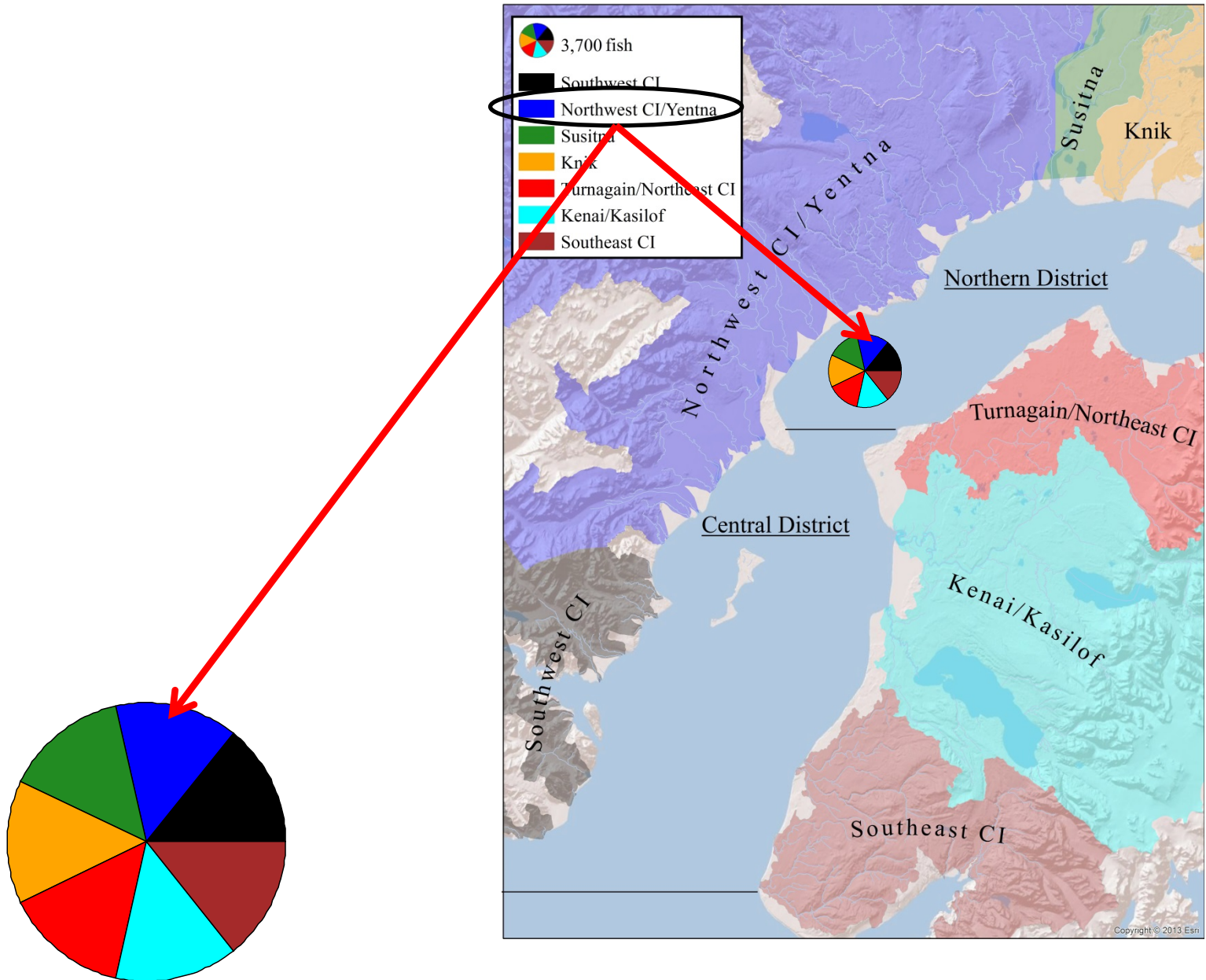
2016 harvest estimates



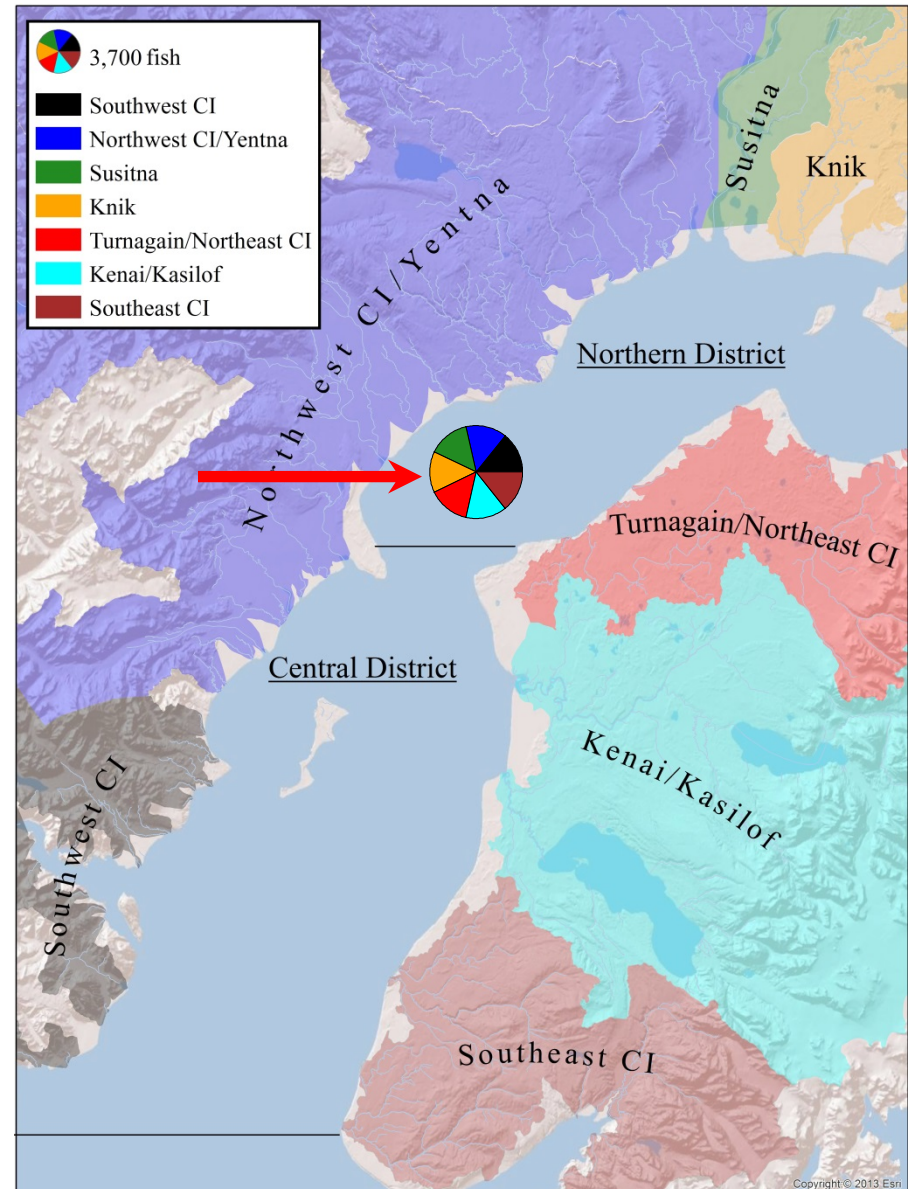
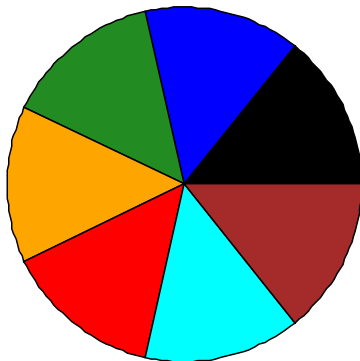
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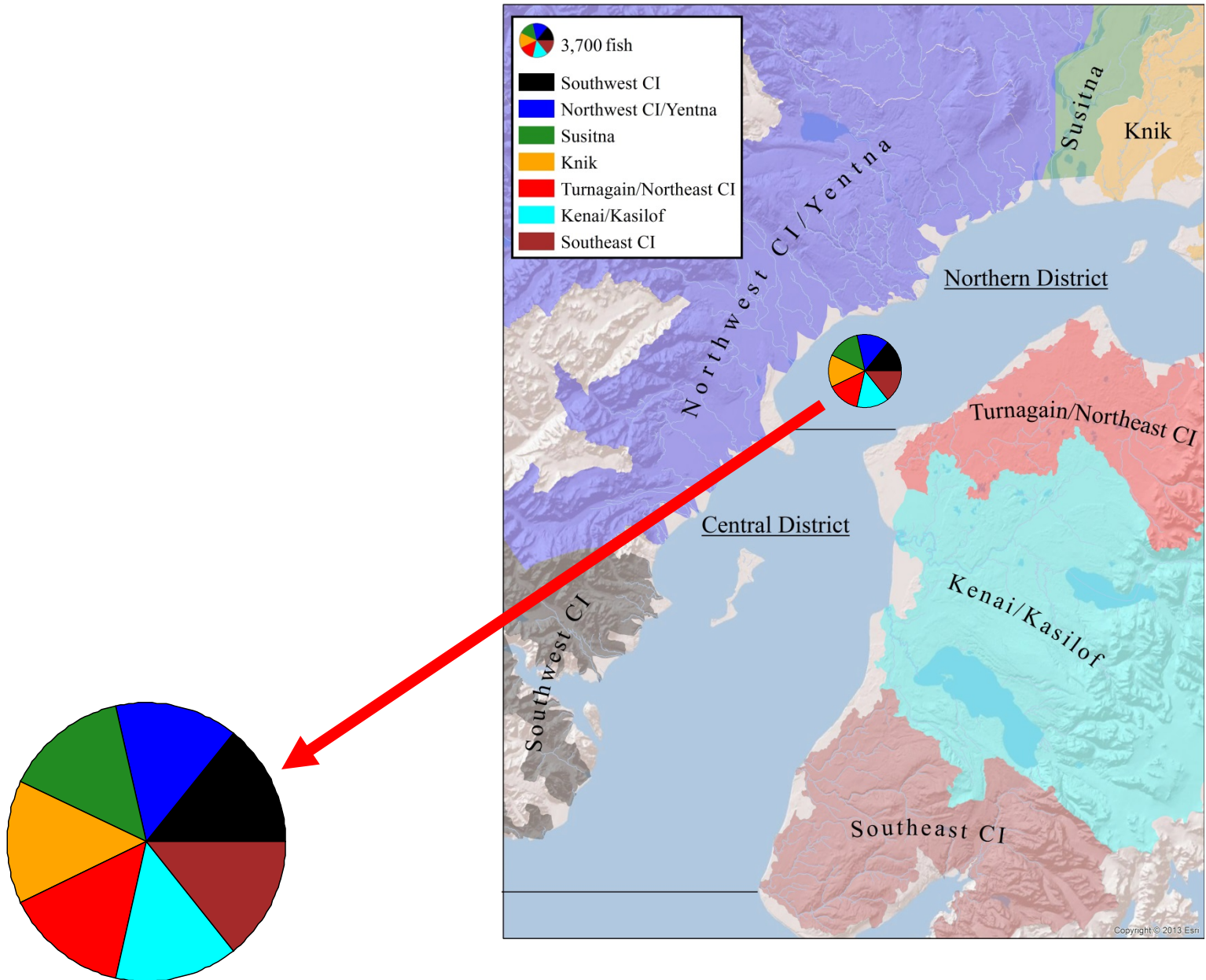
2016 harvest estimates



2016 harvest estimates

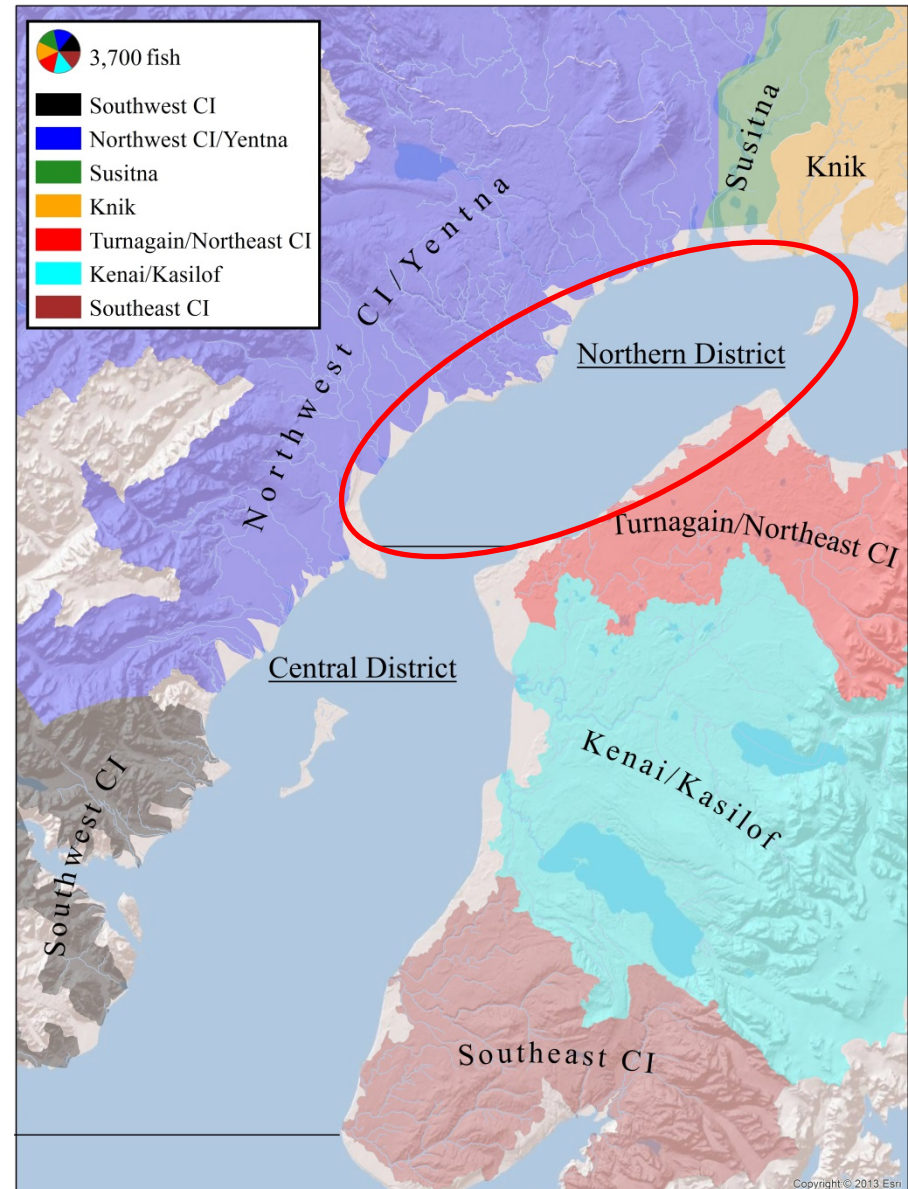


2016 harvest estimates



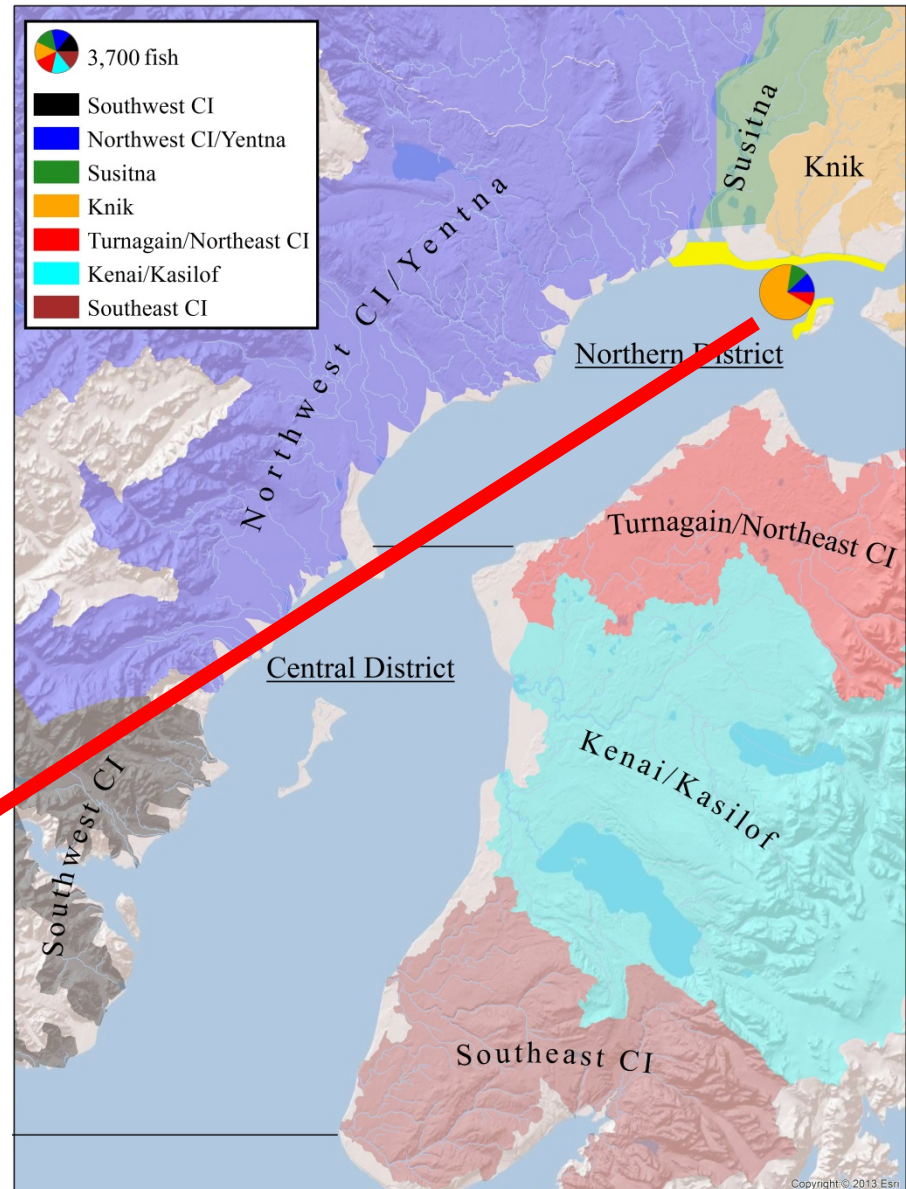
2016 harvest estimates

- Northern District



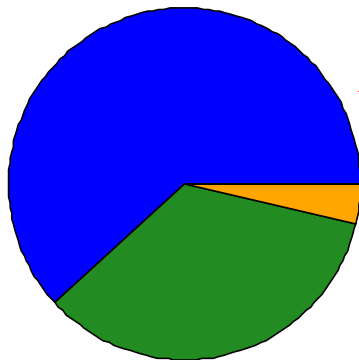
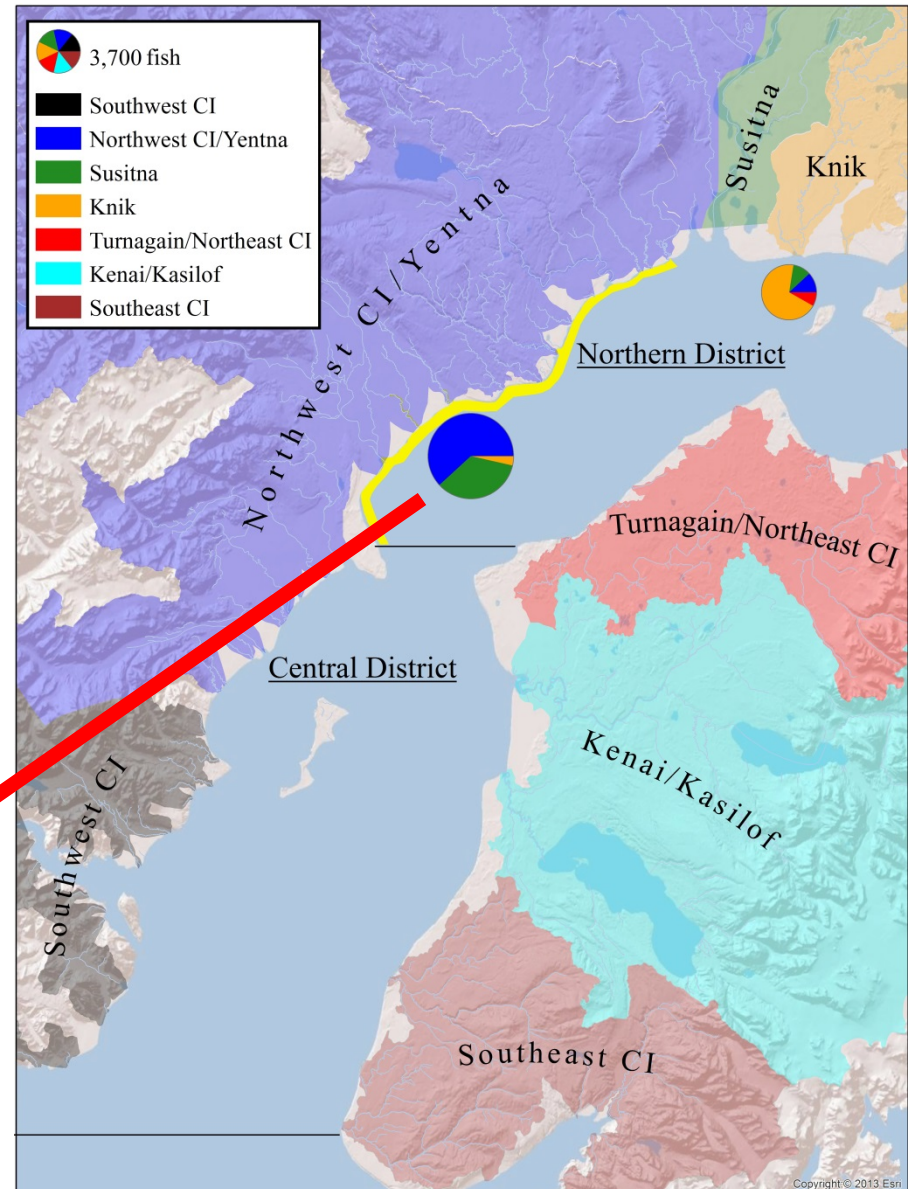
2016 harvest estimates

- Northern District
 - General Subdistrict set (north)



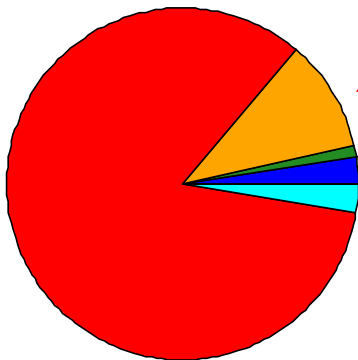
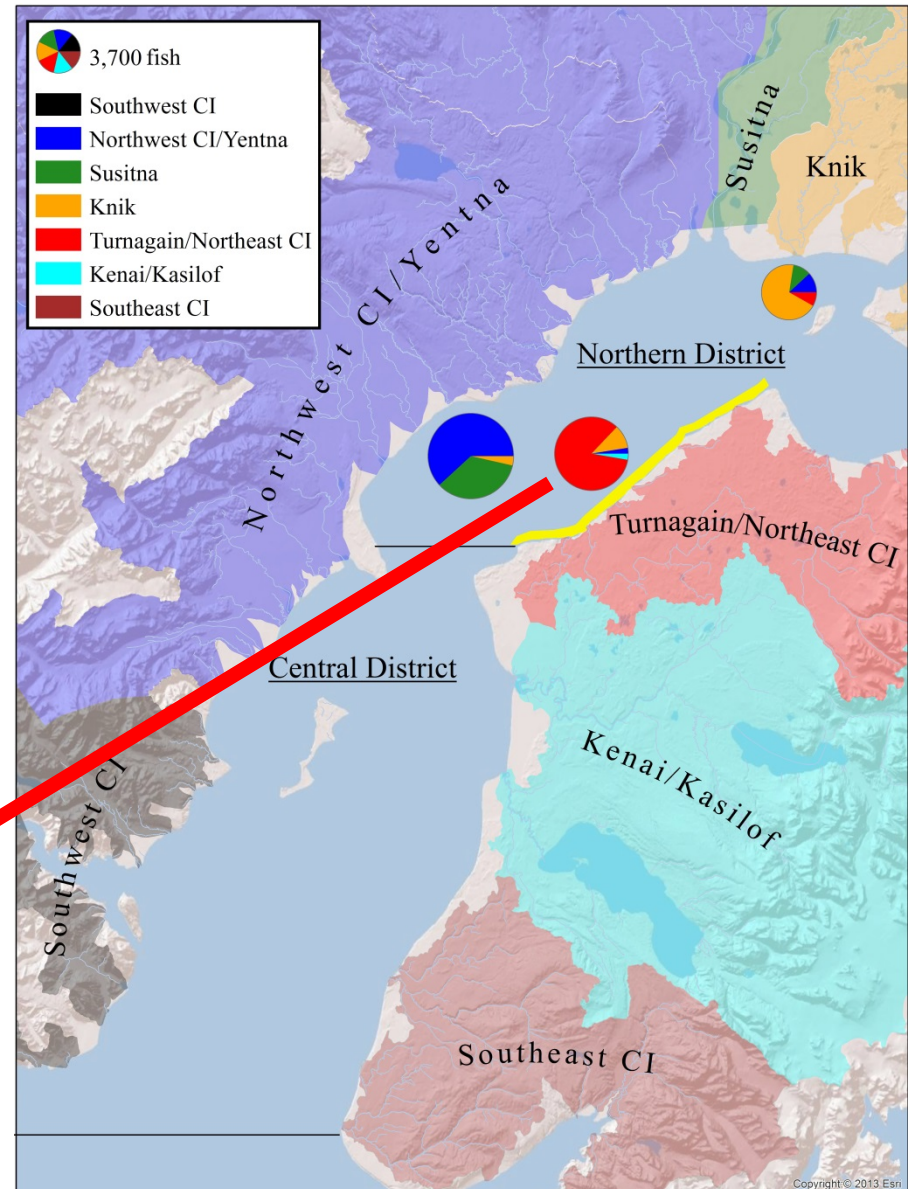
2016 harvest estimates

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)



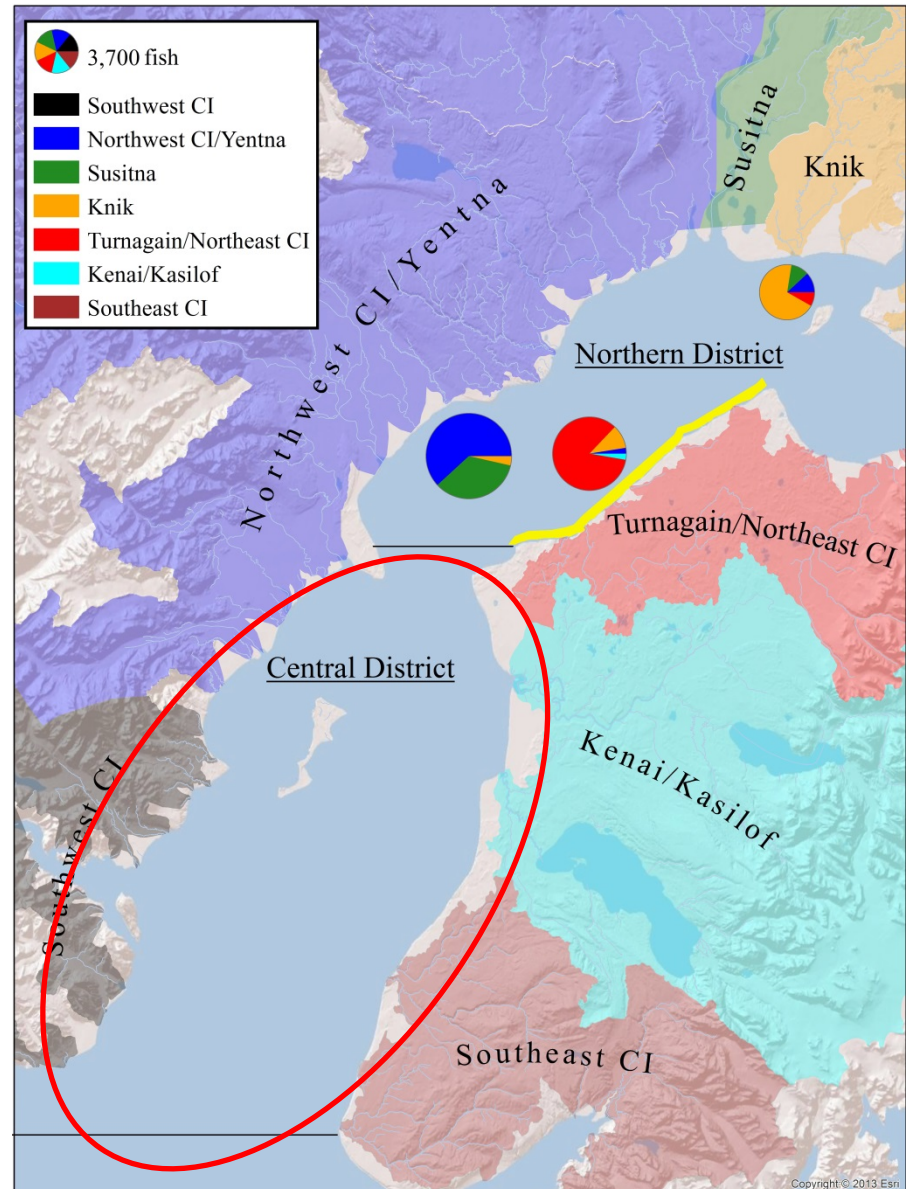
2016 harvest estimates

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set



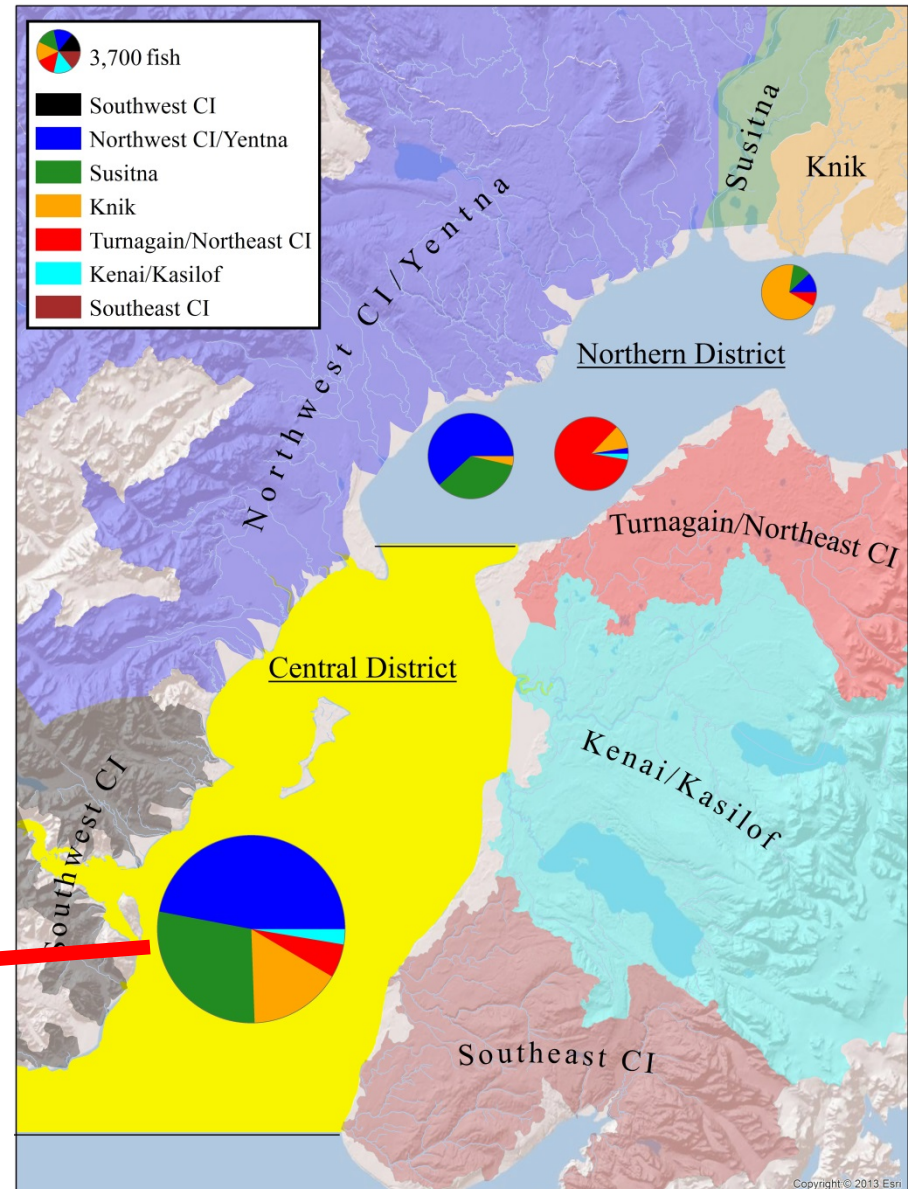
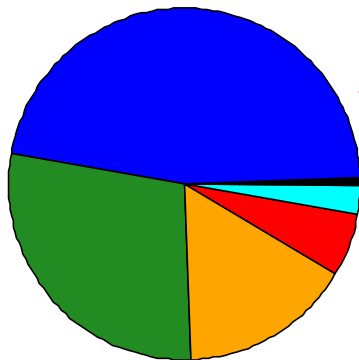
2016 harvest estimates

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District



2016 harvest estimates

- Northern District
 - General Subdistrict set (north)
 - General Subdistrict set (south)
 - Eastern Subdistrict set
- Central District
 - Drift

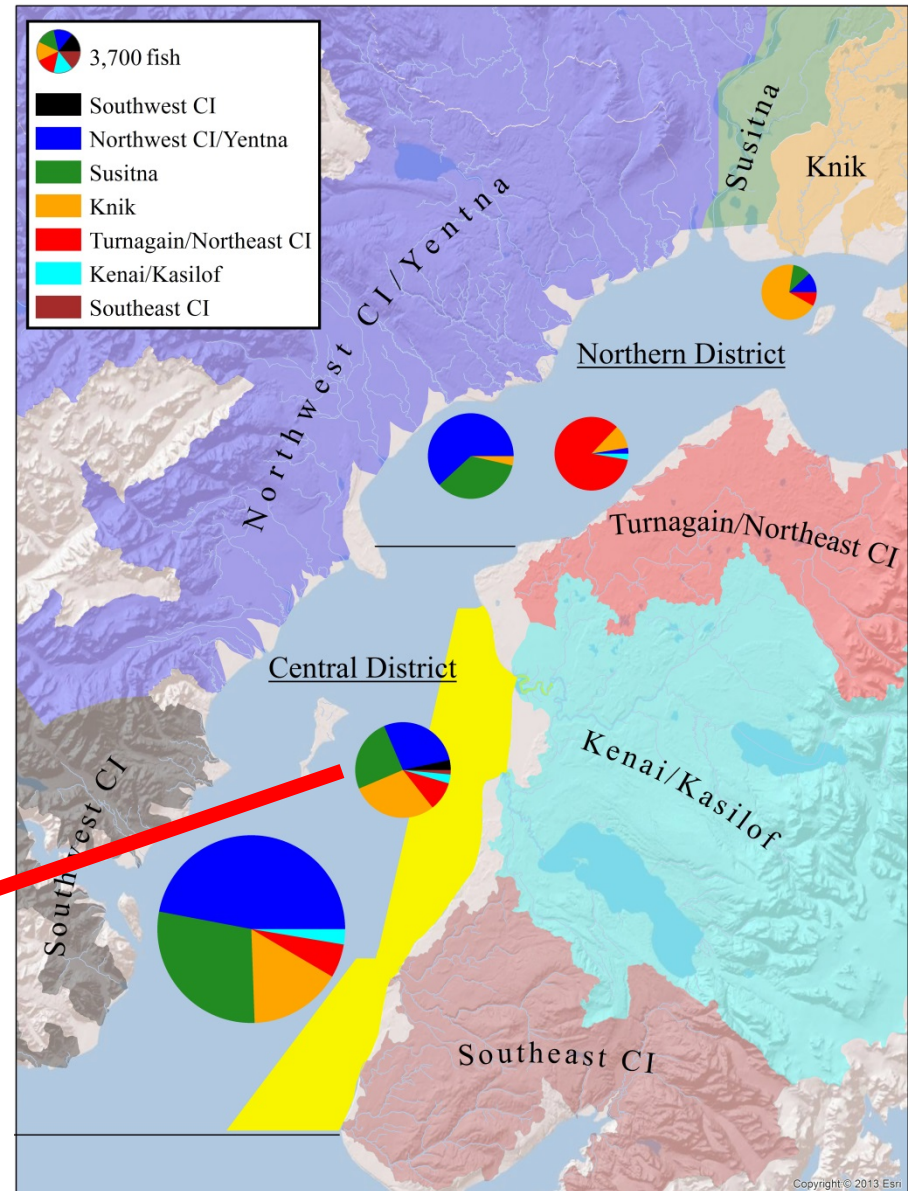
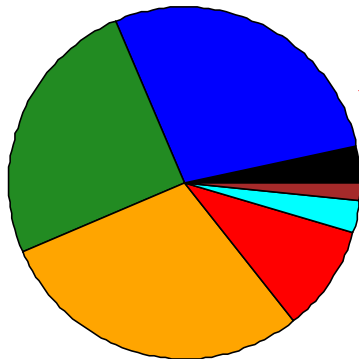


2016 harvest estimates

- Northern District
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 - General Subdistrict set (south)
 - Eastern Subdistrict set

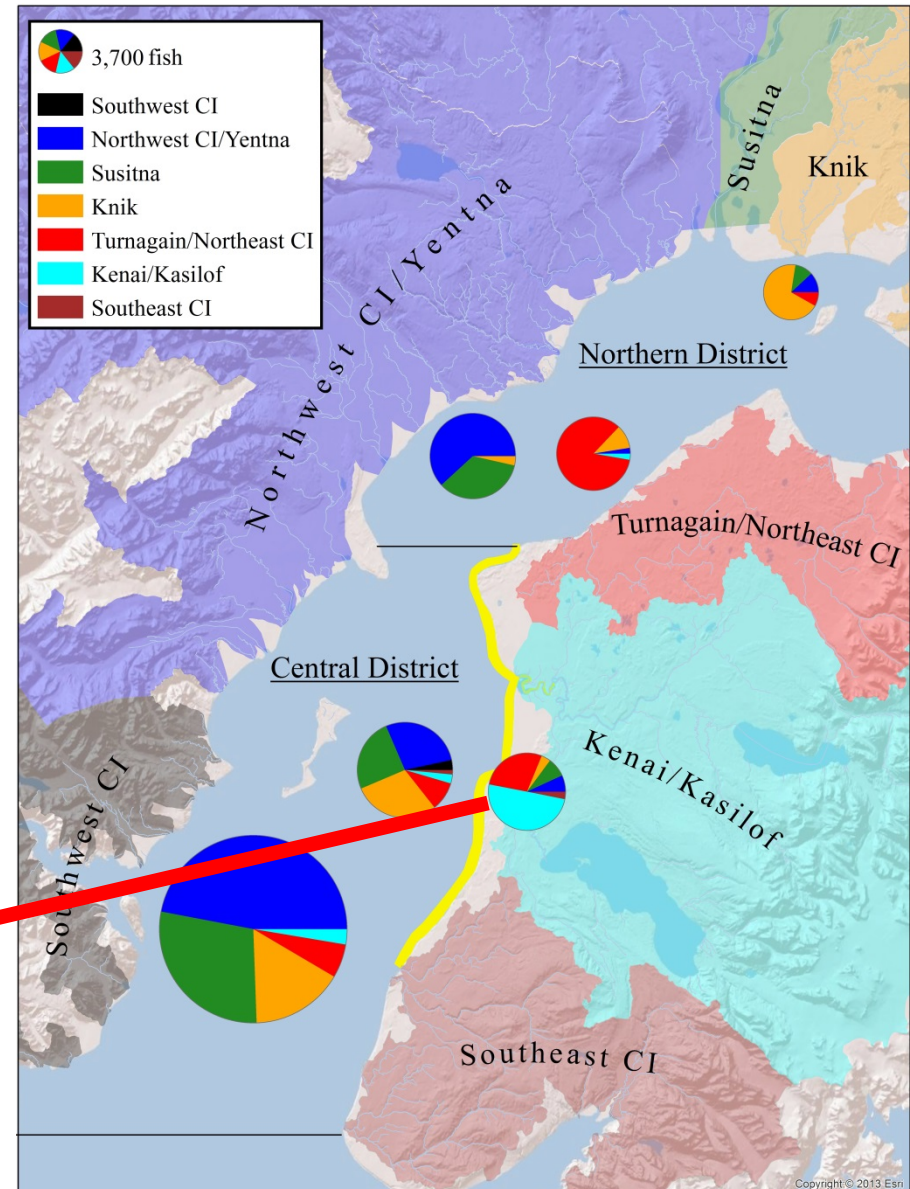
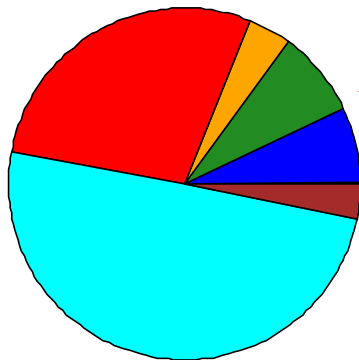
- Central District

- Drift
- Drift (corridor-only)



2016 harvest estimates

- Northern District
 - General Subdistrict set (north)
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 - Eastern Subdistrict set
- Central District
 - Drift
 - Drift (corridor-only)
 - Upper Subdistrict set



Management implications



Management implications

Consistent spatial patterns of stock-specific coho salmon harvests in the Northern District will be useful for escapement goal management.



Management implications

Fishery	Mainstem Susitna Coho Harvest Rates			
	2013	2014	2015	2016
Northern District set gillnet	5%	6%	2%	NA
Central District drift gillnet	28%	20%	16%	NA
Upper Subdistrict set gillnet	-	-	2%	NA
Inriver sport	8%	12%	8%	NA
Overall harvest	41%	38%	28%	NA
Escapement	59%	62%	72%	?



Management implications

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Future work



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 - Separate Yentna River harvest estimates

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 - Estimate harvest and total run for Jim Creek coho salmon

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- Increase baseline representation in Yentna and Knik rivers.
 - Separate Yentna River harvest estimates
 - Estimate harvest and total run for Jim Creek coho salmon
- Estimate Susitna River mainstem escapement using genetic mark-recapture

Acknowledgements

Matanuska-Susitna Borough





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Matanuska-Susitna Borough

ADF&G commercial sampling crew

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Matanuska-Susitna Borough

ADF&G commercial sampling crew

Publications

Barclay, A. W., P. A. Crane, D. B. Young, H. A. Hoyt, and C. Habicht. 2017. Current status of genetic studies of coho salmon from Southcentral Alaska and evaluations for mixed-stock analysis in Cook Inlet. Alaska Department of Fish and Game, Fishery Manuscript Series No. 17-01, Anchorage.

Barclay, A. W., C. Habicht, W. Gist, and T. M. Willette. 2017. Genetic stock identification of Upper Cook Inlet coho salmon harvest, 2013-2015. Alaska Department of Fish and Game, Regional Information Report 5J17-03, Anchorage.

Questions?

