Apr 6th, 9:00 AM - 9:15 AM

Harbour seals consume more juvenile and adult salmon in estuaries than elsewhere in the Strait of Georgia

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1988
2018
30TH ANNIVERSARY
SALISH SEA ECOSYSTEM CONFERENCE

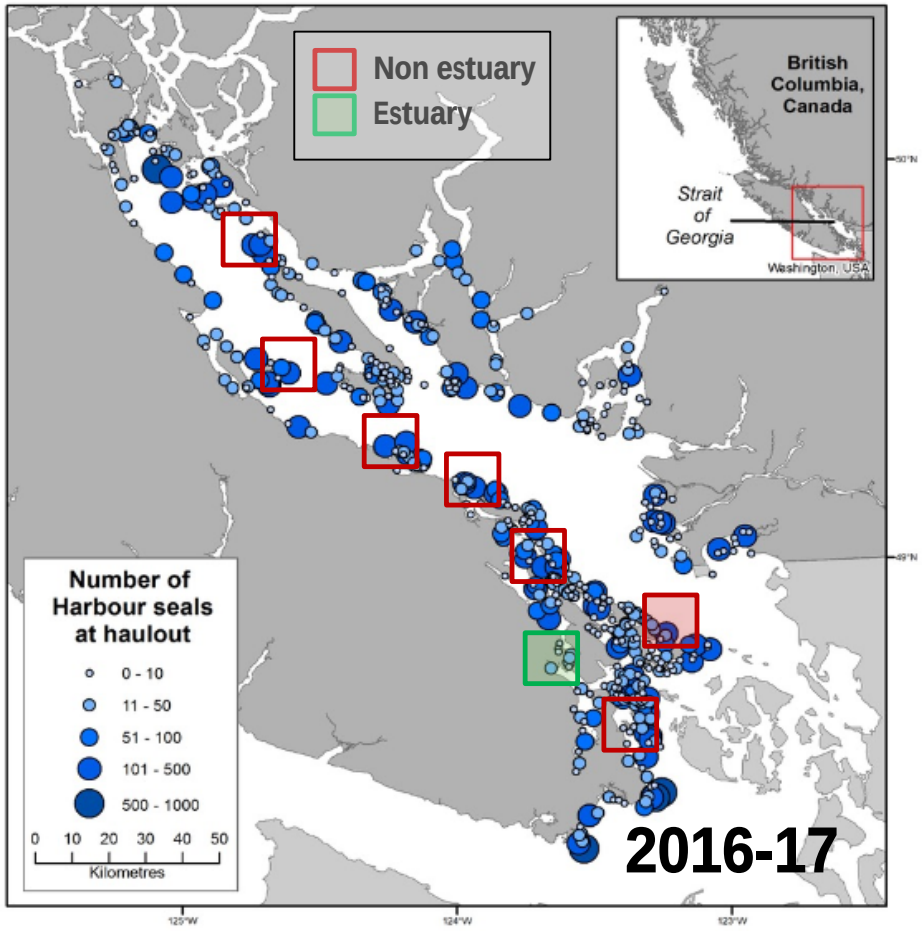
Project Rationale

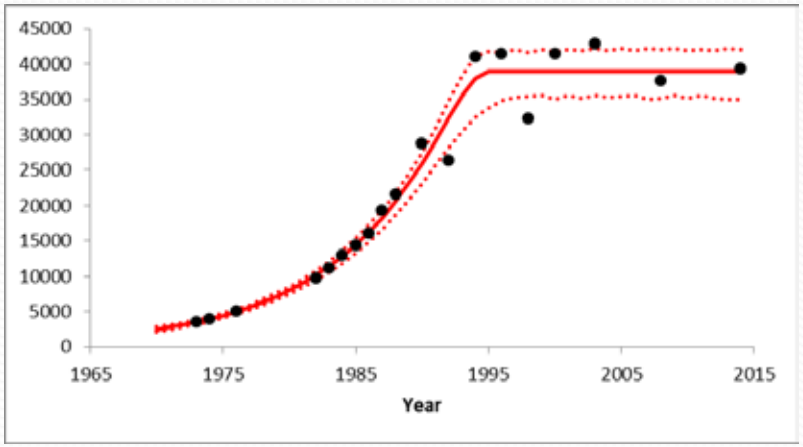
Complement 2012-2014 estuary focused studies (estimates of predation on Chinook and Coho salmon smolts) *(Thomas et. al., 2017)*

Update non-estuary diet information for seals in the Strait of Georgia
(Olesiuk et. al., 1990, 1993)

Are the diets determined from scats collected in estuaries representative of diets throughout the Strait of Georgia?

Harbour Seals - Strait of Georgia



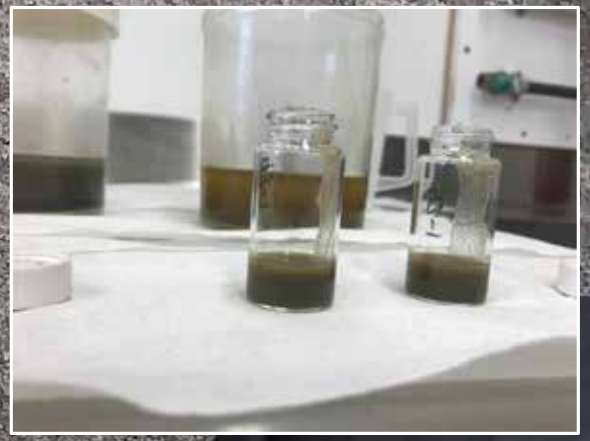


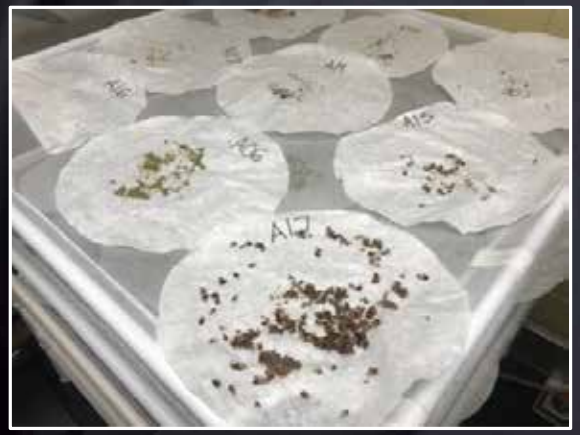

70 scats/month (April – November 2016 and April-May 2017)
1 estuary site (Cowichan Bay)
~ 400 samples
7 primary non-estuary sites
+ other non-estuary sites
~1300 harbour seal and ~300 sea lion samples

Objectives

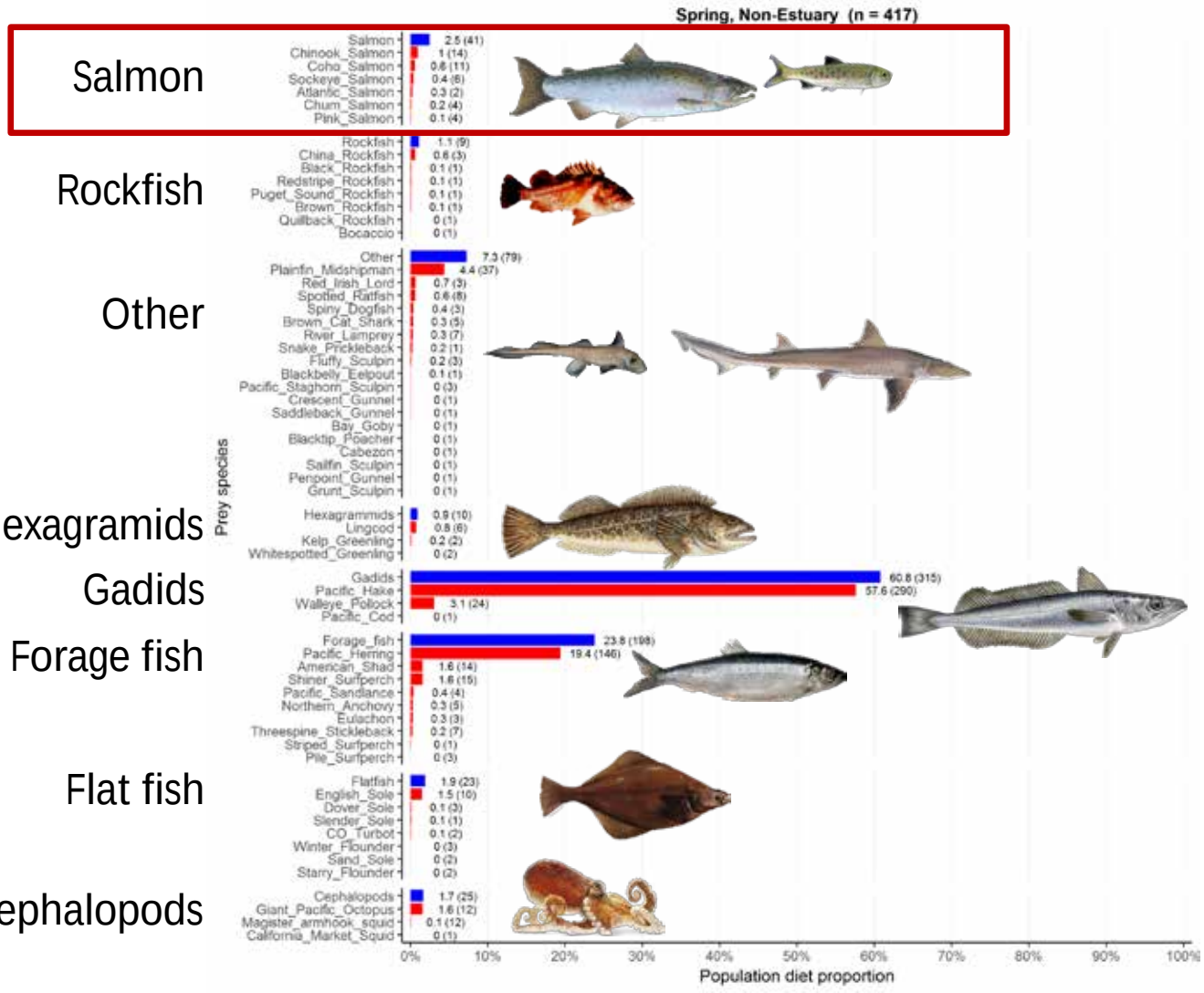
Hake otolith!

- Representative sample (high seal densities)
- DNA metabarcoding (species)
- Analysis of hard parts (size)
- Compare diet findings
  - between estuary / non-estuary
  - within estuaries previous years





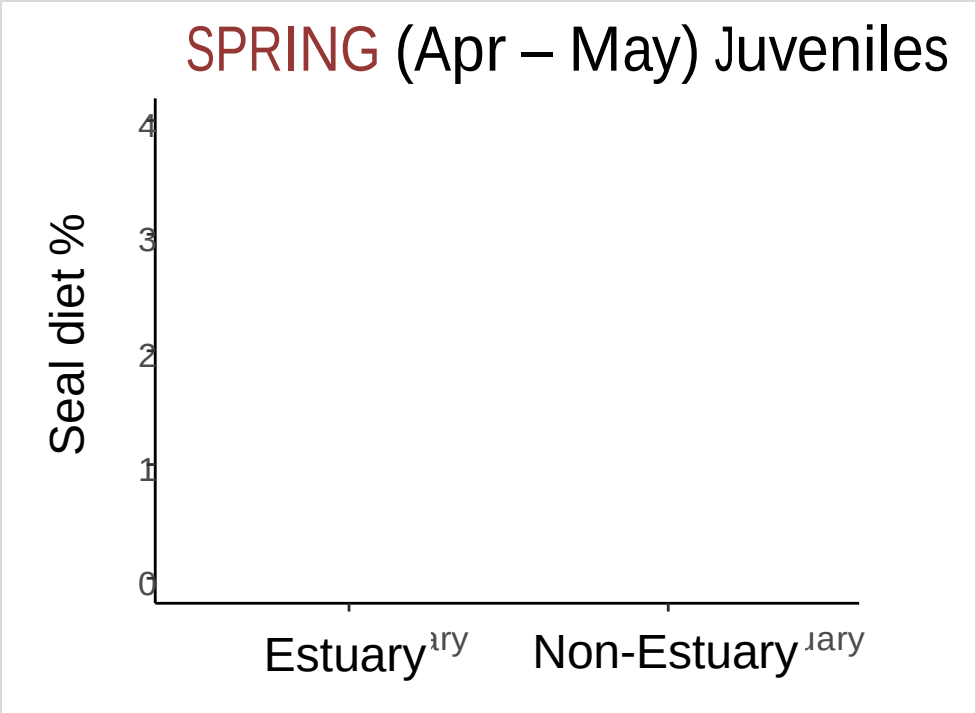
Harbour seal diet - *Strait of Georgia 2016-17*



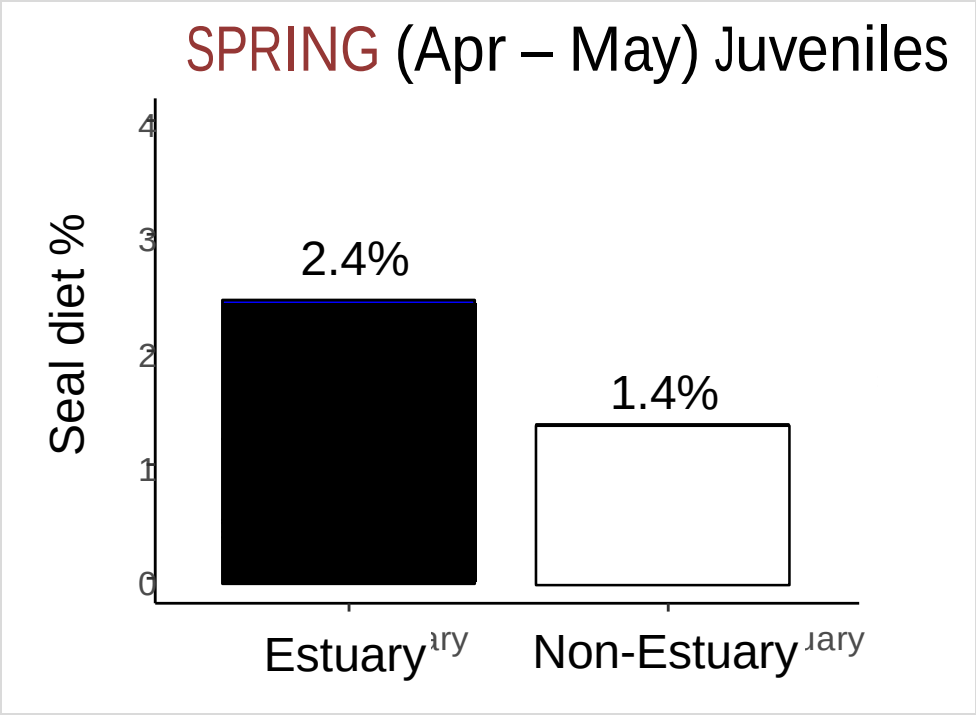
55-85%

238 species

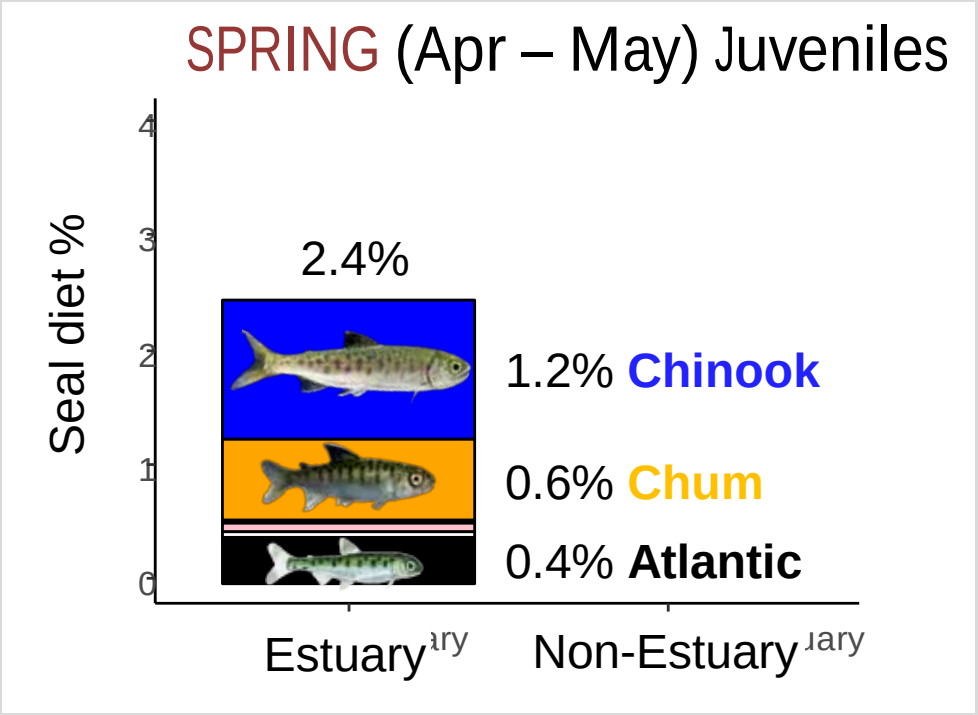
Salmon in diet – Estuary *vs.* non-estuary



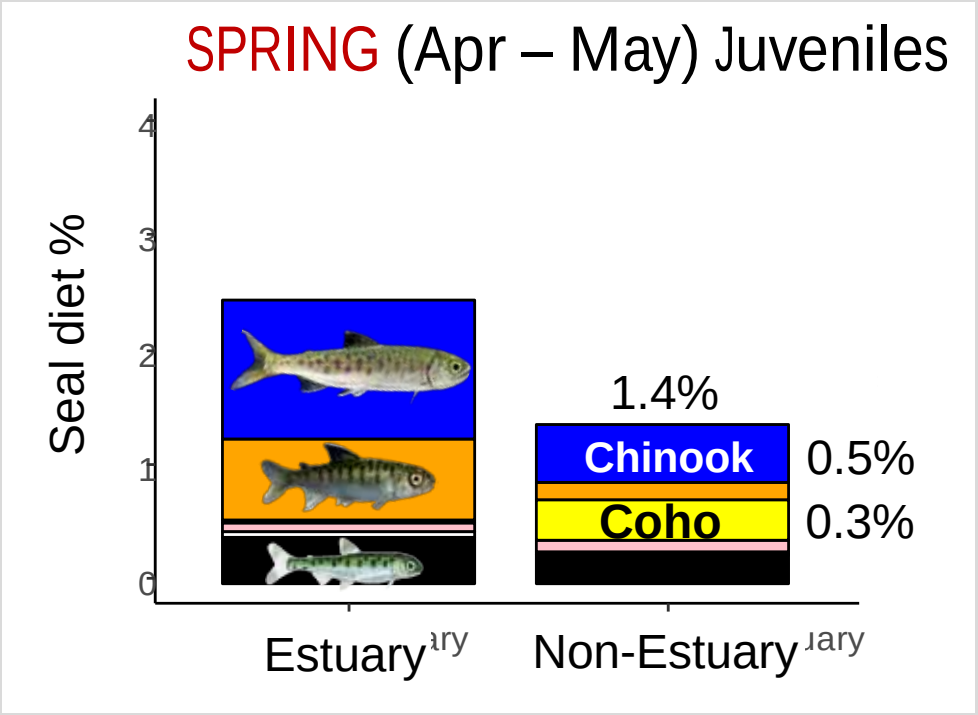
Salmon in diet – Estuary *vs.* non-estuary



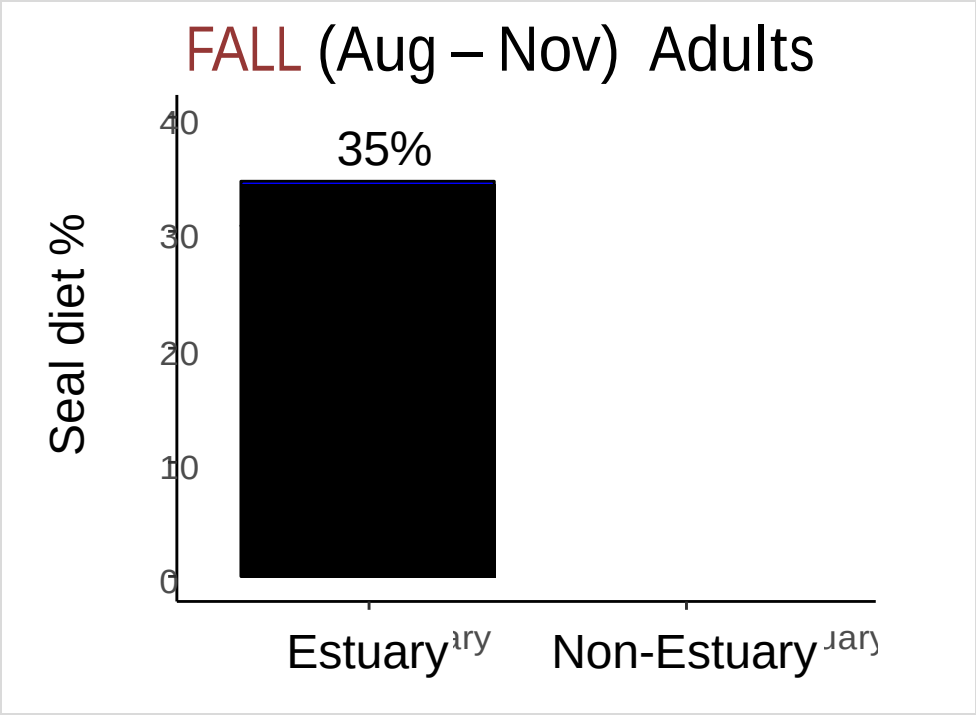
Salmon in diet – Estuary *vs.* non-estuary



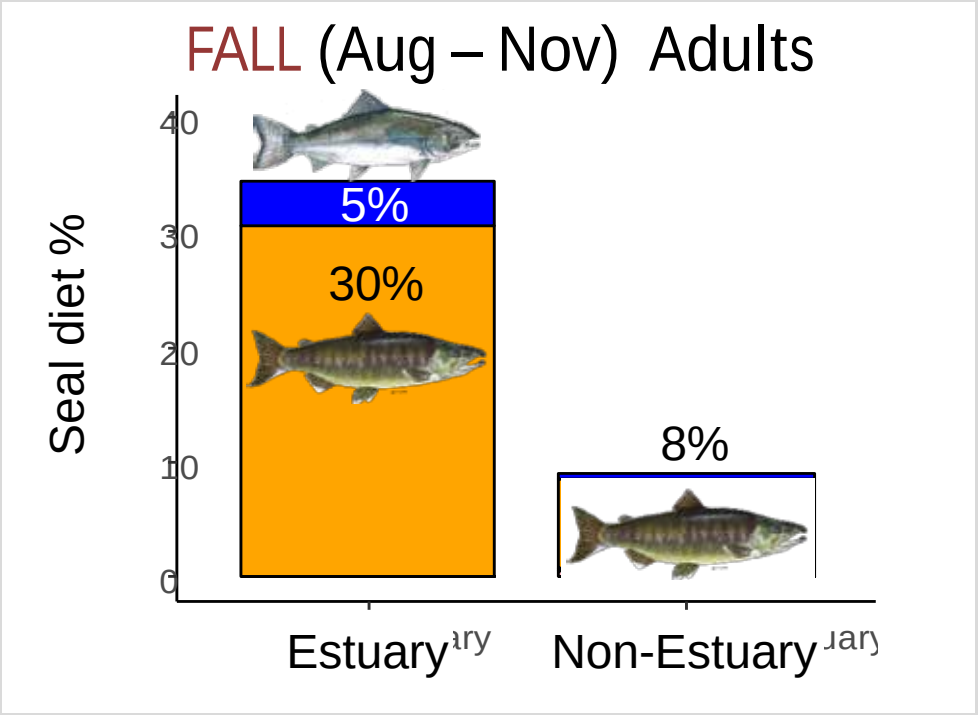
Salmon in diet – Estuary *vs.* non-estuary



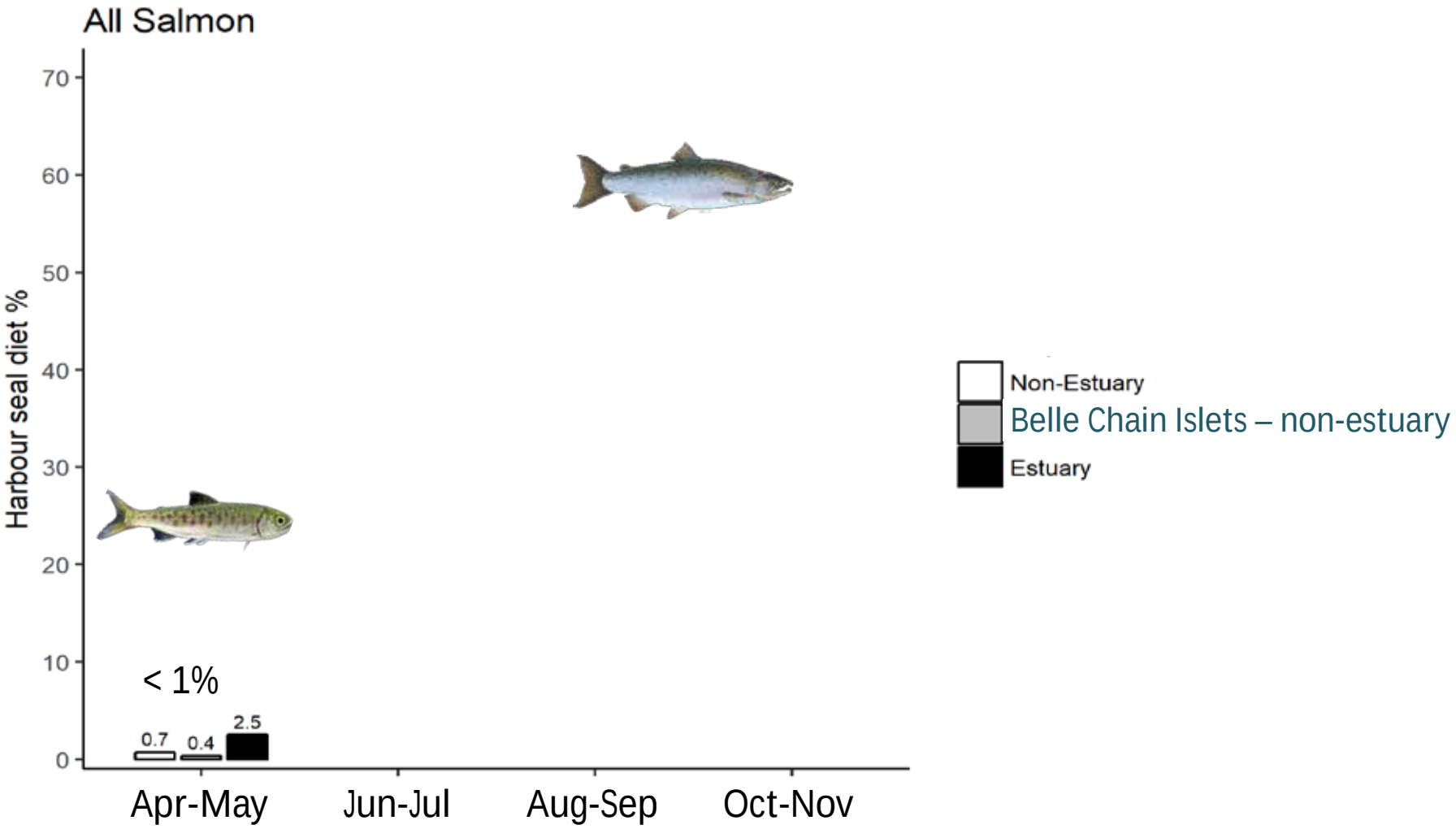
Salmon in diet – Estuary *vs.* non-estuary



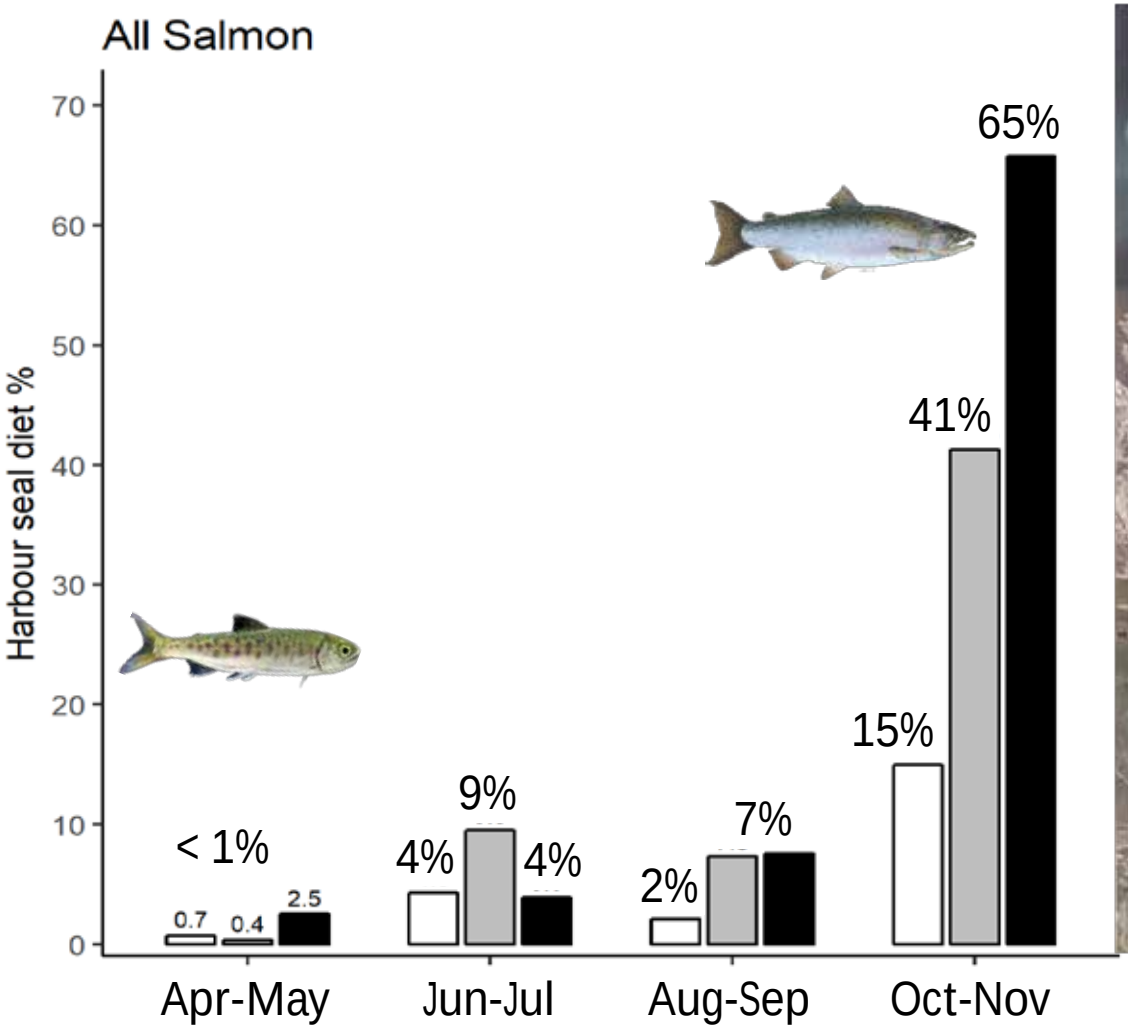
Influence of prey abundance

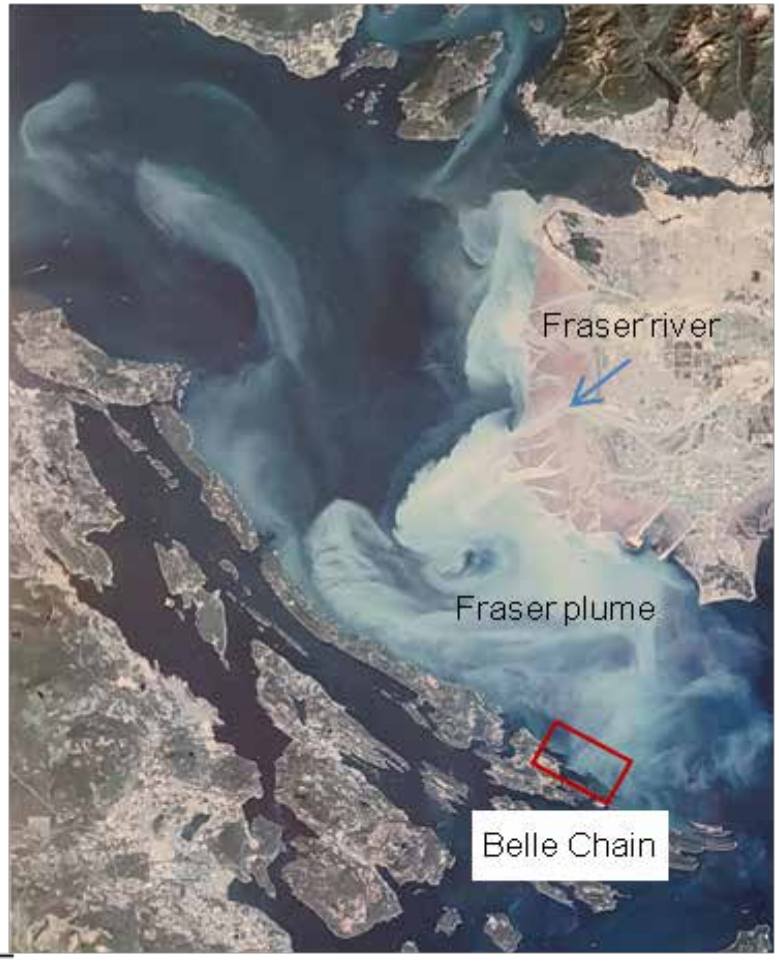


Salmon consumption at Belle Chain Islets

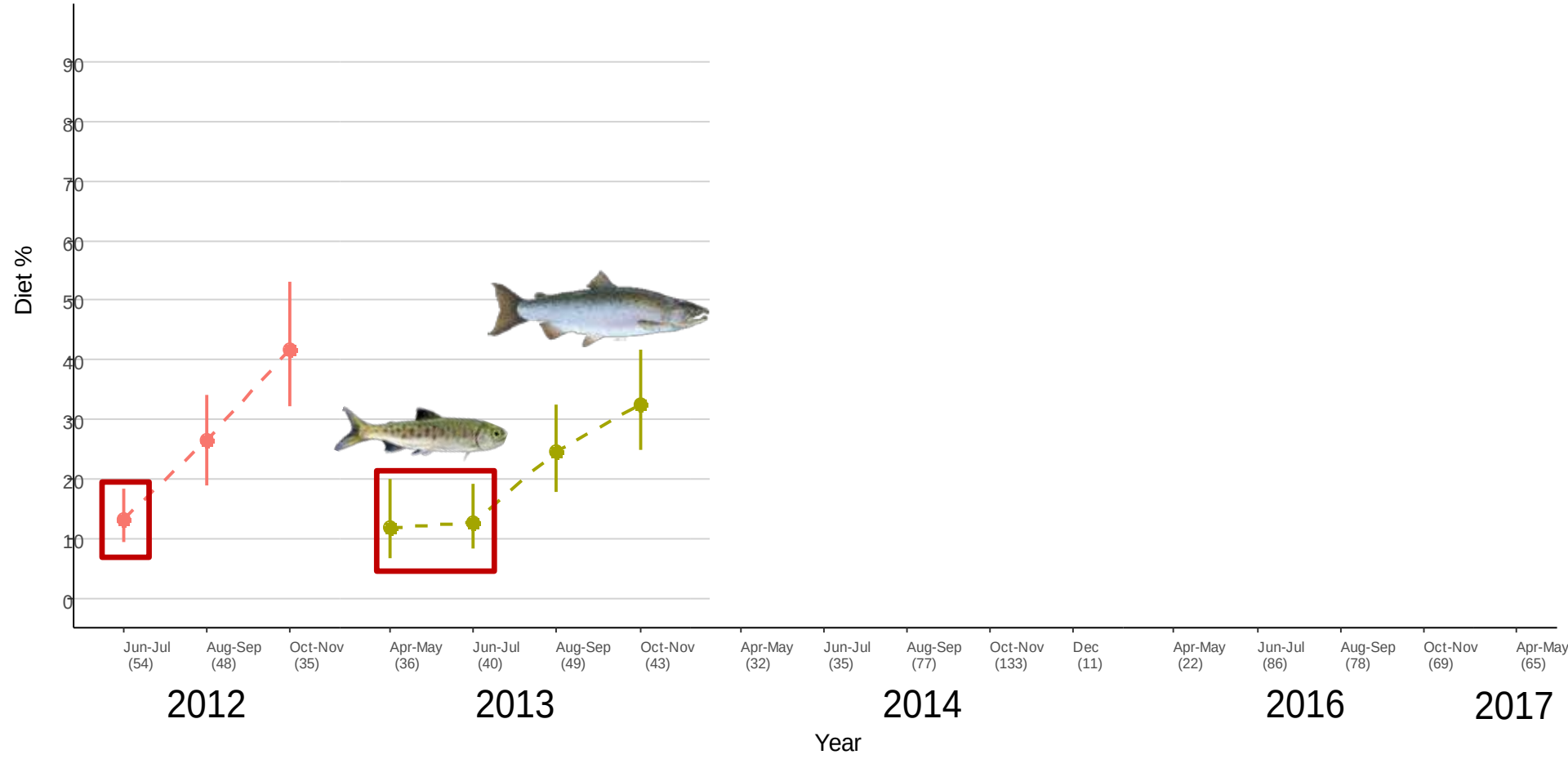


Influence of Site Selection



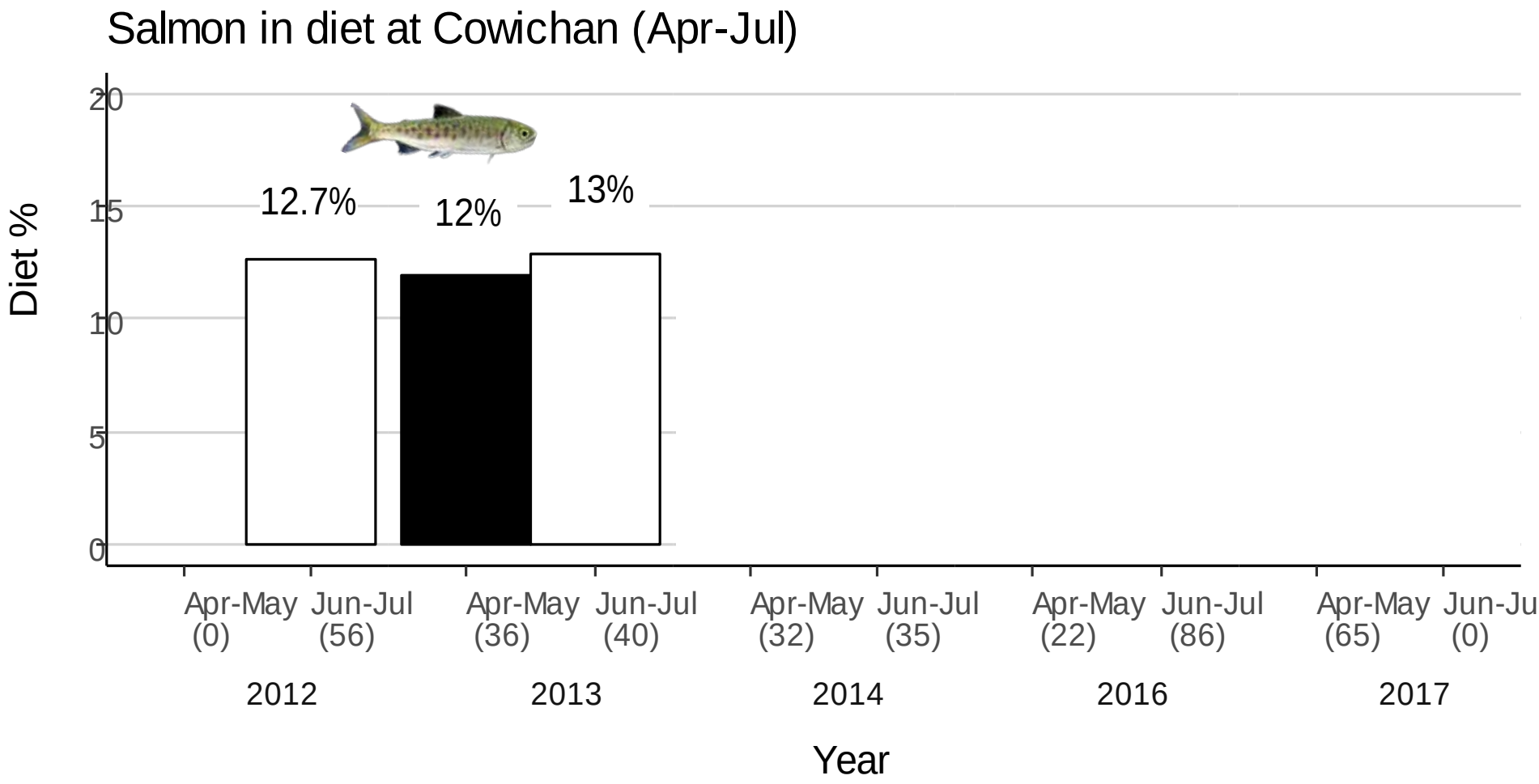


Interannual variability - Cowichan Bay



Thomas et al. 2017 | *Nelson* | *Current study*

Interannual variability - SPRING



Conclusions

Site selection influences consumption estimates

- Salmon consumption inside vs. outside estuaries:
  - significantly higher in estuaries in the fall
  - minor but important differences in diet percentages in spring
- Belle Chain is unique among non-estuary sites (not representative)

Annual and seasonal variability influence estimates

- Salmon diet in estuaries follows an annual pattern
  BUT
  highly variable year to year and between seasons

Long-term monitoring is critical for assessing impacts of predation

Next steps…

Ecosystem perspective

- Ongoing sampling at index sites
- Coordinated Salish Sea harbour seal population surveys
- Further analysis of combined datasets
- Patterns of prey availability (including hatchery releases)
- Indirect effects of predation on salmon
- Impacts on other major prey species
- Species co-occurrence
- Impact of other predators

Acknowledgements

- Pacific Salmon Foundation (Citizen Science and Research Partners)
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- Pacific Identifications Inc.

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