



Fisheries and Oceans
Canada

Pêches et Océans
Canada

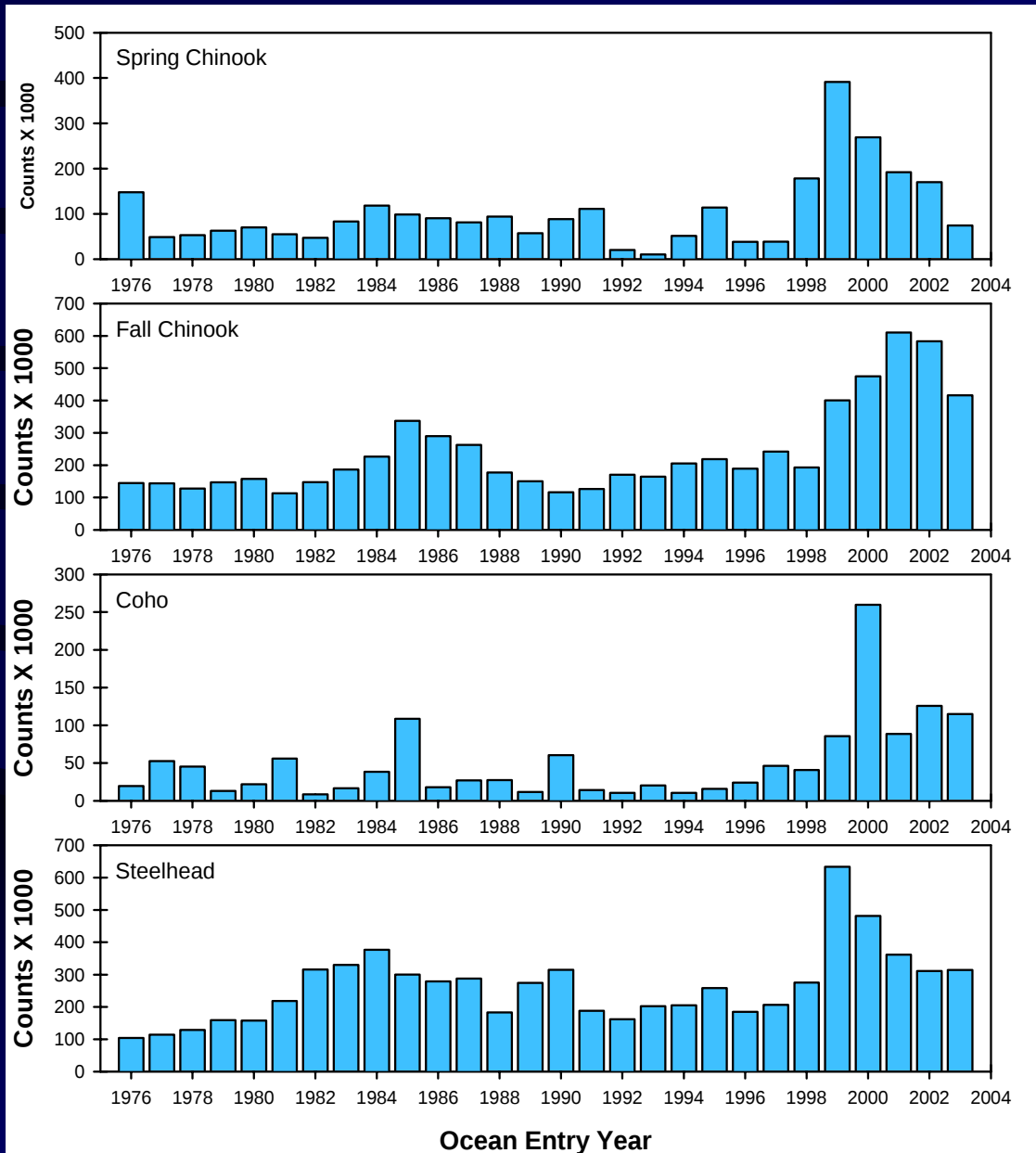
Canada-USA Salmon Shelf Survival Study: Results from 1998-2005 and Future Directions

Marc Trudel
Fisheries and Oceans Canada
High Seas Salmon Program



Canada

Salmon & Steelhead Returns to the Bonneville Dam



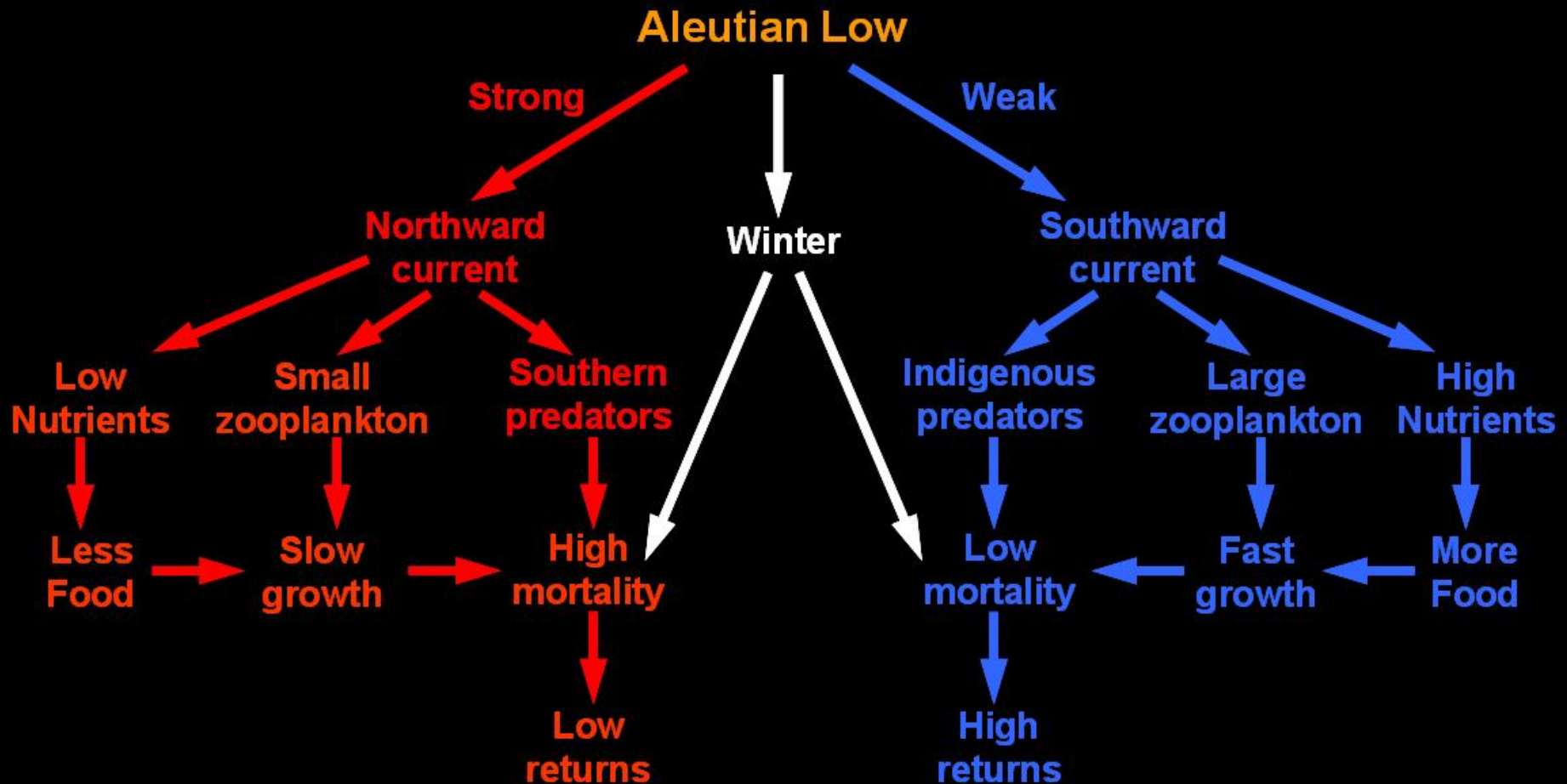
Data from Fish Passage Center

Ocean conditions & salmon production

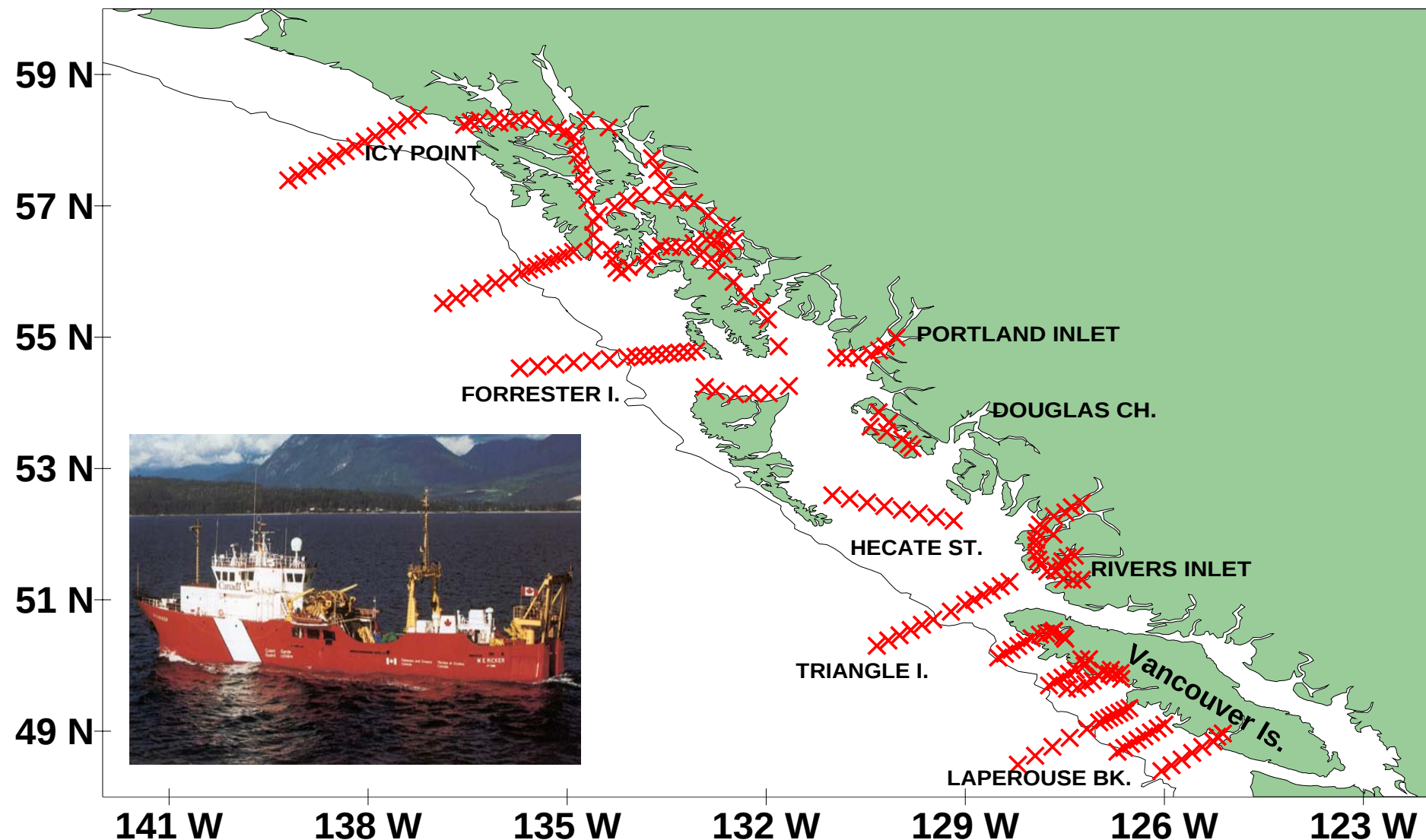
The 5 P's

- *PDO*
- *Productivity*
- *Prey*
- *Predation*
- *Physiology*

Conceptual model



Juvenile Salmon Surveys (1998-2005)

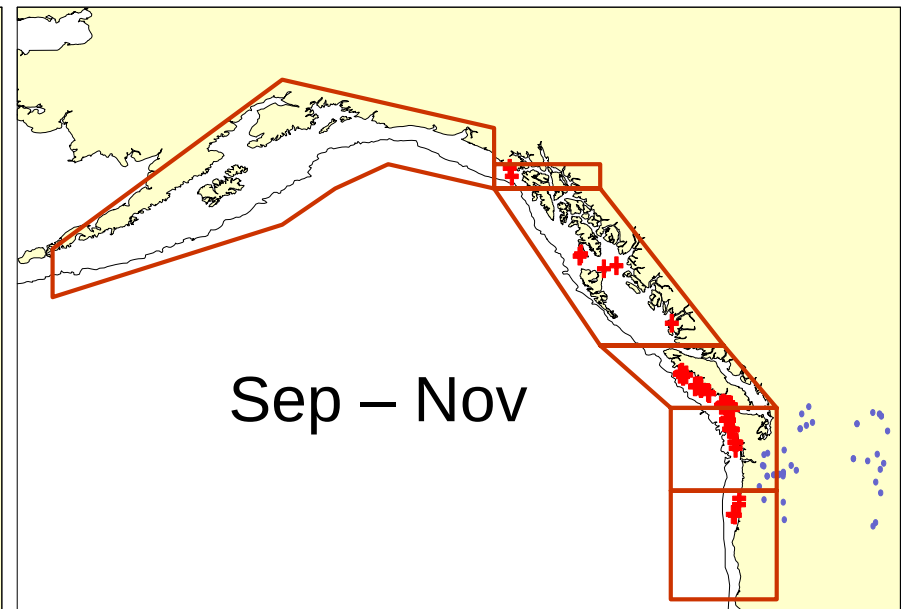
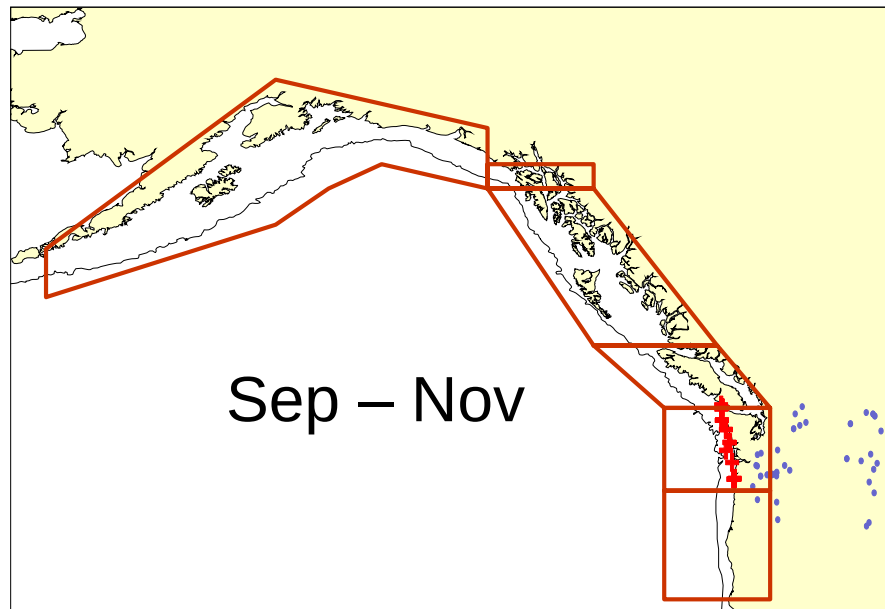
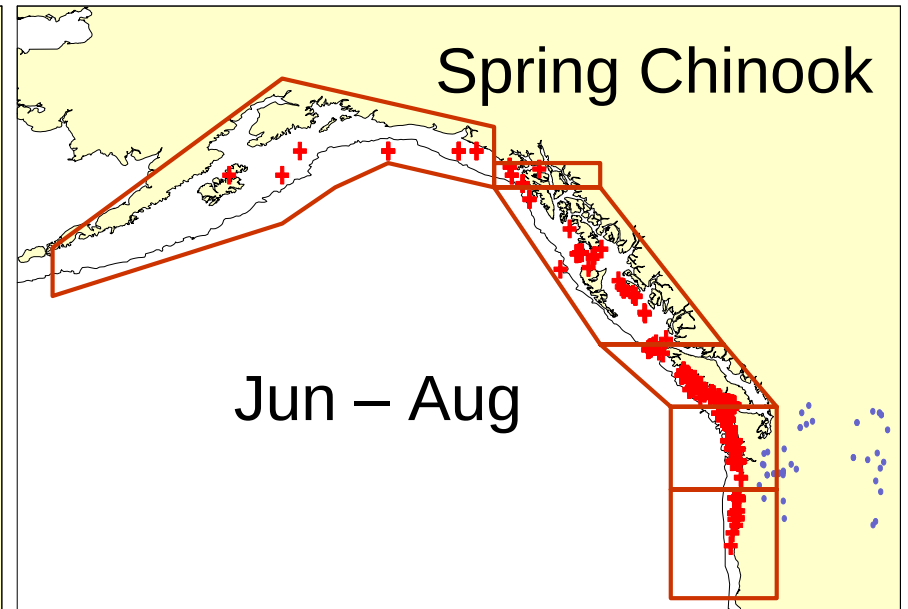
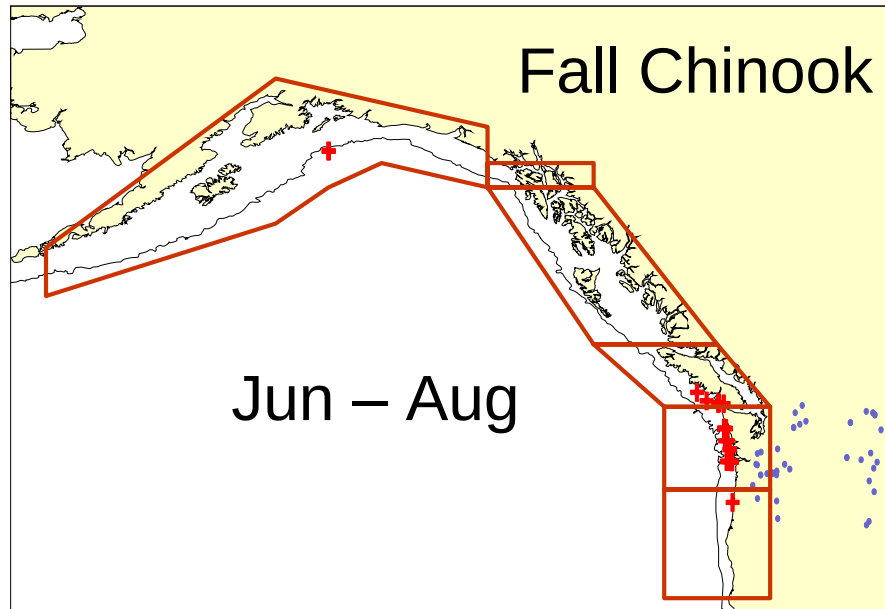


Research questions

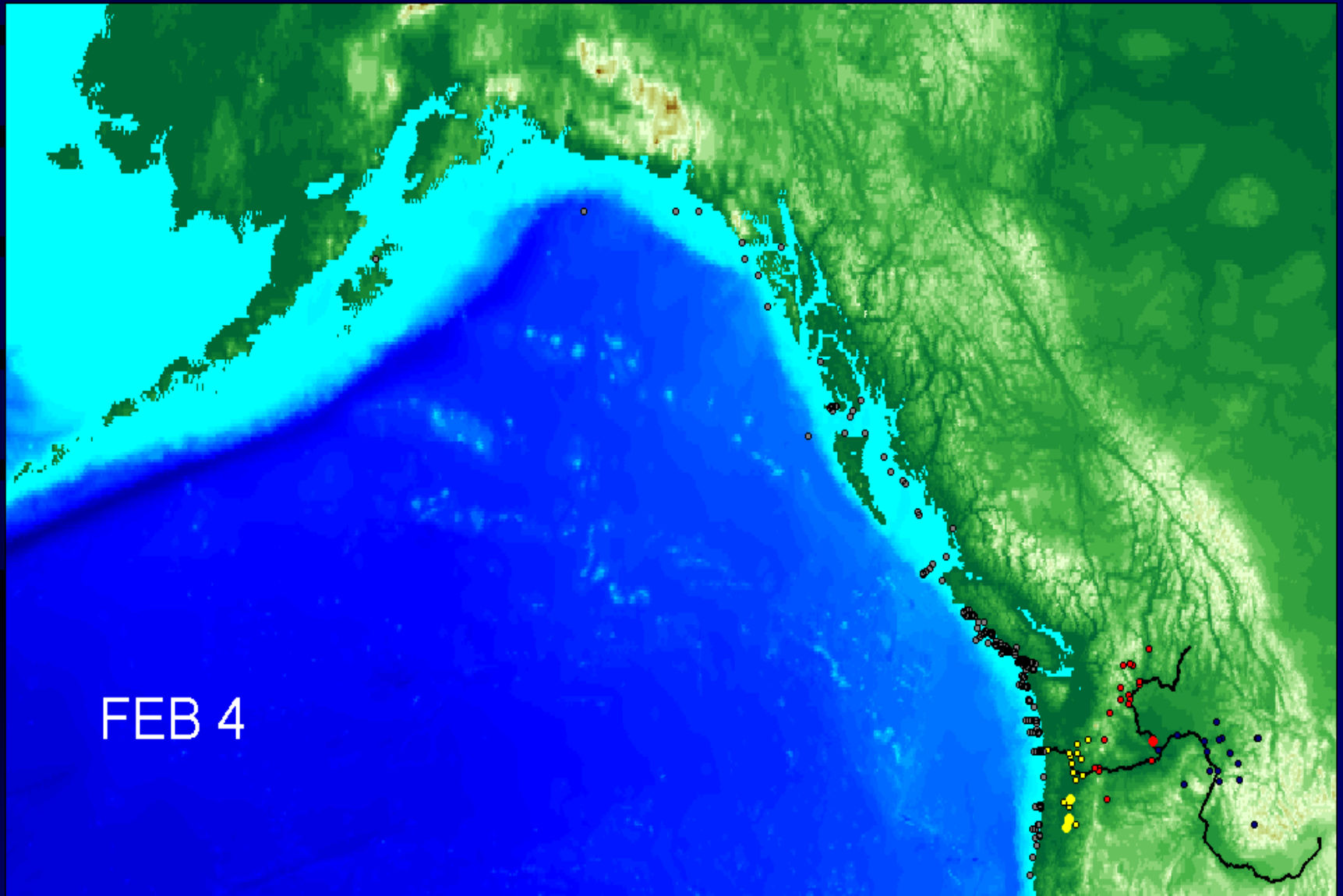
- *Where do salmon go?*
- *How much time do they spend in an area?*
- *What are the environmental conditions they encounter?*
- *How do ocean conditions affect salmon growth?*
- *How do ocean conditions affect salmon survival?*
- *Can we improve salmon forecast?*

Columbia River Salmon distribution & migration

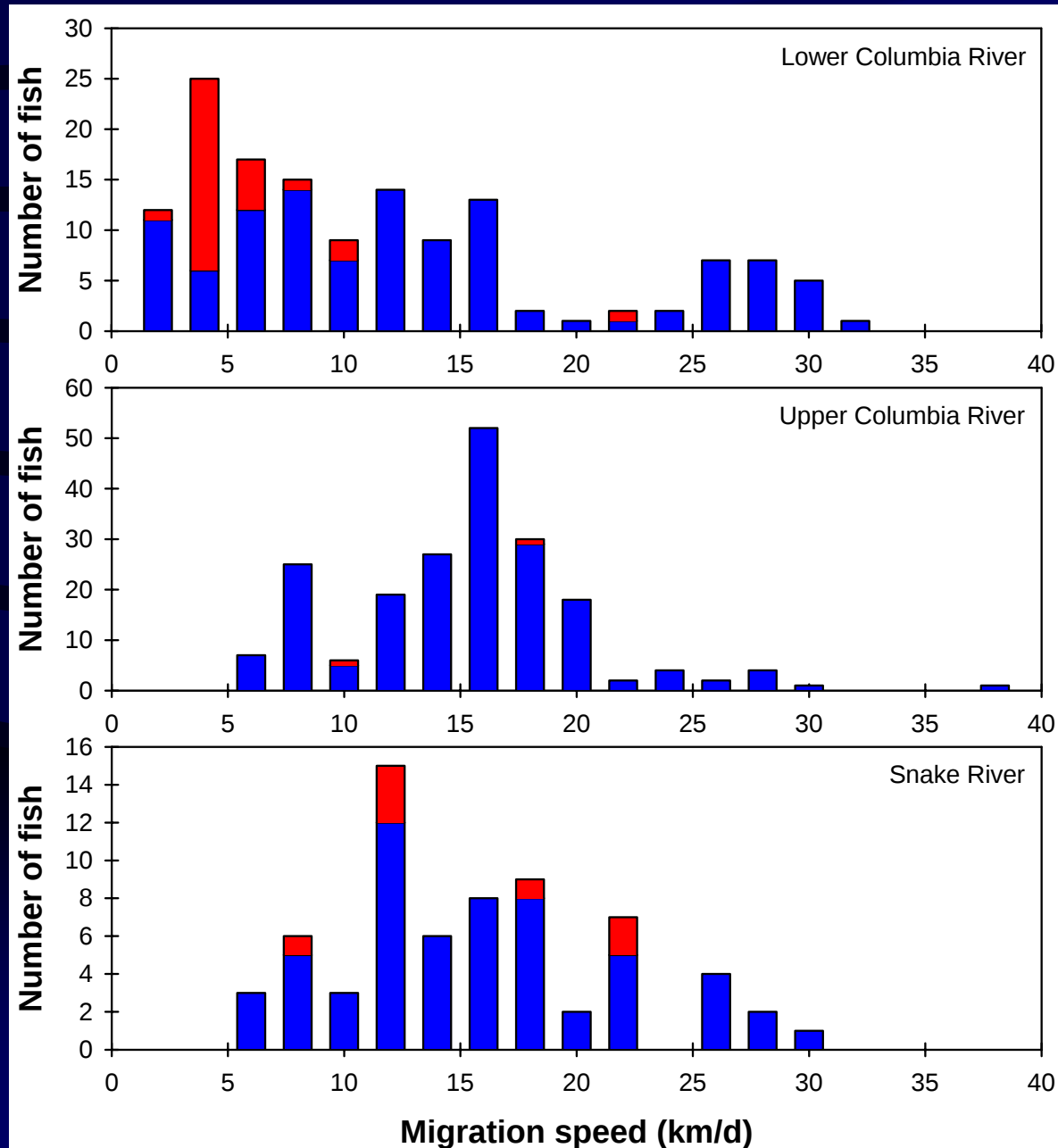
Juvenile Columbia-Snake River Chinook



Juvenile CR Spring Chinook Migration

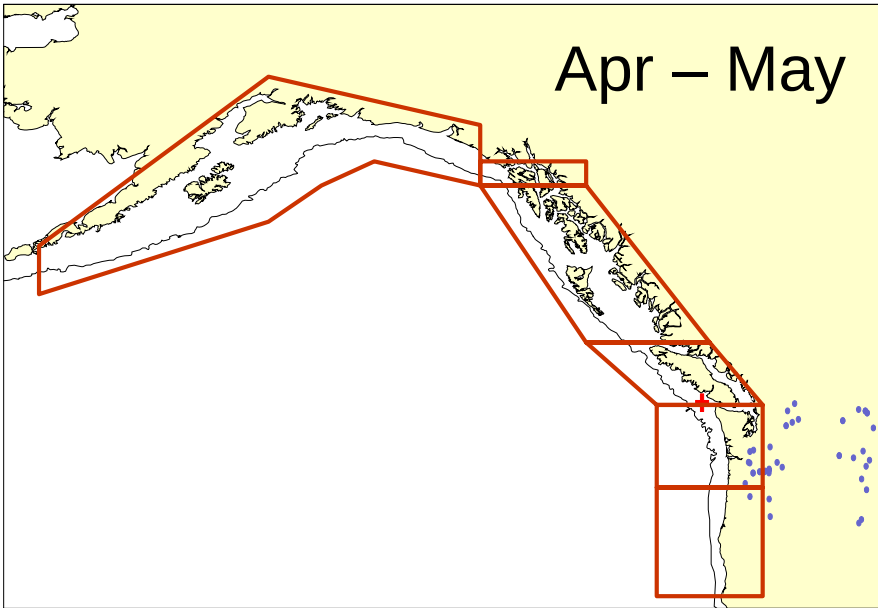


Spring Chinook Salmon Migration Speed

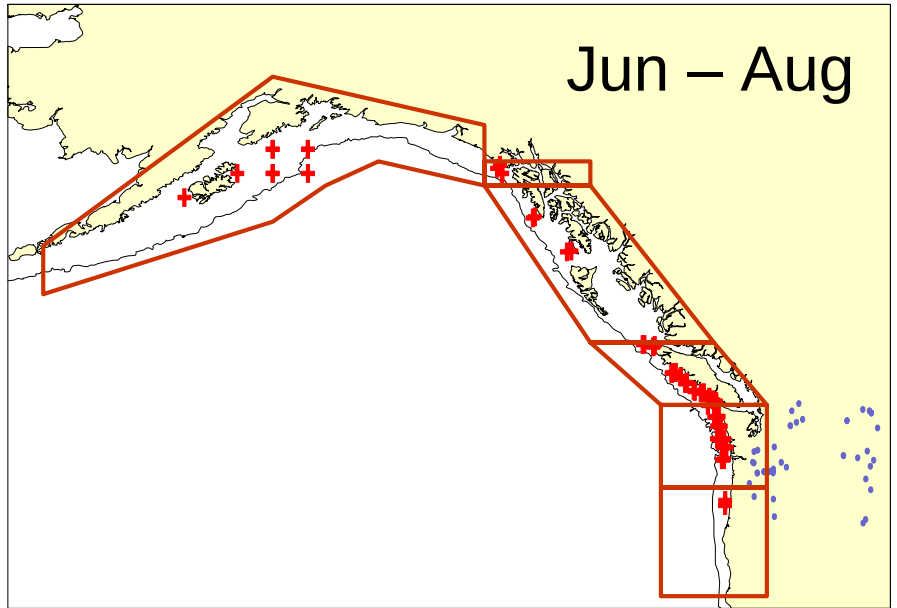


Columbia River Coho

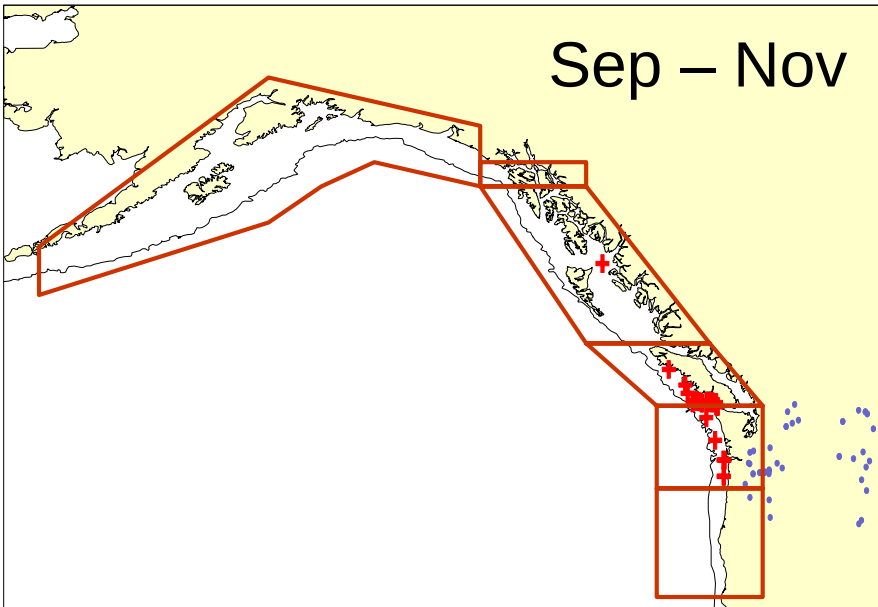
Apr – May



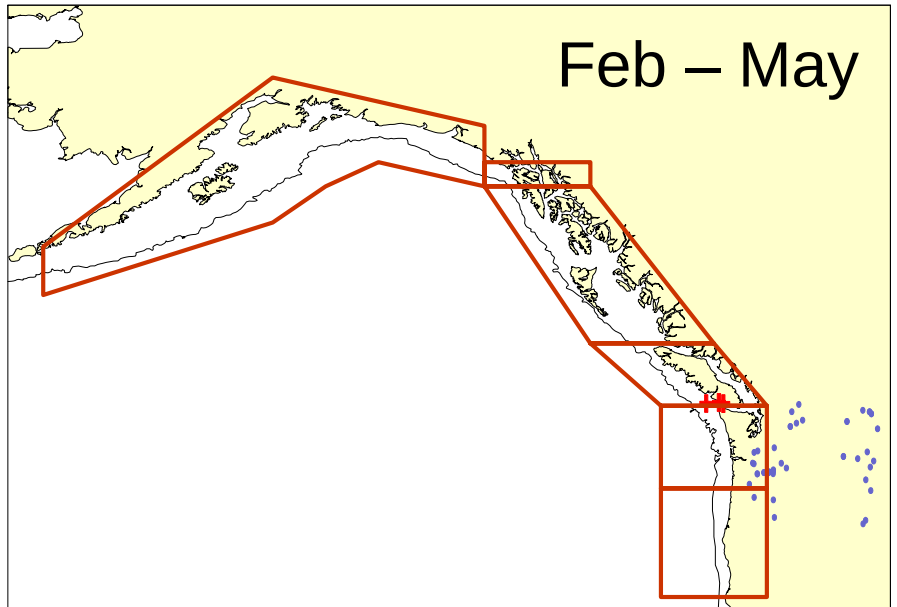
Jun – Aug



Sep – Nov

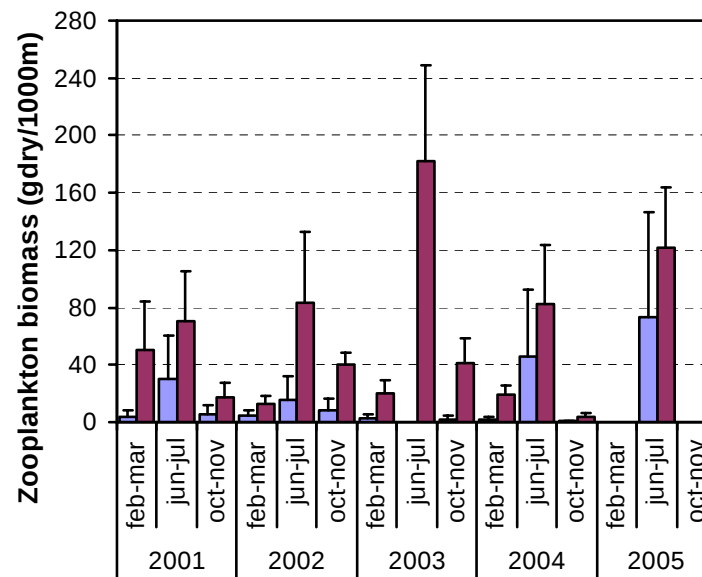
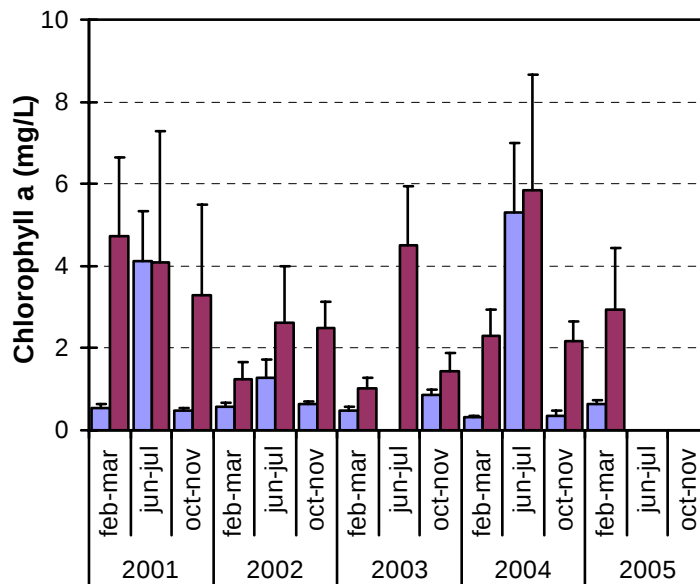
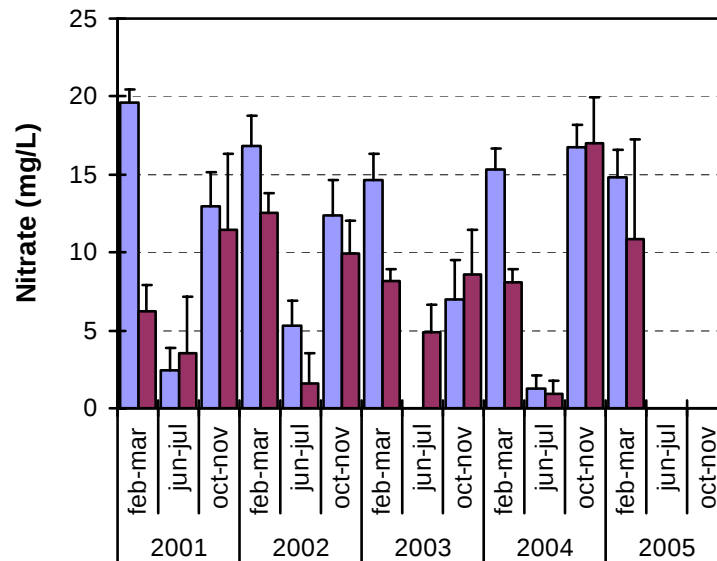
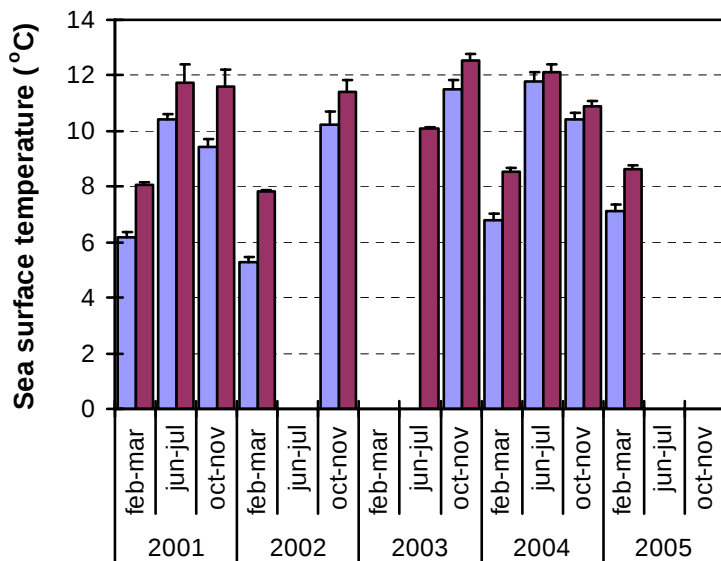


Feb – May

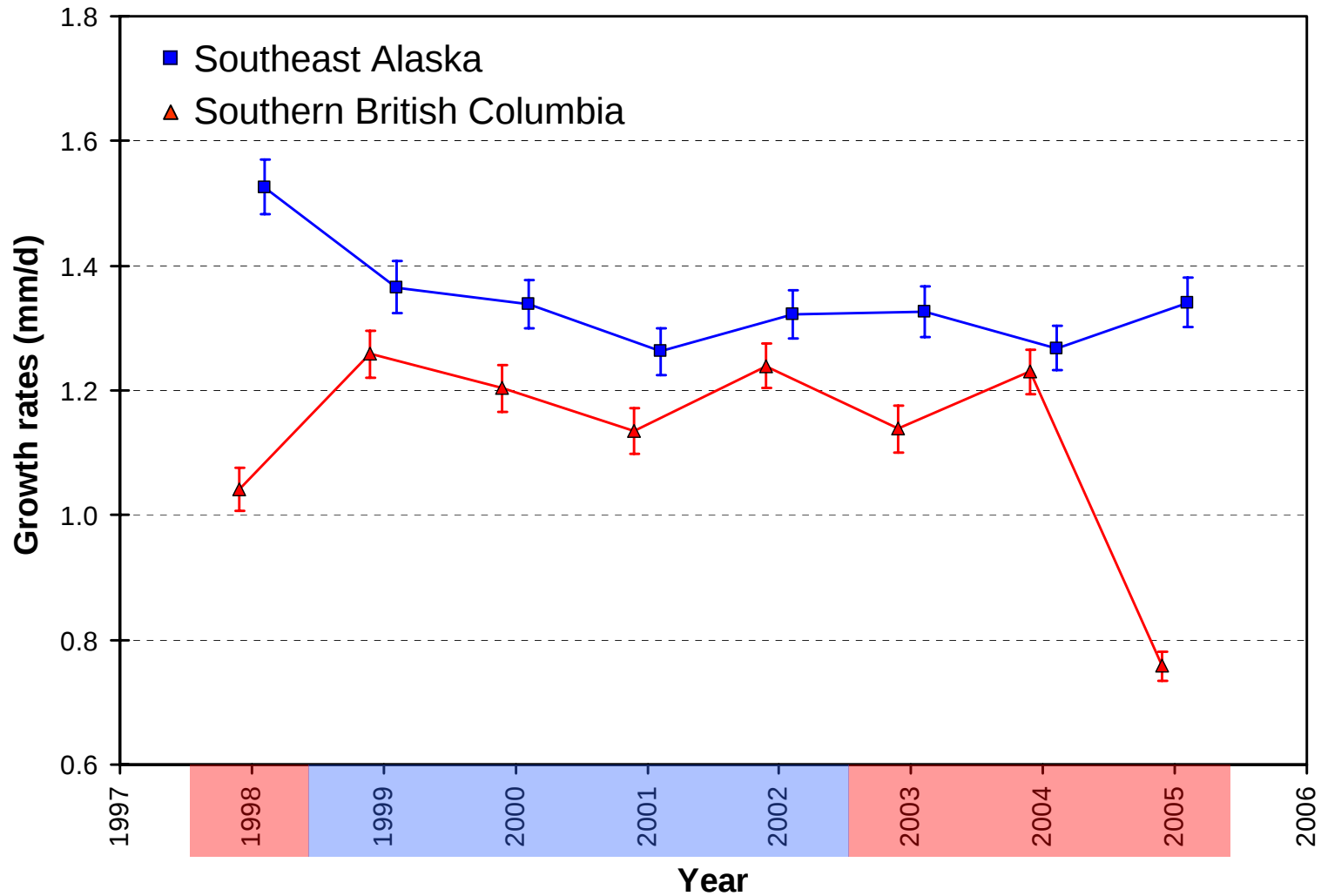


Ocean Conditions & Salmon growth

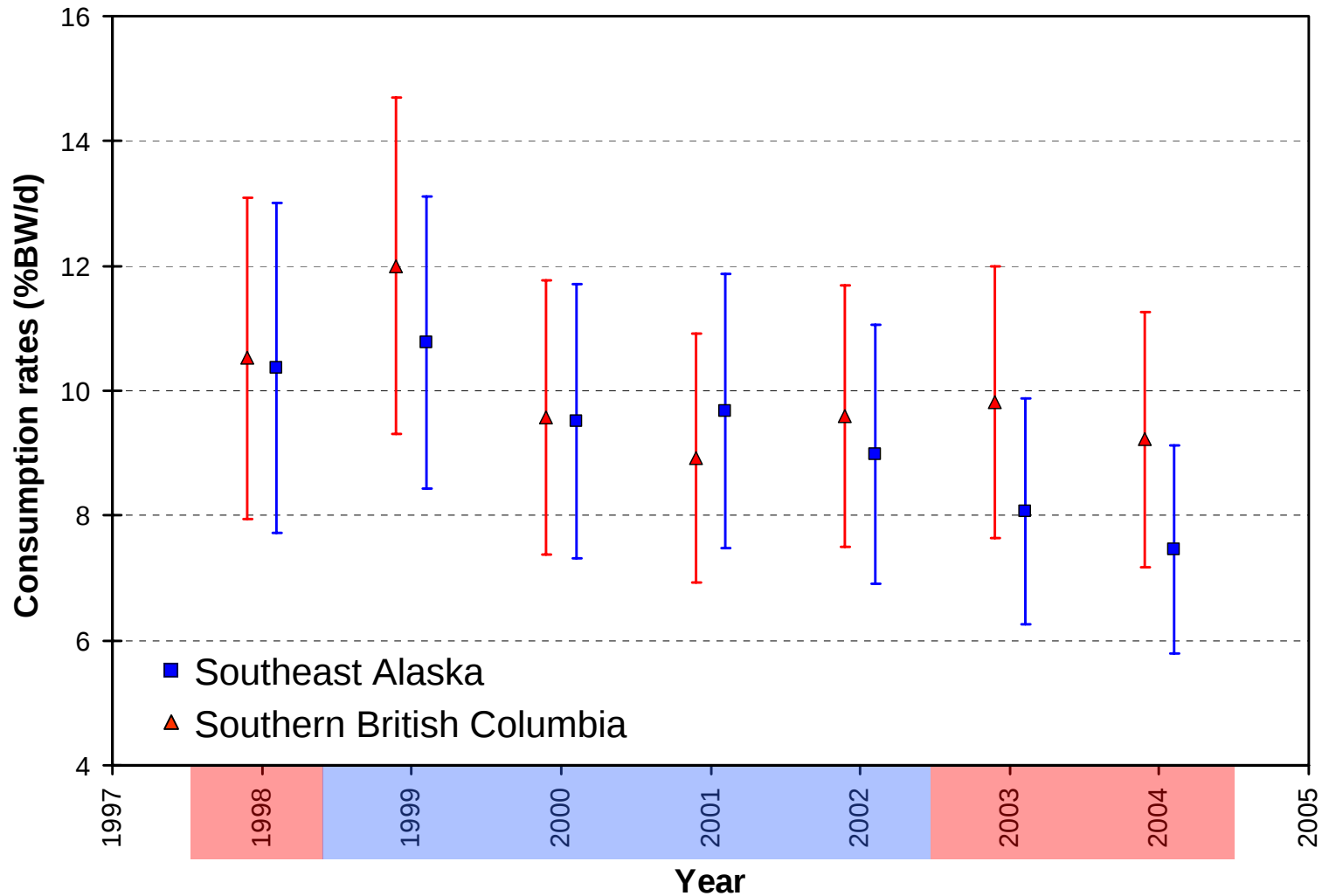
Ocean Conditions (2001-2005)



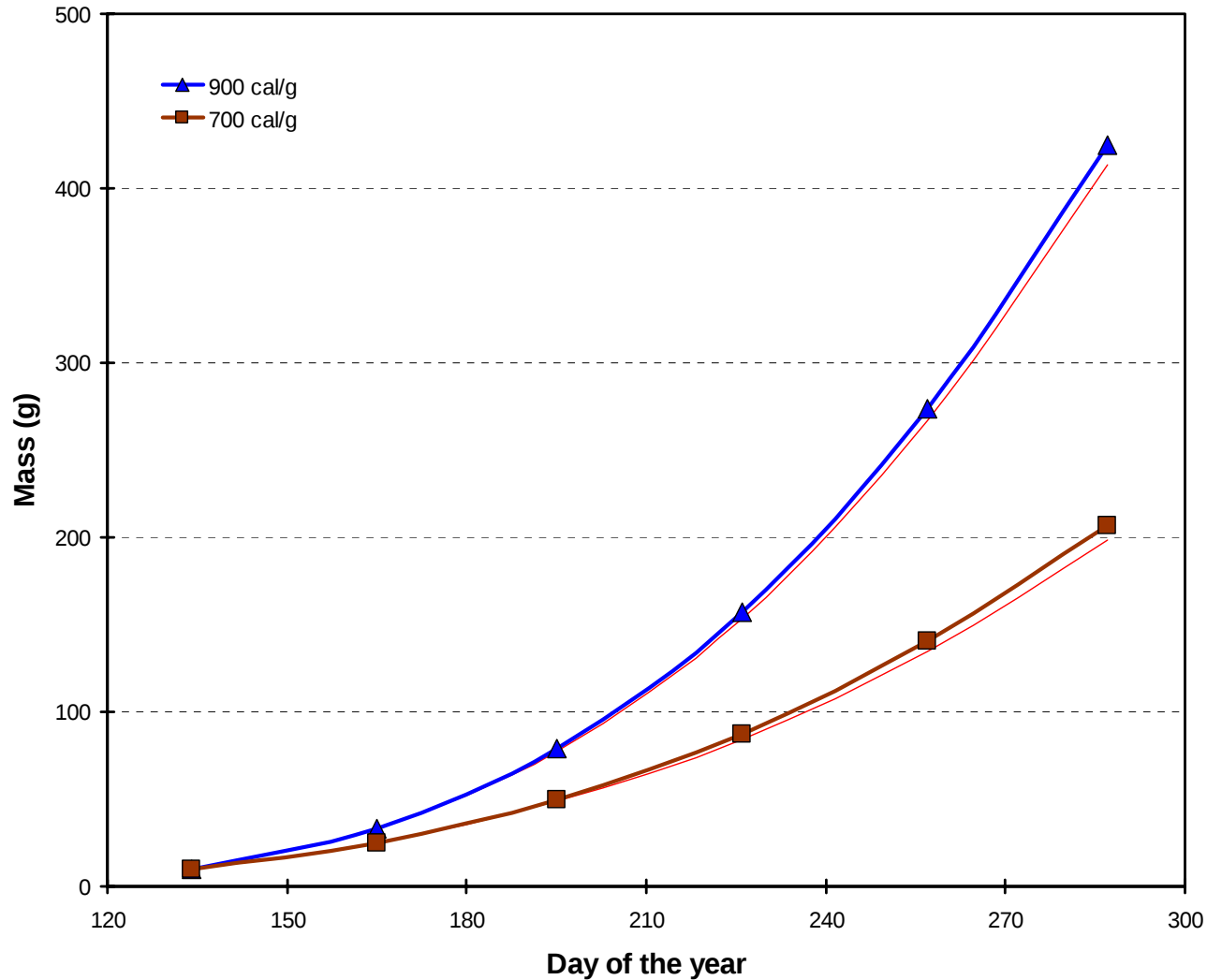
Coho Growth Rate (May-Oct)



Coho Feeding Rate (May-Oct)

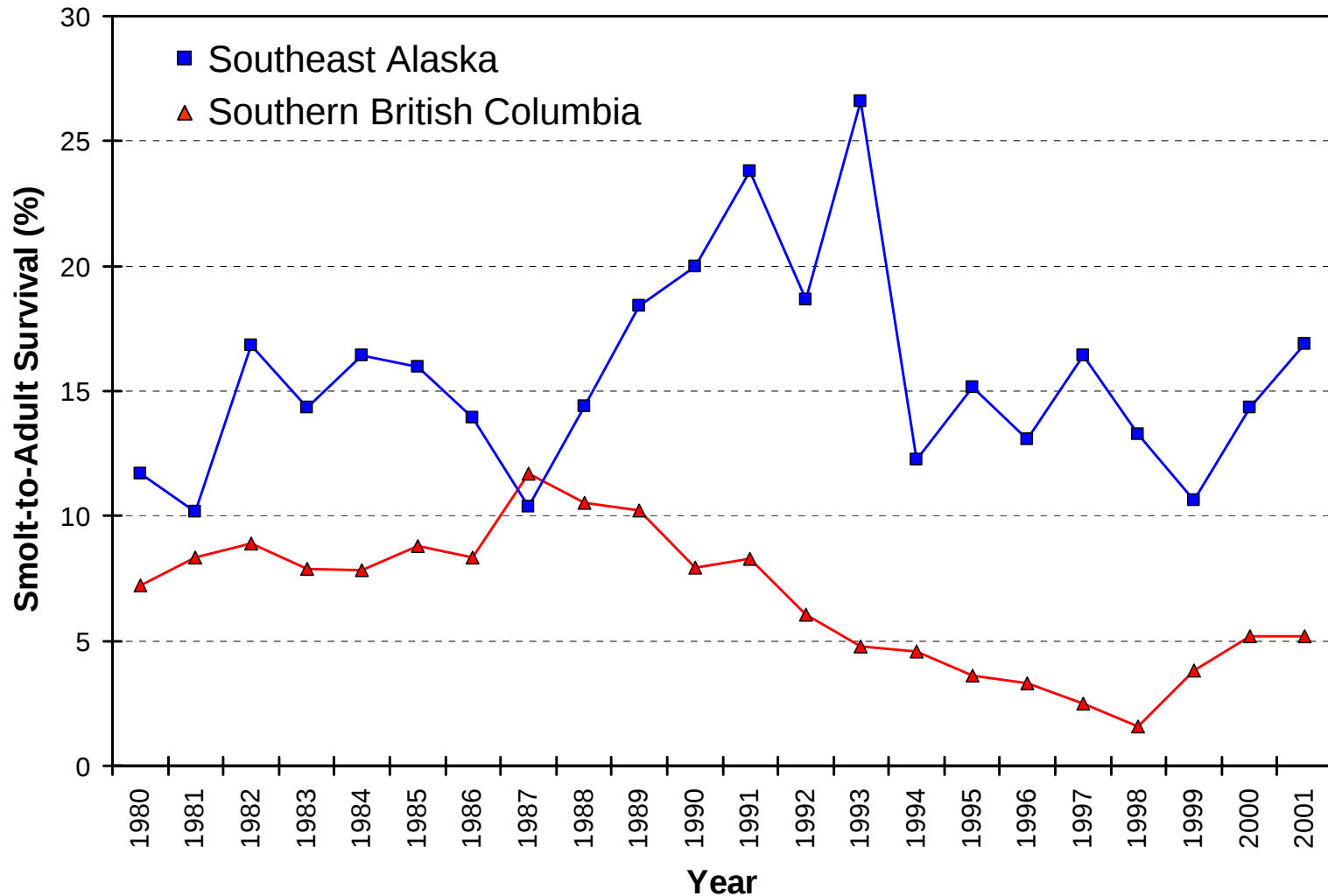


Simulated Growth of Coho (May-Oct)

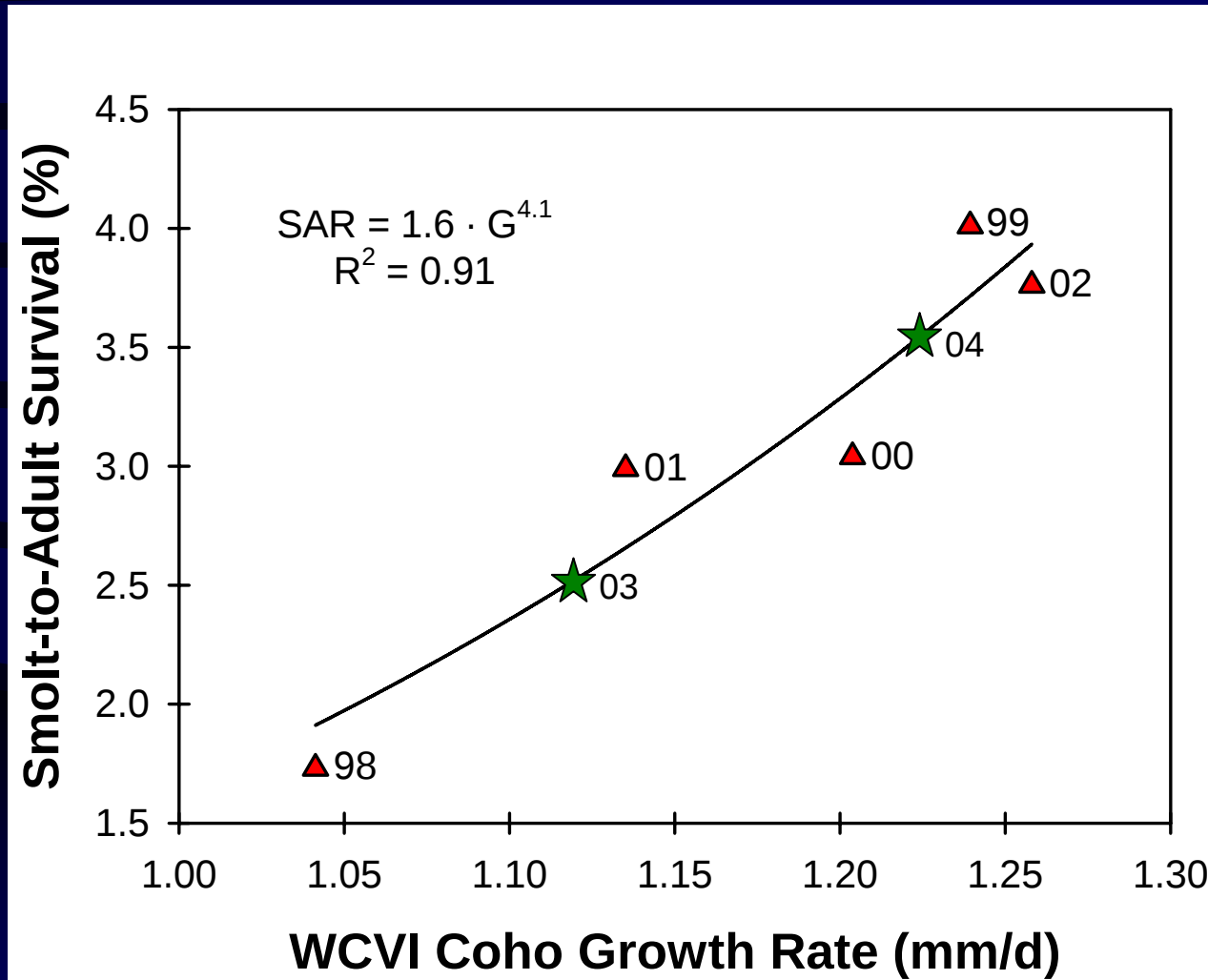


Ocean Conditions & Salmon Survival

Coho Marine Survival



Snake River Spring Chinook Survival

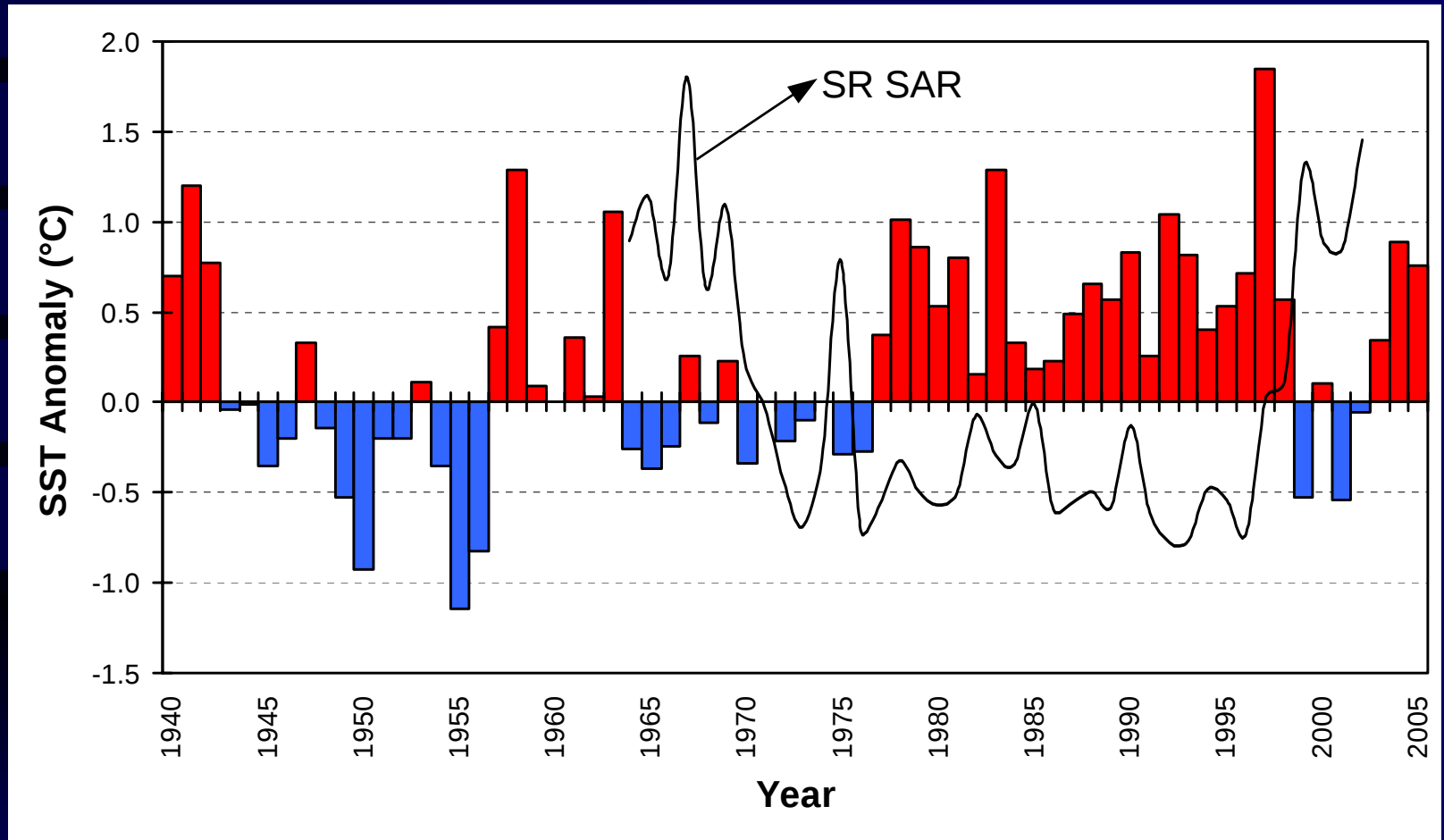


Summary

1. CR Fall Chinook establish coastal residence
2. CR Spring Chinook and Coho
 - Rapid northward migration
 - CR resident off WCVI and WA
 - Some southward migration (LOCR & SR)
3. Higher growth and survival in Alaska than southern BC
4. Marine survival of CR Chinook correlated to growth potential in British Columbia
5. Changes in growth likely due to changes in prey quality

Future Directions

West Coast of Vancouver Island Temperature



Research Needs

1. Annual variation in salmon migration
 2. Direct measurements of survival
- } **POST + DNA**
3. Description of ocean conditions
 - Oregon
 - Washington
 - British Columbia
 - Alaska
- } **Ocean Survival of Salmonids**
- } **Salmon Shelf Survival Study**
4. Assess the effects of ocean conditions on CR salmon
 5. Improve CR salmon forecast

Work plan for FY07-FY09

- Monitor ocean conditions in BC and Alaska
- Determine the biological attributes and migration of CR salmon
- Assess the effects of ocean conditions on CR salmon
- Develop and test metrics to forecast CR salmon runs
- Develop a bioenergetics model of CR salmon growth
- Coordinate research with POST and NMFS
- Disseminate results through publications and presentations

Acknowledgements

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