The First NPAFC Workshop on

Developing a Mechanistic Understanding of the Impact of a Changing Climate on Salmon Abundance and Distribution Trends

Dates: June 4–5, 2024

Venue: Vancouver Airport Marriott Hotel
7571 Westminster Highway, Richmond, BC, V6X 1A3, Canada

Website: https://workshop.npafc.org

Host: The North Pacific Anadromous Fish Commission (NPAFC)

FIRST ANNOUNCEMENT and CALL FOR PAPERS

The North Pacific Anadromous Fish Commission (NPAFC) is pleased to invite you to the First NPAFC Workshop on *Developing a Mechanistic Understanding of the Impact of a Changing Climate on Salmon Abundance and Distribution Trends* to be held on June 4–5, 2024, in Richmond, BC, Canada. The Workshop will bring together scientists, managers, and other stakeholders to consider the current status and future of salmon and their habitats for the conservation of anadromous populations in a changing world.

DEADLINE for ABSTRACT SUBMISSION is February 29, 2024

Background

The North Pacific Anadromous Fish Commission (NPAFC) embarked on a new Science Plan to build on the previous international cooperative research conducted within the International Year of the Salmon (IYS). The primary goal of the 2023–2027 Science Plan is to: "Establish a research framework to develop a mechanistic understanding of the impact of changing climate on salmon abundance and distribution trends in the North Pacific Ocean." The research objectives are to:

1. Improve knowledge of the relative biomass, distribution, migration, and fitness of Pacific salmon in the ocean (Present Knowledge);
2. Understand causes and anticipate changes in the production of Pacific salmon and the marine ecosystems producing them (Forward Action).

Improved understanding of the mechanisms that regulate the distribution and abundance of Pacific salmon will promote the conservation of anadromous populations in the North Pacific Ocean, allow for better projections, or at least include realistic uncertainty given climate change, of Pacific salmon production trends in the future, and enhance the sustainable fisheries management, food security, and economic security in member nations.

Workshop Objectives

- Improve knowledge of the migration, growth and survival of salmon and their environments;
- Increase understanding of the causes of variations in salmon production in changing environments;
- Anticipate future changes in salmon ecosystems and resulting changes in the distribution, survival, and abundance of salmon;
- Provide a forum for results from International Year of the Salmon winter surveys;
- Discuss application of new and developing technologies and analytical methods to research and manage salmon.

Topic Sessions

Topic 1. Pacific Salmon and Steelhead Trout in a Changing North Pacific Ocean (Forward Action)
Moderator: *session leader TBD

Outcome: The effects of natural environmental variability and human factors affecting salmon distribution and abundance are understood and quantified.

Climate change may result in significant variability and overall declines in the carrying capacity and usable habitat (distribution) of Pacific salmon in the North Pacific Ocean, potentially leading to expanded use of the Arctic Ocean, at least seasonally. An improved understanding of linkages between environmental changes and Pacific salmon production will help to plan for the economic consequences of these changes. The objectives are to understand and quantify the effects of environmental variability and anthropogenic factors affecting salmon distribution and abundance, and to project future changes with improved models.

1-1. Pacific salmon distribution/migration, climate and ocean changes
1-2. Pacific salmon density dependence, carrying capacity, climate and ocean changes
1-3. Pacific salmon critical periods, climate and ocean changes
1-4. Modeling the future for salmon
1-5. Summary and discussion

Topic 2. New Technologies
Moderator: Ed Farley (USA)

Outcome: New technologies and analytical methods are advanced and applied to salmon research.

Novel stock and fish identification methods including new molecular techniques, hatchery mass marking, and intelligent tags continue to be developed, and these tools are integral to comprehensive and cost-effective monitoring and mechanistic studies to facilitate the formulation of effective models predicting the distribution and abundance of salmon populations. Although considerable progress has been made in both the basic understanding of population differentiation of mixed marine salmonid assemblages and in genetic research technologies, this knowledge is still insufficient to understand the spatial distribution of different populations in the ocean and the differences in their responses to changing environmental conditions. Implementing genetic methods to differentiate mixed marine salmonid assemblages and to expand the database of reference samples are increasingly needed.

2-1. New tools and activities to improve salmon identification
- additional pink salmon genetic baselines
- develop and standardize Pacific salmon genetic data and analysis methods for comprehensive coastwide genetic baseline database

2-2. New tools to improve an understanding of salmon marine ecology including: genomics, eDNA, marking, intelligent tags, remote sensing/autonomous vehicles, tracking
2-3. Summary and discussion

Topic 3 (Special Session). New Results from the International Year of the Salmon Surveys
Moderator: Jackie King (Canada)

Winter is believed to be a critical period for salmon where reduced prey resources and increased competition may impact survival. One major objective for the IYS was to conduct international collaborative research in the North Pacific Ocean during winter to help understand winter marine ecology for Pacific salmon. Two expeditions during winter 2019 and 2020 focused on Pacific salmon winter

ecology in the Gulf of Alaska and initial results were discussed at a virtual conference held in April 2021. A large-scale international research survey was conducted during winter 2022 and included four research vessels sampling from the eastern to the central North Pacific Ocean. Initial survey results were presented at the IYS Synthesis Symposium in Vancouver, BC, Canada in October 2022. This session is intended to provide a venue for new results from ongoing analyses being conducted by international scientists.

3-1. New results from the International Year of the Salmon winter surveys
3-2. Summary and discussion: overview of lessons learned for future challenges

Oral and Poster Presentations

The workshop will be a hybrid meeting with in-person and virtual accessibility. The workshop will be conducted by oral and poster presentations in English. Sessions will be comprised of contributed presentations, which will be selected for oral or poster presentation.

Key Dates for Workshop

November 2023:	Updated announcement of workshop and call for papers
December 2023:	Workshop website goes live
February 29, 2024:	Abstract submission due
March 15, 2024:	Announcement of abstract selection to authors
March 30, 2024:	Second announcement of workshop and registrations
April 1, 2024:	Workshop and hotel registrations open
May 9, 2024:	Workshop and hotel registrations due
June 4–5, 2024:	Workshop
June 30, 2024:	Extended abstracts due

Workshop Venue

Vancouver Airport Marriott Hotel at 7571 Westminster Highway, Richmond, BC, V6X 1A3, Canada.

Registration

Free

Hotel Accommodations

Hotel information will be available on the workshop website (https://workshop.npafc.org).

Submitting Abstracts

- ✓ Abstracts for oral and poster presentations must be received **by February 29, 2024**, at the NPAFC Secretariat by e-mail (secretariat@npafc.org).
- ✓ Abstracts must be prepared according to the guidelines and sample format (see below).
- ✓ The Science Committee will select abstracts **by March 15, 2024**, and authors will be notified of the results by the NPAFC Secretariat.
- ✓ Presenters who had their abstracts selected will receive guidelines for their oral or poster presentations and a formatting guide for extended abstracts from the NPAFC Secretariat.
- ✓ Presenters who had their abstracts selected will not need to resubmit them unless there are updates that include new results.
- ✓ Presenters may withdraw their abstracts if they are unable to attend the workshop. If you want to withdraw your abstract, please send an e-mail to the NPAFC Secretariat (secretariat@npafc.org) **no later than March 30, 2024**.

Abstract Guidelines

- ✓ Limit the abstract to 400 words and submit using Microsoft Word according to the sample format shown below.
- ✓ Tables and figures are not included in the abstract.
- ✓ Indicate the intended topic session (and sub-session).

- ✓ Specify the presenter with an asterisk (*). Please use full first and last names for each author (not just first initial).
- ✓ State the preference for (1) oral, (2) poster, or (3) oral presentation, but poster or pre-recorded video presentation are acceptable. The Science Committee reserves the right to change the presentation from an oral to a poster or a pre-recorded video presentation depending on time constraints.
- ✓ The abstract should begin with a clear statement of the problem or objectives, give a brief summary of methods and the major results, and end with a substantial conclusion. Do not use vague statements, such as "results will be discussed".
- ✓ Selected abstracts will be included in the program and abstract booklet.
- ✓ Authors are responsible for clarity and accuracy of the information presented in the abstracts, as they may not be edited during the process of compiling the abstract booklet.

Sample Format for Submitting Abstracts

Topic Session: Topic 1. Pacific Salmon and Steelhead Trout in a Changing North Pacific Ocean (Forward Action) (1-3. Pacific Salmon critical periods, climate and ocean changes).
Preferred Presentation Format: (1) oral

Title: Late ocean entry timing provides resilience to populations of Chinook and sockeye salmon in the Fraser River

Authors: Richard J. Beamish*, Ruston Sweeting, and Chrys Neville
Pacific Biological Station, Fisheries and Oceans Canada, 3190 Hammond Bay Rd., Nanaimo, BC, V9T 6N7, Canada (*E-mail: richard.beamish@xxxx.ca; Tel: 1-250-756-xxxx; Fax: 1-250-756-xxxx)

Abstract: Most sockeye salmon from the Fraser River enter the Strait of Georgia by early May and most Chinook salmon by mid May. There are populations of Chinook salmon from the South Thompson River area and one population of sockeye salmon from the Harrison River that enter the Strait of Georgia almost two months later. The productivity of these species with a late ocean entry life history strategy has been exceptional in recent years. The reasons for the recent improved productivity of the late ocean-entry life history type are not known, but the success identifies the importance of a temporal spread in ocean entry timing of the aggregate of populations. The recent success also reminds us that ocean entry timing of the aggregate of populations has evolved to be able to adapt to long-term changes in the timing of prey populations in the early marine period.

Workshop Proceedings

Presenters who had their abstracts selected will be asked to submit an extended abstract **by June 30, 2024**. The extended abstracts will be compiled into workshop proceedings and published as a NPAFC Technical Report after the workshop. The Technical Report will be available online at the NPAFC website.

Science Committee

- Ed Farley, Chairperson (Auke Bay Laboratory, NMFS, USA; SSC)
- Jackie King (Pacific Biological Station, DFO, Canada; SSC)
- Dong Wook Yang (Marine Living Resources Division, FIRA, Korea; SSC)
- Svetlana Naydenko (Pacific Scientific Research Fisheries Center, TINRO, Russia; SSC)
- Alexei Somov (Pacific Scientific Research Fisheries Center, TINRO, Russia)
- Satoshi Honda (Fisheries Resources Institute, FRA, Japan; SSC)
- Ricardo Federizon (NPAFC Secretariat, Canada)

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