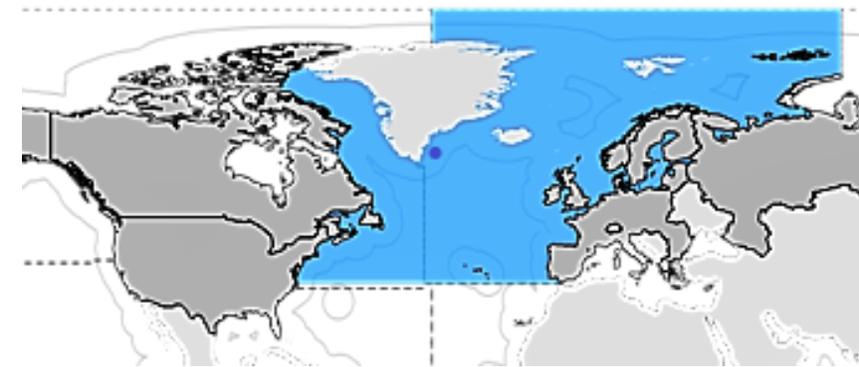
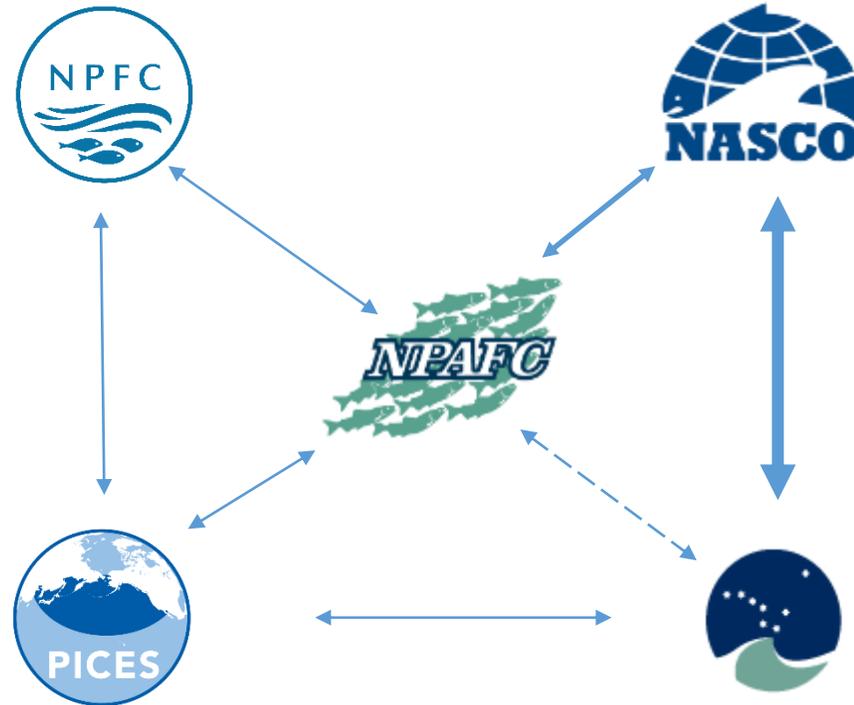
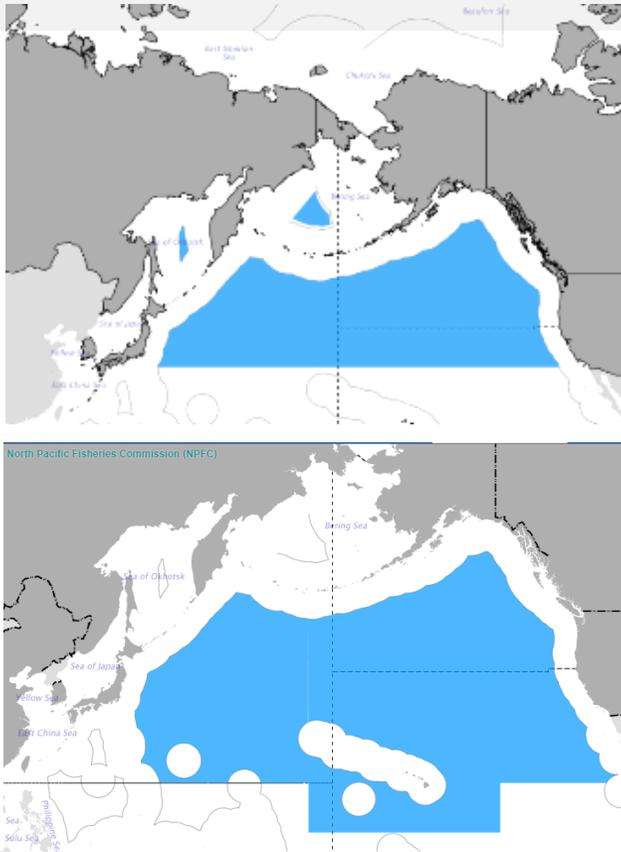




SALMON AND PEOPLE IN A CHANGING WORLD

THE INTERNATIONAL YEAR OF THE SALMON PAN PACIFIC HIGH SEAS EXPEDITION 2022: A COLLABORATIVE INTERNATIONAL APPROACH TO UNDERSTANDING HOW A RAPIDLY CHANGING OCEAN AFFECTS PACIFIC SALMON AND HIGH SEAS ECOSYSTEMS

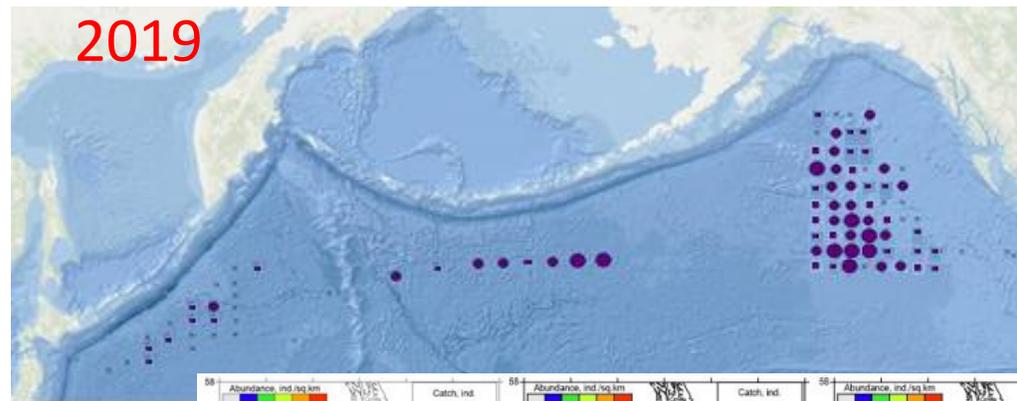
CONNECT INSTITUTIONS



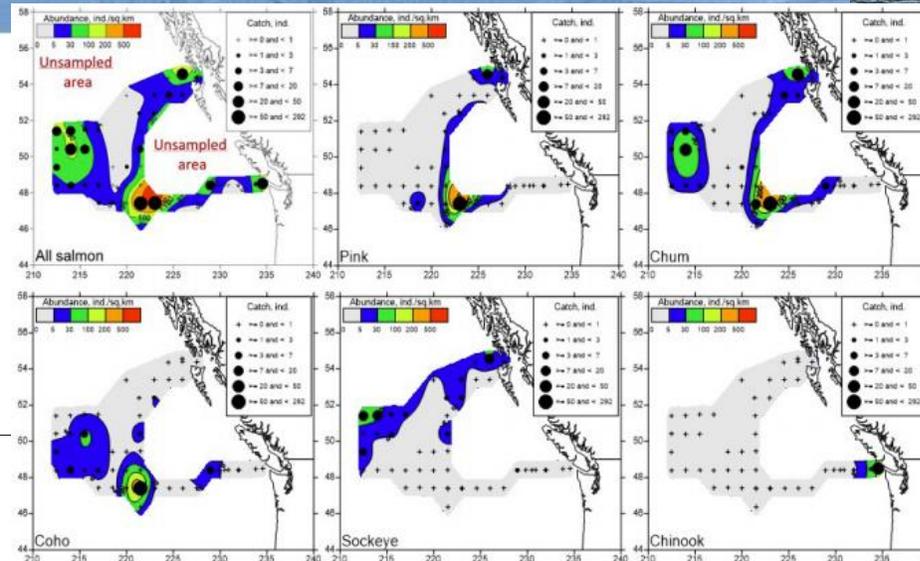
FILLING KNOWLEDGE GAPS

The underlying mechanisms affecting the distribution of salmon and associated species in the NPO must be understood to inform:

- High seas enforcement activities
- Fisheries management

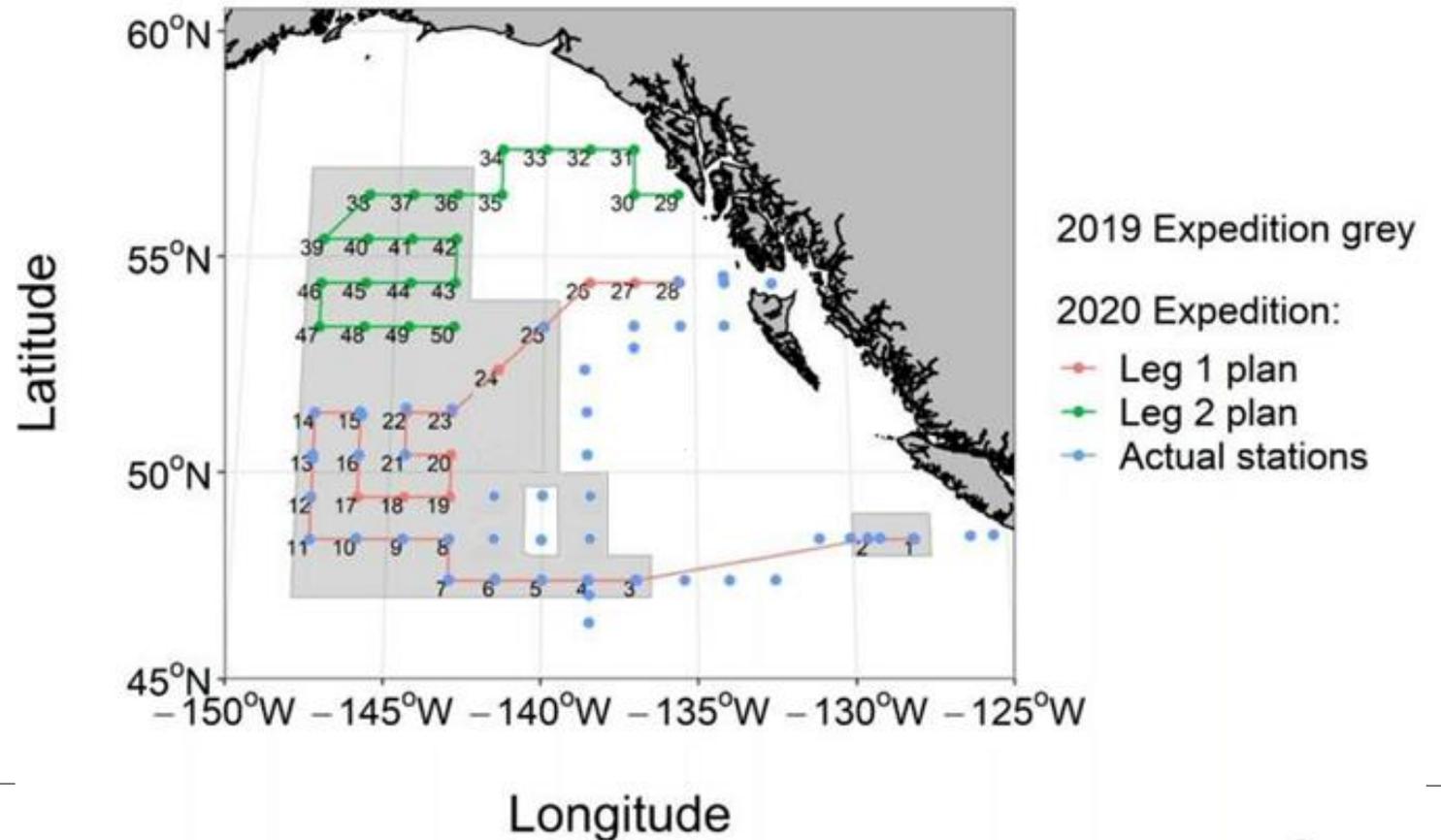


2020



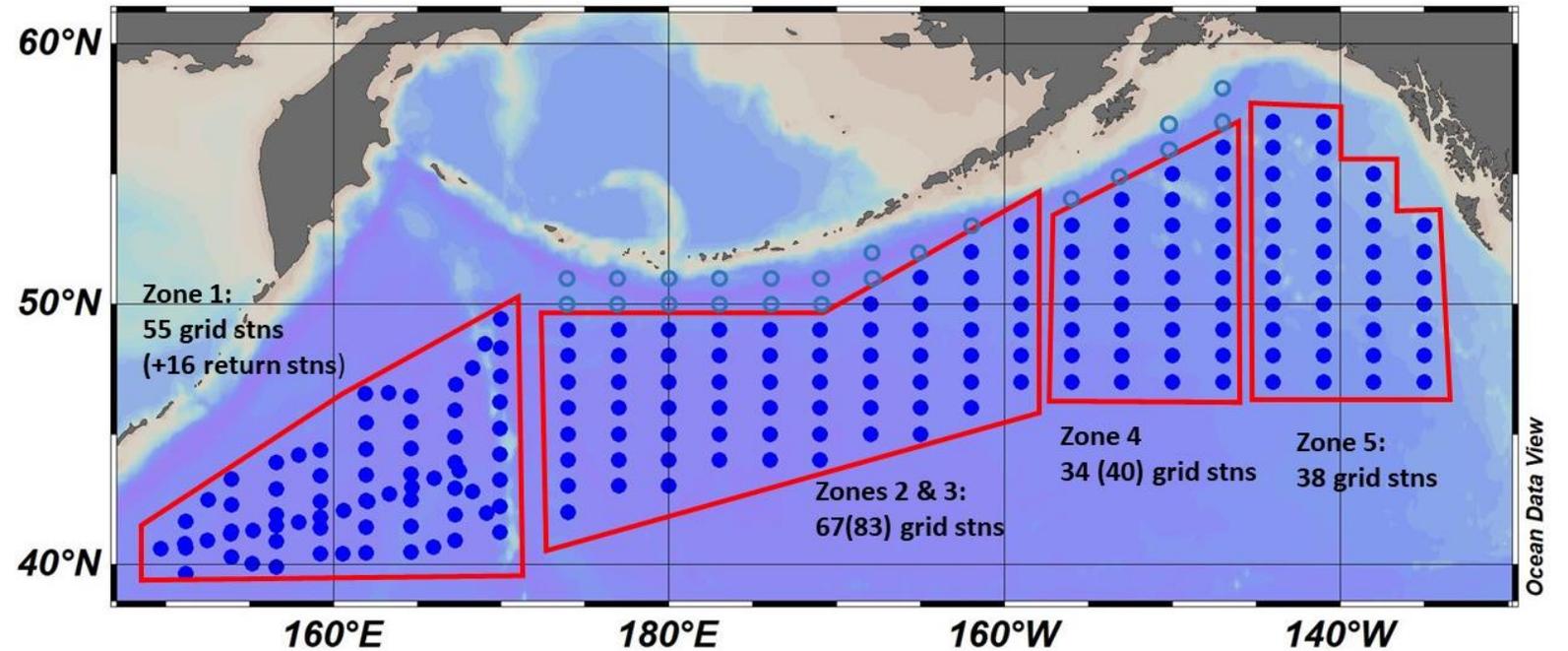
2019 AND 2020 GULF OF ALASKA EXPEDITIONS

- Organized by Dr. Dick Beamish (Canada) and Dr. Brian Riddell (PSF) with support from the NPAFC Secretariat with a combination and government, NGOs, and private sector funding
- Proof of concept for the 2022 Expedition
- Teams of scientists from Canada, Japan, the Republic of Korea, Russia, and the USA spent a month in the Gulf of Alaska in winter performing ecosystem surveys
- Test key the hypothesis that factors affecting return abundance have mostly occurred by the end of the first ocean winter



IYS 2022 PAN PACIFIC WINTER EXPEDITION

- Comprehensive ecosystem survey
- Notional support from Canada, Russia and USA
 - Zone 1 – Russia
 - Zone 2&3 – Chartered Vessel
 - Zone 4 – USA
 - Zone 5 – Canada
- Currently raising funds for a chartered vessel
 - \$300K CAD – BC SRIF
 - \$350K USD - NPRB



2022 EXPEDITION OBJECTIVES



Demonstrate the utility of an international pan-Pacific winter ecosystem survey to understand how increasingly extreme climate variability in the North Pacific Ocean and the associated changes in the physical environment influence the abundance, distribution, migration, growth, fitness and survival of Pacific salmon and ecologically-related species

2022 EXPEDITION OBJECTIVES



1. Determine species and stock-specific ocean distributions and relative abundances, and condition of juvenile, immature/mature Pacific salmon and ecologically related species within the study area, and factors/mechanisms controlling them.
2. Document the spatial and temporal variation in physical and biological oceanographic conditions
3. Document the distribution, condition, and standing stocks of zooplankton, and micronekton that serve as the prey base for Pacific salmon and associated marine fishes
4. Demonstrate the ability to effectively collaborate across the five NPAFC parties and our partners to conduct integrated ecosystem research that will support the sustainable management of salmon in a rapidly changing North Pacific Ocean.

2022 HIGH SEAS PAN-PACIFIC WINTER EXPEDITION

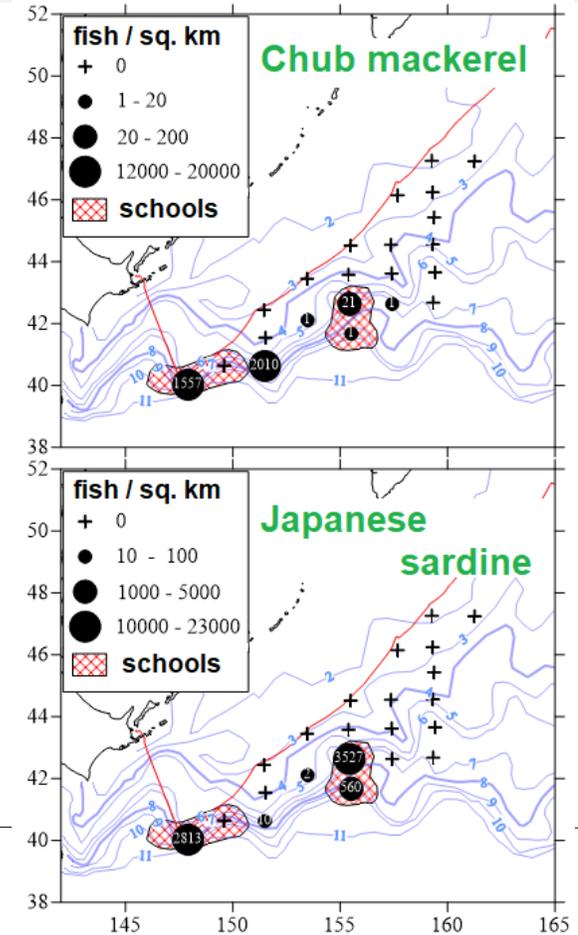
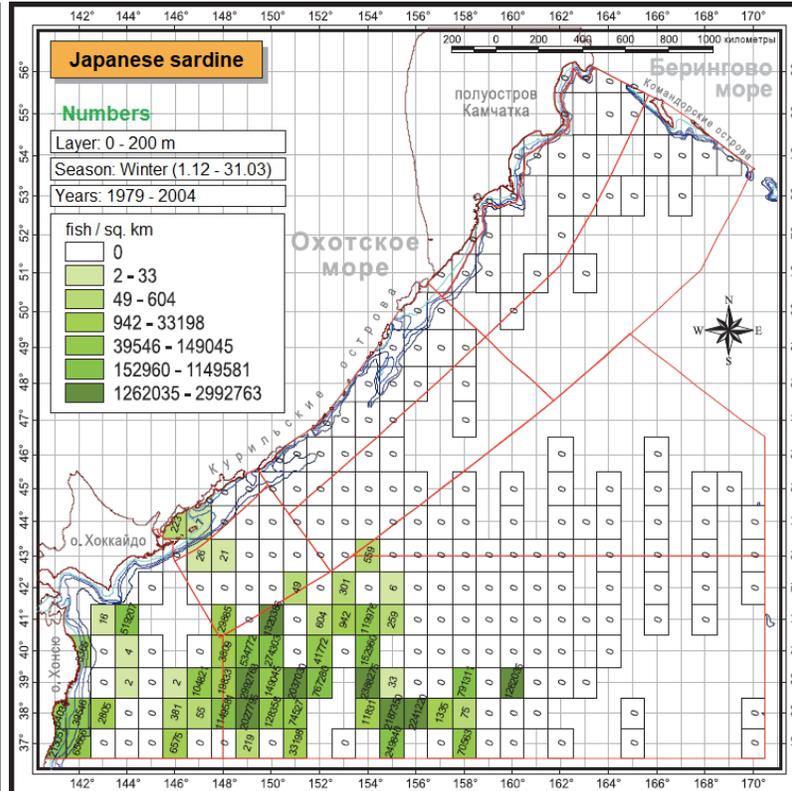
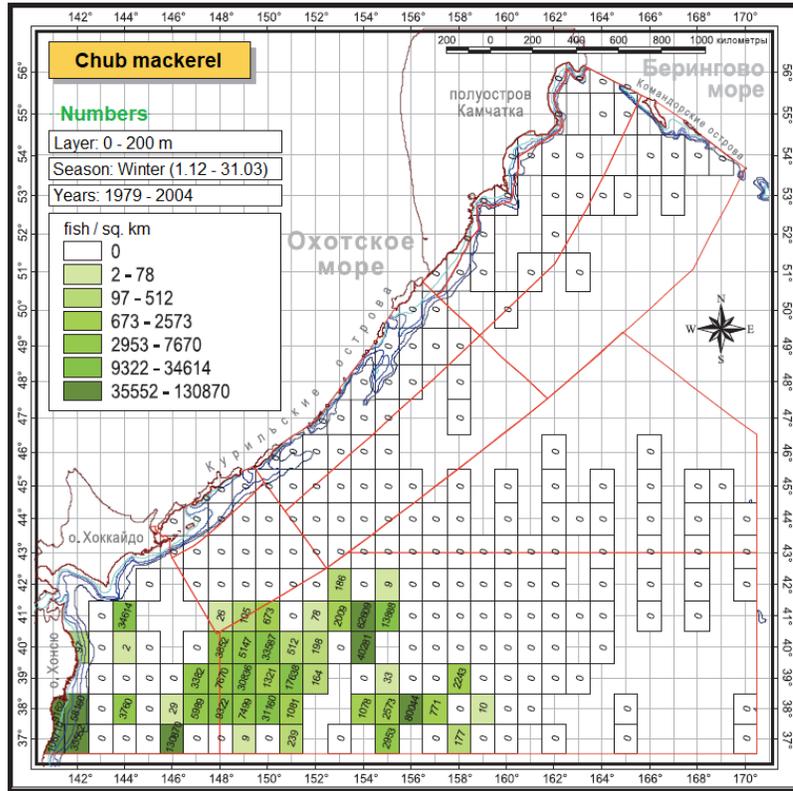
- We are currently in the process of convening groups of experts in the following areas of study
 - Physical oceanography
 - Chemical oceanography
 - Biological oceanography
 - Acoustics
 - Modelling
 - Salmon feeding ecology and energetics
 - Salmon distribution, abundance, and migration
 - Salmon genomics and stock ID
 - Microplastics



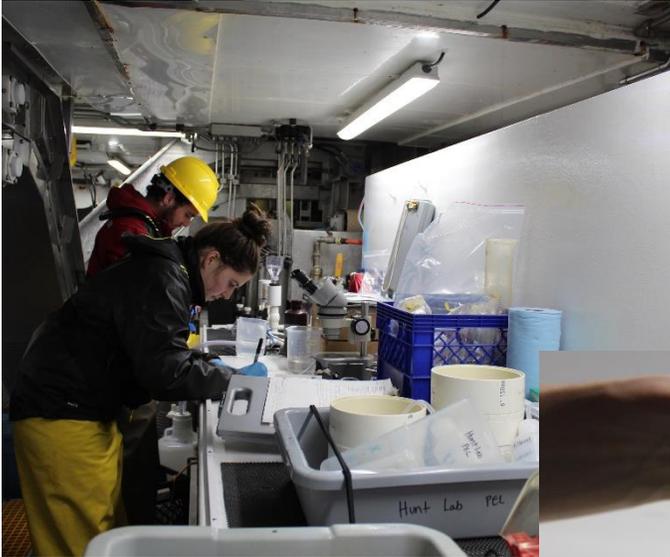
POTENTIAL NPFC INTEREST TO PARTICIPATE

1979 - 2004

2019



NEW FRONTIERS



The 2022 Expedition is an opportunity to test multiple emerging technologies:

- Salmon stock IDs
- eDNA
- Autonomous Vehicles & Remote Sensing
- Genomic assessment of health

SUPPORTING YOUNG SCIENTISTS



OUTCOMES



- A collaborative interdisciplinary approach by intergovernmental organizations to monitoring and understanding the mechanisms affecting salmon and the surrounding species
- Standardized and integrated baseline data are available to all interested parties
- A nimble enforcement and fisheries management system informed by timely science that addresses changing conditions in the open ocean and coastal systems
- New technologies, methods, ideas, and approaches are more rapidly and efficiently developed and applied to gaps in our understanding

NPFC-NPAFC & THE DECADE OF OCEAN SCIENCE: BASIS FOR COLLABORATION ON THE HIGH SEAS EXPEDITION 2022



NPFC/NPAFC Shared Mandate

- Ensure long-term conservation and sustainable use of fisheries within the NPO
- Protecting the marine ecosystems of the NPO

DECADE OF OCEAN SCIENCE

- Predicted ocean – sustainable observing system and improved understanding and forecasts
- Healthy and resilient ocean
- Sustainably harvested and productive ocean
- Partnerships
- Transparent and accessible (data/knowledge) ocean
- Capacity Development and Technology Transfer
- Engaging and inspiring ocean

NEXT STEPS IN NPFC & NPAFC COLLABORATION

- Please consider providing resources for the charter of a vessel for Zones 2&3. Contribution of \$250 CAD will increase available funding for chartered vessel up to one million.
- Engagement of NPFC scientists in expedition planning
- Consider joint NPAFC/NPFC/PICES/ICES proposal for the UN Decade of Ocean Science

