



Réseau de recherche
en aquaculture du Canada

Canada's Research Network
in Aquaculture



AquaNet

The Role of Aquaculture in Meeting Global Seafood Demand

Addressing Challenges ...a Science-based Approach

Dr. R. Scott McKinley



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Outline

- Overview of NCE and AquaNet
- Research Approach
- Examples of Research
- Future Challenges
- Moving Forward



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Overview

- NCE



- mobilise research talent
- develop the economy
- improve quality of life

- AquaNet - Canada's Networks of Centres of Excellence (NCE) in aquaculture.
- Established in 1999 as a collaborative research network



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Overview

Mission

- to foster a sustainable aquaculture sector in Canada through high quality research and education

Vision

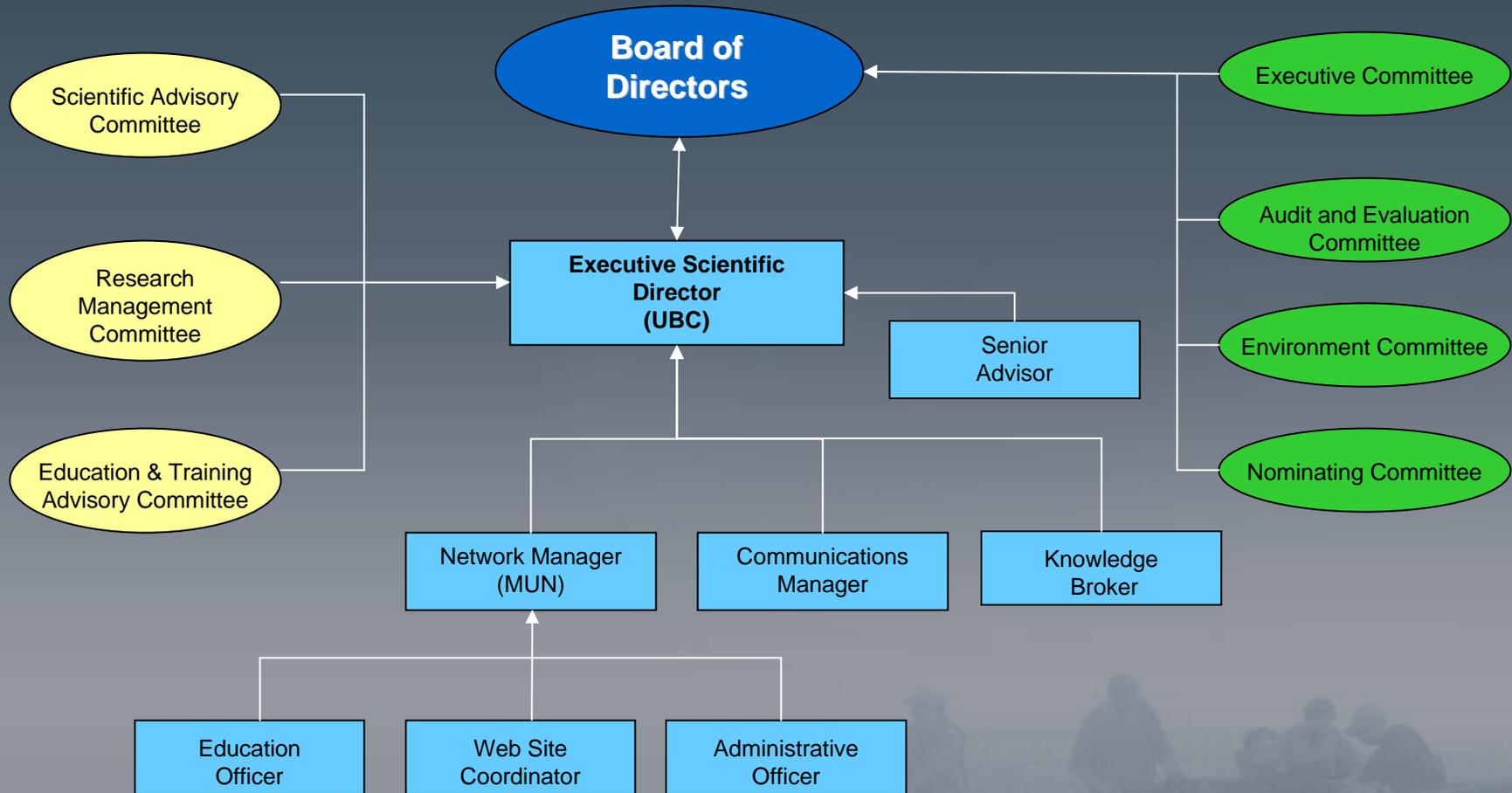
- To help achieve the long term viability and sustainability of the aquaculture sector by significantly contributing to:
 - Diversification
 - Harmonisation
 - Integration



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AquaNet Organisation Chart



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Overview

- Five Operating Principles:
 - Research
 - Highly Qualified Personnel
 - Networking and Partnerships
 - Knowledge and Technology Exchange and Exploitation
 - Management



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Research Approach

- Stakeholder Consultations
- Identification of Priority Issues
- Science Forums
- RFP and the Peer-Review Process
- Progress Reports and Review
- Effective Transfer of Knowledge and Technology



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Stakeholder Consultations

- Consult with various stakeholders across country to identify priority issues / challenges for the sector (2002 and 2004)
 - Industry
 - Governments (federal, provincial, local)
 - Community Groups (e.g., First Nations)
 - Academia
 - NGOs
 - Consumers



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Priority Research Areas (2004)

5 Themes:

- Enabling Communities
- Healthy Ecosystems
- New Tools for Policy / Decision-making
- Species Diversification
- Creative Productive Development and Market Acceptance



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Addressing Aquaculture Challenges ... a Scientific Approach

Science Forums

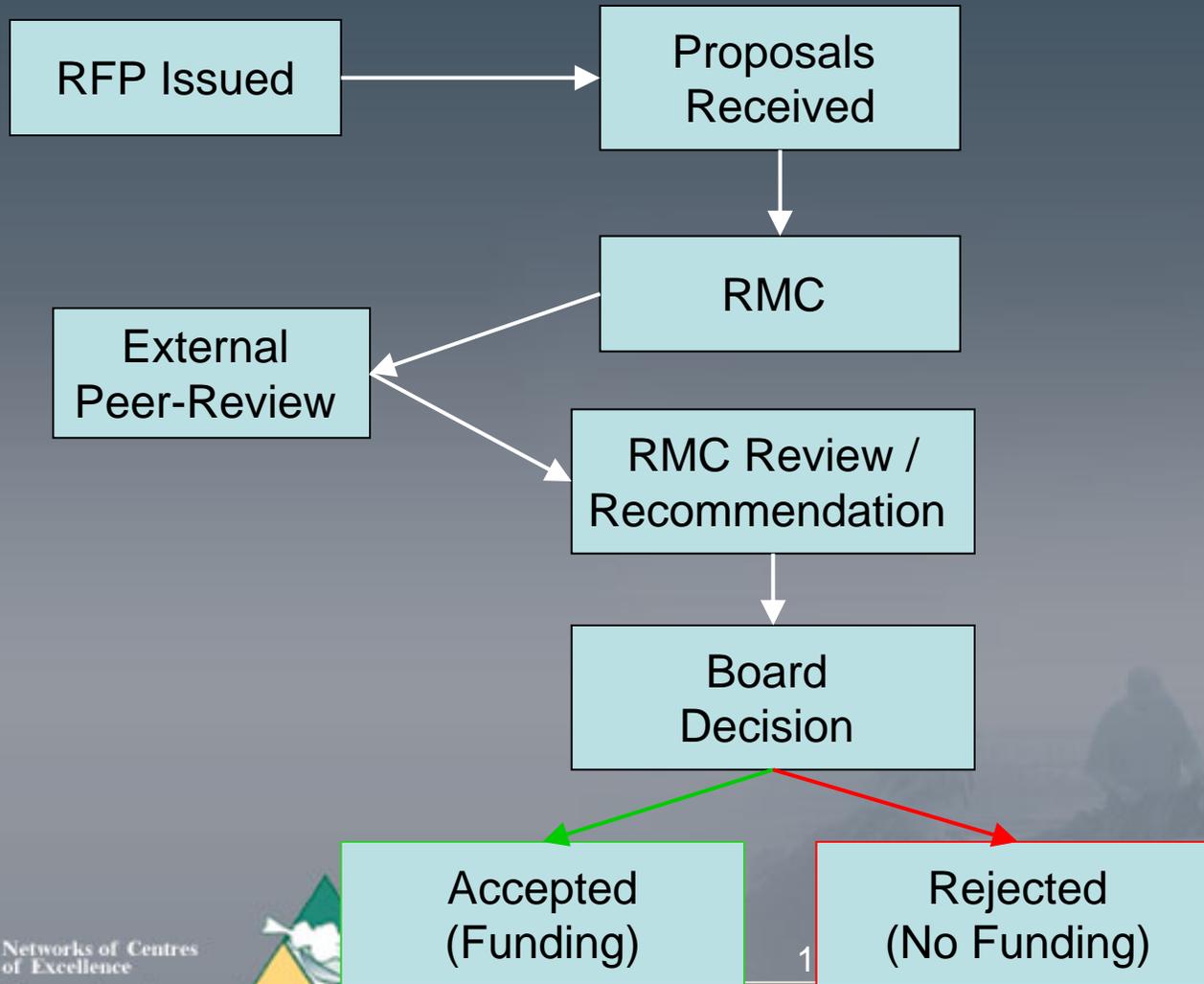
- International experts on issue of concern
- Identify accurate and relevant knowledge gaps
- Design question(s) to address knowledge gaps
- Prepare RFP



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RFP and Peer Review



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Addressing Aquaculture Challenges ... a Scientific Approach

Progress Reports

- AquaNet projects are required to submit annual progress report
- Reviewed by RMC for progress and meeting criteria for continued funding

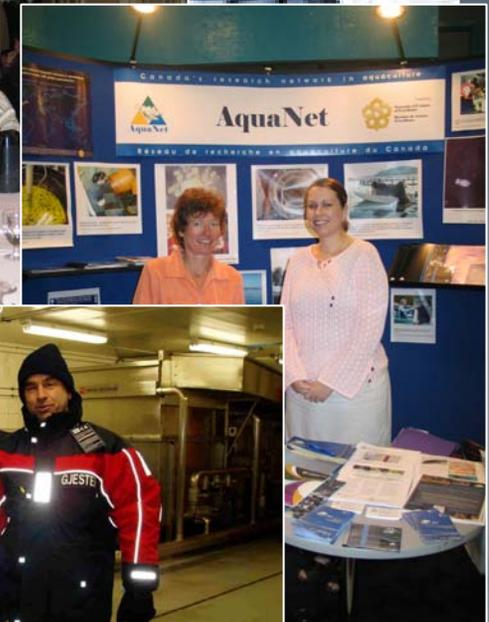


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Information Dissemination

- 627 research articles
- 34 workshops
- 9 Science Forums
- Public outreach
- Aquatic Animal Health Research Advisory Team
- Promoted through network of partners



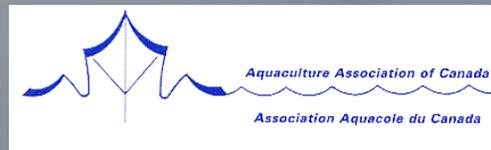
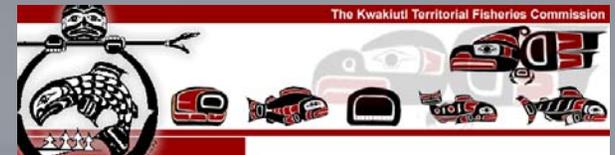
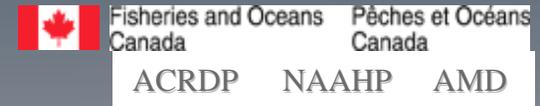
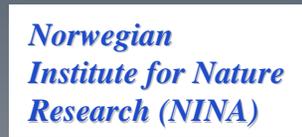
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Addressing Aquaculture Challenges ... a Scientific Approach

Expanding Network of Partners



Research

- Fish Health
- Bioproducts
- Organisms
- Nutrition –
- Shellfish –
- Public Perception
- IMTA – salmon



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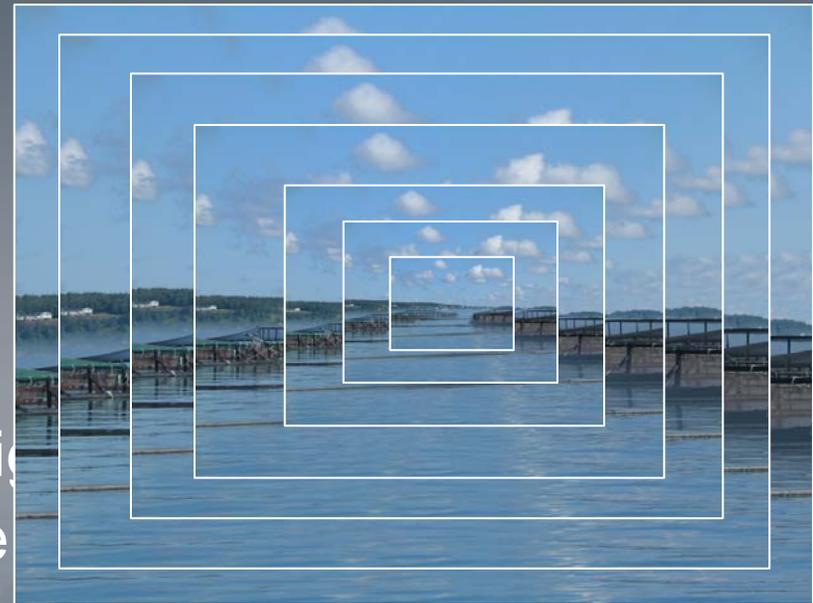
Opportunities / Challenges

- Opportunities

- Growth of aquaculture ~ 12% annual

- Challenges

- Consumer confidence
- Product diversification
- Alternate uses
- Investor confidence
- Market and business intelligence
- Integration of capture fisheries and aquaculture



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AquaNet – Moving Forward

- Collaborative, highly relevant research
- National and international partnerships
- Honest broker - aquaculture science, social effects, and policy options
- Train and retain highly qualified personnel
- Increase knowledge and technology transfer and commercialisation
- Improve communications among all stakeholders



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AquaNet – Moving Forward

- Four underlying principles:
 - Go International
 - Enhance Technology Transfer
 - Take Risks
 - Support the Humanities and Social Sciences



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AquaNet – Moving Forward

- Key Outcomes:
 - Consumer confidence
 - A diverse sector
 - Investor confidence
 - Integration with other users
 - Training and education
 - A self-sustaining research network



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AquaNet – Moving Forward

Together these outcomes deliver our vision:

**Competitive sustainability
for the aquaculture sector**



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Sea Lice Research

- Risk and Consequences of Infestation from Salmon Lice (2000-2003)



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Sea Lice Research

- Risk and Consequences of Infestation from Salmon Lice (2000-2003)
- Sea Lice Resistance to Chemotherapeutants: Diagnosis, Mechanisms, Dynamics and Control (2001-2003 and 2003-2006)



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Scientific Approach

Sea Lice Research

- Risk and Management of Sea Lice Infestation from Salmon L
- Sea Lice Diagnosis and Control (2003-2006)
- Development of a Risk Factor Model to Estimate the Impact of Sea Lice Infestation from Fish Farms on Native Species (2003-2006)



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Flesh Quality Research

- to assess the flesh quality of BC sources of farmed and wild salmon with respect to:
 - concentrations of ...



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Flesh Quality Research

- Major findings - contaminant concentrations:
 - 3 categories of PCB concentrations
 - 25-37 ppb - farmed Atlantics
 - ~10-16 ppb - farmed and wild chinook (and one source of wild coho)
 - ~2-7 ppb - wild sockeye, chum and pinks (and one source of wild coho)

NOTE: Food Safety Standard = 2000 ppb
(HC and US FDA)

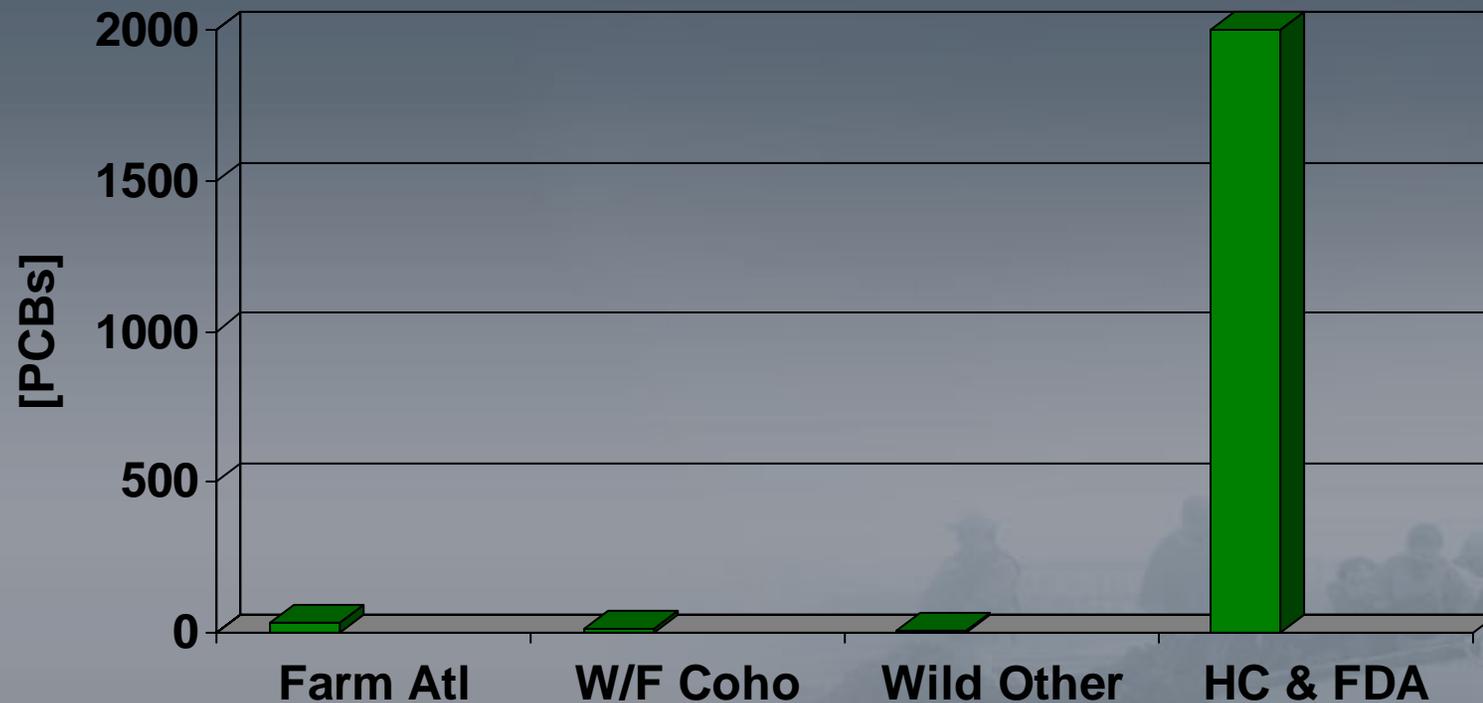


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Flesh Quality Research

- Major findings - contaminant concentrations:



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Flesh Quality Research

- Major findings - contaminant concentrations:
 - Concentrations in Atlantic salmon flesh were influenced by the source of the fish
 - Generally large range of PCBs in wild versus culture
 - Farmed and wild Chinook did not differ in their mean flesh concentrations of PCBs
 - Removal of skin from Atlantic salmon fillets reduced fat content (and concomitantly the concentration of PCBs) by 20%



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Flesh Quality Research

- Major findings - fatty acid concentrations:
 - Flesh concentrations (mg/100g portion) of EPA and DHA were
 - farmed Atlantic salmon (mean = 2317),
 - farmed coho (mean = 1172)
 - farmed chinook (mean = 890),
 - wild sockeye (mean = 872),
 - wild chinook and pink (mean = 812),
 - wild coho (mean = 721),
 - wild chum (mean = 385).

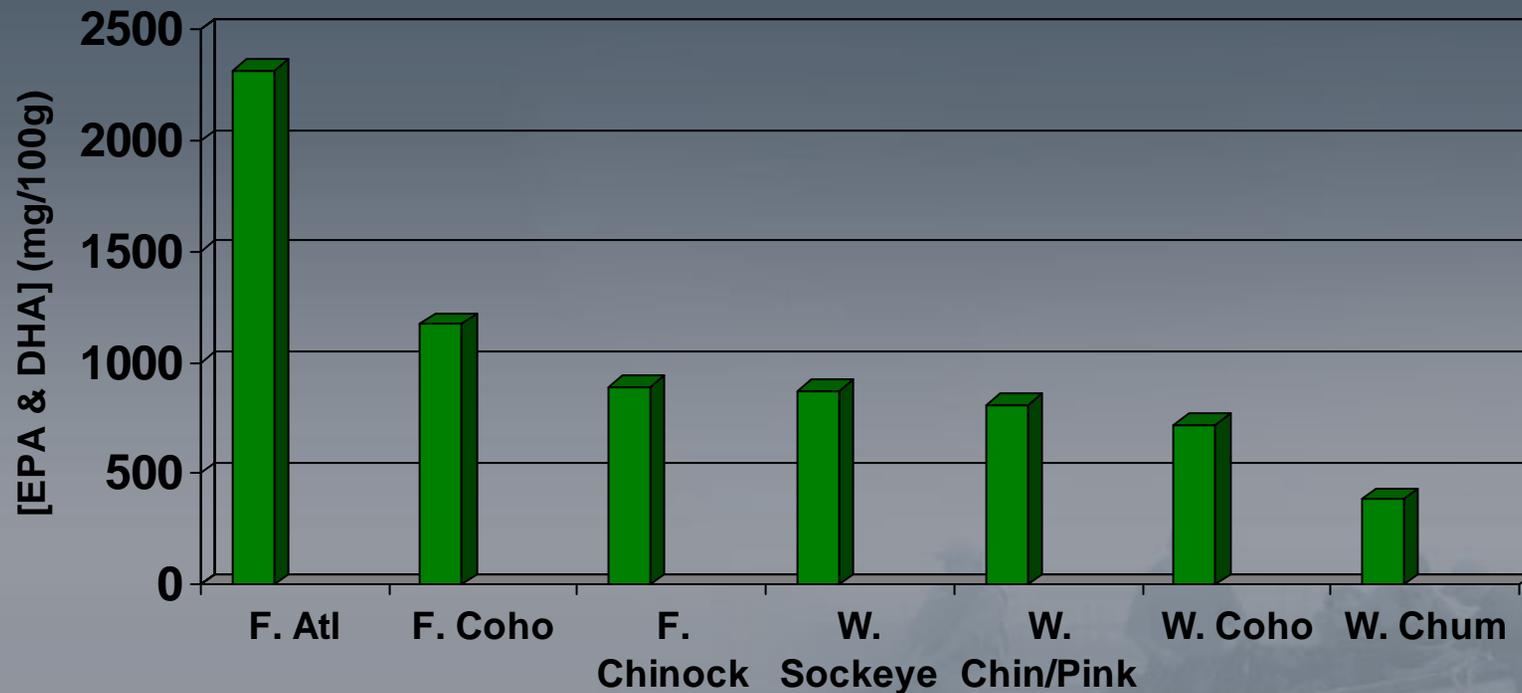


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Flesh Quality Research

- Major findings - fatty acid concentrations:



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Flesh Quality Research

- Next steps:
 - Publication and effective communication of results
 - Subsequent study to reduce organohalogen contaminants in farmed Atlantic salmon flesh to levels seen in wild chum and pink salmon (~2 ppb)



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