

# SALMON IN A RAPIDLY CHANGING WORLD

*Synthesis of the International Year of the Salmon  
and a Roadmap to 2030*



*Program Booklet*





# International Year of the Salmon (IYS) Synthesis Symposium

## Draft Program

### Salmon in a Rapidly Changing World: Synthesis of the International Year of the Salmon and a Roadmap to 2030

4 to 6 October 2022

Westin Bayshore, Vancouver, Canada

Time	October 4 – Day 1	
9:00am-10:30am	Welcome and Opening Addresses	
10:30am-11:00am	Coffee break	
11:00am-11:30am	<p><b>'Human Dimensions' theme session</b>  <b>'Managing Salmon Fisheries with Indigenous Knowledge and Western Science' sub-theme</b>            'Managing Salmon Fisheries with Indigenous Knowledge and Western Science' <b>Synthesis Presentation</b> – Camilla Bratland et al. (1)</p> <p>Session Chair: Livia Goodbrand</p>	
11:30am-12:00pm	<p><b>'Status of Salmon' theme session</b>  <b>'The Status of Salmon across the Northern Hemisphere' sub-theme</b>            'Status of Salmon' <b>Synthesis Presentation</b> – Jonathan Gillson &amp; Nora Hanson (Atlantic) &amp; Andrew Munro et al. (Pacific) (2)</p> <p>Session Chair: Livia Goodbrand</p>	
12:00pm-1:30pm	Lunch break	
1:30pm-2:30pm	<p><b>'Status of Salmon' theme session</b>  <b>'Changing climate, changing status: Understanding shifts in salmon distribution, productivity and abundance under climate change' sub-theme</b></p> <ul style="list-style-type: none"> <li>1:30 pm-2:00 pm: 'Changing Distributions' <b>Synthesis Presentation</b> – Philip McGinnity et al. (Atlantic) &amp; Joe Langan et al. (Pacific) (3)</li> <li>2:00 pm-2:15 pm: 'Embedding Atlantic salmon stock assessment within a Bayesian life cycle modeling framework: a route for an ecosystem-based management for this species' – Etienne Rivot et al. (4)</li> <li>2:15 pm-2:30 pm: 'Chum salmon in the Canadian Arctic tell a story of resilience amidst change' – Karen M. Dunmall et al. (5)</li> </ul> <p>Session Chair: Emma Hatfield</p>	<p><b>'Human Dimensions' theme session</b>  <b>'Managing Salmon Fisheries with Indigenous Knowledge and Western Science' sub-theme</b></p> <ul style="list-style-type: none"> <li>1:30 pm-1:45 pm: 'Our River, Our People, Our Fish: The Kuskokwim River Inter-Tribal Fish Commission as a Model for Indigenous Salmon Stewardship &amp; Management' – Jonathan Samuelson and Terese Schomogyi (6)</li> <li>1:45 pm-2:00 pm: 'Management of Atlantic Salmon – From Indigenous Communities Perspective' – George Russell et al. (7)</li> <li>2:00 pm-2:15 pm: 'SALCUL Project' – Camilla Bratland et al. (8)</li> <li>2:15 pm-2:30 pm: 'Indigenizing Salmon Science &amp; Management: What can we learn from Yup'ik and Athabascan Perspectives and Experiences?' – Janessa Esquible (9)</li> </ul> <p>Session Chair: Livia Goodbrand</p>
2:30pm-3:00pm	Coffee break	
3:00pm-4:00pm	<p><b>'Status of Salmon' theme session</b>  <b>'Changing climate, changing status: Understanding shifts in salmon distribution, productivity and abundance under climate change' sub-theme</b></p> <ul style="list-style-type: none"> <li>3:00 pm-3:15 pm: 'Ocean Basin to Watershed Modeling of the North Pacific Provides a New Basis for Modeling Climate Change Impacts on Salmon' – Charles Seaton et al. (10)</li> <li>3:15 pm-3:30 pm: 'Status and trend of production of Japanese chum salmon under the warming climate' – Masahide Kaeriyama (11)</li> <li>3:30 pm-3:45pm: 'Adapting Pacific salmon management systems to an increasingly warm and crowded ocean' – Brendan Connors et al. (12)</li> </ul> <p><b>'Human Dimensions' theme session</b>  <b>'Managing Salmon Fisheries in a Rapidly Changing Salmosphere: The Future of Management' sub-theme</b></p> <ul style="list-style-type: none"> <li>3:45 pm-4:00 pm: 'Survival and fitness of Pacific salmon released from fisheries capture: a growing concern as stocks decline and climates change' – Scott G. Hinch et al. (13)</li> </ul>	<p><b>'Human Dimensions' theme session</b>  <b>'Managing Salmon Fisheries in a Rapidly Changing Salmosphere: The Future of Management' sub-theme</b></p> <ul style="list-style-type: none"> <li>3:00 pm-3:30 pm: 'Managing Salmon Fisheries in a Rapidly Changing Salmosphere: The Future of Management' – <b>Synthesis Plenary Discussion</b> to be led by a Facilitator (14)</li> <li>3:30 pm-3:45 pm: 'Reconciling Atlantic Salmon Fisheries Harvest Reference Points to Conservation-Based Limit Reference Points Under Non-Stationarity Productivity Conditions' – Guillaume Dauphin et al. (15)</li> <li>3:45 pm-4:00 pm: 'Assessing and Managing Biodiversity of Pacific salmon: Methods for setting Limit Reference Points' – Carrie Holt et al. (16)</li> </ul>

	Session Chair: Emma Hatfield	Session Chair: Aidan Schubert
4:00pm-4:30pm	Break	
4:30pm-5:30pm	Synthesis and Discussion Session	Synthesis and Discussion Session
5:30pm-5:45pm	Break	
5:45pm-7:30pm	Poster Board Session in the Westin Bayshore Ballroom Foyer	

Time	October 5 – Day 2	
9:00am-9:30am	Presentations on Day 1 Synthesis Outcomes	
9:30am-10:30am	<p><b>'Status of Salmon' theme session</b>  <b>'Changing climate, changing status: Understanding shifts in salmon distribution, productivity and abundance under climate change' sub-theme</b></p> <ul style="list-style-type: none"> <li>9:30 am-10:00 am: 'Status of Pink salmon' <b>Synthesis Presentation</b> – Dennis Ensing et al. (17)</li> </ul> <p><b>'Salmon in a Changing Salmosphere' theme session</b>  <b>'Back to the Future: Advances in Understanding the Value of Fresh and Brackish Water Habitats, their Future with Climate Change, and the Efficacy of Habitat Restoration' sub-theme</b></p> <ul style="list-style-type: none"> <li>10:00 am-10:30 am: 'Advances in Understanding the Value of Fresh and Brackish Water Habitats, their Future with Climate Change, and the Efficacy of Habitat Restoration' <b>Synthesis Presentation</b> – Jonathan Moore et al. (18)</li> </ul> <p>Session Chair: Shigehiko Urawa</p>	<p><b>'Human Dimensions' theme session</b>  <b>'Communication of, and Community Engagement in, Salmon Research and Management' sub-theme</b></p> <ul style="list-style-type: none"> <li>9:30 am-10:00 am: 'Communication of, and Community Engagement in, Salmon Research and Management' <b>Synthesis Plenary Discussion</b> to be led by a Facilitator (19)</li> <li>10:00 am-10:15 am: 'Saving the North Atlantic Salmon: The Six Rivers Project' – Peter S. William (20)</li> <li>10:15 am-10:30 am: 'Renovating the regulation of the exploitation of Atlantic salmon by the angling fishery in Brittany (France)' – Etienne Prévost et al. (21)</li> </ul> <p>Session Chair: Ed Farley</p>
10:30am-11:00am	Coffee break	
11:00am-12:00pm	<p><b>'Salmon in a Changing Salmosphere' theme session</b>  <b>'Back to the Future: Advances in Understanding the Value of Fresh and Brackish Water Habitats, their Future with Climate Change, and the Efficacy of Habitat Restoration' sub-theme</b></p> <ul style="list-style-type: none"> <li>11:00 am-11:15 am: 'Environmental and biological factors influencing residence duration of wild sub-yearling Chinook salmon in a fjord estuary of the Salish Sea using micro-acoustic transmitters' – Stephanie Lingard et al. (22)</li> <li>11:15 am-11:30 am: 'Spawning life stage as a critical period for Yukon River Chinook salmon in a changing climate' – Kathrine G. Howard and Vanessa von Biela (23)</li> <li>11:30 am-11:45 am: 'Conserving Salmon at the Southern End of their North American Range: Challenges and Opportunities' – Steve Lindley et al. (24)</li> <li>11:45 am-12:00 pm: 'Juvenile salmon use of habitat mosaics across a gradient of estuarine degradation' – Julian C.L. Gan and Jonathan W. Moore (25)</li> </ul> <p>Session Chair: Shigehiko Urawa</p>	<p><b>'Human Dimensions' theme session</b>  <b>'Managing Salmon Fisheries in a Rapidly Changing Salmosphere: The Future of Management' sub-theme</b></p> <ul style="list-style-type: none"> <li>11:00 am-11:15 am: 'Perspectives on Pacific salmon expanding across the western Canadian Arctic' – Jody Illisiak et al. (26)</li> </ul> <p><b>'Salmon in a Changing Salmosphere' theme session</b>  <b>'Examining the Likely Suspects: Developments in a Holistic Understanding of Salmon Marine and Freshwater Survival' sub-theme</b></p> <ul style="list-style-type: none"> <li>11:15 am-11:45 am: 'Examining the Likely Suspects: Developments in a Holistic Understanding of Salmon Marine and Freshwater Survival' <b>Synthesis Presentation</b> – Wilf Luedke et al. (27)</li> <li>11:45 am-12:00 pm: 'The Likely Suspects Framework for Atlantic salmon: cooperatively building the foundations for a life-cycle approach to guide future management' – Colin Bull et al. (28)</li> </ul> <p>Session Chair: Ed Farley</p>
12:00pm-1:30pm	Lunch	
1:30pm-2:00pm	<p><b>'Salmon in a Changing Salmosphere' theme session</b>  <b>'Hatching Plans: The Future of Fisheries Enhancement Programs' sub-theme</b>  Hatching Plans: The Future of Fisheries Enhancement Programs' <b>Synthesis Presentation</b> – Hannah Harrison et al. (29)</p> <p>Session Chair: Livia Goodbrand</p>	

<b>2:00pm-2:30pm</b>	<b>'Salmon in a Changing Salmosphere' theme session</b> <b>'Hatching Plans: The Future of Fisheries Enhancement Programs' sub-theme</b> <ul style="list-style-type: none"> <li><b>2:00 pm-2:15 pm:</b> 'Supplementation using 0+ parr in the East Machias River. Performance of naturalized parr provides significant positive results in contrast to stocking using various other life stages and methods' – Dwayne Shaw et al. (30)</li> <li><b>2:15 pm-2:30 pm:</b> 'Alaska Hatchery Research Program: A comprehensive approach to investigating hatchery/wild interactions' – William D. Templin and Chris Habicht (31)</li> </ul> <p style="text-align: right;"><i>Session Chair: Aidan Schubert</i></p>	<b>'Salmon in a Changing Salmosphere' theme session</b> <b>'Examining the Likely Suspects: Developments in a Holistic Understanding of Salmon Marine and Freshwater Survival' sub-theme</b> <ul style="list-style-type: none"> <li><b>2:00 pm-2:15 pm:</b> 'The Risk Assessment Method for Salmon (RAMS)' – Wilf Luedke and Isobel Pearsall (32)</li> <li><b>2:15 pm-2:30 pm:</b> 'A synthesis of farmed to wild genetic introgression and the consequences for wild Atlantic salmon' – Sten Karlsson et al. (34)</li> </ul> <p style="text-align: right;"><i>Session Chair: Vladimir Radchenko</i></p>
<b>2:30pm-3:00pm</b>	<b>Coffee break</b>	
<b>3:00pm-4:15pm</b>	<b>'Salmon in a Changing Salmosphere' theme session</b> <b>'Back to the Future: Advances in Understanding the Value of Fresh and Brackish Water Habitats, their Future with Climate Change, and the Efficacy of Habitat Restoration' sub-theme</b> <ul style="list-style-type: none"> <li><b>3:00 pm-3:15 pm:</b> 'Fundy Salmon Recovery: An Innovative Collaboration Turning the Tide in Wild Atlantic Salmon Restoration' – Kurt M. Samways et al. (35)</li> <li><b>3:15 pm-3:30 pm:</b> 'Warming rivers in the Atlantic coast: Is this the end of Atlantic salmon (<i>Salmo salar</i>)?' – Tommi Linnansaari et al. (36)</li> </ul> <b>'Opening the Black Box: Advances in Understanding the Marine Phase of the Salmon Lifecycle' sub-theme</b> <ul style="list-style-type: none"> <li><b>3:30 pm-4:15 pm:</b> 'Opening the Black Box: Advances in Understanding the Marine Phase of the Salmon Lifecycle' <b>Synthesis Presentation</b> – Laurie Weitkamp et al. (37)</li> </ul> <p style="text-align: right;"><i>Session Chair: Aidan Schubert</i></p>	<b>'New Frontiers' theme session</b> <b>'Tiny Clues, Big Insights: The Use of Genomics in Salmon and Ecosystem Research' sub-theme</b> <ul style="list-style-type: none"> <li><b>3:00 pm-3:30 pm:</b> 'Tiny Clues, Big Insights: The Use of Genomics in Salmon and Ecosystem Research' <b>Synthesis Plenary Discussion</b> to be led by a Facilitator – Christoph M. Deeg et al. (38)</li> <li><b>3:30 pm-3:45 pm:</b> 'Entering the next dimension: Combining continuous eDNA, hydroacoustic, and oceanographic sampling to deciphering open ocean ecosystem structure' – Christoph M. Deeg et al. (39)</li> <li><b>3:45 pm-4:00 pm:</b> 'Investigations Into The Emergence Of Widespread Thiamine Deficiency in California Salmon' – Nate Mantua et al. (40)</li> <li><b>4:00 pm-4:15 pm:</b> 'Integrating 'omics approaches for a deeper understanding of Atlantic salmon life history variation' – Jukka-Pekka Verta et al. (41)</li> </ul> <p style="text-align: right;"><i>Session Chair: Vladimir Radchenko</i></p>
<b>4:15pm-4:30pm</b>	<b>Break</b>	
<b>4:30pm-5:30pm</b>	<b>Synthesis and Discussion Session</b>	<b>Synthesis and Discussion Session</b>
<b>5:30pm-6:00pm</b>	<b>Break</b>	
<b>6:45pm-9:45pm</b>	<b>Harbour cruise reception and dinner event – Ship boarding closes at 6:45 pm</b>	

<b>Time</b>	<b>October 6 – Day 3</b>	
<b>9:00am-9:30am</b>	<b>Presentations on Day 2 Synthesis Outcomes</b>	
<b>9:30am-10:00am</b>	<b>'Salmon in a Changing Salmosphere' theme session</b> <b>'Opening the Black Box: Advances in Understanding the Marine Phase of the Salmon Lifecycle' sub-theme</b> <ul style="list-style-type: none"> <li><b>9:30 am-9:45 am:</b> 'Illuminating the black box of North Pacific salmon food webs: identifying trophic pathways and interspecific competition through an ecosystem approach' – Genyffer C. Troina et al. (42)</li> <li><b>9:45 am-10:00 am:</b> 'Towards a better understanding of the winter energetic status and fitness of Pacific salmon in the Gulf of Alaska: Results from the 2019 IYS expedition' – Charles D. Waters et al. (43)</li> </ul> <p style="text-align: right;"><i>Session Chair: Emma Hatfield</i></p>	<b>'New Frontiers' theme session</b> <b>'Tiny Clues, Big Insights: The Use of Genomics in Salmon and Ecosystem Research' sub-theme</b> <ul style="list-style-type: none"> <li><b>9:30 am-9:45 am:</b> 'Exploring the winter salmosphere in the open ocean with genomic tools' – Christoph M. Deeg et al. (44)</li> <li><b>9:45 am-10:00 am:</b> 'Supplementary stocking selects for domesticated genotypes' – Ingerid Hagen and Sten Karlson (33)</li> </ul> <p style="text-align: right;"><i>Session Chair: Livia Goodbrand</i></p>
<b>10:00am-10:30am</b>	<b>'Information Systems' theme session</b> <b>'Towards a data-powered future: Progress and future requirements for data (mobilization) across the salmosphere' sub- theme</b> <b>'Improving Data Mobilization within the Salmosphere' Synthesis Presentation</b> – Scott Akenhead et al. (45) <p style="text-align: right;"><i>Session Chair: Emma Hatfield</i></p>	
<b>10:30am-11:00am</b>	<b>Coffee Break</b>	

11:15am-12:00pm	<p><b><u>'Salmon in a Changing Salmosphere' theme session</u></b>  <b><u>'Opening the Black Box: Advances in Understanding the Marine Phase of the Salmon Lifecycle' sub-theme</u></b></p> <ul style="list-style-type: none"> <li>11:00 am-11:15 am: 'Spawning migration strategies of Chum salmon (<i>Oncorhynchus keta</i>) with marine environment change in the coastal water of Korea' – Beom-sik Kim et al. (46)</li> <li>11:15 am-11:30 am: 'Status of Pacific salmon stocks in the summer Bering Sea based on long monitoring survey by Japanese research cruises in 2007-2021' – Shunpei Sato et al. (47)</li> <li>11:30 am-11:45 am: 'A trans-range "weight of evidence" model for Atlantic Salmon post-smolt oceanic migration and distribution: a first step toward addressing data scarcity' – Eric Verspoor et al. (48)</li> <li>11:45 am-12:00 pm: 'Environmental drivers of the early marine migration of Atlantic salmon (<i>Salmo salar</i>)' – Jessie Lilly et al. (49)</li> </ul> <p><i>Session Chair: Shigehiko Urawa</i></p>	<p><b><u>'Information Systems' theme session</u></b>  <b><u>'Towards a data-powered future: Progress and future requirements for data (mobilization) across the salmosphere' sub- theme</u></b></p> <ul style="list-style-type: none"> <li>11:00 am-11:15 am: 'The Atlantic Salmon Research Joint Venture: Opportunities and challenges of a collaborative community response to answering Atlantic salmon's big questions' – Edmund Halfyard et al. (50)</li> <li>11:15 am-11:30 am: 'The International Year of the Salmon Ocean Observing System' – Tim C. A. van der Stap and Brett Johnson (51)</li> </ul> <p><b><u>'New Frontiers' theme session</u></b>  <b><u>'Are Uncrewed Vessels the Key for Practicable Monitoring of Salmon and their Ecosystems?'</u></b> sub-theme</p> <ul style="list-style-type: none"> <li>11:30 am-12:00 pm: 'Are Uncrewed Vessels the Key for Practicable Monitoring of Salmon and their Ecosystems?' <b>Synthesis Presentation</b> – John Horne et al. (52)</li> </ul> <p><i>Session Chair: Ed Farley</i></p>
12:00pm-1:30pm	<b>Lunch</b>	
1:30 pm-2:30pm	<p><b><u>'Salmon in a Changing Salmosphere' theme session</u></b>  <b><u>'Opening the Black Box: Advances in Understanding the Marine Phase of the Salmon Lifecycle' sub-theme</u></b></p> <ul style="list-style-type: none"> <li>1:30 pm-1:45 pm: 'Life on the high seas: new insights into the marine distributions of Pacific salmon' – Joseph A. Langan et al. (53)</li> <li>1:45 pm-2:00 pm: 'Unraveling the demographic response of Atlantic salmon to a rapidly changing marine environment by the analysis of their scales' – Marie Nevoux et al. (54)</li> <li>2:00 pm-2:15 pm: 'Consequences of variation in body size, condition, physiological state, and in-river conditions for spawning migration success by Alaskan salmon: a three-year telemetry study of Copper River sockeye' – Pete Rand et al. (55)</li> <li>2:15 pm-2:30 pm: 'Understanding What Drives Marine Energy Accumulation in Chinook Salmon, <i>Oncorhynchus tshawytscha</i>' – Jacob E. Lerner et al. (56)</li> </ul> <p><i>Session Chair: Aidan Schubert</i></p>	<p><b><u>'Salmon in a Changing Salmosphere' theme session</u></b>  <b><u>'Opening the Black Box: Advances in Understanding the Marine Phase of the Salmon Lifecycle' sub-theme</u></b></p> <ul style="list-style-type: none"> <li>1:30 pm-1:45 pm: 'A multi-scale view of the ocean environment along a 3,000 km post-smolt migration corridor' – Emma Tyldesley et al. (57)</li> </ul> <p><b><u>'New Frontiers' theme session</u></b>  <b><u>'Tracking the Epic Journeys of Salmon: Advancements in Telemetry and Microchemistry' sub-theme</u></b></p> <ul style="list-style-type: none"> <li>1:45 pm-2:15 pm: 'Tracking the Epic Journeys of Salmon: Advancements in Telemetry and Microchemistry' <b>Synthesis Presentation</b> – Fred Whoriskey et al. (58)</li> <li>2:15 pm-2:30 pm: 'Assessing residence duration in sub-yearling Chinook Salmon in a fjord estuary using micro (V3) acoustic transmitters' – Stephanie Lingard et al. (59)</li> </ul> <p><i>Session Chair: Vladimir Radchenko</i></p>
2:30pm-3:00pm	<b>Coffee Break</b>	
3:00pm-3:15pm	<p><b><u>'New Frontiers' theme session</u></b>  'Basin Events to Coastal Impacts (BECI): An Ocean Intelligence System for Salmon and People' – Robert Day et al. (60)</p> <p><i>Session Chair: Ed Farley</i></p>	
3:15pm-3:45pm	<b>Synthesis and Discussion Session</b>	<b>Synthesis and Discussion Session</b>
3:45pm-4:15pm	<b>Break</b>	
4:15pm-5:15pm	<b>Completing the Roadmap to 2030</b>	
5:15pm-5:30pm	<b>Closing remarks</b>	