

# Ruth Joy

ASSISTANT PROFESSOR · GRADUATE PROGRAM CHAIR OF ECOLOGICAL RESTORATION

School of Environmental Science, Simon Fraser University, 8888 University Drive, Burnaby, BC, Canada, V5A 1S6

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## Education

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### Simon Fraser University

Burnaby, BC

#### PHD STATISTICS

2010 - 2013

- Advisor: Dr. Richard Routledge  
PhD Thesis: Methodology for analysing at-sea dive behaviour of a marine mammal

### Simon Fraser University

Burnaby, BC

#### MSc STATISTICS

2000 - 2002

- Advisor: Dr. Richard Routledge  
MSc Thesis: Assessing infilling methods for missing data in spawning salmon estimates

### University of Victoria

Victoria, BC

#### BSc BIOLOGY (Co-OP)

1991 - 1996

## Professional Experience

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- 2023+ **Assistant Professor, Ecological Restoration Program Chair**, School of Environmental Science, SFU
- 2021-2023 **Assistant Professor Practitioner**, School of Environmental Science, SFU
- 2022-2027 **Adjunct Professor**, Faculty of Graduate Studies (Computer Science), Dalhousie University
- 2020-2025 **Adjunct Professor**, Department of Statistics and Actuarial Science, SFU
- 2014-2020 **Senior Marine Mammal Consultant**, SMRU Consulting, St Andrews University, Scotland
- 2010-2013 **PhD Student**, Department of Statistics and Actuarial Science, SFU
- 2002-2010 **Biostatistician**, Institute for the Oceans and Fisheries, University of British Columbia
- 2000-2002 **MSc Student**, Department of Statistics and Actuarial Science, Simon Fraser University
- 1996-2000 **Biologist**, Ministry of Environment, Nanaimo Regional Office

## Research Experience

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### University of St Andrews University, SMRU Consulting Ltd.

Vancouver, BC

POSITION: SENIOR RESEARCH SCIENTIST

2014 - 2020

### University of British Columbia, Institute for the Oceans and Fisheries

Vancouver, BC

POSITION: BIostatistician

2002 - 2005; 2008 - 2010

### University of British Columbia, Centre for Excellence in HIV/AIDS

Vancouver, BC

POSITION: BIostatistician

2005 - 2008

## Academic Awards

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- 2024 **Dean of Graduate Studies Awards for Excellence in Graduate Student Supervision**, SFU
- 2024 **Dean's Award of Excellence in Graduate Student Mentorship**, Faculty of Environment, SFU
- 2022 **Dean's Award of Excellence in Research**, Faculty of Environment, SFU

## Grants & Scholarships

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### \$5 MILLION IN RESEARCH GRANTS AWARDED TO **RUTH JOY**, STUDENTS AND POSTDOCS

2024-2026	<b>Liber Ero Postdoc</b> , Awarded to Peter Thompson, Liber Ero Fellowship Program	\$170,000
2024	<b>MITACS GlobalLink</b> , Awarded to <b>Andrea Mendez-Bye</b> , MITACS Student Mobility	\$6,000
2023-2024	<b>Saturna Island - Analysis of Conservation Measures</b> , Transport Canada	\$90,400
2023-2024	<b>Oil Spill Response, Conservation and Protection</b> , Fisheries and Oceans Canada	\$51,750
2023-2025	<b>MITACS</b> , Awarded to MSc student A. Houweling, JASCO Applied Sciences	\$95,000
2022-2026	<b>Canada Nature Fund</b> , Fisheries and Oceans Canada	\$ 1.5 million
2022-2026	<b>France Canada Research Fund and PhD Student Grant</b> , French Embassy and Ministry of Higher Education, Research and Innovation	\$ 112,000
2022-2024	<b>NSERC MITACS Alliance Grant</b> , Government of Canada, Vancouver Fraser Port Authority	\$ 70,000
2022-2023	<b>Environment and Climate Change Canada</b> , Canadian Wildlife Service	\$36,209
2022	<b>MITACS</b> , Awarded to MSc student, J. Cormier, City of Port Moody	\$15,000
2022-2023	<b>Ocean and Freshwater Science Contribution Grant</b> , Fisheries and Oceans Canada	\$ 70,000
2021-2026	<b>NSERC Discovery Grant</b> , with Discovery Launch Supplement	\$ 152,500
2021-2024	<b>NSERC DND Grant Supplement</b> , Department of National Defence	\$ 120,000
2021	<b>Habitat Conservation Trust Fund</b> , BC Ministry of Environment and Climate Change	\$ 52,000
2021	<b>MITACS</b> , MSc student K. Baril, Saturna Island Marine Research and Education Society	\$ 15,000
2021	<b>MITACS</b> , MSc student A. Gheibi, Port of Vancouver ECHO Program	\$ 15,000
2021	<b>MITACS</b> , MSc students M. Bouvier & V. Rani, CETUS Research and Conservation Society	\$ 30,000
2020-2022	<b>Ocean and Freshwater Science Contribution Grant</b> , Fisheries and Oceans Canada	\$ 970,000
2020	<b>Canadian Wildlife Service Equipment Grant</b> , Environment and Climate Change Canada	\$ 35,000
2019-2022	<b>Ocean and Freshwater Science Contribution Grant</b> , Fisheries and Oceans Canada	\$ 1.1 million
2019-2020	<b>MITACS</b> , SMRU Consulting and the Port of Vancouver	\$ 60,000
2017-2020	<b>Habitat Conservation Trust Foundation</b> , Public Assistance Fund	\$ 7,000
2016-2019	<b>National Geographic Society Waitt Grant</b> , Waitt Foundation	\$ 15,000
2014-2016	<b>Elevate Post-doctorate Fellowship</b> , MITACS	\$ 120,000
2006-2009	<b>Canadian Institute of Health Research Grant (R111)</b> , Health Canada	\$ 143,550

### ACADEMIC SCHOLARSHIPS

2010-2013	<b>Hakai Network Research Scholarship</b> , Tula Foundation
2010-2012	<b>Canadian Graduate Scholarship (PhD)</b> , NSERC
2010-2012	<b>Provost Award of Distinction</b> , Simon Fraser University
2000-2002	<b>Canadian Graduate Scholarship (MSc)</b> , NSERC
2000	<b>Graduate Entrance Scholarship</b> , Simon Fraser University
1995-1996	<b>Rhododendron Society Scholarship</b> , Undergraduate Award, UVic
1994-1995	<b>John Trelnawney Scholarship</b> , Undergraduate Award, UVic

## Graduate Student Supervision

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### POSTDOCTORAL FELLOWS

2024 +	<b>Kait Palmer</b> , School of Environmental Science	SFU
2024 +	<b>Peter Thompson</b> , School of Environmental Science	SFU
2023 +	<b>Bruno Padovese</b> , School of Environmental Science	SFU
2020 - 2023	<b>Paul Nguyen Hong Duc</b> , Co-supervised, School of Math and Statistics	Carleton U
2019 - 2022	<b>Marine Randon</b> , Department of Statistics	SFU

### GRADUATE STUDENTS

2024 +	<b>Teng-Wei Lin</b> , PhD Statistics	SFU
2023 +	<b>Andrea Mendez-Bye</b> , PhD Ecology, Cosupervised	SFU
2023 +	<b>April Houweling</b> , MSc Statistics	SFU
2023 +	<b>Lindsay Lalach</b> , MSc Biological Sciences, Co-supervised	SFU
2021 +	<b>Fábio Frazao</b> , PhD Computer Science, Cosupervised	Dalhousie U
2022-2024	<b>Janine McNeilly</b> , MSc Ecological Restoration	SFU
2022-2024	<b>Sam Broadley</b> , MSc Ecological Restoration	SFU
2022-2024	<b>Mikayla Young</b> , MSc Ecological Restoration	SFU
2022-2024	<b>Rachel Fairfield Checko</b> , MSc Ecological Restoration	SFU
2021-2023	<b>Teng-Wei Lin</b> , MSc Statistics	SFU
2021-2023	<b>Joseph Cormier</b> , MSc Ecological Restoration	SFU
2021-2023	<b>Olivia Murphy</b> , MSc Ecological Restoration	SFU
2021-2023	<b>Rachel Stapleton</b> , MSc Ecological Restoration	SFU
2020-2022	<b>Kaitlin Baril</b> , MSc Ecological Restoration	SFU
2020-2022	<b>Madie Bouvier</b> , MSc Ecological Restoration	SFU
2020-2022	<b>Azadeh Gheibi</b> , MSc Ecological Restoration	SFU
2020-2022	<b>Varsha Rani</b> , MSc Ecological Restoration	SFU
2020-2022	<b>Rosalin Wilkin</b> , MSc Ecological Restoration	SFU
2019-2021	<b>Kathleen Meszaros</b> , MSc Ecological Restoration	SFU
2019-2021	<b>Macus Ong</b> , MSc Ecological Restoration	SFU
2019-2021	<b>Lucy Quayle</b> , MSc Ecological Restoration	SFU
2018-2020	<b>Okezi Akporuno</b> , MSc Ecological Restoration	SFU
2018-2020	<b>Madeleine Edmonds</b> , MSc Ecological Restoration	SFU
2018-2020	<b>Alex Harris</b> , MSc Ecological Restoration	SFU

### RESEARCH ASSISTANTS

2024	<b>Dhanvi Desai</b> , Ugrad Research Assistant, Data Science	SFU
2024	<b>Leah Egery-Haley</b> , Ugrad Research Assistant, School of Environmental Science	SFU
2023-2024	<b>Olivia Murphy</b> , Grad Research Assistant, School of Environmental Science	SFU
2023	<b>Jessiquence Tang</b> , Ugrad Research Assistant, School of Environmental Science	SFU
2023	<b>Claudia Cristescu</b> , Ugrad Research Assistant, School of Environmental Science	SFU
2023	<b>Lauren McKay</b> , Ugrad Research Assistant, School of Environmental Science	SFU
2022-2024	<b>Lauren Laturus</b> , Ugrad Research Assistant, School of Environmental Science	SFU
2021-2022	<b>Laurence Cojocar</b> , Ugrad Co-op Student, Department of Statistics	SFU
2021	<b>Lucy Quayle</b> , Grad Research Assistant, School of Environmental Science	SFU
2020-2021	<b>Macus Ong</b> , Grad Research Assistant, School of Environmental Science	SFU
2020, 2021	<b>Hoky Hsu</b> , Ugrad Summer Student, School of Environmental Science	SFU
2020-2021	<b>Emma Cummings</b> , Grad Research Assistant, School of Environmental Science	SFU

## Graduate Student & Postdoc Awards

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2024	<b>Janine McNeilly</b> , Excellence in Graduate Research and Engagement	<i>SFU</i>
2024-2026	<b>Peter Thompson</b> , Liber Ero Postdoctoral Fellowship	<i>SFU</i>
2023	<b>Janine McNeilly</b> , Graduate Research Award in Environmental Science	<i>SFU</i>
2023	<b>Samantha Broadley</b> , Graduate Research Award in Environmental Science	<i>SFU</i>
2023	<b>Fabio Frazao</b> , Ocean Networks Canada Roy, Hyndman Ocean Observing Award	<i>ONC</i>
2022-2023	<b>Rachel Stapleton</b> , Faculty of Environment Excellence in Graduate Research Award	<i>SFU</i>
2022	<b>Rachel Stapleton</b> , Rudy North Academic Bursary	<i>BCIT</i>
2021	<b>Marine Randon</b> , Best poster award at SFU Postdoc Research Day	<i>SFU</i>
2021	<b>Marine Randon</b> , Runner-up writing award at SFU Postdoc Research Day	<i>SFU</i>
2020	<b>Joe Watson</b> , Student presentation award, International Statistical Ecology Conference	<i>ISEC</i>
2020	<b>Macus Ong</b> , Runner-up photography award in BBC Photo Magazine, November 2020	<i>BBC</i>

## Service

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### SERVICE TO THE DEPARTMENT, UNIVERSITY AND LOCAL COMMUNITY

2021-2025	<b>Ecological Restoration Graduate Program, School of Environmental Science</b> , Chair
2021-2025	<b>Coastal Marine Science and Management Ugrad Curriculum Committee</b> , Chair
2023-2025	<b>Undergraduate Committee Curriculum, School of Environmental Science</b> , Member
2023-2025	<b>Justice, Equity, Diversity and Inclusivity Committee</b> , Member
2022-2025	<b>Frontiers in Marine Science, Marine Conservation and Sustainability</b> , Editorial Board
2022-2023	<b>BC NoiseTracker Technical Committee</b> , Member
2020-2023	<b>International Biometric Society, Western North American Region (WNAR)</b> , Board Member
2021-2026	<b>Pacific WildLife Foundation</b> , Associate Member
2023-2025	<b>Equity, Diversity and Inclusivity Committee</b> , Committee Member
1999-2023	<b>Breeding Bird Surveys/Breeding Bird Atlas</b> , Volunteer with Bird Studies Canada
1990-2022	<b>Christmas Bird Counts</b> , Volunteer with National Audubon Society
2007-2017	<b>Bat inventory for the Whistler Bioblitz</b> , Volunteer with Whistler Naturalists
2006-2017	<b>Public event: 'Wings on their Fingers'</b> , Volunteer with Meadowlark Nature Festival

### CURRICULUM DEVELOPMENT

2021-2022	<b>Marine and Coastal Science and Management Program</b> , Curriculum development for cross-disciplinary undergraduate degree
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## Professional Development

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### PROFESSIONAL MEMBERSHIPS

Society of Marine Mammology

Pacific Seabird Group

International Biometric Society (WNAR)

The Association of Professional Biologists of B.C. (Registered Professional Biologist since 1999)

## Teaching Experience

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### GRADUATE COURSES

- 2018-2023 **EVSC 645: Environmental Data Analysis**, Instructor
- 2023 **INTE 7000: Acoustic Data Analysis**, Interdisciplinary Directed Studies Course
- 2019-2022 **ECO 611: Concepts of Restoration and the Biological Environment**, Instructor
- 2019 **ECO 600: Rewilding agricultural ecosystems**, Directed Studies Course

### UNDERGRADUATE COURSES

- 2021 - 2022 **EVSC 445: Environmental Data Analysis**, Instructor
- 2013 **Stat 380: Stochastic Processes**, Teaching Assistant
- 2012 **Stat 450: Statistical Theory**, Teaching Assistant
- 2012 **Biol/Stat 650/403: Statistics for Resource Managers and Biologists**, Teaching Assistant
- 2001 **Stat 201: Statistics for the Life Sciences**, Teaching Assistant
- 2000 **EVSC 200: Environmental Sciences**, Teaching Assistant

### WORKSHOPS

- 2019 **Research Methods and Design Workshop, MER Program**, Instructor
- 2008 **Linear Models Workshop, Fisheries Centre**, Instructor
- 2006 **Power Analysis Workshop, iCapture Centre, UBC**, Instructor

### INVITED LECTURER

- 2021-2022 **EVSC 201: Environmental Science in Practise, SFU**, Invited Lecture
- 2020 **EVSC 400: Environmental Science Capstone, SFU**, Invited Lecture
- 2006 **HCEP 504: Application of Epidemiological Methods, UBC**, Invited Lecture
- 2006 **HCEP 400: Statistics for Health Research, UBC**, Invited Lecture
- 2001 **EVSC 401: Current Topics in Environmental Science**, Invited Lecture

### FIELD COURSES

- 2001 **EVSC 491: Advanced Field Studies in Environmental Science**, Course Designer

## Publications

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<sup>+</sup> mentored student/postdoc; \* My last name changed to Joy from van den Driessche

### PEER-REVIEWED PUBLICATIONS (40)

- Clarke, C.M.K., V. Rani<sup>+</sup>, E. Stredulinsky, S. Toews, M. Bouvier<sup>+</sup>, D. Smyth, **R. Joy**, S.J. Thornton. 2024. Assessing the efficacy of ecological reserves: killer whale beach rubbing behaviour and vessel disturbance. *Endangered Species Research*.
- Ryder, M., C. Booth, C. Oedekoven, T. Marques, **R. Joy**, and D. Harris. 2023. Passive acoustic monitoring power analysis: A tool for designing an acoustic monitoring program. In: Popper, A.N., Sisneros, J., Hawkins, A.D., Thomsen, F. (eds) *The Effects of Noise on Aquatic Life*. Springer, Cham.
- Randon<sup>+</sup>, M., M. Dowd, and **R. Joy**. 2022. A real-time data assimilative forecasting system for animal tracking. *Ecology*. pe3718.
- Joy, R.**, R. S. Schick, M. Dowd, T. Margolina, J. E. Joseph and L. Thomas. 2022. A fine-scale marine mammal movement model for assessing long-term aggregate noise exposure. *Ecological Modelling*. 493:109798.
- Watson, J., **R. Joy**, D. J. Tollit, S. J. Thornton, and M. Auger-Méthé. 2021. Estimating animal utilization distributions from multiple data types: A joint spatiotemporal point process framework. *Annals of Applied Statistics*. 15(4): 1872-1896.
- Williams, R., E. Ashe, L. Yruretagoyena, N. Mastica, M. Siple, J. Wood, **R. Joy**, R. Langrock, S. Mews, E. V. Finne. 2021. Reducing vessel noise benefits foraging in endangered killer whales. *Marine Pollution Bulletin*. 173:00-00.
- De Groot, K. L., A. N. Porter, A. R. Norris, A. C. Huang, and **R. Joy**. 2021. Seasonal patterns of bird-window collisions at a Pacific coast site and high vulnerability of the Varied Thrush (*Ixoreus naevius*) in winter. *Ornithological Applications*. 123(3): 1-15.
- Trounce, K., O. Robinson, A. MacGillivray, D. Hannay, J. Wood, D.J. Tollit, and **R. Joy**. 2020. The effects of vessel slowdowns on foraging habitat of the southern resident killer whales. *Proceedings of the Meetings on Acoustics (POMA)*. vol. 37, no. 1, p. 070009.
- Millikin, R., **R. Joy**, J. Komaromi, M. Harrison, P. Krannitz, N. Mahony, M. Vander Haegen. 2020. Critical habitat identification of peripheral Sage Thrashers under climate change. *Conservation Science and Practice*. 2(12), p.e290.
- Wilson, L.J., J. Harwood, C.G. Booth, **R. Joy**, and C.M. Harris. 2020. A decision framework to identify populations that are most vulnerable to the population level effects of disturbance. *Conservation Science and Practice*. 2(2), p.e149.
- Joy, R.**, D.J. Tollit, J. Wood, A. MacGillivray, Z. Li, K.Trounce and Orla Robinson. 2019. Benefits of vessel slowdowns on endangered southern resident killer whales. *Frontiers of Marine Science*, 6: 344-363.
- Tollit, D.J., **R. Joy**, J. Wood, A. Redden, C. Booth, T. Boucher, P. Porskamp and M. Oldreive. 2019. Effects of tidal turbine installation and operations on harbor porpoise in Minas Passage, Bay of Fundy. *The Journal of Ocean Technology*, 14: 22-48.
- Joy, R.**, J. Wood, C Sparling, D. J. Tollit, A. Copping, and B. McConnell. 2018. Harbor seal behavior and avoidance of an operational tidal turbine. *Marine Pollution Bulletin*, 136: 92-106.
- Malinka, C., D. Gillespie, J. MacAulay, **R. Joy**, and C. Sparling. 2018. First in-situ passive acoustic monitoring for marine mammals during operation of a tidal turbine. *Marine Ecology Progress Series*. 590: 247-266.
- Tollit, D.J., L. Fritz, **R. Joy**, K. Miller, A. Schulze, J. Thomason, W. Walker, T. Zeppelin, and T.S. Gelatt. 2017. Diet of endangered Steller sea lions in the Aleutian Islands: New insights from DNA detections and bio-energetic reconstructions. *Canadian Journal of Zoology*, 95(11): 853-868.
- Ainsworth, L.M., C.B. Dean, and **R. Joy**. 2016. Zero-inflated spatial models: application and interpretation. *International Symposium in Statistics 2015. Proceedings Volume on Advances and Challenges in Parametric and Non-parametric Analysis of Correlated Data*. Springer New York, NY. 75 - 96 pp.
- Joy, R.**, M.G. Dowd, B.C. Battaile, P.M. Lestenkof, J.T. Sterling, A.W. Trites, and R.D. Routledge. 2015. Linking northern fur seal dive behavior to environmental variables in the eastern Bering Sea. *Ecosphere*. 6 (5): 75. DOI 10.1890/ES14-00314.1
- Savo, V., **R. Joy**, G. Caneva, and W.C. McClatchey. 2015. Plant selection for ethnobotanical uses on the Amalfi Coast (Southern Italy). *Journal of Ethnobiology and Ethnomedicine*. 11(1): 58. DOI: 10.1186/s13002-015-0039-y.
- Muir, J.E., **R. Joy**, Y. Bychkov, K. Bröker, G. Gailey, V. Vladimirov, S. Starodymov and G. Gailey. 2015. Delineation of a coastal gray whale feeding area using opportunistic and systematic survey effort. *Endangered Species Research*. 29(2): 147-160.

- Muir, J.E., L. Ainsworth, **R. Joy**, R. Racca, Y. Bychkov, G. Gailey, V. Vladimirov, S. Starodymov, and K. Bröker. 2015. Distance from shore of gray whales during a seismic survey off Sakhalin Island, Russia. *Endangered Species Research*. 29(2), pp.161-178. DOI: 10.3354/esr00701
- Chatwin, T.A., **R. Joy**, and A.E. Burger. 2013. Set-back distances to protect nesting and roosting seabirds off Vancouver Island from boat disturbance. *Waterbirds*. 36 (1): 42–51.
- Fahlman, A., S.H. Loring, M. Ferrigno, C. Moore, G. Early, M. Niemeyer, B. Lentell, F. Wenzel, **R. Joy**, and M. Moore. 2011. Inflation and deflation pressure-volume loops in breath-hold diving marine mammals. *Journal of Experimental Biology*. 214: 3822-3828.
- Dowd, M., and **R. Joy**. 2011. Estimating behavioural parameters in animal movement models using a state-augmented particle filter. *Ecology*. 92: 568–575.
- Svärd C., A. Fahlman, D.A.S. Rosen, **R. Joy**, and A.W. Trites. 2009. Fasting affects the surface and diving metabolic rates of Steller sea lions (*Eumetopias jubatus*). *Aquatic Biology*. 8: (71-82).
- Joy, R.**, and J. Muir. 2009. Hybrid spatial approach for the estimation of a perimeter monitoring line in Report of the small specialist workshop to determine the perimeter monitoring line, IUCN Headquarters, Gland, Switzerland. 23-26 October 2009.
- Joy, R.**, E.F. Druyts, E.K. Brandson, V.D. Lima, C.A. Rustad, W. Zhang, E. Wood, J.S.G. Montaner, and R.S. Hogg. 2008. Impact of Neighborhood-Level Socioeconomic Status on HIV Disease Progression in a Universal Health Care Setting. *Journal of AIDS*. 47 (4): 500-505.
- Joy, R.**, D.J. Tollit, J. Laake and A.W. Trites. Using Feeding Trials and Computer Simulations to assess error and bias in scat analysis. 2006. In A.W. Trites, S. Atkinson, D.P. DeMaster, L.W. Fritz, T.S. Gelatt, L.D. Rea and K. Wynne (eds), *Sea Lions of the World*. Alaska Sea Grant College Program, University of Alaska, Fairbanks. pp. 205-222.
- Tollit, D.J., S.G. Heaslip, B.E. Deagle, S.J. Iverson, **R. Joy**, D.A. Rosen, and A.W. Trites. Estimating diet composition in sea lions: which technique to choose. 2006. In A.W. Trites, S. Atkinson, D.P. DeMaster, L.W. Fritz, T.S. Gelatt, L.D. Rea and K. Wynne (eds), *Sea Lions of the World*. Alaska Sea Grant College Program, University of Alaska, Fairbanks. pp. 293-307.
- Harris M., **R. Joy**, G. Larsen, M. Valyi, E. Walker, LW Frick, R.M. Palmatier, S.A. Wring, and J.S. Montaner. 2006. Enfuvirtide plasma levels and injection site reactions using a needle-free gas-powered injection system (Biojector). *AIDS*. 20(5):719-723.
- Palepu, A., M.W. Tyndall, **R. Joy**, T. Kerr, E. Wood, N. Press, R.S. Hogg, and J.S. Montaner. 2006. Antiretroviral adherence and HIV treatment outcomes among HIV/HCV co-infected injection drug users: the role of methadone maintenance therapy. *Drug and Alcohol Dependence*. 84(2):188-194.
- Moore, D., R. Copes, R. Fisk, **R. Joy**, K.Chan, and M. Brauer. 2005. Population health effects of air quality changes due to forest fires in British Columbia in 2003: Estimates from physician-visit billing data. *Canadian Journal of Public Health*. 97(2):105-8.
- Trites, A.W., and **R. Joy**. 2005. Dietary analysis from fecal samples: How many scats are enough? *Journal of Mammology*. 86(44), 704-712.
- Tollit, D.J., S.G. Heaslip, T.K. Zeppelin, **R. Joy**, K.A. Call, and A.W. Trites. 2004. A method to improve size estimates of walleye pollock and Atka mackerel consumed by pinnipeds using digestion correction factors applied to bones and otoliths recovered in scats. *Fishery Bulletin*, 102(3) 498-508.
- von Dadelszen, P., S. Kives, M.F. Delisle, R.D. Wilson, **R. Joy**, L. Ainsworth, L.A. Kharusi, M. Oskamp, J.F.R. Barrett, G. Ryan, D. Farine, and P.G.R. Seaward. 2003. Evaluation of predictors of latency, clinical chorioamnionitis, postpartum fever and neonatal infection in twin pregnancies complicated by preterm prelabor rupture of membranes. *Twin Research*. 6(4): 257-262.
- Buchanan, S., J. Fraser, T. Farrell, P. Gallagher, **R. Joy**, and R. Routledge. 2002. Reducing gillnet mortality of incidentally caught coho salmon. *North American Journal of Fisheries Management*. 22: 1270-1275.
- Hay, D.E., P.B. McCarter, **R. Joy**, M. Thompson, and K. West. 2001. Fraser River Eulachon Biomass Assessments and Spawning Distribution: 1995-2002. Canadian Science Advisory Secretariat Research Document – 2002/117. 58pp.
- van den Driessche, R.\***, M. Mather, and T.A. Chatwin. 2001. Habitat Selection by bats in temperate old-growth forests, Clayoquot Sound, British Columbia. *Proceedings of the Species and Habitats at Risk Conference*. February 15-18, 1999. Ministry of Environment, Lands and Parks.

Chatwin, T.A., and **R. van den Driessche\***. 1996. Long-term effects of prescribed fire in a grassland ecosystem of central British Columbia. Proceedings of the 61st North American Wildlife and Natural Resources Conference, Tulsa, Oklahoma.

**van den Driessche, R.\***, S.D. McConnell and T.D. Hooper. 1994. First confirmed breeding record for Upland Sandpiper, *Bartramia longicauda*, in British Columbia. Canadian Field Naturalist. 108: 89-91.

McConnell, S.D., **R. van den Driessche\***, T.D. Hooper, A. Roberts and G. Roberts. 1993. First sight and breeding record of Sprague's Pipit, *Anthus spragueii*, in British Columbia. Canadian Field Naturalist. 107: 222-223.



## TECHNICAL & GOVERNMENT REPORTS (55)

- Murphy<sup>+</sup>, O., L. Laternus<sup>+</sup>, L. Egery-Haley<sup>+</sup>, D. Desai<sup>+</sup>, and **R. Joy**. 2024. How to effectively measure and enforce marine vessel noise disturbance for marine mammals: Underwater Noise Disturbance Literature Review. Technical report prepared by the School of Environmental Science, Simon Fraser University for the Fisheries and Oceans Canada, Conservation and Protection.
- Laternus<sup>+</sup>, O., M. Murphy<sup>+</sup>, L. Egery-Haley<sup>+</sup>, D. Desai<sup>+</sup>, and **R. Joy**. 2024. How to effectively measure and enforce marine vessel speed regulations for marine mammals: Vessel Speed Literature Review. Technical report prepared by the School of Environmental Science, Simon Fraser University for the Fisheries and Oceans Canada, Conservation and Protection.
- Young<sup>+</sup>, M., R. Fairfield Checko<sup>+</sup>, O. Murphy<sup>+</sup>, L. Laternus<sup>+</sup>, A. Gheibi<sup>+</sup>, K. Baril<sup>+</sup>, L. Quayle<sup>+</sup> and **R. Joy**. 2024. Boundary Pass 2023 Land-based Cetacean Observations: ECHO Program 2022 Slowdown Evaluation. Technical report prepared by the School of Environmental Science, Simon Fraser University for the Vancouver Fraser Port Authority.
- Laternus<sup>+</sup>, L., L. McKay<sup>+</sup>, C. Cristescu<sup>+</sup>, and **R. Joy**. 2024. How to effectively measure and enforce approach distances between marine mammals and vessels. Technical report prepared by the School of Environmental Science, Simon Fraser University for Fisheries and Oceans Canada, Conservation and Protection Program.
- Murphy<sup>+</sup>, O., R. Fairfield Checko<sup>+</sup>, M. Young<sup>+</sup>, L. Laternus<sup>+</sup>, T.-W. Lin<sup>+</sup>, B. Padovese<sup>+</sup> and **R. Joy**. 2023. Analysis of Southern Resident Killer Whale Management Measures Surrounding Saturna Island. Technical report prepared by the School of Environmental Science, Simon Fraser University for Whale Protection Policy – West Coast Branch, Transport Canada.
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## Conference & Workshop Presentations

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### INVITED TALKS (17)

<sup>+</sup> mentored student/postdoc; \* Last name changed to Joy from van den Driessche in 1999

- Murphy<sup>+</sup>, O., R. Fairfield Checko<sup>+</sup>, M. Young<sup>+</sup>, L. Laturus<sup>+</sup>, T.-W. Lin<sup>+</sup>, B. Padovese<sup>+</sup> and **R. Joy**. January 2024. Analysis of Southern Resident Killer Whale Management Measures Surrounding Saturna Island. Southern Resident Killer Whale Multi-Nation Tier II Meeting Hosted by Technical Whale Protection Policy – West Coast Branch, Transport Canada.
- Joy, R.** November 2023. *Orcas on the Move: Building an Operational Forecast System for SRKW Movement in the Salish Sea*. Department of Statistics Seminar Series, Simon Fraser University.
- Joy, R.** October 2023. *Eagle-eyed predators, Cormorant colonies and Balancing on bridges*. Pacific Wildlife Research Centre Seminar Series, Environment and Climate Change Canada.
- Joy, R.** September 2023. *Orcas on the Move: Building an Operational Forecast System for SRKW Movement in the Salish Sea*. School of Environmental Science Seminar Series, Simon Fraser University.
- Joy, R.** June 2023. *Forecasting Movement of Southern Resident Killer Whales in the Northeast Pacific*. Centre National de la Recherche Scientifique, Centre d'Études Biologiques de Chizé, Université de la Rochelle, France.
- Joy, R.** June 2023. *Forecasting Movement of Southern Resident Killer Whales in the Northeast Pacific*. École Nationale Supérieure de Techniques Avancées (ENSTA) Bretagne, France.
- Joy, R.** March 2023. *Orca Occupancy in the Salish Sea*. Vital Signs Workshop: Aligning Canada and US Metrics and Methods for Killer Whales of the Salish Sea.
- Joy, R.** February 2023. *Double-Crested Cormorants in the Salish Sea: Paradise Lost?* Les Ecologistes Seminar Series, Department of Biological Sciences, SFU.
- Joy, R.** November 2022. *Novel data inputs for forecasting movement of whales in the Salish Sea. Detecting and Monitoring Megafauna from Space: Exploring Opportunities for the Northeast Pacific*. Public Webinar, Ocean Decade Collaborative Center for the NE Pacific, Tula Foundation.
- Joy, R.**, S. Bergner, D. Campbell, M. Dowd, F. Frazao<sup>+</sup>, O. Kirsebom, P. Nguyen Hong Duc<sup>+</sup>, M. Randon<sup>+</sup>, A. Riera, S. Veirs, V. Veirs, J. Wladichuk<sup>+</sup> and H. Yurk. December 2021. *Integrating visual and acoustic observations to build an 'intelligent' killer whale movement forecast system*. The Acoustical Society of America.
- Joy, R.** August 2021. *Challenges in building a Real-Time Forecast System for Movement of Whales Near Coastal Shipping Lanes*. SFU Big Data Hub: Advances in Marine Data Sciences Event.
- Joy, R.** December 2019. *Statistics in Science and Policy: A case study of the Southern Resident Killer Whales*. Departmental Seminar, Department of Statistics and Actuarial Science, SFU.
- Joy, R.** November 2019. *Statistics in Science and Policy: A case study of the Southern Resident Killer Whales*. Departmental Seminar, Department of Mathematics and Statistics, University of Victoria.
- Joy, R.** November 2018. *Managing Noise Disturbance in Southern Resident Killer Whale Habitat in the Salish Sea*. Pacific Wildlife Research Centre Seminar Series at Canadian Wildlife Service, ECCC.
- Joy, R.**, M.G. Dowd, B.C. Battaile, P.M. Lestenkof, J.T. Sterling, A.W. Trites, and R.D. Routledge. June 2016. *At-sea behaviour of northern fur seals in the Bering Sea*. International Statistical Ecology Conference.
- Joy, R.**, M.G. Dowd, B.C. Battaile, P.M. Lestenkof, J.T. Sterling, A.W. Trites, and R.D. Routledge. May 2015. *Methodology for analyzing at-sea dive behaviour of northern fur seals in the Bering Sea*. Peter Wall International Research Roundtable.
- Joy, R.** November 2014. *Statistical Interactions of Science with the Community*. Science World. Coastal Connections.

### CONFERENCE CHAIR (1)

Adrean, L. and **R. Joy**. February 2022. *Session Moderator, West Coast Offshore Wind Panel*. Pacific Seabird Conference.

### HOST OF ACADEMIC WORKSHOPS (1)

**Joy, R.**, P. Nguyen Hong Duc<sup>+</sup>, F. Frazao<sup>+</sup>, and H. Yurk. A workshop in harnessing the power of underwater hydrophone data for detecting whales in an era of Forecast Models, Machine Learning, Cluster-based Computing, and Citizen Science Engagement. Simon Fraser University. August 2022

## CONTRIBUTED PRESENTATIONS (108)

- Padovese<sup>+</sup>, B., and **R. Joy**. An open-source deep learning model for Fin Whale classification. Journées des Jeunes Bioacousticiens. Brest, France. June 2024.
- Houweling<sup>+</sup>, A., and **R. Joy**. Investigating Southern Resident and Bigg's killer whale clicks to explore ecotype-specific detectors. Journées des Jeunes Bioacousticiens. Brest, France. June 2024.
- Padovese<sup>+</sup>, B., F. Frazao<sup>+</sup>, and R. Gehrman, O. Kirsebom, and **R. Joy**. From Stationary to Mobile listening platforms: Adapting deep learning models for North Atlantic right whale upcall detection. DCLDE Conference, Rotherdam, The Netherlands. June 2024.
- Frazao<sup>+</sup>, F., O.S. Kirsebom, B. Padovese<sup>+</sup>, **R. Joy**, and M. Dowd. An open-source deep learning model for North Atlantic right whale gunshot identification. DCLDE Conference, Rotherdam, The Netherlands. June 2024.
- Frazao<sup>+</sup>, F., O.S. Kirsebom, A. Houweling<sup>+</sup>, J. Wladichuk<sup>+</sup>, J. Kanés, **R. Joy**, and M. Dowd. Using a sequence deep learning model to increase the acoustic context of a killer whale detector. 186th Meeting of the Acoustical Society of America, Ottawa, Canada. May 2024.
- Broadley<sup>+</sup>, S. L. Lalach<sup>+</sup>, and **R. Joy**. Bridging Success: Pacific Seabird Conference, Seattle, Washington, February 2024.
- Broadley<sup>+</sup>, S. Bridging Success: Navigating the Recovery of the Double-Crested Cormorant in the Strait of Georgia Amid Urban and Ecological Challenges, IDEAS Symposium, SFU, February 2024.
- Fairfield-Checko<sup>+</sup>, R. Kelp Help! Do you see what I sea?. IDEAS Symposium, SFU, February 2024.
- McNeilly<sup>+</sup>, J. Sablefish are on the menu for Southern Resident Killer Whales, but at what cost? IDEAS Symposium, SFU, February 2024.
- Murphy<sup>+</sup>, O., R. Fairfield Checko<sup>+</sup>, M. Young<sup>+</sup>, L. Laturus<sup>+</sup>, T.-W. Lin<sup>+</sup>, B. Padovese<sup>+</sup> and **R. Joy**. Analysis of Southern Resident Killer Whale Management Measures Surrounding Saturna Island. SFU Bi-weekly seminar series on Bioacoustics, Cetaceans and Advanced Computing. February 2024.
- Fairfield Checko<sup>+</sup>, R. Multi-year marine mammal observations in and around the Saturna Island Interim Sanctuary Zone. 31<sup>st</sup> B.C. Marine Mammal Symposium, November 2023.
- McNeilly<sup>+</sup>, J. Sablefish are on the menu for Southern Resident Killer Whales, but at what cost?. 31<sup>st</sup> B.C. Marine Mammal Symposium, November 2023.
- Young<sup>+</sup>, M. Optimizing Techniques for Vessel Adherence Monitoring and Whale Detection in the Saturna ISZ. 31<sup>st</sup> B.C. Marine Mammal Symposium, November 2023.
- Clarke, C.M.K., V. Rani<sup>+</sup>, E. Stredulinsky, S. Toews, M. Bouvier<sup>+</sup>, D. Smyth, **R. Joy**, S.J. Thornton. A marine reserve reduces vessel presence, with implications for Northern Resident Killer Whale (*Orcinus orca*) beach rubbing behaviour. Coastal Zones Canada Conference, Victoria, BC. June 2023.
- Stapleton<sup>+</sup>, R., and **R. Joy**. Monitoring nest success of Double-crested Cormorants within the Strait of Georgia. 44<sup>th</sup> Annual Pacific Ecology and Evolution Conference, April 2023.
- Murphy<sup>+</sup>, O., and **R. Joy**. Analysing marine vessel noise impacts on acoustic behaviour of endangered Southern Resident killer whale. 44<sup>th</sup> Annual Pacific Ecology and Evolution Conference, April 2023.
- Stapleton<sup>+</sup>, R., L. Cowen, R. Wilkin, J. Cragg, A. Lenske, G. McClelland, and **R. Joy**. Multi-event modelling shows variable nest success for the at-risk Double-crested Cormorant population within the Strait of Georgia. Pacific Seabird Conference, Scripps Institute of Oceanography, California. February 2023.
- Wilkin<sup>+</sup>, R., J. Anderson, R. Stapleton<sup>+</sup>, J. Cragg, G. McClelland, A. Lenske, and **R. Joy**. Deep Learning of orthomosaic images is an efficient tool for monitoring nest success of an urban seabird colony. Pacific Seabird Conference, Scripps Institute of Oceanography, California. February 2023.
- M. Dowd , T.W. Lim<sup>+</sup>, and **R. Joy**. Towards Predicting Whale Movement. Machine learning advances for marine acoustics and imagery data workshop. Dalhousie University. November 2022.
- Dowd, M. and **R. Joy**. Overview: Elements of whale detection using acoustics. Workshop on Machine Learning and Movement Models. Burnaby, BC. August 2022.
- Dowd, M., T.W. Lim<sup>+</sup> and **R. Joy**. November 2022. Towards Predicting Whale Movement. Machine learning advances for marine acoustics and imagery data workshop. Dalhousie University.

- Frazao<sup>+</sup>, F., O. Kirsebom, M. Dowd., **R. Joy**. Open-source deep learning models for detection and classification of orcas. Workshop on Machine Learning and Movement Models, Burnaby, BC. August 2022.
- Nguyen Hong Duc<sup>+</sup>, P., D. Campbell, and **R. Joy**. Characterizing southern resident killer whale (SRKW) calls using a particle filter for frequency ridge extraction. Workshop on Machine Learning and Movement Models. Burnaby, BC. August 2022.
- Toews, S., J. Watson, **R. Joy**, E. Stredulinsky, C. Konrad, and S. Thornton. Temporal Shifts in Habitat Preference of Southern Resident Killer Whales: Impacts of Prey Abundance. Conference of the Society for Marine Mammals. Palm Beach, Florida. August 2022.
- Randon<sup>+</sup>, M., M. Dowd, and **R. Joy**. A real-time data assimilative forecasting system for animal tracking. Conference of the Society for Marine Mammals. Palm Beach, Florida. August 2022.
- Ryder, M., C. Booth, C. Oedekoven, D. Harris, **R. Joy**, T. Marques, L. Marshall, and L. Thomas. Passive Acoustic Monitoring Power Analysis: A tool for designing an acoustic monitoring program. International Conference on the Effects of Noise on Aquatic Life. Berlin, Germany. July 2022.
- Rani<sup>+</sup>, V., M. Bouvier<sup>+</sup>, C. Konrad Clarke, **R. Joy**, and S.J. Thornton. Effects of vessel presence on Northern Resident killer whale rubbing behaviour. Salish Sea Ecosystem Conference. April 2022.
- Bouvier<sup>+</sup>, M., V. Rani<sup>+</sup>, H. Yurk, C. Konrad Clarke, S.J. Thornton, and **R. Joy**. Characterization of Northern Resident killer whale (*Orcinus orca*) call types and source levels during beach rubbing. Salish Sea Ecosystem Conference. April 2022.
- Quayle<sup>+</sup>, L., K. Baril<sup>+</sup>, A. Gheibi<sup>+</sup>, SIMRES, SGIWSN, and **R. Joy**. Eyes on the Water: Citizen Science in the Salish Sea. Salish Sea Ecosystem Conference. April 2022.
- Randon<sup>+</sup>, M., M. Dowd, and **R. Joy**. A real-time data assimilative forecasting system for Southern Resident killer whales in the Salish Sea. Salish Sea Ecosystem Conference. April 2022.
- Randon<sup>+</sup>, M., M. Dowd, and **R. Joy**. 2022. Can ecological forecasting help mitigate the risk of collision between whales and commercial vessels? The case of the endangered Southern Resident Killer Whales. International Statistical Ecology Conference.
- Randon<sup>+</sup>, M., M. Dowd, and **R. Joy**. 2022. A real-time forecasting system to mitigate the risk of collision between whales and commercial vessels. European Cetacean Society.
- Stapleton<sup>+</sup>, R., R Wilkin<sup>+</sup>, M Ong<sup>+</sup> and **R. Joy**. February 2022. *Photogrammetry results and future research on the Double-crested Cormorant Within the Salish Sea*. Mitlenatch Island Stewardship Workshop.
- Frazao<sup>+</sup>, F., P. Nguyen Hong Duc<sup>+</sup>, O. Kirsebom, **R. Joy** and S. Matwin. Comparing snapshot and sequence ANN: A study case with blue whales. DCLDE Conference, On-line March 2022.
- Wilkin<sup>+</sup>, R., M. Ong<sup>+</sup>, L. Cojocar<sup>+</sup>, J. Anderson, J. Cragg, G. McClelland and **R. Joy**. Machine learning as a tool for monitoring seabird nesting colonies. Pacific Seabird Conference, On-line March 2022.
- Kirsebom, O.S., S. Bergner, D. Campbell, M. Dowd, F. Frazao<sup>+</sup>, **R. Joy**, P. Nguyen Hong Duc<sup>+</sup>, B. Padovese, M. Randon, A. Riera, S. Sakib, S. Veirs, V. Veirs, J. Wladichuk<sup>+</sup>, and H. Yurk. Open-source deep learning models for acoustic detection and classification of orcas. Detection, Classification, Localisation, and Density Estimation (DCLDE) International Workshop. Oahu, Hawaii. March 2022.
- Sakib, S., S. Bergner, D. Campbell, M. Dowd, F. Frazao<sup>+</sup>, J. MacAulay, **R. Joy**, O. S. Kirsebom, P. Nguyen Hong Duc<sup>+</sup>, B. Padovese, M. Randon<sup>+</sup>, A. Riera, S. Veirs, V. Veirs, J. Wladichuk<sup>+</sup> and H. Yurk. Open-source deep learning models for acoustic detection and classification of orcas. Acoustic Society of America. Seattle, WA. December 2021.
- Nguyen Hong Duc<sup>+</sup>, P., D. Campbell, and **R. Joy**. Characterizing Southern Resident killer whale calls using a particle filter for frequency contour extraction. Acoustic Society of America. Seattle, WA. December 2021.
- Frazao<sup>+</sup>, F., S. Bergner, D. Campbell, M. Dowd, **R. Joy**, O. S. Kirsebom, P. Nguyen Hong Duc<sup>+</sup>, B. Padovese, M. Randon<sup>+</sup>, A. Riera, S. Sakib, S. Veirs, V. Veirs, J. Wladichuk<sup>+</sup> and H. Yurk. Novel software for deep-learning based acoustic data analysis. Acoustic Society of America. Seattle, WA. December 2021.
- Meszaros<sup>+</sup>, K., K. Roessingh, and **R. Joy**. February 2021. *Birds of a feather: Non-invasive sampling reveals British Columbia's Sandhill Cranes don't all flock together*. Provincial Working Group 'Threat' Series.
- Yurk, H., S. Berger, M. Randon<sup>+</sup>, and **R. Joy**. February 2021. *Using big (acoustic) data, neural networks and artificial intelligence in the conservation of Southern Resident killer whales*. Invited by the Port of Vancouver ECHO Program.
- Quayle<sup>+</sup>, M., H. Yurk, P. Nguyen Hong Duc<sup>+</sup> and **R. Joy**. Assessing vessel related threats on whales in Boundary Pass. Canadian Society for Ecology and Evolution. August 2021.

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- Randon<sup>+</sup>, M., M. Dowd, and **R. Joy**. Where are they going? A real-time forecasting system for animal tracking. The 7th Annual SFU Post Doc Research Day. March 2021.
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- Akporuno<sup>+</sup>, O., T. Reid, S. Chartrand, and **R. Joy**. Assessing macro-benthic invertebrate communities in dendritic tidal channels of a berm impacted area of the Nanaimo River Estuary. Salish Sea Ecosystem Conference.
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- Roessingh, K. and **R. Joy**. Sandhill Cranes of coastal British Columbia: Nesting habitat and foraging studies. 16th Alaska Bird Conference, Juneau, Alaska. December 9-11, 2014.
- Tollit, D.J., L.W. Fritz, K.M. Miller, A.D. Schulze, T.K. Zeppelin, T.S. Gelatt, J. Thomason, **R. Joy**, and W.A. Walker. Diet of endangered Steller sea lions in the Aleutian Islands: New insights from DNA detections and bio-energetic reconstructions. 21st Conference of the Society for Marine Mammals, San Francisco, California. December 2015.
- Joy, R.** and K. Roessingh. Population structure in the Pacific flyway of migratory Sandhill Cranes. Hakai Research Exchange, UBC. January 2015. 121. Muir, J.E., L.M. Ainsworth, **R. Joy**, R. Racca, Y. Bychkov, G. Gailey, V. Vladimirov, S. Starodimov, and K Bröker. Western Gray Whale Distribution and Abundance during a 4-D Seismic Survey. 20th Conference of the Society for Marine Mammals, Dunedin, New Zealand. December 2013.
- Joy, R.**, and R.D. Routledge. A hierarchical Bayes model for incorporating uncertainties in data from marine mammal at-sea foraging tracks. Fall 2013 SFU-UBC Workshop in Statistics. Vancouver, Canada. October 2013.
- Ainsworth, L., J.E. Muir, R. Racca, **R. Joy**, G. Gailey, V. Vladimirov et al. A case study in zero-inflation: a space-time model for whale densities in the presence of pulsed sound. 23rd Conference of the International Environmetrics Society, Anchorage, Alaska, June 2013.
- Joy, R.**, and R.D. Routledge. Estimating the effect of groundfish abundance and other spatial covariates on northern fur seal behavior. Joint Statistical Meeting, Montreal, August 2013.
- Joy, R.**, and Z. Sun. Impact of human disturbances on habitat selection and on calf survival for forest-dwelling caribou. 41st annual meeting of the Statistical Society of Canada, Edmonton, Alberta, May 2013.
- Chatwin, T.A., **R. Joy** and A.E. Burger. Set-back Distances to Protect Nesting and Roosting Seabirds off Vancouver Island from Boat Disturbance. Pacific Seabird Group Conference, Portland, February 2013.
- Trites, A.W., R. Grybda, **R. Joy**, and B. Battaile. Is fishing for Atka mackerel responsible for the decline of Steller sea lions in the western and central Aleutian Islands? 19th Conference of the Society for Marine Mammals, Tampa, Florida, November 2011.
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- A.W. Trites, R. Flinn, **R. Joy**, and B. Battaile. 2011. Steller sea lion trends from 2000 to 2009 were not associated with Atka mackerel fishery indices in the western and central Aleutian Islands. Marine Science in Alaska Symposium. January 2011. Anchorage, Alaska.
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- Joy, R.** and M.G. Dowd. Analysis of marine animal movement data using state space models for behavioural inference. 2010 Ocean Sciences Meeting. February 2010. Portland, Oregon
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