

NATIONAL MARINE FISHERIES SERVICE REPORT
FISHERIES SCIENCE CENTER ACTIVITIES

Recent Salmon-Related Publications by the NMFS Science Centers (2022-2023)

Joint

Buckner, Jack H., William H. Satterthwaite, Benjamin W. Nelson, and Eric J. Ward. In press. Interactions between life history and the environment on changing growth rates of Chinook salmon. *Canadian Journal of Fisheries and Aquatic Sciences*. <https://doi.org/10.1139/cjfas-2022-0116>

McClure, Michelle M., Melissa A. Haltuch, Ellen Willis-Norton, David D. Huff, Elliott L. Hazen, Lisa G. Crozier, Michael G. Jacox, Mark W. Nelson, Kelly S. Andrews, Lewis A.K. Barnett, Aaron M. Berger, Sabrina Beyer, Joe Bizzarro, David Boughton, Jason M. Cope, Mark Carr, Heidi Dewar, Edward Dick, Emmanis Dorval, Jason Dunham, Vladlena Gertseva, Correigh M. Greene, Richard G. Gustafson, Owen S. Hamel, Chris J. Harvey, Mark J. Henderson, Chris E. Jordan, Isaac C. Kaplan, Steven T. Lindley, Nathan J. Mantua, Sean E. Matson, Melissa H. Monk, Peter Moyle, Colin Nicol, John Pohl, Ryan R. Rykaczewski, Jameal F. Samhouri, Susan Sogard, Nick Tolimieri, John Wallace, Chantel Wetzel, and Steven J. Bograd. 2023. Vulnerability to climate change of managed stocks in the California Current large marine ecosystem. *Frontiers in Marine Science* 10:1103767 (21 p.).
<https://doi.org/10.3389/fmars.2023.1103767>

Rougemont, Quentin, Amanda Xuereb, Xavier Dallaire, Jean-Sebastien Moore, Eric Normandeau, Alysse Perreault-Payette, Berenice Bougas, Eric B. Rondeau, Ruth E. Withler, Donald M. Van Doornik, Penelope A. Crane, Kerry A. Naish, John Carlos Garza, Terry D. Beacham, Ben F. Koop, and Louis Bernatchez. 2023. Long-distance migration is a major factor driving local adaptation at continental scale in Coho salmon. *Molecular Ecology* 32(3):542-559. <https://doi.org/10.1111/mec.16339>

Satterthwaite, William H., and Andrew Olaf Shelton. 2023. Methods for assessing and responding to bias and uncertainty in U.S. West Coast salmon abundance forecasts. *Fisheries Research* 257:106502 (14 p.). <https://doi.org/10.1016/j.fishres.2022.106502>

Jensen, Alexander J., Ryan P. Kelly, Eric C. Anderson, William H. Satterthwaite, Andrew Olaf Shelton, and Eric J. Ward. 2022. Introducing zoid: A mixture model and R package for modeling proportional data with zeros and ones in ecology. *Ecology* 103(11):e3804 (8 p.). <https://doi.org/10.1002/ecy.3804>

Munsch, Stuart H., Correigh M. Greene, Nathan J. Mantua, and William H. Satterthwaite. 2022. One hundred-seventy years of stressors erode salmon fishery climate resilience in California's warming landscape. *Global Change Biology* 28(7):2183-2201. <https://doi.org/10.1111/gcb.16029>

Thompson, Andrew R., Eric P. Bjorkstedt, Steven J. Bograd, Jennifer L. Fisher, Elliott L. Hazen, Andrew Leising, Jarrod A. Santora, Erin V. Satterthwaite, William J. Sydeman, Michaela Alksne, Toby D. Auth, Simone Baumann-Pickering, Noelle M. Bowlin, Brian J. Burke, Elizabeth A. Daly, Heidi Dewar, John C. Field, Newell T. Garfield, Ashlyn Giddings, Ralf Goericke, John Hildebrand, Cheryl A. Horton, Kym C. Jacobson, Michael G. Jacox, Jaime Jahncke, Michael Johns, Joshua Jones, Raphe M. Kudela, Sharon R. Melin, Cheryl A. Morgan, Catherine F. Nickels, Rachael A. Orben, Jessica M. Porquez, Elan J. Portner,

Antonella Preti, Roxanne R. Robertson, Daniel L. Rudnick, Keith M. Sakuma, Isaac D. Schroeder, Owyn E. Snodgrass, Sarah Ann Thompson, Jennifer S. Trickey, Pete Warzybok, William Watson, and Edward D. Weber. 2022. State of the California Current Ecosystem in 2021: Winter is coming? *Frontiers in Marine Science* 9:958727 (23 p.). <https://doi.org/10.3389/fmars.2022.958727>

Waples, Robin S., Michael J. Ford, Krista Nichols, Marty Kardos, Jim Myers, Tasha Q. Thompson, Eric C. Anderson, Ilana J. Koch, Garrett McKinney, Michael R. Miller, Kerry Naish, Shawn R. Narum, Kathleen G. O'Malley, Devon E. Pearse, George R. Pess, Thomas P. Quinn, Todd R. Seamons, Adrian Spidle, Kenneth I. Warheit, and Stuart C. Willis. 2022. Implications of large-effect loci for conservation: A review and case study with Pacific salmon. *Journal of Heredity* 113(2):121-144. <https://doi.org/10.1093/jhered/esab069>

Northwest Fisheries Science Center

Beechie, T., C. Fogel, C. Nicol, J. Jorgensen, B. Timpane-Padgham, and P. Kiffney. 2023. How does habitat restoration influence resilience of salmon populations to climate change? *Ecosphere* 14:e4402. (<https://doi.org/10.1002/ecs2.4402>)

Beechie, T. J., A. Goodman, Michaela Lowe, O. Stefankiv, B. Timpane-Padgham. 2023. Habitat Assessment and Restoration Planning (HARP) Model for the Snohomish and Stillaguamish River Basins. NOAA Contract Report NMFS-NWFSC-CR-2023-02.

Bond, M. H., T. J. Beechie, and G. R. Pess. 2023. Habitat Capacity for Chinook Salmon and Steelhead Spawning and Rearing in the Similkameen River Basin. U.S. Department of Commerce, NOAA Contract Report NMFS-NWFSC-CR-2023-01. (<https://doi.org/10.25923/xf8y-x065>)

Bosch, B.J., Pandit, S.N., Sandford, B.P., Temple, G.M., Johnston, M.V., and Larsen, D.A. 2023. Effects of volitional emigration timing and smolt size on survival and age-at-return in a Pacific salmon hatchery population. *Environmental Biology of Fishes*. (<https://doi.org/10.1007/s10641-023-01395-0>)

Burke, B., C. Norrie, J. Miller, L. Weitkamp, and C. Morgan 2022. Growth prior to ocean entry may provide a survival advantage to Columbia River Interior Spring Chinook salmon. , 131-149. (<https://doi.org/10.3354/meps14069>)

Chamberlin, J. 2022. Chinook Salmon Use of Tidal Delta Habitats: Synthesis for Snohomish Recovery Plan Revision. (<https://doi.org/10.25923/nafn-jp23>)

Dittman, A.H., Cunningham, C.J., and T.P. Quinn. 2022. Can unique amino acid profiles guide adult salmon to natal streams? A comparison of streams sampled prior to and after the arrival of adult Pacific salmon. *Hydrobiologia* 849:3501-3513. (<https://doi.org/10.1007/s10750-022-04948-z>)

Ebel, J.D., Larsen, D.A., Conley, K.R., and Middleton, M.A. 2022. A fish out of basin: Increased stress physiology and reduced performance of Salmon River Hatchery Chinook Salmon. *North American Journal of Fisheries Management*. 42 (3): 1548-8675. (<https://doi.org/10.1002/nafm.10760741>)

Fogel, C., C. Nicol, J. C. Jorgensen, G. B. Seixas, T. J. Beechie, B. Timpane-Padgham, P. M. Kiffney, J. Winkowski. 2022. How riparian and floodplain restoration modifies the effects of increasing temperature on adult salmon spawner abundance in the Chehalis River, WA. *PLoS ONE* 17(6): e0268813 (<https://doi.org/10.1371/journal.pone.0268813>)

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French, BF, DH Baldwin, J Cameron, J Prat, K King, JW Davis, JK McIntyre, NL Scholz, Urban Roadway Runoff Is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye. *Environ. Sci. Technol. Lett.* 2022, 9:733-738. (<https://doi.org/10.1021/acs.estlett.2c00467>)

Frick, K.E., Kagley, A.N., Fresh, K.L., Samhour, J.F., Ward, L.S., Stapleton, J.T. and Shelton, A.O. 2022. Spatiotemporal Variation in Distribution, Size, and Relative Abundance within a Salish Sea Nearshore Forage Fish Community. *Marine and Coastal Fisheries*, 14: e10202. <https://doi.org/10.1002/mcf2.10202>

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Hunsicker, M.E., Ward, E.J., Litzow, M.A., Anderson, S.C., Harvey, C.J., et al. 2022. Tracking and forecasting community responses to climate perturbations in the California Current Ecosystem. *PLOS Climate* 1(3): e0000014. <https://doi.org/10.1371/journal.pclm.0000014>

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Kiffney, P., J. Thompson, B. Blaud, and L. Hoberecht. 2022. Nonfishing Impacts on Essential Fish Habitat. U.S. Department of Commerce, NOAA White Paper NMFS-NWFSC-WP-2022-01. (<https://doi.org/10.25923/zxz1-m712>)

Kiffney, P., G. Pess, J. Anderson, T. Buehrens, S. Naman, T. Quinn, K. Burton, M. Koehler, and P. Faulds. 2023. Fish recolonization of a temperate river following restoration of longitudinal connectivity: population, community and ecosystem-level changes. *Ecosphere* 2023:e4336. (<https://doi.org/10.1002/ecs2.4336>)

- Lamb, J. J., B. P. Sandford, G. A. Axel, M. G. Nesbit, and B. L. Sanderson. 2021. Monitoring the Migrations of Wild Snake River Spring/Summer Chinook Salmon Juveniles: Fish Collection and Tagging, 2021. Project 1991-028-00, Contract 83639 Rel 21. Northwest Fisheries Science Center, Seattle.
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- Malick, M.J., Moore, M.E., and Berejikian, B.A. 2022. Higher early marine mortality of steelhead associated with releases of hatchery coho salmon but not Chinook salmon. *Marine and Coastal Fisheries* 14(6): e10225. (<https://doi.org/10.1002/mcf2.10225>)
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- Munsch, S.H., Beaty, F.L., Beheshti, K.M., Chesney, W.B. and others. 2023. Northeast Pacific eelgrass dynamics: interannual expansion distances and meadow area variation over time. *Marine Ecology Progress Series* 705:61-75. (<https://doi.org/10.3354/meps14248>)
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(<https://doi.org/10.25923/kq2n-ke70>)
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(<https://doi.org/10.1002/esp.5520>)
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Richerson, K., K. Somers, J. Jannot, V. Tuttle, N. Riley, J. Mcveigh 2022. Observed and Estimated Bycatch of Salmon in U.S. West Coast Fisheries, 2002-20. (<https://doi.org/10.25923/pm3a-ad32>)

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Southwest Fisheries Science Center

Carvalho, Paul G., William H. Satterthwaite, Michael R. O'Farrell, Cameron Speir, and Eric P. Palkovacs. In press. Role of maturation and mortality in portfolio effects and climate resilience. Canadian Journal of Fisheries and Aquatic Sciences. <https://doi.org/10.1139/cjfas-2022-0171>

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Reis-Santos, Patrick, Bronwyn M. Gillanders, Anna M. Sturrock, Christopher Izzo, Dion S. Oxman, Jessica A. Lueders-Dumont, Karin Hussy, Susanne E. Tanner, Troy Rogers, Zoe A. Doubleday, Allen H. Andrews, Clive Trueman, Deirdre Brophy, Jason D. Thiem, Lee J. Baumgartner, Malte Willmes, Ming-Tsung Chung, Rachel C. Johnson, Yvette Heimbrand, Karin E. Limburg, and Benjamin D. Walther. In press. Reading the

biomineralized book of life: expanding otolith biogeochemical research and applications for fisheries and ecosystem-based management. *Reviews in Fish Biology and Fisheries*. <https://doi.org/10.1007/s11160-022-09720-z>

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