

Casey T. Clark

Research Scientist 1, WDFW

Marine Mammal Investigations
7801 Phillips Rd SW,
Lakewood, WA 98498

206-503-4244
Casey.Clark@dfw.wa.gov
www.caseytklark.com

Professional Experience	Lead Marine Mammal Researcher Science Division, Wildlife Program <i>Washington Department of Fish and Wildlife</i>	2021 – Present
	Postdoctoral Scholar Joint Institute for the Study of Atmosphere and Ocean Cooperative Institute for Climate, Ocean, and Ecosystem Studies <i>University of Washington, Seattle, WA</i>	2019 – 2021
	Postdoctoral Scholar Water and Environmental Research Center <i>University of Alaska Fairbanks, Fairbanks, AK</i>	2019
Education	University of Alaska Fairbanks , Fairbanks, AK <i>Doctor of Philosophy, Marine Biology</i>	2019
	Moss Landing Marine Laboratories , Moss Landing, CA <i>Master of Science, Marine Science</i>	2013
	University of California Santa Cruz , Santa Cruz, CA <i>Bachelor of Science, Marine Biology</i>	2007

Publications (*student mentee)

- Charapata, P., C.T. Clark, N. Miller, S.S. Kienle, D.P. Costa, M.E. Goebel, H. Gunn, E.S. Sperou, S.B. Kanatous, D.E. Crocker, R. Borrás-Chavez, and S.J. Trumble. **2023**. *Whiskers provide time-series of toxic and essential trace elements, Se:Hg molar ratios, and stable isotope values of an apex Antarctic predator, the leopard seal*. *Science of the Total Environment*. 854: 158651. DOI: 10.1016/j.scitotenv.2022.158651.
- Clark, C.T., M. Cape, M.D. Shapley, F.J. Mueter, B.P. Finney, and N. Misarti. **2021**. *SuessR: Regional Suess and Laws corrections for $\delta^{13}\text{C}$ data from marine organisms*. *Methods in Ecology and Evolution*. DOI:
- Clark, C.T., L. Horstmann, N. Misarti. **2021**. *Walrus teeth as biomonitors of trace elements in Arctic Marine Ecosystems*. *Science of the Total Environment*. 772: 145500. DOI: 10.1016/j.scitotenv.2021.145500
- Clark, C.T., L. Horstmann, and N. Misarti. **2020**. *Evaluating tooth strontium and barium as indicators of weaning age in Pacific walruses*. *Methods in Ecology and Evolution*. 11(12). DOI: 10.1111/2041-210X.13482
- Halfmann C., B. Potter, E. Bartelink, M. Buckley, C.T. Clark, B. Finney, J. Johnson, B.M. Kemp, B. Bingham, F. Lanoë, H. McKinney, J. Reuther, R. Sattler, T. Tsutaya, and M. Wooller. **2020**. *Ancient Beringian paleodiets revealed through multi-proxy stable isotope analyses*. *Science Advances*. DOI: 10.1126/sciadv.abc1968
- *Taylor, N., C.T. Clark, N. Misarti, and L. Horstmann. **2020**. *Determining sex of adult Pacific walruses from mandible measurements*. *Journal of Mammalogy*. 101:4. DOI: 10.1093/jmammal/gyaa051
- Clark, C.T., L. Horstmann, and N. Misarti. **2020**. *Zinc concentrations in teeth of female Pacific walruses reflect onset of reproductive maturity*. *Conservation Physiology*. 8:1. DOI: 10.1093/conphys/coaa029
- Clark, C.T., L. Horstmann, and N. Misarti. **2019**. *Lipid normalization and stable isotope discrimination in Pacific walrus tissues*. *Scientific Reports*. 9:5843. DOI: 10.1038/s41598-019-42095-z1
- Clark, C.T., L. Horstmann, A. de Vernal, A.M. Jensen, and N. Misarti. **2019**. *Pacific walrus diet across 4000 years of changing sea ice conditions*. *Quaternary Research*. DOI: 10.1017/qua.2018.140

- Clark, C.T., L. Horstmann, and N. Misarti. **2017**. *Quantifying variability in stable carbon and nitrogen isotope ratios within the skeletons of marine mammals of the suborder Caniformia*. Journal of Archaeological Science: Reports. 15: 393-400. DOI: 10.1016/j.jasrep.2017.09.007
- Clark, C.T., A.H. Fleming, J. Calambokidis, N.M. Kellar, C.D. Allen, K.N. Catelani, M. Robbins, N.E. Beaulieu, D. Steel, and J.T. Harvey. **2016**. *Heavy with child? Pregnancy status and stable isotope ratios as determined from biopsies of humpback whales*. Conservation Physiology. DOI: 10.1093/conphys/cow050
- Fleming, A.H., C.T. Clark, J. Calambokidis and J. Barlow. **2015**. *Humpback whale diet responds to variance in ocean climate and ecosystem conditions in the California Current*. Global Change Biology. DOI: 10.1111/gcb.13171
- Vu, E.T., C. Clark, N.M. Kellar, K.N. Catelani, and J. Calambokidis. **2014**. *Seasonal blubber testosterone concentrations of male humpback whales (Megaptera novaeangliae)*. Marine Mammal Science. DOI: 10.1111/mms.12191

Relevant Presentations (*student mentee)

- Clark, C.T., L. Horstmann, N. Misarti, and K. Laidre. *Using tooth trace elements to estimate weaning age in walrus*. **Oral presentation** at World Marine Mammal Conference, Barcelona, Spain. Dec **2019**.
- Clark, C.T., L. Horstmann, and N. Misarti. *Using trace elements in Pacific walrus teeth to track the impacts of petroleum production in the Alaskan Arctic*. **Oral presentation** at Coastal Marine Institute Annual Research Review, Anchorage, AK. Jan **2019**.
- Clark, C.T., L. Horstmann, and N. Misarti. *Reconstructing Pacific walrus population dynamics using trace elements in teeth*. **Oral presentation** at Alaska Marine Science Symposium, Anchorage, AK. Jan **2019**.
- *N. Taylor, C.T. Clark, N. Misarti, and L. Horstmann. *A cost-effective method to determine Pacific walrus sex from skeletal remains*. **Poster** at Alaska Marine Science Symposium, Anchorage, AK. Jan **2019**.
- *Starbuck, H., C.T. Clark, L. Horstmann, and N. Misarti. *Stable isotopes and trace elements in walrus whiskers reflect different sources of variability*. **Oral presentation** at Midnight Sun Science Symposium, Fairbanks, AK. Apr **2018**.
- Clark, C.T., L. Horstmann, and N. Misarti. *Past changes in sea ice cover did not drive shifts in walrus diet*. **Oral presentation** at Alaska Marine Science Symposium, Anchorage, AK. Jan **2018**
- *Starbuck, H., C.T. Clark, L. Horstmann, and N. Misarti. *Stable isotopes and trace elements in walrus whiskers as potential indicators of seasonality*. **Poster** presented at Alaska Marine Science Symposium, Anchorage, AK. Jan **2018**.
- Clark, C.T., L. Horstmann, and N. Misarti. *Investigating Pacific walrus life history using trace elements in teeth*. **Oral presentation** at 22nd Biennial Conference on the Biology of Marine Mammals, Halifax, Canada. Oct **2017**.
- Clark, C.T., L. Horstmann, and N. Misarti. *Like pulling teeth: Using trace elements to detect seasonality in Pacific walrus teeth*. **Poster** presented at Alaska Marine Science Symposium, Anchorage, AK. Jan **2017**.
- *Akeya, Z., *E. Oxereok, L. Horstmann, A. Thornton, C.T. Clark, and N. Misarti. *Time travel through walrus teeth and bones: Collagen and the story behind it*. **Poster** presented at Alaska Marine Science Symposium, Anchorage, AK. Jan **2017**.
- Clark, C.T., L. Horstmann, and N. Misarti. *Using the Past to Inform the Future: Investigating Pacific Walrus Foraging Across 2,500 Years*. **Poster** presented at Arctic Observing Summit. Fairbanks, AK. Mar **2016**.

- Clark, C.T., L. Horstmann-Dehn, and N. Misarti. *Tooth and Bone: Reconstructing 2,500 years of Pacific walrus foraging ecology*. **Poster** presented at Alaska Marine Science Symposium, Anchorage, AK. Jan **2016**.
- Clark, C.T., L. Horstmann-Dehn, and N. Misarti. *CSI Beringia: Reconstructing 2,500 years of Pacific walrus foraging*. **Oral presentation** at 21st Biennial Conf. on the Biology of Marine Mammals, San Francisco, CA. Dec **2015**.
- Clark, C.T., L. Horstmann-Dehn, and N. Misarti. *Blast from the past: Pacific walrus foraging ecology across prehistoric, historic, and modern timeframes*. **Poster** presented at Alaska Marine Science Symposium, Anchorage, AK. Jan **2015**.
- Clark, C.T., A.H. Fleming, J. Calambokidis, and J.T. Harvey. *Examining humpback whale migratory behavior using demographic and physiological parameters*. **Poster** presented at the 20th Biennial Conference on Biology of Marine Mammals, Dunedin, New Zealand, Dec **2013**.
- Clark, C.T., J. T. Harvey, A.H. Fleming, and J. Calambokidis. *Last to leave the dinner table: Monterey Bay as important habitat for female humpbacks late in the year*. **Oral presentation** at Western Society of Naturalists Annual Meeting, Monterey, CA, Nov **2012**

Relevant Research Experience

Postdoctoral Scholar

Nov 2019 – Dec 2020

JISAO/CICOES, University of Washington

Investigating the links between important life history events and patterns of trace element accumulation in marine mammal teeth, with the goal of developing new methods to improve management and conservation. Current research focuses include assessing strontium and barium concentrations in Pacific walrus teeth as indicators of weaning age and exploring the possibility of using walrus tooth trace elements as archives of historical trace metal contamination in the Bering and Chukchi seas. Additional research includes collaboration with Department of Fisheries and Oceans, Canada, to test these tooth trace element approaches for beluga whales.

Postdoctoral Scholar

Jun 2019 – Oct 2019

SuessR Project, University of Alaska Fairbanks

Developed an R package and web-hosted Shiny application for applying Suess corrections to stable carbon isotope data from marine ecosystems. Responsibilities included literature review, data analysis, organizing and consolidating information to update the existing mathematical Suess correction equation, writing code for the R package and Shiny app, deploying both pieces of software, writing a scientific paper introducing the SuessR package, and presenting this new tool to marine researchers.

Research Assistant

Aug 2017 – Aug 2018

BLaST Graduate Mentor, University of Alaska Fairbanks

Mentored undergraduate students in research through the NIH funded Biomedical Learning and Student Training (BLaST) program. Taught mentees study design, critical reading of scientific publications, literature review, lab skills, statistical analyses, technical writing, and dissemination of results to broad audiences. Independent research projects included a study of trace element concentrations and stable isotope ratios in walrus whiskers (preliminary results presented at a scientific conference in Jan 2018) and a project testing the viability of Pacific walrus mandible measurements as a tool for determining the sex of the animal.

Research Assistant

Aug 2014 – Jul 2017

WALRUS Project, University of Alaska Fairbanks

Aug 2018 – Dec 2019

Conducted research related to the impacts of climate change on Pacific walrus. Learned a variety of laboratory techniques including bone collagen extractions, bulk and compound specific stable isotope analysis, and trace element analysis using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Used reconstructions of paleoclimate to generate an index of sea ice concentrations in the Chukchi Sea over the last 4,000 years. Additional responsibilities included technical writing, statistical analyses, lab management, and mentoring of undergraduates.

Harbor Seal Capture Assistant Oct 2010 – May 2013

Harbor Seal Research Program, Moss Landing Marine Labs

Aided in periodic harbor seal captures to gather data related to population health, movements, foraging ecology, and habitat selection. Duties included employment of live-capture techniques from small boats and from shore, animal handling and care, conducting biological sampling, and marking (flipper tags) seals.

Project Coordinator Jan 2010 – Jan 2012

Gray Whale Habitat Use Study, Moss Landing Marine Labs

Organized and conducted a study of gray whale migration off the California coast. Results were used to mitigate the impacts of a wave-energy system on migrating whales. Responsibilities included scheduling/organization of boat-based surveys, interviewing/hiring observers, marine mammal observation using distance sampling methods, and design/development of a tagging system.

Research Assistant Jan 2008 – Mar 2008

A.R.E.V.A. Project, Akaroa, New Zealand

Aided in data collection for a Ph.D. project studying the effect of vessel activity on Hector's dolphins. Duties included land-based observations of dolphin behavior using a theodolite and boat-based observations of Hector's dolphin behavior.

Marine Mammal Observer 2006 – 2007

Wind to Whales Project, University of California Santa Cruz

Assisted on a series of boat-based marine mammal and seabird surveys of Monterey Bay. Duties included line transect data collection and visual identification of marine mammals at sea.

Research Technician Jun – Sep 2005

Gulf Apex Predator-Prey Study, Kodiak, AK

Jun – Sep 2004

Assisted with research on foraging behavior/genetic structure of humpback whales in the Gulf of Alaska, as well as data collection for Steller sea lion abundance estimates/diet studies. Responsibilities included photo-ID/matching of humpback fluke and dorsal fin photos, remote biopsy sample collection and processing, operation of VHF antenna while tracking telemetric tags, aerial surveys to locate cetaceans and photograph Steller sea lion haul-outs.

Relevant Professional Service

Reviewer: National Science Foundation, Marine Ecology Progress Series, Journal of Experimental Marine Biology & Ecology, Marine Mammal Science, Conservation Physiology, PLOS One, Aquatic Mammals, Ocean Science Journal

Science Committee Member, Sitka WhaleFest 2020 – Present

Councilmember, Association of Polar Early Career Scientists 2017 – 2018

Student Representative, Irving-Scholander Memorial Lecture Series Organizing Committee 2017 – 2018

Vice-President & Founding Member, Fisheries and Ocean Sciences Student Association 2016 – 2018

Teaching & Mentoring

2020	<i>Guest Lecturer</i>	Archaeology of Climate Change ANTH492/692
	<i>Guest Lecturer</i>	Seminar in Marine Biology OCEAN/FISH/BIOL477
2019	<i>Guest Lecturer</i>	Introduction to Marine Science, MSL212
2018	<i>Undergraduate Research Mentor</i>	BLaST Graduate Mentoring Fellowship
2017	<i>Undergraduate Research Mentor</i>	BLaST Graduate Mentoring Fellowship
	<i>Guest Lecturer</i>	Introduction to Marine Science, MSL212
	<i>Guest Lecturer</i>	Biology of Marine Mammals, MSL619
	<i>Teaching Assistant</i>	Human Anatomy & Physiology, BIOL214
2016	<i>Guest Lecturer</i>	Introduction to Marine Science, MSL212
	<i>Research Mentor</i>	Rural Alaska Honors Institute