

Matthew L.H. Cheng

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EDUCATION

University of Alaska Fairbanks, College of Fisheries and Ocean Sciences

PhD., Fisheries Science (GPA: 4.0/4.0)

2021 - Present

Juneau, AK

University of New Hampshire, College of Life Sciences and Agriculture

BS., Marine Estuarine and Freshwater Biology (GPA: 3.75/4.0)

2017 - 2021

Durham, NH

PUBLICATIONS

Published:

1. **Cheng, M.L.H.**, Goethel, D.R., Cunningham, C.J., 2024. Addressing complex fleet structure in fishery stock assessment models: Accounting for a rapidly developing pot fishery for Alaska sablefish (*Anoplopoma fimbria*). **Fisheries Research** 271, 106917. <https://doi.org/10.1016/j.fishres.2023.106917>
2. Fitzgerald K.A., Bellmore R.J., Fellman J.B., **Cheng M. L. H.**, Delbecq C.E., Falke J.A. "Stream hydrology and a pulse subsidy shape patterns of fish foraging" **Journal of Animal Ecology**, <https://doi.org/10.1111/1365-2656.14018>
3. **Cheng, M. L. H.**, Thorson, J.T., Ianelli, J.N., Cunningham C.J., Estimating age, year, and cohort effects in stock assessments: demonstration of a computationally efficient and reproducible framework" **Fisheries Research**, 266. <https://doi.org/10.1016/j.fishres.2023.106755>
4. **Cheng, M. L. H.**, Rodgveller, C. J., Langan, J. A., Cunningham, C. J. (2023). Standardizing fishery-dependent catch-rate information across gears and data collection programs for Alaska sablefish (*Anoplopoma fimbria*). **ICES Journal of Marine Science**, fsad037. <https://doi.org/10.1093/icesjms/fsad037>
5. **Cheng, M. L. H.**, Hinch, S. G., Juanes, F., Healy, S. J., Lotto, A. G., Mapley, S. J., Furey, N. B. (2022). Acoustic Imaging Observes Predator-Prey Interactions between Bull Trout and Migrating Sockeye Salmon Smolts. **North American Journal of Fisheries Management**, nafm.10833. <https://doi.org/10.1002/nafm.10833>
6. Stasse, A., **Cheng, M. L. H.**, Meyer, K., Bumbera, N., Van Volkom, K., Laferriere, A. M., Dijkstra, J. A., Brown, B. (2022). Temporal Dynamics of Eastern Oyster Larval Abundance in Great Bay Estuary, New Hampshire. **Journal of Shellfish Research**, 40(3). <https://doi.org/10.2983/035.040.0303>
7. **Cheng, M. L. H.**, Lippmann, T. C., Dijkstra, J. A., Bradt, G., Cook, S., Choi, J.-G., Brown, B. L. (2021). A baseline for microplastic particle occurrence and distribution in Great Bay Estuary. **Marine Pollution Bulletin**, 170, 112653. <https://doi.org/10.1016/j.marpolbul.2021.112653>

Technical reports:

1. Goethel, D.R., **Cheng, M.L.H.**, Echave, K.B., Marsh C., Rodgveller, C.J., Shotwell, S.K., Siwicke, K.A. 2023. Assessment of the Sablefish Stock in Alaska. 87.
2. Goethel, D.R., Rodgveller, C.J., Echave, K.B., Shotwell, S.K., Siwicke, K.A., Malecha, P.W., **Cheng, M.**, Williams, M., Omori, K., and Lunsford, C.R. 2022. Assessment of the Sablefish Stock in Alaska. 182.

In review:

1. Fitzgerald K.A., Bellmore R.J., Fellman J.B., **Cheng, M. L. H.**, Boyles-Muehleck N., Delbecq C.E., Falke J.A., Pink Salmon spawning abundance fluctuations impart biennial growth disparities to juvenile Coho Salmon in a southeast Alaska watershed" *In review - Freshwater Biology*

In preparation (Available upon request):

1. **Cheng, M.L.H.**, Goethel, D.R., Hulson, P.J.F., Cunningham C.J., Confronting shifts in fishery fleet structure: Practical recommendations for integrated stock assessments" *Plan to submit to Canadian Journal of Fishery and Aquatic Sciences*
2. Charpentier, J.E., Gunn, J.S., **Cheng, M.L.H.**, Licht, S., McCoy, J., Truscott, J., Furey, N.B., "Invasive knotweed (*Fallopia* spp.) movement in a northern New Hampshire (USA) stream system" *Plan to submit to Invasive Plant Science and Management*

EXPERIENCE

Field Technician

University of New Hampshire

Supervisor: Nathan B. Furey

Jun 2021 - Aug 2021

- Coordinated field logistics, conducted habitat mapping, and collected stream macro-invertebrates
- Mark-recapture experiment for knotweed to understand dispersal
- Conducted electrofishing surveys to capture Brook Trout and other stream fishes

Research Assistant

University of New Hampshire

Supervisor: Bonnie L. Brown

May 2019 - May 2021

- Designed physical and chemical methods for separating microplastics from sediment cores
- Quantified microplastics using confocal microscopy
- Collected zooplankton via larval tows and estimated oyster larval abundance via microscopy
- Investigated environmental factors influencing larval abundance of oysters

Research Coordinator

University of New Hampshire

Supervisor: Elizabeth Craig

Jan 2021 - May 2021

- Designed methods for separating microplastics from regurgitated bird pellets
- Coordinated project logistics and mentored two undergraduates
- Provided reading material, introduced R software for statistical analyses, and assisted with coding

Research Assistant

University of New Hampshire

Supervisor: Nathan B. Furey

May 2020 - May 2021

- Analyzed acoustic sonar videos from Chilko Lake, British Columbia to investigate predator-prey dynamics between Bull Trout and migrating Sockeye Salmon smolts

Wildlife Intern

USGS Northeast Climate Adaptation Science Center

Supervisor: Alexej Sirén

Aug 2020 - May 2021

- Collated wildlife and snow data into a central database
- Responsible for data management and proofing of database (Microsoft Access)

NSF REU Intern

University of Delaware

Supervisor: Joanna York

Summer 2020

- In-person projects cancelled due to COVID-19, but relevant distance learning in topics such as scientific communication, current research at UD, science ethics, technical writing, and data visualization.

Intern

Supervisor: Andrea Tomlinson

New Hampshire Community Seafood

Jul 2019 - Dec 2020

- Engaged harvesters to coordinate and collaborate with academics on research projects
- Directed public outreach efforts on sourcing sustainable and local seafood, and fishery related topics
- Solicited potential customers to join a community supported fishery program

TEACHING

UAF NSF GRFP Workshop

Workshop Lead

University of Alaska Fairbanks

Fall 2022, Fall 2023

- Led a workshop covering application components for the NSF GRFP, and paired applicants with mentors to develop a fellowship application (2 awards, 1 Honorable Mention).

BIOL 492; Biology Seminar

Guest Lecturer

University of Alaska Southeast

Spring 2022

- Presented a lecture on predator-prey interactions between sockeye smolts and bull trout, and catch-per-unit-effort standardization methods.

NSF Tamamta Graduate Fellowship

Teaching assistant

University of Alaska Fairbanks

Fall 2021

- Provided personalized tutoring for graduate students(s) taking Calculus I.

BIOLG 541; General Ecology Teaching Assistant

Supervisor: James Haney

University of New Hampshire

Spring 2020

- Assisted with lab and field instruction, and engaged students in basic ecological concepts

CONFERENCE PRESENTATIONS

*Best student (or runner-up) presentation/poster award

Cheng, M. L. H., Goethel, D.R., Hulson, P.J., Cunningham C.J., Confronting changes in fishery fleet structure for stock assessments: Insights from Alaska sablefish and a simulation study" (2023) University of Washington SAFS Quantitative Seminar, *Oral Presentation*, Virtual

***Cheng, M. L. H.**, Goethel, D.R., Cunningham C.J., Incorporating dynamic fleet structure in stock assessment models: Accounting for a rapidly developing pot fishery for Alaska sablefish (*Anoplopoma fimbria*)" (2023) Western Groundfish Conference, *Oral Presentation*, Juneau AK

***Cheng, M. L. H.**, Goethel, D.R., Cunningham C.J., Incorporating dynamic fleet structure in stock assessment models: Accounting for a rapidly developing pot fishery for Alaska sablefish (*Anoplopoma fimbria*)" (2023) 49th Annual American Fisheries Society Alaska Chapter Meeting, *Oral Presentation*, Fairbanks AK

*Muehleck, N., Fitzgerald K.A., **Cheng, M. L. H.**, Bellmore, J.R., Fellman, J.B., Falke, J.A., "Juvenile Coho Salmon growth patterns track biennial Pink Salmon spawning abundance fluctuations in a southeast Alaska watershed" (2023) 49th Annual American Fisheries Society Alaska Chapter Meeting, *Poster Presentation*, Fairbanks AK

***Cheng, M. L. H.**, Thorson, J.T., Ianelli, J.N., Cunningham C.J., "Unlocking the triad of age, year, and cohort effects in stock assessment: a proof-of-concept study" (2023) 26th Annual American Fisheries Society Student Symposium (UAF CFOS), *Oral Presentation*, Juneau AK

Cheng M. L. H., Rodgveller CJ, Langan JA, Cunningham CJ, Development of Fishery-dependent Abundance Indices for Alaska Sablefish (*Anoplopoma fimbria*) (2022) 152nd Annual American Fisheries Society Meeting, *Oral Presentation*, Spokane WA

***Cheng M.LH.**, Rodgveller CJ, Cunningham CJ, Development of Fishery-dependent Abundance Indices for Alaska Sablefish (*Anoplopoma fimbria*) (2022) 25th Annual American Fisheries Society Student Symposium (UAF CFOS), *Oral Presentation*, Juneau AK

Cheng M.LH., Rodgveller CJ, Cunningham CJ, Development of Fishery-dependent Abundance Indices for Alaska Sablefish (*Anoplopoma fimbria*) (2022) 48th Annual American Fisheries Society Alaska Chapter Meeting, *Oral Presentation*, Virtual

Stasse. A, Meyer. K, **Cheng M. L. H.**, Brown BL. Evaluation of Oyster Larval Abundance in the Great Bay Estuary (2022) Aquaculture, *Poster Presentation*, San Diego CA

Cheng M. L. H., Lippmann TC, Dijkstra JA, Bradt G, Cook S, Choi JG, Brown BL. A deposition baseline for microplastic particle distribution in an estuary (2021) College of Life Sciences Agriculture Undergraduate Research Conference, *Oral Presentation*, Virtual

Cheng M. L. H., Mapley SJ, Lotto AG, Hinch SG, Juanes F, Furey NB. Assessing predator-prey interactions between migrating juvenile sockeye salmon smolts and bull trout in British Columbia (2021) College of Life Sciences Agriculture Undergraduate Research Conference, *Poster Presentation*, Virtual

Stasse. A, Meyer. K, **Cheng M. L. H.**, Brown BL. Evaluation of Oyster Larval Abundance in the Great Bay Estuary. (2021) New Hampshire Sea Grant Symposium, *Poster Presentation*, Virtual

*McDowell L, Wardinski C, **Cheng M. L. H.**, Caldwell AE, Craig, E. Evaluating regurgitated pellets as indicators of microplastic ingestion by NH-breeding seabirds. (2021) College of Life Sciences Agriculture Undergraduate Research Conference, *Poster Presentation*, Virtual

Brammer D, **Cheng M. L. H.**, Derrick. M, Dunn. T, Orzech. E Vajda. Z. Monitoring of Temperature in the Benthic Zone of the Gulf of Maine and Assessment of the Effects of Temperature on Disease Incidence of *Strongylocentrotus droebachiensis* and *Henricia sanguinolenta*. (2020) College of Life Sciences Agriculture Undergraduate Research Conference, *Poster Presentation*, Virtual

TECHNICAL PRESENTATIONS

Cheng M. L. H., Goethel, DR., Cunningham CJ., Exploring alternative parameterizations to account for the emerging pot gear fleet in the sablefish stock assessment. (2023) September Groundfish Plan Team Meeting, Seattle WA

Cheng M. L. H., Rodgveller CJ., Langan JA., Goethel, DR., Cunningham CJ., Standardizing sablefish catch-per-unit-effort (CPUE) across gear types and data sources. (2022) September Groundfish Plan Team Meeting, Seattle WA

Cheng M. L. H., Rodgveller CJ., Cunningham CJ., Development of Fishery-dependent Abundance Indices for Alaska Sablefish (*Anoplopoma fimbria*). (2022) NOAA CPUE Discussion Group

SERVICE

Journal Referee: Journal of Fish and Wildlife Management ($n = 1$)

Western Groundfish Conference, Juneau AK, Volunteer (2023)

University of Alaska Fairbanks Justice, Equity, Diversity, and Inclusion Committee (2021 - 2022)

University of Alaska Fairbanks Student Well-being Committee (2021 - 2022)

Alaska American Fisheries Society Student Symposium Organizer (UAF CFOS; 2021 - 2023)

AWARDS, GRANTS, AND HONORS

2023 2023 Western Groundfish Conference, Best Presentation (\$300)
2023 Alaska EPSCoR NSF Travel Award (\$1000)
2023 49th Annual American Fisheries Society Alaska Chapter Meeting, Best PhD Oral Presentation (\$450)
2023 Alaska American Fisheries Society Student Symposium, Runner Up for Best Short Talk
2023 Alaska Chapter American Fisheries Society Travel Award (\$1300)
2022 American Fisheries Society Marine Fisheries Section Student Travel Award (\$500)
2022 Alaska EPSCoR NSF Travel Award (\$2500)
2022 National Science Foundation Graduate Research Fellowship Program (Award offered) (\$147,000)
2022 Alaska American Fisheries Society Student Symposium Best Long Talk (\$100)
2021 National Science Foundation Graduate Research Fellowship Program (Honorable Mention)
2019 Rutman Scholars Initiative (\$1500)
2019 John and Katharyn Williams Scholarship (\$3500)

RELEVANT COURSEWORK

University of Alaska Fairbanks: Statistical Computing in R, Regression and Analysis of Variance, Estimation of Fish Abundance, Bayesian Decision Theory for Resource Management, Ecosystem-based Fisheries Management, Time Series, Quantitative Population Dynamics, Modern Applied Statistics for Fisheries (*Informal audit*), Statistical Theory I
University of New Hampshire: Quantitative Ecology, Experimental Design and Analysis, Introduction to the R Software, Physiology of Fishes, Sharks and Bony Fishes (Ichthyology), Fisheries Biology, Sustainable Marine Fisheries, Biological Oceanography, Evolution

SKILLS

At-Sea Experience:

- * Volunteer scientist, NOAA Sablefish Longline Survey, Dutch Harbor to Kodiak, AK (6/12/23 - 7/1/23)
- * Volunteer scientist, NOAA Sablefish Longline Survey, Yakutat to Seward, AK (7/17/22 - 8/3/22)

Programming languages: R, LATEX, ADMB, TMB

Statistical methods: regression methods, maximum likelihood estimation, time series, Bayesian statistics, non-linear models, sex-and age-structured models