Noah S. Khalsa
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EDUCATION

MS Marine and Atmospheric Sciences. August 2022
Stony Brook University (Transferred with lab from University of Maine), School of Marine and Atmospheric Sciences and the Institute for Advanced Computational Science
Thesis: **Evaluating the Effectiveness of Minimum Legal Size for Mitigating Impacts of Climate-Driven Changes to Size-at-Maturity and Growth on the Gulf of Maine American Lobster Fishery**
Committee: Dr. Yong Chen (major advisor), Dr. Ellen Pikitch, & Dr. Burton Shank

BS Fisheries and Ocean Sciences (Fisheries Science Concentration). May 2020
Minor in Marine Science
University of Alaska Fairbanks, College of Fisheries and Ocean Sciences
Magna Cum Laude (cumulative GPA: 3.96)
Senior thesis: **Abiotic drivers of abundance of coastal Arctic fishes**
Advisor: Dr. Amanda Kelley

RESEARCH & WORK EXPERIENCE

Research Technician II. September 2022 – present
Chen Lab, SBU.
Supervisor: Dr. Yong Chen.

- Spearheaded project modeling white perch egg abundance and spatiotemporal shifts in spawning grounds in relation to environmental conditions in the Hudson River, NY
- Assisted with exploration and analyses of the Hudson River Biological Monitoring Program dataset (40 years of long-term fisheries and environmental survey data)
- Contributed to ongoing research programs within the Chen Lab

Graduate Research Assistant. August 2020 – August 2022
Chen Lab, SBU.
Supervisor: Dr. Yong Chen.

- Led project assessing the effectiveness of minimum legal-size regulations under climate-driven changes to American lobster maturity and growth using individual-based modeling
- Contributed to global crustacean fisheries performance indicators review project
- Co-led published global stock assessment model review project
- Co-led (in 2022) and served as a member on (in 2020) peer review group for International Council for the Exploration of the Seas (ICES) EU fisheries stock assessments
- Collaborated with the Lenfest Ocean Program International Crustacean Fisheries Task Force as part of the task force team on developing global best-practices for crustacean fisheries management
- Participated in the development of a funded NOAA Sea Grant proposal ($270,394) as co-PI
- Contributed to developing a seasonal, sex-specific, size-structured stock assessment model for American lobster in the Bay of Fundy, CA in collaboration with Fisheries and Oceans Canada
- Analyzed the sensitivity of a size-structured stock assessment model for American lobster to climate-driven life history changes

- Showcased American lobster stock assessment models used in the Chen Lab to stakeholders
- Interfaced with American lobster fishery stakeholders to discuss research and inform study design
- Assisted with planning multi-day stakeholder workshop to showcase and discuss research
- Expanded and operated an individual-based simulation model for American lobster

Undergraduate Research Assistant. October 2018 – May 2020
DNA Sequencing at Sea Project, UAF.
PI: Dr. Anne-Lise Ducluzeau.

- Sampled, extracted, and sequenced environmental DNA (eDNA) from water samples using Oxford Nanopore MinION platform during two at-sea cruises
- Characterized microorganism communities from eDNA samples sequenced while at sea
- Lived and worked aboard a research vessel (R/V Sikuliaq)

Fisheries Field Technician. May 2018 – August 2018
Sitka Tribe of Alaska.
Supervisor: Kyle Rosendale.

- Enumerated sockeye salmon escapement at Klag Bay, Alaska (USA) weir for in-season management
- Installed and operated rigid picket weir
- Conducted fry index monitoring, shellfish biomass beach surveys, and wetlands assessments
- Helped prepare logistically for field work
- Headed up the fabrication of a new weir sampling station
- Assisted with office duties related to fisheries data recording and analysis
- Produced standardized data recording methods for shellfish biomass beach survey data
- Carried out research project to assess whether sockeye salmon (*Oncorhynchus nerka*) were experiencing thermal stress at locations where they aggregated before migrating upstream

Undergraduate Research Assistant. August 2017 – May 2020
Kelley Lab, UAF.
PI: Dr. Amanda Kelley.

- Guided the writing of a published manuscript resulting from my senior thesis
- Directed two field missions to the Arctic for deploying and collecting data from oceanographic instrumentation
- Installed and maintained fyke nets
- Identified, enumerated, and sampled Arctic fish
- Generated and explored one of the first high-frequency *in-situ* time-series of carbonate chemistry for the coastal Beaufort Sea, Alaska (USA)
- Modeled the environmental drivers of abundance of fish in the coastal Arctic using generalized additive models
- Participated in scientific diving missions for servicing and calibrating SeaFET™ sensors
- Deployed and maintained SeaFET™ ocean pH sensors
- Calibrated oceanographic data using lab-derived empirical measurements of water chemistry according to best practices in chemical oceanography
- Analyzed oceanographic time series data
- Executed western blot protein assays

Undergraduate Research Assistant. May 2017 – May 2020
Museum of the North, UAF.
PI: Dr. J. Andrés Lòpez.

- Led the writing of a published manuscript with novel insights on the use of eDNA as a sampling method under-ice in remote regions
- Spearheaded analysis of environmental DNA to map the overwintering distribution of juvenile Chinook salmon on military training grounds in cooperation with US Army biologists
- Trained collaborators on eDNA filter extraction and quantitative polymerase chain reaction (qPCR) analysis

GRANTS

Chen et al. (co-PI). Evaluating impacts of changing life history parameters on the American lobster stock dynamics under different management regulations in a warming Northeastern US. $270,394. NOAA National Sea Grant. 2021.

AWARDS, FELLOWSHIPS, & SCHOLARSHIPS

Awards

Maze-Landeau Travel Award (2x). $3,752. School of Marine and Atmospheric Sciences, SBU. 2022, 2021.
Brina Kessel Medal for Excellence in Science. College of Natural Science and Mathematics, UAF. 2020.
Outstanding Undergraduate Leadership. College of Fisheries and Ocean Sciences, UAF. 2020.
Outstanding CFOS Undergraduate. College of Fisheries and Ocean Sciences, UAF. 2020.
Chancellor's List. UAF. Spring 2020, Fall 2019, Spring 2019, Fall 2018, Spring 2018, Fall 2017, Spring 2017.
Scientist of the Month. Biomedical Learning and Student Training, UAF. September 2019.
Outstanding Junior. College of Fisheries and Ocean Sciences, UAF. 2019.
BLaST Travel Award (6x). $6,416. Biomedical Learning and Student Training, UAF. September 2019, August 2019, July 2019, October 2018, May 2018, January 2018.
Mary Louise Rasmuson Undergraduate Fisheries Endowment Award. $500. College of Fisheries and Ocean Sciences, UAF. 2019, 2018.
Outstanding Sophomore. College of Fisheries and Ocean Sciences, UAF. 2018.
Dean's Choice Poster Award. Research and Creative Activity Day, UAF. 2018.
URSA Travel Award. $1,525. Undergraduate Research and Scholarly Activity, UAF. 2018.
URSA Research Award. $3,450. Undergraduate Research and Scholarly Activity, UAF. 2017.

Fellowships

NOAA Sea Grant Knauss Marine Policy Fellowship. $71,500. National Oceanic and Atmospheric Administration Sea Grant College Program. 2022.
NSF Graduate Research Fellowship. $138,000. National Science Foundation. 2020.

Scholarships

Crowley Scholarship. $2,500. College of Fisheries and Ocean Sciences, UAF. 2019.
Al Tyler Memorial Scholarship. $5,000. College of Fisheries and Ocean Sciences, UAF. 2019.
Molly Ahlgren Scholarship. $2,000. American Fisheries Society Alaska Chapter. 2019.

BLaST Scholarship. Competitive full-ride scholarship that provided a $1,070.00/month stipend and ~$3,000-$7,000 annually in research funding. Biomedical Learning and Student Training, UAF. 2017 – 2020.
Alaska Performance Scholarship Level 1. $4,755/semester. UAF. 2016 – 2020.
University of Alaska Scholarship. $12,000. UAF. 2015.

PUBLICATIONS (* denotes joint first-authors)

1. **Khalsa, N. S.***, Hodgdon, C.*, Li, Y., Sun, M., Boenish, R., & Chen, Y. 2022. Global crustacean stock assessment modelling: Reconciling available data and complexity. *Fish and Fisheries* 23(3):697-707.
2. **Khalsa, N. S.**, Gatt, K. P., Sutton, T. M., & Kelley, A. L. 2021. Characterization of the abiotic drivers of abundance of nearshore Arctic fishes. *Ecology and Evolution* 11(16):11,491-11,506.
3. **Khalsa, N. S.**, Smith, J., Jochum, K. A., Savory, G., & Lòpez, J. A. 2020. Identifying under-ice overwintering locations of juvenile Chinook salmon by using environmental DNA. *North American Journal of Fisheries Management* 40(3):762-772.

Forthcoming

1. Hodgdon, C., **Khalsa, N. S.**, Mazur, M., & Chen, Y. Accepted. Implications of climate-driven changes on growth and size-at-maturity for Gulf of Maine lobster stock assessment. *Fishery Bulletin*.
2. Ducluzeau, A., Lekanoff, R. M., **Khalsa, N. S.**, & Drown, D. M. Accepted. A modular workshop introducing next-generation sequencing with Nanopore Minion to the next generation of stem researchers aboard a research vessel. *Journal of Microbiology and Biology Education*.
3. **Khalsa, N. S.**, Hodgdon, C., Mazur, M., & Chen, Y. In revision. Climate-driven shifts in maturity and growth induce changes to population and fishery dynamics of a high-value crustacean.
4. **Khalsa, N. S.**, Pikitch, E., Shank, B., & Chen, Y. In prep. Performance of alternative minimum legal sizes under anticipated climate-drive changes to maturity and growth for the Gulf of Maine American lobster fishery.
5. Ober, C., Ernawati, T., Li, Y., **Khalsa, N. S.**, & Chen, Y. In prep. Application of performance indicators to management of international crustacean fisheries.

Preprints

1. Ducluzeau, A., Lekanoff, R. M., **Khalsa, N. S.**, Smith, H. H., & Drown, D. M. 2019. Introducing DNA sequencing to the next generation on a research vessel sailing the Bering Sea through a storm. *Preprints*.

REPORTS

1. Hodgdon, C., Sun, M., Chang, H.-Y., Willse, N., **Khalsa, N.**, Kim, J., Fitting, E., Woodruff, P., Rokosz, K., Ren, Q., Eigenberger, T., Li, Y., Yang, X., Sivel, E., Linner, R., Pan, X., Leone, F., Ober, C., Arsenault, S., & Ervin, A. 2022. Technical minutes of the Stony Brook University review group for the advice drafting group for biology and assessment of the North Sea fisheries resources. Stony Brook, New York: 25 pp.

2. Hodgdon, C., Chang, H.-Y., Sun, M., **Khalsa, N.**, & Chen, Y. 2022. Assessing American lobster stock in the Bay of Fundy, Canada (LFAs 34-38) using a seasonal, sex-specific length-structured assessment model. Report prepared for the Department of Fisheries and Oceans Canada.
3. Hodgdon, C., Chang, H.-Y., Sun, M., Willse, N., Xu, L., Behan, J., Britsch, M., Chang, B., Chen, N., Jarrett, R., **Khalsa, N.**, Kim, J., Li, Y., Li, Y., Libin, D., Linner, R., Mazur, M., Mensinger, M., Ober, C., Qinqin, L., Risley, S., Su, S., Wang, J., & Zhao, S. 2020. Technical minutes of the University of Maine review group for the advice drafting group for biology and assessment of deep-sea fisheries resources. Orono, Maine: 53 pp.
4. US Forest Service & Sitka Tribe of Alaska. 2019. 2018 Lava Falls fry index monitoring report.
5. Smith, J., Lutz, L., & **Khalsa, N. S.** 2018. TFTA king salmon habitat study: Fort Wainwright, Alaska. *USAG-AK FWA Natural Resources Report, SOW 15-46*.
6. **Khalsa, N. S.** 2018. Klag Bay temperature regime. Report prepared for the Sitka Tribe of Alaska Resource Protection Department.

PRESENTATIONS

Invited Talks

1. **Khalsa, N. S.** 2020. Habitat preferences and drivers of catches of nearshore Arctic fishes in the Beaufort Sea. BLaST One Health Seminar (Seminar canceled due to Covid-19). Biomedical Learning and Student Training, UAF.
2. Kelley, A. L., Washburn, M., & **Khalsa, N. S.** 2020. Kelley Lab sampler: The importance of pairing environmental data and laboratory studies in the context of ocean change. Fisheries Seminar. College of Fisheries and Ocean Sciences, UAF.

Oral

1. **Khalsa, N. S.**, Hodgdon, C., & Chen, Y. 2022. Global crustacean stock assessment modeling: Reconciling available data and complexity. ICES Annual Science Conference. Dublin, Ireland.
2. **Khalsa, N. S.**, Hodgdon, C., & Chen, Y. 2022. Resolving impacts of climate-induced life history changes of American lobster on its management. ICES Annual Science Conference. Dublin, Ireland.
3. **Khalsa, N. S.**, Hodgdon, C., & Chen, Y. 2022. Comparing alternative minimum legal size regulations for the Gulf of Maine American lobster fishery under climate-driven changes to maturity and growth. American Fisheries Society New York Chapter Annual Meeting. Virtual.
4. **Khalsa, N. S.**, Hodgdon, C., & Chen, Y. 2021. Evaluating the utility of minimum legal size for alleviating impacts of climate-driven changes to maturity and growth on the Gulf of Maine American lobster fishery. American Fisheries Society Annual Meeting. Baltimore, MD.
5. **Khalsa, N. S.**, Smith, J., & Lòpez, J. A. 2019. Identifying juvenile Chinook salmon (*Oncorhynchus tshawytscha*) overwintering locations in the Tanana Flats (Alaska, USA). American Fisheries Society – The Wildlife Society Joint National Conference. Reno, NV.
6. **Khalsa, N. S.** 2018. Klag Bay weir internship report. Undergraduate Research Symposium. College of Fisheries and Ocean Sciences, UAF.

Poster

1. **Khalsa, N. S.**, Gatt, K. P., Sutton, T. M., & Kelley. A. L. 2020. Abiotic drivers of catches of nearshore fishes in a changing Arctic. NIH Diversity Program Consortium Coordination and Evaluation Center at UCLA. Virtual conference hosted on diversityprogramconsortium.org.
2. **Khalsa, N. S.**, Lekanoff, R., Drown, D. M., & Ducluzeau, A. 2019. DNA sequencing at sea with the Oxford Nanopore MinION. American Fisheries Society – The Wildlife Society Joint National Conference. Reno, NV.
3. **Khalsa, N. S.**, Lòpez, J. A., & Smith, J. 2018. Using environmental DNA to map the overwintering distribution of juvenile Chinook salmon in the Tanana Flats of Alaska. American Fisheries Society Western Division Annual Meeting. Anchorage, AK.

SKILLS

Fishery Assessment, Computer & Data Analytics

- Individual-based simulation modeling
- Fisheries population dynamics theory and modeling
- Fisheries stock assessment including size- and age-structured frameworks
- Spatial data analysis and mapping in R Studio and ArcGIS
- Univariate and multivariate statistical analyses
- CO2Calc software for carbonate chemistry analysis

Fish & Ecosystem Sampling

- Fyke net, gill net, kick net and hook and line sampling
- Backpack, tote-barge, and boat electrofishing
- Aging fishes using otoliths and scales
- Rigid picket weir operation and maintenance
- Collection of age, sex, and length data from fishes
- Field identification of Pacific salmon species
- Escapement enumeration of salmonids using picket weir
- Salmonid fry index monitoring

Field

- Remote site living and work (7 and 14 day rotations for one summer season)
- Living and working aboard research vessels (17 days at sea)
- Wilderness first aid/CPR, firearms use and bear safety
- AAUS Certified Scientific Diver (2018, UAF)
- Operation and maintenance of outboard boats, all-terrain vehicles, and snow-machines

Molecular Assays

- DNA extraction from tissue and eDNA filters
- Oxford Nanopore MinION DNA sequencing platform
- qPCR
- Western blot protein assays

Special Equipment

- Onset HOBO data loggers
- MiniDOT data loggers

- Sea-Bird Scientific SeaFET™ pH sensors
- Spectrophotometer
- Auto-titrator

TEACHING

Teacher's assistant. April 2019.
DNA Sequencing Workshop at Sea. UAF.
Primary instructor: Dr. Anne-Lise Ducluzeau.

- Filtered and prepared eDNA samples from seawater
- Trained students on pipetting techniques and DNA sequencing using the Oxford Nanopore MinION
- Guided students in analysis of DNA metagenomic data
- Instructed students on figure creation using R Studio

CONFERENCES & WORKSHOPS

Conferences
ICES Annual Science Conference. Dublin, Ireland. 2022.
American Fisheries Society New York Chapter Annual Meeting. Virtual. 2022.
American Fisheries Society Annual Meeting. Baltimore, Maryland. 2021.
American Fisheries Society Alaska Chapter Annual Meeting. Virtual. 2021.
American Fisheries Society Annual Meeting. Virtual. 2020.
American Fisheries Society Annual Meeting. Reno, Nevada. 2019.
American Fisheries Society Alaska Chapter Annual Meeting. Sitka, Alaska. 2019.
Alaska Marine Science Symposium. Anchorage, Alaska. 2018.
American Fisheries Society Western Division Annual Meeting. Anchorage, Alaska. 2018.

Workshops
Length-Based Stock Assessment Techniques Workshop. Cooperative Institute for the North Atlantic Region Education Program. Fall 2022.
State Space Modeling Workshop. New England Fishery Management Council. 2021.
Spatiotemporal Analysis of Ecological Data. American Fisheries Society Annual Meeting. 2021.
Population Dynamics and Ecosystem Science Quantitative Sciences Workshop. NOAA Fisheries. Hatfield Marine Science Center, Oregon State University. 2019.
Alaska Environmental DNA Workshop. Southeast Alaska Watershed Coalition and Southeast Alaska Fish Habitat Partnership. 2019.

SERVICE

Advisory Committee Participation
Student Representative. Institutional Program Review. College of Fisheries and Ocean Sciences, UAF. 2019.
Student Representative. Student Advisory Committee. College of Fisheries and Ocean Sciences, UAF. 2018 – 2020.
Student Representative. Student Advisory Committee. Undergraduate Research and Scholarly Activity, UAF. 2018 – 2020.
Student Representative. SWOT Analysis Group. College of Fisheries and Ocean Sciences, UAF. 2018.

Leadership
Vice President, American Fisheries Society UAF Student Sub-unit. UAF. 2019 – 2020.

Stock Assessment Peer Review
ICES Stock Assessment Review Group. SBU. 2022.
ICES Stock Assessment Review Group. UMaine. 2020.

Journal Referee
Canadian Journal of Fisheries and Aquatic Sciences, *Fisheries Oceanography*, and *Environmental* DNA

PROFESSIONAL AFFILIATIONS & STUDENT ORGANIZATIONS

Professional
American Fisheries Society. 2017 – present.
Northeastern Division. 2021 – present.
Western Division. 2017 – present.
Alaska Chapter. 2017 – present.

Student
Graduate Student Club. School of Marine and Atmospheric Sciences, SBU. 2021 – 2022.
American Fisheries Society Student Sub-unit. UAF. 2017 – 2020.

REFERENCES

Dr. Yong Chen (graduate advisor)
Professor of Marine Science
School of Marine and Atmospheric Sciences, Stony Brook University
yong.chen.2@stonybrook.edu; 631-632-3187

Dr. Ellen Pikitch (graduate committee member)
Endowed Professor of Ocean Conservation Science
Executive Director, Institute for Ocean Conservation Science
School of Marine and Atmospheric Sciences, Stony Brook University
ellen.pikitch@stonybrook.edu; 631-632-9599

Dr. Burton Shank (graduate committee member)
Research Fishery Biologist
Northeast Fisheries Science Center, NOAA Fisheries
burton.shank@noaa.gov; 508-495-2363

Dr. Amanda Kelley (undergraduate research mentor)
Assistant Professor
College of Fisheries and Ocean Sciences, University of Alaska Fairbanks
alkelley@alaska.edu; 907-474-2474

Dr. J. Andrés Lòpez (undergraduate research mentor)
Associate Professor
College of Fisheries and Ocean Sciences, University of Alaska Fairbanks
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