Carl St. John

Permanent Address:
7106 Exfair Rd.
Bethesda, MD 20814

cas399@cornell.edu
240-643-6300

Current Address:
1850 Glacier Ave. Apt 3
Juneau, AK 99801

Education

Cornell University Ithaca, NY — May 2016
College of Arts and Sciences
B.A. Cum Laude Biological Sciences
Cumulative GPA: 3.33/4.33

California State University Los Angeles Los Angeles, CA — May 2019
College of Natural and Social Sciences
M.S. in Biological Sciences
Cumulative GPA: 4.00/4.00

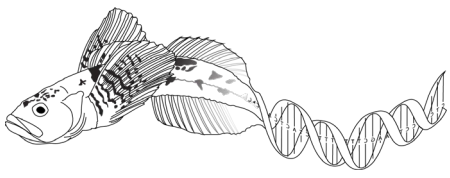
Cornell University Ithaca, NY — August 2024
College of Agriculture and Life Sciences
PhD in Natural Resources and the Environment

Awards and grants

Graduate Recruitment Fellowship		Fall 2019-Spring 2020
Kieckhefer Adirondack Fellowship	$11,000	Spring 2020
New York State Dept. of Environmental Conservation - grant #137418	$20,000	Spring 2022-Summer 2024
Kieckhefer Adirondack Fellowship	$11,000	Spring 2023
Atkinson Sustainability Biodiversity Fund	$2,750	Spring 2023-S

Research Experience

Evolutionary Studies of Pacific Rockfishes (*Sebastes*) March 2015-May 2016
Advisor: Dr. William Bemis; Ecology and Evolutionary Biology, Cornell University
- Compared anatomy and feeding mechanisms of five common species of Pacific Rockfishes using dry osteological preparations and dissections of frozen specimens
- CT scanning of skulls to digitally reconstruct specimens



Research Experience (cont.)

Convergent evolution in two pelagic genera from the Lake Baikal cottid radiation Jan 2018-Dec 2020

Advisor: Dr. Andres Aguilar; Biological Sciences, California State University Los Angeles

- Prepared RADseq libraries for high throughput sequencing on Illumina platform
- GATK and custom pipelines to process raw reads from 2bRADseq; and wrote custom pipelines to analyze exome data sets
- Proficient with adegenet, fastSTRUCTURE, RAxML, BEAST, HYPHY, and PHAST
- Field sampling aboard research vessels on Lake Baikal and surrounding areas in Irkutsk Oblast, Russia

Species delineation and the genomic basis of extreme trait variation in a long lived fish Aug 2019 – Jan 2025

Advisors: Dr. Peter B. McIntyre, Natural Resources and the Environment, Cornell University; Dr. Nina Overgaard Therkildsen, Natural Resources and the Environment, Cornell University

- Field sampling using trap nets, gill nets, and backpack electrofishing. Collection of fin clips for genetic analysis.
- Bead extractions and prepared low coverage whole genome sequencing (lcWGS) libraries for high throughput sequencing on illumine platform
- Adapting lcWGS pipelines for genomic analysis on local cpu and HPC
- Otolith extraction and aging for Suckers

Modeling of life history evolution using integral projection models Sept 2023 - present

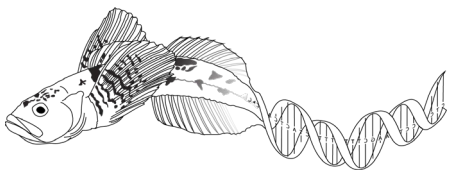
Advisors: Dr. Peter B. McIntyre, Natural Resources and the Environment, Cornell University; Dr. Megan A. Greischar, Natural Resources and the Environment, Cornell University; Dr. Christina M. Hernandez, Biology, Oxford University

- Adapting integral projection models (IPM) to empirical data
- Model-based inference of evolutionary mechanisms

Population genomics and local adaptation to inform stock enhancement of Red King Crab in Alaskan waters May 2022 – Oct 2024

Collaborators: Wes Larson, Program Manager, NOAA, National Marine Fisheries Service Alaska Fisheries Science Center, Genetics Program; Laura Timm, Post-doc, NOAA, National Marine Fisheries Service Alaska Fisheries Science Center, Genetics Program

- Genomic data analysis of low coverage whole genome sequencing data using angsd
- Coordination with fisheries managers to determine best use of available dataset



Professional Experience

Fishery Biologist II Alaska Dept. of Fish and Game June 2016-December 2017
Supervisor: Dr. Chris Siddon; Alaska Dept. of Fish and Game, Division of Commercial Fisheries

- In excess of 400 dive surveys of Sea Cucumber (*Parastichopus californicus*), Red Urchin (*Mesocentrotus franciscanus*), Abalone (*Haliotus kamtschatkana*), and the invasive tunicate, *Didemnum vexillum*
- Worked with ADF&G DSO and dive research coordinators to formulate dive plans, surveys, and sampling methods
- Golden and Red King Crab Surveys aboard commercial vessels in the Bering Sea

Publications and Presentations

Bemis KE, Burke SM, St. John C A, Hilton EJ, Bemis WE. 2019. Tooth development and replacement in the Atlantic Cutlassfish, *Trichiurus lepturus*, with comparisons to other Scombroidei. *Journal of Morphology*. 280(1):78-94 doi:10.1002/jmor.20919

St. John C A, Lou N, Overgaard Therkildsen N, Carlson D, McIntyre P. Summer Suckers, some are not: Species delineation and the genomic basis of trait variation in a long-lived fish with extreme life history morphs. Oral presentation at Virtual Evolution 2021, Joint Aquatic Sciences Meeting 2022.

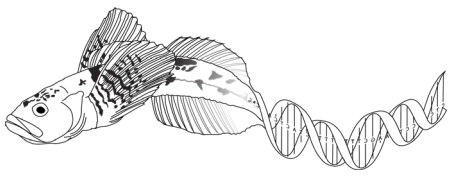
St. John C A, Lou N, Overgaard Therkildsen N, Carlson D, Holst L, McIntyre P. Genetic Differentiation in Spawning Phenology and Size at Maturity in a Long Lived, Alpine Fish. Oral presentation at American Fisheries Society Meeting 2022.

St. John, C. A., Buser, T. J., Kee, V. E., Kirilchik, S., Bogdanov, B., Neely, D., … Aguilar, A. (2022). Diversification along a benthic to pelagic gradient contributes to fish diversity in the world's largest lake (Lake Baikal, Russia). *Molecular Ecology*, 31(1), 238–251. doi: 10.1111/mec.16209

St. John, C. A., Timm, L. E., Gruenthal, K. M., & Larson, W. A. (2025). Whole Genome Sequencing Reveals Substantial Genetic Structure and Evidence of Local Adaptation in Alaskan Red King Crab. Evolutionary Applications, 18(1), e70049. doi: 10.1111/eva.70049

St. John, C. A., Carlson, D. M., Holst, L. K., Therkildsen, N. O., McIntyre, P. B. Resolving ecological and taxonomic uncertainty in an imperiled fish: integrative approaches aid conservation unit delineation in species complexes. *In review*.

St. John, C. A., Therkildsen, N. O., McIntyre, P. B. Convergent evolution of life history traits evolves through different genomic mechanisms in a freshwater fish ecotype. *In preparation.*



St. John, C. A., Hernandez, C. M., Greischar, M. A., McIntyre, P. B. Emergence and maintenance of simultaneous bistability in life history strategies of the white sucker (catostomus commersonii). *In preparation.*

Relevant Skills

Field work: AAUS scientific diver certified, proficient in underwater transects and fish identification, photographic data collection and analysis, survey and sampling methods; operating various styles of trapnets and gillnets; skiff driving; genetic data collection and preservation

Specimen Preparation: Vertebrate dissection, dry skeletal preparation (dermestid beetles followed by hand cleaning), formalin fixation, CT scan preparation, cataloging for Cornell University Museum of Vertebrates, otolith extraction and aging, analysis of fish reproductive structures, column and magnetic bead DNA extractions, 2b-RAD library preparation, low coverage whole genome sequencing library preparation.

Software and programming: Python, UNIX (bash scripting, sed), R statistical software, ANGSD, Microsoft Office Adobe CS (Photoshop and Illustrator), Osirix™