Max Czapanskiy, PhD

Ecological Data Scientist

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Research interests

- Ecophysiology of marine vertebrates
- Developing cyberinfrastructure for bio-logging research
- Promoting open science through software engineering principles

Education

Stanford University — *Pacific Grove, CA*

PhD in Biology — *2022*

- Advised by Jeremy Goldbogen
- Dissertation: Baleen whale physiology revealed through the integration of bio-logging and ecoinformatics

San Francisco State University — *San Francisco, CA*

MS in Geographic Information Systems — *2018*

- Advised by Ellen Hines
- Thesis: Using energy landscapes to understand seabird movement and spatial ecology
- Graduate hood, College of Science & Engineering

Columbia University — *New York, NY*

BS in Computer Science — *2014*

Publications

Field measurements reveal the risk of microplastic ingestion by filter-feeding megafauna — *Nature Communications*

Kahane-Rapport, S.R., **Czapanskiy, M.F.**, Fahlbusch, J.A., Friedlaender, A.S., Calambokidis, J., ..., Savoca, M.S. — *In press*

Fast and furious: energetic tradeoffs and scaling of high-speed foraging in rorqual whales — *Integrative Organismal Biology*

Gough, W.T., Cade, D.E., **Czapanskiy, M.F.**, Potvin, J., Fish, F.E., ..., Goldbogen, J.A. — *2022*

Blue whales increase feeding rates at fine-scale ocean features — *Proceedings of the Royal Society B*

Fahlbusch, J.A., **Czapanskiy, M.F.**, Calambokidis, J., Cade, D.E., Abrahms, B., ..., Goldbogen, J.A. — *2022*

Baleen whale inhalation variability revealed using animal-borne video tags — *PeerJ*

Nazario, E.C., Cade, D.E., Bierlich, K., **Czapanskiy, M.F.**, Goldbogen, J.A., ..., Friedlaender, A.S. — *2022*

How reproducibility will accelerate discovery through collaboration in physio-logging — *Frontiers in Physiology*

Czapanskiy, M.F., Beltran, R.S. — *2022*

An accelerometer-derived ballistocardiogram method for detecting heartrates in free-ranging marine mammals — *Journal of Exp. Bio.*

Czapanskiy, M.F., Ponganis, P.J., Fahlbusch, J.A., Schmitt, T.L., Goldbogen, J.A. — *2022*

Elephant seals time their long-distance migrations using a map sense — *Current Biology*

Beltran, R.S., Yuen, A.L., Condit, R., Robinson, P.W., **Czapanskiy, M.F.**, ..., Costa, D.P. — *2022*

Scaling of maneuvering performance in baleen whales: larger whales outperform expectations — *Journal of Exp. Bio.*

Segre, P.S., Gough, W.T., Roualdes, E.A., Cade, D.E., **Czapanskiy, M.F.**, ..., Goldbogen, J.A. — *2022*

Tools for integrating inertial sensor data with video bio-loggers, including estimation of animal orientation, motion, and position — *Animal Biotelemetry*

Cade, D.E., Gough, W.T., **Czapanskiy, M.F.**, Fahlbusch, J.A., Kahane-Rapport, S.R., ..., Goldbogen, J.A. — *2021*

Baleen whale prey consumption based on high-resolution foraging measurements — *Nature*

Savoca, M.S., **Czapanskiy, M.F.**, Kahane-Rapport, S.R., Gough, W.T., Fahlbusch, J.A., ..., Goldbogen, J.A. — *2021*

Modelling short-term energetic costs of sonar disturbance to cetaceans using high-resolution foraging data — *Journal of Applied Ecology*

Czapanskiy, M.F., Savoca, M.S., Gough, W.T., Segre, P.S., Wisniewska, D.M., ..., Goldbogen, J.A. — *2021*

Scaling of oscillatory kinematics and Froude efficiency in baleen whales — *Journal of Exp. Bio.*

Gough, W.T., Smith, H.J., Savoca, M.S., **Czapanskiy, M.F.**, Fish, F.E., ..., Goldbogen, J.A. — *2021*

Cervical air sac oxygen profiles in diving emperor penguins: parabronchial ventilation and the respiratory oxygen store — *Journal of Exp. Bio.*

Williams, C.L., **Czapanskiy, M.F.**, John, J.S., St Leger, J., Scadeng, M., Ponganis, P.J. — *2021*

Why whales are big but not bigger: Physiological drivers and ecological limits in the age of ocean giants — *Science*

Goldbogen, J.A., Cade, D.E., Wisniewska, D.M., Potvin, J., ..., **Czapanskiy, M.F.**, ..., Pyenson, N.D. — *2019*

Extreme bradycardia and tachycardia in the world's largest animal — *PNAS*

Goldbogen, J.A., Cade, D.E., Calambokidis, J., **Czapanskiy, M.F.**, Fahlbusch, J., ..., Ponganis, P.J. — *2019*

Diving behavior of Pink-footed Shearwaters *Ardenna creatopus* rearing chicks on Isla Mocha, Chile — *Marine Ornithology*

Adams, J., Felis, J.J., **Czapanskiy, M.F.**, Carle, R., Hodum, P. — *2019*

Collision and displacement vulnerability to offshore wind energy infrastructure among marine birds of the Pacific Outer Continental Shelf — *Journal of Env. Mgmt.*

Kelsey, E.C., Felis, J.J., **Czapanskiy, M.F.**, Pereksta, D.M., Adams, J. — *2018*

In review

rstickleback: supervised behavior detection in bio-logging data — *Journal of Open Source Software*

Czapanskiy, M.F., Mann, A.

Technical reports

Habitat Affinities and At-Sea Ranging Behaviors among Main Hawaiian Island Seabirds: Breeding Seabird Telemetry, 2013–2016. — *OCS Study BOEM 2020-006.*

Adams, J., Felis, J.J., **Czapanskiy, M.F.** — *2020*

Trends in mammalian predator control trapping events intended to protect ground-nesting, endangered birds at Haleakalā National Park, Hawai'i: 2000–14. — *U.S. Geological Survey Open-File Report 2019–1122.*

Kelsey, E.C., Adams, J., **Czapanskiy, M.F.**, Felis, J.J., Yee, J.L., Kaholoaa R.L., and Bailey, C.N. — *2019*

Teaching and Mentoring

Undergraduate researcher mentor — *Stanford University*

REEFS Mentor — *2022*

- Mentored Lilah McCormick in quantitative ecophysiology.
- Lilah learned reproducible research techniques in R and is writing a paper about measuring cardiac function in narwhals.

Just Enough Software Engineering (For Scientists) — *Stanford University*

Lead instructor and course designer — *2021*

- Self-guided, mastery-based software engineering course for biosciences graduate students
- Two-week intensive short course

Introduction to Physiological Ecology — *Stanford University*

Teaching assistant — *2021*

Undergraduate researcher mentor — *CSU Monterey Bay REU*

NSF REU Mentor — *2019*

- Mentored Hayden Smith in quantitative analysis.
- Hayden presented his work at the 2020 Society for Int. and Comp. Bio. Meeting and published it in the *Journal of Exp. Bio.* (Gough et al., 2021).

Data Carpentry — *The Carpentries*

Certified Instructor — *2018 - present*

Introduction to Ecology — *Stanford University*

Teaching assitant — *2018*

Introduction to GIS — *San Francisco State University*

Teaching assistant — *2016 - 2017*

Software

stickleback (pypi.org/project/stickleback)

A machine learning pipeline for detecting fine-scale behavioral events in bio-logging data — *Python*

rstickleback (github.com/FlukeAndFeather/rstickleback)

An R interface to the stickleback machine learning pipeline — *R*

catsr (doi.org/10.5281/zenodo.5140484)

Tools for reading and visualizing 3D bio-logging data; accompanies Cade et al. (2021) — *R*

beats (github.com/FlukeAndFeather/beats)

Interactive tools for importing, annotating, and validating ECG bio-logger data — *R*

Conference presentations

Stickleback: A machine learning pipeline for detecting behavioral events in bio-logging data — *Online*

7th International Bio-Logging Symposium — *2021*

Quantifying the Influence of Energy Windscapes on Seabird Distributions — *Portland, OR*

Ocean Sciences Meeting — *2018*

Modeling Seabird Habitat Accessibility — *Pacific Grove, CA*

Society for Conservation GIS Annual Conference — *2017*

Taking the Plunge: Comparing Diving Behavior of Red-footed and Brown Boobies Breeding on Lehua Islet, Hawaii — *Turtle Bay, HI*

Pacific Seabird Group Annual Meeting — *2016*

Work experience

U.S. Geological Survey Western Ecological Research Center

Biological Sciences Technician — *2014 - 2017*

University of Montana Avian Science Center

Avian Point Count Technician — *2014*

Friends of Cooper Island

Field Assistant and Data Analyst — *2012 - 2013*

Point Blue Conservation Science

Marine Ecology Intern — *2013*

Microsoft

Software Developer Engineer in Test — *2009 - 2013*

Awards and scholarships

- Stanford Data Science Scholar Fellowship, Stanford Data Science Initiative (2020)
- Stanford Graduate Fellowship, Vice Provost for Graduate Education (2018)
- Graduate Hood, San Francisco State University, College of Science and Engineering (2018)
- Esri Development Center Student of the Year, Esri (2018)
- COAST Research Award, California State University, Council on Ocean Affairs (2018)
- Maxwell Memorial Scholarship, San Francisco State University, College of Science and Engineering (2017)
- Pease Award, San Francisco State University, Department of Geography and Environment (2017)
- CWEP Award for Graduate Student Writing, San Francisco State University (2017)