

Curriculum Vitae

TYLER OSBORNE GAGNÉ

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Confident data scientist and machine learning specialist with strong technical skills and excellent self-learning capacity. Skilled at exploring diverse datasets across fields and formats and developing pipelines for processing, visualization, modeling, and interpretation.

**portfolio of visualizations available upon request*

1. ANALYTIC SUMMARY

- Quantitative ecologist, 4+ years
- Machine learning, 2+ years
- Quick returns on data exploration, visualization, modeling, and interpretation
- Data pipeline development, API interfacing, data portal extraction, scraping
- Extensive academic research and publishing experience
- Technical reviewer and consultant
- Kaggle data science competition medal winner
- R/Python

2. PROFESSIONAL EXPERIENCE

March 2017 – Present

Assistant Research Scientist and Data/Machine Learning Scientist – Conservation & Research Department, Monterey Bay Aquarium, Monterey, CA

Responsibilities include:

- Extensive processing, visualization, and modeling of diverse datasets
- Web scraping, sourcing APIs, and managing repositories to collate textual corpora, satellite sensing data, historical records.
- High frequency signal processing of accelerometer and Raman spectroscopy data in to data augmentation ML model development and deployment
- Foster transparent algorithm interpretation through advanced development of interpretive frameworks for exploring model architecture of artificial neural networks, gradient boosting models, and spatial models
- Scripting version control via git and github repositories
- Confident analysis of time series, spatial raster data, remote sensing products, text corpora, tabular, and high frequency streams

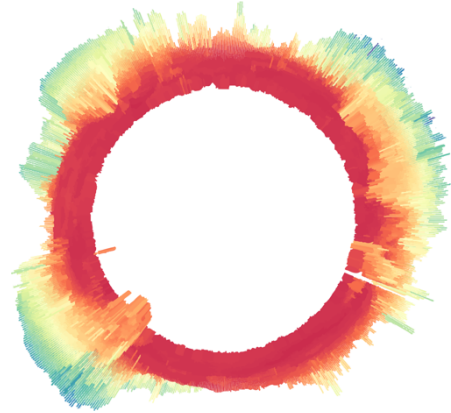
- Analyze datasets, model multivariate patterns, develop indices, and foster transparent methodology
- Ecology study design, development, and implementation
- Actively manage research partnerships and co-authorships with collaborators at Stanford University, Duke University, University of British Columbia, and more.

May 2016 – March 2017

Research Associate – Department of Environmental Conservation, University of Massachusetts Amherst, Andy J. Danylchuk Lab

Responsibilities included:

- First author on several peer reviewed scientific publications
- Exploration, visualization, modeling, and interpretation of complex interactive and non-linear datasets



Abstract ANN model prediction of biodiversity in the southern hemisphere.

May 2016 – August 2016

Multivariate Morphometric Stock Analysis Internship – Gulf of Maine Research Institute, Portland, Maine

Responsibilities included:

- Tasked with stock identification analysis methodology development
- Morphometric Box-truss processing and analysis
- Database management
- Factor analysis and group discrimination (Cluster analysis, PCA, CPCA, LDA)

January 2016 – Present

Ecology and Quantitative Analysis Private Consulting – Northampton, Massachusetts

Responsibilities include:

- Model development, study design
- Data manipulation, exploration, and visualization

September 2014 – May 2016

Teaching Assistant: Environment and Society, Conservation Genetics, and Aquatic Conservation

University of Massachusetts Amherst

Responsibilities included:

- Advised undergraduate/graduate students on assignments, exams, problem sets, and research papers
- Graded course materials, papers, exams, assignments
- Lectured and led class specific course material
- Provided educational guidance for research, citations, course content, and course preparation

March 2012 – August 2014

Research Assistant – University of Massachusetts Amherst

Responsibilities included:

- Designed acoustic telemetry networks (VPS and coarse acoustic nodal array)
- Deployed acoustic receivers and developed monitoring arrays
- Compiled and archived databases of tropical benthic survey transects

August 2013 – May 2014

Aquatic Ecology Field Technician – University of Illinois: Natural History Survey

Responsibilities included:

- Long term natural history data collection and database management
- Electrofishing, gill netting, seine netting
- species identification and dichotomization

May 2011 – August 2011

Alaska Mountain Guides - Day Trip Rock Guide, Skagway, AK

Responsibilities included:

- WFA certified, first Aid/CPR
- Logistical field safety management and climbing instruction

January 2011 – May 2011

Sustainable Aquaculture Lab Technician - University of Massachusetts Amherst

Responsibilities included:

- Lab maintenance, equipment design, research, and development
- Experienced in managing small scale recirculating hydroponic/aquaculture systems

September 2009 – June 2009

Sensing Systems Intern – New Bedford, MA

Responsibilities included:

- Load cell fabrication, calibration, and cycle testing

3. PUBLICATIONS

- Brownscombe, J. W., Griffin, L. P., Gagne, T., Haak, C. R., Cooke, S. J., & Danylchuk, A. J. (2015). Physiological stress and reflex impairment of recreationally angled bonefish in Puerto Rico. *Environmental Biology of Fishes*, 98(11), 2287-2295.
- Chapman, D. A.*, Gagne, T. O.*, Ovitz, K. L., Griffin, L. P., Danylchuk, A. J., & Markowitz, E. M. (2018). Modeling intentions to sanction among anglers in a catch-and-release recreational fishery for golden dorado (*Salminus brasiliensis*) in Salta, Argentina. *Human Dimensions of Wildlife*, 1-8.
- Finn, J. T., Brownscombe, J. W., Haak, C. R., Cooke, S. J., Cormier, R., Gagne, T., & Danylchuk, A. J. (2014). Applying network methods to acoustic telemetry data: modeling the movements of tropical marine fishes. *Ecological Modelling*, 293, 139-149.
- Gagne, T., Hyrenbach, K. D., Hagemann, M., Bass, O., Pimm, S., MacDonalrd, M., ... & Van Houtan, K. (2018). Seabird Trophic Position Across Three Ocean Regions Tracks Ecosystem Differences. *Frontiers in Marine Science*, 5, 317.
- Gagne, T. O., Hyrenbach, K. D., Hagemann, M. E., Bass, L. O., Pimm, S. L. MacDonald, M., Peck, B. & Van Houtan, K. S. (2018). Trophic downgrading across three ocean regions track ecosystem status. *In prep.*
- Gagne, T. O., Reygondeau, G., Jenkins, C. N., Sexton, S. J., Bograd, E. L. Hazen, E. L., & Van Houtan, K. S. (2018). On the drivers of global biodiversity: unifying tools, data, metrics, and domains. *In prep.*
- Gagne, T. O., Hyrenbach, K. D., Hagemann, M. E., & Van Houtan, K. S. (2018). Trophic signatures of seabirds suggest shifts in oceanic ecosystems. *Science advances*, 4(2).
- Gagne, T. G., Ovitz, K. O., Griffin, L. P., Brownscombe, J. W., Cooke, S. J., & Danylchuk, A. J. (2016). Evaluating the consequences of catch-and-release recreational angling on golden dorado (*Salminus brasiliensis*) in Salta, Argentina. *Fisheries Research*.
- Griffin, L. P., Brownscombe, Gagne, T.O., J.W., Wilson, A., & Danylchuk, A. J. (2016). Individual-level behavioral responses of immature green turtles (*Chelonia mydas*) to snorkeler disturbance. *Oecologia*. In Press.
- Liu, Z., Moxley, J. H., Kanive, P., Gleiss, A., Maughan, T., Bird, L. ..., Tyler Gagne; Connor F. White; Salvador J. Jorgensen. Deep learning accurately predicts white shark locomotor activity from depth data. *Animal Biotelemetry*. *In prep.*

* *shared co-first authorship*

4. PRESENTATIONS

- Gagne, T. O. (2017, June). Trophic signatures of seabirds suggest shifts in oceanic ecosystems. Hawaii Ecosystems Meeting. University of Hawaii Hilo.
- Gagne, T. O. (2015, November). Evaluating emerging catch-and-release fisheries: Implications for conservation and management of dorado in Salta, Argentina. Life Sciences Graduate Research Symposium. University of Massachusetts Amherst.
- Gagne, T. O. (2015, August). Multi-Stakeholder Participation in the Development of Best Practices for Catch-and-Release: A Case Study on Golden Dorado, Argentina. Session: Fishing Blind: Highlighting the Need for the Development and Communication of Species-Specific Guidelines for Catch-and-Release. American Fisheries Society Annual Meeting. Portland, Oregon.

5. EDUCATION

Master of Science 2014 - 2016
 University: University of Massachusetts Amherst
 Major: Environmental Conservation
 Specialization: Quantitative Ecology
 Degree work: Recreational fisheries evaluation

Bachelor of Science 2009 - 2012
 University: University of Massachusetts Amherst
 Major: Wildlife and Fish Conservation

6. HONORS and AWARDS

Awards

- Richard Cronin, Fisheries Research Award Fund, 2015
- ECo Department Distinguished Summer Research Fellowship, 2012

7. PROFESSIONAL AFFILIATIONS

American Fisheries Society.....Member 2014-present
 Fisheries Research Manuscript Reviewer..... 2015-present

8. ANALYTIC SKILLS CONTINUED

Data manipulation and management

- data.table, dplyr, reshape2
- tidyr, broom
- git/github

Visualization

- Advanced ggplot2, plotly, lattice, carto
- Tabular, matrices, imaging, hyperspectral, spatial, time series
- R Shiny app development

Feature engineering

- Dimensional scaling, reduction
- PCA, LDA, Autoencoders, tSNE
- Hierarchical clustering
- Unsupervised learning and classification
- Self-organizing maps
- Group discrimination
- Natural language processing, tfidf, N-grams, word vectors, sentiment analysis

Modeling

- Keras, H2o.ai, Tensorflow
- Light gradient boosting models, XGBoost, GBMs
- RandomForest
- Spatial autocorrelative regression models
- Sentiment Analysis
- Machine vision
- GLMs, GLMMs, lme4, nlme
- Bayesian hierarchical modeling, rstan, rstanarm, brms
- Sensitivity analysis, cross validation
- Variable importance

Other

- 3D modeling, Autodesk Fusion
- Gcode development
- Toolpath mapping
- Adobe Creative suite

9. RELEVANT COURSEWORK

Analysis of Environmental Data
 Independent Study - Marine Spatial Planning
 Applied Biostatistics with R/lab
 Advanced Fisheries Management
 Recreational Fisheries Science and Conservation
 Current Research in Environmental Conservation
 Readings in Environmental Psychology

Communicating Science: Video Media and
 Conservation Landscape Ecology
 Environmental Economics
 Human Dimensions in Natural Resource Management
 Dynamics
 Management of Wildlife Populations
 Advanced GIS: Habitat Modeling
 Sustainable Aquaculture

Fish Ecology
Nat Res Policy and Admin
Indigenous Peoples and Conservation

Wildlife Habitat Management
Forest and Wetland Hydrology

10. FIELD SKILLS

- Map use/orienteering
- GPS, PLB and EPIRB
- Expedition provisioning, planning, logistics, snow and ice travel
- Extended remote living
- Sailing, inshore and coastal navigation
- Engine rebuild and repair
- Manual trans, four-wheel drive operation
- Mechanic skill, MIG welding
- Fisheries sampling protocol
- Underwater acoustic telemetry network development, design, and management
- Videography

11. SERVICE

La Loma Permaculture Farm, Field Tech, Bastimentos, Panama

The Plant – Aquaponics Farm Lab Tech, Chicago, Illinois

Cooperative Agricultura Cafetelera Pangoa, San Martin de Pangoa, Peru

12. JOB RELATED TRAINING

First Aid - Summer 2016
CPR/AED - Summer 2016
WFA - Fall 2011
NAUI Basic Scuba - Fall 2011 w/100+ tech/research dives
Safety-at-Sea/Seamen training – Summer 2016