

Elmer O. Quispe Salazar

Quantitative biologist in marine ecology and fisheries

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Education

- 2025 **Master's degree in Marine Sciences**, *Universidad Peruana Cayetano Heredia*
- Thesis: State indicators of the north-central stock of the Peruvian anchovy (*Engraulis ringens*): sensitivity to environmental and anthropogenic factors.
- 2025 **Professional Degree in Biology, specialization in Hydrobiology and Fisheries (with highest honors)**, *Universidad Nacional Mayor de San Marcos*
- Thesis: Interannual variability in the growth of the north-central stock of the Peruvian anchovy (*Engraulis ringens*) during the period 1960–2022. 
- 2018 **Bachelor's degree in Biological Sciences**, *Universidad Nacional Mayor de San Marcos*

Experience

- 2021–Present **Researcher in biological and biometric information from pelagic resource assessment surveys**, *Population Dynamics and Pelagic Resource Assessment Unit*, Instituto del Mar del Perú, Peru, PE
- Supervisor: MSc. Erich Diaz Acuña | Unit coordinator
- Processing, validation, and analysis of pelagic resource assessment survey data.
 - Estimation of biological and population parameters for the main pelagic resources.
 - Preparation of technical-scientific reports on the status of pelagic resources and fishery projections.
 - Development of automated routines in scientific programming environments.
 - Standardization of results with traceability for stock assessments.
- 2019–2021 **Researcher on the effects of the environment on fishery production and the spatial distribution of anchovy**, *Population Dynamics and Pelagic Resource Assessment Unit*, Instituto del Mar del Perú, Peru, PE
- Supervisor: MSc. Erich Diaz Acuña | Unit coordinator
- Analysis of environmental effects on fleet dynamics and anchovy landings.
 - Modeling of the spatial distribution of anchovy in relation to the environment.
 - Integration of satellite information in scientific programming environments.
 - Preparation of technical-scientific reports on the status of pelagic resources and fishery projections.

- 2018–2019 **Researcher on the spatial distribution of pelagic resources**, *Population Dynamics and Pelagic Resource Assessment Unit*, Instituto del Mar del Perú, Peru, PE
 Supervisor: MSc. Erich Diaz Acuña | Unit coordinator
- Processing and analysis of geospatial data on anchovy distribution.
 - Support in the implementation of spatial distribution models for anchovy.
 - Production of maps and exploratory analysis using GIS and scientific programming.
 - Preparation of technical products and participation in reports on spatial patterns of biomass and size structure.
- 2016–2018 **Technical assistant in biological assessment and monitoring of marine and coastal ecosystems**, *Biological Assessment Laboratory*, The Environment Management (TEM), Peru, PE
 Supervisor: MSc. Elmer Ramo Figueroa | Scientific Manager
- 2015–2016 **Pre-professional intern in assessment and monitoring of ichthyic resources and marine benthos**, *Monitoring and Assessment Program of Peruvian Andean Biodiversity and the Marine Ecosystem (BMAP)*, Center for Education and Sustainability of the Smithsonian Conservation Biology Institute, Peru, PE
 Supervisor: Ph.D. Ximena Velez-Zuazo | Director of the Peru Marine Program

Peer-reviewed publications

- 2025 **Quispe-Salazar, E.**, Sánchez, J., & Perea, Á. *Classification models based on the gonadosomatic index to determine gonadal maturity stages: a case study in the Peruvian anchovy *Engraulis ringens**. *Scientia Marina* Vol. 89, No. 4, e117.. doi:10.3989/scimar.05636.117
- 2025 **Quispe-Salazar, E.**, Grados, D., Pozada-Herrera, M. *Aggregative behavior of the Peruvian anchovy (*Engraulis ringens*): description of school typology from onboard observations*. *Bol. Inst. Mar Perú* (under review).
- 2025 Galarza-Tirado, G., **Quispe-Salazar, E.**, Limache, J., Moron, G. *Marine fauna associated with the industrial purse seine fishery based on observations from the program 'Bitácoras de Pesca'*. *Bol. Inst. Mar Perú* (under review).

Grey literature

- 2024 Ayón, P., Bruno, C., Canales-Aguirre, C. B., ... Pinedo, E., Pozada, M., **Quispe, E.**, Sotil, G., Stephenson, F., Vásquez, S. I., Zenteno, J. *Critical appraisal of research approaches to inform evidence of connectivity of *Trachurus murphyi*: A systematic review of 11 topics*. Working Paper SC12-WP03, 12th Scientific Committee Meeting, South Pacific Regional Fisheries Management Organisation (SPRFMO) Lima, Peru, Sep–Oct. ■
- 2024 Geronimo, M., Lujan, C., Torrejón, J., & **Quispe, E.** *The Joint Jack Mackerel (JJM) model: A user guide. IMARPE's proposal*. Document SC12-JM08, 12th Scientific Committee Meeting, South Pacific Regional Fisheries Management Organisation (SPRFMO) Lima, Peru, Sep–Oct. ■
- 2023 Gutiérrez, M., Tarazona, A., Grados, D., Valdez, C., **Quispe, E.**, Pereyra, N., Peraltila, S., Meneses, G., & Vásquez, L. *Habitat conditions of jack mackerel (*Trachurus murphyi*) and chub mackerel (*Scomber japonicus*) in the Peruvian sea between 2021 and 2023*. Document SC11-HM02, 11th Meeting of the Scientific Committee, South Pacific Regional Fisheries Management Organisation (SPRFMO) Panama City, PA, Sep. ■

Conferences and presentations

- 2024 **Quispe-Salazar, E.** *PelagicSurveys: An R package for the analysis of biometric and biological data from hydroacoustic surveys of pelagic resources*. Invited keynote talk at CONECTA PESQUERO: III Research, Development and Innovation Meeting, Faculty of Fisheries, UNALM Lima City, Peru, Dec. 📄
- 2024 **Quispe, E., & Sánchez, J.** *Suitability of the gonadosomatic index in anchoveta (*Engraulis ringens*): sexual maturity, 5% critical value, and seasonal variation*. Oral presentation and abstract published in the proceedings of the VI Ibero-American Symposium on Reproductive Ecology, Recruitment and Fisheries (SIBECORP) Lisbon City, PT, Nov. 📄
- 2024 Díaz, E., Marín, P., **Quispe-Salazar, E.**, Torrejón, J., & Grados, D. *Impacts of El Niño 2023–2024 on the population dynamics of the Peruvian anchoveta*. Abstract published in the proceedings of the Scientific Workshop: El Niño 2023–2024 — Effects and projections on the Peruvian Sea and its living resources Callao City, PE, May. 📄
- 2024 **Quispe-Salazar, E.** *Changes in the pelagic community associated with El Niño 2023–2024 in the Humboldt Current Ecosystem off Peru*. Oral presentation and abstract published in the proceedings of the Scientific Workshop: El Niño 2023–2024 — Effects and projections on the Peruvian Sea and its living resources Callao City, PE, May. 📄
- 2022 Díaz, E., Marín, P., & **Quispe-Salazar, E.** *Variability at different time scales in the biomass of the north-central stock of the Peruvian anchoveta, period 1953–2022*. Oral presentation at the Open Science Conference on Eastern Boundary Upwelling Systems (EBUS) & Second International Conference on the Humboldt Current System Lima City, PE, Sep. 📄
- 2018 **Quispe-Salazar, E.**, Uribe, R. A., & Perea, A. *Marine biodiversity refuges in Peru: Underwater forests of *Eisenia cokeri* M. Howe 1914*. Oral presentation and abstract published in the abstract book of the VI Congress of Marine Sciences of Peru (CONCIMAR) Huacho City, PE, Oct. 📄
- 2018 **Quispe-Salazar, E.**, & Uribe, R. A. *Community dynamics of the megabenthos inhabiting the brown macroalgal forests of *Eisenia cokeri* M. Howe 1914 on the north-central coast of Peru*. Abstract published in the abstract book of the VI Congress of Marine Sciences of Peru (CONCIMAR) Huacho City, PE, Oct. 📄

Awards and Funding

- 2024 Best Doctoral Research Award – VI Ibero-American Symposium on Reproductive Ecology, Recruitment and Fisheries (VI SIBECORP) (*Oral Presentation*). Title: “Suitability of the gonadosomatic index in anchoveta (*Engraulis ringens*): sexual maturity, 5% critical value, and seasonal variation” Lisbon, PT, Nov. Organized by: Portuguese Institute for the Sea and Atmosphere (IPMA), Spanish Institute of Oceanography (IEO), Ibero-American Fisheries Research Network (INVIPECA).

- 2024 Recognition in the Marine Science Hackathon *Outstanding collaborative open-source project*. Title: "Spatio-temporal variability of tuna catches (1990–2023)" Organized by: Spanish Institute of Oceanography (IEO-CSIC) and Spanish Agency for International Development Cooperation (AECID). ■
- 2023 Scholarship recipient for the Diploma in "*Fisheries Resources Assessment*" *Full scholarship*. School of Marine Sciences, Pontificia Universidad Católica de Valparaíso (PUCV) Valparaíso, Chile, Aug–Nov. Lead instructor: Dr. Cristian M. Canales.
- 2022–2023 Recognition for excellence in the "*Statistical Models*" program (*first place*). Data Science Research Perú (DSRP) Lima, PE, Nov–Jan. Lead instructor: Dr. Ernesto A. Ponsot Balaguer.
- 2018 Recognition for outstanding academic performance in the course "*Population Dynamics of Fisheries Resources – Part I*" (*first place*). Instituto del Mar del Perú (IMARPE) – General Directorate of Pelagic Resources Research Callao, PE, Sep. Lead instructor: MSc. Erich Díaz Acuña.

Teaching

- 2025 Course "Introduction to Fisheries Stock Assessment" (*6 academic hours*). Modules: somatic growth and selectivity. Callao, PE, Jan. Organizer: Instituto del Mar del Perú (IMARPE).
- 2024 Course "Scientific Programming in R: Basic Level" (*18 academic hours*). Modules: introduction to R, data handling and visualization. Lima, PE, Nov. Organizer: Data Science Research Perú (DSRP).

Specialized Training

Population dynamics, stock assessment, and fisheries management

- 2024 Applications of natural tags in fisheries science (*5h, Course*). VI SIBECORP - IPMA (Portugal) and INVIPESCA Network. Virtual mode, Nov.
- 2024 Application of molecular genetics tools in ecology and fisheries (*5h, Course*). VI SIBECORP - IPMA (Portugal) and INVIPESCA Network. Virtual mode, Nov.
- 2024 Simulation modeling in R for fisheries management (*15h, Course*). Pontificia Universidad Católica de Valparaíso (PUCV) Valparaíso, CL, Aug.
- 2023 Fisheries Resources Assessment (*80h, Diploma*). Pontificia Universidad Católica de Valparaíso (PUCV) Valparaíso, CL, Aug–Dec.
- 2023 Stock assessment of dolphinfish (*Coryphaena hippurus*) in the Southeast Pacific (*40h, Course*). Instituto del Mar del Perú (IMARPE), Sustainable Fisheries & Public Research Institute of Aquaculture and Fisheries Lima, PE, Jun.
- 2023 Stock Assessment Using Age-Structured Models (*40h, Course*). Instituto del Mar del Perú (IMARPE) & University of Washington Callao, PE, Jan.

- 2022 Introduction to the use of open-source software applied to oceanographic data analysis and fisheries management (30h, *Course*). Spanish Institute of Oceanography (IEO-CSIC) and Spanish Agency for International Development Cooperation (AECID) La Antigua Guatemala, GT, Dec.
- 2020 Ecosystem Approach to Fisheries Management (40h, *Course*). United Nations Food and Agriculture Organization (FAO) & United Nations Development Programme (UNDP) Virtual mode, Apr.
- 2019 Population Dynamics of Fisheries Resources – Part I (24h, *Workshop course*). Instituto del Mar del Perú (IMARPE) – General Directorate of Pelagic Resources Research Callao, PE, Sep.
- Data science, scientific programming, statistics, and modeling
- 2024 Marine science hackathon in Spanish (35h, *Hackathon*). Spanish Institute of Oceanography (IEO-CSIC) and Spanish Agency for International Development Cooperation (AECID) La Antigua Guatemala, GT, Nov.
- 2024 Python Fundamentals for Data Science (16h, *Course*). Data Science Research Perú (DSRP) Lima, PE, Jan.
- 2024 Descriptive Statistics (32h, *Course*). Data Science Research Perú (DSRP) Lima, PE, Feb.
- 2024 Foundations for Data Science (24h, *Course*). Data Science Research Perú (DSRP) Lima, PE, Jan.
- 2024 Statistics and Probability (40h, *Course*). Universidad Nacional Autónoma de México Virtual mode, MX, Jan.
- 2024 Python Fundamentals for Data Science (16h, *Course*). Data Science Research Perú (DSRP) Lima, PE, Jan.
- 2023 Statistical Models (48h, *Course*). Data Science Research Perú (DSRP) Lima, PE, Nov–Jan.
- 2023 Introduction to Python and Numerical Methods for Science (30h, *Course*). Universidad Nacional Pedro Ruiz Gallo (UNPRG) Lambayeque, PE, Jul.
- 2023 C++ Programming (20h, *Course*). Azul School - Collaborative educational platform Virtual mode, Jan.
- 2023 Statistical Models (48h, *Course*). Data Science Research Perú (DSRP) Lima, PE, Jan.
- 2020 Advanced Git and GitHub (17h, *Course*). Edutin Academy (United States) Virtual mode, Sep.
- 2020 Git + GitHub (26h, *Course*). EDESCE - Software Development Consulting and Specialization Virtual mode, Sep–Nov.
- 2020 Introduction to Python Programming (18h, *Course*). Pontificia Universidad Católica de Valparaíso (PUCV) & Coursera Virtual mode, Apr.
- 2019 Basic-Intermediate L^AT_EX (32h, *Course*). Universidad Nacional Mayor de San Marcos (UNMSM) Lima, PE, Nov.

- 2019 Multivariate Techniques with R (*15h, Workshop course*). Universidad Nacional Agraria La Molina (UNALM) Lima, PE, Feb.
- 2017 Programming in R: Basic, Intermediate, and Advanced (*72h, Workshop course*). Universidad Nacional Mayor de San Marcos (UNMSM) Lima, PE, Sep–Oct.
- Technologies, tools, and geospatial analysis
- 2025 Remote Sensing and Emerging Technologies (*21h, Course*). Pontificia Universidad Católica del Perú (PUCP) Lima, PE, Mar.
- 2025 Spatial Modeling with Template Model Builder (TMB) (*12h, Course*). Pontificia Universidad Católica de Valparaíso (PUCV). Valparaíso, CL, Jan.
- 2019 Introduction to Spatial Statistics with QGIS, GEODA, and R (*20h, Workshop course*). Universidad Nacional Agraria La Molina (UNALM) Lima, PE, Feb.
- Marine ecosystems, ecology, and marine biodiversity
- 2024 Fundamentals for publishing marine biodiversity data in OBIS (*20h, Course*). IOC-UNESCO/IODE, INVEMAR, & OBIS nodes Colombia, Caribbean and ESP. Ocean-Teacher Global Academy (OTGA), Dec.
- 2022–2023 TRASMARES: Specialized TRaining on Applied tools for Sustainable MARine EcosystemS (*120h, Erasmus+ Program*). University of Cantabria (Spain) & European Union Erasmus+ Program. Virtual mode, Nov–Jan.
- 2024 Application of Biomarkers for the Study of Marine Food Webs (*48h, Course*). GMF Global Capacity Building Fund, VLIR-USO Program (Flemish Interuniversity Council - University Development Cooperation) & Belgian Cooperation (Belgian Development Cooperation) Lima, PE, Apr.
- 2017 Marine Area Management (*24h, Course*). Universidad Nacional Mayor de San Marcos (UNMSM) & Universidad Nacional Agraria La Molina (UNALM) Lima, PE, Jun.
- Systems, tools, and ocean information analysis
- 2024 Selection, acquisition, and processing of oceanographic data (*2h, Course*). VI SIBECORP - IPMA (Portugal) & INVIPESCA Network. Virtual mode, Nov.
- 2023 Marine Sciences: use of ocean databases to support robust policies and decision-making (*20h, Course*). National University of Costa Rica & International Ocean Institute. Heredia, CR, May–Jun.
- 2023 Machine Learning in Weather & Climate (*13.5h, Course*). European Centre for Medium-Range Weather Forecasts (ECMWF) & International Foundation Big Data and Artificial Intelligence for Human Development (IFAB) Virtual mode, Jan–Apr.
- Research ethics
- 2023 Responsible Conduct of Research - CITI Program (*Certification, Expiration Date 25-Apr-2026*). Universidad Peruana Cayetano Heredia & CITI Program. International certification, Apr.

2023 Responsible Conduct of Research (*Certification*). Andean Center for Research and Training in Global Health Informatics, Universidad Peruana Cayetano Heredia National certification, Apr..