

SHIPENG DONG

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Employment

Postdoctoral Researcher - GEOMAR Helmholtz Centre for Ocean Research Kiel (Germany)	2025 - present
Project title: Predicting the growth and survival of temperature-acclimated mussels under marine heatwaves.	

EDUCATION

Visiting Ph.D Student - Institute of Marine Research (Norway)	2023 - 2024
Project title: Modeling the effects of climate change on mussels and tunicate farming in a Norwegian fjord.	
Doctor of Agriculture in Aquaculture - Ocean University of China (China)	2020 - 2024
Thesis title: Assessment of the carrying capacity of integrated aquaculture pond of <i>Portunus trituberculatus</i> .	
Master's Degree in Aquaculture - Shanghai Ocean University (China)	2017 - 2020
Thesis title: Estimation of carrying capacity of <i>Ruditapes philippinarum</i> aquaculture in Jiaozhou Bay.	
Bachelor's Degree in Aquaculture - Yantai University (China)	2013 - 2017

RESEARCH INTEREST

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- Applications of Individual-based model (IBM) of aquatic species
 - Applications of regional ecosystem model and food-web model
 - Prediction of the effects of climate change on fisheries and aquaculture

RESEARCH EXPERIENCE

Predicting the growth and survival of two mussel populations under marine heatwaves

Principal participant –postdoctoral project **2025-2026**

The project aims to predict how mussels from different coastal populations respond to marine heatwaves. Mussels were temperature-acclimated in mesocosm experiments for five months, followed by laboratory tests of growth and survival under heatwave conditions. The collected data will be analyzed with Dynamic Energy Budget (DEB) and Thermal Tolerance Landscape (TTL) models.

Modeling the effects of climate change on mussels farming in a Norwegian fjord

Principal supervisor – Visiting researcher project **2023-2024**

This project aimed to predict how marine organisms respond to the combined stressors of ocean acidification and warming. IBMs were developed using data from a three-month mesocosm experiment..

Practice assessment of integrated pond mariculture of swimming crab

Principal supervisor - Doctoral project **2021-2023**

This project aimed to optimize an integrated pond mariculture system. Aquaculture management practices and key biogeochemical processes were parameterized. An ecosystem model of the pond was developed by coupling the IBMs of swimming crab, kuruma shrimp, and razor clam. The carrying capacity was then evaluated by adjusting stocking densities and management strategies in accordance with tailwater discharge standards.

Performance evaluation of razor clam and hard clam

Principal participant - Doctoral project **2020-2023**

This project aimed to develop mechanistic IBMs to assess the performance of bivalves under climate change. IBMs were first constructed for razor clams and hard clams. The effects of altered food availability and temperature on razor clam growth were then evaluated. For hard clams, the consequences of sulfide accumulation on population dynamics were quantified by integrating a toxicokinetic-toxicodynamic model.

PUBLICATIONS

- Yue L. [†], Dong S.P. [†], et al. (2025). Impact assessment of Chinese mitten crab polyculture on saline-alkali rice fields based on food web models. **Aquaculture Reports**, 40, 102597.
- Zhang H. [†], Dong S.P. [†], et al. (2025). Application of the DEB-TKTD model with multi-omics data: Prediction of life history traits of Chinese mitten crab (*Eriocheir sinensis*) under different salinities. **Ecotoxicology and Environmental Safety**, 290, 117635.
- Dong S.P., Wang F., et al. (2024). Bioremediation potential of the hard clam *Mercenaria mercenaria* as an intensive shrimp aquaculture pond polyculture candidate. **Water Research**, 121552
- Dong S.P., Wang F., et al. (2024). Practice assessment of integrated marine pond aquaculture for increasing benefits and reducing environmental pollution using an ecosystem modeling approach. **Science of Total Environment**, 908.
- Dong S.P., Wang F., et al. (2022). Growth performance and ecological services evaluation of razor clams based on dynamic energy budget model. **Journal of Environmental Management**, 306, 114392.
- Dong S.P., Shan H.W., et al. (2022). An ecosystem approach for integrated pond aquaculture practice: application of food web models and ecosystem indices. **Ecological Indicators**, 141, 109154.
- Dong S.P., Wang F., et al. (2022). A discontinuous individual growth model of swimming crab *Portunus trituberculatus* and its application to the nutrient dynamic simulation in an intensive mariculture pond. **Frontiers in Marine Science**, 9, 918449.
- Dong S.P., Liu D.P., et al. (2022). A dynamic energy budget model for kuruma shrimp *Penaeus japonicus*: Parameterisation and application in integrated marine pond aquaculture. **Animals**, 12, 1828.
- Xu X. [†], Dong S.P. [†], et al. (2022). Filter-feeding bivalve weakens food competition between crustaceans (*Portunus trituberculatus*, *Marsupenaeus japonicus*) in integrated culture ponds: Evidence from 18S rDNA barcoding and stable isotope analysis. **Frontiers in Marine Science**, 489.
- Dong S.P., Wang F., et al. (2021). Assessment of the carrying capacity of integrated pond aquaculture of *Portunus trituberculatus* at the ecosystem level. **Frontiers in Marine Science**, 1495.
- Dong S.P., Wang F., et al. (2021). Evaluation of the trophic structure and energy flow of a rice-crayfish integrated farming ecosystem based on the Ecopath model. **Aquaculture**, 539, 736626.
- Dong S.P., Jiang Z.J., et al. (2022). Dynamical ecosystem model-based carrying capacity estimation on Manila Clam (*Ruditapes philippinarum*) in Jiaozhou Bay. **Progress in Fishery Sciences**, 43: 72-82. (in Chinese).

Note: “[†]” denotes co-first authors.

MERITS AND AWARDS

Period	Funder	My role
2025 - 2026	Ocean University of China	Applicant
2023 - 2024	The Research Council of Norway	Applicant
2022 - 2024	Ministry of Finance of People's Republic of China	Applicant
2022 - 2023	Ministry of Education of People's Republic of China	Applicant
2021 - 2022	Ocean University of China	Applicant

TECHNICAL SKILLS AND LANGUAGE

Programming: Python, Matlab, R, Fortran

Graphing: Origin, Graphpad, SigmaPlot, Photoshop

Others: Rich experience in bay, pond, and lake investigation, as well as shellfish and crustacean culture