# 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 *Portunus trituberculatus*.

**Master's Degree in Aquaculture -** *Shanghai Ocean University* (China) **2017 - 2020**

Thesis title: Estimation of carrying capacity of *Ruditapes philippinarum* aquaculture in Jiaozhou Bay.

**Bachelor's Degree in Aquaculture -** *Yantai University* (China) **2013 - 2017**

## RESEARCH INTEREST

- 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

Jiang, K.Y., Jiang, T., **Dong, S.P.*,** Wang, F.* (2025). Assessment of carrying capacity and management practices for *Litopenaeus vannamei* industrialized aquaculture based on an ecosystem model. Aquaculture, 743453.

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.Z. †, **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 condidate. **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 estimationon Manila Clam (*Ruditapes philippinarum*) in Jiaozhou Bay. **Progress in Fishery Sciences**. 43: 72-82. (in Chinese).

Note: "†" denotes co-first authors, "*" denotes corresponding author.

## 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