

## Personal Webpage (English Version)

### Welcome Message

Welcome to the personal webpage of **Professor Xiaowei Zhang**, a dedicated researcher and educator in aquatic ecology and environmental sciences. Through this platform, I aim to share insights into my academic journey, research achievements, and contributions to fostering ecological sustainability.

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Prof. Xiaowei Zhang holds a Distinguished Professorship from the School of Ecology and Environment Science, Yunnan University. He is mainly engaged in the research on the theory and methods of aquatic ecosystem security and health, focusing on the development of environmental DNA technologies in Biodiversity Conservation and Ecosystem Restoration. Currently his research group is devoted in **Spatiotemporal Intelligence of Eco-Environment through eDNA**: Utilizing cutting-edge community eDNA data to gain insights into ecological and environmental dynamics over time and space. He has published more than 200 SCI papers (H-index=50) and 3 books. He serves as Associate Editor of *Environmental Science & Technology*.

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### Research Focus Areas:

- Developing eDNA technologies and instruments for biodiversity monitoring in aquatic ecosystems (rivers, lake, coastal environment)
- Developing innovations in wastewater surveillance for public health monitoring.
- Ecotoxicology of emerging pollution and risk management

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### Academic Background

- **2004-2008:** Ph.D. in Zoology & Environmental Toxicology, Michigan State University.
  - **2000-2003:** Master's Degree in Environmental Science, City University of Hong Kong.
  - **1996-2000:** Bachelor's Degree in Environmental Science & Technology, Nanjing University.
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### Awards and Honors

- **China Toxicology Society “Development Award for Alternative Methods in Toxicology” (2023):** Recognizing his contribution in technology innovation on new methodology approach in toxicology
  - **Gold Medal Advisor for the “China International Internet+ College Student Innovation and Entrepreneurship Competition” (2020)** Recognizing exceptional mentorship on college student innovation.
  - **National Ecological Environmental Protection Professional and Technical Leading Talent, Ministry of Ecology and Environment, China (2020):** For achievement in science and technology innovation in Chinese Ecological Environmental Protection.
  - **Early Career Scientist, Environmental Science & Technology, American Chemical Society (2019):** This prestigious recognition aims to encourage early-career scientists to continue driving forward research in critical areas of environmental science
  - **National High-Level Talent Special Support Program – Leading Talent in Scientific and Technological Innovation (2019)**
  - **Youth Scientist Gold Award, Chinese Society for Environmental Sciences (2018)**
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### Research Highlights

Professor Xiaowei Zhang has recently led significant national and international research projects, contributing to the advancement of ecological health assessments and environmental risk management. Below are some key highlights:

1. **Yangtze River Ecosystem Health Assessment (2022YFC3202100, 2022YFC3202101)**

Under China's National Key Research and Development Program, these projects focus on developing a comprehensive evaluation of critical indicator species and ecosystem health within the Yangtze River basin. The research involves constructing a detailed database and assessment system to support ecological restoration efforts. With a total funding of ¥15 million, these projects span from 2022 to 2026 and aim to provide groundbreaking methodologies for monitoring and safeguarding aquatic biodiversity.

2. **Predictive Toxicology for Zooplankton (Grant 41977206)**

Supported by the National Natural Science Foundation of China, this project (2020-2023) investigated cross-species sensitivity in zooplankton bio-toxicity. With ¥600,000 in funding, the study yielded insights into interspecies variability and predictive models for ecological risk, advancing our understanding of aquatic toxicology.

3. **Environmental DNA Applications (2022001)**

Focused on the practical applications of environmental DNA (eDNA), this project,

funded by the Jiangsu Provincial Department of Ecology and Environment, aims to develop smart analysis systems and automated collection devices for eDNA monitoring. With ¥3 million in funding, it facilitates real-time ecological data acquisition and supports environmental decision-making.

#### 4. Foundational Contributions to Toxicogenomics

Earlier works, including the National Natural Science Foundation's Excellent Young Scientist Grant (2014-2016, ¥1 million) and a pivotal 863 Program project (2013-2015, ¥11.8 million), laid the groundwork for Professor Zhang's research trajectory. These projects addressed chemical risk assessment and the ecological safety of industrial regions, introducing genomic tools and systemic approaches to risk evaluation.

#### 5. International Collaboration on Emerging Pollutants

Through the European Union's FP7 program, Professor Zhang co-led the Chinese team in a multinational initiative (2013-2018) addressing emerging pollutants in land and water management. This collaborative research provided sustainable solutions for mitigating pollution impacts across diverse ecosystems.

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### Professional Activities

- **Editorial Role:** Associated editor of *Environmental Science and Technology*.
- **Peer Review Contributions:** Reviewer for top-tier journals, including *Nature Communications* and *Molecular Ecology*.
- **Professional Affiliations:** Member of the Chinese Society for Environmental Sciences and the Ecological Society of America.

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### Selected Publications

- 1、 **Zhang X.** Environmental DNA Shaping a New Era of Ecotoxicological Research. *Environ Sci Technol.* 2019 53(10):5605-5612. **(Invited Perspective)**
- 2、 **Zhang X,** Xia P, Wang P, Yang J, Baird D. 2018. Omics advances in Ecotoxicology. *Environ Sci Technol.* 52(7):3842-3851. **(Invited Feature)**
- 3、 Liu YY, Yu NY, Fang WD, Tan QG, Ji R, Yang LY, Wei S, **Zhang X,** Miao AJ. Photodegradation of carbon dots cause cytotoxicity. *Nat Commun.* 2021;12(1):812.
- 4、 Li F, Altermatt F, Yang J, An S, Li A, **Zhang X.** Human activities' fingerprint on multitrophic biodiversity and ecosystem functions across a major river catchment in China. *Glob Chang Biol.* 2020 Dec;26(12):6867-6879.

**View Full publication list:** <https://orcid.org/0000-0001-8974-9963>

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### Publications in the Recent two years:

- 1) Zhang Y, Qu Y, Liu K, Zhong W, Yang J, Altermat F. **Zhang X\***. Evaluating eDNA and eRNA metabarcoding for aquatic biodiversity assessment: From bacteria to vertebrates, *Environ Sci Ecotechnol*, 2024, 21, 100441.

- 2) Zhang, Y., Huang, D., Jin, X. **Zhang X**. Long-term wetland biomonitoring highlights the differential impact of land use on macroinvertebrate diversity in Dongting Lake in China. *Commun Earth Environ* 5, 32 (2024).
- 3) Mu, Y., Zhang, J., Yang, J., Wu, J., Zhang, Y., Yu, H., **Zhang, X\***. Enhancing amphibian biomonitoring through eDNA metabarcoding. *Molecular Ecology Resources*, 2024, 00, e13931.
- 4) Li F\*, Zhang Y, Altermatt F, Yang J, **Zhang X\***. Destabilizing Effects of Environmental Stressors on Aquatic Communities and Interaction Networks across a Major River Basin. *Environ Sci Technol*. 2023, 57(20):7828-7839.
- 5) Yang J, Zhang L, Mu Y, Wang J, Yu H, **Zhang X\***. Unsupervised biological integrity assessment by eDNA biomonitoring of multi-trophic aquatic taxa. *Environ Int*. 2023,175:107950.
- 6) Altermatt, F\*, Carraro, L, Antonetti, M, Albouy, C, Zhang, Y, Lyet, A, **Zhang, X\***, & Pellissier, L\*. Quantifying biodiversity using eDNA from water bodies: General principles and recommendations for sampling designs. *Environmental DNA*, 2023, 5, 671–682.
- 7) Zhang Y, **Zhang X\***, Li F, Altermatt F, Fishing eDNA in one of the world's largest rivers: a case study of cross-sectional and depth profile sampling in the Yangtze" *Environ Sci Technol*. 2023. 57 (51), 21691-21703
- 8) Lin Y, Li X, Zhang S, Yang Q, Zhang R, **Zhang, X\***. Congener Variation of Genetic Dependent-Developmental Toxicology in Two Emerging Classes of Dioxin-like Compounds. *Environ Sci Technol*. 2023 57 (51), 21650-21661

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