

KAI CHEN

Department of Entomology, Nanjing Agricultural University, Nanjing Jiangsu 210095 China

Phone: (+86) 13813376717

Twitter: @kaic62952097

Email: ckai2005@gmail.com; kai.chen@njau.edu.cn; kaic2018@uw.edu

ResearchGate: https://www.researchgate.net/profile/Kai_Chen32

Research Interests

Macroecology and biogeography of aquatic organisms

Macroinvertebrate and fish traits and functional diversity

Environmental modeling

Assessment and monitoring of aquatic biodiversity and ecological integrity

Stream & large river ecology

Education

Ph.D. (2014) Nanjing Agricultural University (China). Entomology.

Visiting Student Program Utah State University (USA). Stream Ecology and Watershed Sciences
(2012 – 2013) (Advisor: Prof. Charles P. Hawkins).

B.S. (2009) Nanjing Agricultural University (China). Entomology.

Professional Experience

Visiting Scholar School of Aquatic and Fishery Sciences, University of Washington (USA)
(2018 – 2019) (Prof. Julian D. Olden).

Assistant Professor Department of Entomology, Nanjing Agricultural University (China).
(2016 – present)

Postdoctoral Fellow Center for Eco-environmental Science Researches, Nanjing Hydraulic Research
(2014 – 2016) Institute (China).

Research Assistant Department of Entomology, Nanjing Agricultural University (China).
(2009 – 2014)

Teaching Experience

Instructor Sino-Danish Center – Water and Environment: Freshwater Ecology:
(2020) Stream/River Ecology (*in English*)

Instructor Nanjing Agricultural University – Technical Entomology (PLPR4207),
(2017 – present) Biodiversity and Conservation (PLPR4222)

Teaching Assistant General Entomology (PLPR4201)
(2011)

Publications

† Corresponding author.

Peer Reviewed Articles:

Chen K., J.D. Olden. 2020. Threshold responses of riverine fish communities to land use conversion across regions of the world. *Global Change Biology* 26: 4952–4965.

- He S., K. Chen, J. Soininen, J. Heino, N. Ding, B. Wang. 2020. Elements of metacommunity structure of diatoms and macroinvertebrates within stream networks differing in environmental heterogeneity. *Journal of Biogeography* 47: 1755–1764.
- He S., J. Soininen, K. Chen, B. Wang. 2020. Environmental factors override dispersal-related factors in shaping diatom and macroinvertebrate communities within stream networks in China. *Frontiers in Ecology and Evolution* 8: 141.
- Zhang J., P. Jiang, K. Chen, S. He, B. Wang, X. Jin. 2020. Development of biological water quality categories for streams using a biotic index of macroinvertebrates in the Yangtze River Delta, China. *Ecological Indicators* 117: 106650.
- Chen K., A.R. Rajper, R.M. Hughes, J.R. Olson, H. Wei, B. Wang. 2019. Incorporating functional traits to enhance multimetric index performance and assess land use gradients. *Science of the Total Environment* 691: 1005–1015.
- Liu X., J. Zhang, W. Shi, M. Wang, K. Chen, L. Wang. 2019. Priority pollutants in water and sediments of a river for control basing on benthic macroinvertebrate community structure. *Water* 11: 1267.
- Chen K., J.R. Olson, J.J. Vander Laan, R.A. Hill, B. Wang, C.P. Hawkins. 2019. Improving the performance of ecological indices by selecting reference sites to balance quality and representation of natural conditions. *Hydrobiologia* 837: 177–194.
- Chen K., D. Sun, A.R. Rajper, M. Mulatibieke, R.M. Hughes, Y. Pan, A. Tayibazaer, Q. Chen, B. Wang. 2019. Concordance in biological condition and biodiversity between diatom and macroinvertebrate assemblages in Chinese arid-zone streams. *Hydrobiologia* 829: 245–263.
- Li S., W. Yang, L. Wang, K. Chen †, S. Xu, B. Wang. 2018. Influences of Environmental Factors on Macroinvertebrate Assemblages: Difference Between Mountain and Lowland Ecoregions, Wei River, China. *Environmental Monitoring and Assessment* 190(3): 152.
- Chen K., R.M. Hughes, J.G. Brito, C.G. Leal, R.P. Leitao, J.M.B. de Oliveira-Junior, V.C. de Oliveira, K.D. da Silva, S.F.B. Ferraz, J. Ferreira, N. Hamada, L. Juen, J. Nessimian, P.D.S. Pompeu, J. Zuanon. 2017. A multi-assemblage, multi-metric biological condition index for eastern Amazon streams. *Ecological Indicators* 78: 48–61.
- Ding N., W. Yang, Y. Zhou, I. Gonzalez-Bergonzoni, J. Zhang, K. Chen, N. Vidal, E. Jeppesen, Z. Liu, B. Wang. 2017. Different responses of functional traits and diversity of stream macroinvertebrates to environmental and spatial factors in the Xishuangbanna watershed, upper Mekong River Basin, China. *Science of the Total Environment* 574: 288–299.
- Lin Y., K. Chen, Q. Chen, Q. Yang. 2016. Effect of Disturbance on the Hydro-environmental Factors and Macroinvertebrate Community in the Lijiang River. *Procedia Engineering* 154: 247–251.
- Lin Y., Q. Chen, K. Chen, Q. Yang. 2016. Modelling the presence and identifying the determinant factors of dominant macroinvertebrate taxa in a karst river. *Environmental Monitoring and Assessment* 188: 318.
- Chen K., R.M. Hughes, B. Wang. 2015. Effects of fixed-count size on macroinvertebrate richness, site separation, and bioassessment of Chinese monsoonal streams. *Ecological Indicators* 53: 162–170.
- Chen K., R.M. Hughes, S. Xu, J. Zhang, D. Cai, B. Wang. 2014. Evaluating performance of macroinvertebrate-based adjusted and unadjusted multi-metric indices (MMI) using multi-season and multi-year samples. *Ecological Indicators* 36: 142–151.
- Wei H., K. Chen †, B. Wang. 2020. The spatial scale dependency of elevational patterns of taxonomic and functional diversity in aquatic insects in the Lancang River, Yunnan, China. *Biodiversity Science*, 28(4): 504–514. (in Chinese with English abstract) [魏慧玉, 陈凯 †, 王备新. 2020. 澜沧江流域水生昆虫群落分类多样性和功能多样性海拔格局的空间尺度依赖性. *生物多样性* 28(4):

504–514.]

- Wu C., J. Xu, S. Yin, C. Tan, K. Chen, J. Gao, B. Wang. 2019. The littoral zone macroinvertebrate distribution in relation to environment variables in the lower Yangtze River Channel from Nanjing down to estuary. *Chinese Journal of Applied & Environmental Biology* 25(3): 1–11. (in Chinese with English abstract) [吴聪, 徐靖, 银森录, 谈潮忠, 陈凯, 高晋, 王备新. 2019. 长江下游南京段至河口近岸带底栖动物分布格局及影响因素. *应用与环境生物学报* 25(3): 1–11.]
- Wang S., J. Zhang, Y. Lin, Q. Chen, K. Chen, W. Li. 2019. Multi-scale evaluation of river based on the macroinvertebrates multi-metric index. *Research of Environmental Sciences* 32(2): 284–292. (in Chinese with English abstract) [王硕, 张建云, 林育青, 陈求稳, 陈凯, 李卫明. 2019. 基于大型底栖动物多度量指数的河流多尺度评价. *环境科学研究* 32(2): 284–292.]
- Liu Y., K. Chen, Y. Cai, H. Yin, Y. Yan. 2018. The Health Assessment of the Main Rivers in the Chaohu Basin Using Fish-Index of Biotic Integrity. *Environmental Monitoring in China* 6: 73–83. (in Chinese with English abstract) [刘杨, 陈凯, 蔡永久, 尹洪斌, 严云志. 2018. 应用鱼类完整性指数 F-IBI 评价巢湖流域的主要河流健康. *中国环境监测* 6: 73–83.]
- Chen K., Q. Chen, H. Yu, B. Wang, X. Jin, Y. Wang, R. Ji, K. Cai. 2018. Methods and prospects of index of biological integrity used for China river health assessment. *China Environmental Science* 38(4): 1589–1600. (in Chinese with English abstract) [陈凯, 陈求稳, 于海燕, 王备新, 金小伟, 王业耀, 许人骥, 蔡琨. 2018. 应用生物完整性指数评价我国河流的生态健康. *中国环境科学* 38(4): 1589–1600.]
- Li S., M. Yi, K. Chen †, N. Ding, B. Wang, H. Yao. 2018. Differences in responses of macroinvertebrate traits and functional diversity to environmental variables at different spatial scales between ecoregions in the Wei River basin, China. *Acta Ecologica Sinica* 38(7): 2566–2578. (in Chinese with English abstract) [李胜利, 易茂红, 陈凯 †, 丁宁, 王备新, 姚花荣. 2018. 渭河底栖动物性状和功能对空间尺度环境变量响应的生态区差异性. *生态学报* 38(7): 2566–2578.]
- Qiu Y., Y. Lin, J. Liu, L. Tang, T. Guan, Q. Chen, K. Chen, L. Wang. 2018. The biodiversity assessment of phytoplankton community in summer within main stream and tributary of Huaihe River. *Acta Scientiae Circumstantiae* 38(4): 1665–1672. (in Chinese with English abstract) [邱阳凌, 林育青, 刘俊杰, 唐磊, 关铁生, 陈求稳, 陈凯, 王丽. 2018. 淮河干流及主要支流夏季浮游植物群落生物多样性评价. *环境科学学报* 38(4): 1666–1672.]
- Chen K., H. Yu, J. Zhang, B. Wang, Q. Chen. 2017. Predictive model based Multimetric Index of macroinvertebrates for river health assessment. *Chinese Journal of Applied Ecology* 28(6): 1993–2002. (in Chinese with English abstract) [陈凯, 于海燕, 张汲伟, 王备新, 陈求稳. 2017. 基于底栖动物预测模型构建生物完整性指数(MMI)评价河流健康. *应用生态学报* 6(28): 1993–2002.]
- Liu X., K. Chen, M. Wang, L. Hu, Q. Chen. 2017. Ecosystem health assessment based on O/E model and chemical-biological integrated index in the key sections of Huai River basin. *Acta Scientiae Circumstantiae* 37(7): 2767–2776. (in Chinese with English abstract) [刘祥, 陈凯, 王敏, 胡柳明, 陈求稳. 2017. 基于 O/E 模型和化学-生物综合指数的淮河流域关键断面生态健康评价. *环境科学学报* 37(7): 2767–2776.]
- Liu X., M. Wang, Q. W. Chen, K. Chen, L. Hu. 2017. Oxidative damage and interaction induced by typical heavy metals in waters on the *Macrobranchium nipponense*. *Asian Journal of Ecotoxicology* 12(6): 116–126. (in Chinese with English abstract) [刘祥, 王敏, 陈求稳, 陈凯, 胡柳明. 2017. 典型重金属胁迫对日本沼虾的氧化损伤及交互作用. *生态毒理学报* 12(6): 116–126.]
- Chen K., X. Liu, Q. Chen, M. Wang, L. Wang, B. Wang. 2016. Application of O/E model for measuring the biological integrity of the Huai River basin. *Acta Scientiae Circumstantiae* 36(7): 2677–2686. (in Chinese with English abstract) [陈凯, 刘祥, 陈求稳, 王敏, 王丽, 王备新. 2016. 应用 O/E 模型评价淮河流域典型水体底栖动物完整性健康的研究. *环境科学学报* 36(7): 2677–2686.]

- Wang L., Q. Chen, K. Chen, X. Liu. 2016. Establishment of target fishes for ecological flow in the main stream of Huaihe River. *Acta Scientiae Circumstantiae* 37(6): 2379–2386. (in Chinese with English abstract) [王丽, 陈求稳, 陈凯, 刘祥. 2016. 淮河干流生态流量目标鱼类选择研究. *环境科学学报* 37(6): 2379–2386.]
- Liu X., K. Chen, Q. Chen, M. Wang, L. Wang. 2016. Characteristics of macroinvertebrate community structure and its relationship to environmental factors in summer and autumn within typical reaches of Huai River Basin. *Acta Scientiae Circumstantiae* 36: 1928–1938. (in Chinese with English abstract) [刘祥, 陈凯, 陈求稳, 王敏, 王丽. 2016. 淮河流域典型河流夏季秋季底栖动物群落特征及其与环境因子的关系. *环境科学学报* 36: 1928–1938.]
- Liu X., M. Wang, J. Liu, K. Chen, L. Hu, Q. Chen. 2016. Effects of oxidative stress on *Macrobrachium nipponense* induced by single and joint toxic effect of mercury and arsenic. *Asian Journal of Ecotoxicology* 11(6): 144–152. (in Chinese with English abstract) [刘祥, 王敏, 刘俊杰, 陈凯, 胡柳明, 陈求稳. 2016. 汞和砷单一及联合暴露下日本沼虾的氧化应激效应. *生态毒理学报* 11(6): 144–152.]
- Chen K., N. Xiao, B. Wang, J. Li. 2012. The effects of petroleum exploitation on water quality bioassessment and benthic macroinvertebrate communities in the Yellow River Delta wetland, Dongying. *Acta Ecologica Sinica* 6: 1970–1978. (in Chinese with English abstract) [陈凯, 肖能文, 王备新, 李俊生. 2012. 黄河三角洲石油生产对东营湿地底栖动物群落结构和水质生物评价的影响. *生态学报* 6: 1970–1978.]
- Chen K., Y. Zhang, D. Cai, J. Zhang, S. Xu, B. Wang. 2012. Benthic Macroinvertebrate Community Structure and Water Quality Bioassessment in Lijiang River, Guilin, China. *Journal of Guangxi Normal University (Natural Science Edition)* 30: 115–122. (in Chinese with English abstract) [陈凯, 张永祥, 蔡德所, 张杰, 徐盛, 王备新. 2012. 漓江大型底栖无脊椎动物群落结构与水质生物评价. *广西师范大学学报(自然科学版)* 30: 115–122.]
- Chen K., Z. Zhang, S. Liu, B. Wang. 2011. Characteristics of water environment and benthic macroinvertebrate community structure of Qinhu National Wetland Park. *Wetland Science* 9: 26–32. (in Chinese with English abstract) [陈凯, 张宗祥, 刘朔孺, 王备新. 2011. 溱湖国家湿地公园水环境特征及底栖动物群落结构研究. *湿地科学* 09: 26–32.]

Books

- Hughes, R.M., D. Infante, L. Wang, K. Chen, B.F. Terra. 2019. *Advances in understanding landscape influences on freshwater habitats and biological assemblages*. In American Fisheries Society, Symposium (Vol. 90).

Manuscripts in Review:

- Wang Y.; K. Chen, J. Gao, M. Wang, J. Dong, F. Zhang, Y. Xie, J. Giesy, X. Jin, B. Wang. *With Editor*. Environmental DNA of preservative ethanol performed better than water samples in detecting macroinvertebrate diversity using metabarcoding. *Water Research*.
- Mbao E., Y. Wang, T. Sheng, J. Gao, N. Kitaka, K. Chen, B. Wang. *Under review*. Comparison of morphological and molecular approaches in the identification of diatoms as bioindicators in urbanized watershed. *Environmental Pollution*.

Manuscripts in Prep:

- Chen K., J.D. Olden. *In prep*. Functional and taxonomic threshold responses of riverine fish and insect communities to land use conversion across the conterminous USA. To be submitted to *Global Change Biology*.

Chen K., Y. Cui, Z. Li, R.M. Hughes, J.R. Olson, Y. He, Z. Xie, H. Wang, B. Wang. *In prep.* Current biological integrity of stream and river invertebrates in southern China. To be submitted to *Ecological Applications*.

Reports:

Wang L., Q. Chen, K. Chen, L.M. Hu, R.R. Feng. 2018. The relationship between ecological evolution and hydrological processes of the typical sub-basin ecosystem in the Huai River basin. Center for Eco-environmental Researches, Nanjing Hydraulic Research Institute (*in Chinese*).

Chen K., B. Wang. 2017. Macroinvertebrate-based BI and MMI indices for assessing the biological condition of Taihu, China. Department of Entomology, Nanjing Agricultural University (*in Chinese*).

Chen K., B. Wang, J. Zhang. 2016. Macroinvertebrate-based BI and MMI indices for assessing the biological condition of Taihu, China. Department of Entomology, Nanjing Agricultural University (*in Chinese*).

Chen K., Q. Chen. 2012. Application of biological condition indices for the ecosystem health assessment of the Huai River Basin. Center for Eco-environmental Researches, Nanjing Hydraulic Research Institute (*in Chinese*).

Chen K., B. Wang, S. Liu. 2012. Bio-indicators screening for the water quality assessment of Dongjiang River watershed. Department of Entomology, Nanjing Agricultural University (*in Chinese*).

Chen K., B. Wang, J. Zhang. 2011. Biological condition assessments protocols in petroleum exploitation area and discrimination of reference and impaired streams. Department of Entomology, Nanjing Agricultural University (*in Chinese*).

Grants

Mechanisms affecting elevational patterns of taxonomic and functional diversity of aquatic insects. KYZ201820, ¥300,000 (≈\$42,857) (Awarded by Nanjing Agricultural University, 2018–2019, PI). [中央高校基本科研业务费专项基金项目, KYZ201820, 水生昆虫多样性沿海拔梯度的垂直分布格局和机制, 2018–2019, 30 万元]

Nutrient based tolerance values for common river benthic macroinvertebrates in Jiangsu Province. BK20171385, ¥100,000 (≈\$15,384) (Awarded by the Natural Science Foundation of Jiangsu Province, 2017–2020, PI). [江苏省科技项目基础研究计划(自然科学基金), 面上项目, BK20171385, 基于营养盐浓度的江苏省河流底栖动物耐污值研究, 2017.07–2020.06, 10 万元]

Factors and mechanism affecting ecological indicators for aquatic ecosystem health assessment, 51509159, ¥210,000 (≈\$33,333) (Awarded by the National Natural Science Foundation of China, 2016–2018, PI). [国家自然科学基金委员会, 青年项目, 51509159, 影响水生态系统健康评价生物指标体系的因素与机制, 2016–2018, 21 万元]

Effects of multiple stream assemblages and spatial factors on aquatic ecosystem health assessment, 2015M581830, ¥50,000 (≈\$7,936) (Awarded by China Postdoctoral Science Foundation, 2016, PI). [中国博士后科学基金, 面上资助, 2015M581830, 水生态系统健康评价的生物因素及空间尺度效应, 2015.12–2016.08, 5 万元]

Identification of macroinvertebrate indicator species for Huai River health assessment, BH91401, ¥30,000 (≈\$4,840) (Awarded by Nanjing Hydraulic Research Institute, 2015–2016, PI). [南京水利科学研究所博士后基金, BH91401, 淮河流域典型水体水生生态健康指示性底栖动物识别, 2015–2016, 3 万元]

Participated projects:

The effect of watershed agricultural and urban land use change on macroinvertebrate functional diversity, 41771052, ¥ 700,000 (≈\$100,000) (Awarded by the National Natural Science Foundation of China, 2018–2021, PI-Dr. Beixin Wang) [国家自然科学基金委员会, 面上项目, 41771052, 流域农业和城镇用地变化对溪流底栖动物群落功能多样性的影响及机制, 2018–2021, 70万元]

The relationship between ecological evolution and hydrological processes of the typical sub-basin ecosystem in the Huai River basin, 2014ZX07204-006-01, ¥2,420,000 (≈\$384,127) (Awarded by the Ministry of Environmental Protection of China, 2014–2016, PI-Dr. Qiuwen Chen) [国家科技重大专项河流主题-淮河流域水污染治理技术与集成示范项目, 2014ZX07204-006-01, 淮河流域典型水域水生态系统变化及其与水文过程关系研究, 2014–2016, 242万元]

Exploring the influence of land use on stream macroinvertebrates community at multiple spatial scales, 41271525, ¥750,000 (≈\$120,968) (Awarded by the National Natural Science Foundation of China, 2013–2016, PI-Dr. Beixin Wang) [国家自然科学基金委员会, 面上项目, 41271525, 土地利用影响溪流底栖动物群落特征的空间尺度效应研究, 2013–2016, 70万元]

Bio-indicators screening for the water quality assessment of Dongjiang River watershed, 2009ZX07211-009-02, ¥ 360,000 (≈\$59,065) (Awarded by the Ministry of Environmental Protection of China, 2009–2011, PI-Dr. Beixin Wang) [国家科技重大专项河流主题东江项目, 2009ZX07211-009-02, 土地利用影响溪流底栖动物群落特征的空间尺度效应研究, 2009–2011, 36万元]

Presentations (first author and invited only)

Chen K., J.D. Olden. 2020. Threshold responses of riverine fish communities to land use conversion across regions of the world. Institute of Hydrobiology, Chinese Academy of Science, Wuhan, China. (*in Chinese*).

Chen K., J.D. Olden. 2019. Threshold responses of temperate fish communities to watershed land use across the world. Pacific Ecological Systems Division, US EPA Corvallis, OR, USA.

Chen K., J.D. Olden. 2019. Threshold responses of temperate fish communities to watershed land use across the world. Annual Meeting of the Society for Freshwater Science, Salt Lake City, UT, USA.

Chen K., R.M. Hughes, J.R. Olson, B. Wang. 2018. Incorporating trait and functional diversity to enhance multimetric index performance and assess land use gradients. The 4th Symposium of Benthological Society of Asia (BSA), Nanjing, China.

Chen K., S. Li, L. Wang, B. Wang. 2017. Influences of Environmental Factors on Macroinvertebrate Assemblages: Difference Between Mountain and Lowland Ecoregions, Wei River, China. The 12th International Congress of Ecology, Beijing, China.

Chen K., B. Wang, R.M. Hughes, C.P. Hawkins. 2016. Developing and evaluating predictive models in Chinese monsoonal stream bioassessment. Xi'an Jiaotong-Liverpool University, Suzhou, China.

Chen K., B. Wang, R.M. Hughes, Y. Pan, Q. Chen. 2016. Concordance in Biological Condition and Biodiversity Between Diatom and Macroinvertebrate Assemblages in Chinese Arid Zone Stream. The 3rd Symposium of Benthological Society of Asia (BSA), Vladivostok, Russia.

Chen K., R.M. Hughes, B. Wang, Q. Chen, Y. Pan. 2016. Concordance in Biological Condition and Biodiversity Between Diatom and Macroinvertebrate Assemblages in Chinese Arid Zone Stream. Annual Meeting of the Society for Freshwater Science, Sacramento, CA, USA.

Chen K. 2015. Improving the performance of ecological indices by selecting reference sites to balance quality and representation of natural conditions. Institute of Hydrobiology, Chinese Academy of Science, Wuhan, China. (*in Chinese*)

- Chen K., R.M. Hughes, B. Wang. 2014. Effects of fixed-count subsampling on macroinvertebrate richness, site separation and bioassessment in Chinese monsoonal streams. The 2nd Symposium of Benthological Society of Asia (BSA), Busan, Republic of Korea.
- Chen K., J.R. Olson, C.P. Hawkins, J.J. Vander Laan, R.A. Hill, B. Wang. 2014. Improving the performance of ecological indices by selecting reference sites with both high quality and better representativeness of natural conditions. Joint Aquatic Sciences Meeting, Portland, OR, USA.
- Chen K., J.R. Olson, C.P. Hawkins, R.A. Hill, J.J. Vander Laan, R.M. Hughes, B. Wang. 2013. The effect of number and distribution of reference sites on macroinvertebrate RIVPACS model and multimetric index development for stream biomonitoring. Environmental Protection Agency, Corvallis, OR, USA.
- Chen K., R.M. Hughes, C.P. Hawkins, D. Cai, B. Wang. 2013. Evaluating performance of macroinvertebrate-based multimetric indices (MMI) and RIVPACS models using multi-season and multi-year samples. Annual Meeting of the Society for Freshwater Science, Jacksonville, FL, USA.
- Chen K., N. Xiao, B. Wang, J. Li. 2010. The effects of petroleum exploitation on water quality bio-assessment and benthic macroinvertebrate communities in the Yellow River Delta wetland, Dongying. International Workshop on Water Quality Biomonitoring and Assessment, Nanjing & Changzhou, China. (*in Chinese*)

Journal Referee

Aquatic Ecology, Ecological Indicators, Ecological Informatics, Environmental Monitoring and Assessment, Environmental Pollution, Environmental Science and Pollution Research, Heliyon, Limnologica, Riparian Ecology and Conservation
生物多样性(Biodiversity Science), 湖泊科学(Journal of Lake Sciences), 应用生态学报(Chinese Journal of Applied Ecology), 水生态学杂志(Journal of Hydroecology), 中国环境监测(Environmental Monitoring in China)

Society Memberships

Society for Freshwater Science, Benthological Society of Asia