

Yang Shi, Ph.D.

Senior Research Fellow | CFI Research Manager

Coastal Protection and Flood Resilience Institute (CFI) Singapore

Civil and Environmental Engineering, National University of Singapore

Email: yangshi@nus.edu.sg | Phone: +65 89652169

Address: 3 Engineering Drive 2, Queenstown, Singapore 117578



Research Profile

Interdisciplinary researcher working at the interface of coastal engineering, hydro-meteorology, and computational environmental modeling. My research combines physics-based numerical modeling, field observations, and data-driven methods to investigate coastal extremes, coupled air-sea-land processes, and hydrological variability. I have developed expertise in coupled environmental simulation, multiphase-flow modeling, and predictive analysis across coastal, atmospheric, and water-resources systems. This cross-disciplinary background supports my longer-term goal of advancing interpretable and uncertainty-aware approaches for climate-risk and water-related environmental research.

Research Interests

1. **Coastal Hazards and Coupled Ocean Dynamics:** Coastal extremes, storm surges, wind-wave-current interactions, and flow-structure interactions using coupled modeling frameworks such as COAWST and SPH.
2. **Hydro - Meteorology and Atmospheric Water Processes:** Aerosol-cloud-precipitation interactions, atmospheric water resources, and hydro-meteorological processes in high-altitude and data-scarce regions.
3. **Computational Multiphase Flow and Environmental Fluid Mechanics:** High-fidelity numerical modeling of multiphase flows, sediment transport, and oil-spill containment.
4. **Data-Driven Hydrology and Environmental Prediction:** Machine learning and hybrid physics-based/data-driven approaches for hydrological prediction, reconstruction, and uncertainty quantification.

Academic Appointments

National University of Singapore (NUS) | Singapore

Senior Research Fellow & CFI Research Manager | **2025 – Present**

Advisor: Prof. Yuzhu Pearl Li

- **Research Management:** Serving as Research Manager for a SGD 1.61 million government-funded project at the Coastal Protection and Flood Resilience Institute (CFI).
- **Extreme Sea Level Analysis:** Conducting advanced simulations using the COAWST modeling system to analyze the impact of atmospheric and oceanographic variables on coastal extremes.
- **Scientific Innovation:** Integrating hybrid physics-guided and data-driven methods for attribution and uncertainty quantification of storm surges.

Tsinghua University | Beijing, China

Research Fellow (Shuimu Scholar) | **2018 – 2024**

Advisors: Prof. Guangqian Wang (Academician of CAS) and Prof. Jiahua Wei

- **Atmospheric Research:** Spearheaded the design and construction of a cloud chamber to investigate aerosol particle dynamics.
- **Field Leadership:** Led meteorological detection and artificial precipitation experiments on the Tibet Plateau at altitudes exceeding 4000 meters.

- **Hydro-Informatics:** Applied machine learning techniques to meteorohydrology and lake bathymetry reconstruction.

Tianjin Research Institute for Water Transport Engineering (MOT) | China

Research Assistant | **2014 – 2018**

Advisors: Prof. Hanbao Chen and Prof. Shitao Peng

- **Experimental Design:** Participated in the construction and maintenance of a 45m laboratory wave-current tank.
- **Hydrodynamic Modeling:** Compared sediment scour and flow-structure interactions using Lagrangian DualSPHysics and Eulerian OpenFoam models.

Selected Awards & Honors

1. **Forbes China 30 Under 30 (Science)**, 2023. Selected as one of 7 scientists nationwide in the science category.
2. **Outstanding Postdoctoral Award**, Tsinghua University, 2022. Awarded annually to 10 postdoctoral researchers university-wide.
3. **Young Elite Scientists Sponsorship Program (YESS)**, China Association for Science and Technology (CAST), 2021. National talent program supporting outstanding early-career scientists.
4. **Shuimu Tsinghua Scholar Program**, Tsinghua University, 2020. Prestigious postdoctoral fellowship at Tsinghua University.
5. **Postdoctoral Support Program**, Tsinghua University, 2018.
6. **Outstanding Graduate Award**, Tianjin University, 2018.
7. **Principal Academic Scholarship**, Tianjin University, 2017.
8. **Student Science and Technology Talent Scholarship**, Tianjin University, 2017.

Research Grants

Selected Competitive Grants as PI / Co-PI

1. Impact of water diversion of western route of South-to-North water transfer project on ecological environment of Yangtze River and Yellow River and Countermeasures (No. 2022YFC3202400), National Key Research and Development Project, Ministry of Science and Technology of China, **Co-PI**, CNY 54.48 million, Allocation of CNY 1.0 million, 2022.11-2026.10.
2. Multi-source balanced allocation and intelligent control technology of water conveyance in eastern route of South-to-North water transfer project (No. 2022YFC3204600), National Key Research and Development Project, Ministry of Science and Technology of China, **Co-PI**, CNY 44.96 million, Allocation of CNY 500,000, 2022.11-2026.2.
3. Research on the performance and mechanism of air curtain reinforced ice control boom under complex sea conditions in the Arctic ice region (No. 52271357), General Project of National Natural Science Funds, National Natural Science Foundation of China, **Co-PI**, CNY 540,000, 2023.1-2026.12.
4. Assessment of water resources allocation and scheduling in Beijing (2021~2022) (No. SDZX-2022-0009), Technology Management Integration Project, Beijing Water Authority, **Co-PI**, CNY 1787,500 2022.3-2022.12.
5. Research and development of management measures for major scientific and technological tackles (No. DXZ-2021-106-SZ-ZX), Technology Management Integration Project, China South-to-North Water Diversion Corporation Limited, **Co-PI**, CNY 150,000 2022.1-2023.1.

6. Mathematical model experimental study on flood control safety and river regime impact for the Yangqiangyan Bridge of the S309 Hezhang County (Houhe to Kuixiang, Guizhou-Yunnan Border) Highway Reconstruction and Expansion Project (No. 20212001109), Technology Management Integration Project, PowerChina Guiyang Engineering Corporation Limited, **Co-PI**, CNY 296,000, 2021.6-2021.8.
7. Research on mechanism and numerical model of acoustic agglomeration of aerosol particles (No. 2021T140385), Special Funding Project, China Postdoctoral Science Foundation, **PI**, CNY 180,000, 2021.7-2023.12.
8. Research on the Potential Exploitation Technology of Precipitation Conversion Rate Based on Ultra-High Power Focused Acoustic Waves (No. YESS20200094), Young Elite Scientists Sponsorship Program, China Association for Science and Technology (CAST), **PI**, CNY 450,000, 2021.1-2023.12.
9. Research on agglomeration process and mechanism of aerosol particle under the action of combined acoustic waves and currents (No. 52009059), National Natural Science Funds for Young Scholars, National Natural Science Foundation of China, **PI**, CNY 240,000, 2021.1-2023.12.
10. Study on local scour process of bed surface near vibration submarine pipeline under wave and current (No. HESS-1909), Open Fund Project, State Key Laboratory of Hydraulic Engineering Simulation and Safety, Tianjin University, **PI**, CNY 60,000, 2019.10-2022.10.
11. Research on failure mechanism and fine numerical model of floating oil boom under complex sea conditions (No. 2018M641372), General Project, China Postdoctoral Science Foundation, **PI**, CNY 50,000, 2018.10-2020.10.

Major Collaborative Research Projects

12. Hybrid physics-guided and data-driven attribution and uncertainty quantification of coastal extremes incorporating different sources of information (No. wosA-8001778-00-00), government-funded applied research project on coastal extremes led by CFI SINGAPORE, **Senior Researcher / Research Manager**, SGD 1.61 million, 2023.11-2027.11.
13. Research and application of key technologies for interannual runoff regulation and intelligent scheduling in the upper Yellow River (No. 2023YFC3206700), National Key Research and Development Project, Ministry of Science and Technology of China, **RF**, CNY 42.00 million, 2023.12-2027.11.
14. Study on water and sediment characteristics and prevention and control technology of Pinglu Canal (No. 2022AA15002), Major Science and Technology Projects of Guangxi Province, Science and Technology Department of Guangxi Zhuang Autonomous Region, **RF**, CNY 24 million, 2023.1-2025.12.
15. Study on the influences of water resources evolvement on the complementary operation of hydro-solar-wind-storage power system in the upper Yellow River (No. U2243232), Yellow River Water Science Research Joint Fund, National Natural Science Foundation of China, **RF**, CNY 2.45 million 2023.1-2026.12.
16. Prediction and risk assessment of water regime change of key rivers and lakes in Qinghai-Tibet Plateau (No. 2021-SF-A6), Major Science and Technology Projects, Qinghai Provincial Department of Science and Technology, **RF**, CNY 10 million, 2021.11-2024.12.
17. Study on the theory and technology of joint regulation of air - ground water resources in southwest river source area (No. 91847302), Major Research Program Integration Projects, National Natural Science Foundation of China, **RF**, CNY 2 million, 2019.1-2023.12.
18. Potential tapping and efficient utilization technology of rainfall runoff in river source area and arid area (No. 2017YFC0403600), National Key Research and Development Project, Ministry of Science and Technology of China, **RF**, CNY 17.87 million, 2017.7-2020.6.

19. International scientific plan of global water cycle and 'Tianhe Project' theory and key technologies (No. 2016YFE0201900), Key Projects of Strategic International Scientific and Technological Innovation Cooperation, Ministry of Science and Technology of China, **RF**, CNY 10.02 million, 2017.09-2020.8.
20. Study on numerical simulation method of hydrodynamic characteristics of oil Fence (No. 18JCYBJC23900), Tianjin Natural Science Foundation Project, Tianjin Natural Science Foundation, **RF**, CNY 100,000, 2018.4-2021.3.
21. Local erosion mechanism and fine mathematical model of super large scale and complex foundation structure under wave and current (No. 51779170), General Project, National Natural Science Foundation of China, **RF**, CNY 600,000, 2018.01-2021.12.

Selected Publications (* denotes corresponding author)

Selected First-Author and Corresponding-Author Publications

1. **Yang Shi***, Yousheng Zhang, Minglei Hou and Jiahua Wei*. Spatio – temporal hydrological cycle characteristics in the upper reaches of the Yangtze River: A multi-source remote sensing and machine learning perspective. *Journal of Hydrology: Regional Studies*, 2026, 64: 103142.
2. Sai Ge, Shaowu Li*, Ye Liu, **Yang Shi***, Dong Wang and Tinghao Yang. ISPH simulation of non-equilibrium suspended sediment transport using a generalized sediment transport equation. *Journal of Marine Science and Engineering*, 2026, 14(10): 900.
3. **Yang Shi**, Jiahua Wei, Haotian Yang, Shaowu Li and Yuzhu Pearl Li*. Prediction of local scour beneath vibrating submarine pipelines subjected to waves and currents based on CFD and machine learning approach. *Ocean Engineering*, 2026, 345: 123777.
4. **Yang Shi***, Jiahua Wei*, Minglei Hou and Wenwen Bai. A numerical study of the acoustic and turbulent agglomeration processes by a coupled computational fluid dynamics–population-balance model. *Physics of Fluids*, 2025, 37: 113324.
5. Yousheng Zhang, Jiahua Wei*, **Yang Shi***, Minglei Hou. Comprehensive diagnostic framework and application of water balance in the water source area of the Western Route of the South-to-North Water Diversion Project. *Journal of Changjiang River Scientific Research Institute*, 2025, 1: 1-13.
6. **Yang Shi**, Jiahua Wei*, Wenwen Bai, Zhifeng Zhao, Olusola O. Ayantobo, Guangqian Wang. Theoretical analysis of acoustic and turbulent agglomeration of droplet aerosols. *Advanced Powder Technology*, 2023, 34(10): 104145.
7. Haitao Yu, Zhigang Bai*, **Yang Shi**¹, Chongjiu Zhao, Xuan Liu, Yingzhi Wang. Hydrodynamic performance of an elastic capsule oscillating water column type WEC: An experimental study. *Applied Ocean Research*, 2023, 142: 103850.
8. **Yang Shi**, Zhen Qiao, Guangqian Wang, Jiahua Wei*. In situ experimental study of cloud-precipitation interference by low-frequency acoustic waves, *Remote Sensing*, 2023, 15: 993.
9. **Yang Shi**, Haotian Yang, Jiahua Wei, Haitao Yu*, Ye Liu, Sai Ge, Zhigang Bai, Shaowu Li. Numerical study of scour below vibrating pipelines under waves and currents. *Ocean Engineering*, 2022, 266(2022): 112718.
10. Wenwen Bai, **Yang Shi***, Zhifeng Zhao, Jiahua Wei*. Investigation of critical response characteristics of micro-droplets under the action of low-frequency acoustic waves. *Frontiers in Environmental Science*, 2022, 10: 972648.
11. **Yang Shi**, Jiahua Wei*, Zhen Qiao, Jie Zhao, Guangqian Wang. Atmospheric exploration of the Qinghai–Tibet Plateau during the East Asian Winter Monsoon (EAWM) from a ground-based microwave radiometer. *Atmosphere*, 2022, 13(04): 549.

12. **Yang Shi**, Jiahua Wei*, Zhen Qiao, Weiwen Shen, Jianguo Yin, Minglei Hou, Olusola O. Ayantobo, Guangqian Wang. Investigation of strong acoustic interference on clouds and precipitation in the source region of the Yellow River using KaKu radar. *Atmospheric Research*, 2021, 267(2022): 105992.
13. **Yang Shi**, Jiahua Wei*, Yan Ren, Zhen Qiao, Qiong Li, Xiaomei Zhu, Beiming Kang, Peichong Pan, Jiongwei Cao, Jun Qiu, Tiejian Li, Guangqian Wang. Investigation of precipitation characteristics under the action of acoustic waves in the source region of the Yellow River, *Journal of Applied Meteorology and Climatology*, 2021, 60(07): 951-966.
14. Jiahua Wei, **Yang Shi***, Yan Ren, Qiong Li, Zhen Qiao, Jiongwei Cao, Olusola O. Ayantobo, Jianguo Yin, Guangqian Wang. Application of ground-based microwave radiometer in retrieving meteorological characteristics of Tibet Plateau, *Remote Sensing*, 2021, 13: 2527.
15. **Yang Shi**, Jiahua Wei, Qiong Li, Haijiao Yang, Zhen Qiao, Yan Ren, Sanchuan Ni, Julong He, Weiwen Shen, Shoukai Cao, Guangqian Wang. Investigation of vertical microphysical characteristics of precipitation under the action of low-frequency acoustic waves, *Atmospheric Research*, 2021, 249(2021): 105283.
16. **Yang Shi**, Jiahua Wei*, Jun Qiu, Haibo Chu, Wenwen Bai, Guangqian Wang. Numerical study of acoustic agglomeration process of droplet aerosol using a three-dimensional CFD-DEM coupled model, *Powder Technology*, 2020, 362(2020): 37-53.
17. **Yang Shi**, Jiahua Wei*, Wenwen Bai, Guangqian Wang. Numerical investigations of acoustic agglomeration of liquid droplet using a coupled CFD-DEM model, *Advanced Powder Technology*, 2020, 31(06): 2394-2411.
18. **Yang Shi**, Jiahua Wei, Shaowu Li*, Shitao Peng, Bangwen Zhang. Experimental study on containment of moderate-viscous oil by floating boom subject to waves and currents, *Applied Ocean Research*, 2020, 94(2020): 102003.
19. **Yang Shi**, Jiahua Wei*, Shaowu Li, Peng Song, Bangwen Zhang. A meshless WCSPH boundary treatment for open-channel flow over small-scale rough bed, *Mathematical Problems in Engineering*, 2019, 2019(01): 1573049.
20. Xing Feng, **Yang Shi***. Numerical study of containment of spilled medium-viscosity oil in wave-current flow, *Journal of Engineering Mechanics*, 2019, 145(08): 04019056.
21. **Yang Shi**, Shaowu Li*, Hanbao Chen, Ming He, Songdong Shao. Improved SPH simulation of spilled oil contained by flexible floating boom under wave-current coupling condition, *Journal of Fluids and Structures*, 2018, 76(2018): 272-300.
22. **Yang Shi**, Shaowu Li*, Shitao Peng, Hanbao Chen, Ming He. Numerical modeling of flexible floating boom using a coupled SPH-FEM model, *Coastal Engineering Journal*, 2018, 60(02): 140-158.
23. Yufen Cao, **Yang Shi***, Yuchuan Bai, Shaowu Li, Hanbao Chen, Huili Yang. Numerical modeling of permeable floating breakwater under the action of waves, *Journal of Coastal Research*, 2018, 85:1101-1105.
24. **Yang Shi**, Shaowu Li*, Huaqin Zhang, Hanbao Chen, Ran Zhou. Analysis of instability mechanism of oil-water interface of oil boom under wave-current, *Journal of Tianjin University (Science and Technology)*, 2018, 51(07): 691-701. (In Chinese)
25. **Yang Shi**, Shaowu Li*, Huaqin Zhang, Shitao Peng, Hanbao Chen. Experimental studies on performances of flexible floating oil booms in coupled wave-current flow, *Applied Ocean Research*, 2017, 69(2017): 38-52.
26. **Yang Shi**, Shaowu Li*, Huaqin Zhang, Shitao Peng, Hanbao Chen, Ran Zhou, Tianyu Mao. Numerical modeling of floating oil boom motions in wave-current coupling conditions, *Journal of Ocean University of China*, 2017, 16(04):602-608.

Other Peer-Reviewed Publications

27. Wenwen Bai, Miao Wu, Jiahua Wei*, Yifeng Liu, Zhen Qiao, **Yang Shi**, Shangyao Du, Shengchun Wang. Flocculation characteristics and mechanism of suspended sediment under ultrasound-electric coupling intervention. *International Journal of Sediment Research*, 2026, 42: 1-26.
28. Minglei Hou, Jiahua Wei, **Yang Shi**, Shengling Hou, Wenqian Zhang, Jiaqi Xu, Yue Wu, He Wang. Hydroformer: Frequency domain enhanced multi-attention transformer for monthly lake level reconstruction with low data input requirements. *Water Resources Research*, 2024, 60: e2024WR037166.
29. Minglei Hou, Jiahua Wei*, **Yang Shi**, Olusola O. Ayantobo, Shengling Hou. Catchment characteristics dominate the hydrological behavior of closed lakes across the Tibetan Plateau. *Catena*, 2024, 242: 108090.
30. Kun Liu, Ye Liu, Shaowu Li, Hanbao Chen, Songgui Chen, Taro Arikawa, **Yang Shi**. Coupling SPH with a mesh-based Eulerian approach for simulation of incompressible free-surface flows. *Applied Ocean Research*, 2023, 138: 103673.
31. Yue Wu, Jiaqi Xu, Wenshun Qiu*, Mengyao Wang, Shu Li, **Yang Shi**, Jiahua Wei*. A study on ecological water replenishment scheduling scheme of Chaobai river in Beijing section. *Water Resources and Hydropower Engineering*, 2023, 54(9): 180-189.
32. Jiaqi Xu, Yue Wu, Wenshun Qiu*, Shu Li, Mengyao Wang, **Yang Shi**, Jiahua Wei*. Ecological water replenishment and discharge mode in Beijing section of the Yongding River. *South-to-North Water Transfers and Water Science & Technology*, 2023, 21(4): 669-678.
33. Olusola O. Ayantobo, Jiahua Wei, **Yang Shi**, Guangqian Wang. Climatological changes in rainfall distributions at different rain-rates under Qinghai-Tibet Plateau warming during 1981–2060. *Theoretical and Applied Climatology*, 2022, 152(5895):663-679.
34. Wenwen Bai, Jiahua Wei *, Haijiao Yang, Julong He, **Yang Shi**, Qiong Li. Experimental and theoretical analysis of hydrogen and oxygen isotope effects of droplet group under the action of low-frequency acoustic waves. *Journal of Basic Science and Engineering*, 2022, 30(06): 1357-1365. (In Chinese)
35. Minglei Hou, Jiahua Wei*, Haibo Chu, **Yang Shi**, Olusola O. Ayantobo, Jiaqi Xu, Xiaomei Zhu, Yan Ren. Conceptual hydrological model-guided SVR approach for monthly lake level reconstruction in the Tibetan Plateau. *Journal of Hydrology: Regional Studies*, 2022, 44(2022): 101271.
36. Zhen Qiao, Jiahua Wei*, Jie Zhao, Qiong Li, **Yang Shi**. Microphysical characteristics of cold cloud catalytic snowfall processes in the source region of the Yellow River in winter. *Journal of Basic Science and Engineering*, 2022, 30(05): 1121-1137. (In Chinese)
37. Qiong Li, Jiahua Wei *, Jianguo Yin, Zhen Qiao, Jiongwei Cao, **Yang Shi**. Microphysical characteristics of raindrop size distribution and implications for radar rainfall estimation over the northeastern Tibetan Plateau. *Journal of Geophysical Research-Atmospheres*, 2022, 127(12): e2021JD035575.
38. Bangwen Zhang, Anjun Deng*, Dangwei Wang, **Yang Shi**, Xianrong Dong. Numerical analysis of motion characteristics of sliding or rolling and saltation of sediment particles under turbulent flow, *Water*, 2022, 14: 1506.
39. Wenwen Bai, Jiahua Wei*, **Yang Shi**, Zhifeng Zhao, Qiong Li. Microphysical characteristics and environmental isotope effects of the micro-droplet groups under the action of acoustic waves. *Atmosphere*, 2021, 12: 1488.
40. Zhifeng Zhao, Wenwen Bai, **Yang Shi**, Jiahua Wei*. Simulation of sound transmission of rotary flute pneumatic sound source and analysis of its calculation results. *Journal of Qinghai University*, 2021, 39(02): 85-90. (In Chinese)
41. Peichong Pan, **Yang Shi**, Zhifeng Zhao, Jia Wang, Jiongwei Cao, Wenwen Bai, Hongwei Xie, Jiahua Wei*. Microphysical characteristics of precipitation under the intervention of

- acoustic over an inland arid region, *Arid Land Geography*, 2021, 44(04): 906-913. (In Chinese)
42. Bangwen Zhang, Baosheng Wu, Shaowu Li*, **Yang Shi**. Large eddy simulation of sediment transport in high flow intensity by discrete particle method, *Journal of Hydraulic Research*, 2021, 59(04): 605-620.
 43. Wenwen Bai, Jiahua Wei*, Sanchuan Ni, **Yang Shi**. Experimental study on micro-droplet sedimentation under the action of low-frequency acoustic wave, *Journal of Basic Science and Engineering*, 2020, 28(02): 247-258. (In Chinese)
 44. Wenwen Bai, Jiahua Wei*, Qiong Li, **Yang Shi**, Sanchuan Ni, Fakai Lei. A study on the collision and deposition of droplets and its hydrogen and oxygen isotopes characteristics under the action of sound waves, *Journal of Applied Acoustics*, 2021, 40(01): 103-112. (In Chinese)
 45. Dong Wang, Songdong Shao, Shaowu Li*, **Yang Shi**, T Arikawa, Hongqian Zhang. 3D ISPH erosion model for flow passing around a cylinder, *Journal of Fluids and Structures*, 2018, 78(2018): 374-399.
 46. Shaowu Li*, Zezhou Ji, Qingwei Wu, Hongqian Zhang, **Yang Shi**. Estimation of dynamical forces on turbidity curtain in combined wave-current flow, *Journal of Coastal Research*, 2018, 85:1181–1185.
 47. Shaowu Li*, Demei Zhen, **Yang Shi**, Hanbao Chen. Experimental study on the motion response of a float-type boom under the action of wave current, *Journal of Waterway and Harbor*, 2017, 38(01): 20-25. (In Chinese)

Manuscripts Under Review / Submitted

48. **Yang Shi**, Yousheng Zhang, Minglei Hou, Wenwen Bai, Chunyan Wang, Jiahua Wei*. A study on the impact of climate change and human activities on the blue-green water in the upper reaches of the Yangtze River. *Catena*, 2026. (Under review)
49. **Yang Shi**, Yuzhu Pearl Li*, Yingmin Low. Wave current coupling regulates storm driven coastal extremes in the South China Sea. *npj Climate and Atmospheric Science*, 2026. (Under review)
50. **Yang Shi**, Yuzhu Pearl Li*, Yingmin Low. Regime-dependent two-way wave-current interactions during storms in the South China Sea: A process-based regime fingerprint perspective. *Coastal Engineering*, 2026. (Under review)
51. Minglei Hou, Jiamu Chen, Jiahua Wei*, **Yang Shi**, Wenqian Zhang, Shengling Hou, Zhen Qiao, and Jianshi Zhao. Advancing high-resolution lake bathymetry reconstruction through geomorphologically-informed deep learning. *Water Resources Research*, 2026. (Under review)
52. Shaowu Li*, Ziqi Lin, **Yang Shi** and Ye Liu. Numerical simulation of spilled oil contained by flexible floating oil boom based on SPH. *Advances in Water Science*, 2026. (Under review, in Chinese)

Patents and Software Copyrights

1. **Yang Shi**, Jiahua Wei. An acoustic agglomeration observation system and operating method for aerosol particles, *China Patent*, 2023, 202311338681.8.
2. **Yang Shi**, Jiahua Wei, Jiaqi Xu, Yue Wu. A rapid pre-assessment method, device and equipment for ecological water replenishment effect in North China watersheds, *China Patent*, 2023, ZL 202311386297.5.
3. **Yang Shi**, Jiahua Wei, Jiaqi Xu, Yue Wu. A method, device, apparatus and medium for determining an ecological water recharge pattern in a watershed, *China Patent*, 2023, ZL 202311404752.X.

4. **Yang Shi**, Jiahua Wei, Jiaqi Xu, Yue Wu. An integrated benefit assessment method for water resources allocation and disposition in North China watersheds, *China Patent*, 2023, ZL 202311395418.2.
5. **Yang Shi**, Jiahua Wei, Zhifeng Zhao, Wenwen Bai. An experimental platform and method for visualising acoustic flocculation of suspended particles, *China Patent*, 2023, ZL 202311386896.7.
6. **Yang Shi**, Jiahua Wei. Computational fluid dynamics software based on the population balance method (HydroLab_PBM), *Software Copyright*, 2024, 2024SR0385201.
7. **Yang Shi**, Jiahua Wei. Computational fluid dynamics software based on the discrete element method (HydroLab_DEM), *Software Copyright*, 2024, 2024SR0385196.
8. **Yang Shi**, Jiahua Wei. Computational fluid dynamics software based on the smooth particle method (HydroLab_SPH), *Software Copyright*, 2023, 2023SR1611097.
9. **Yang Shi**, Jiahua Wei. Computational fluid dynamics software based on the finite element method (HydroLab_FEM), *Software Copyright*, 2023, 2023SR1611106.
10. Huaqin Zhang, Ran Zhou, Songgui Chen, Shitao Peng, **Yang Shi**, Jianing Luo, Hanbao Chen, Zhaoyang Zhang, Longzai Ge, Chen Peng. Oil deflector wings for avoiding spilled oil over the boom, *China Patent*, 2017, CN206607567U.
11. Huaqin Zhang, **Yang Shi**, Shitao Peng, Zhaoyang Zhang, Hanbao Chen, Shaowu Li, Ran Zhou, Demei Zhen, Pengxu Zou, Hongbo Zhao. A wave–current tank for oil spill containment experiment of oil boom, *China Patent*, 2017, CN206034365U.
12. Hanbao Chen, Zhaoyang Zhang, Huaqin Zhang, Ran Zhou, Songgui Chen, Shitao Peng, **Yang Shi**, Jianing Luo. An experimental method for changing the weight of a uniform skirt to form a proper buoyancy–weight ratio, *China Patent*, 2017, CN106769664A.
13. Shitao Peng, **Yang Shi**, Jianing Luo, Hanbao Chen, Zhaoyang Zhang, Huaqin Zhang, Ran Zhou, Songgui Chen, Yanran Liu. An experimental method for optimizing ballast mass distribution of oil boom skirt, *China Patent*, 2017, CN106768839A.
14. **Yang Shi**, Huaqin Zhang, Ran Zhou, Hanbao Chen, Jianing Luo. Oil boom dynamic response acquisition and analysis program, *Software Copyright*, 2016, 1568785.
15. Ran Zhou, Zhaoyang Zhang, Xiaoli Wang, Jiaqi Zhang, Shitao Peng, Hanbao Chen, **Yang Shi**, Songgui Chen, Haiyuan Liu, Lequn Zhu. An experimental device for environmental adaptability analysis and detection of sheet-like oil absorbing materials, *China Patent*, 2016, CN205941508U.
16. Ran Zhou, Zhaoyang Zhang, Xiaoli Wang, Jiaqi Zhang, Shitao Peng, Hanbao Chen, **Yang Shi**, Songgui Chen, Xu Zhao, Lequn Zhu. An environment-adaptive performance analysis and detection method for sheet-like oil absorbing material, *China Patent*, 2016, CN106198887A.

Selected Presentations

1. **Yang Shi**, Numerical analysis of wind–wave–current interactions during tropical cyclones in the South China Sea using COAWST, *AGU Fall Meeting 2025*, New Orleans, 2025. 12.
2. **Yang Shi**, Exploration of air water resources development and utilization technology, *Postdoctoral ZiJin Salon of Tsinghua University*, Beijing, China, 2022.10.
3. **Yang Shi**, Theory, technology and practice of exploitation and utilization of air water resources, *Training Course on Rainwater Collection & Utilization for Developing Countries*, Ministry of Commerce, China, 2022.9.
4. **Yang Shi**, Clean Energy Science and Technology Innovation Highland, *Young Scientist Salon of China Association for Science and Technology (CAST)*, Beijing, China, 2022.9.
5. **Yang Shi**, Theory, technology and practice of exploitation and utilization of air water resources——Sky River for a more harmonious green earth, *2nd Asia International Water Week (AIWW)*, Babuan Bajo (Online meeting), Indonesia, 2022.3.

6. **Yang Shi**, Original technology curation and modern industry chain - Air water utilization, *Young Scientist Salon of China Association for Science and Technology (CAST)*, Beijing, China, 2022.1.
7. **Yang Shi**, Investigation of acoustic interference on precipitation characteristics in the region of Tibet Plateau, *AGU Fall Meeting 2021*, New Orleans, LA (Online meeting), 2021. 12.
8. **Yang Shi**, Investigation of microphysical characteristics of precipitation under the action of acoustic waves in the source region of the Yellow River, *AGU Fall Meeting 2020*, San Francisco (Online meeting), 2020. 12.
9. **Yang Shi**, Investigation of precipitation characteristics under the action of acoustic waves in the source region of the Yellow River, *International Symposium on Plateau Ecology Environment Protection and High-quality Development of the Yellow River Basin*, Xi'an, Shanxi, 2020. 12.
10. **Yang Shi**, Discrete Element Simulation of Acoustic Agglomeration of Aerosol Particles, *2nd International Workshop on Global Water Cycle and Sky River Research*, Beijing, China, 2019.7.
11. **Yang Shi**, Modified WCSPH method and its application on hydroelasticity computation, *Meshfree Methods International Workshop*, Dalian, Liao Ning, China, 2018.3.
12. **Yang Shi**, Numerical modeling of spilled oil contained by flexible floating boom under waves and currents, *International Conference on Estuarine and Offshore Science and Engineering*, Yan Tai, Shan Dong, China, 2016.11.

Professional Activities & Service

Editorial Roles:

- Guest Editor: Applied Sciences (2025–Present).
- Guest Editor: Frontiers in Environmental Science (2022–Present).
- Youth Review Editor: Water Resources Development Research (2024–Present).
- Youth Review Editor: Water Resources and Hydropower Engineering (2023–Present).
- Youth Review Editor: South-to-North Water Transfers and Water Science and Technology (2022–Present).
- Youth Review Editor: Journal of Basic Science and Engineering (2022–Present).
- Youth Review Editor: Hydro-Science and Engineering (2022–Present).

Committee Memberships (CHES):

- Member: Specialized Committee of Rainwater Utilization, Chinese Hydraulic Engineering Society (2025–Present).
- Member: Specialized Committee of Water, Wind and Energy, Chinese Hydraulic Engineering Society (2023–Present).
- Member: Youth Science and Technology Working Committee, Chinese Hydraulic Engineering Society (2021–Present).

Academic Societies:

- Member: American Geophysical Union (AGU) (2018–Present).
- Member: Coastal Education and Research Foundation (CERF) (2018–Present).
- Member: International Association of Hydraulic Engineering and Research (IAHR) (2016–Present).

Peer Reviewer

Reviewer for Coastal Engineering, Atmospheric Research, Ocean Engineering, Physics of Fluids, Powder Technology, Applied Ocean Research, Journal of Coastal Research, Journal of Ocean University of China, and other journals.

Education

Tianjin University | Tianjin, China

Ph.D. in Coastal Engineering | **2013 – 2018**

Advisors: Prof. Shaowu Li and Prof. Songdong Shao

Thesis: WCSPH simulation and experimental research of flexible floating oil boom under waves and currents.

Tianjin University | Tianjin, China

B.E. in Coastal Engineering | **2009 – 2013**

Advisors: Prof. Shaowu Li and Prof. Hanbao Chen

Thesis: Numerical simulation of wind waves and storm surges in Bohai bay.