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🏢 中国科学院水利部成都山地灾害与环境研究所

## 研究兴趣

河流碳循环；内陆水体生物地球化学；冻土水文及水环境；多年冻土的碳反馈效应；生态水文学

## 工作经历

中国科学院水利部成都山地灾害与环境研究所

2019 年 7 月 – 今

特别研究助理

## 教育背景

中国科学院水利部成都山地灾害与环境研究所 & 中国科学院大学 2015 年 9 月 – 2019 年 6 月

理学博士，自然地理学，导师：王根绪研究员

毕业论文：长江源区河流碳输移过程研究

耶鲁大学森林与环境学院

2017 年 11 月 – 2019 年 1 月

联合培养博士研究生，河流生物地球化学方向，合作导师：Professor Peter A. Raymond

中国科学院水利部成都山地灾害与环境研究所 & 中国科学院大学 2013 年 9 月 – 2015 年 8 月

硕士研究生，自然地理学，导师：王根绪研究员

四川大学水利水电学院

2009 年 9 月 – 2013 年 6 月

工学学士，水文与水资源工程

毕业论文：若尔盖湿地花湖核心区生态需水研究

## 科研成果

### 待发表论文

- **Song, C.**, Wang, G., Hu, Z., Zhang, T., Chen, X., Huang, K., Li, Y. Net ecosystem carbon budget of alpine permafrost watersheds in the central Qinghai-Tibet Plateau: integrating the terrestrial and aquatic carbon fluxes. (准备中)
- **Song, C.**, Wang, G., Liu, J., Huang, K., Li, Y. Suspended sediment and particulate C and N transport in Yangtze River source region of the Qinghai-Tibet Plateau. *Science of the Total Environment* (在审)
- **Song, C.**, Wang, G., Haghipour, N., Raymond, P.A. Warming and monsoonal climate lead to a large export of millennial-aged carbon from permafrost catchments of the Qinghai-Tibet Plateau. *Environmental Research Letters* (在审)
- Rosentreter, J.A., Borges, A.V., Raymond, P.A., Deemer, B.R., Holgerson, M.A., Duarte, C.M., Liu, S., **Song, C.**, Allen, G.H., Melack, J., Olefeldt, D., Battin, T.I., Eyre, B.D. Aquatic ecosystems are the largest source of methane on Earth. *Nature* (在审)
- **Song, C.**, Raymond, P.A., Wang, G. Distinct seasonality and hydrological control of river CO<sub>2</sub> partial pressure and efflux in permafrost catchments of the Qinghai-Tibet plateau. *Journal of Hydrology* (在审)

### 已发表论文

#### 第一作者

7. **Song, C.**, Wang, G., Mao, T., Huang, K., Sun, X., Hu, Z., Chang, R., Chen, X., Raymond, P.A. (2019). Spatiotemporal variability and sources of DIC in permafrost catchments of the Yangtze River source

更新于 2019 年 12 月；更多信息：[https://www.researchgate.net/profile/Chunlin\\_Song4](https://www.researchgate.net/profile/Chunlin_Song4)

region: insights from stable carbon isotope and water chemistry. *Water Resources Research*, 55. <https://doi.org/10.1029/2019WR025343>

6. **Song, C.**, Wang, G., Mao, T., Dai, J., Yang, D. (2019). Linkage between permafrost distribution and river runoff changes across the Arctic and the Tibetan Plateau. *Science China-Earth Sciences*, 62. <https://doi.org/10.1007/s11430-018-9383-6>
5. **Song, C.**, Wang, G., Mao, T., Chen, X., Huang, K., Sun, X., Hu, Z. (2019). Importance of active layer freeze-thaw cycles on the riverine dissolved carbon export on the Qinghai-Tibet Plateau permafrost region. *PeerJ*, 7:e7146. <https://doi.org/10.7717/peerj.7146>
4. **Song, C.**, Wang, G., Liu, G., Mao, T., Sun, X., Chen, X. (2017). Stable isotope variations of precipitation and streamflow reveal the young water fraction of a permafrost watershed. *Hydrological Processes*, 31(4), 935-947. <https://doi.org/10.1002/hyp.11077>
3. **Song, C.**, Wang, G., Sun, X., Chang, R., Mao, T. (2016). Control factors and scale analysis of annual river water, sediments and carbon transport in China. *Scientific Reports*, 6:25963. <https://doi.org/10.1038/srep25963>
2. **宋春林**, 孙向阳, 王根绪 (2015). 森林生态系统碳水关系及其影响因子研究进展. *应用生态学报*, 2015, 26(9): 2891-2902.
1. **宋春林**, 孙向阳, 王根绪 (2015). 贡嘎山亚高山降水稳定同位素特征及水汽来源研究. *长江流域资源与环境*, 2015, 24(11): 1860-1869.

#### 非第一作者

11. Huang, K., Dai, J., Wang, G., Chang, J., Lu, Y., **Song, C.**, Hu, Z., Ahmed, N., Ye, R. (2020). The Impact of Land Surface Temperatures on Suprapermafrost Groundwater on the Central Qinghai Tibet Plateau. *Hydrological Processes*, 124389. <https://doi.org/10.1002/hyp.13677>
10. Sun, X., Wang, G., Huang, M., Chang, R., Hu, Z., **Song, C.**, Sun, J. (2020). The asynchronous response of carbon gain and water loss generate spatio-temporal pattern of WUE along elevation gradient in southwest China. *Journal of Hydrology*, 124389. <https://doi.org/10.1016/j.jhydrol.2019.124389>
9. Song, X., Wang, G., Ran, F., Huang, K., Sun, J., **Song, C.** (2020). Soil moisture as a key factor in carbon release from thawing permafrost in a boreal forest. *Geoderma*, 357, 113975. <https://doi.org/10.1016/j.geoderma.2019.113975>
8. Hu, Z., Wang, G., Sun, X., Wang, J., Chen, X., **Song, C.**, Song, X., Lin, S. (2019). Variations in below-ground carbon use strategies under different climatic conditions. *Agricultural and Forest Meteorology*, 268, 32-39. <https://doi.org/10.1016/j.agrformet.2019.01.005>
7. Hu, Z., Wang, G., Sun, X., Zhu, M., **Song, C.**, Huang, K. and Chen, X. (2018). Spatial-Temporal Patterns of Evapotranspiration Along an Elevation Gradient on Mount Gongga, Southwest China. *Water Resources Research*, 54(6), 4180-4192. <https://doi.org/10.1029/2018WR022645>
6. Chen, X., Wang, G., Zhang, T., Mao, T., Wei, D., **Song, C.**, Hu, Z., Huang, K. (2017). Effects of warming and nitrogen fertilization on GHG flux in an alpine swamp meadow of a permafrost region. *Science of the Total Environment*, 601, 1389-1399. <https://doi.org/10.1016/j.scitotenv.2017.06.028>
5. Chen, X., Wang, G., Huang, K., Hu, Z., **Song, C.**, Liang, Y., Wang, J., Song, X., Lin, S. (2017). The effect of nitrogen deposition rather than warming on carbon flux in alpine meadows depends on precipitation variations. *Ecological Engineering*, 107, 183-191. <https://doi.org/10.1016/j.ecoleng.2017.07.018>
4. Song, X., Wang, G., Ran, F., Chang, R., **Song, C.**, Xiao, Y. (2017). Effects of topography and fire on soil CO<sub>2</sub> and CH<sub>4</sub> flux in boreal forest underlain by permafrost in northeast China. *Ecological Engineering*, 106, 35-43. <https://doi.org/10.1016/j.ecoleng.2017.05.033>
3. Wang, G., Mao, T., Chang, J., **Song, C.**, Huang, K. (2017). Processes of runoff generation operating during the spring and autumn seasons in a permafrost catchment on semi-arid plateaus. *Journal of Hydrology*, 550:307-317. <https://doi.org/10.1016/j.jhydrol.2017.05.020>

2. Chen, X., Wang, G., Zhang, T., Mao, T., Wei, D., Hu, Z., **Song, C.** (2017). Effects of warming and nitrogen fertilization on GHG flux in the permafrost region of an alpine meadow. *Atmospheric environment*, 157, 111-124. <https://doi.org/10.1016/j.atmosenv.2017.03.024>
1. Sun, X., Wang, G., Huang, M., Hu, Z., **Song, C.** (2017). Effect of climate change on seasonal water use efficiency in subalpine *Abies fabri*. *Journal of Mountain Science*, 14(1), 142-157. <https://doi.org/10.1007/s11629-016-3867-9>

## 授权专利

- 宋春林, 王根绪, 孙向阳. 一种水面温室气体自动采样静态箱. 专利类型: 发明, 专利号: ZL201610102693.4, 2019-06-21.
- 宋春林, 孙向阳, 胡兆永, 王根绪. 一种真空砂芯抽滤装置. 专利类型: 实用新型, 专利号: ZL201520272366.4, 2015-09-16.

## 学术报告

- 宋春林. 青藏高原典型多年冻土河流碳输出动态规律与机制. 山地科学青年发展论坛. 成都, 2019年9月20日.
- Peter A. Raymond, **Chunlin Song**, Shaoda Liu, George H. Allen. Stream and River Methane Emissions. AGU Fall Meeting 2018, Washington, D.C., USA. 12/14/2018.
- **Chunlin Song**, Genxu Wang, Tianxu Mao. Seasonal riverine export of dissolved carbon affected by active layer freeze-thaw cycles in headwater streams of the Qinghai-Tibet Plateau permafrost region. AGU Fall Meeting 2017, New Orleans, USA. 12/13/2017.
- Genxu Wang, **Chunlin Song** (speaker). Mechanism of the surface runoff processes of a permafrost watershed in the Qinghai-Tibet plateau. The 2nd Asian Conference on Permafrost, Sapporo, Japan. 07/03/2017.

## 科研项目经历

- 主持中国博士后科学基金面上资助项目: 青藏高原连续多年冻土区河流溶解态碳输出年龄和源解析, 2019-2021
- 主研王根绪主持的国家自然科学基金委重点基金项目“三江源径流形成与变化机制及其冻土生态水文过程模拟 (91547203)”专题: 长江源区径流变化下河流生源物质的迁移转化规律研究, 2016-2019
- 主研王根绪主持的国家自然科学基金委重大计划项目“地形急变带生态-水文过程对岩土水力性质的影响及分异规律 (41790431)”专题: 高寒山地降水-径流形成过程及水源划分研究, 2018-2022
- 参与王根绪主持的中国科学院前沿科学重点研究项目: 山地生态水文过程的带谱分异规律及其流域水文影响研究 (QYZDJ-SSW-QDC006)
- 参与王根绪主持的科技部 973 计划项目课题: 冰冻圈变化的生态过程及其对碳循环的影响 (2013CBA01807)
- 参与孙向阳主持的国家自然科学基金委青年科学基金项目: 亚高山森林小流域有机碳输出季节动态及影响因子研究 (41401044)
- 参与 Peter A. Raymond 合作的 The Arctic Great Rivers Observatory (Arctic-GRO) 项目, 负责 DOC 样品同位素检测、数据分析和阐释等工作
- 参与 Peter A. Raymond 主持的 Magnitude and Controls on the Lateral Transport of Carbon via Streams and Rivers 项目, 负责河流甲烷数据收集、分析和论文撰写等工作

## 奖励情况

- 2017 年获中国科学院大学“三好学生标兵”称号
- 2017 年获 Bronze Prize of ACOP 2017 Photo Contest
- 2016 年获博士研究生国家奖学金
- 2016 年获成都山地所一等学业奖学金
- 2015 年获中国科学院成都分院院长奖学金
- 2014 年获硕士研究生国家奖学金
- 2014 年获成都山地所一等奖学金
- 2014、2015 和 2016 年获中国科学院大学“三好学生”称号
- 2013 年获四川大学优秀本科毕业论文

## 其他

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- 计算机能力: R, ArcGIS, EndNote, Adobe Photoshop, Adobe Illustrator, AutoCAD, HTML & CSS, GitHub, L<sup>A</sup>T<sub>E</sub>X, MS Office
- 实验和仪器经验: vario TOC select TOC/TNb Analyser; Los Gatos Research DLT-100 Liquid Water Isotope Analyser; Eddy Covariance Systems; Campbell Scientific CR1000 dataloggers; LI-8150 Soil CO<sub>2</sub> Flux System; Vario MACRO cube Elemental Analyzer; Cryogenic carbon purification from water samples; Thermo MAT 253 Stable Isotope Analyser; Potassium persulfate method and TC/EA for DOC isotope analysis
- 野外工作经验: 具有水文和生态学科领域野外考察和观测经验, 熟悉水、土、气、植物等样品采集处理, 有贡嘎山、青藏高原、长江上游干支流、康涅狄格河等野外出差经历
- 外语水平: 英语 - 熟练 (雅思 6.5 分)
- 审稿服务: Environmental Research Letters; Hydrology and Earth System Sciences; Quaternary International; 应用生态学报
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- 英文履历: [https://songchunlin.net/files/others/songchunlin\\_cv.pdf](https://songchunlin.net/files/others/songchunlin_cv.pdf)