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

更新于 2019 年 12 月；更多信息：[ResearchGate](#); [Google Scholar](#)

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*. <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)