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Research Experience

Postdoc	2021.9-Present	Scripps Institution of Oceanography, UC San Diego
Research Associate	2019.9-2021.9	South China Sea Institute of Oceanology, CAS

Education

Ph.D.	2013.9-2019.6	South China Sea Institute of Oceanology (SCSIO), Chinese Academy of Sciences (CAS) Physical Oceanography
Visiting student	2016.9-2018.9	Scripps Institution of Oceanography, UC San Diego Physical Oceanography
B.S.	2009.9-2013.6	School of Geography and Ocean Science, Nanjing University Ocean Science

Research Interests

El Niño-Southern Oscillation (ENSO); Air-sea interaction; Climate change; Ocean circulation changes; Ocean dynamics

Peer-reviewed Publications

- Peng, Q.**, Xie, S. P., Miyamoto, A., Deser, C., Zhang, P., & Luongo, M. T. (2025). Strong 2023–2024 El Niño generated by ocean dynamics. *Nature Geoscience*, 1-8.
- Peng, Q.**, Xie, S.-P., & Deser, C., (2024). Collapsed upwelling weakens ENSO under sustained warming beyond the 21st century. *Nature Climate Change*, 14(8), 815-822.
- Peng, Q.**, Xie, S.-P., Passalacqua, G., Miyamoto A., & Deser, C., (2024). The 2023 extreme coastal El Niño: Atmospheric and air-sea coupling mechanisms. *Science Advances*, 10(12).
- Peng, Q.**, Xie, S.-P., Huang R., Wang, W., Zu, T., & Wang, D. (2023). Indonesian Throughflow slowdown under global warming: Remote AMOC effect vs. regional surface forcing. *Journal of Climate*, 36(5),1301-1318.
- Peng, Q.**, Xie, S.-P., Wang, D., Huang R., Chen G., Shu Y., et al. (2022). Surface warming–induced global acceleration of upper ocean currents. *Science Advances*, 8(16).
- Peng, Q.**, Xie, S.-P., Wang, D., Kamae, Y., Zhang, H., Hu, S., et al. (2020). Eastern Pacific wind effect on the evolution of El Niño: Implications for ENSO diversity. *Journal of Climate*, 33(8), 3197-3212.
- Peng, Q.**, Xie, S.-P., Wang, D., Zheng, X.-T., & Zhang, H. (2019). Coupled ocean-atmosphere dynamics of the 2017 extreme coastal El Niño. *Nature Communications*, 10(1), 298.
- Xie, S.-P., **Peng, Q.**^{#(co-first author)}, Kamae, Y., Zheng, X.-T., Tokinaga, H., & Wang, D. (2018). Eastern Pacific ITCZ dipole and ENSO diversity. *Journal of Climate*, 31(11), 4449-4462.
- Peng, Q.**, Huang, R.-X., Wang, W., & Wang, D. (2020). The main heaving modes in the Pacific Ocean. *Journal of Tropical Oceanography*, 39(2), 1-10.
- Zheng, X., Long, S., Zhou Z.Q., **Peng, Q.**, Wang C. (Trans.) (2025). Coupled Atmosphere-Ocean Dynamics: From El Nino to Climate Change (Chinese Edition). Science Press.

- Ren Q., Xie, S. P., **Peng, Q.**, Li Y., & Wang F. (2025). Equatorial Atlantic mid-depth warming indicates Atlantic meridional overturning circulation slowdown. *Communications Earth & Environment*, (Accepted).
- Cheng, L., **Peng, Q.**, ... & Yuan, H. (2025). Ocean stratification in a warming climate. *Nature Reviews Earth & Environment*, 1-19.
- Shu, Y., Lu, X., Xia, R., **Peng, Q.**, & Wang, D. (2025). Heaving induced by PDO driving abyssal water decadal variability in the Eastern Philippine Sea. *Geophysical Research Letters*, 52(19), e2025GL116364.
- Taylor, B. A., Shi, J. R., Xie, S. P., Talley, L. D., Luongo, M. T., & **Peng, Q.** (2025). Warming Band in Southern Ocean's Indian Sector: The Role of Remote Atlantic Buoyancy Forcing via Poleward-Shifting Circulation Response. *Journal of Climate*, 38(14), 3219-3238.
- Luongo, M. T., Xie, S. P., Eisenman, I., Sun, S., & **Peng, Q.** (2025). How the Subsurface Tropical Pacific Responds to Subtropical Surface Cooling: Implications for Cross-Equatorial Transport. *Journal of Climate*.
- Luo, X., Yang, L., Chan, J.C., Chen, S., **Peng, Q.**, & Wang, D., (2024). China coasts facing more tropical cyclone risks during the second decaying summer of double-year La Niña events. *npj Climate and Atmospheric Science*, 7(1), 198.
- Zhou, X., Zhou, W., Wang, D., Xie, Q., Yang, L. and **Peng, Q.**, (2024). Westerlies Affecting the Seasonal Variation of Water Vapor Transport over the Tibetan Plateau Induced by Tropical Cyclones in the Bay of Bengal. *Advances in Atmospheric Sciences*, 41(5), 881-893.
- Wang, S., Jing, Z., Wu, L., Sun, S., **Peng, Q.**, Wang, H., et al. (2023). Southern hemisphere eastern boundary upwelling systems emerging as future marine heatwave hotspots under greenhouse warming. *Nature Communications*, 14(1), 28.
- Li, Y., Xie, S.P., Lian, T., Zhang, G., Feng, J., Ma, J., **Peng, Q.**, Wang, W., Hou, Y. and Li, X., (2023). Interannual variability of regional Hadley circulation and El Niño interaction. *Geophysical Research Letters*, 50(4), e2022GL102016.
- Chu, X., & **Peng, Q.** (2023). The role of alongshore wind and ocean wave in generating the northward Somali Current. *Journal of Tropical Oceanography*, 42(2), 1-8.
- Chen, G., Huang, R. X., **Peng, Q.**, & Chu, X. (2022). A time-dependent Sverdrup relation and its application to the Indian Ocean. *Journal of Physical Oceanography*, 52(6), 1233-1244.
- Liang, Z., Zeng, L., Wang, Q., **Peng, Q.**, & Wang, D. (2022). Interpretation of interannual variability of the zonal contrasting thermal conditions in the winter South China Sea. *Climate Dynamics*, 1-19.
- Zhang, Y., Yu, S.-Y., Xie, S.-P., Amaya, D. J., **Peng, Q.**, Kosaka, Y., et al. (2022). Role of ocean dynamics in equatorial Pacific decadal variability. *Climate Dynamics*, 59(7-8), 2517-2529.
- Zhong, Q., Chen, G., Li, Y., **Peng, Q.**, & Chu, X. (2022). Intraseasonal variability of the surface zonal current in the equatorial Indian Ocean: Seasonal differences and causes. *Acta Oceanologica Sinica*, 41(5).
- Shi, J.-R., Talley, L. D., Xie, S.-P., **Peng, Q.**, & Liu, W. (2021). Ocean warming and accelerating Southern Ocean zonal flow. *Nature Climate Change*.
- Zeng, L., Chen, G., Huang, K., Chen, J., He, Y., Zhou, F., Yang, Y., Liang, Z., **Peng, Q.**, Shi, R. and Gamage, T.P., (2021). A decade of eastern tropical Indian Ocean Observation Network (TIOON). *Bulletin of the American Meteorological Society*, 102(10), E2034-E2052.

Professional Skills

Numerical simulations: Ocean model (MITgcm; Reduced gravity model; Linear wave model); Atmospheric General Circulation Model (CAM 6); Coupled General Circulation Model (including CESM 2.1 and GFDL's CM).

Programming language & Professional software: Matlab, NCL, Python, Linux shell scripting;

Other software: Photoshop, Adobe Illustrator, Corel VideoStudio, Office;

Professional Activities

Reviewer for Nature, Nature Climate Change, Nature Communications, Science Advances, Journal of Climate, Geophysical Research Letters, npj Climate and Atmospheric Science, Communications Earth & Environment, Journal of Geophysical Research: Oceans, Scientific Report, Weather and Climate Extremes, Frontiers Environmental Science.

Reviewing Editor for Springer Nature; Nominator for the Blue Planet Prize

Selected Conference and Workshop Participation

The unique air-sea dynamics of the 2023 tropical Pacific: from coastal to basin-scale El Niño. Climate and Atmosphere Seminar, San Diego, USA (2025, invited talk)

Ocean-atmosphere dynamics underlying the weakened ENSO under sustained warming beyond the twenty-first century. Washington D.C., USA (2024, Poster)

The 2023 extreme coastal El Niño: Atmospheric and air-sea coupling mechanisms. Lima, Peru (2024, invited talk)

El Niño Southern Oscillation inhibited by ocean heating in a warmer climate. AMS Meeting, Denver, USA (2023, Poster)

Ocean dynamics underlying the weakening of the Indonesian Throughflow under global warming. Lihai Youth Academic Forum, Guangzhou, China (2022, invited Talk).

Upper ocean current acceleration due to surface heating. Ocean, Climate, and Environmental Change workshop, Guangzhou, China (2022, invited Talk).

2017 Extreme Coastal El Niño, IMBeR International Conference (Online, 2021, Oral Presentation)

Coupled ocean-atmosphere dynamics of the 2017 extreme coastal El Niño. Ocean Sciences Meeting 2020, San Diego, USA (2020, Poster).

Dynamics of the 2017 extreme coastal El Niño. Indian Ocean Dynamics Meeting 2020, Zhan Jiang, China (2020, Oral Presentation).

A reconsideration of ENSO diversity. Lihai Youth Academic Forum, Guangzhou, China (2019, Oral Presentation).

An Eastern Pacific ITCZ dipole mode and its implications for ENSO evolution. Yuehai Youth Academic Forum, Guangzhou, China (2019, Oral Presentation).

Coupled ocean-atmosphere dynamics of the 2017 extreme coastal El Niño. State Key Laboratory of Tropical Oceanography (LTO) Annual Meeting, Guangzhou, China (2019, Poster).

Mechanism of the deep permanent thermocline depth in the Subtropical South Indian Ocean. Western Pacific-Indian Ocean regional model workshop, Guangzhou, China (2016, Oral).

The heaving modes in the Pacific Ocean. LTO Annual Meeting, Guangzhou, China (2015, Poster).

Honors and Awards

1. Outstanding Ph.D. Thesis of the Chinese Academy of Sciences for 2020 (Top 100 Nationwide), 2020.
2. Top-10 scientific and technological achievements in oceanology and limnology of China, 2020.
3. First Prize for the best posters, LTO Annual Meeting, 2019.
4. First Prize for the Oral Presentation, LTO, 2018.
5. The China Scholarship Council (CSC) Scholarship, 2016.
6. Merit student of SCSIO, 2015.
7. Outstanding student of SCSIO, 2015.
8. Chinese Academy of Sciences Scholarship, 2013.