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## [1] V. Ramanathan, Y. Xu, and A. Versaci, “Modelling human–natural systems interactions with implications for twenty-first-century warming,” Nat Sustain, vol. 5, no. 3, pp. 263–271, Dec. 2021, doi: 10.1038/s41893-021-00826-z.

# MDP-Multiagent+water

## [1] F. Hung and Y. C. E. Yang, “Assessing Adaptive Irrigation Impacts on Water Scarcity in Nonstationary Environments—A Multi‐Agent Reinforcement Learning Approach,” Water Resources Research, vol. 57, no. 9, p. e2020WR029262, Sep. 2021, doi: 10.1029/2020WR029262.

【RL方法的好处，适宜于陈列问题】

【然而，RL-ABM的参数可以塑造意识过程提供主体对环境反馈】

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Moreover, RL-ABM parameters can better characterize an agent's cognitive processes comparing to Hyun et al. (2019), which can provide information about agents’ reactions to environmental changes.

【文章结构书写顺序的安排】

# Pnas文章

## [1] K. Feng, N. Lin, R. E. Kopp, S. Xian, and M. Oppenheimer, “Reinforcement learning–based adaptive strategies for climate change adaptation: An application for coastal flood risk management,” Proc. Natl. Acad. Sci. U.S.A., vol. 122, no. 12, p. e2402826122, Mar. 2025, doi: 10.1073/pnas.2402826122.

【未来情景变化的预估因素有两个：热带气旋和SLR】

## 【未来情景变化的预估因素有两个：热带气旋和SLR】

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We account for projected changes in tropical cyclones (TCs), which may induce higher storm surges under climate change ( 29 – 33 ), and sea-level rise (SLR), which has been and will remain primarily responsible for increasing coastal flooding.

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However, future SLR projections are characterized by large and deep uncertainties, associated par ticularly with human emissions and with ice-sheet physics, that currently impede modeling optimal risk mitigation strategies ( 29 , 34 – 38 ).

【利用RL来解决以下问题：动作的决策（适应，撤出、改造和筑堤）】

【RL算法带来的优越之处：解决了计算成本的问题】

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We focus on coastal flood risk management to evaluate the effectiveness of RL in the wider optimization frameworks for climate adaptation strategies.

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# 1+RL+ABM

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## [1] F. M. Strnad, W. Barfuss, J. F. Donges, and J. Heitzig, “Deep reinforcement learning in world-earth system models to discover sustainable management strategies,” Chaos: An Interdisciplinary Journal of Nonlinear Science, vol. 29, no. 12, p. 123122, Dec. 2019, doi: 10.1063/1.5124673.

# C-切入点-ClimateRL-theo

## [1] T. Wolf, N. Nardelli, J. Shawe-Taylor, and M. Perez-Ortiz, “Can reinforcement learning support policy makers? A preliminary study with integrated assessment models,” Dec. 11, 2023, arXiv: arXiv:2312.06527. doi: 10.48550/arXiv.2312.06527.

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# C-切入点-Shuvo