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Plain Language Summary: The long-term turbulent heat fluxes in the North Pacific for the period 1921–2014 were reconstructed based on observed sea surface temperature, air temperature, wind and humidity. The Coupled Ocean–Atmosphere Response Experiment (COARE3.5) algorithm, modified Fisher–Tippett (MFT) distribution method and data interpolating empirical orthogonal functions (DINEOF) were employed to reconstruct the turbulent heat flux. The reconstructed turbulent heat flux was shown to be in accordance with the commonly used heat flux datasets. Also, the reconstructed turbulent heat flux can well reproduce the main features of the air-sea interaction in the North Pacific.

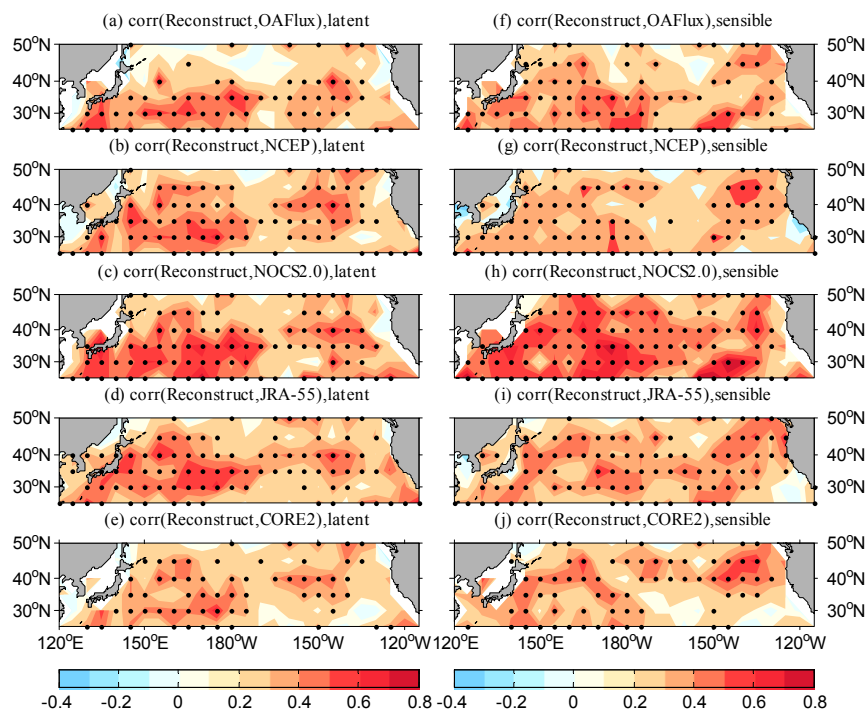


Figure 1. Correlation coefficients between the reconstruction and other commonly used datasets for both latent and sensible heat fluxes. Dotted are the areas passing 95% significant level test.

- The long-term turbulent heat fluxes in the North Pacific for the period 1921–2014 were reconstructed based on observations.
- By comparison with the commonly used heat flux datasets and application in the air-sea interaction in the North Pacific, the reconstructed turbulent heat fluxes were shown to be reasonable.
- The reconstructed turbulent heat fluxes provide the opportunity for the study of the air-sea interaction in the North Pacific on multidecadal timescales.