日本学術会議公開シンポジウム「最終氷期以降の日本列島の気候・環境変動と人類の応答」（オンライン開催）、2023年6月11日（日）13:00～17:20

最終氷期における日本周辺の海洋環境

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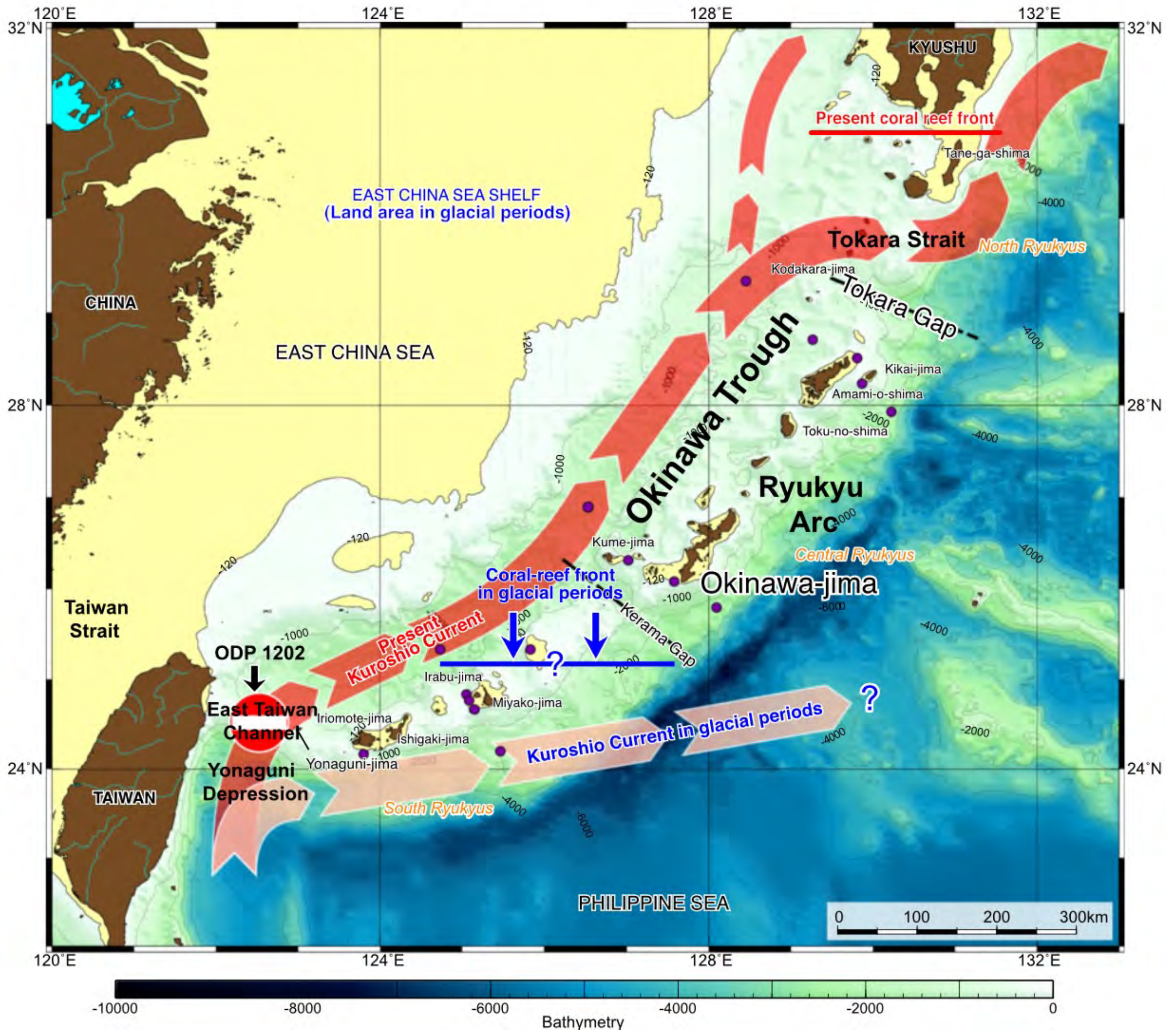
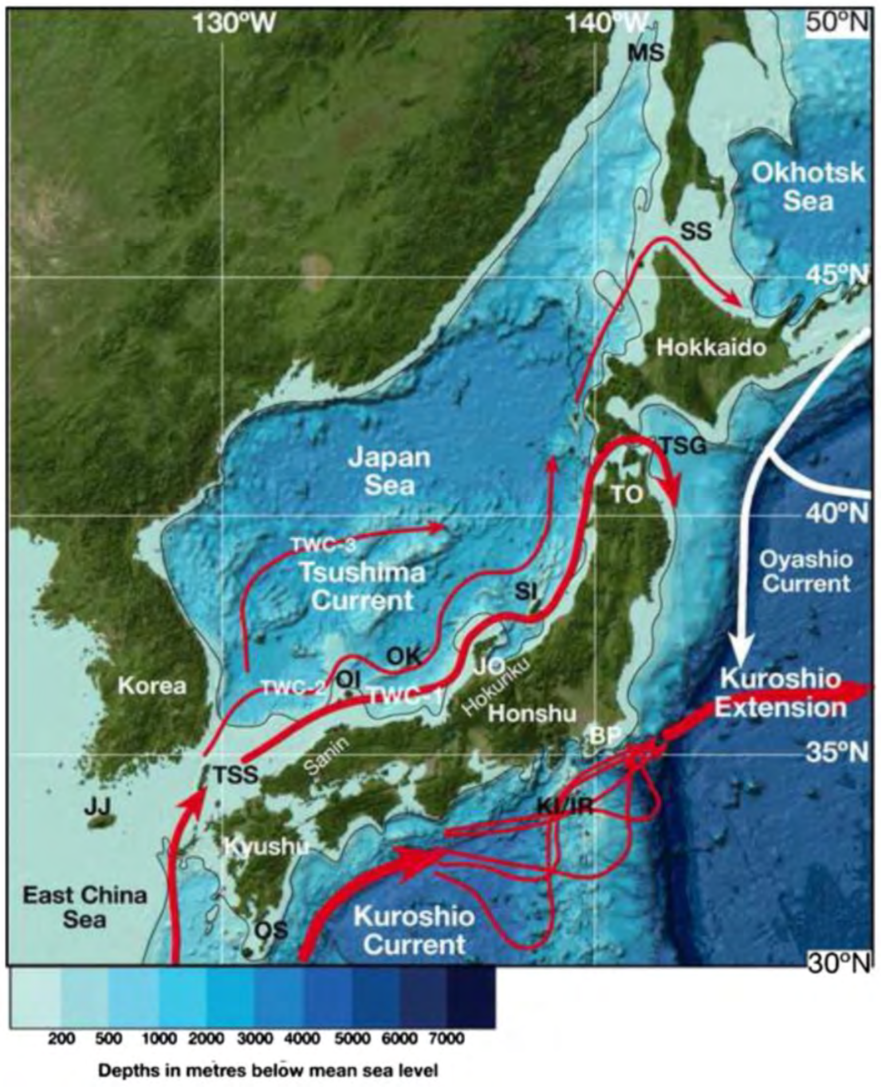


現代と最終氷期の東シナ海黒潮の模式図 (Gallagher et al., 2015)



日本南岸と日本海の主要海流の模式図(Gallagher et al., 2015)

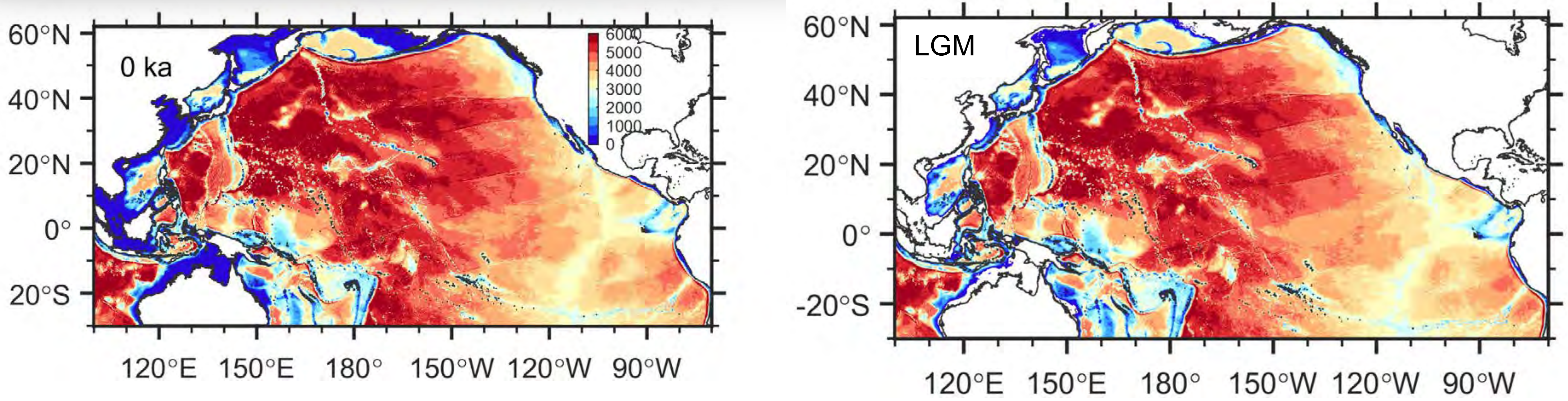


Fig. The domain and bathymetry of the model. Colors indicate model bathymetry (unit: m).

Model: SbPOM (Stony Brook Parallel Ocean Model, Jordi & Wang, 2012) (1/12°×1/12°×47 σ layers)

Water depth: Interpolated from **ETOPO1** (1/60°)

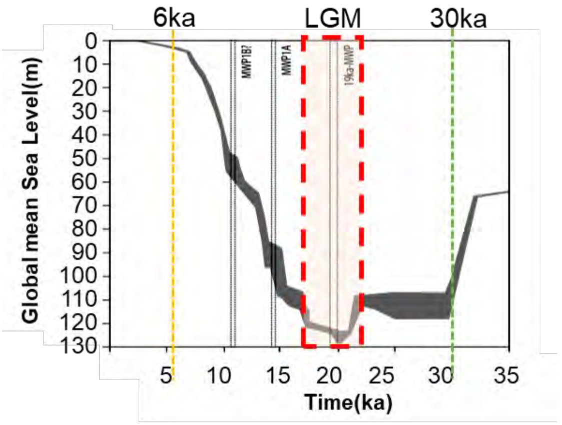
Meteorological data and SST data: NCEP/NCAR (1992-2017)

0 ka (Pre-Industrial experiment) and LGM from climate models

Changes in input factors: **Sea level**, **air-sea heat flux** and **wind stresses**

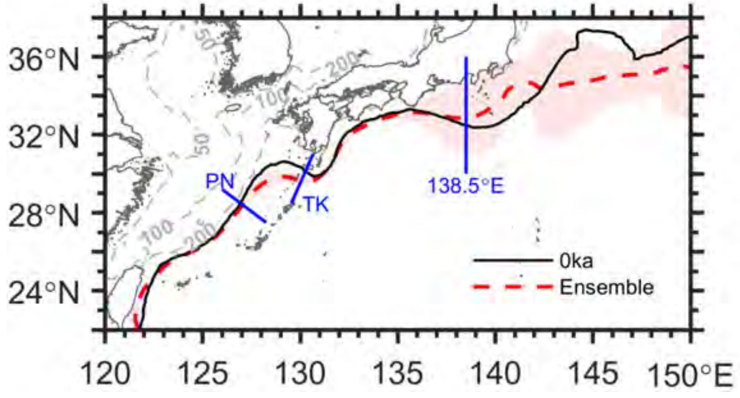
Experiments: 0ka, LGM (-130m)

Region: 30°S ~ 62°N, 100°E ~ 70°W



Yokoyama et al. (2019)

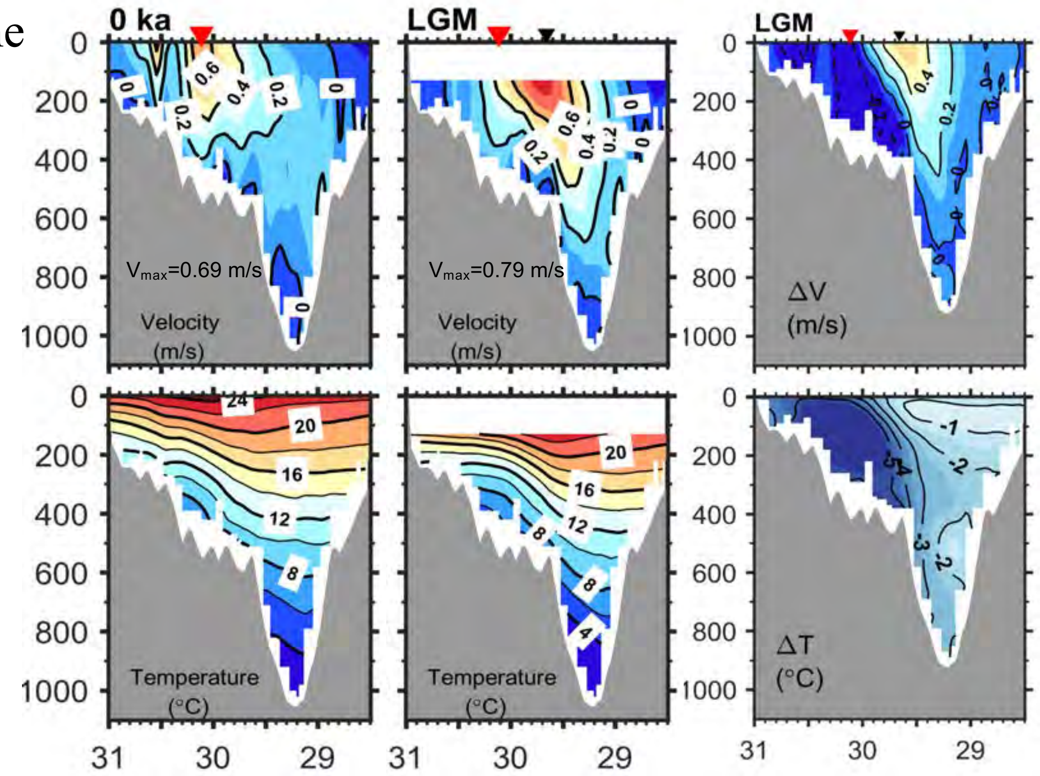
Vertical distributions of velocity and potential temperature



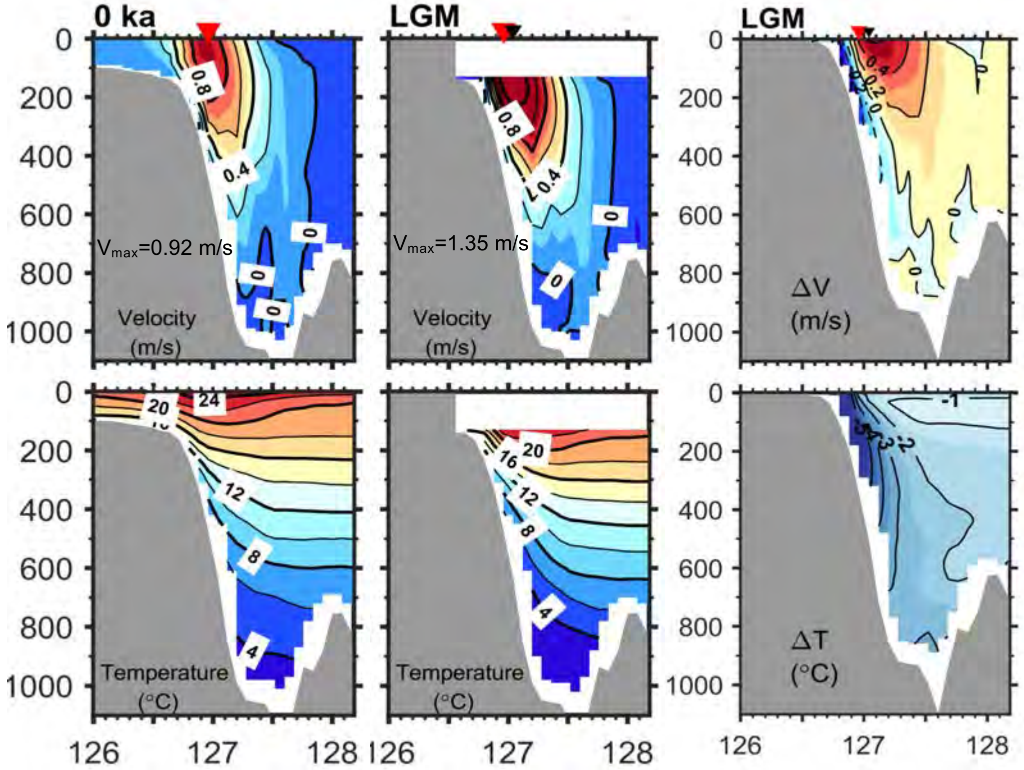
▼ (red) The location of maximum speed core at 0ka

▼ (black) The location of maximum speed core at LGM

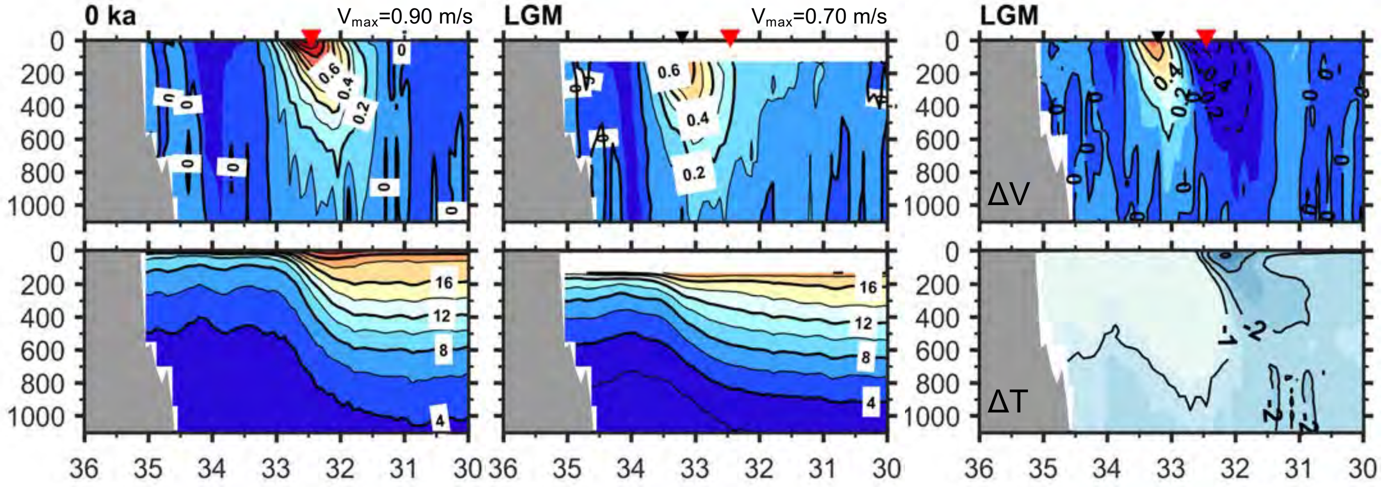
TK line

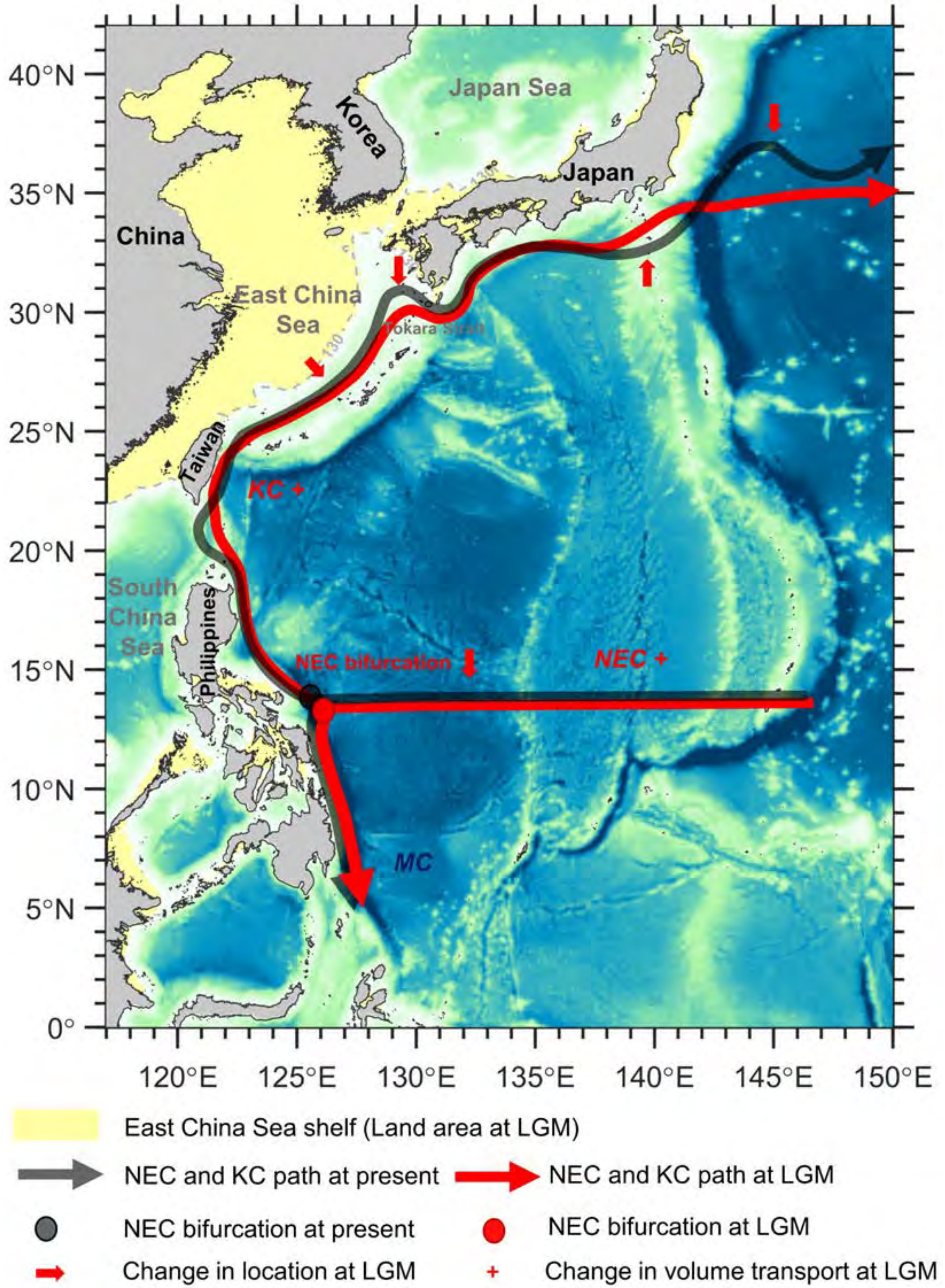


PN line



138.5°E line





Summary

- Relative to the present, the Kuroshio during the LGM traveled the similar path with higher surface velocity in the East China Sea, while it migrated northward south of Japan and southward in the Kuroshio Extension region.
- To a certain extent, stronger glacial trade winds enhanced the North Equatorial Current. Consequently, Kuroshio transport increased in the southern and middle Okinawa Trough.
- The ensemble mean of 10 LGM models show that the SST cooling at LGM exceeds 6℃ in the Japan Sea and the Kuroshio–Oyashio confluence region at 40 °N, with large standard deviations.