**Air-Sea fluxes of CO2 in the Indian Ocean between 1985 and 2018: A synthesis based on Observation-based surface CO2, hindcast and atmospheric inversion models.**

VVSS Sarma1, B. Sridevi1, N. Metzl2, P. Patra3, Z. Lachkar4, Kunal Chakraborty5, C. Goyet6,7, M. Levy2, M. Mehari4, N. Chandra3

1CSIR-National Institute of Oceanography, Regional Centre, 176 Lawsons Bay Colony, Visakhapatnam, India

2LOCEAN/IPSL laboratory, Sorbonne Université, CNRS/IRD/MNHN, Paris, France

3Japan Agency for Marine-Earth Science and Technology, Kanagawa, Japan

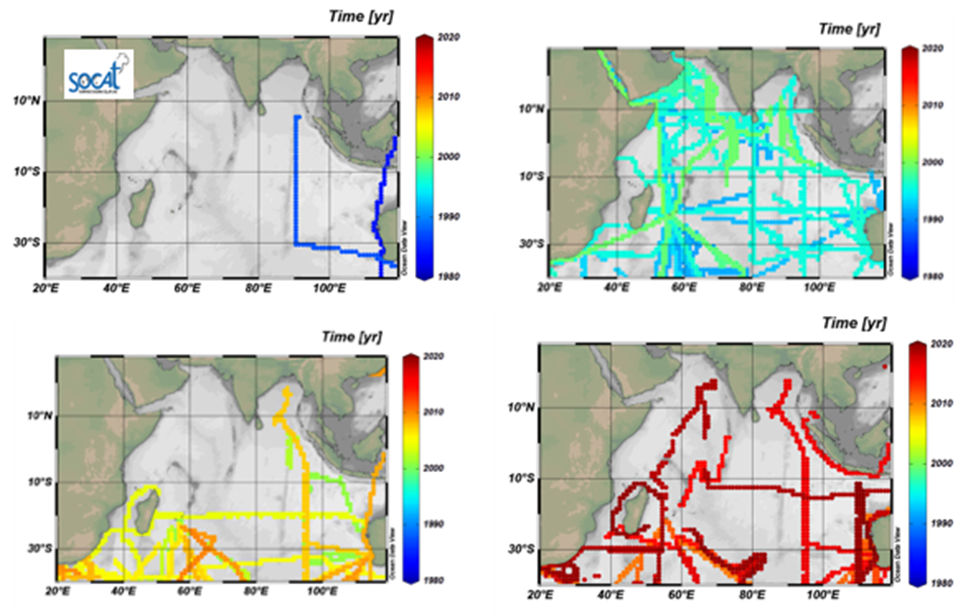
4Arabian Center for Climate and Environmental Sciences, New York University Abu Dhabi, Abu Dhabi, United Arab Emirates

5Indian National Centre for Ocean Information Services, Ministry of Earth Sciences, Hyderabad, India

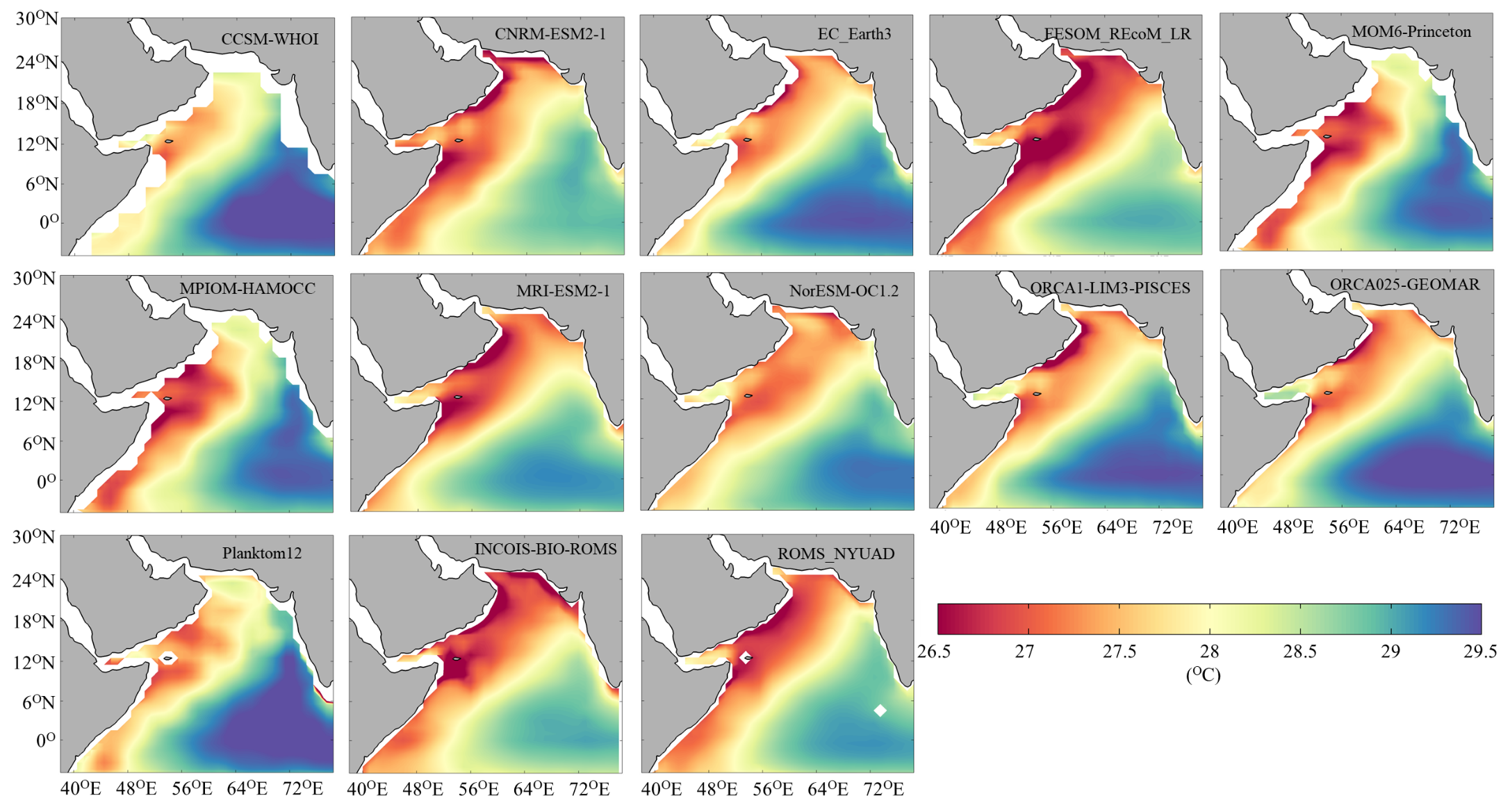
6Espace-Dev, UPVD, Perpignan France

7Espace-Dev, Univ. Montpellier, UPVD, IRD, Montpellier, France

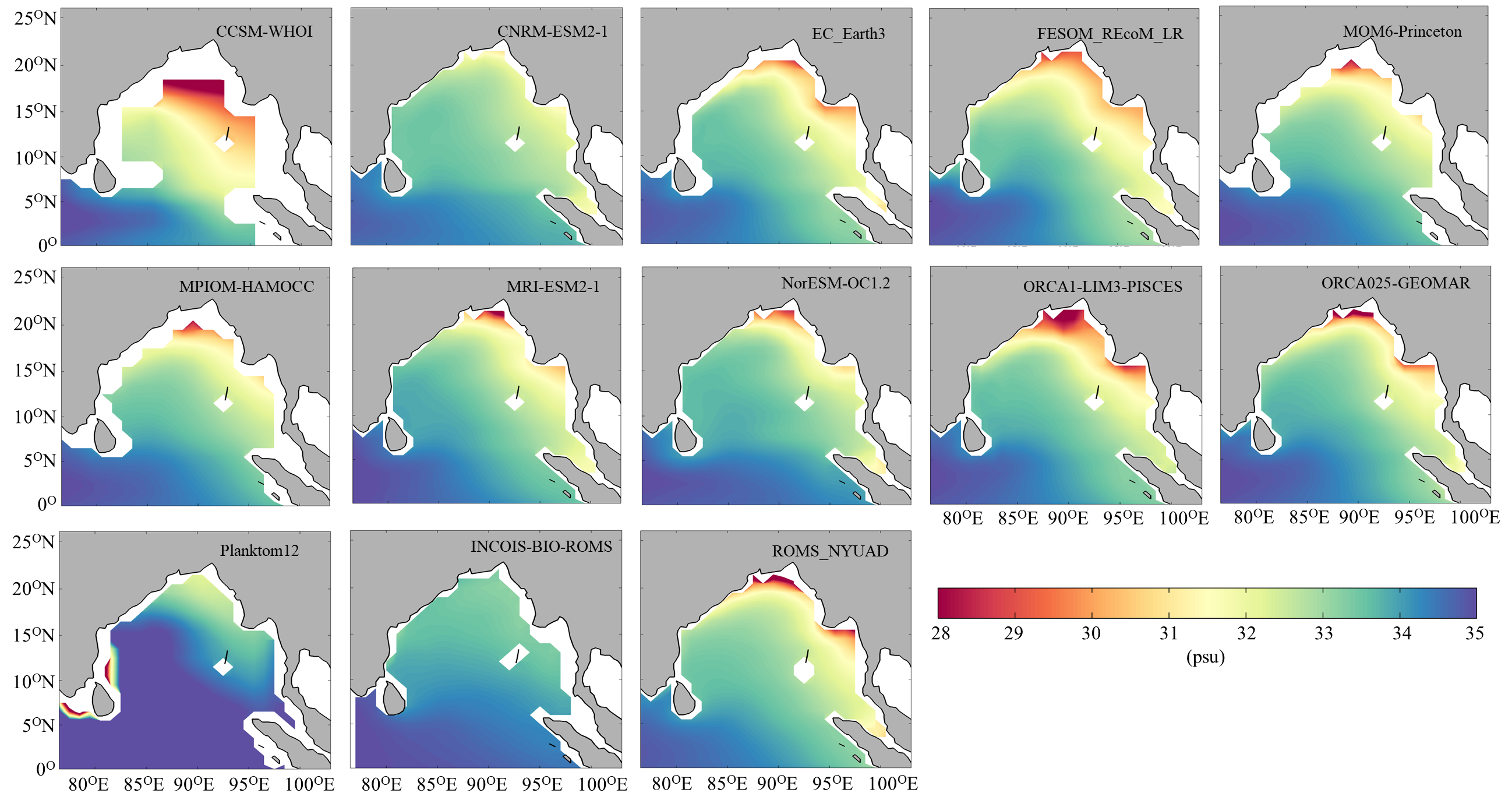
Supplementary Figure S1: Locations of pCO2 data collected with reference to space and time are given in the Indian Ocean (Source: SOCAT, Bakker et al, 2020)



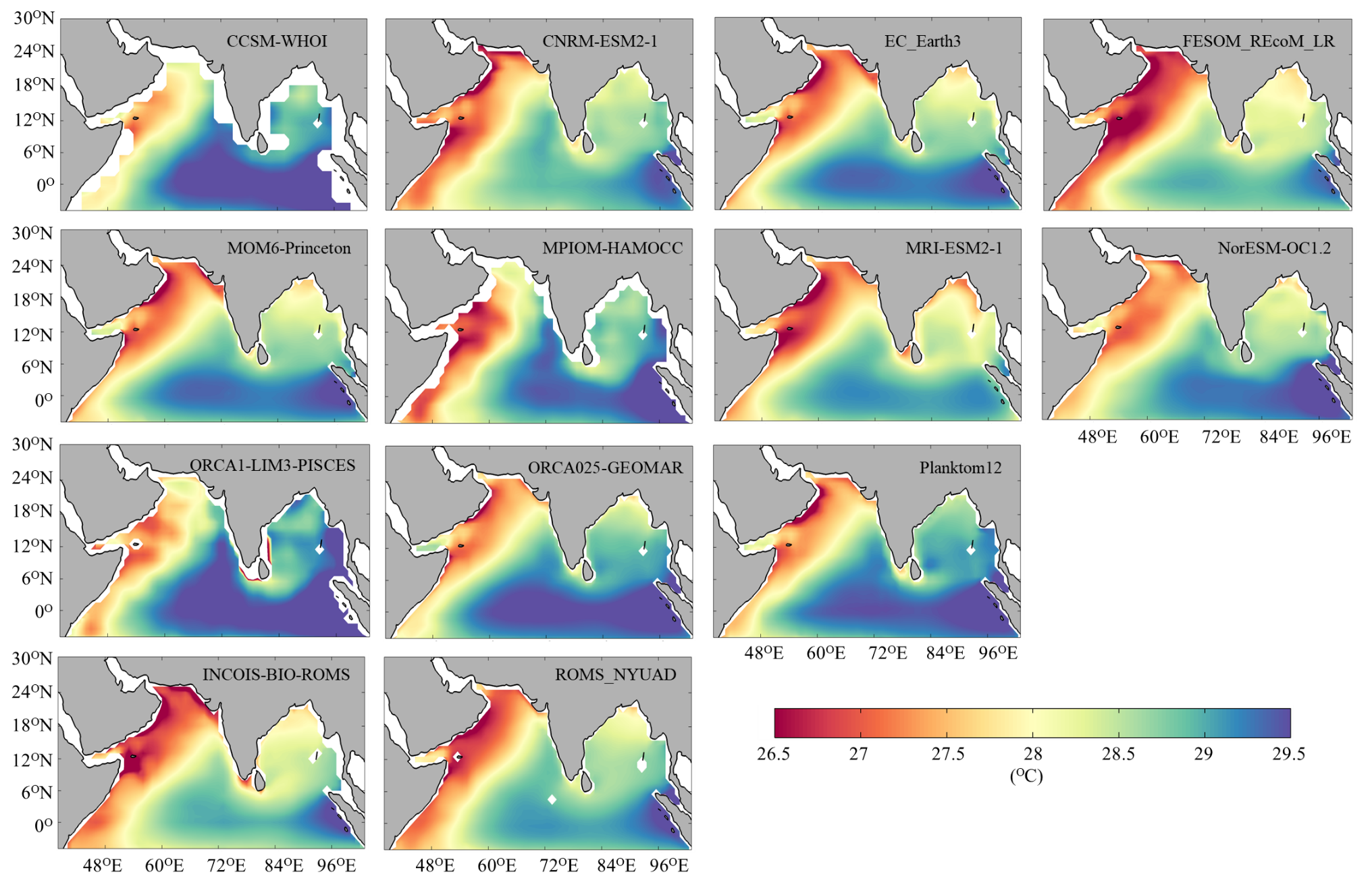
Supplementary Figure S2: The simulated mean sea surface temperature (1985-2018) by hindcast models in the Arabian Sea. Due to a lack of SST data from the CESM\_ETHZ model, it was not included.



Supplementary Figure S3: The simulated mean sea surface salinity (1985-2018) by hindcast models in the Bay of Bengal. Due to a lack of SSS data from the CESM\_ETHZ model, it was not included.



Supplementary Figure S4: The simulated mean sea surface temperature (1985-2018) by hindcast models in the Bay of Bengal. Due to a lack of SST data from the CESM\_ETHZ model, it was not included.



Supplementary Figure S5: Seasonal cycle of the CO2 flux (PgC yr-1; left panel) and dpCO2 (matm; right panel) from observations and hindcast models in the Indian Ocean, Arabian Sea, BoB, EIO and SIO.

