Extended Reconstructed Sea Surface Temperature version 5 (ERSSTv5)

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Introduction

NOAA/NCEI has reexamined assumptions and algorithms applied to ERSSTv4 (Huang et al. 2015) released in early 2014. Innovations and improvements are made in ERSSTv5 (Huang et al. 2017) towards estimating the true SST state through time globally, regionally and locally.

Progressive revisions from v4 to v5

| Exp.	Progressive revisions
UnadjFG	Using unadjusted first-guess
NDP	No high-latitude damping in EOTs
SMT	Reduced smoothing of 6-deg in EOTs
EOT140	Additional 10 EOTs in the Arctic
ShipBias	Ship bias correction referenced to buoy SST
ICOADS3	Using ICOADS R3.0
Argo5m	Including Argo observations above 5 m
ERSSTv5	Using HadISST2 sea-ice concentration

Summary

Cross-validations and verifications with independent observation benchmark show that the updates incorporated in ERSSTv5 have improved the representation of spatial variability over the global oceans, the magnitude of El Niño and La Niña events, and the decadal nature of SST changes over 1930s–40s when observation instruments changed rapidly. Both long (1900–2015) and short (2000–2015) term SST trends in ERSSTv5 remain significant and close to ERSSTv4.

Reference

Huang, B., P. W. Thorne, V. F. Banzon, T. Boyer,   G. Chepurin, J. H. Lawrimore, M. J. Menne,   T. M. Smith, R. S. Vose, and H.-M. Zhang, 2017: Extended Reconstructed Sea Surface Temperature version 5 (ERSSTv5): Upgrades, Validations, and Intercomparisons, J. Climate, under review.
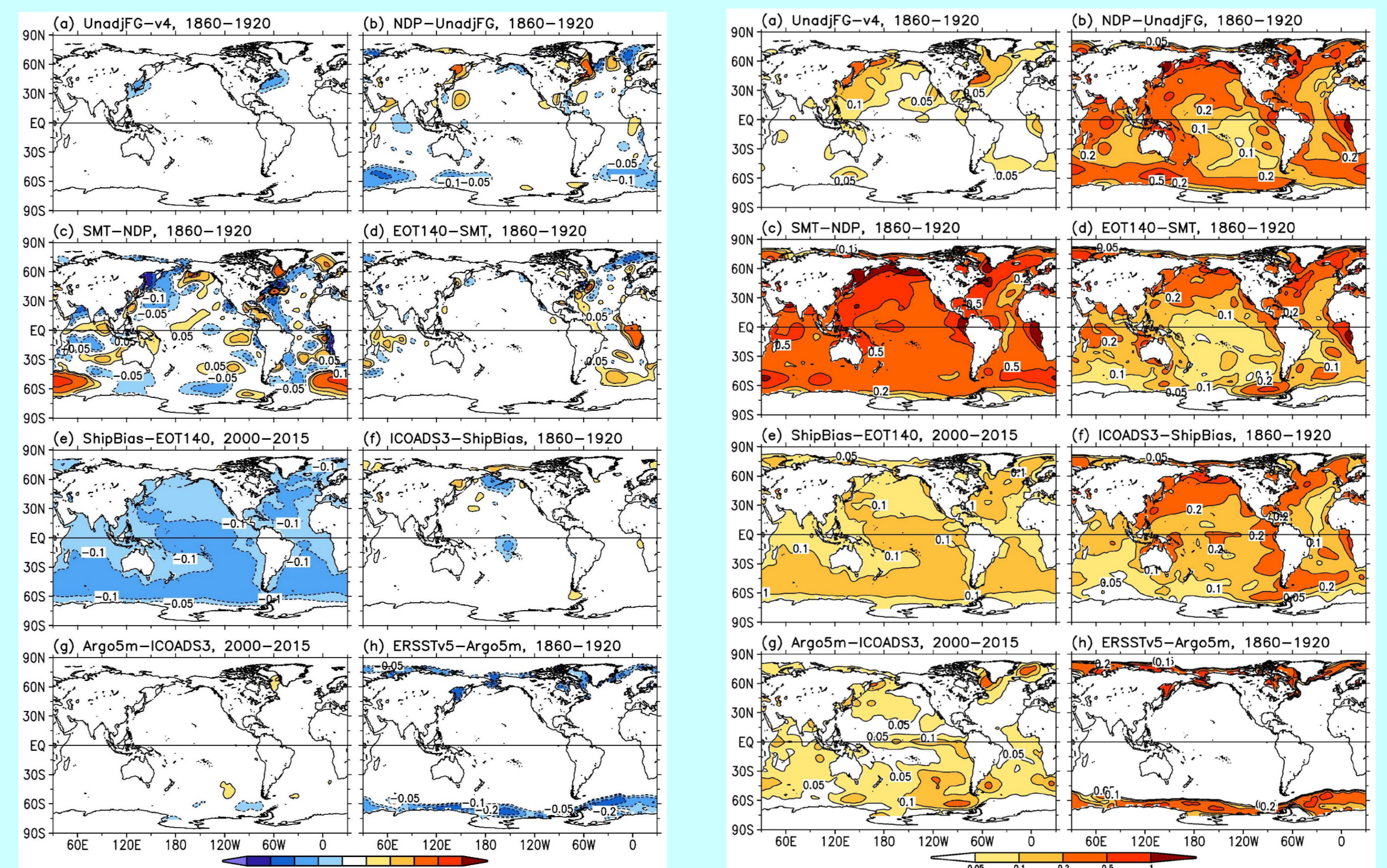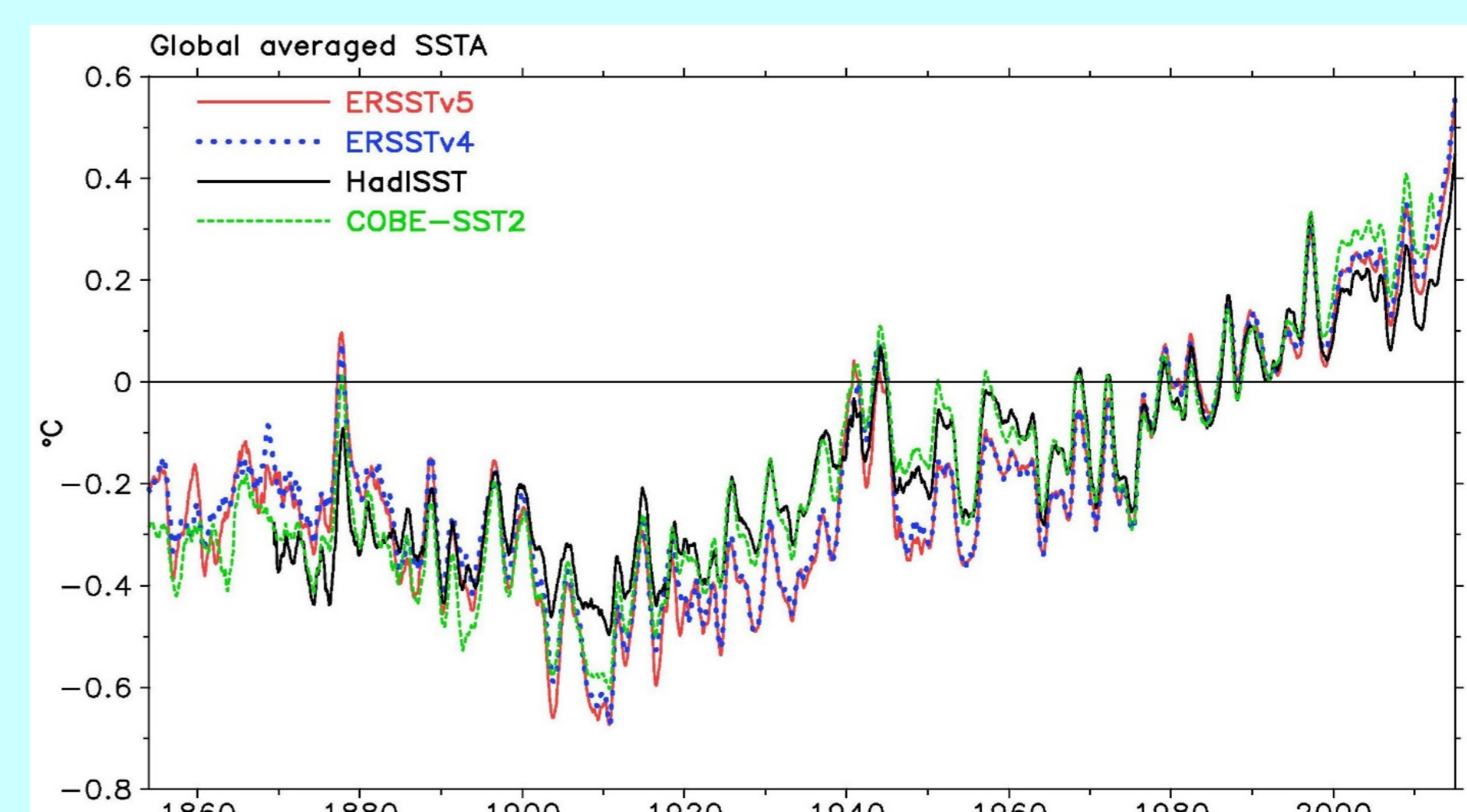

Differences (left) and RMSD (right) calculated from progressive experiments.
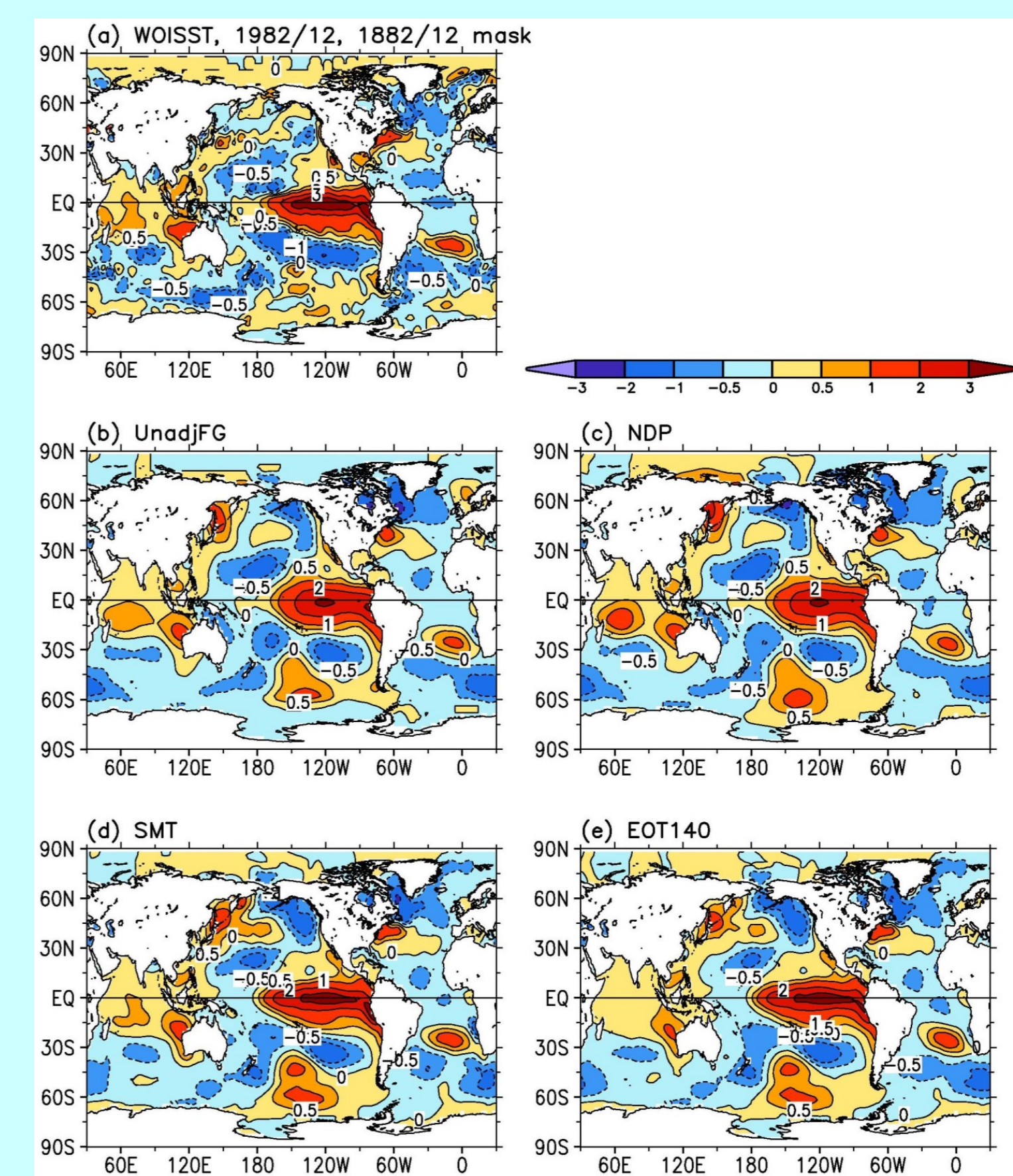
Example of reconstructed Dec1982 El Niño using Dec1882 observation mask.
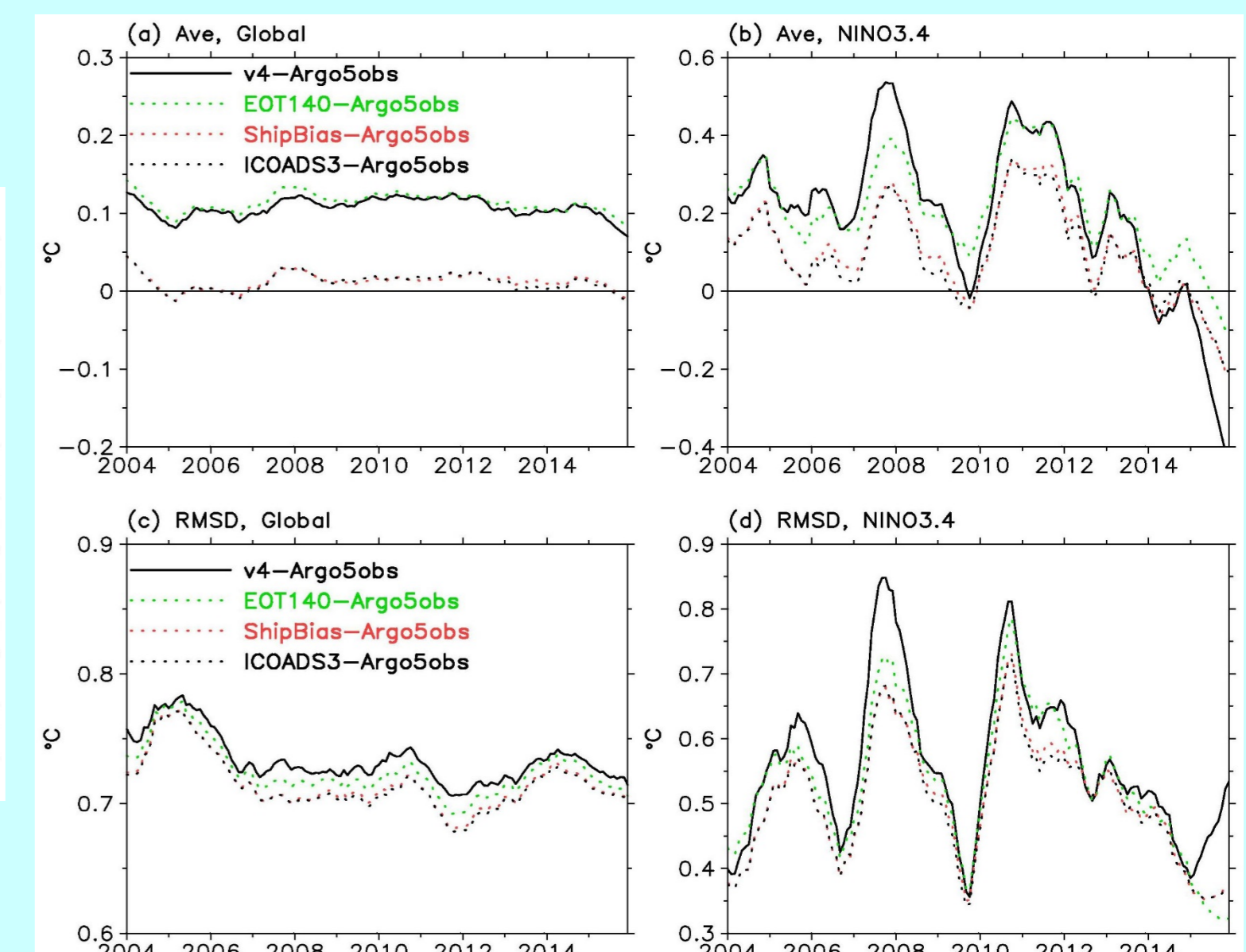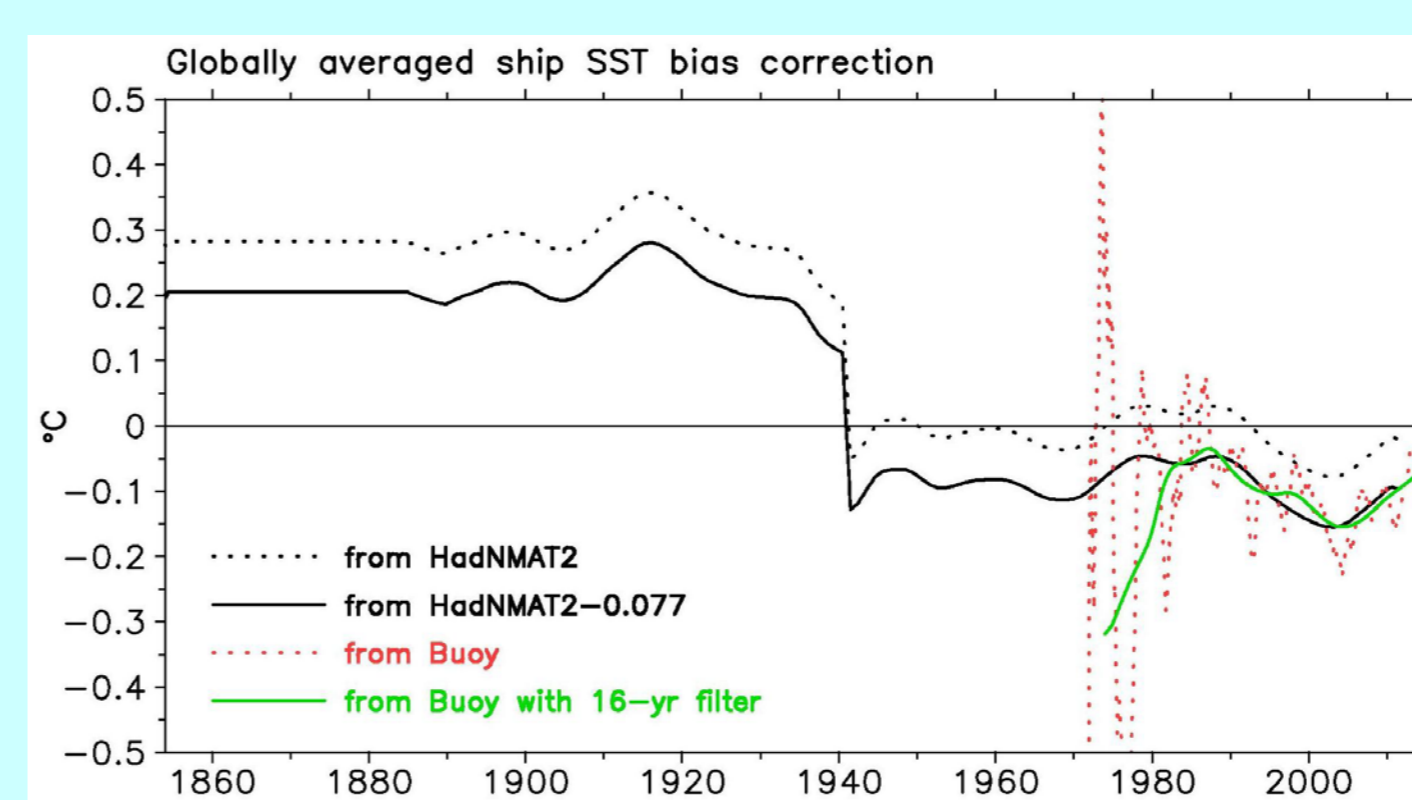
Ship SST bias correction in v5 (left, solid black) and validation of resulted SST analyses (right) with independent Argo SST.

Globally averaged SSTAs from ERSSTv5, ERSSTv4, HadISST, and COBE-SST2.

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