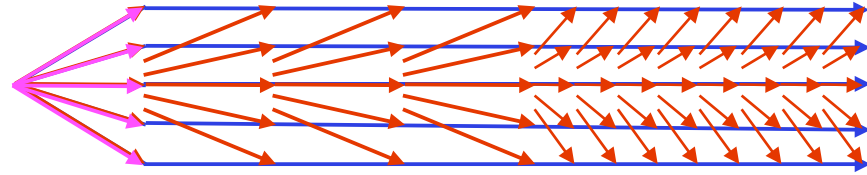
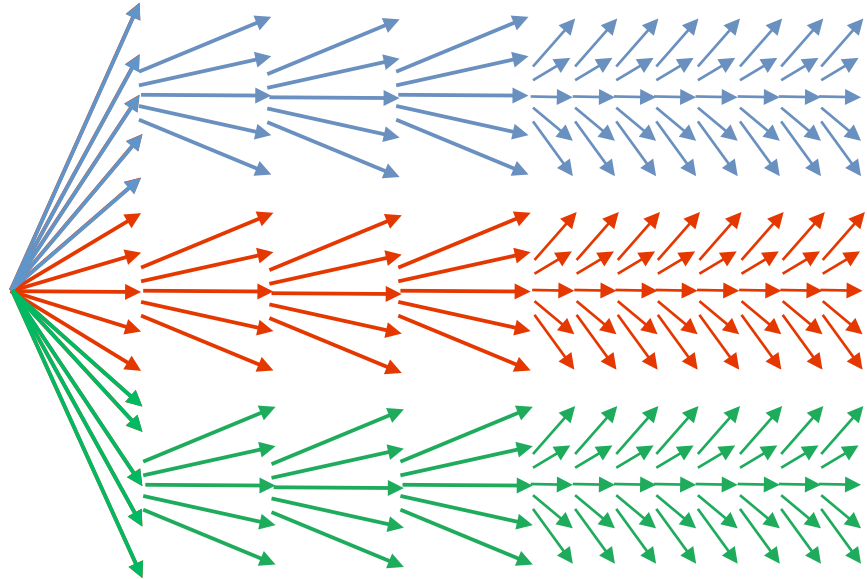


Experiment Setup to get „a“ spread back

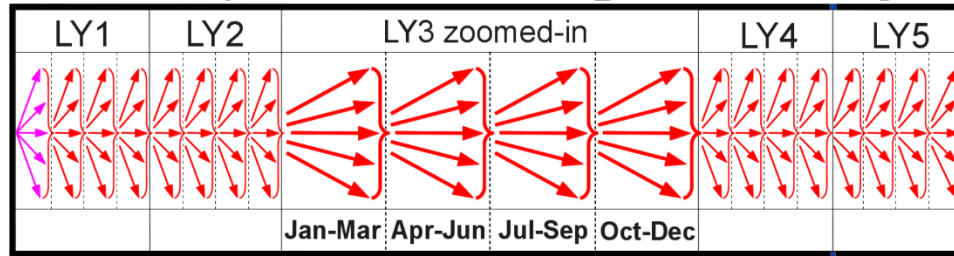
decadal experiment
Raw and EDF



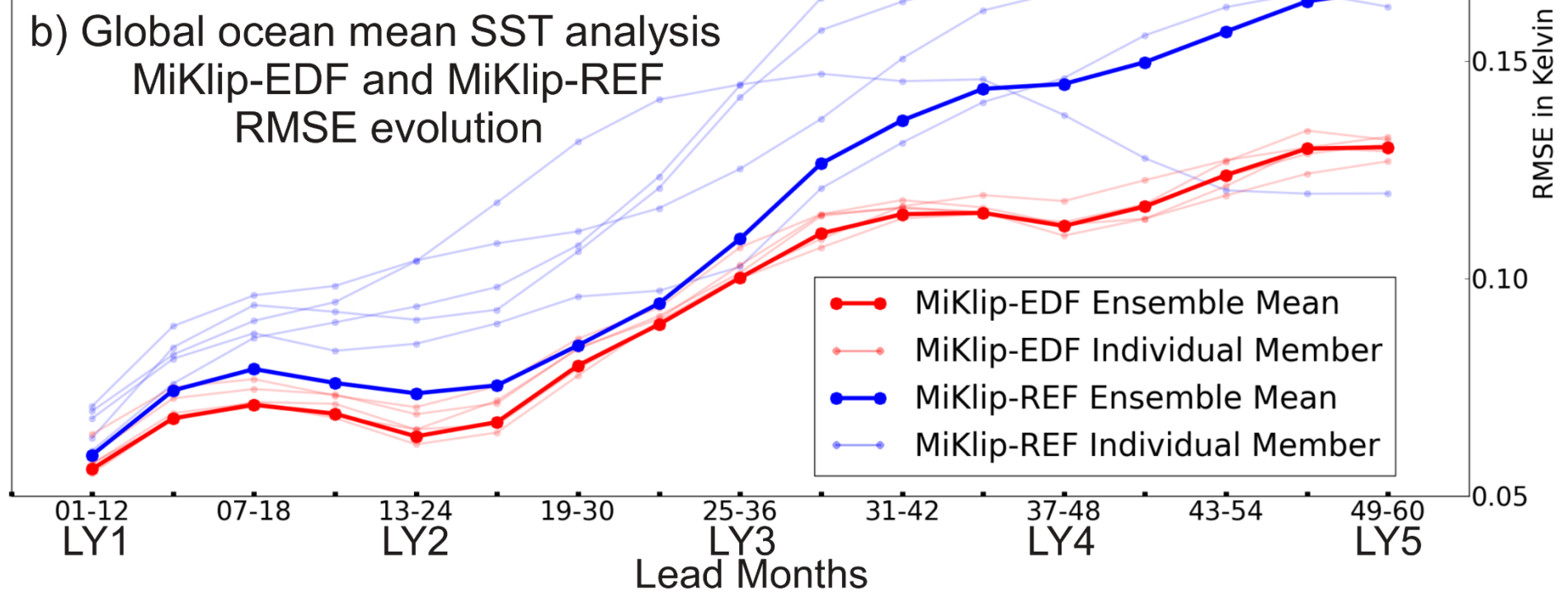
decadal experiment
15 Members EDF



a) Decadal predictions using runtime adjustments - MiKlip-EDF



b) Global ocean mean SST analysis MiKlip-EDF and MiKlip-REF RMSE evolution



Question: Is the EDF system better? **Answer:** Compare the evaluations!

Temporal Mean State of

Temperature

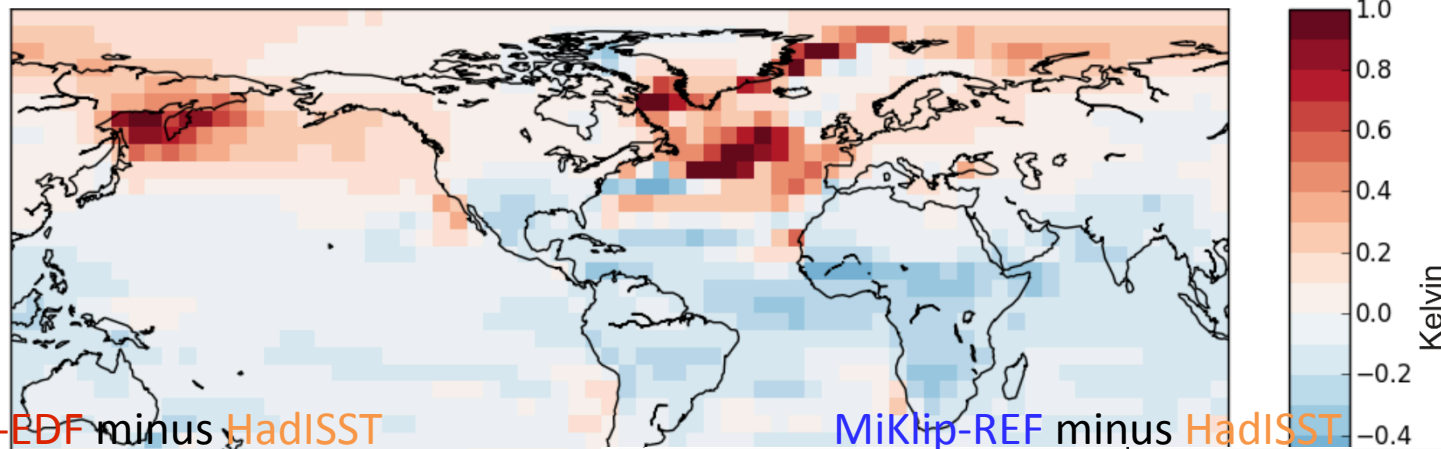
- + Colder Lower Latitudes, warmer Higher Latitudes
- + Reduction of Cold Bias in the North Atlantic
- + Removed (small) Cold Bias in the Sea of Okhotsk

+ Instead of telling the model what is doing wrong (flux-corrections), find inner-model solution to common problem

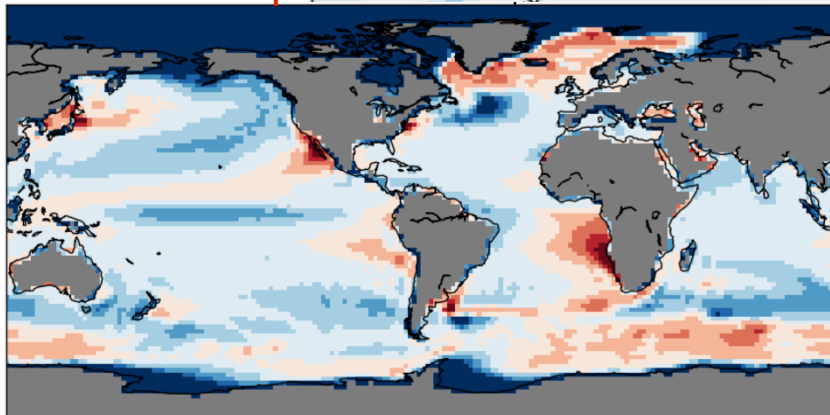
Surface Temperature - Temporal Mean of Lead Year 2-5 - 1979 to 2013

MiKlip-EDF minus MiKlip-REF

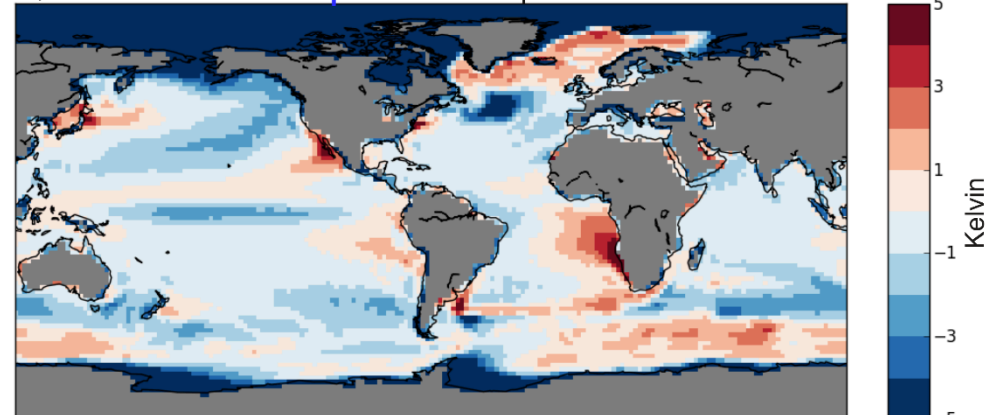
Differences in Kelvin



MiKlip-EDF minus HadISST



MiKlip-REF minus HadISST

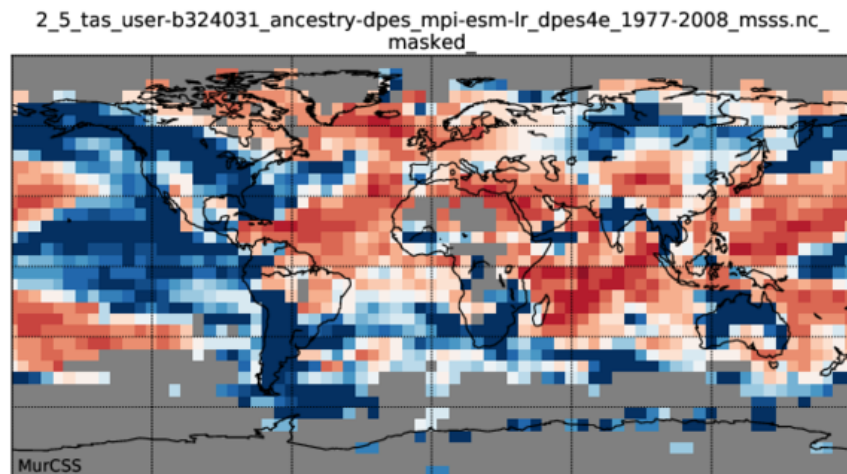
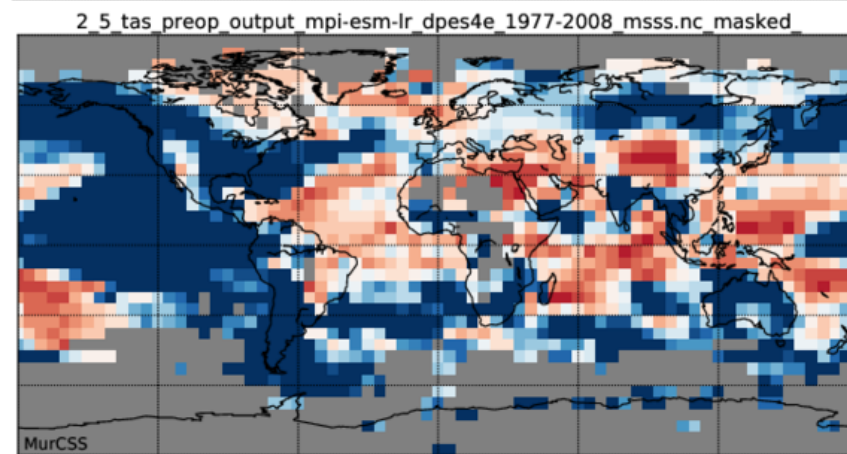
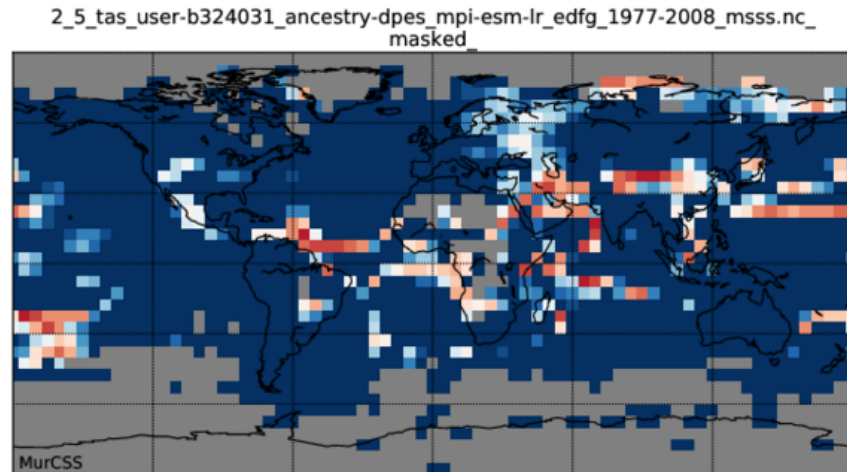


Smooth out?

Smooth out

Normal MiKlip
Prediction System

Ensemble Dispersion
Filter

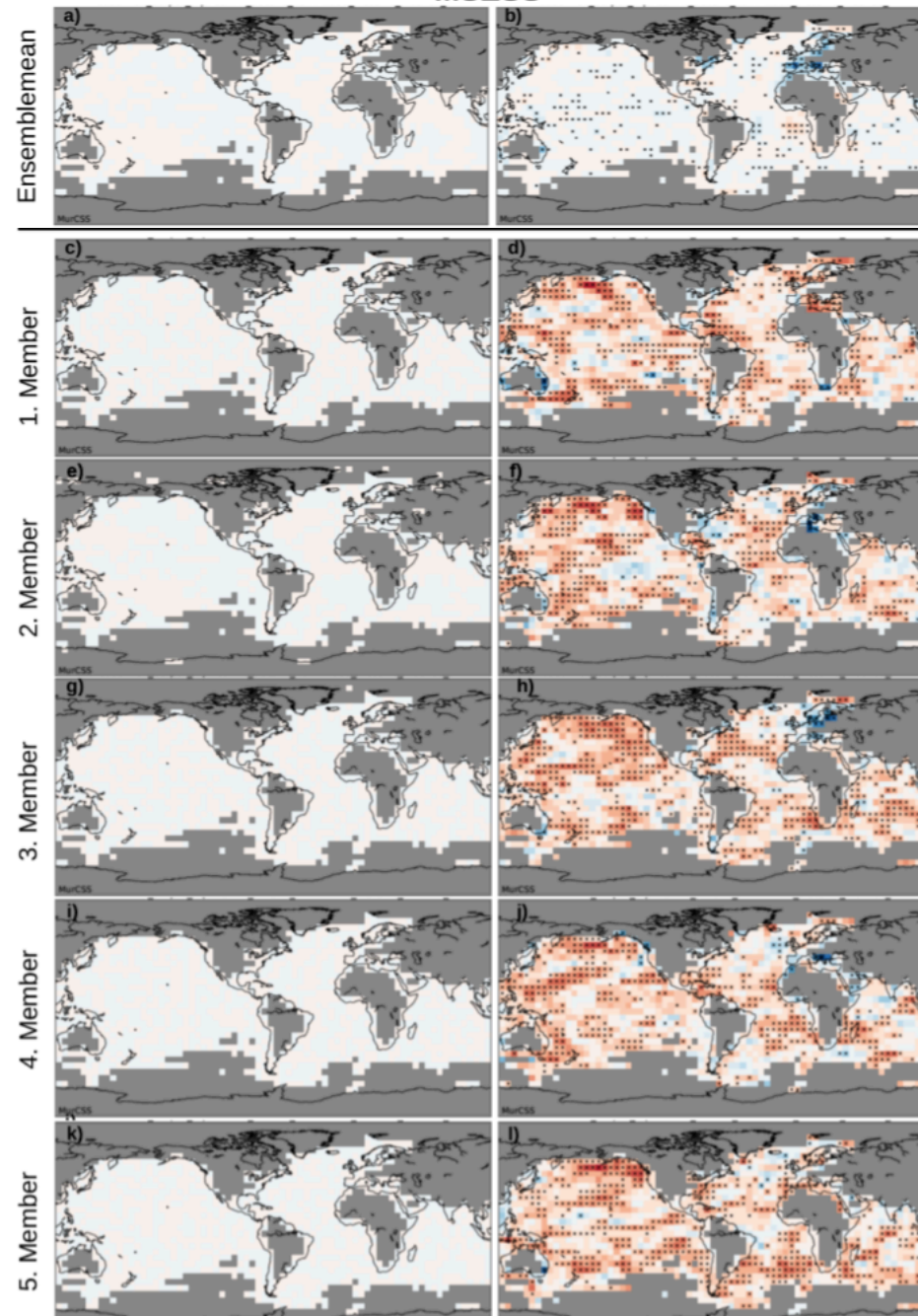


Early stage effect of the EDF by improving each Member

Lead Month 3

MSESS

Lead Month 4



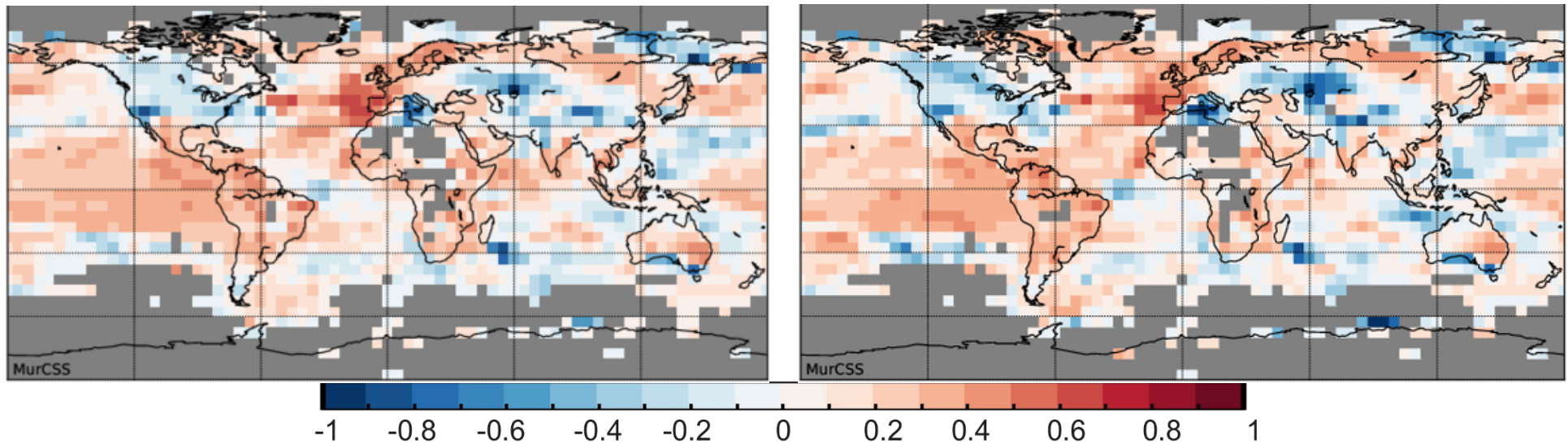
Detrended?

MSESS LY2-5 Near Surface Air
Temperature

Pure Signal

MiKlip-EDF VS MiKlip-REF

Detrended

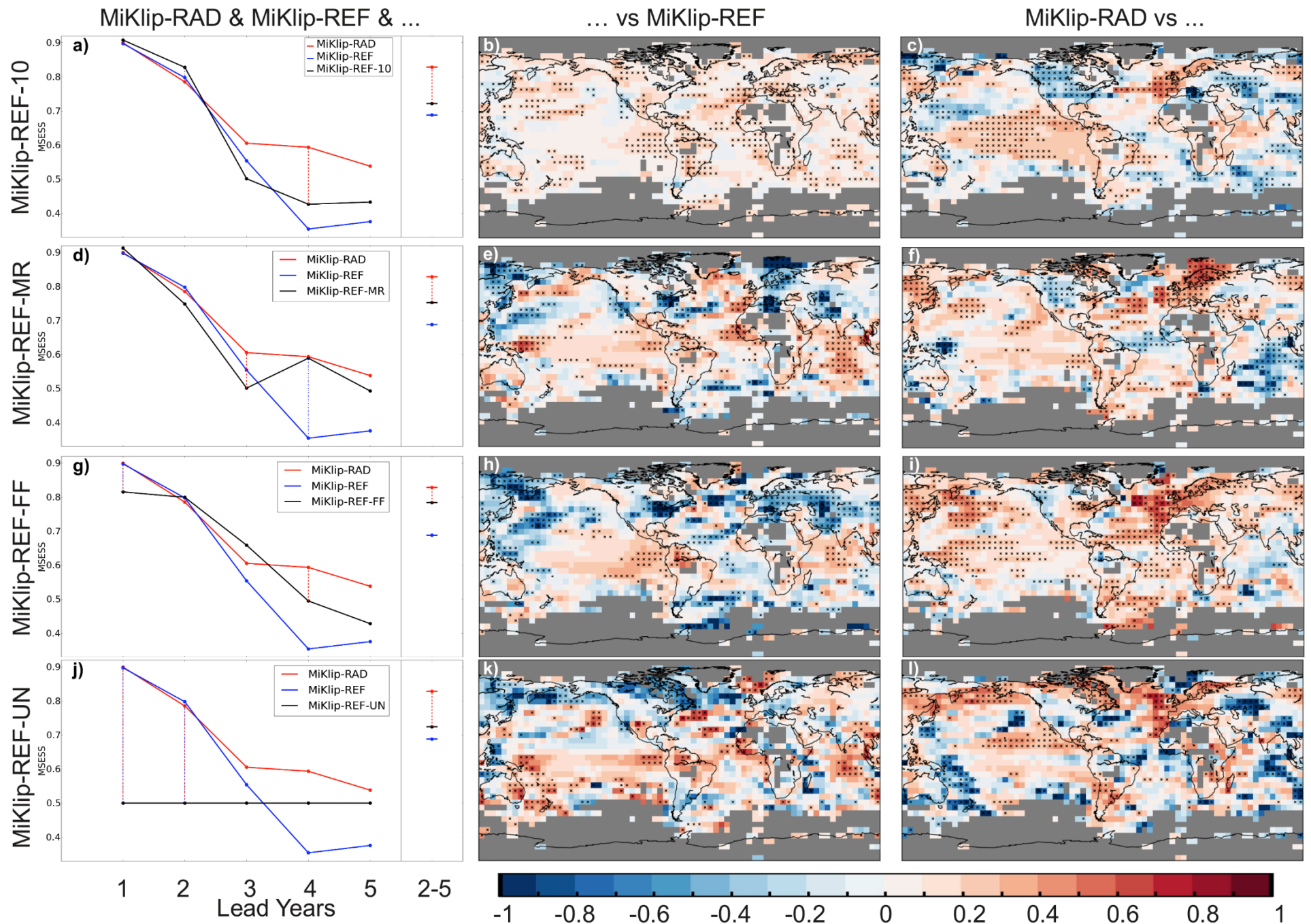


Improvement is also true for detrended analysis
and true for global mean temperature (not shown)

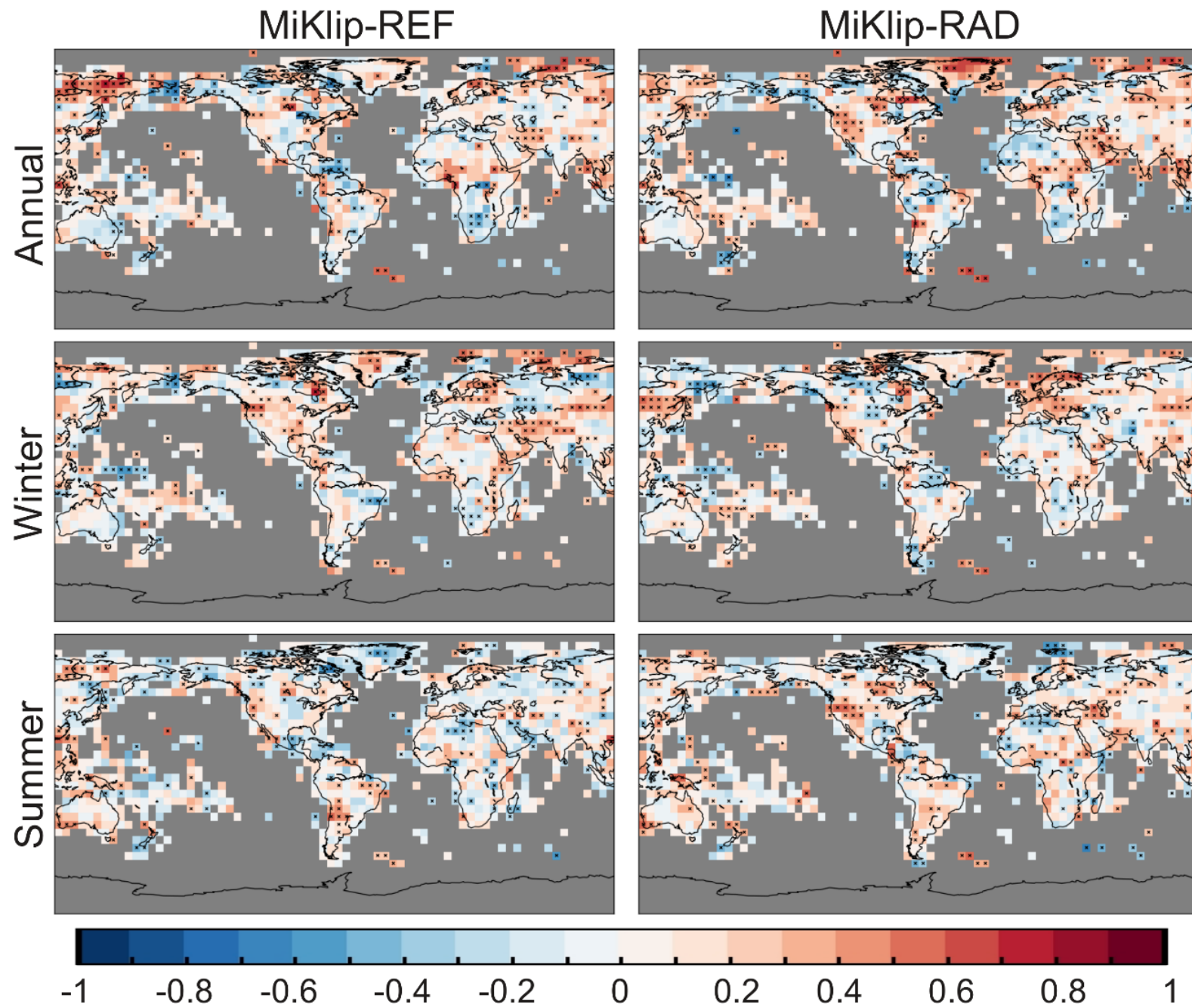
QUESTION:

What about other MiKlip
Prediction Systems?

MSESS - Near Surface Air Temperature



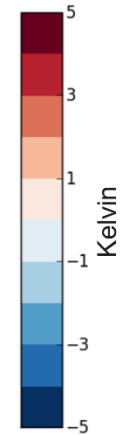
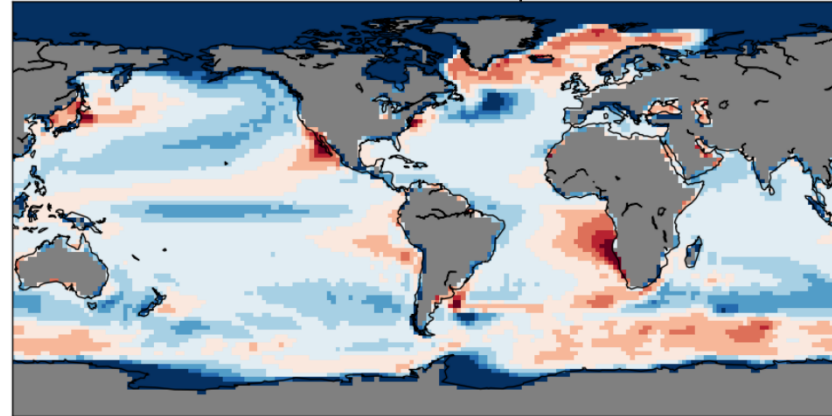
Correlation - Precipitation



Sea Surface Temperature

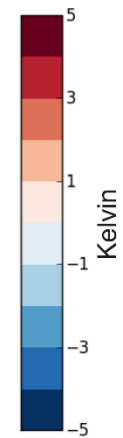
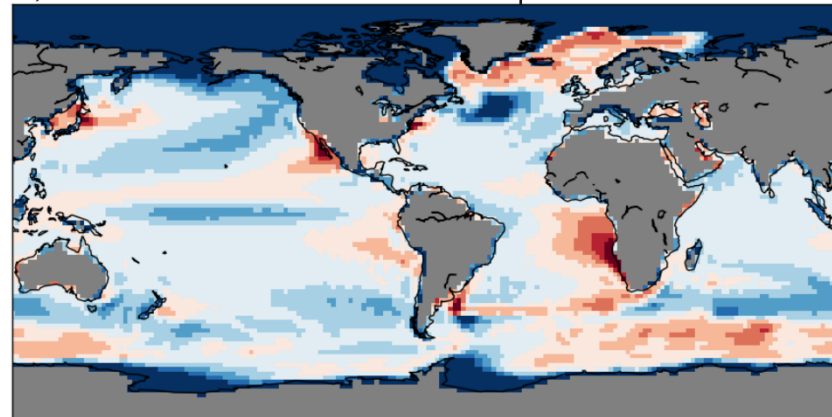
a)

HadISST - MiKlip-RAD



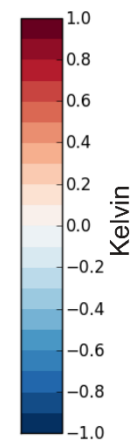
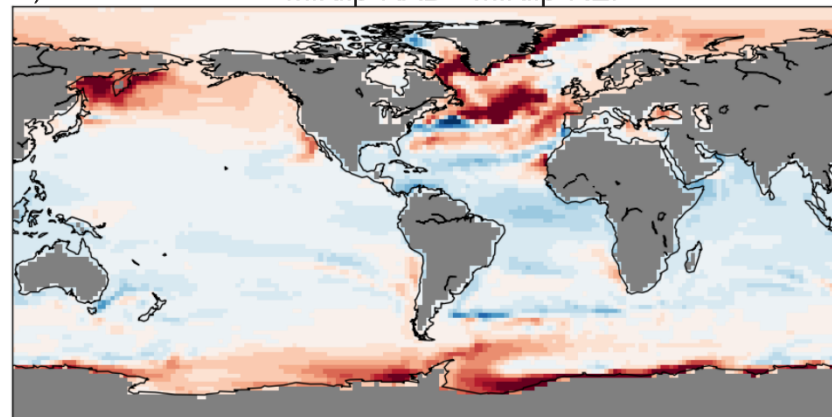
b)

HadISST - MiKlip-REF

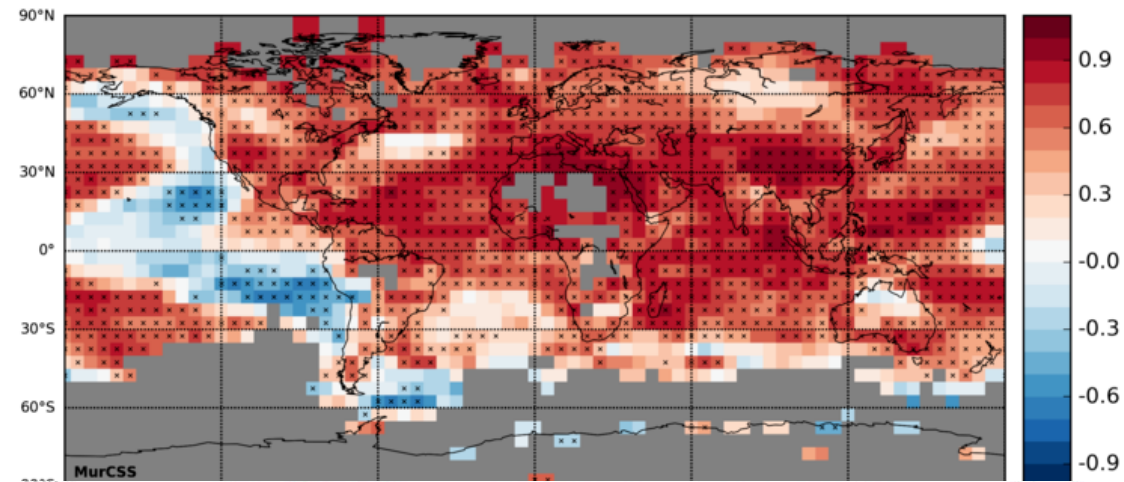


c)

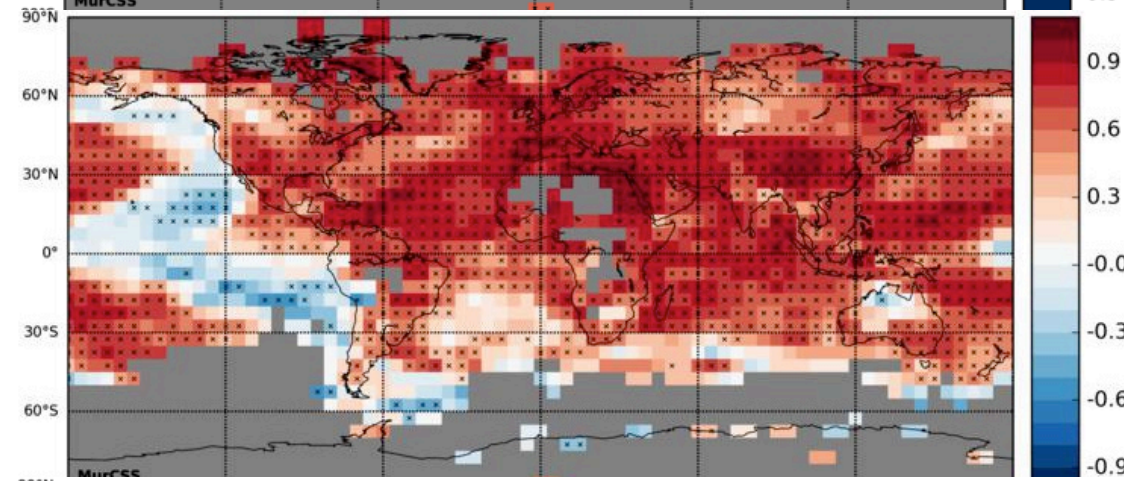
MiKlip-RAD - MiKlip-REF



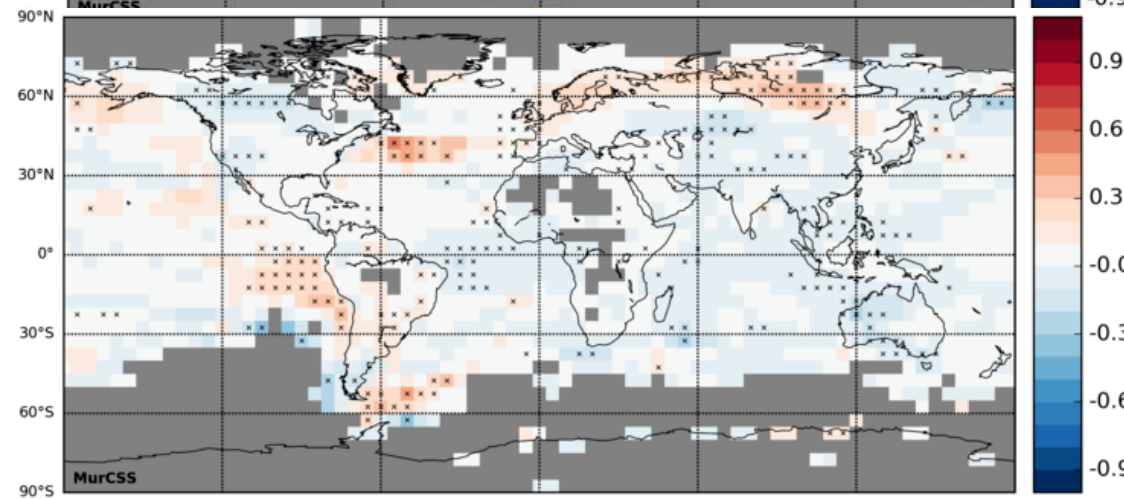
MiKlip-REF



MiKlip-EDF



Difference



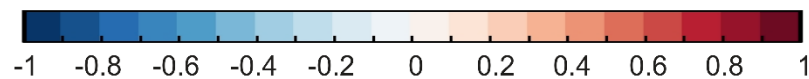
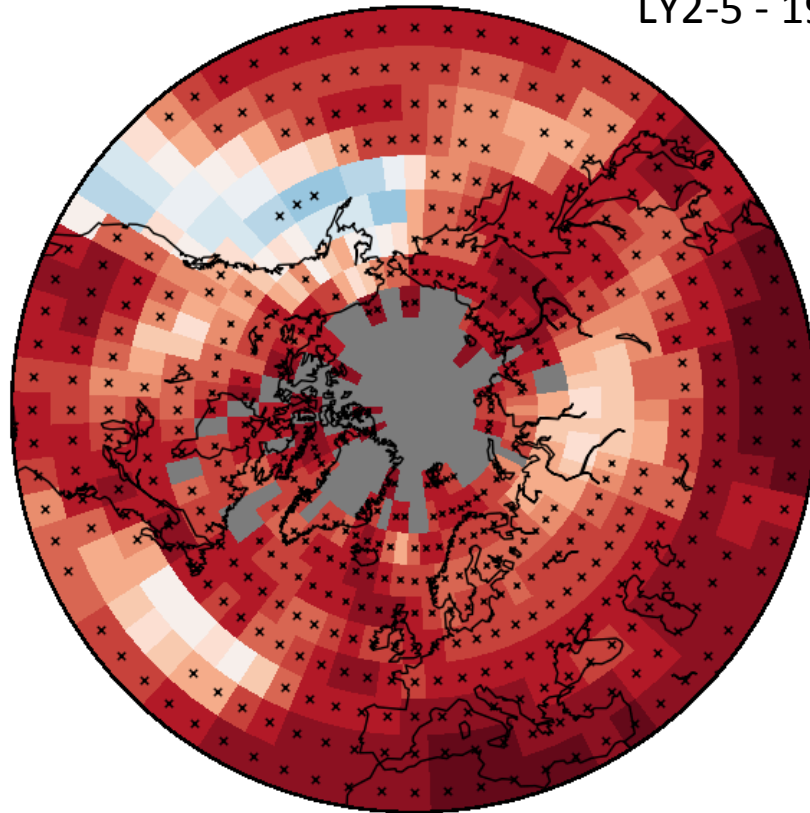
Question: Is the EDF system better? **Answer:** Compare the evaluations!

Near-Surface Air Temperature

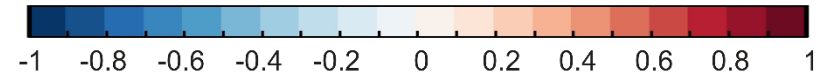
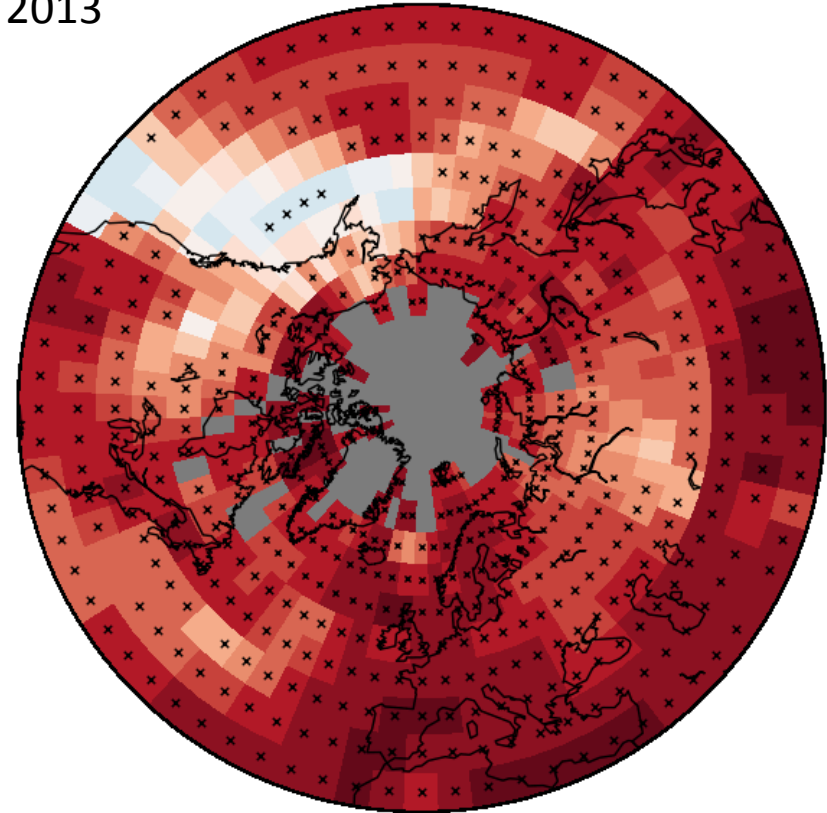
MiKlip-REF

MiKlip-EDF

Correlation Coefficient
LY2-5 - 1979 to 2013



Forecast compared to Observations
MiKlip-REF compared to HadCRUT4



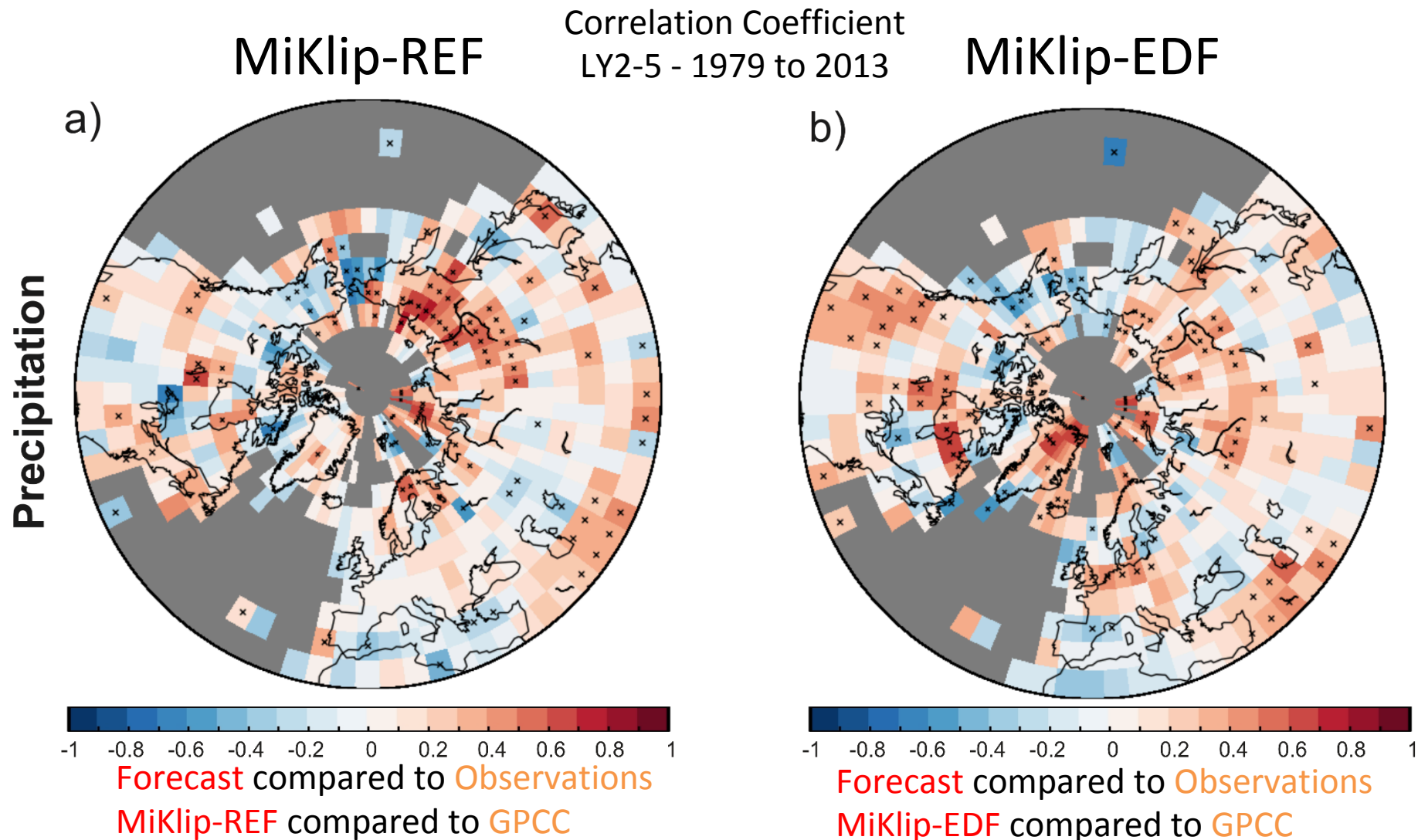
Forecast compared to Observations
MiKlip-EDF compared to HadCRUT4

Question: Is the EDF system better? **Answer:** Compare the evaluations!

Other Climate Variables: Precipitation

+ Positive significant Signal over North-East Asia, Northern Scandinavia, and Middle East

+ Positive significant Signal over North America, Central Europe, around Iceland, and Middle East



Question: Is the EDF system better? **Answer:** Compare the evaluations!

Other Climate Variables: Winter Cyclones (DJF)

+ Pretty noisy signal, not much to interpret
+ Especially no signal along the stormtracks

+ Large positive significant areas along the North-Atlantic stormtrack and Europe

