



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG



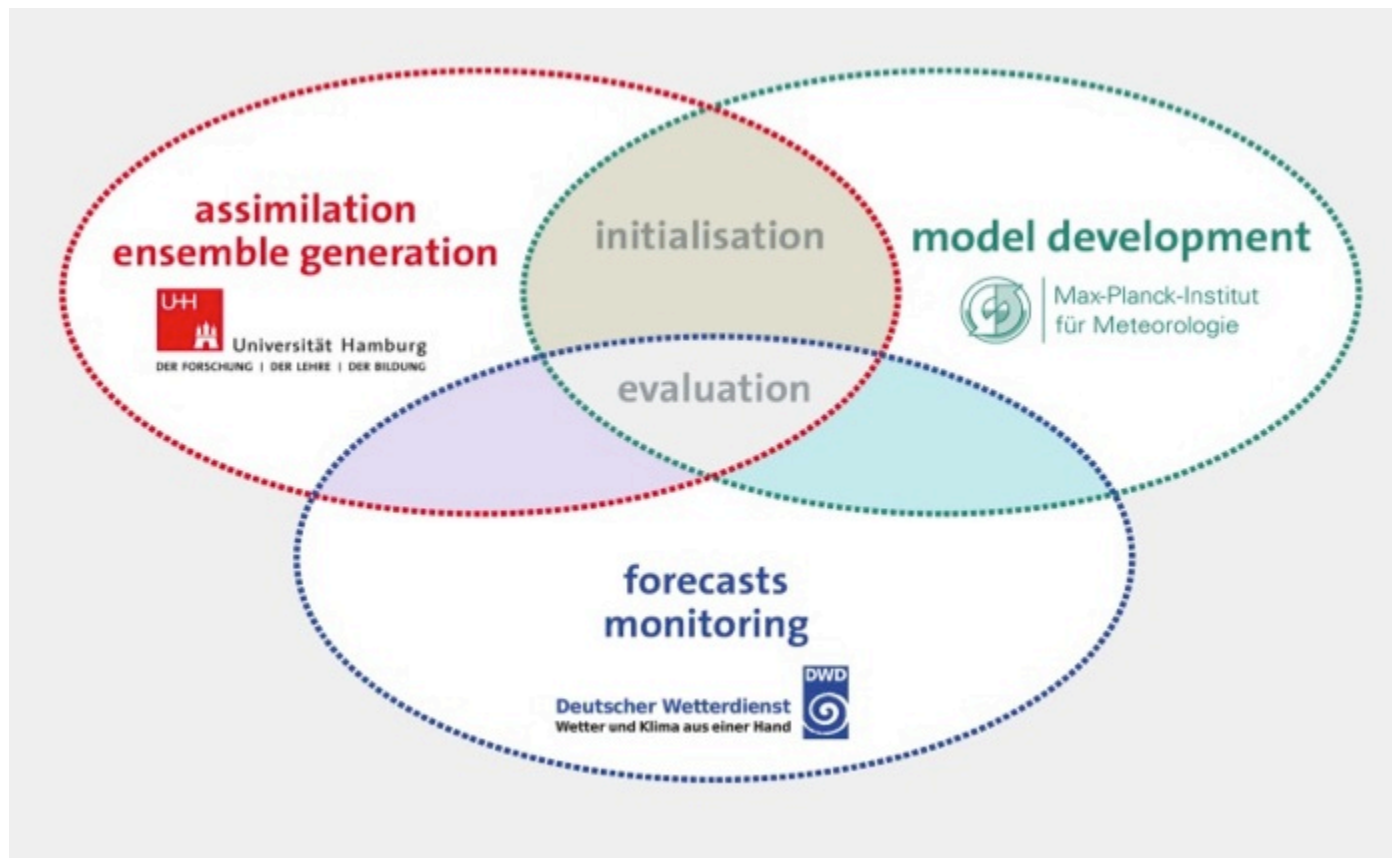
# Uni Hamburg/DWD/GCFS

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in collaboration with Wolfgang Müller (MPI-M) and  
Kristina Fröhlich (DWD)

# GCFS – German Climate Forecast System

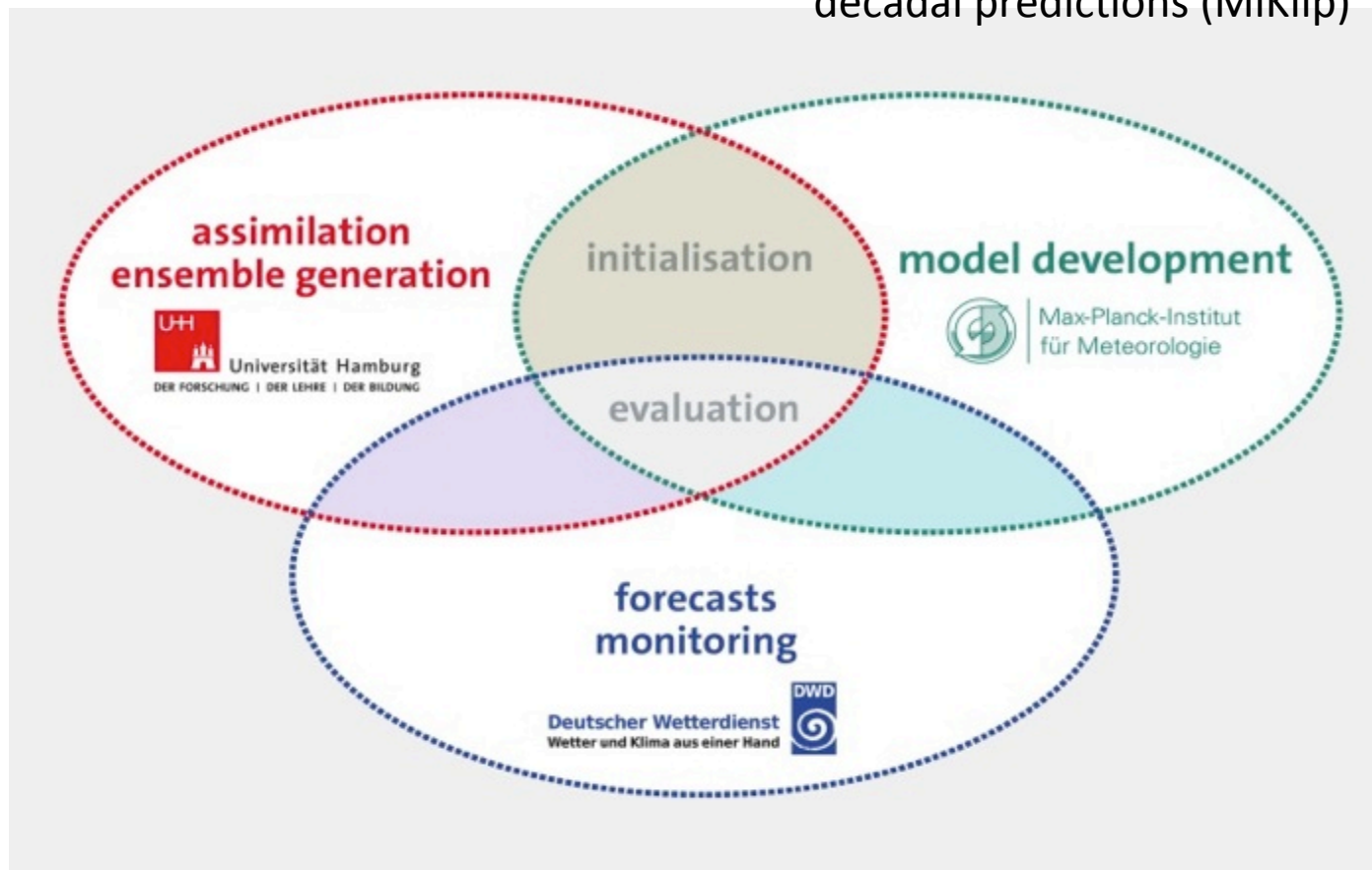
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# GCFS – German Climate Forecast System

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Starting point:  
MPI-ESM, as used for CMIPx, and  
decadal predictions (MiKlip)



# GCFS1.0

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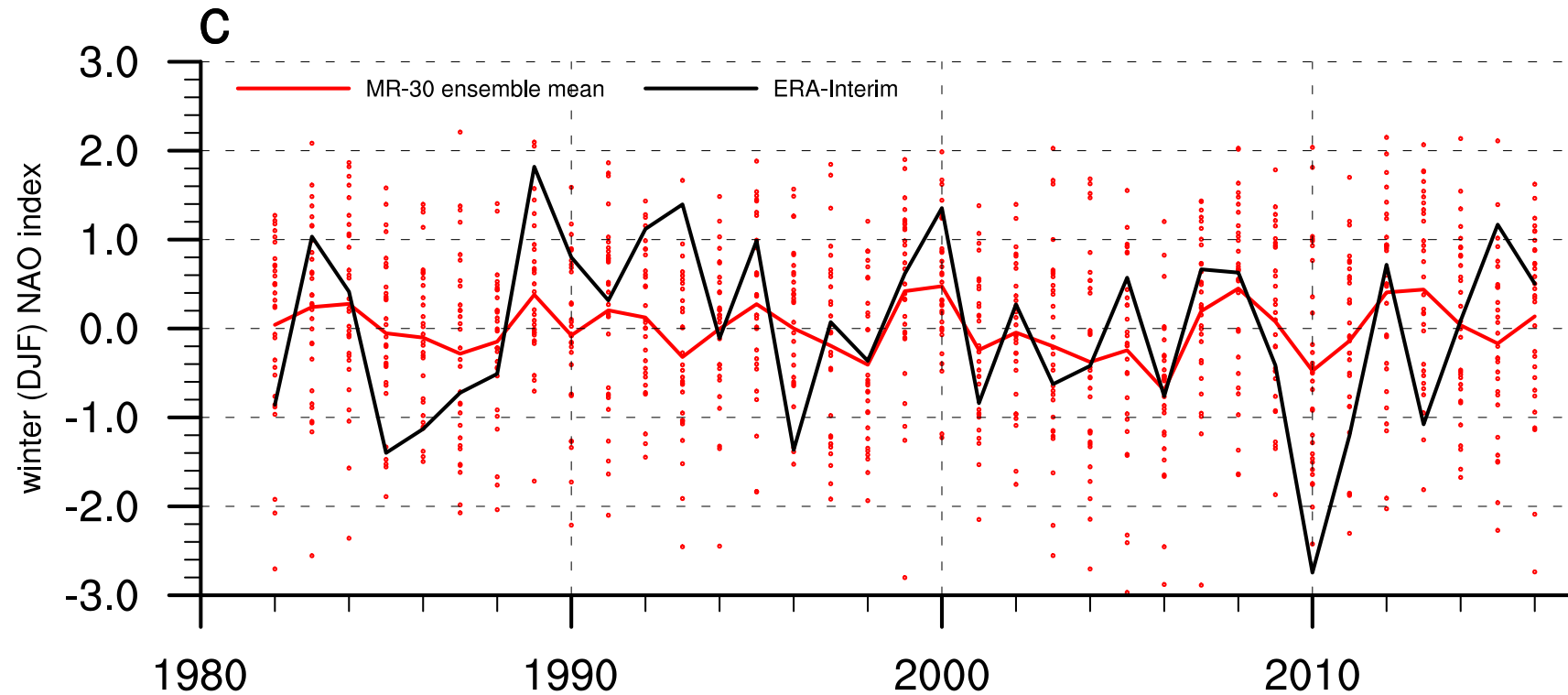
- based on MPI-ESM-LR
  - T63/L47 with ~1.5 degree/L40 ocean
- Atmosphere, ocean and sea-ice initialized via full-field nudging
- Operational since 2016
  - [www.dwd.de/jahreszeitenvorhersage.html](http://www.dwd.de/jahreszeitenvorhersage.html)
- Currently used for C3S
- No relevant NAO skill

# Intermediate science version

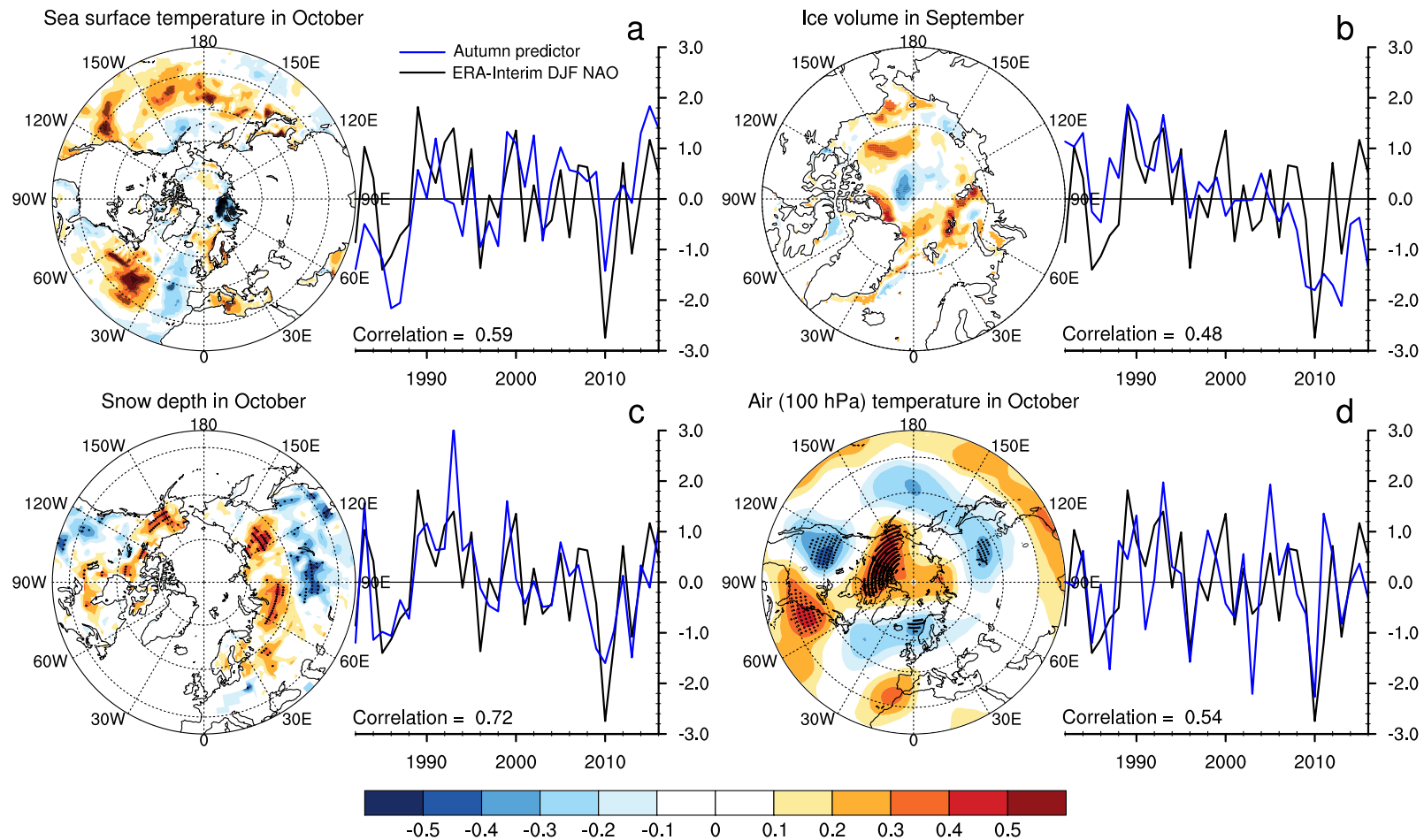
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- based on MPI-ESM-MR
  - T63/L95 with  $\sim 0.4$  degree/L40 ocean
- Atmosphere, ocean and sea-ice initialized via full-field nudging
- Only used by MPI-M and Uni Hamburg for scientific purposes
- With modest NAO skill: 0.49

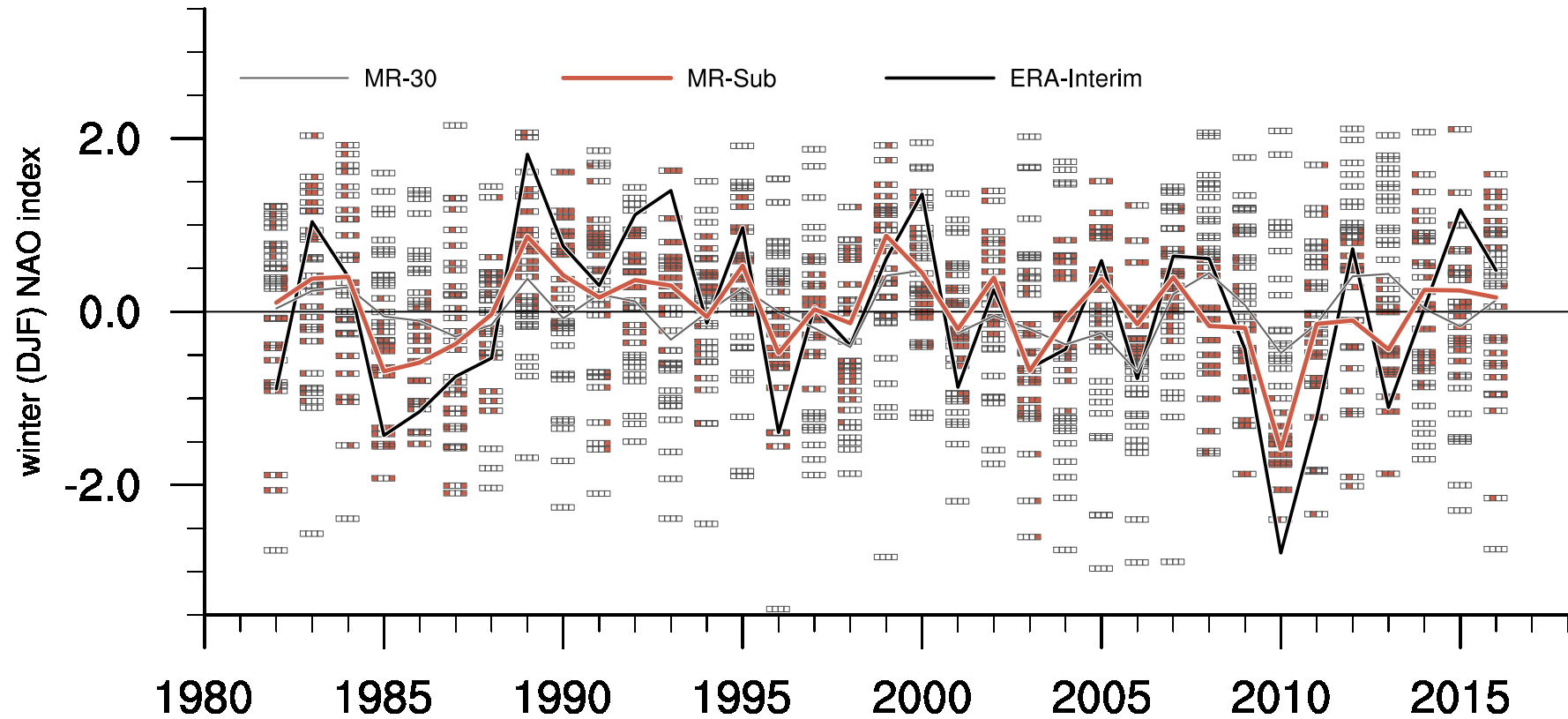
# Hindcast skill for winter NAO



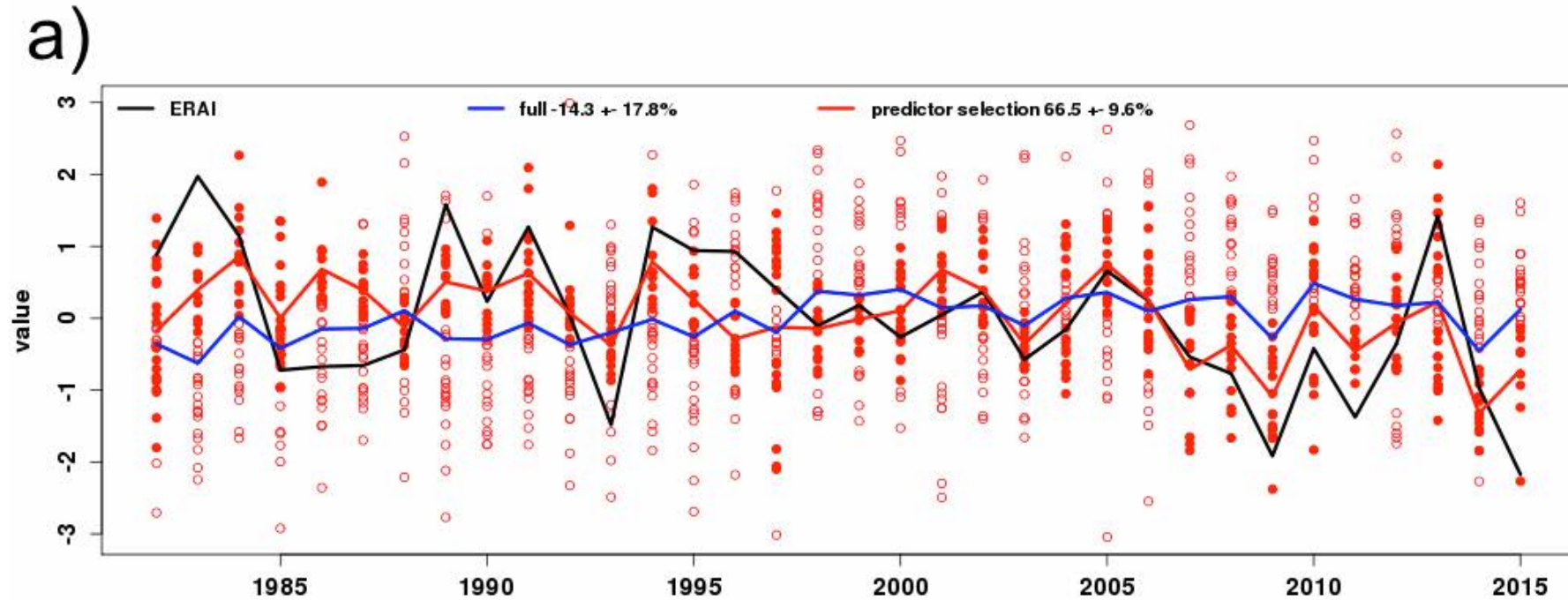
# NAO teleconnections



# NAO – ensemble subselection

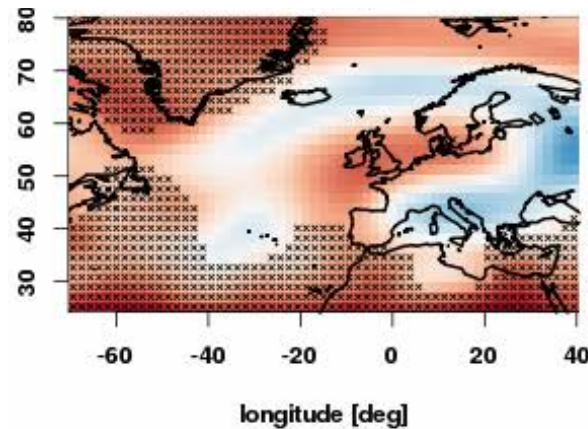


# Summer NAO hindcast skill

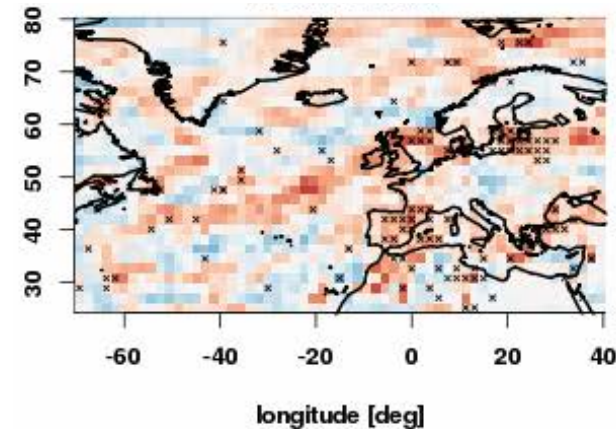


# Summer hindcast skill based on NAO subselection

Full ensemble

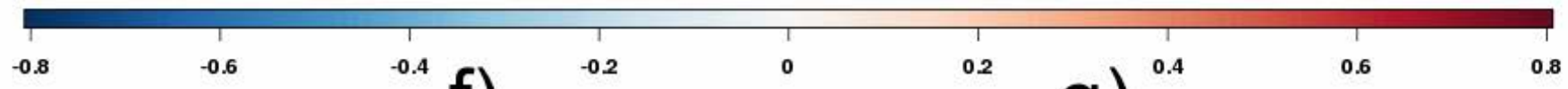
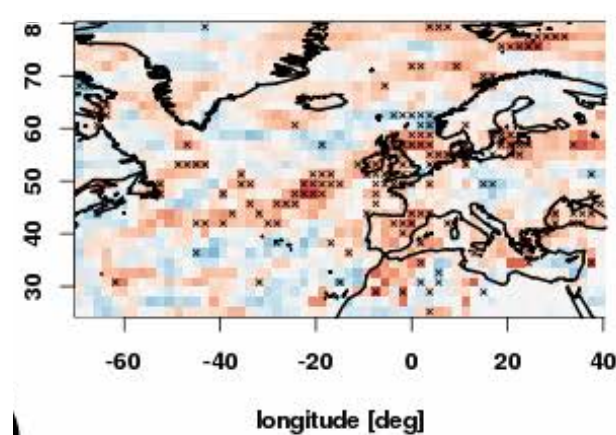
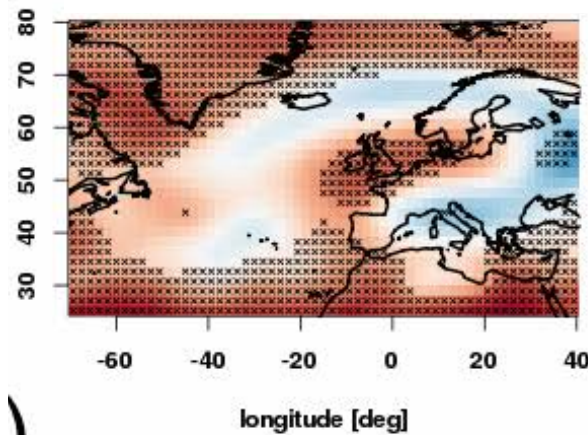


Z500



Precip

Subselected ensemble



# Towards GCFS2.0

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- Now: GCFS1.0 – based on MPI-ESM-LR
  - T63/L47 with ~1.5 degree/L40 ocean
- Intermediate: noGCFS – based in MPI-ESM-MR
  - T63/L95 with ~ 0.4 degree/L40 ocean
- Soon: GCFS2.0 – based on MPI-ESM-HR
  - T127/L95 with ~ 0.4 degree/L40 ocean