



P.P. Shirshov Institute
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Cyclone activity in modern era reanalyses comparative assessment

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Motivation

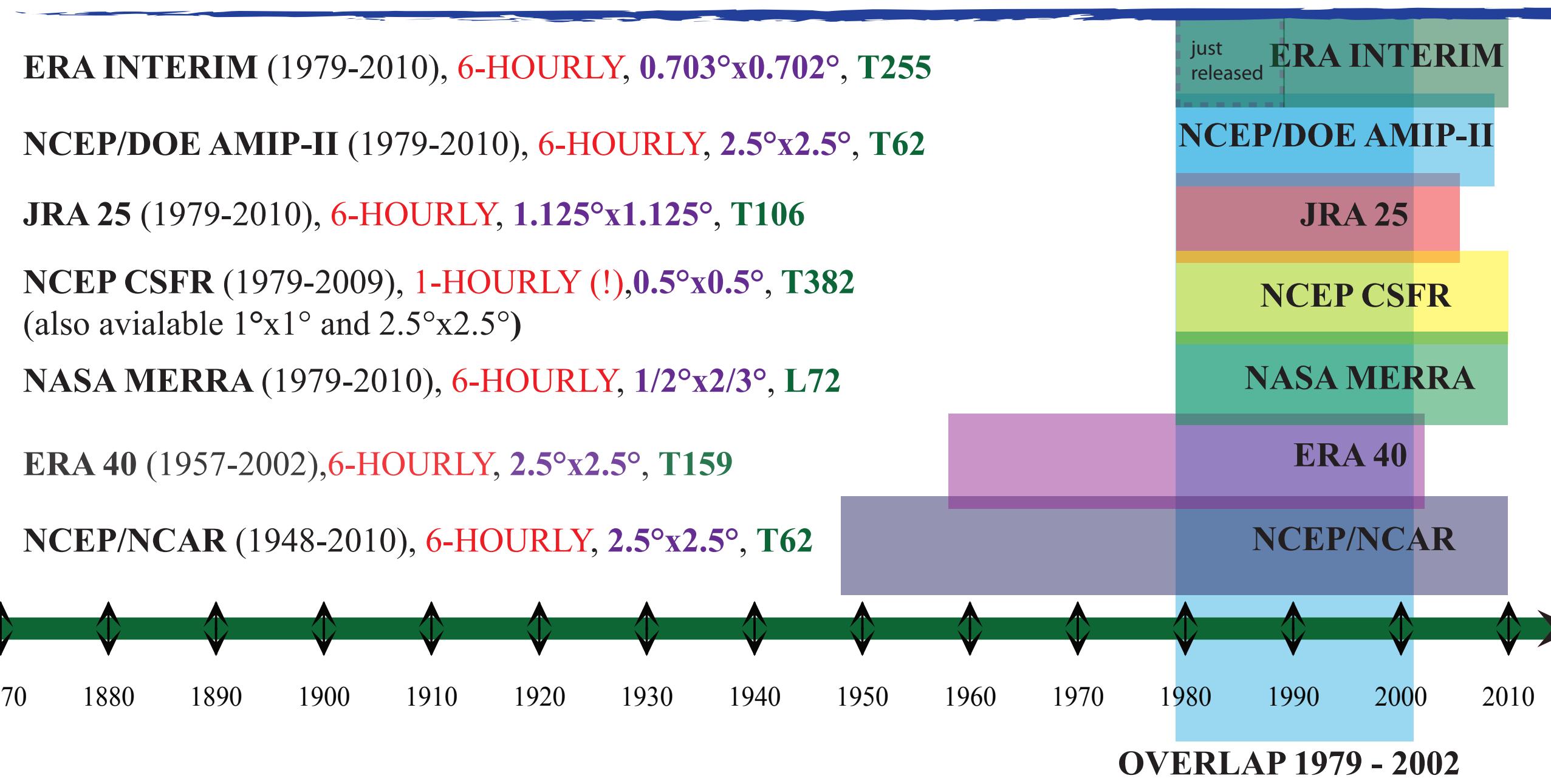
How do all reanalyses reproduce the main midlatitude mechanism of heat and moisture transport in the Northern Hemisphere?

Whether reanalyses are in a good consideration in representing interannual variability of cyclone activity and cyclone lifecycle characteristics?

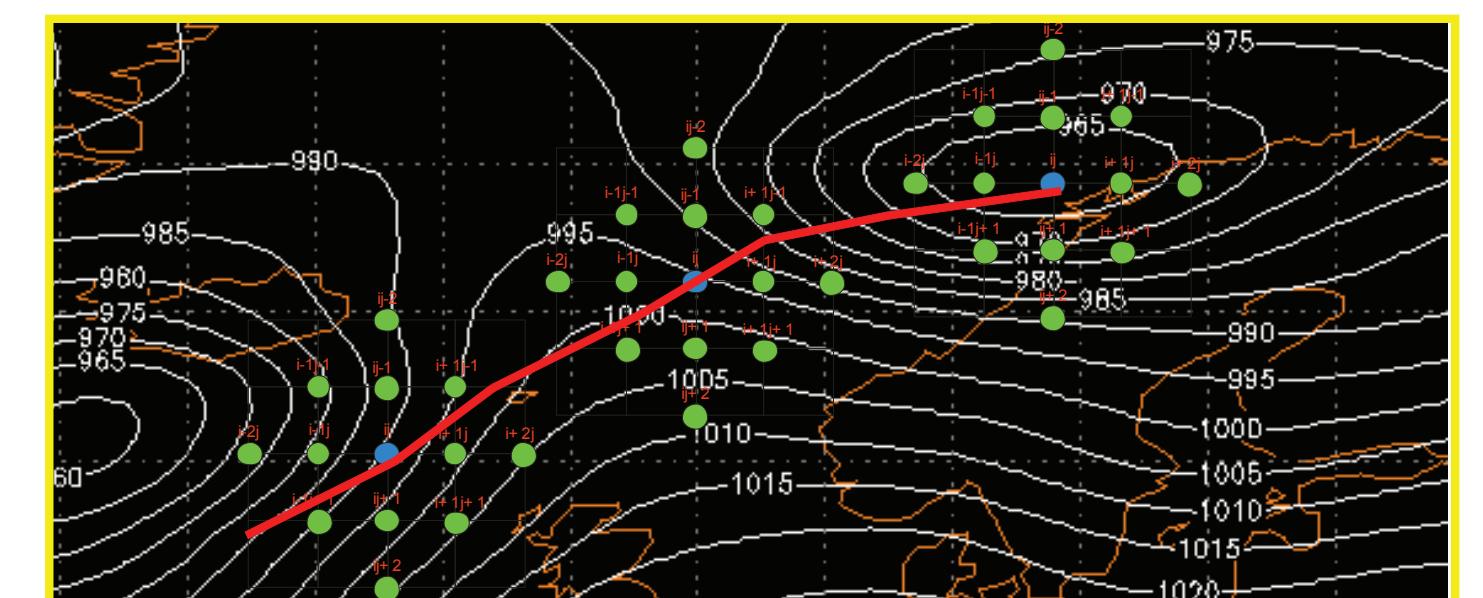
Are trends in cyclone numbers same in all datasets?

What are there the regional differences between reanalyses?

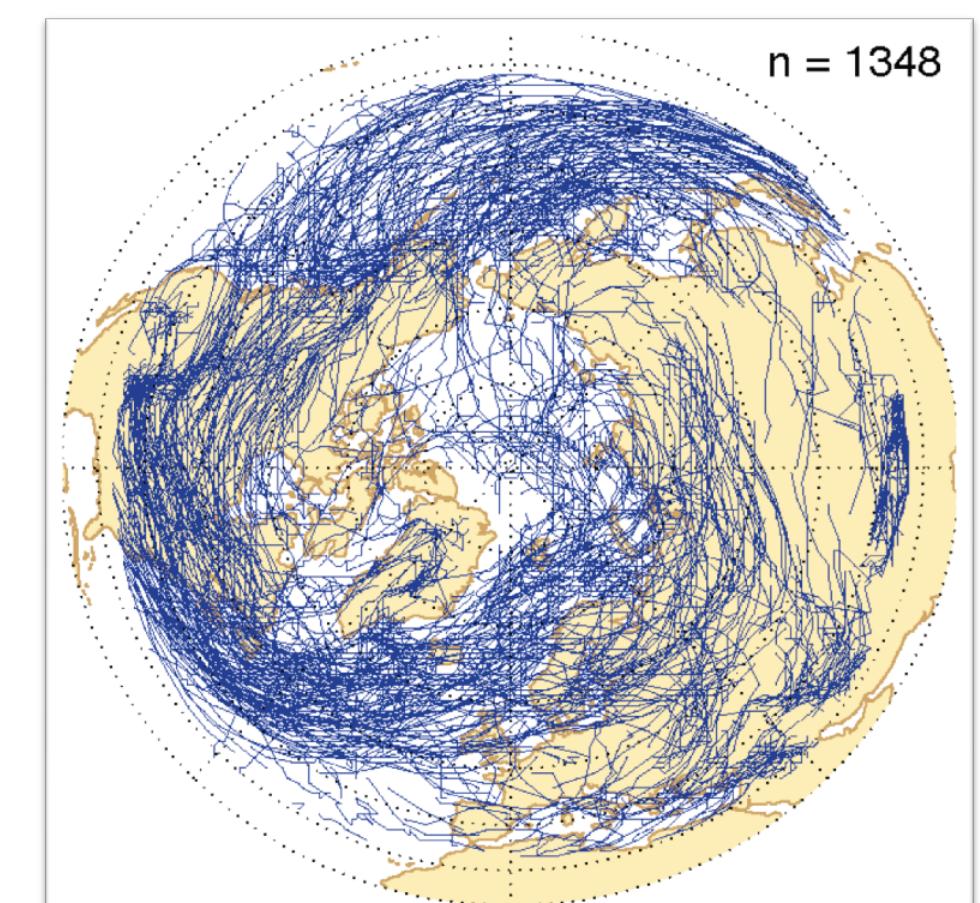
Data



Numerical scheme developed
in P.P. Shirshov Institute of Oceanology
Gulev et. al, 2001



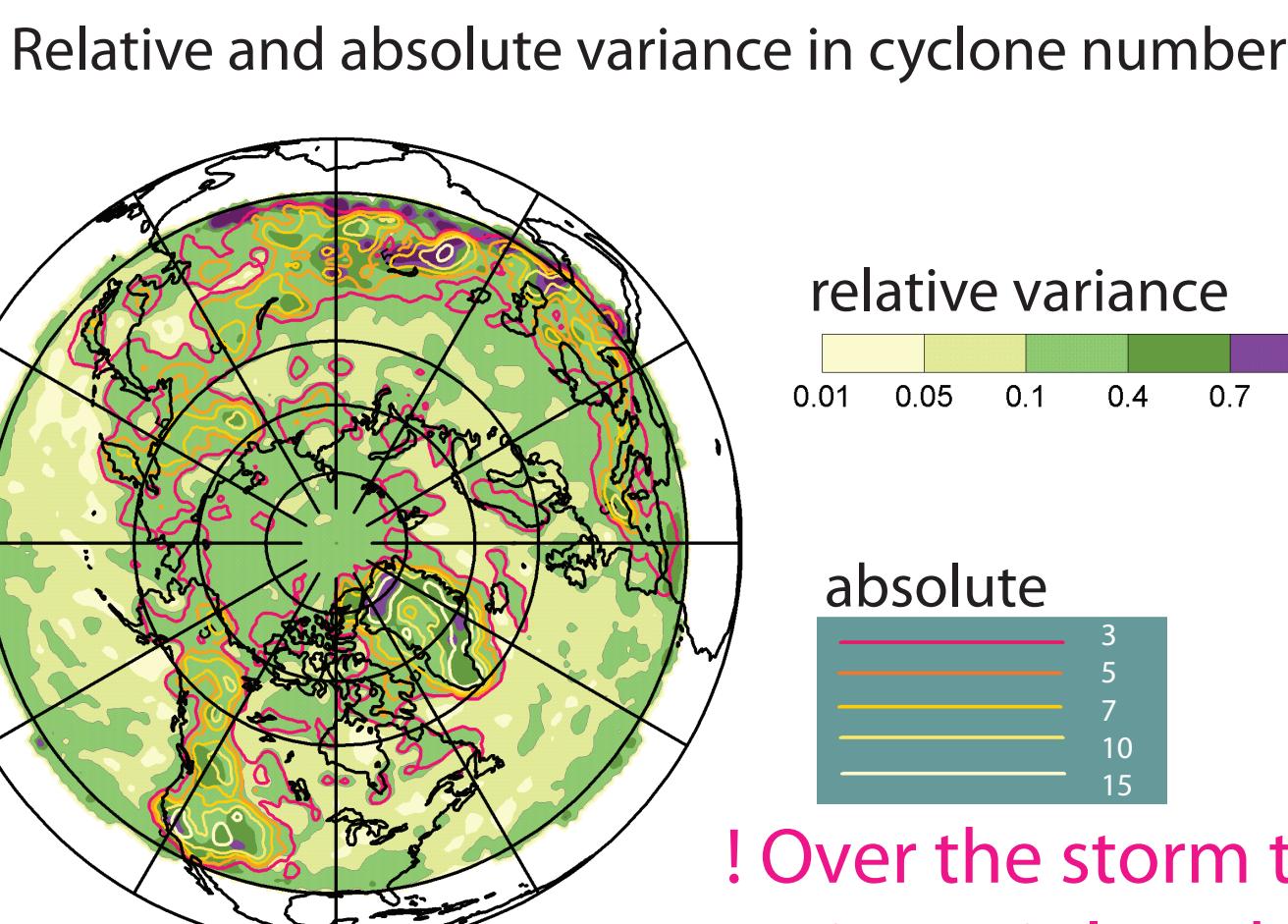
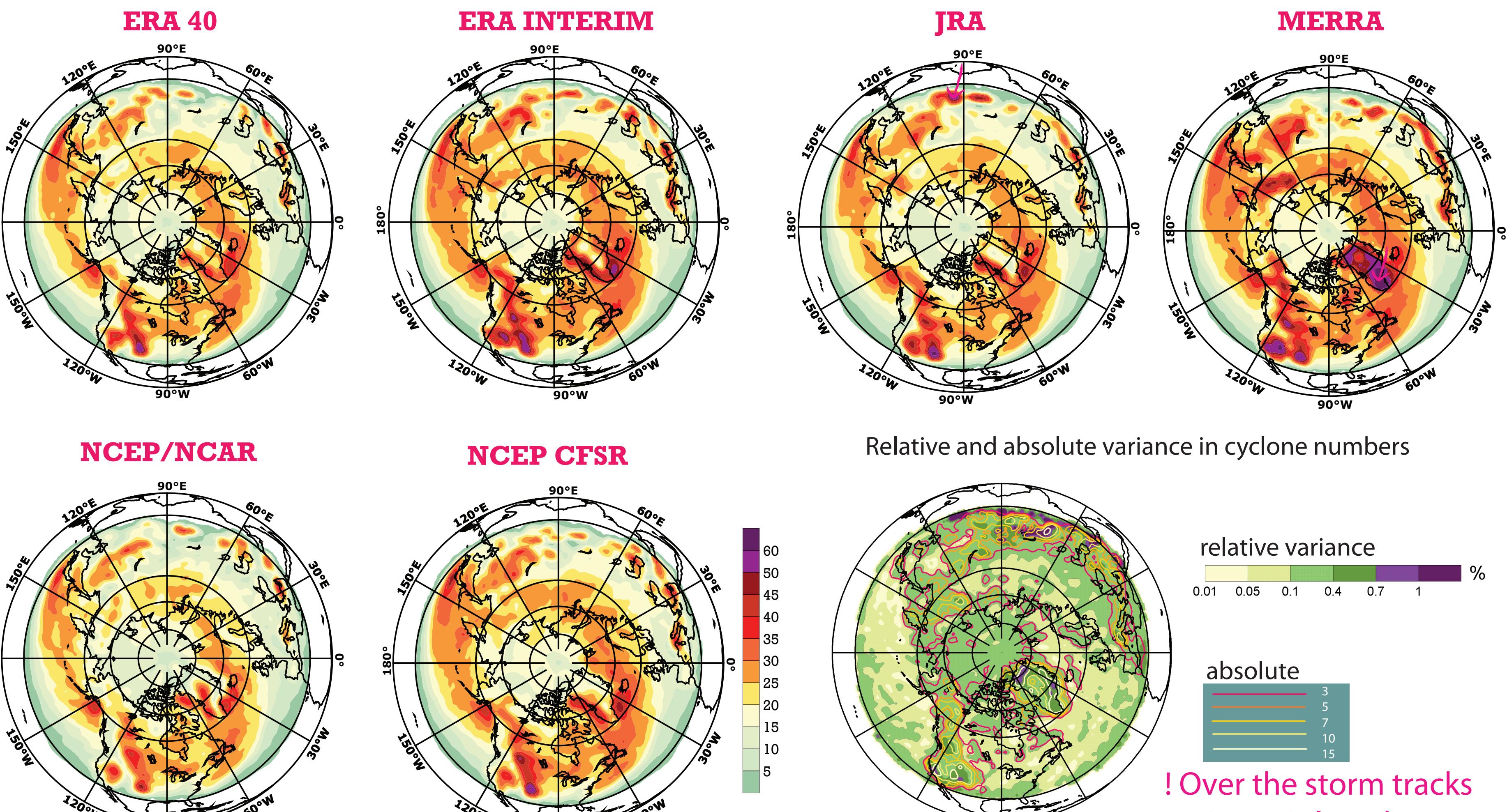
Building
trajectories



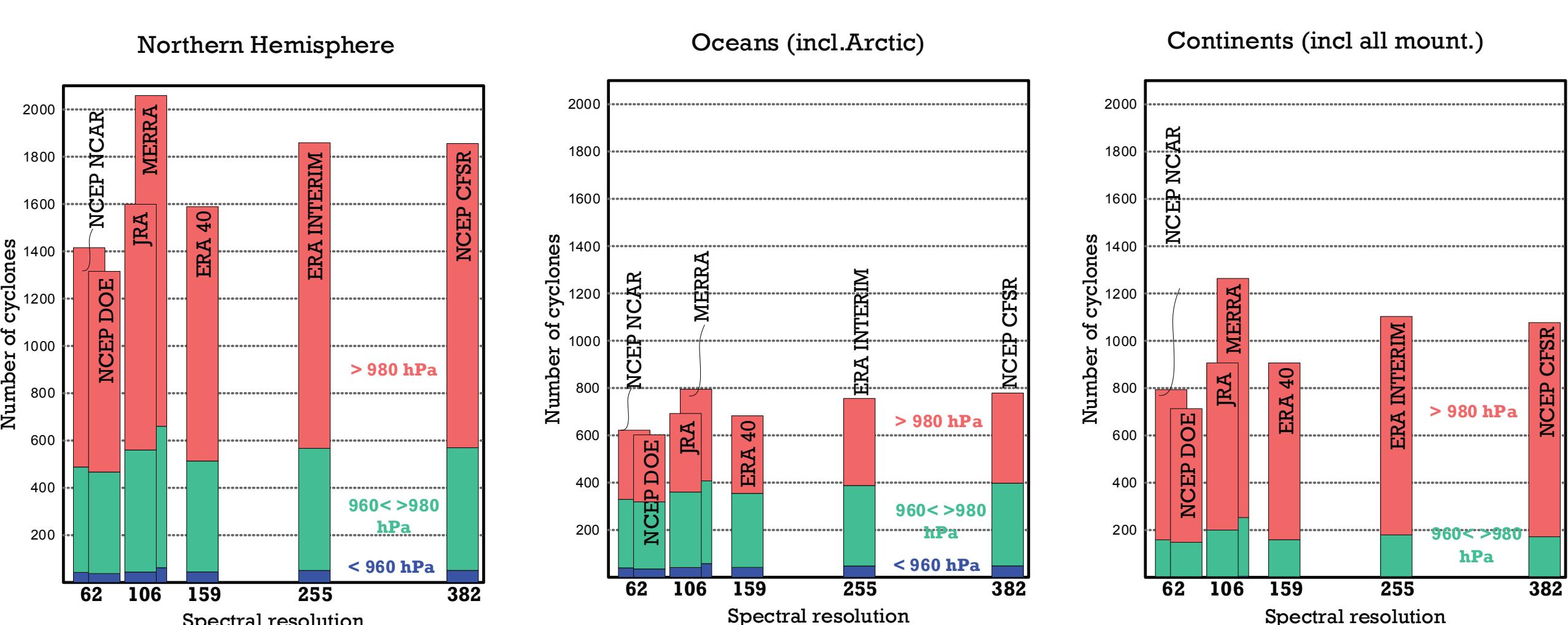
We use here sea level pressure filed,
scheme also adopted for vorticity

RESULTS

Climatology, cyclone numbers



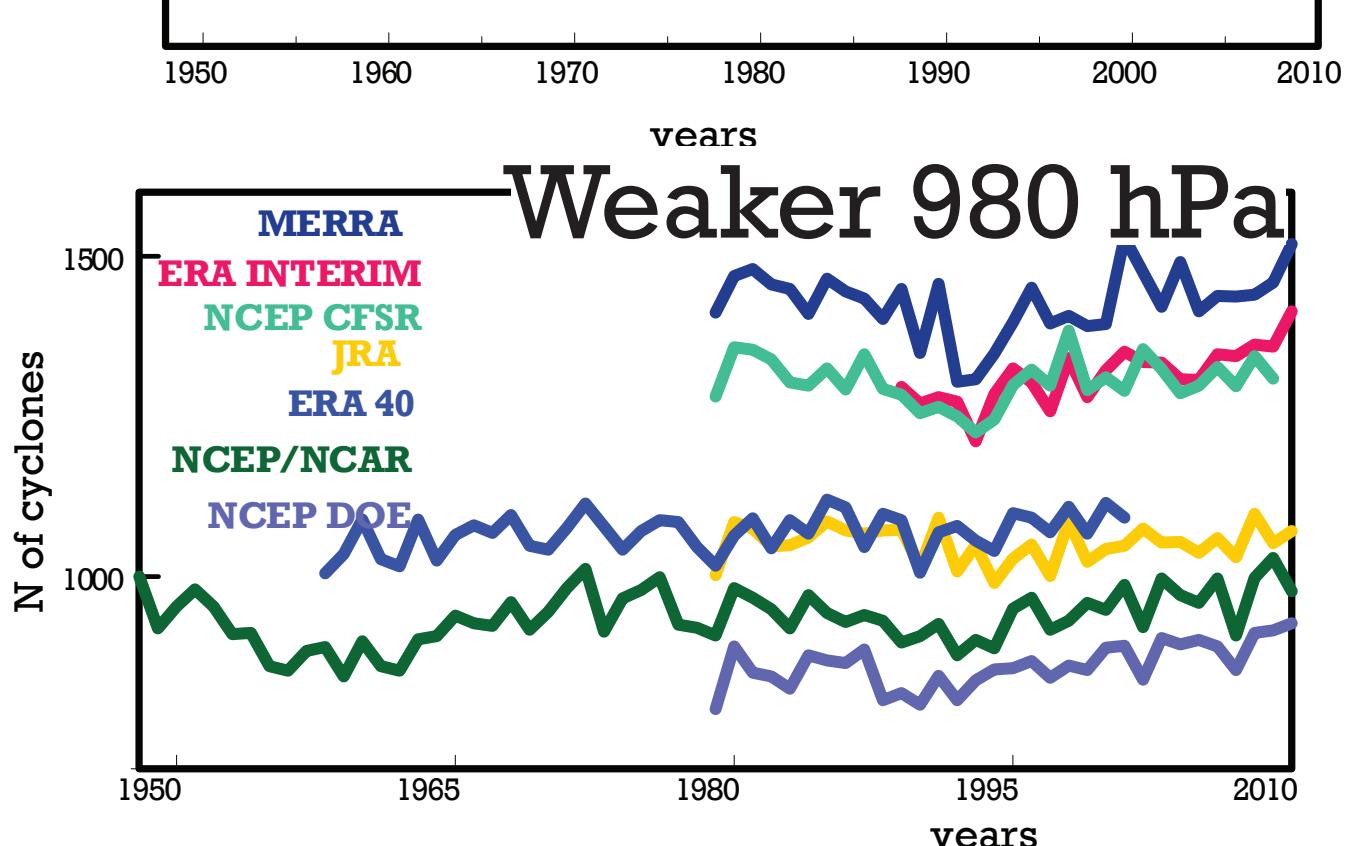
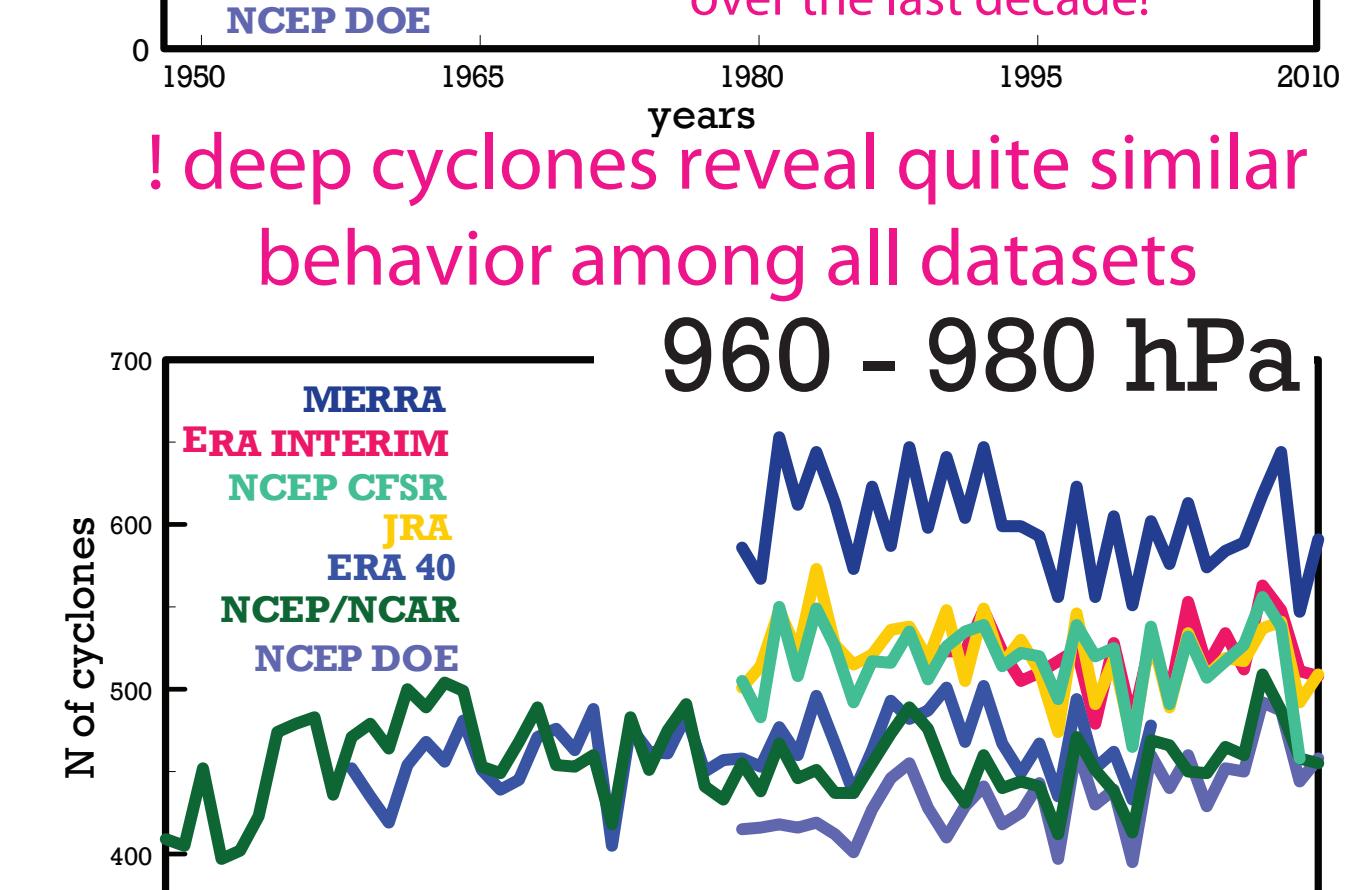
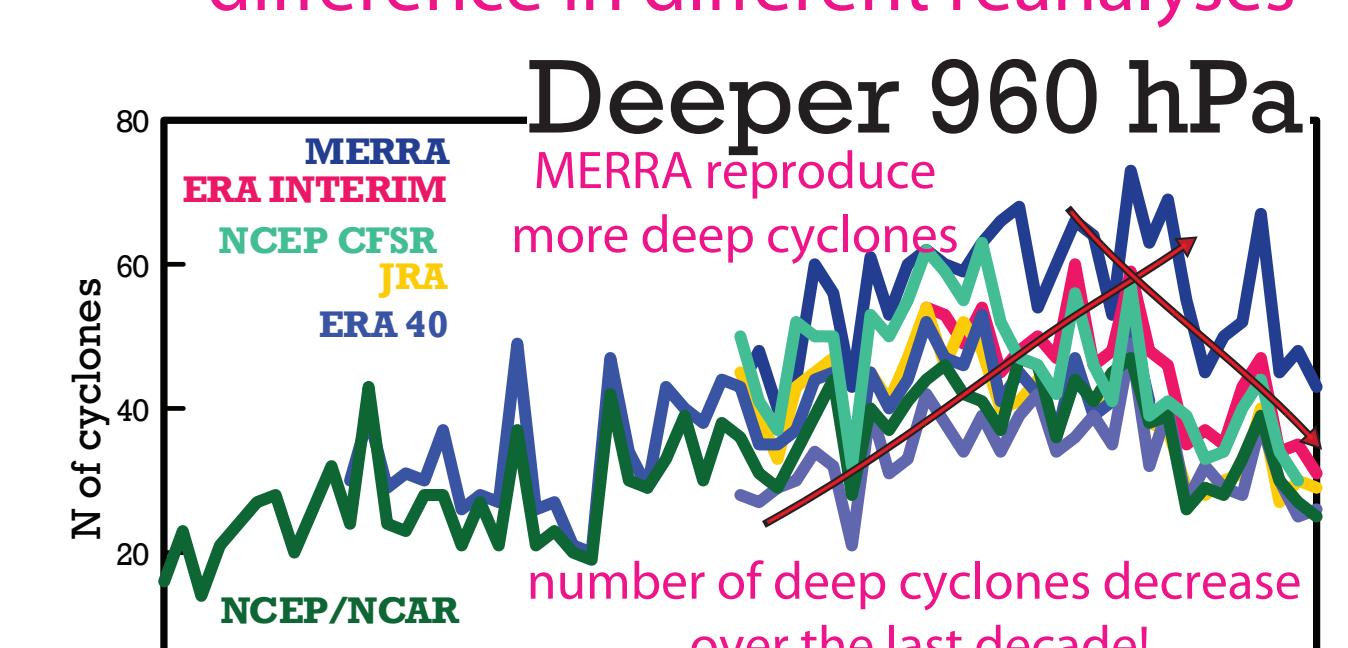
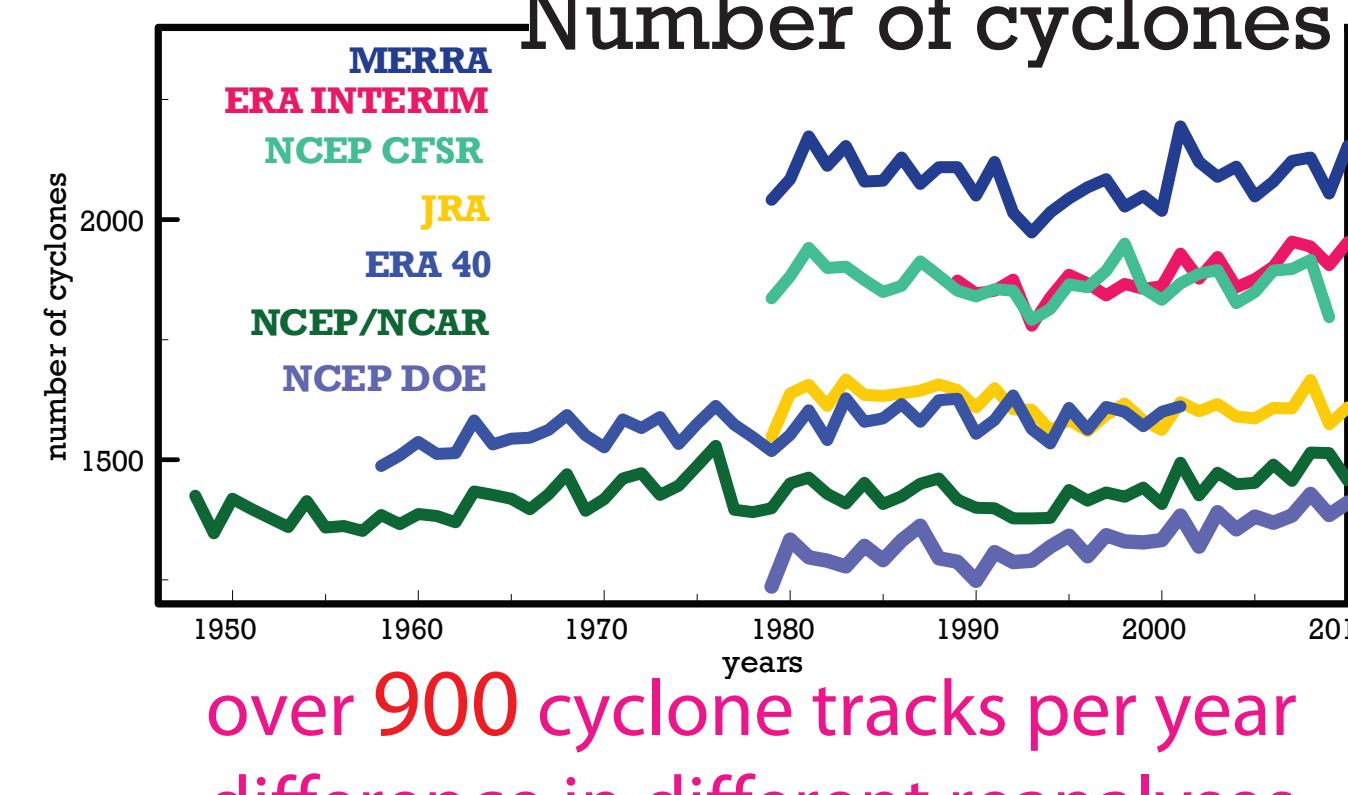
N of cyclones/yr vs spectral resolution of reanalysis model



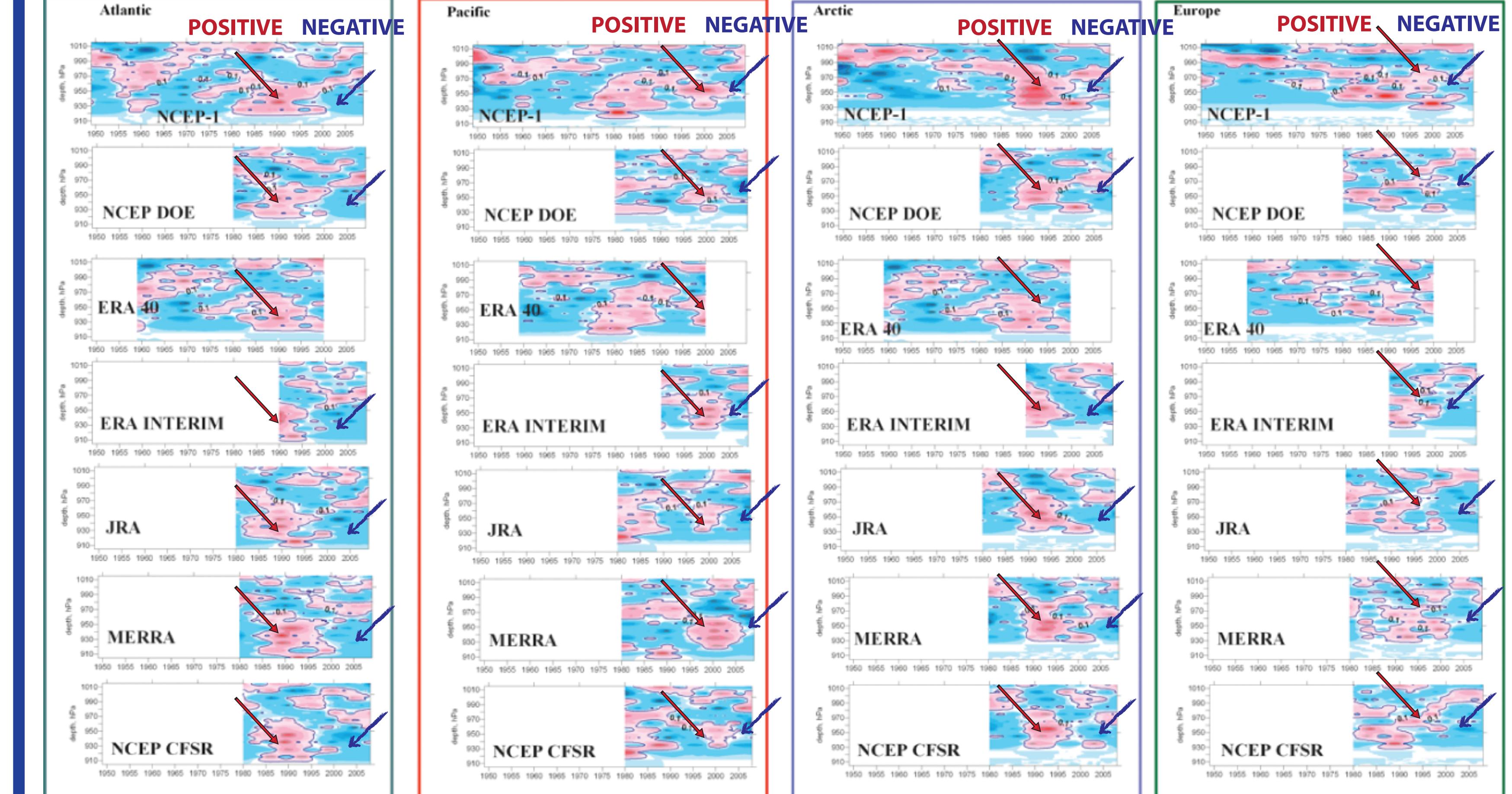
Cyclone climatology is represented by similar pattern through all datasets, differences occur mostly in absolute values

Higher spectral resolution -> more cyclones (?vortices) over the land, except for MERRA

Time series Number of cyclones

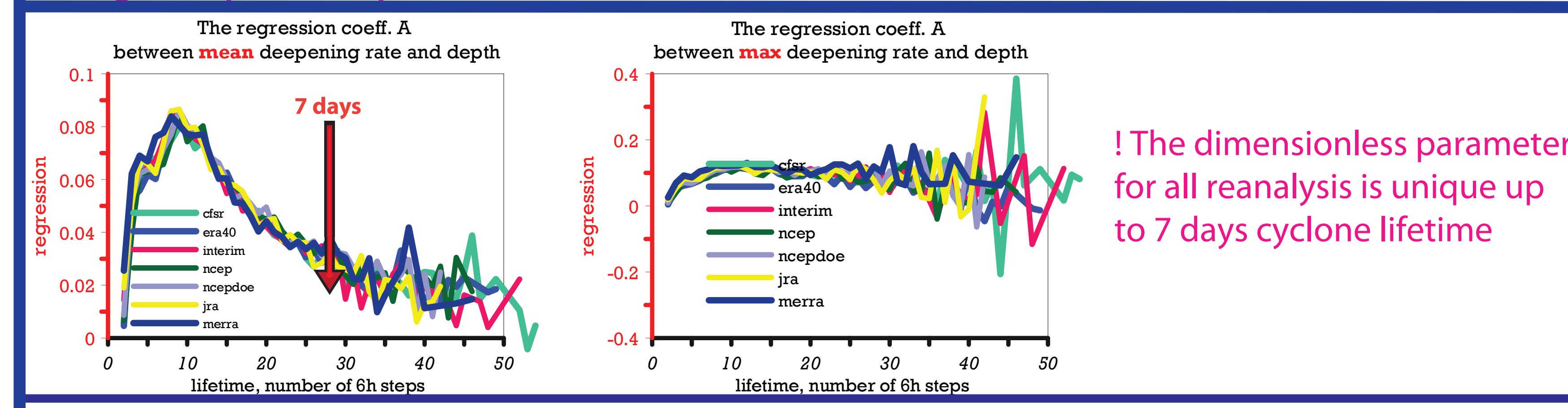


Core pressure PDF anomalies



! The phase of cyclones deepening has reversed,
over the last decade cyclones become less intense

All over the Earth cyclones exhibit coordinated changes in cyclone lifecycle



! The dimensionless parameter
for all reanalysis is unique up
to 7 days cyclone lifetime