



CYCLONE ACTIVITY IN 20th CENT REAN

COMPARING TO OTHER MODERN REANALYSES

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DATA

SEA LEVEL PRESSURE FIELDS FROM REANALYSES:

ERA Interim (1989-2010), 6-HOURLY, $0.703^\circ \times 0.702^\circ$, T255

NCEP/DOE AMIP-II (1979-2010), 6-HOURLY, $2.5^\circ \times 2.5^\circ$, T62

NCEP CSFR (1979-2009), 1-HOURLY (!), $0.5^\circ \times 0.5^\circ$, T382
(also available $1^\circ \times 1^\circ$ and $2.5^\circ \times 2.5^\circ$)

MERRA (1979-2010), 6-HOURLY, $1/2^\circ \times 2/3^\circ$, L72

NOAA-CIRES 20th Cent. Reanalysis II (1871-2008), 6-HOURLY, $2^\circ \times 2^\circ$, T62

NOAA-CIRES



ERA Interim

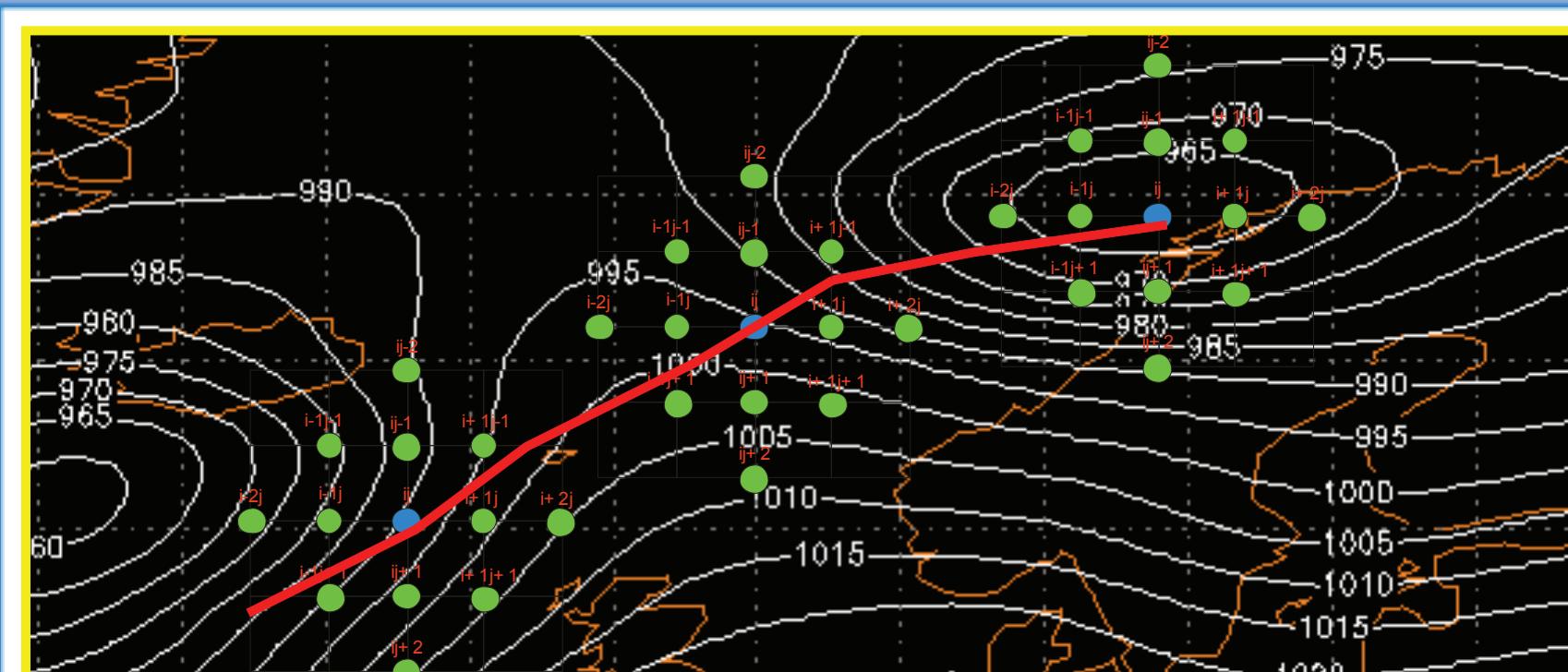
NCEP/DOE AMIP-II

NCEP CSFR

MERRA

NOAA-CIRES

CYCLONE TRACKING

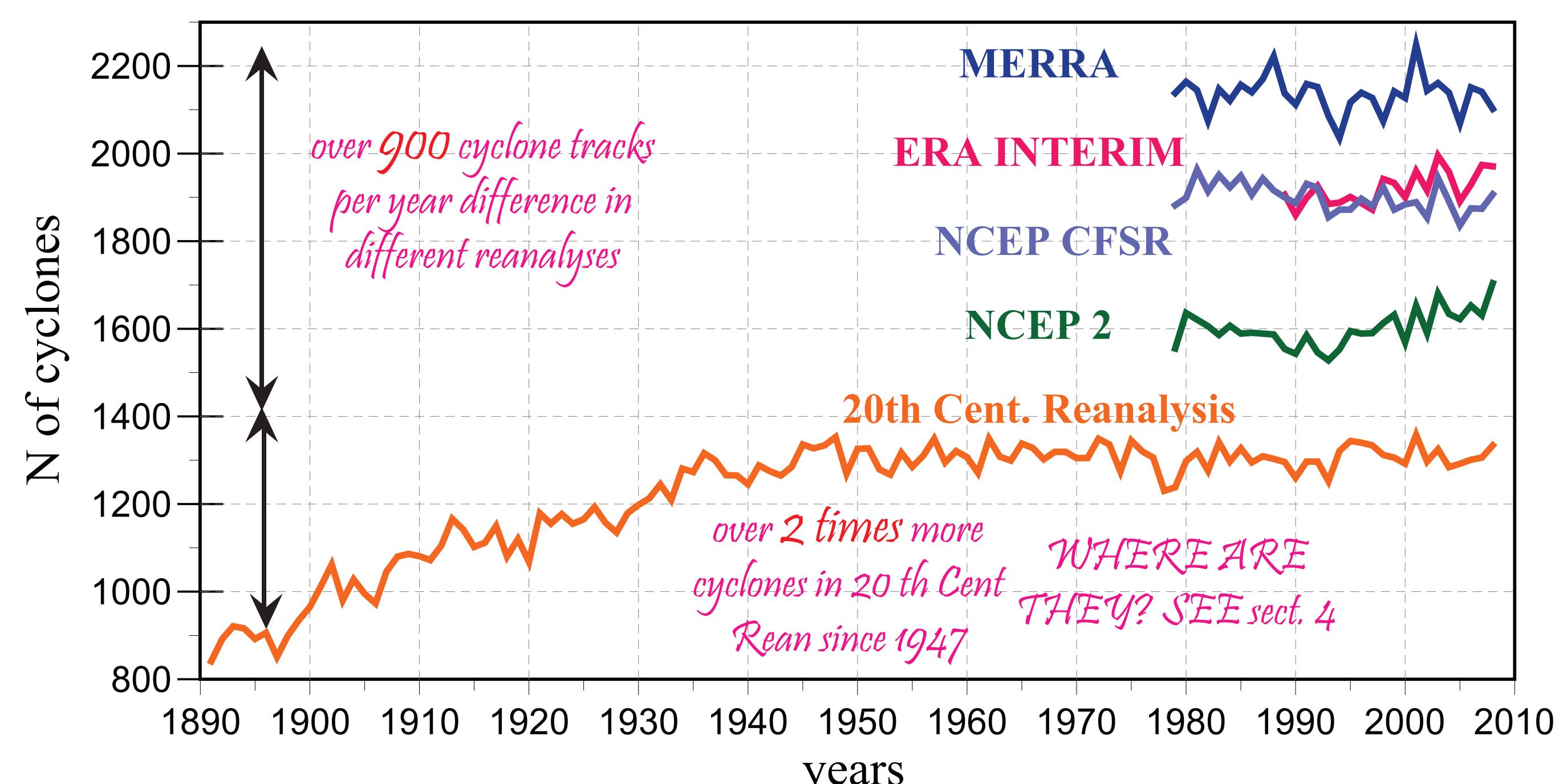


Identification of centers and building the trajectories
(Zolina and Gulev, 2002)

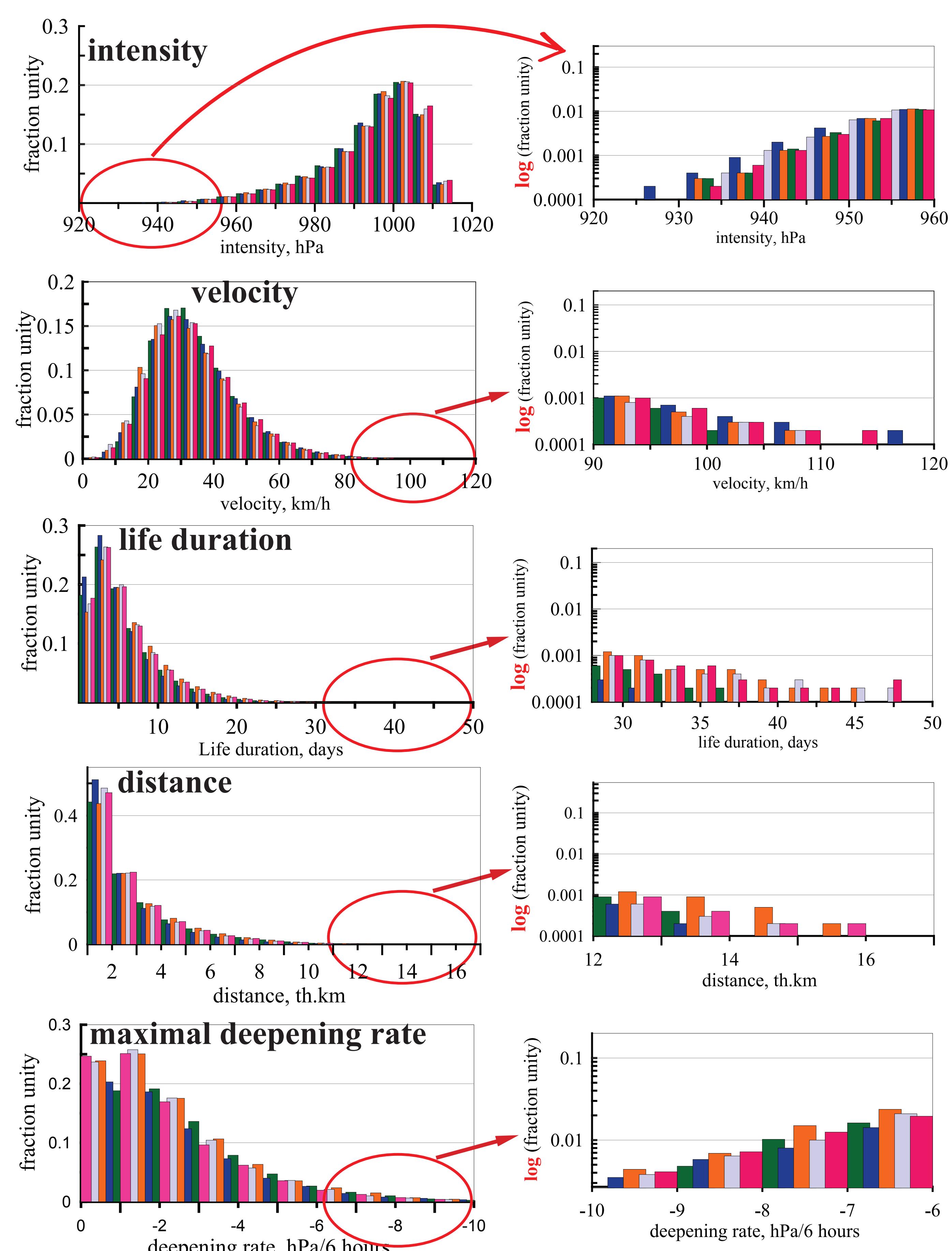
The cyclone identification and tracking algorithm consists essentially on the detection of minima in sea level pressure fields that are eligible for possible storm centres, and on their further tracking by looking for the nearest neighbour in consecutive charts.

RESULTS. NORTHERN HEMISPHERE.

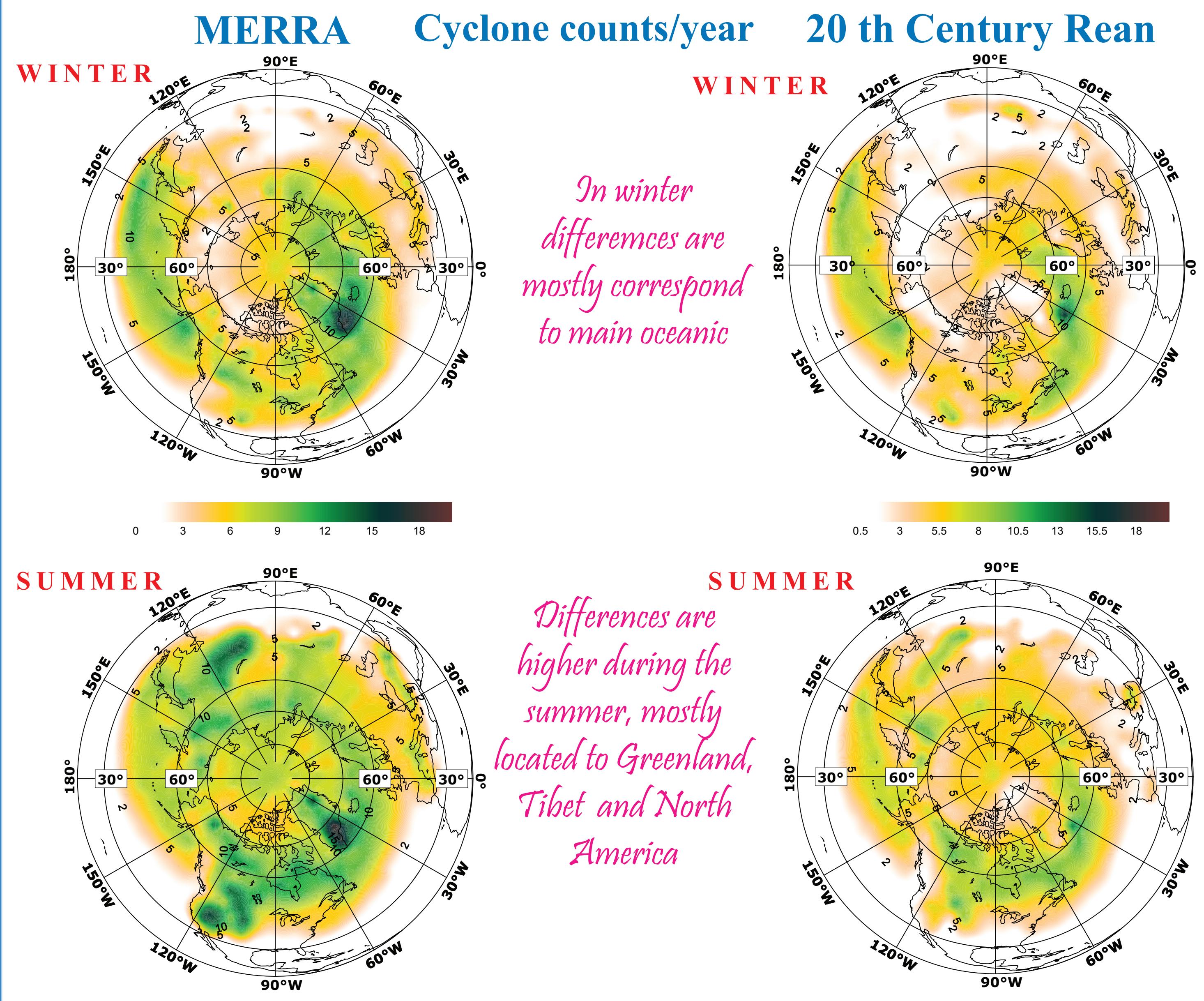
1. TOTAL NUMBER OF CYCLONE TRACKS



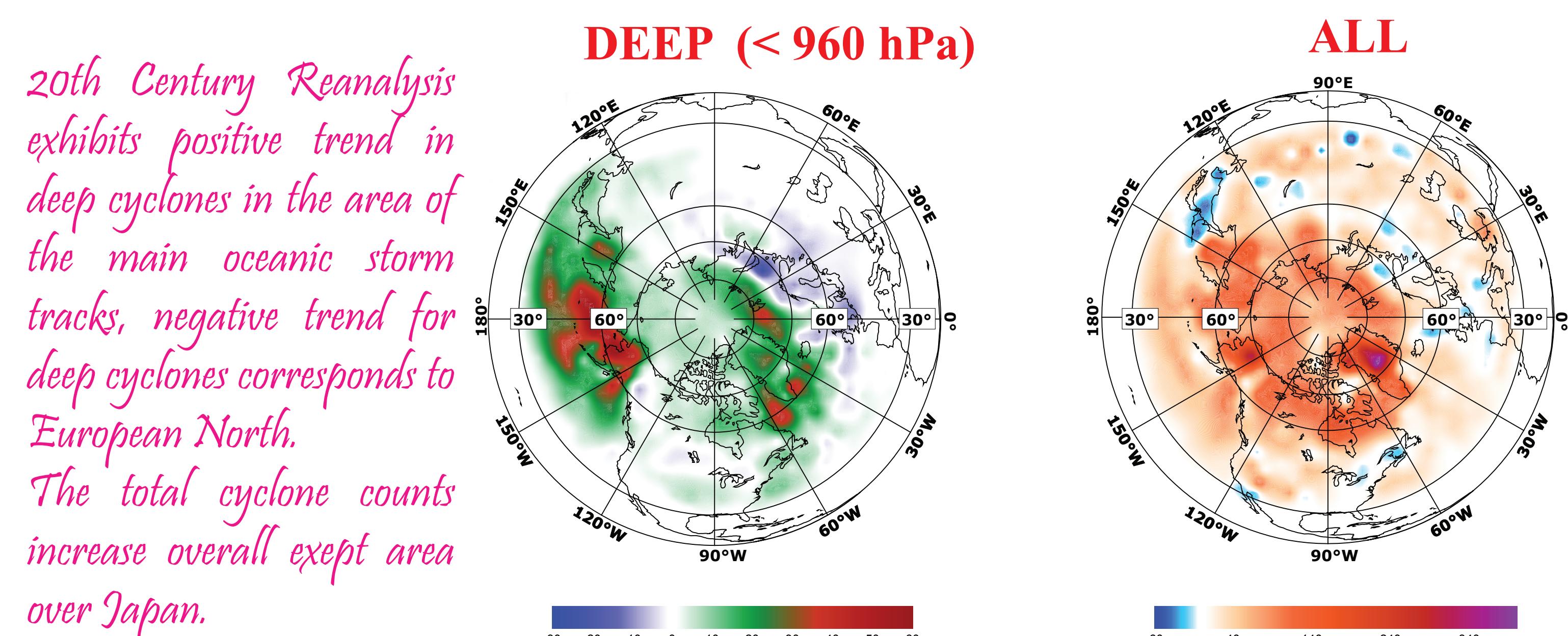
3. PROBABILITY DISTRIBUTION FUNCTION OF CYCLONE LIFECYCLE CHARACTERISTICS



2. 20th CENTURY REANALYSIS VS MERRA

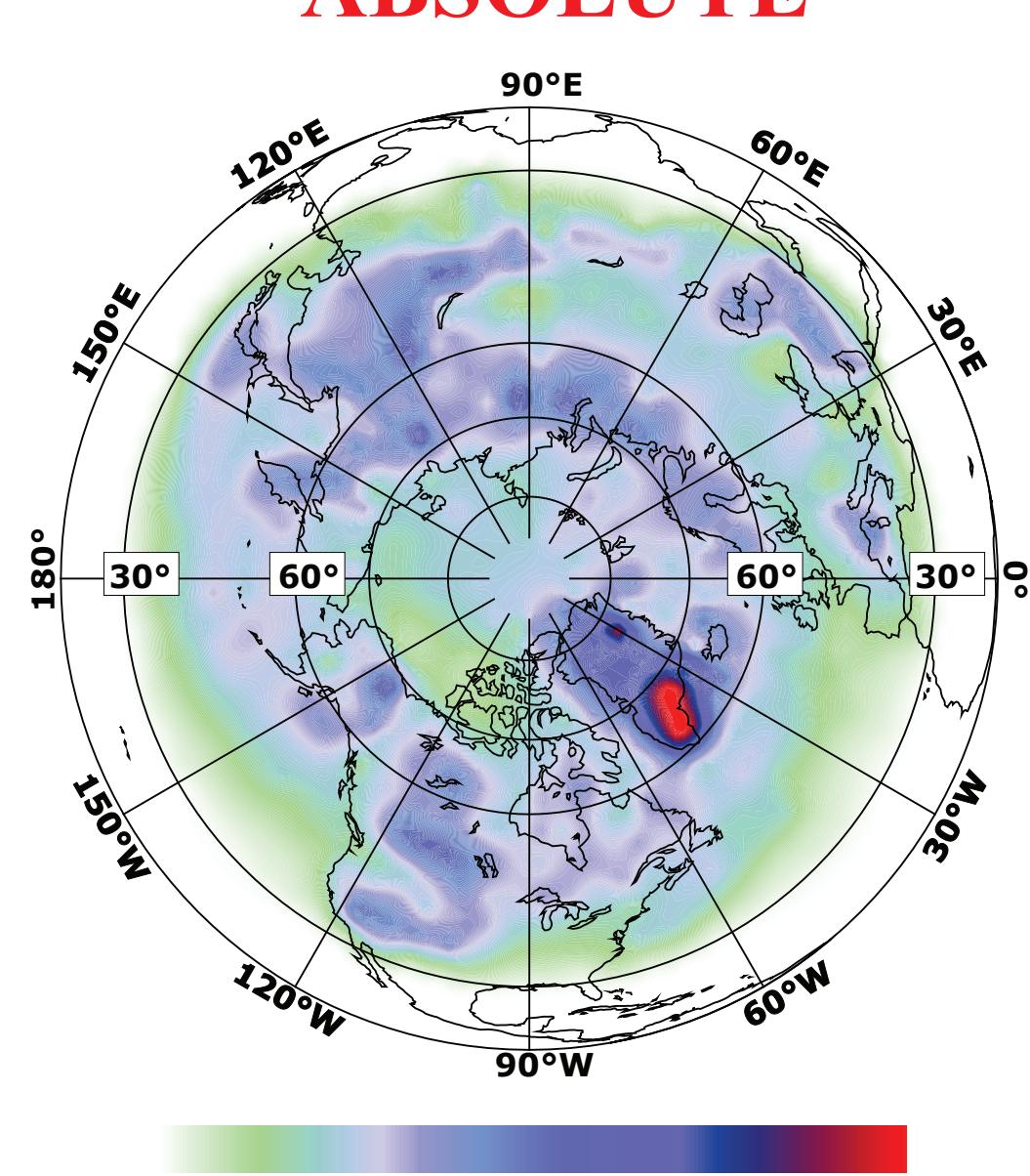


4. 20th Century Rean LINEAR TREND IN NUMBER OF CYCLONE/100 YR

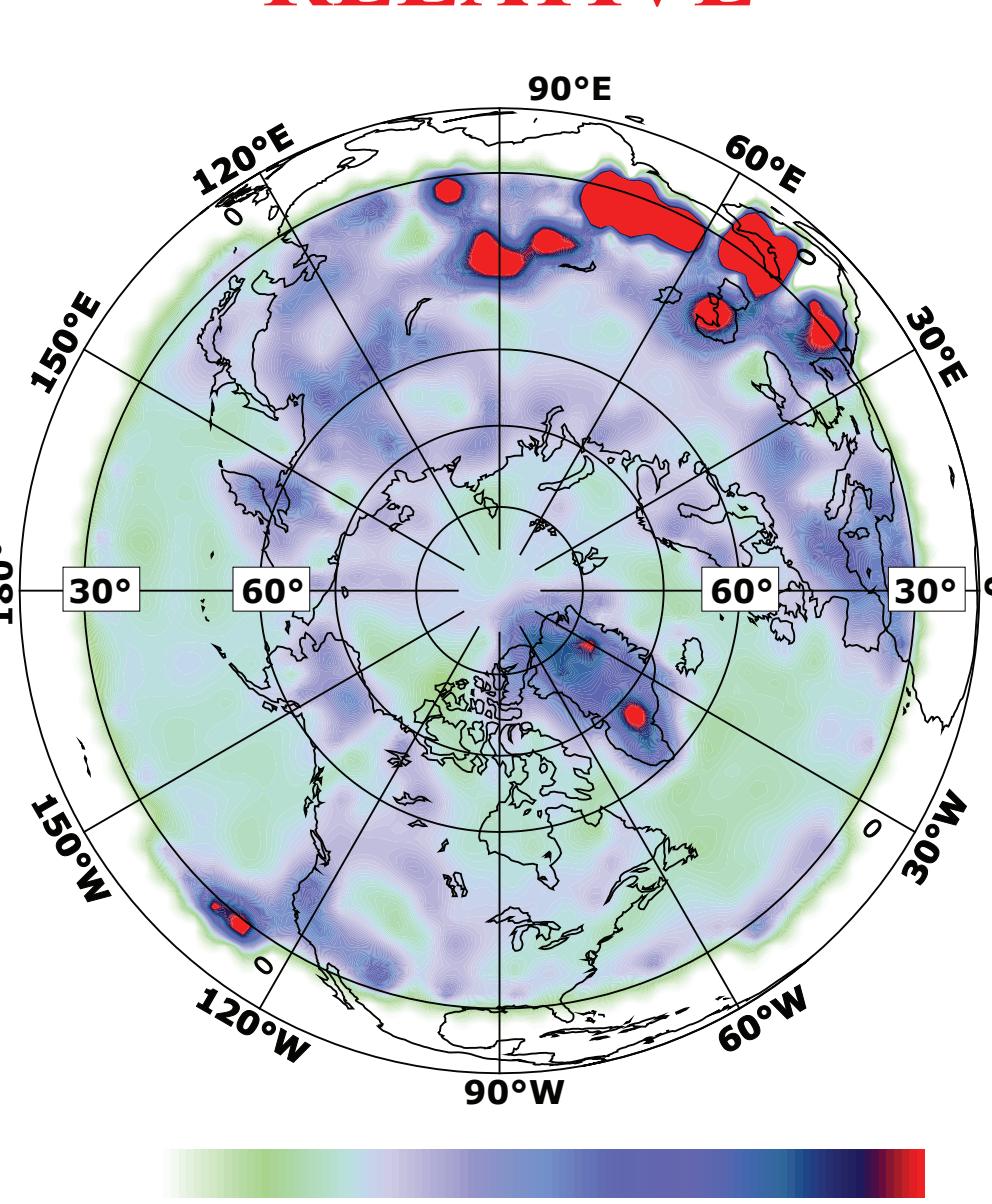


5. REANALYSIS TO REANALYSIS VARIATIONS

ABSOLUTE



RELATIVE



We don't know the truth
To estimate reanalysis to reanalysis variation we calculated ABSOLUTE - D and RELATIVE - R variations

$$D_{1,2} = |x_1 - x_2|$$

$$R_{1,2} = D_{1,2}/|x_2|$$

gives the relative variation of results of the datasets "1" with respect to the scheme "2". For n dataset (we have 10 combinations here):

$$\langle D_{1,j} \rangle = \sum |D_{1,j}| / 10,$$

$$\langle R_{1,j} \rangle = \sum |R_{1,j}| / 10$$

Over the main storm tracks the error between reanalyses is less than 20%