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Atmospheric circulation features in the baroclinity zones of the Northern Hemisphere

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Main goal

to estimate the changes of atmospheric circulation characteristics in the baroclinity zones of the Northern Hemisphere at the end of XX and at the beginning of XXI centuries and their influence on the global climate change.

Baroclinic instability parameter (BI) (Lindzen & Farrell, 1980) :

$$BI = 0.31 \frac{g}{NT} \left| \frac{T}{y} \right|$$

N - Brunt-Vaisala frequency

$$N = \sqrt{\frac{g}{z}}$$

g - free fall acceleration (9,8 m/s²)

T - zonal mean temperature

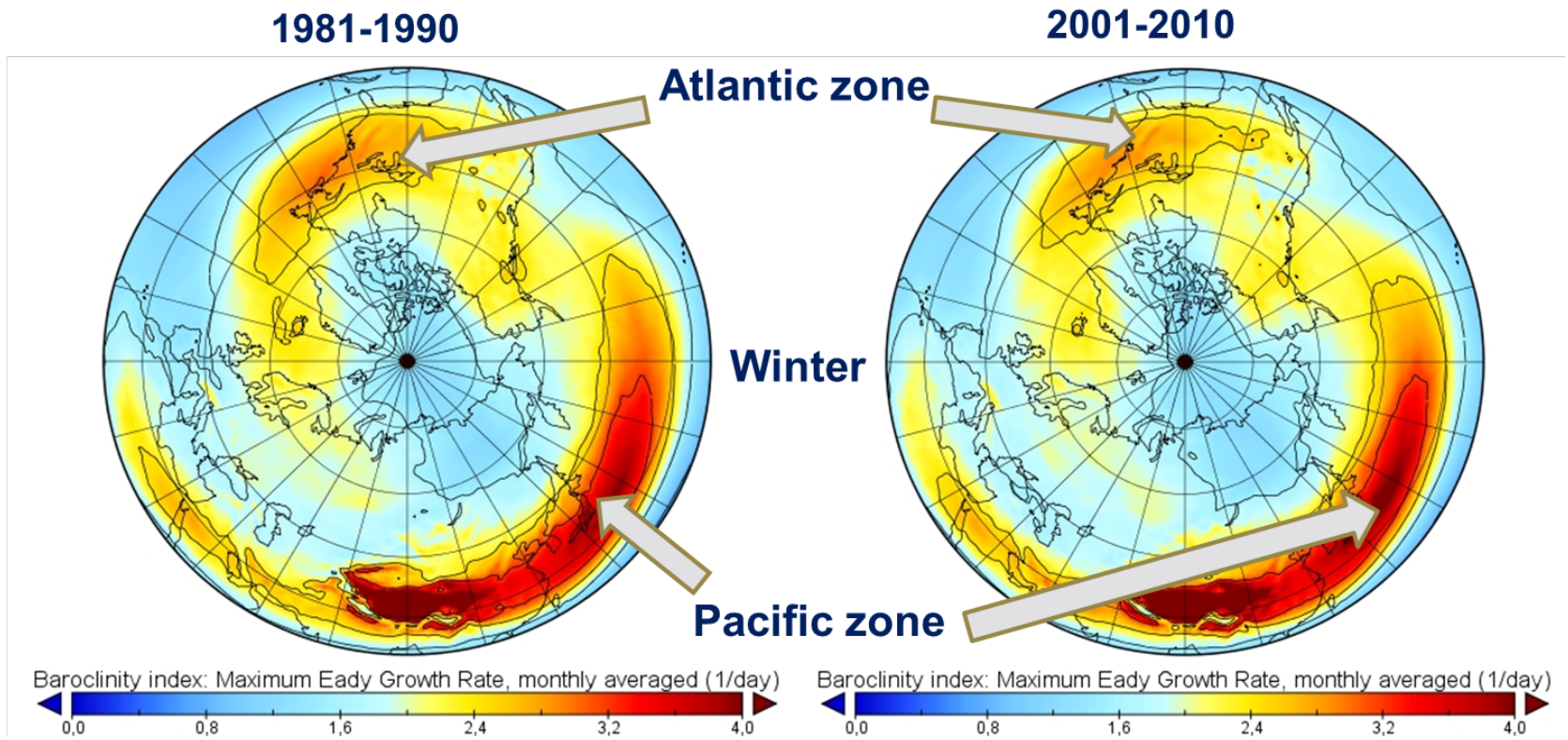
ERA Interim

<http://www.ecmwf.int/en/research/climate-reanalysis/era-interim/>

JRA-55

http://jra.kishou.go.jp/JRA-55/index_en.html

Baroclinic zones

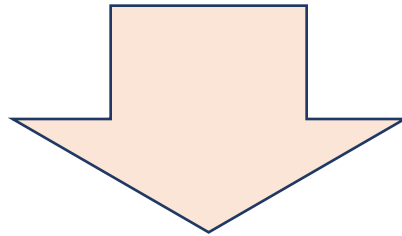


ERA Interim

<http://www.ecmwf.int/en/research/climate-reanalysis/era-interim/>

Conclusion

The analysis of statistical estimations of atmospheric circulation characteristics in baroclinity zones and their relationships with variability of zonal, meridional and eddy circulation, which includes synoptic scale and low-frequency variability, was carried out for the Northern Hemisphere.



The variability of atmospheric circulation (including large-scale) characteristics can indicate that enhancement of meridional circulation forms is observed. It leads to the development of blocking processes.