

NCEP - NCAR Reanalysis

1990 - 2019

variables: geopotential height and horizontal wind components U,V in 500 hPa

Identification of Instantaneous Blocked Longitudes (IBLs) and blocking events with *freva* plugin *Blocking* and *post-processing*

Input: geopotential height in 500 hPa
Output: IBL, CRBL, blocking events

Step 1

Calculation of the blocking properties using the trapezoid method

Input: Data set with blocking events
Output: various variables for each blocking (e.g. circulation, lat/lon associated with high and lows)

Note: All variables are calculated for both types (*HoL* and *Omega*)

Step 2

Blocking type decision: *High-over-Low* or *Omega*

Input: variables for box/ trapezoid from step 2
Output: file with date, block number, type ...

Step 3

Choose region of interest

Input: Data set with HoL and Omega blocks, area
Output: filtered data set
(a) northern hemisphere 90°W to 90°E
(b) Euro-Atlantic region (40°W to 30°E)

Step 4

Analysis of blocking occurrence probabilities using logistic regression and multinomial regression

logistic regression
Eq. 22 and 24: Fig. 7
Eq. 25 : Fig. 8

multinomial regression
Eq. 26 and 27: Fig 10
Eq. 28. : Fig. 11

Step 5

Analysis of blocking transition probabilities using Markov models

Markov model
Eq. 17 and 18: Fig. 12

Markov + log. regression
Eq. 19: Fig. 8 (Suppl.)
Fig. 9 (Suppl.)

Markov + multinom. regression
Eq. 29 : Fig. 13
Eq. 20 and 21: Fig. 14

Step 6