

An example of extratropically transitioning storms – Hurricane Gonzalo

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09 / 2015



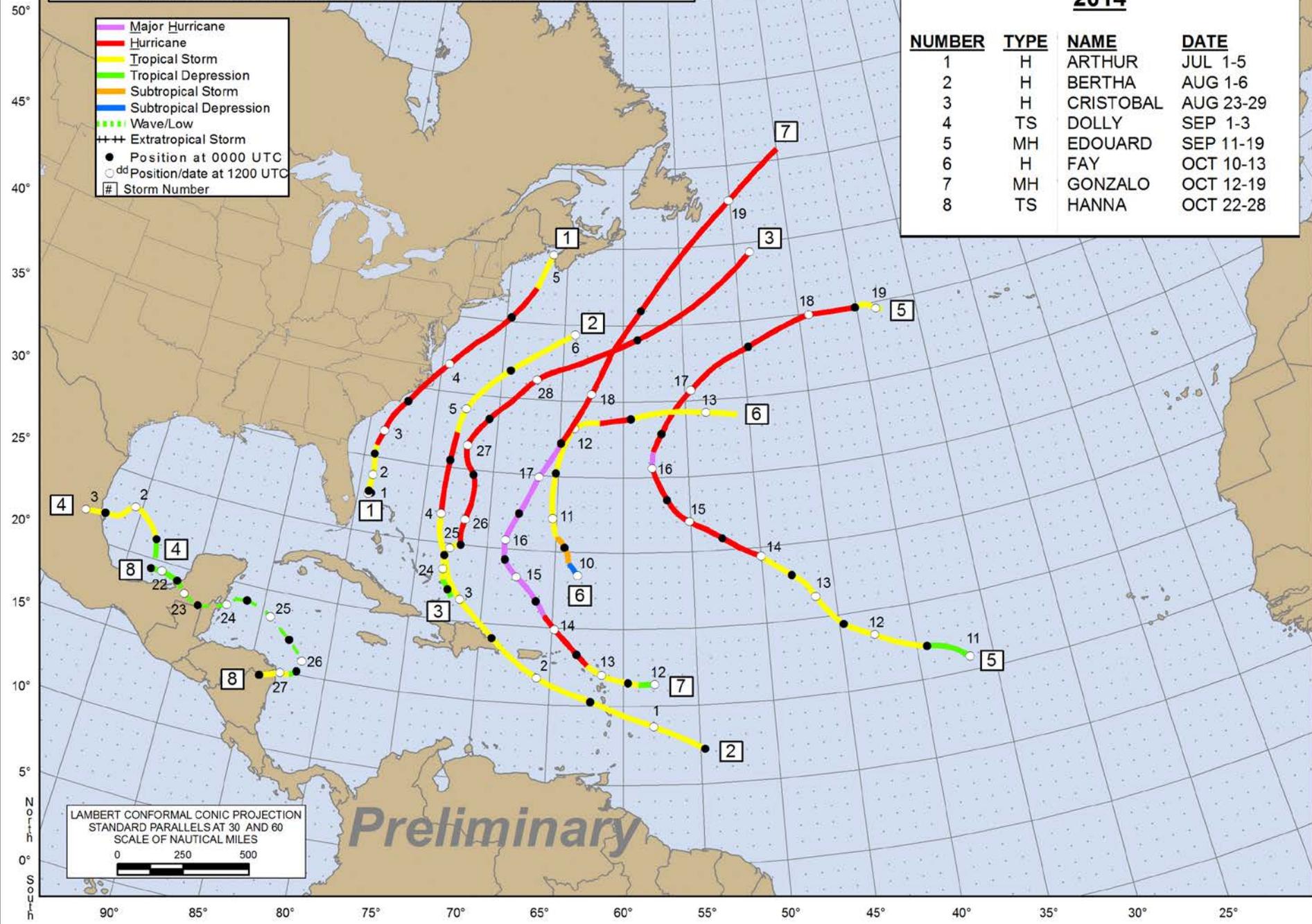
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120° 115° 110° 105° 100° 95° 90° 85° 80° 75° 70° 65° 60° 55° 50° 45° 40° 35° 30° 25° 20° 15° 10° 5° West 0° East 5° 10°

**U.S. DEPARTMENT OF COMMERCE, NATIONAL WEATHER SERVICE
NORTH ATLANTIC HURRICANE TRACKING CHART**

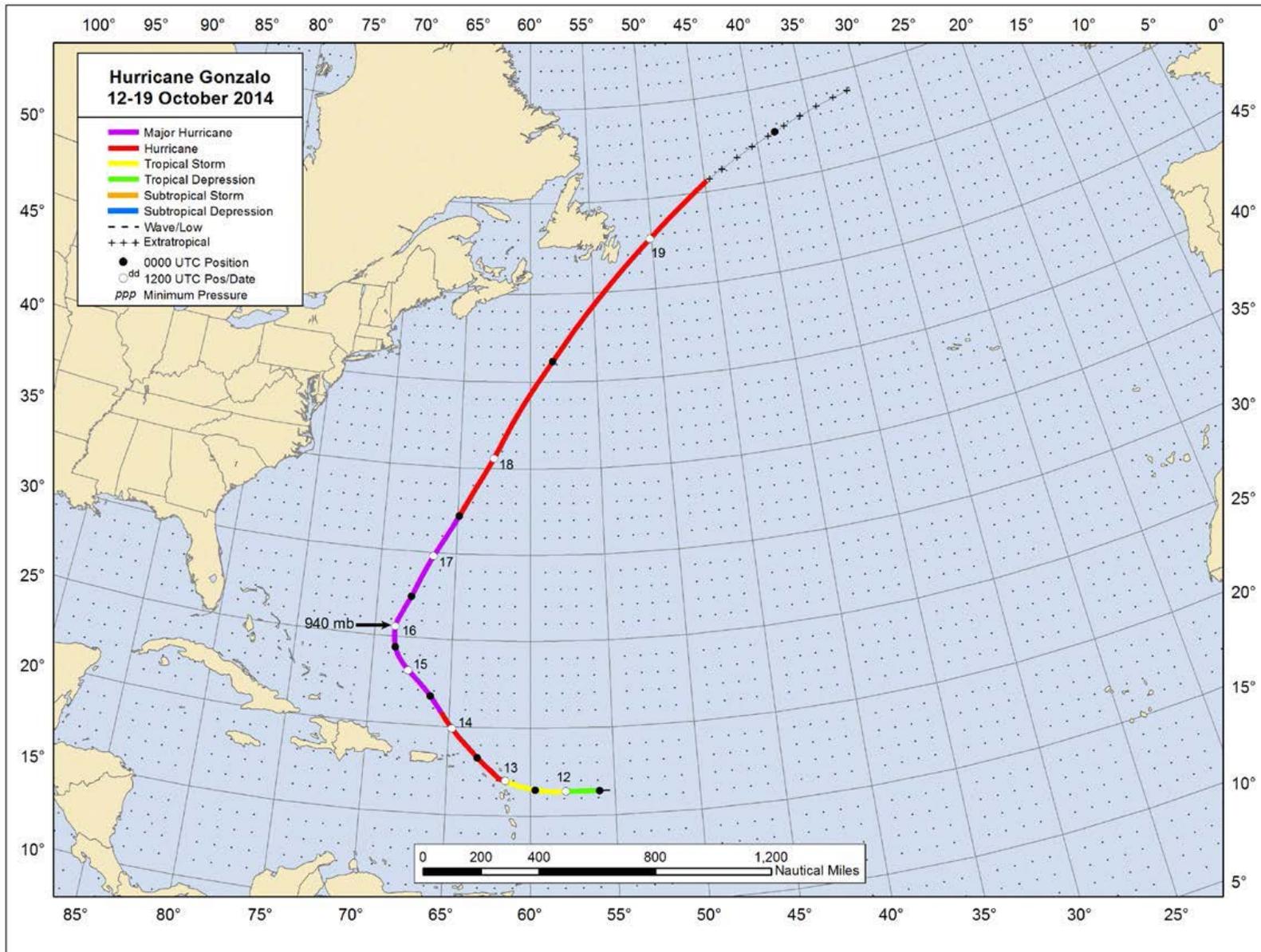
- Major Hurricane
- Hurricane
- Tropical Storm
- Tropical Depression
- Subtropical Storm
- Subtropical Depression
- - - Wave/Low
- - - Extratropical Storm
- Position at 0000 UTC
- Position/date at 1200 UTC
- # Storm Number

2014			
NUMBER	TYPE	NAME	DATE
1	H	ARTHUR	JUL 1-5
2	H	BERTHA	AUG 1-6
3	H	CRISTOBAL	AUG 23-29
4	TS	DOLLY	SEP 1-3
5	MH	EDOUARD	SEP 11-19
6	H	FAY	OCT 10-13
7	MH	GONZALO	OCT 12-19
8	TS	HANNA	OCT 22-28



LAMBERT CONFORMAL CONIC PROJECTION
STANDARD PARALLELS AT 30 AND 60
SCALE OF NAUTICAL MILES
0 250 500

Gonzalo's Track



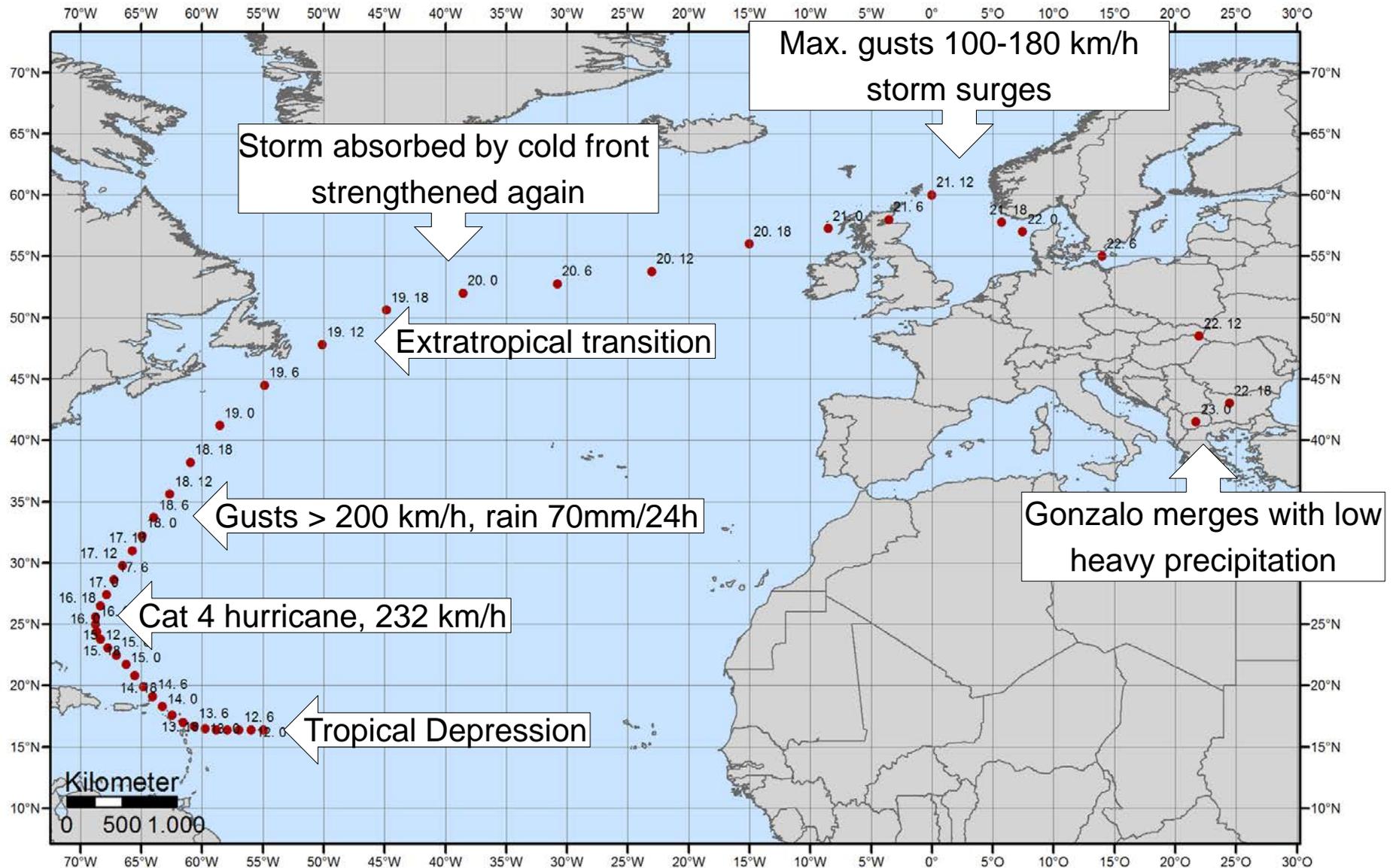


Hurricane Gonzalo, October 16, 2014





Track of hurricane Gonzalo & extratropical storm





Waves in Blackpool / UK



Picture: Daily Mail

© PA

Global high-resolution climate reconstruction

A new global high-resolution model data set:

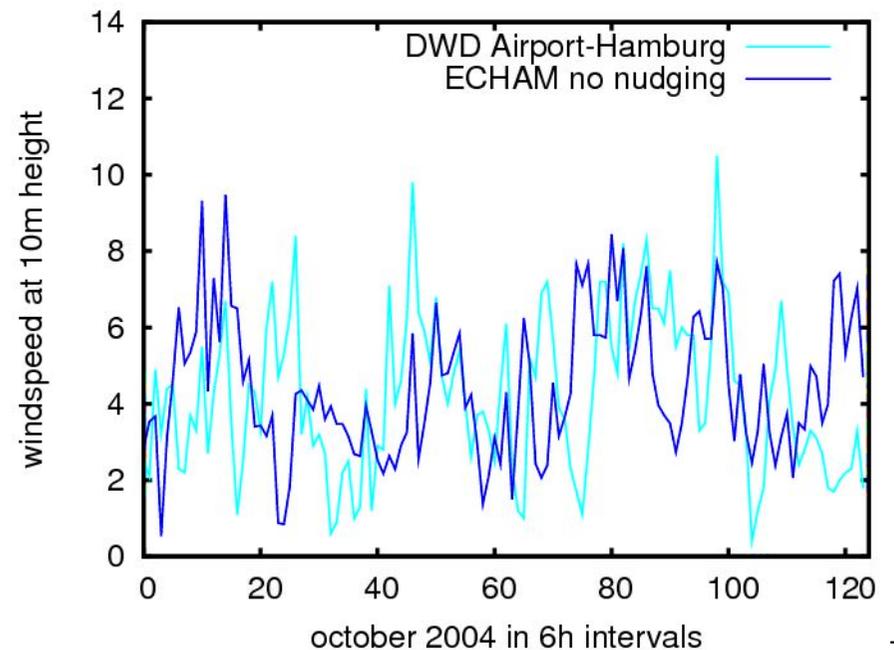
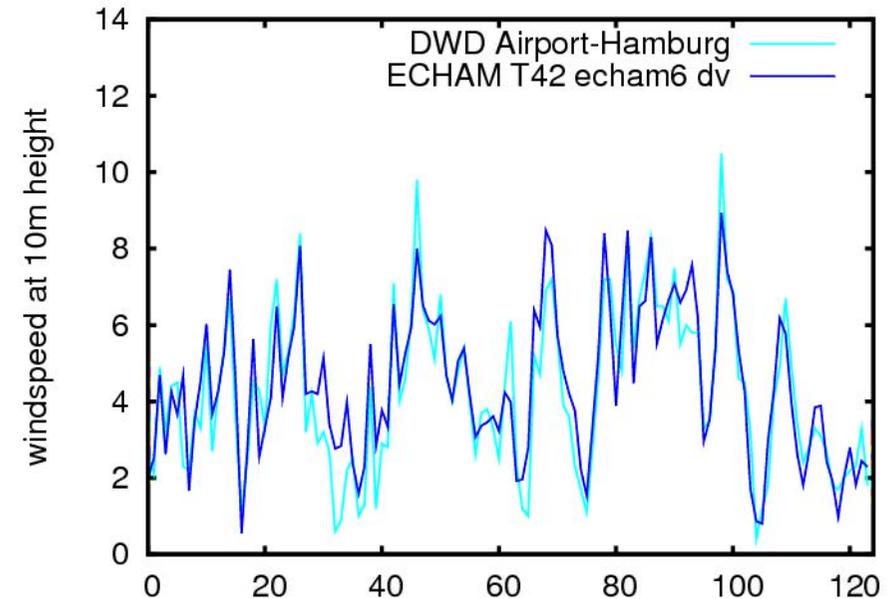
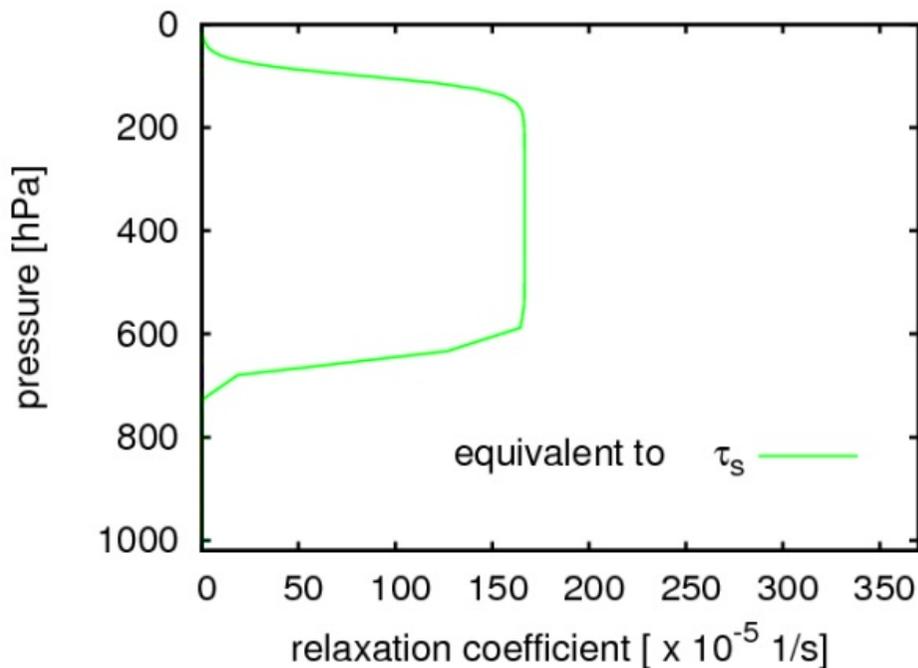
ECHAM6 T255L95, 1948-2014

SST and sea ice as lower boundary conditions

Spectral nudging towards NCEP I reanalysis

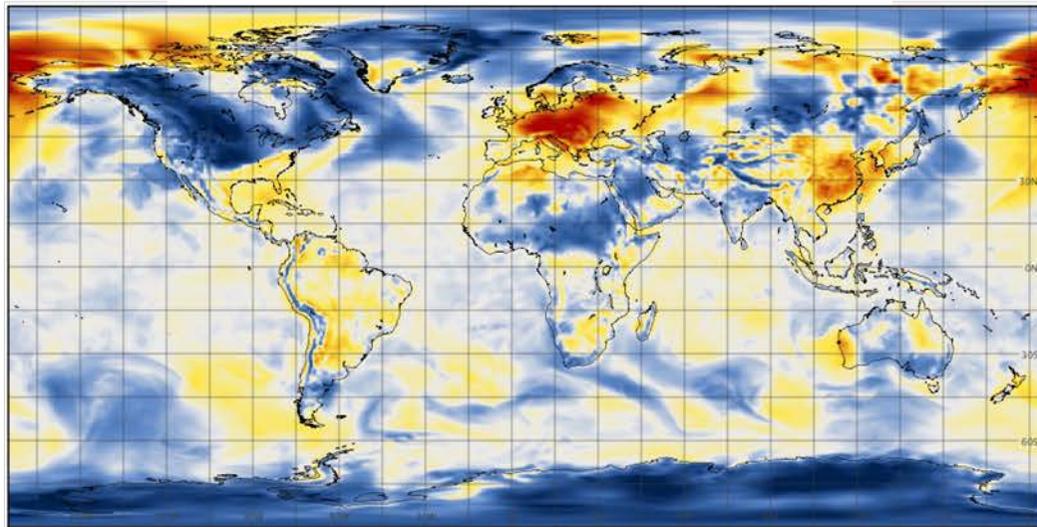
applied for vorticity and divergence

with a specific height profile

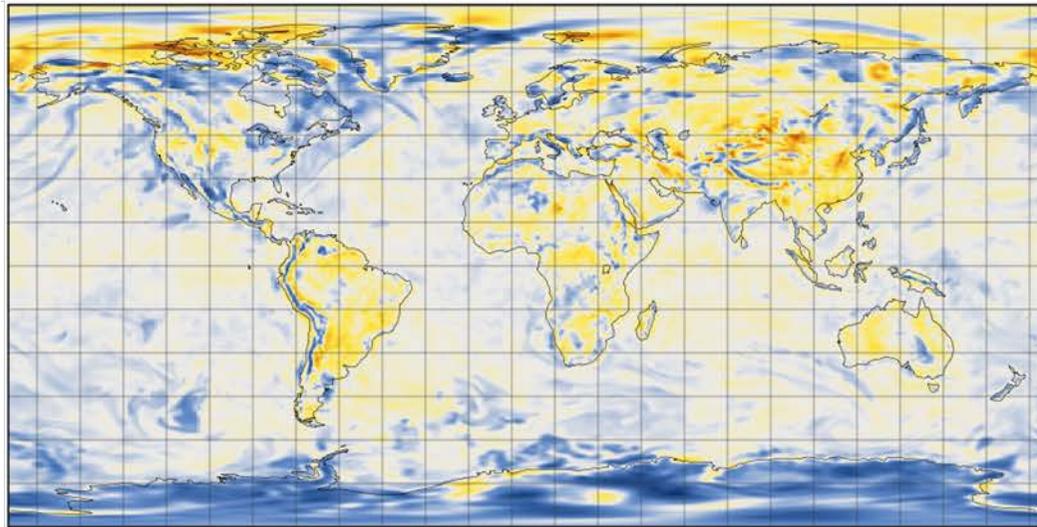
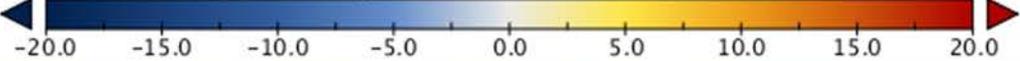


Global high-resolution climate reconstruction

ECHAM6 AMIP2, no spectral nudging - NCEP



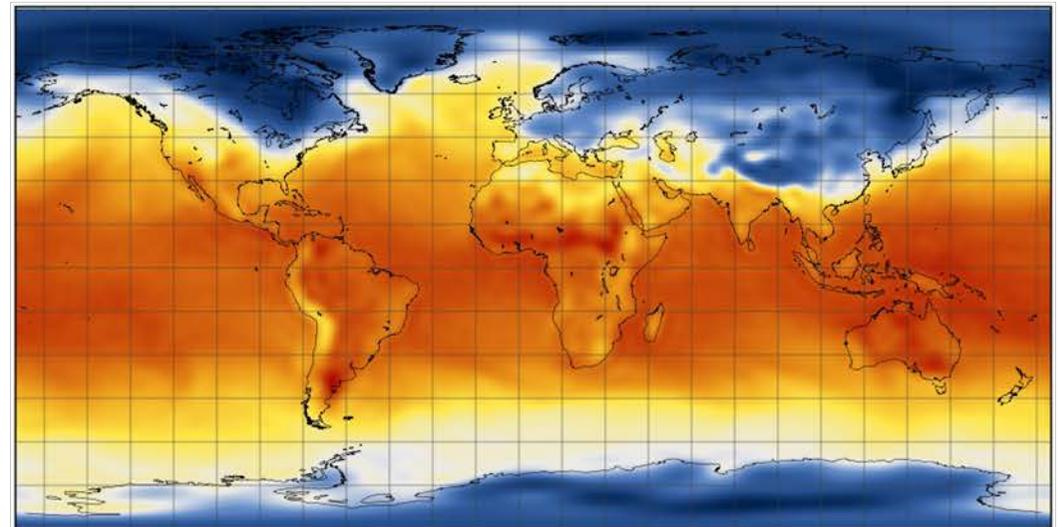
temperature difference [°C]



ECHAM6, spectral nudging - NCEP

2m-Temperature [K] 30.01.1976, 0:00

NCEP/NCAR Reanalysis

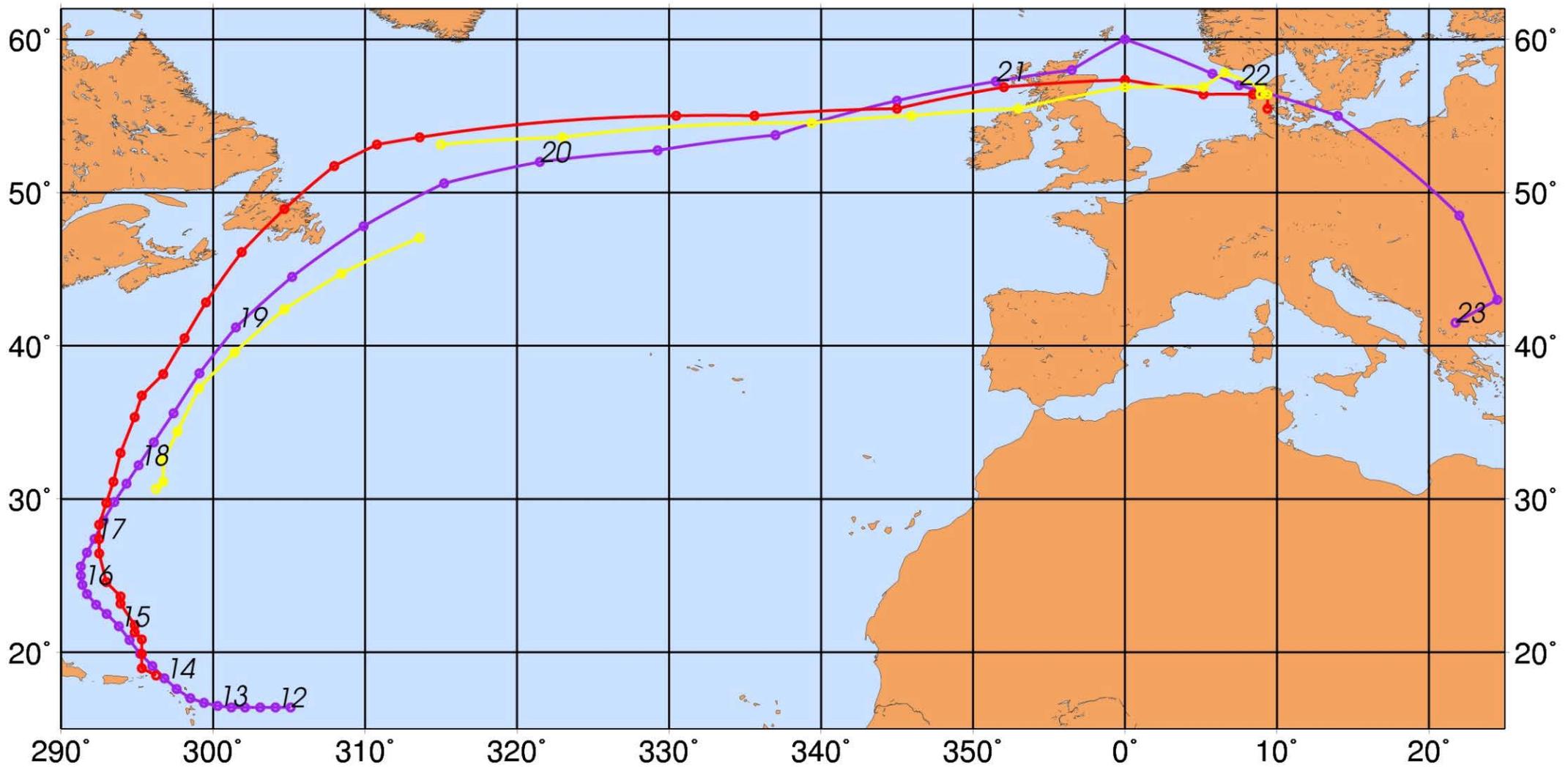


temperature [°C]



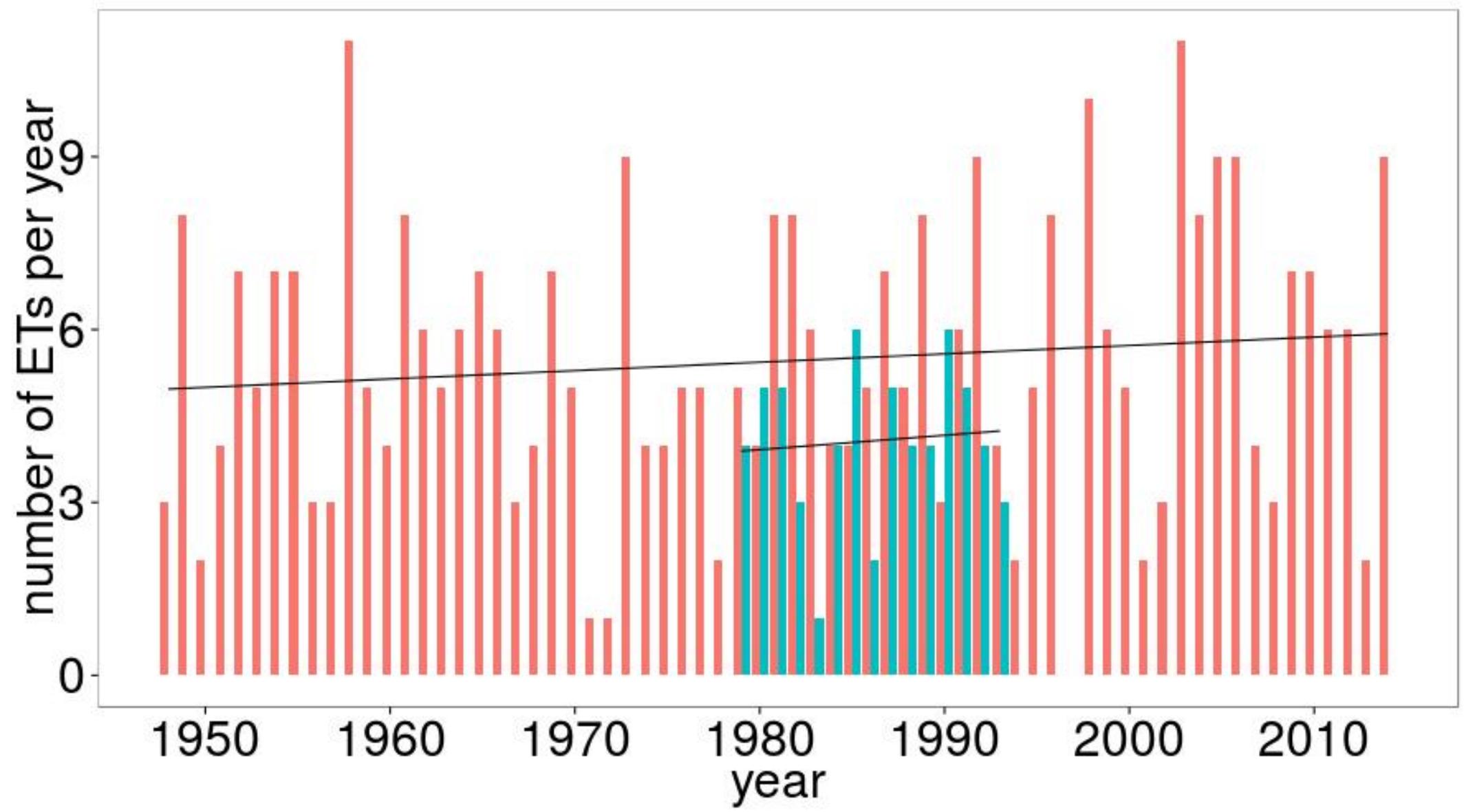


Tracks of hurricane Gonzalo



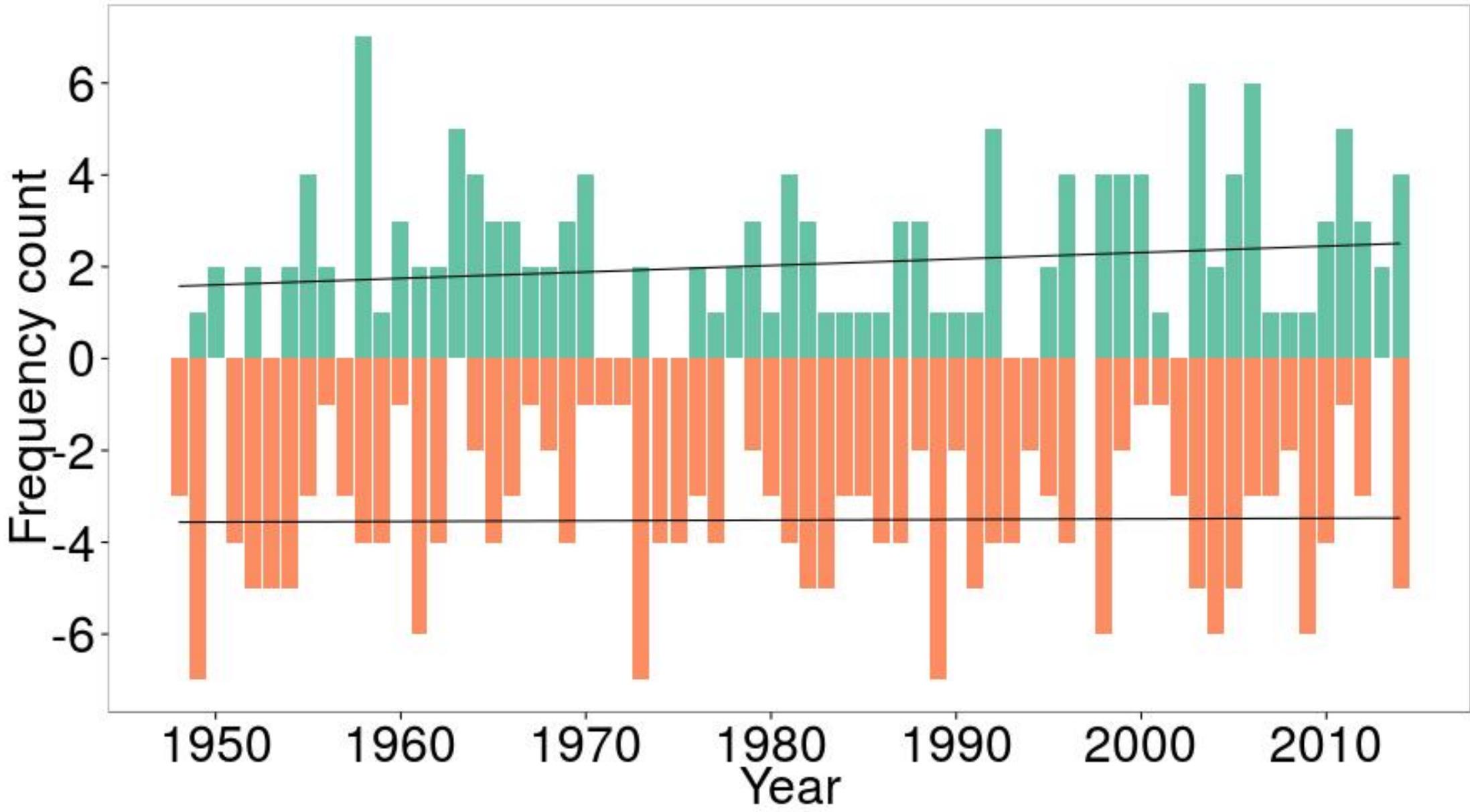


Number of extratropically transitioning cyclones



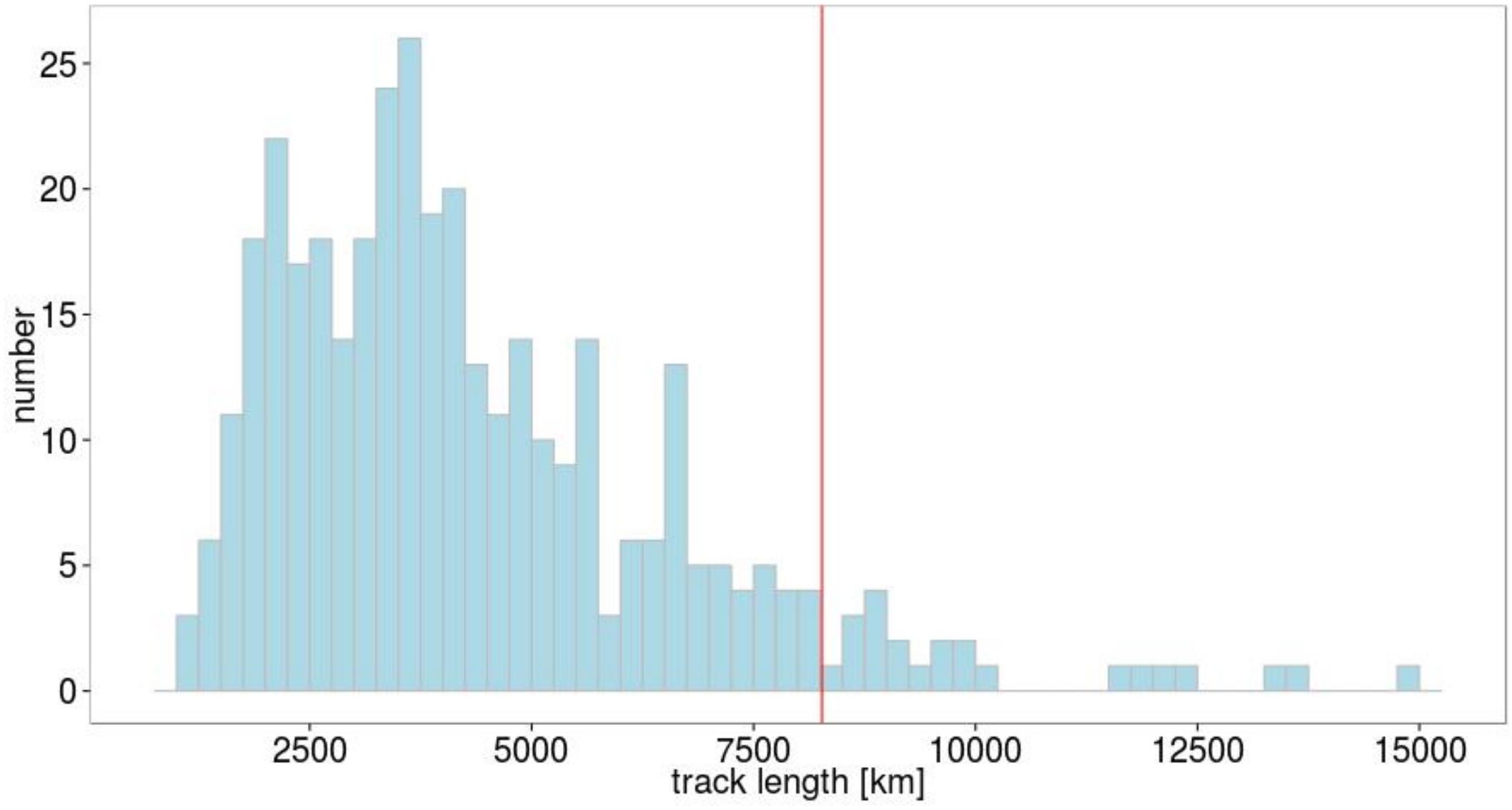


Number of ET storms stronger / weaker than Gonzalo



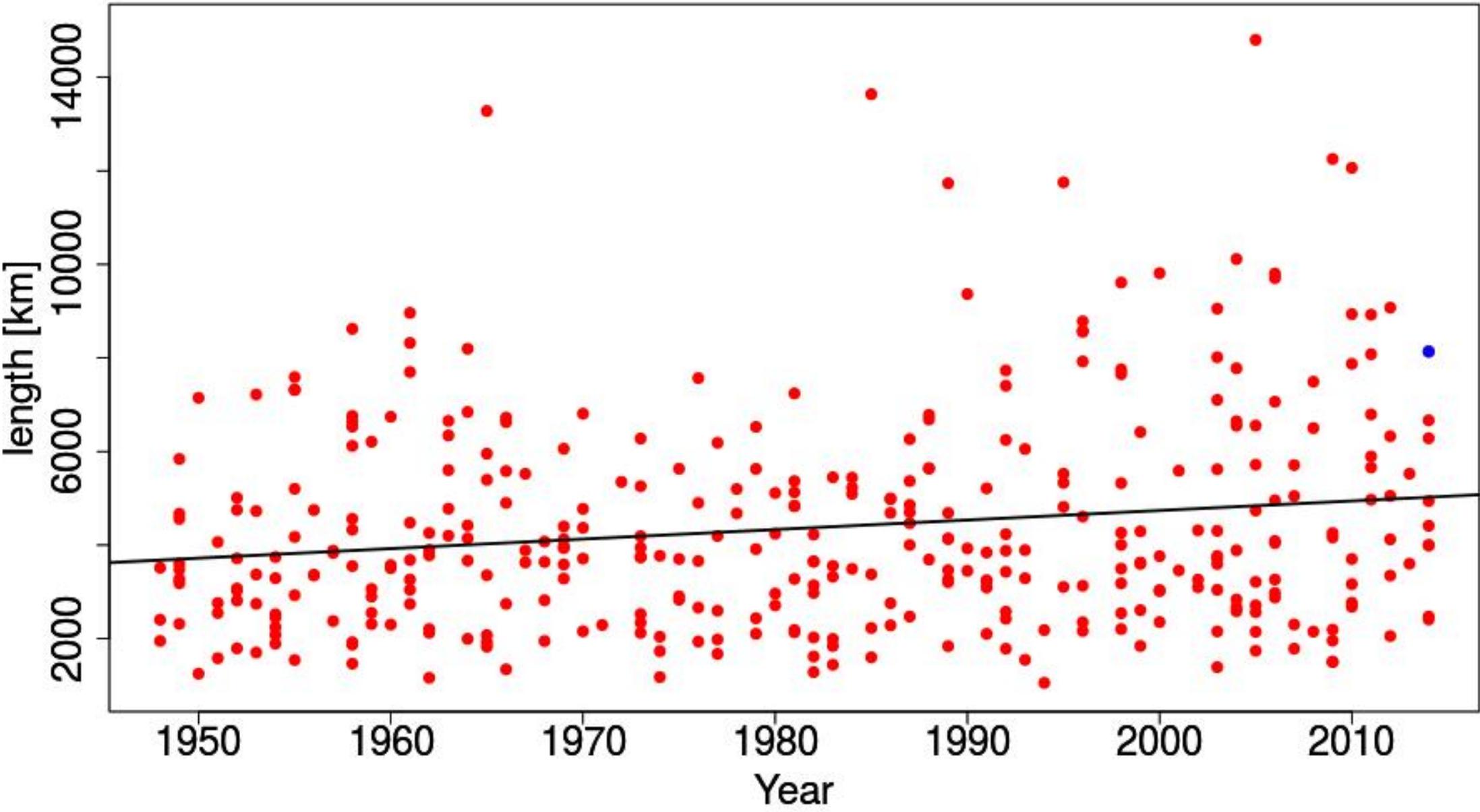


ET cyclone track lengths



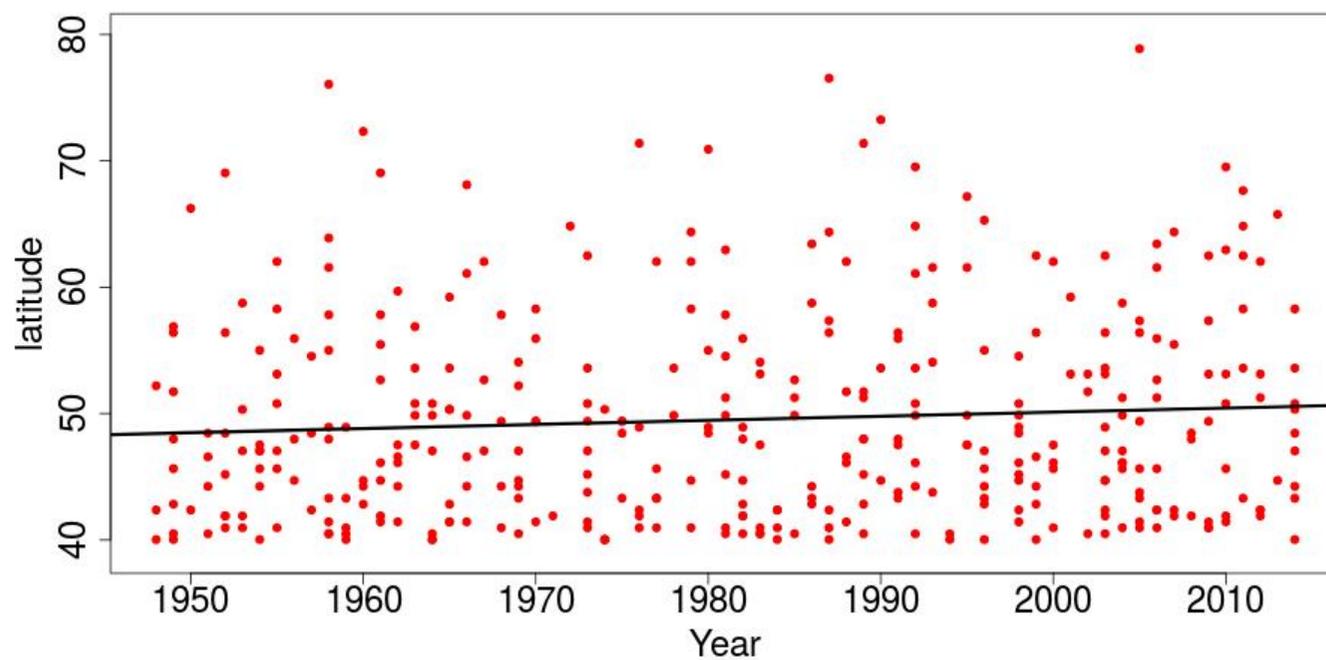
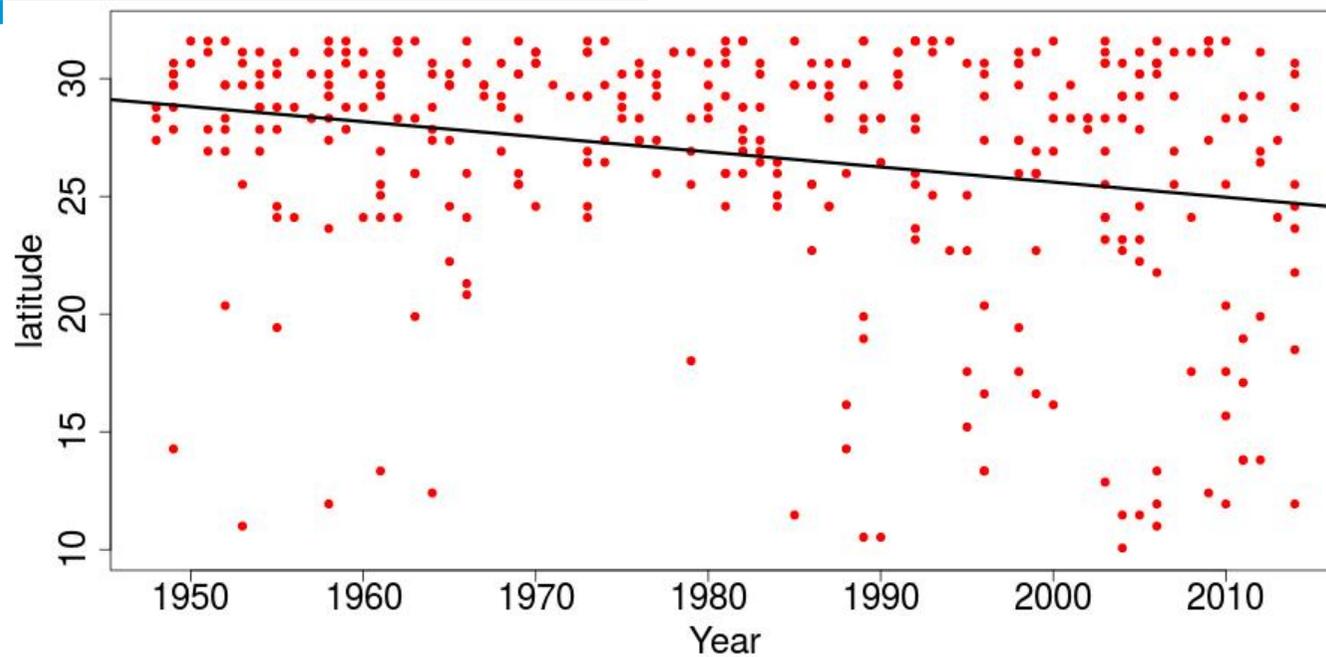


Track lengths of ET cyclones





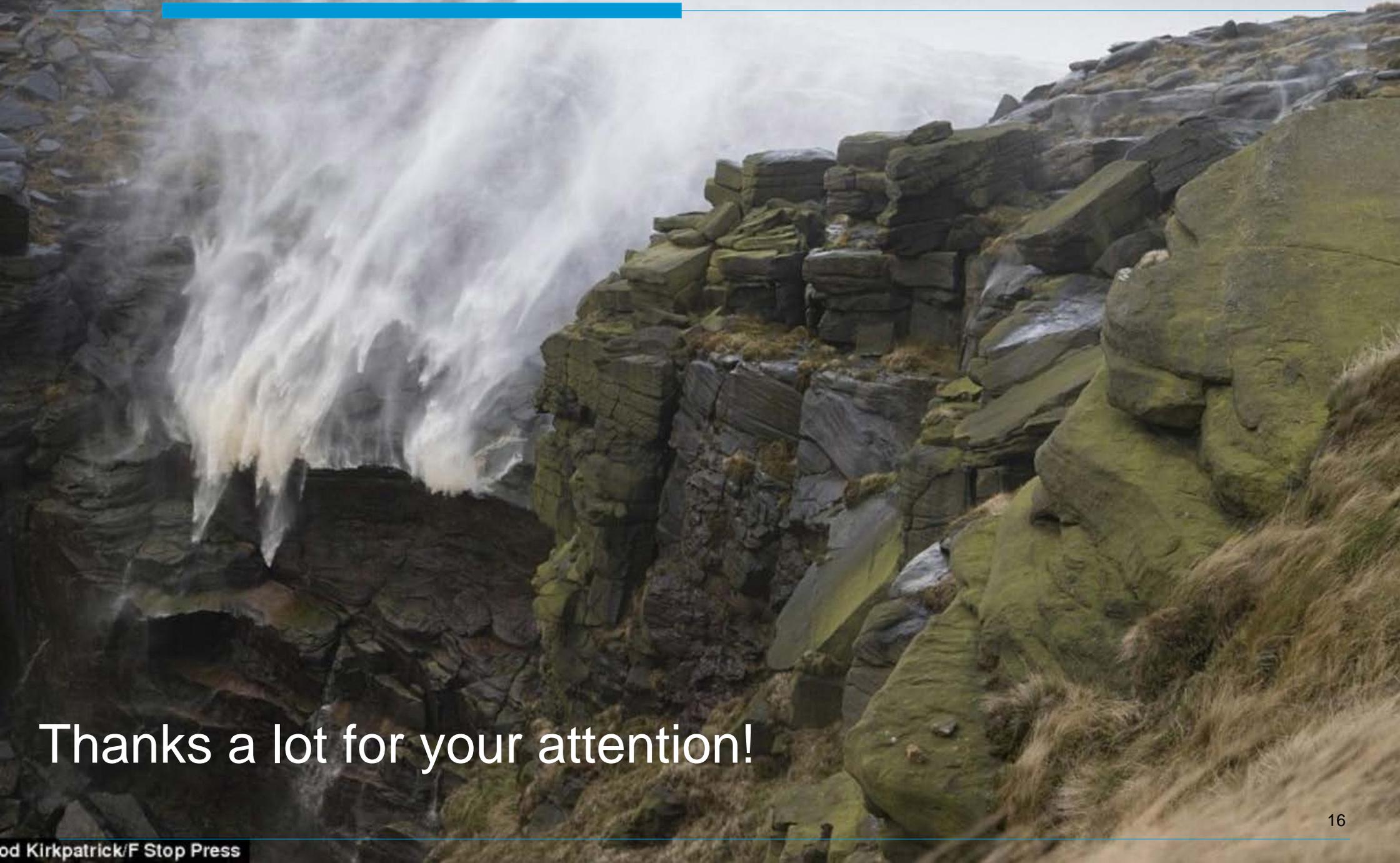
Latitudes of origin and dissipation of ET storms



Summary and Conclusions

- 'Gonzalo' was a strong (Category 4) hurricane that underwent an ET and then headed for Europe
- Number of ET did increase marginally, but large year-to-year variability
- Intensity of ET cyclones: no trends for storms weaker than Gonzalo, but slight increase for stronger storms
- Gonzalo: unusual long track which ranks among the highest 7 % of all extratropically transitioning TCs during the last 67 years. The simulated track lengths: increasing trend
- But still, according to climatology, the storm is within the expectations of current climate and can so far not be attributed to climate change.

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Thanks a lot for your attention!