

D. Future Changes in storms

Focus: NH / Atlantic Stormtrack

Main properties: Number, Intensity, Location of storms

Q1) What are the key physical processes for future changes?

- Decrease in Number of Storms on Southern flank (Expansion of the tropics)
- Thermodynamics: moisture content increase, baroclinicity changes
- Precipitation: increases e.g. Clausius-Clapeyron
- Local versus global constraints e.g. poleward flux of moisture and heat
- External drivers: MOC, Stratosphere, Land sea contrast, Sea Ice, etc.

Q2) Why do climate models give such different responses?

- Large natural variability in storm tracks (sampling uncertainty)
- Response depends on present-day basic state (jet latitude, storms intensity, blocking,...)
- Different forcing due to different changes in “external drivers”
- Known Unknown: Release of diabatic heat in cyclones in E. Atlantic (future Xynthias?)

Q3) How should we combine and calibrate multi-model ensembles responses?

- Comparing models with different number of initial condition ensembles
- Excluding outlier models - quality control.
- Use of regression to combine models e.g. more precise prediction by regression of responses on key basic state variables