

R: Higher Vertical Resolution

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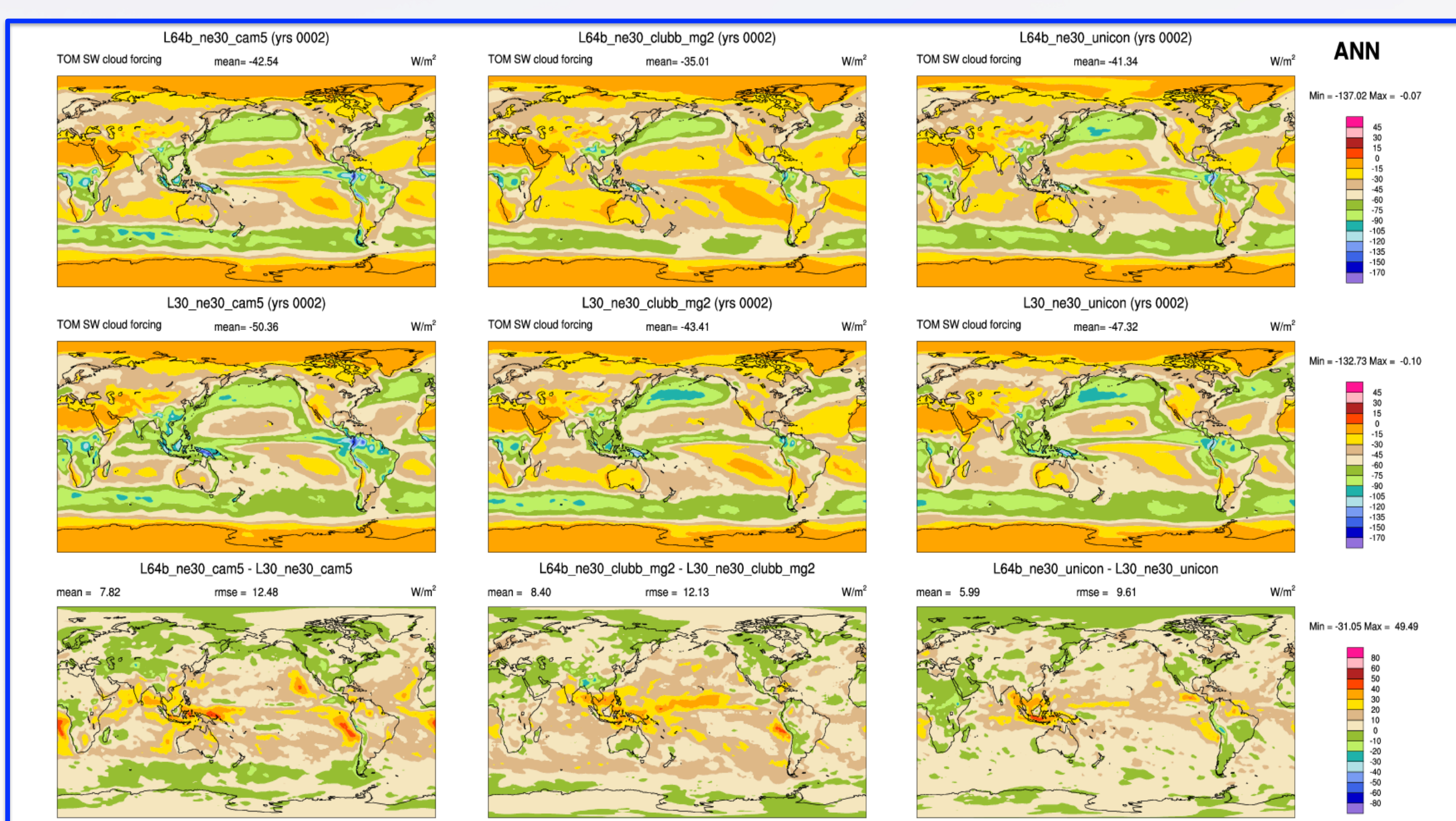
Objective

- Identify common features of vertical resolution sensitivity in **CAM5**, **CLUBB**, and **UNICON**
- Identify structural difference of vertical resolution sensitivity due to convection scheme
- Identify the dependence of vertical resolution sensitivity on tunable parameters

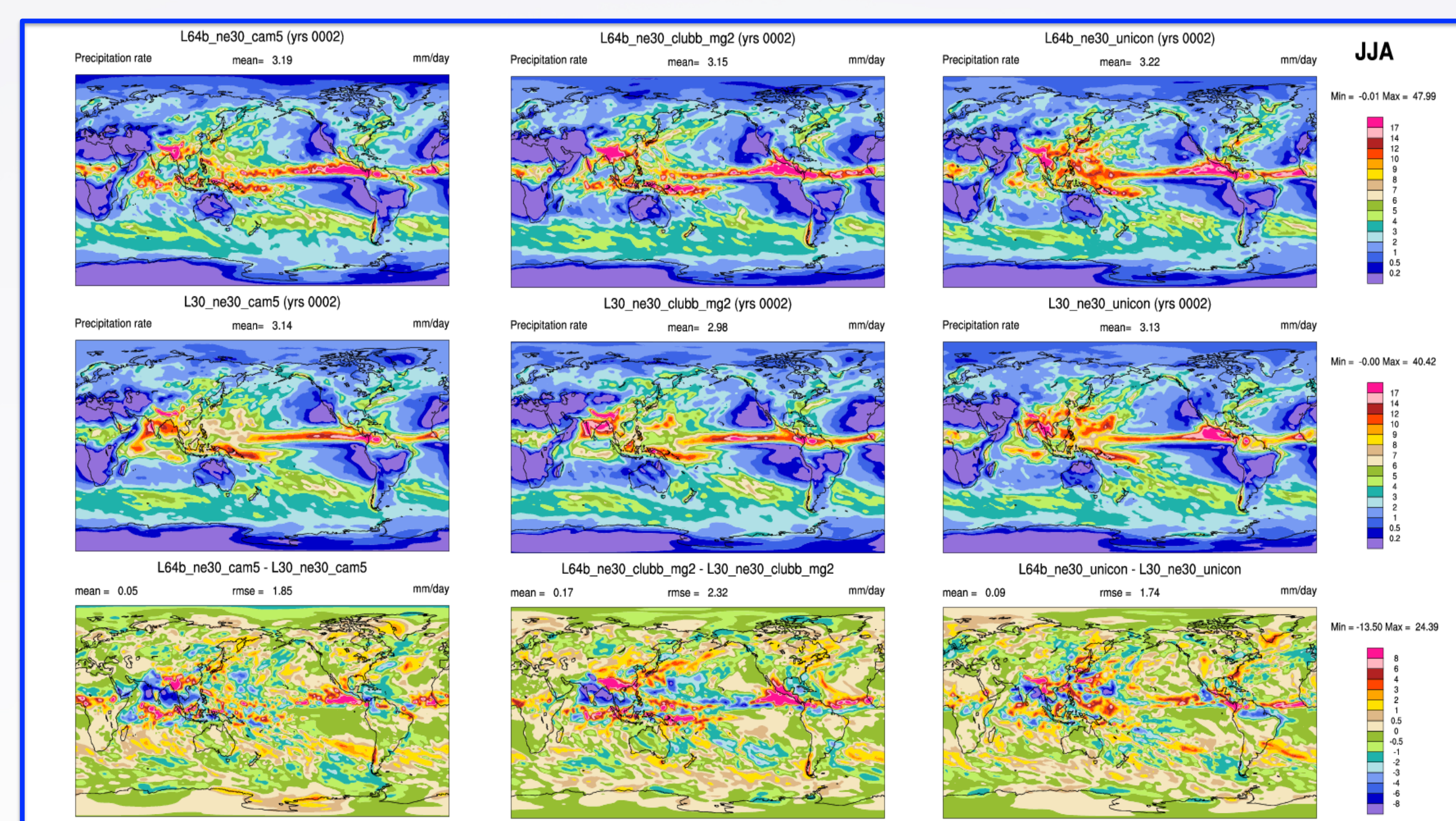
Approach

- Perform L30, L64a, L64b, L72 simulations with CAM5, CLUBB, and UNICON
- Perform diagnostics to assess the mean climatology at different vertical resolutions
- Perform short (1-year) simulations to explore the model response to tunable parameters

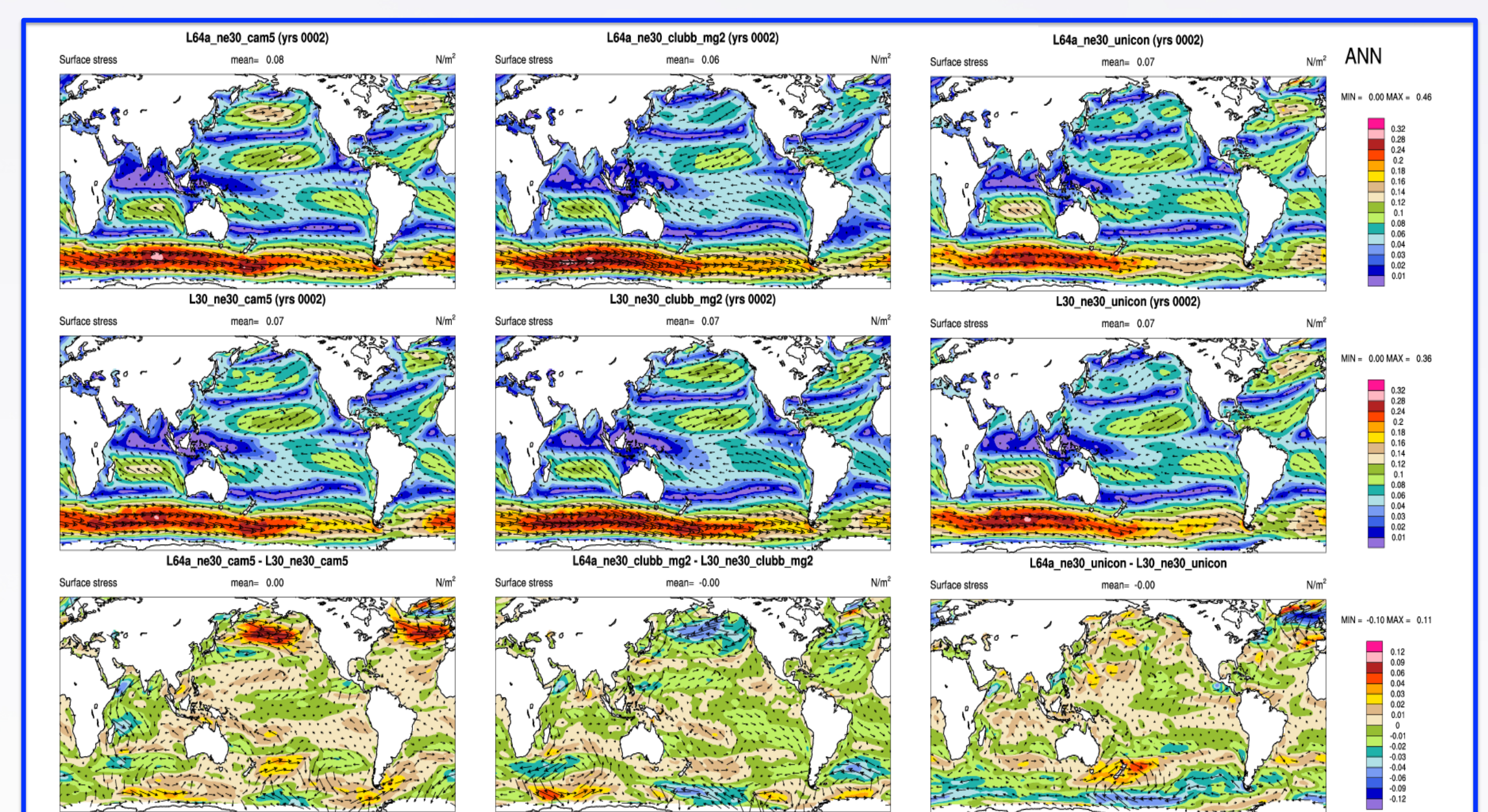
Results



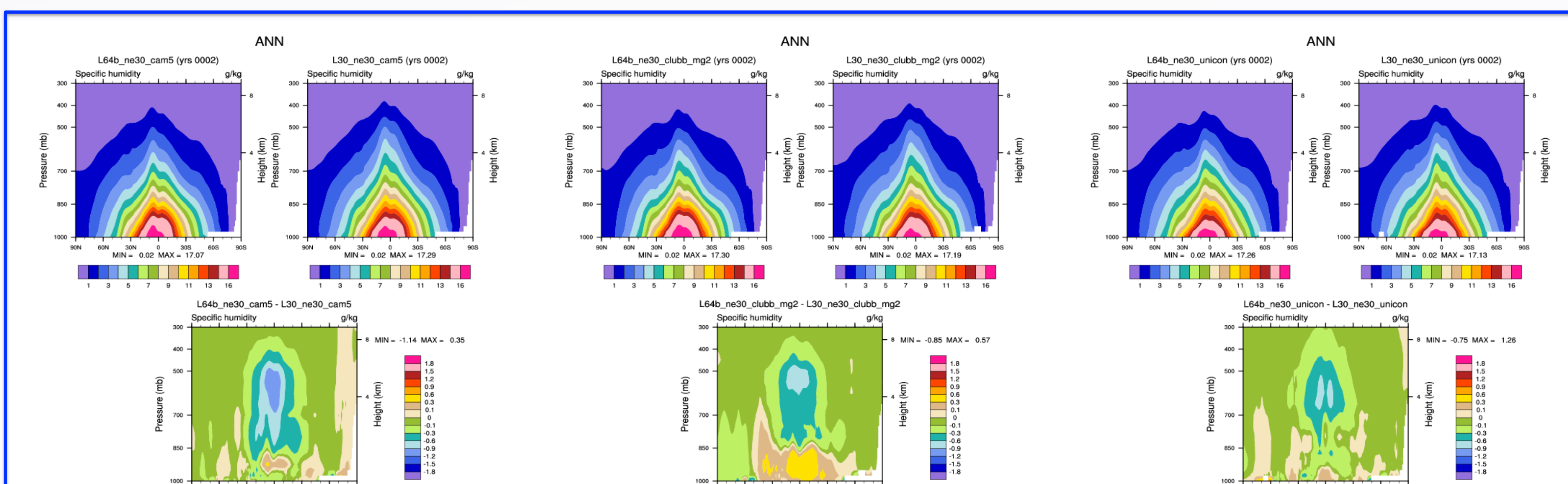
- Reduction of SWCF (stratocumulus)
- UNICON shows the smallest resolution sensitivity.



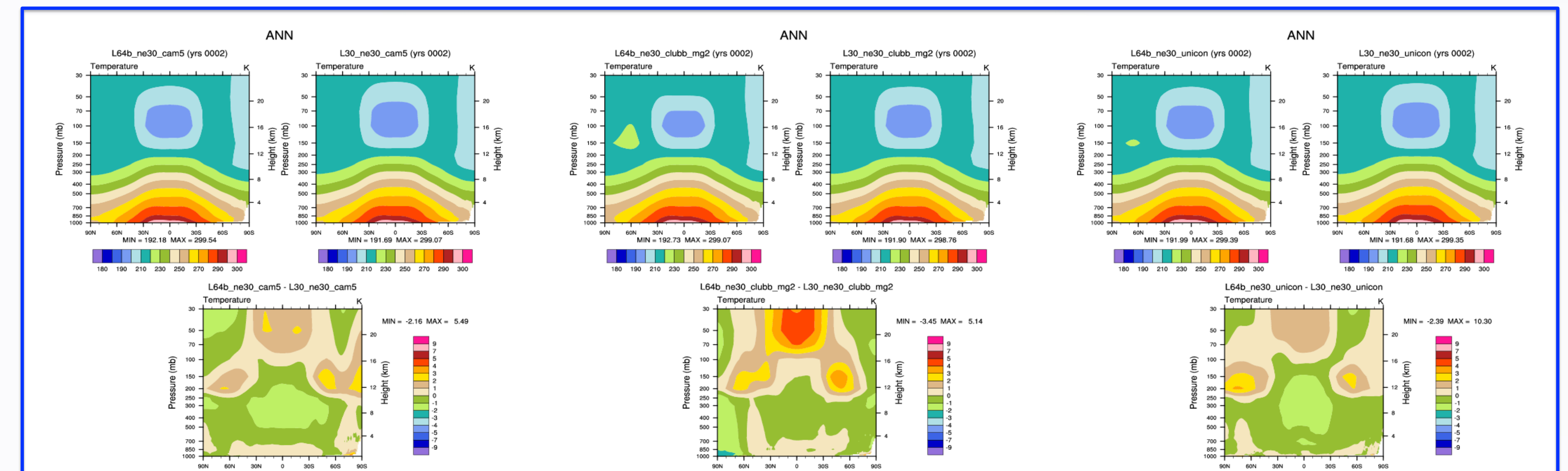
- Shift of Indian summer monsoonal precipitation
- Deterioration of double ITCZ bias



- Reduction of surface wind stress over Atlantic and Pacific in CLUBB
- Reduction of southern ocean surface wind stress bias in UNICON



- Drier mid- and upper troposphere— common in all 3 schemes
- Significant moistening of lower troposphere in CLUBB, while CAM5 and UNICON shows much smaller sensitivity.



- Warmer upper troposphere in the mid-latitudes and stratosphere in the tropics
- Colder mid and lower troposphere
- CLUBB shows the largest vertical resolution sensitivity, producing a 4K warming in the tropical stratosphere.