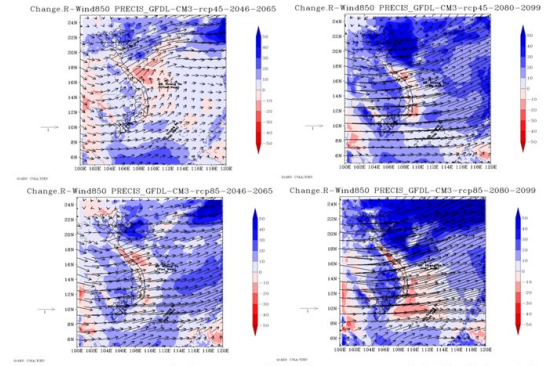
Projections of Variability and Trends of Summer Monsoon Rainfall over Vietnam

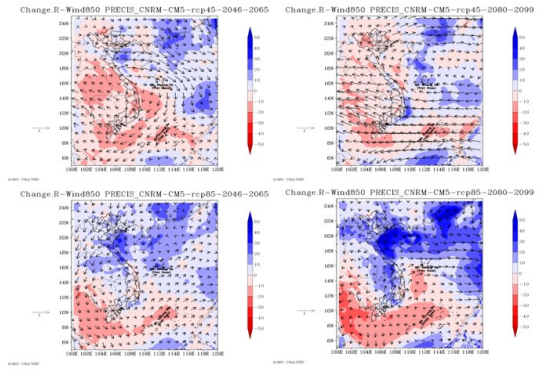
N.D. Mau, N.V. Thang and M.V. Khiem

Vietnam Institute of Meteorology, Hydrology and Climate Change, Hanoi, Vietnam; +84-4-62728299, E-mail: mau.imhen@gmail.com

In this paper, the variability and trends of summer monsoon rainfall of near-future (2046-2065) and far-future (2080-2099) compared with a baseline period (1986-2005) over Vietnam are projected by the PRECIS model under RCP4.5 and RCP8.5 scenarios. In this study, the PRECIS model was driven by the CNRM-CM5 (PRECIS/CNRM-CM5) and GFDL-CM3 (PRECIS/GFDL-CM3) for the baseline simulation (1986-2005) and future projections (2046-2065 and 2080-2099). The variability of summer monsoon rainfall was defined by the standard diviasion (SD). The trend analysis shows that the trend of the 21st century average monsoon rainfall is increasing under PRECIS/GFDL-CM3 projections in both RCP4.5 and RCP8.5 scenarios. However, the PRECIS/CNRM-CM5 shows the 21st century average monsoon rainfall is increasing in the RCP8.5 scenarios; and decreasing in the RCP4.5 scenario. The PRECIS/GFDL-CM3 and PRECIS/CNRM-CM5 show the increasing of variability of summer monsoon rainfall during near-future under both RCP4.5 and RCP8.5, with the inceasing rate of SD is about 0 to 80% compared with baseline simulation. However, both PRECIS models show the little change and decreasing in SD during far-future compared with baseline simulation.

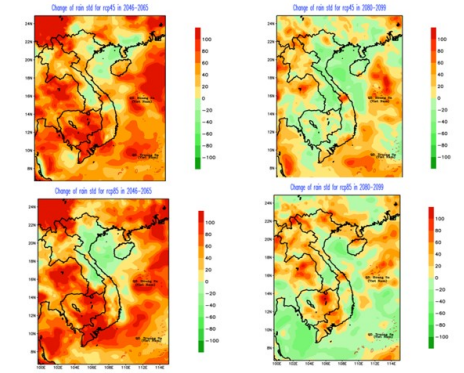


a) Changes in 850 winds (vector, m/s) and summer rainfall (shaded, %), by PRECIS/GFDL-CM3: RCP4.5 (above) and RCP8.5 (below); near future (2046-2065, Left), far future (2080-2099, Right)

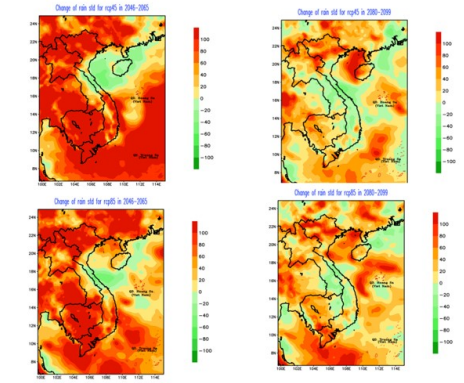


b) Changes in 850 winds (vector, m/s) and summer rainfall (shaded, %), by PRECIS/CNRM-CM5: RCP4.5 (above) and RCP8.5 (below); near future (2046-2065, Left), far future (2080-2099, Right)

Figure 1. Projections of changes in 850 winds (vector, m/s) and summer rainfall (shaded, %) compared with baseline simulation: (a) PRECIS/GFDL-CM3 and (b) PRECIS/CNRM-CM5; RCP4.5 (above) and RCP8.5 (below); near-future (2046-2065; Left), far-future (2080-2099; Right)



a) Changes in SD (shaded, %), by PRECIS/GFDL-CM3: RCP4.5 (above) and RCP8.5 (below); near future (2046-2065, Left), far future (2080-2099, Right)



b) Changes in SD (shaded, %), by PRECIS/CNRM-CM5: RCP4.5 (above) and RCP8.5 (below); near future (2046-2065, Left), far future (2080-2099, Right)

Figure 2. Projections of changes in SD (shaded, %) compared with baseline simulation: (a) PRECIS/GFDL-CM3 and (b) PRECIS/CNRM-CM5; RCP4.5 (above) and RCP8.5 (below); near-future (2046-2065; Left), far-future (2080-2099; Right)