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Supplement of

The impact of lateral boundary forcing in the CORDEX-Africa ensemble over southern Africa

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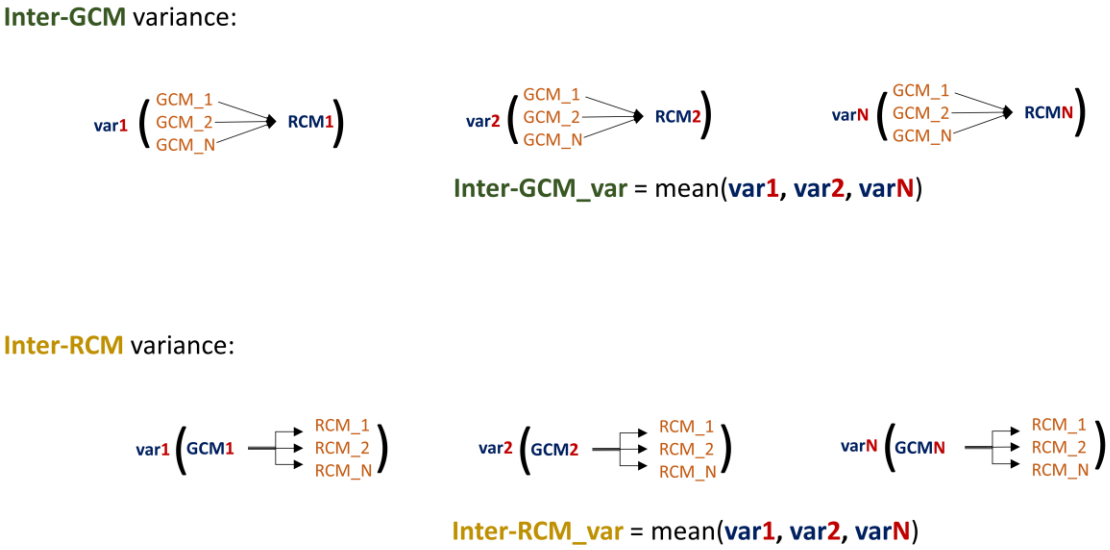


Fig. S1 Schematic process for the analysis of variance

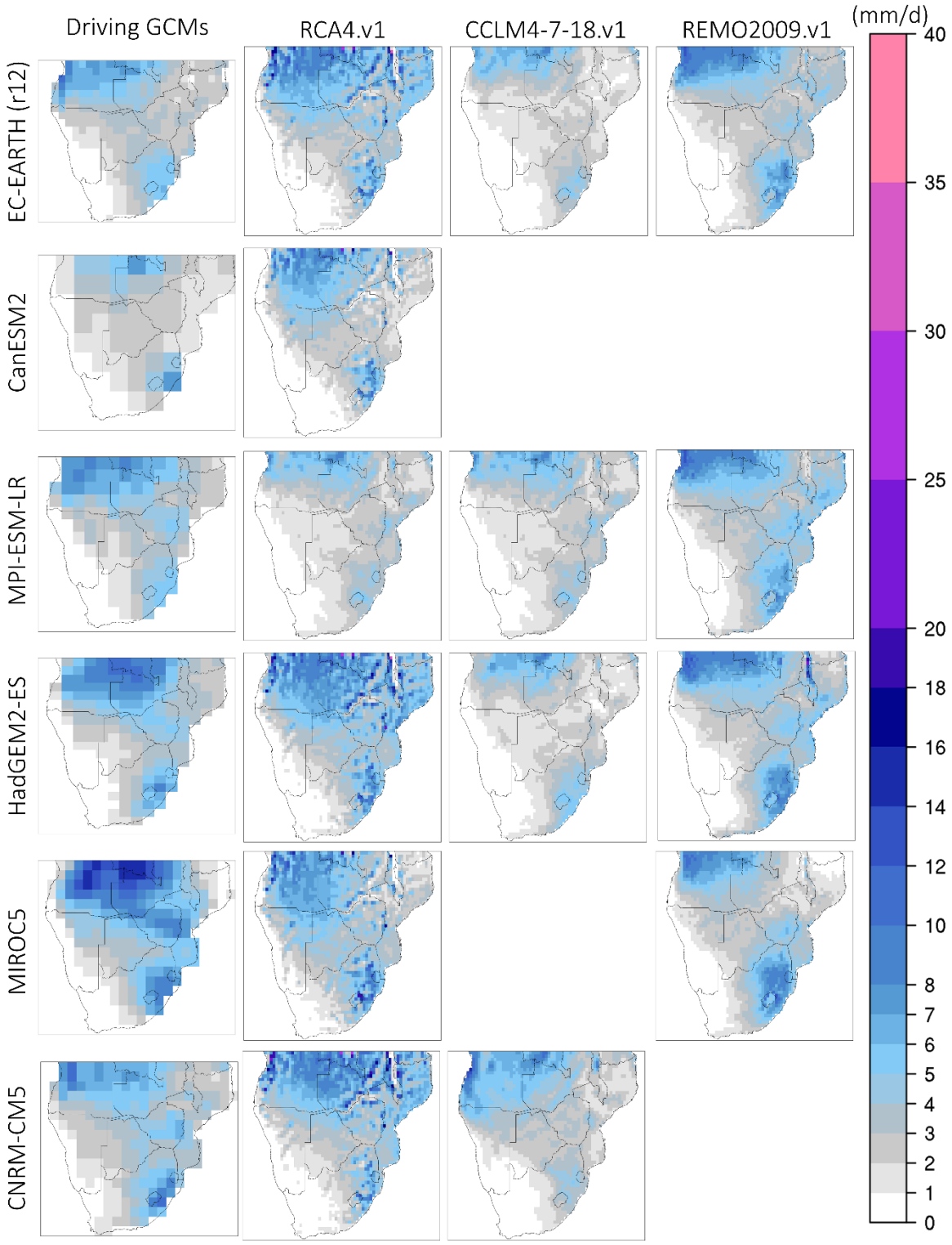


Fig. S2: Monthly precipitation climatologies (mm/d) during November for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

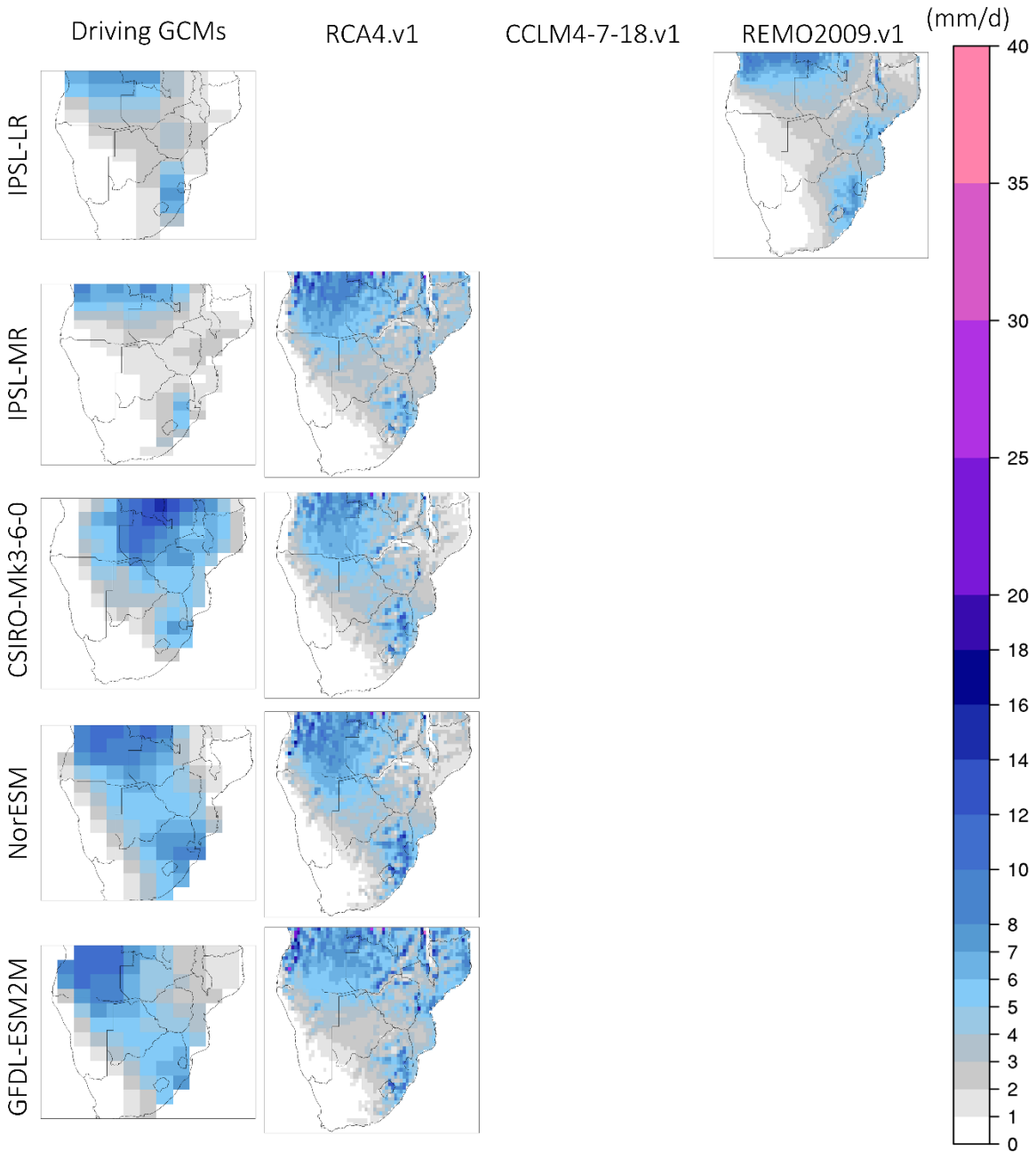


Fig. S2: Continued

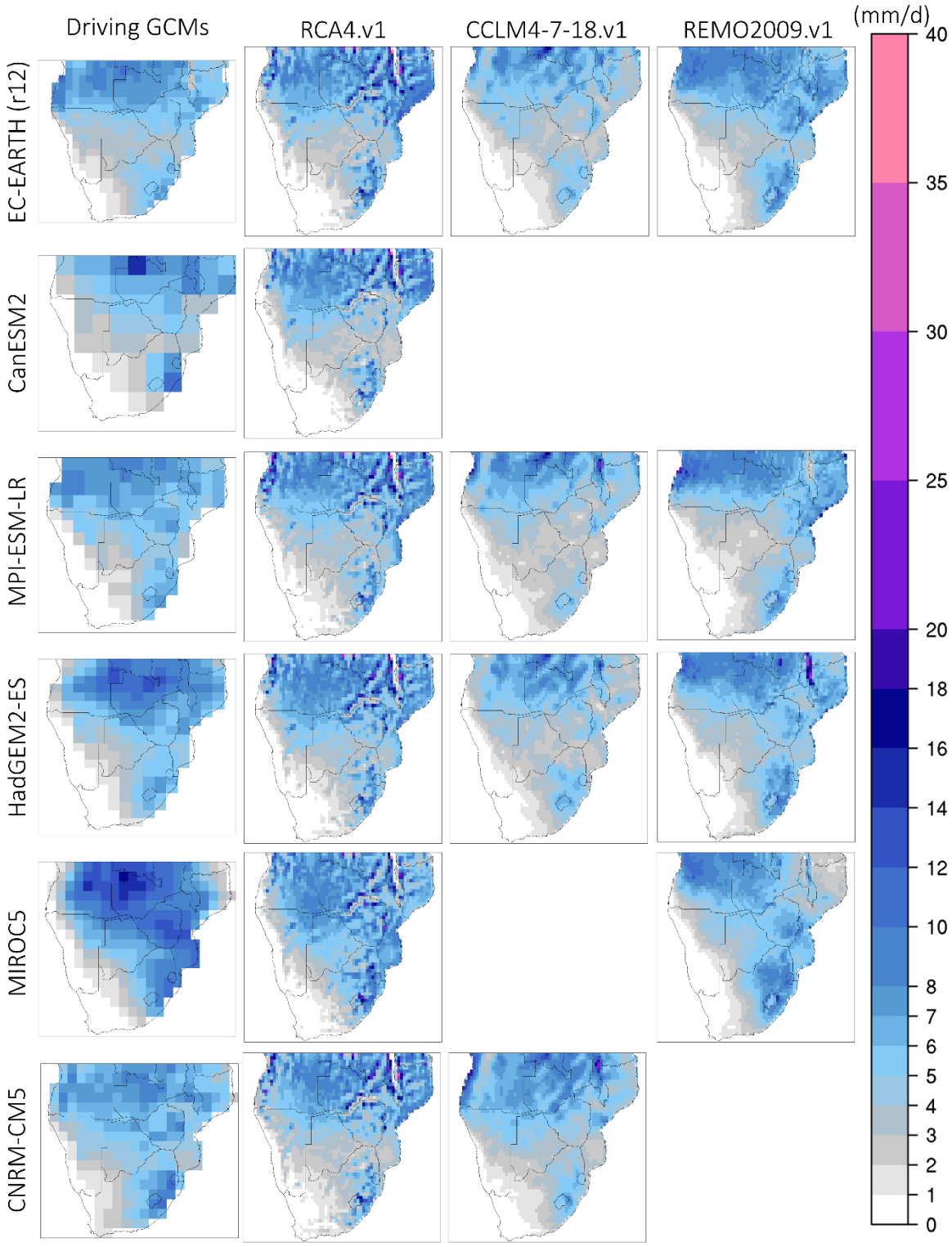


Fig. S3: Monthly precipitation climatologies (mm/d) during December for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

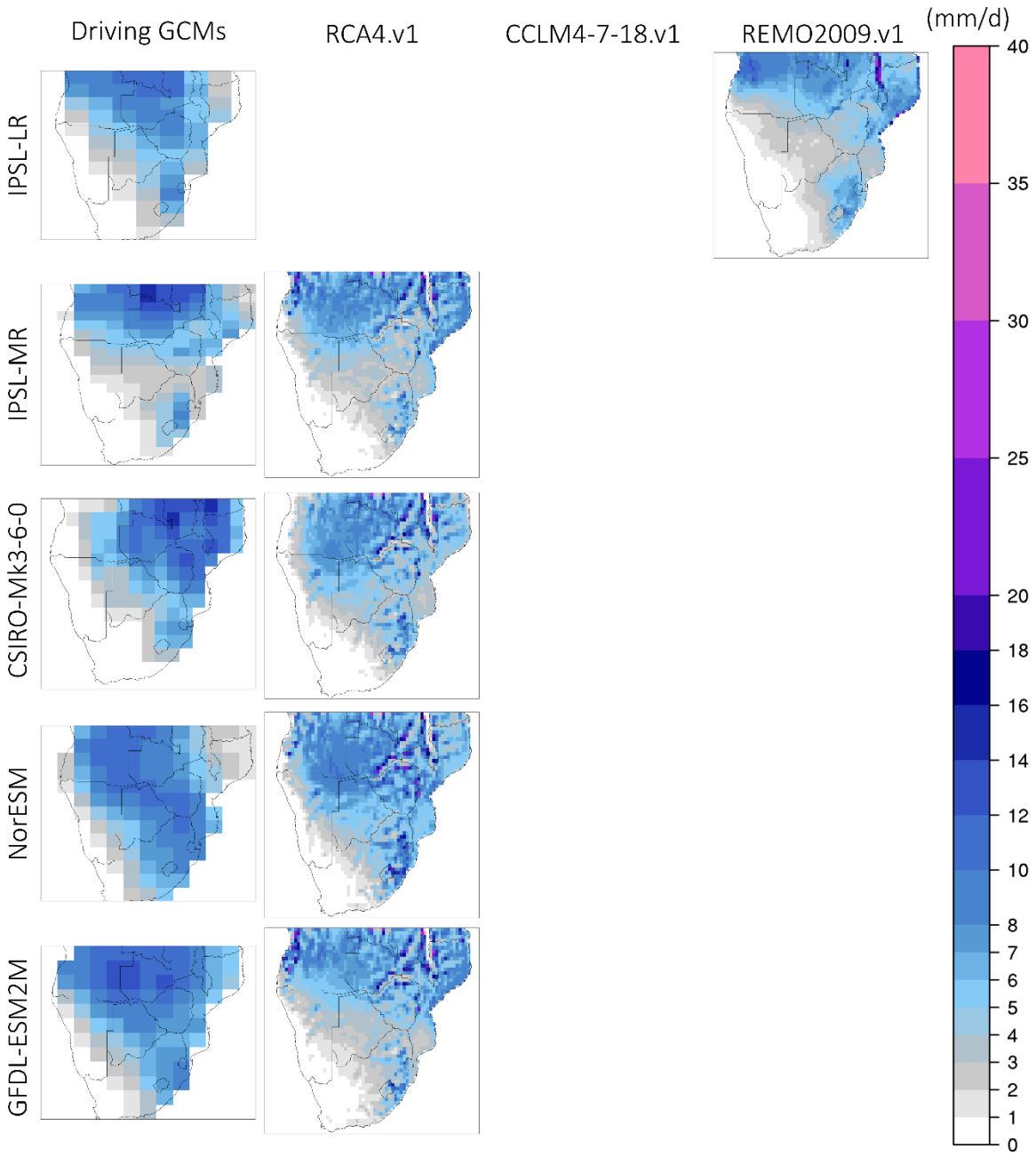


Fig. S3: Continued

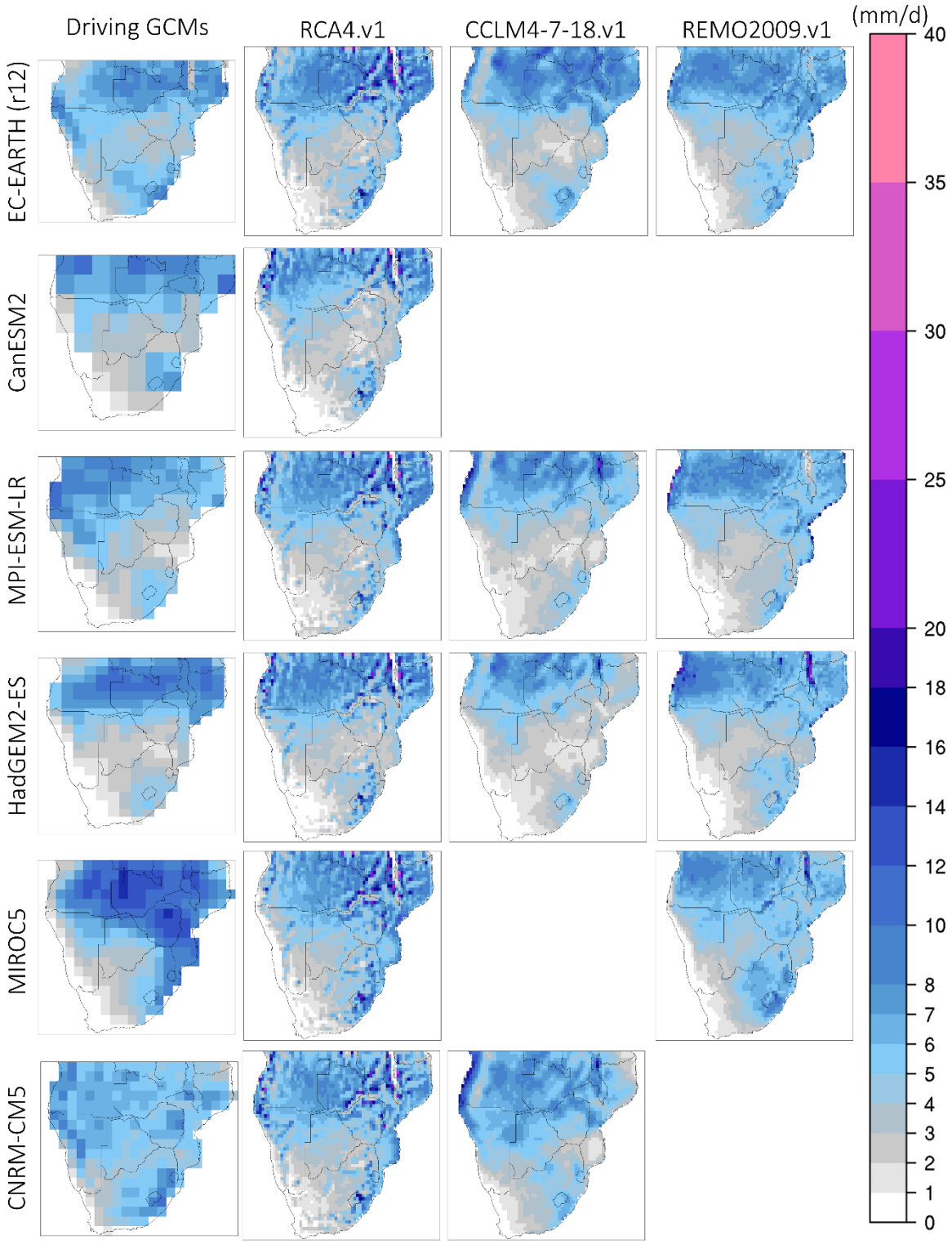


Fig. S4: Monthly precipitation climatologies (mm/d) during February for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

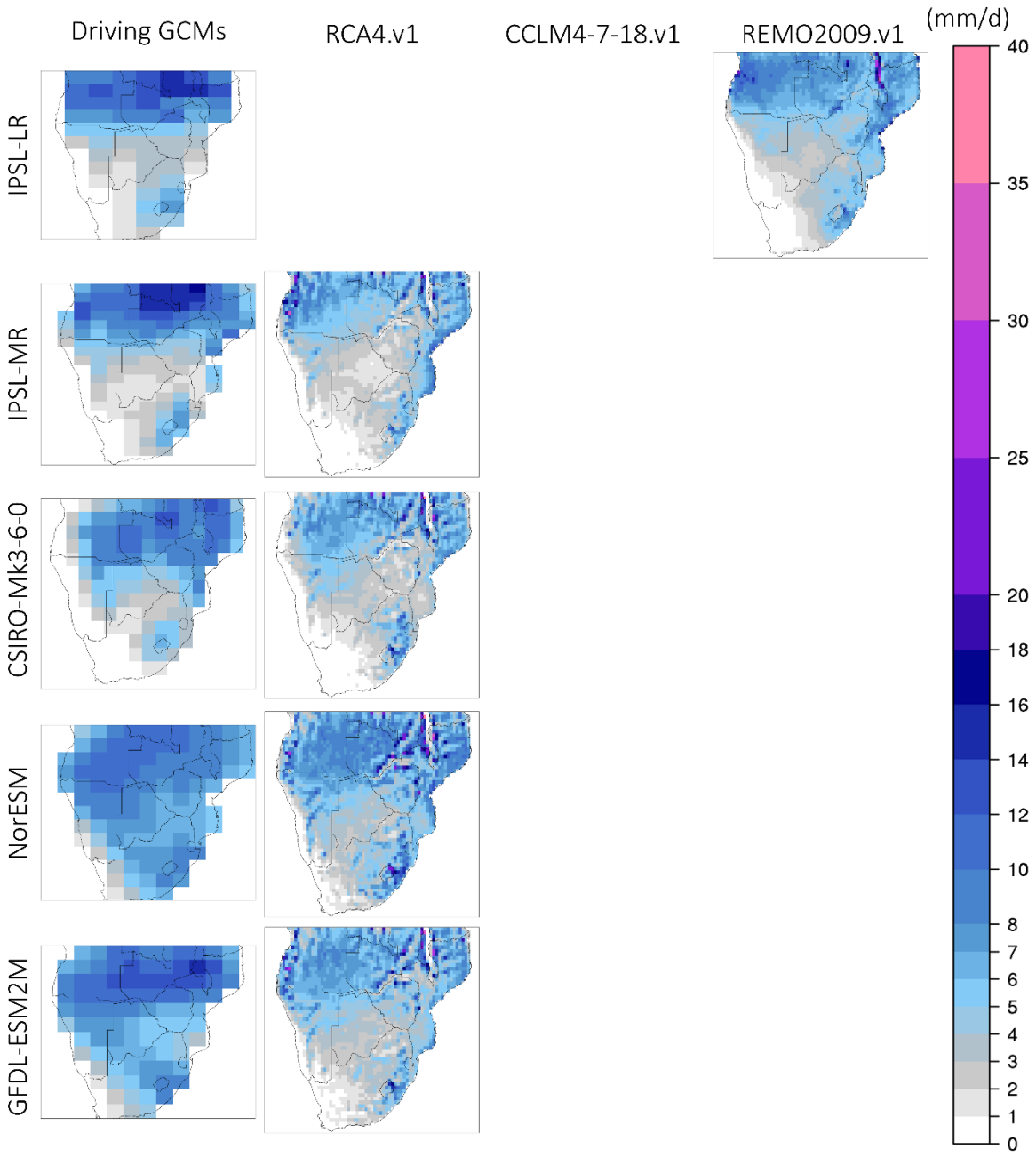


Fig. S4: Continued

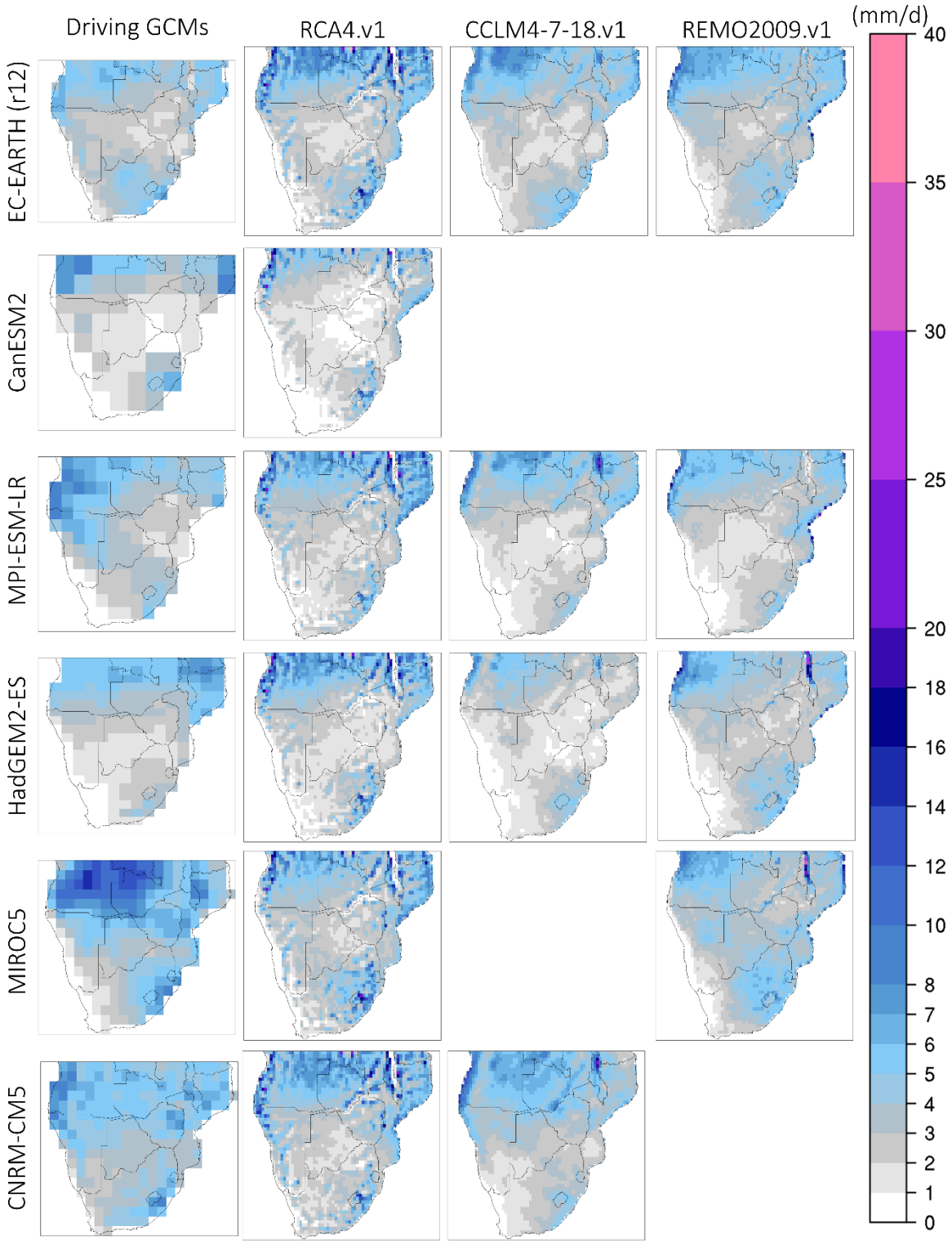


Fig. S5: Monthly precipitation climatologies (mm/d) during March for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

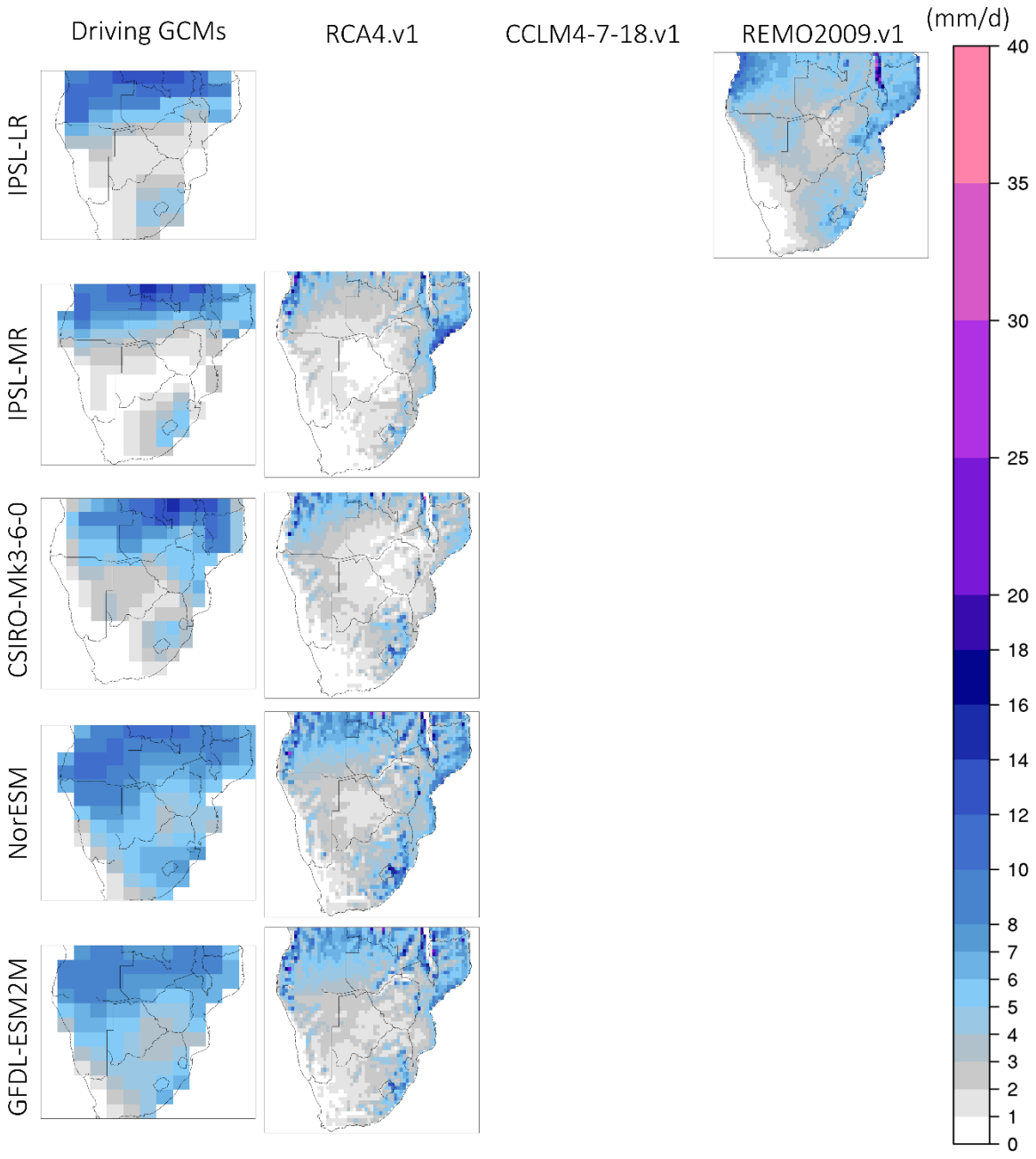


Fig. S5: Continued

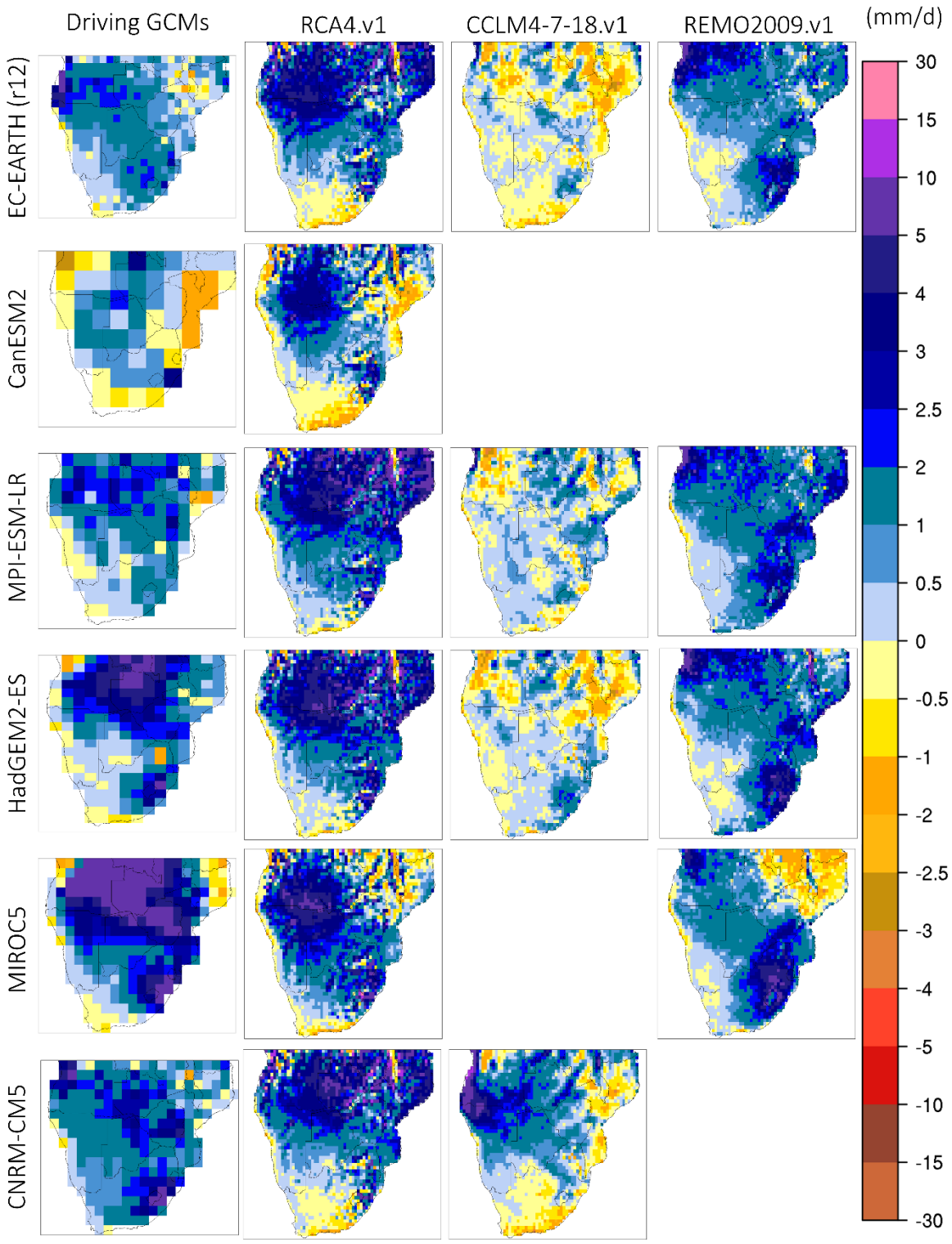


Fig. S6: Monthly precipitation bias (model – CHIRPS in mm/d) during November for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

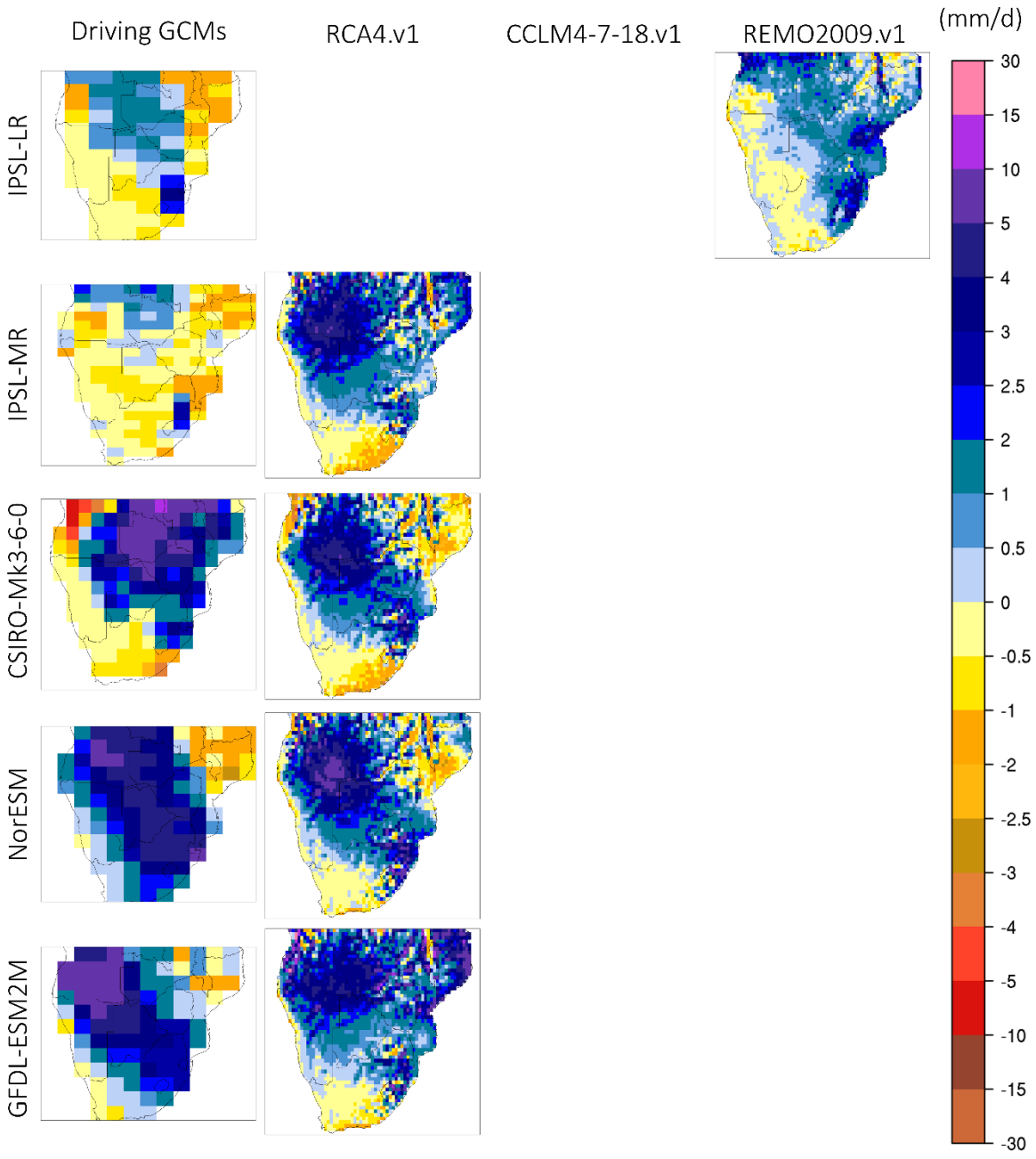


Fig. S6: Continued

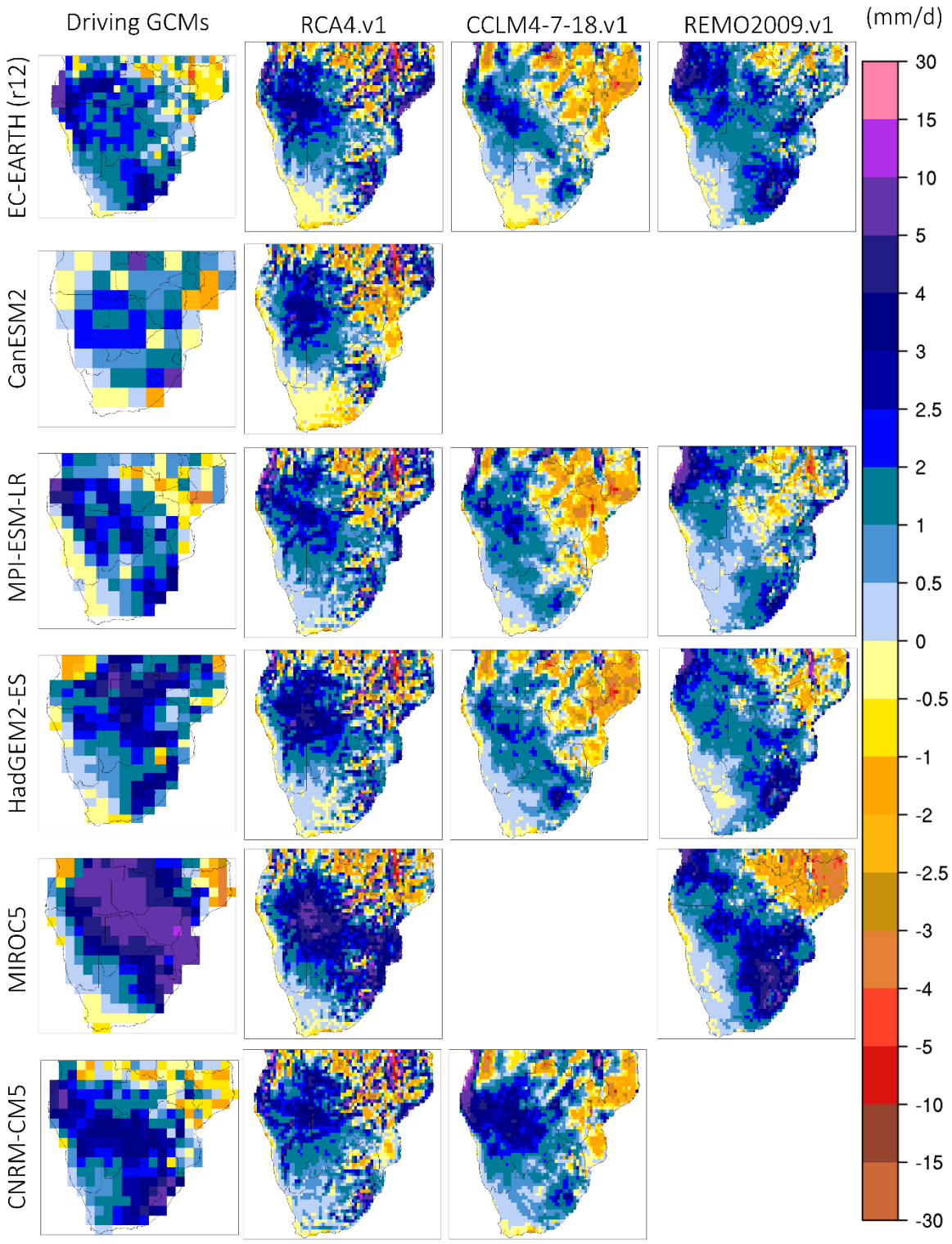
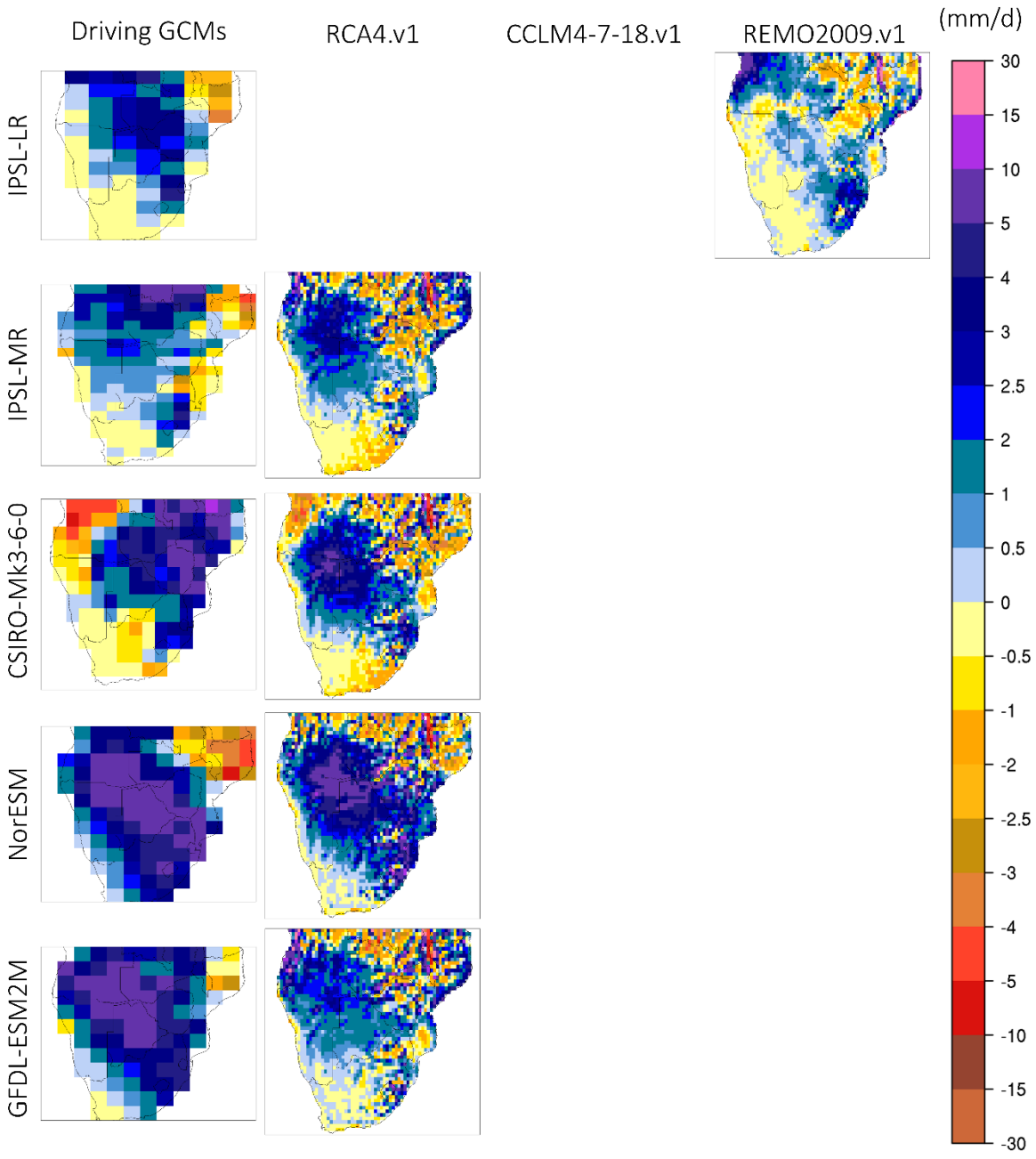


Fig. S7: Monthly precipitation bias (model – CHIRPS in mm/d) during December for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1



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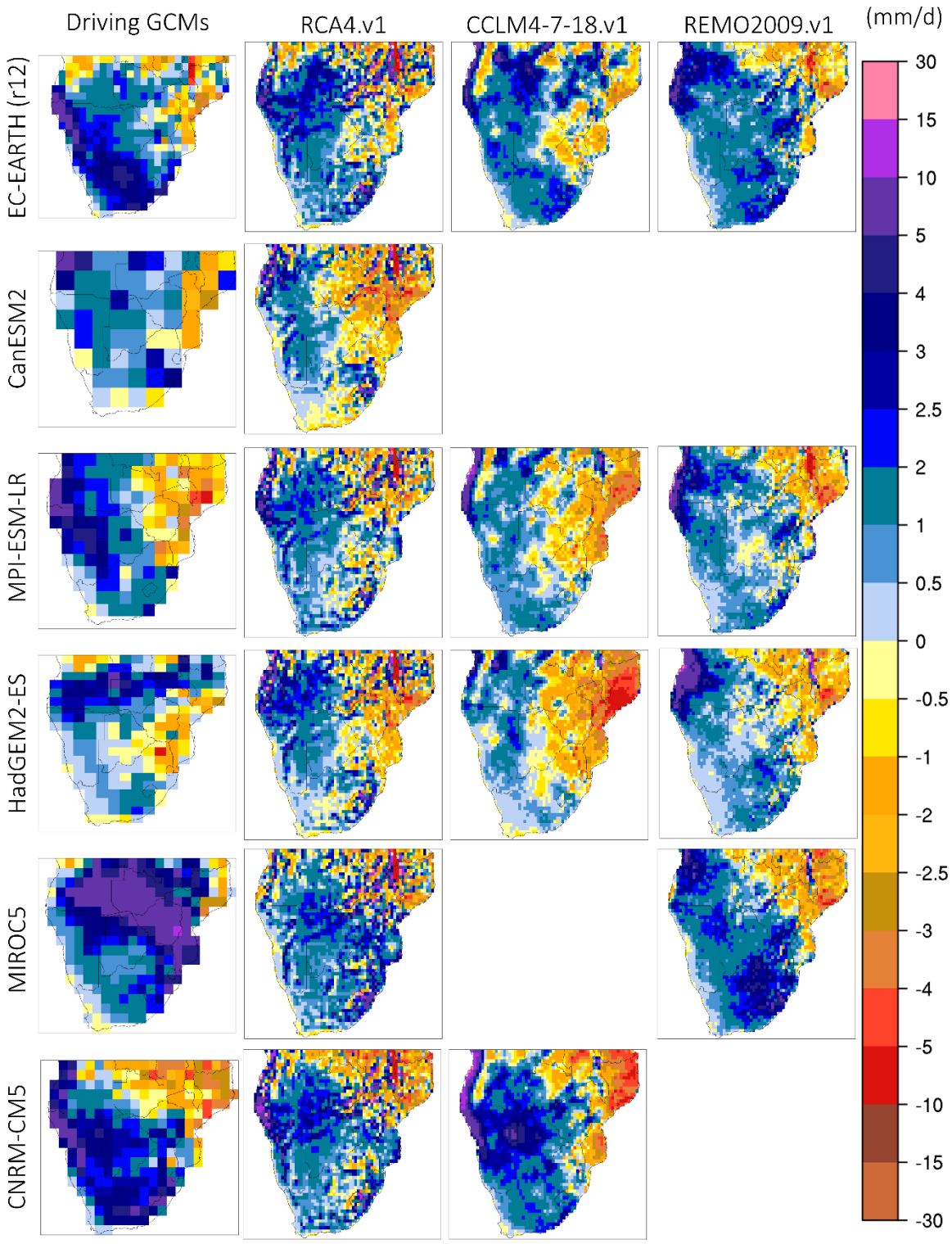

Fig. S8: Monthly precipitation bias (model – CHIRPS in mm/d) during February for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

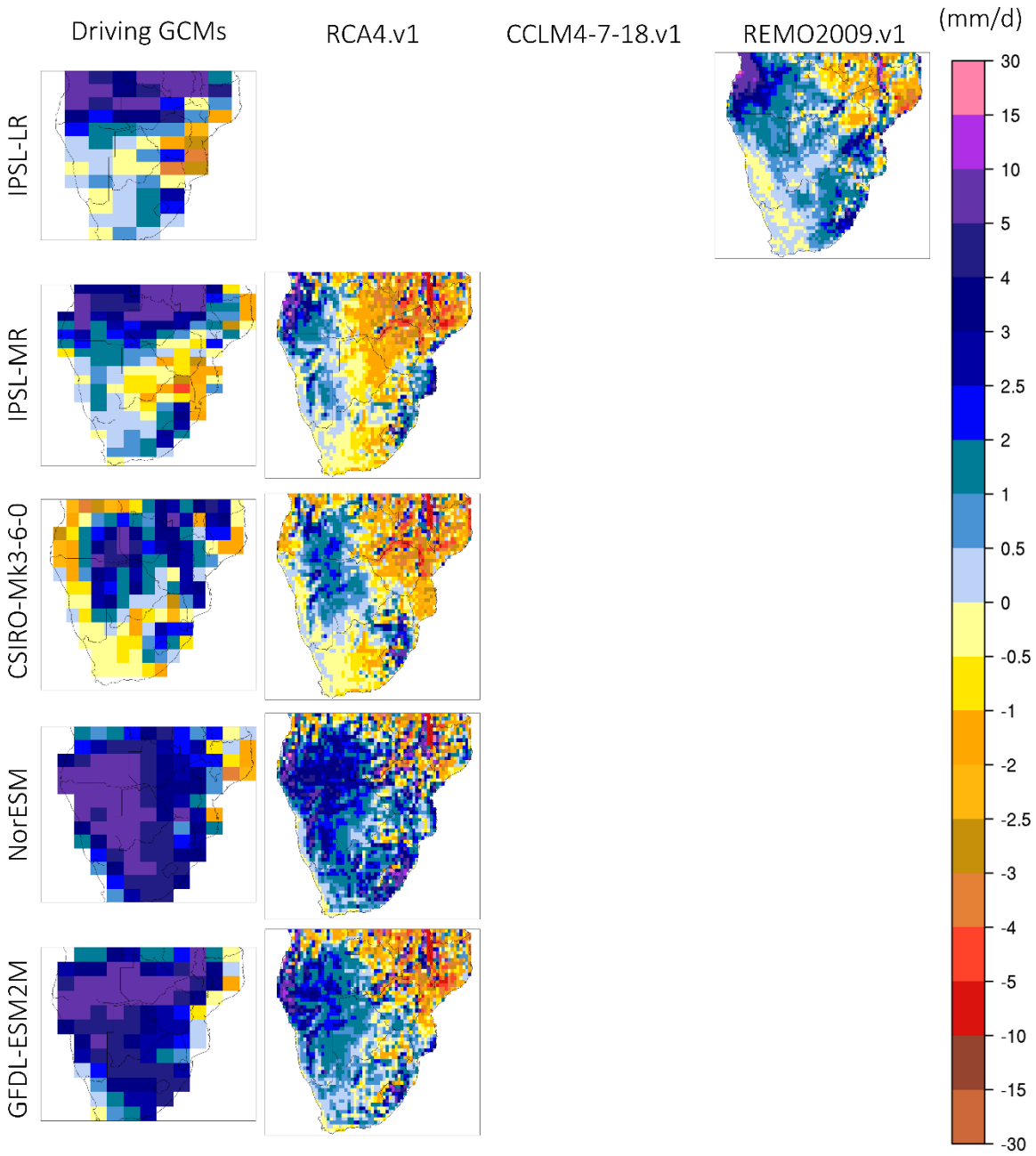

Fig. S8: Continued

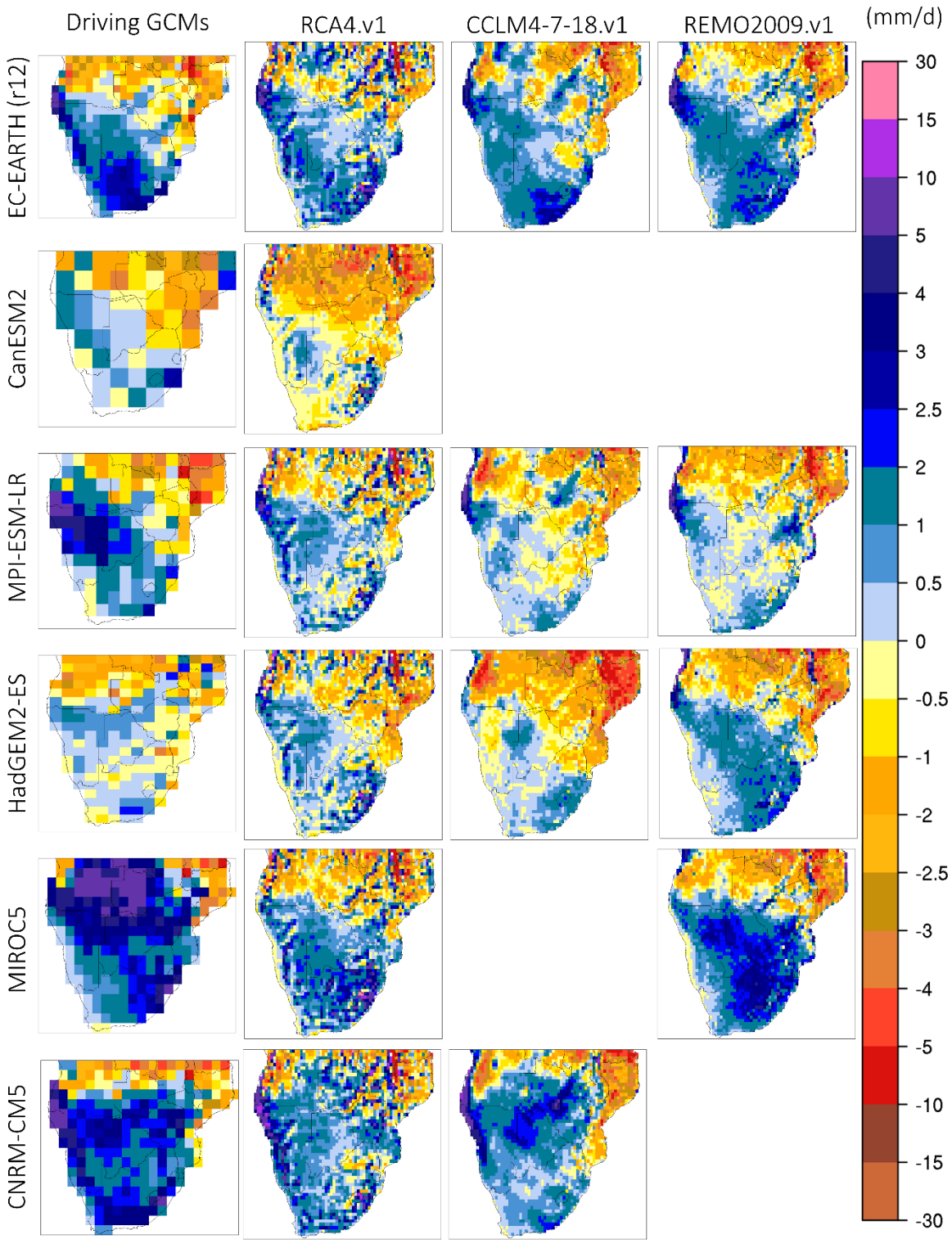

Fig. S9: Monthly precipitation bias (model – CHIRPS in mm/d) during March for the period 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

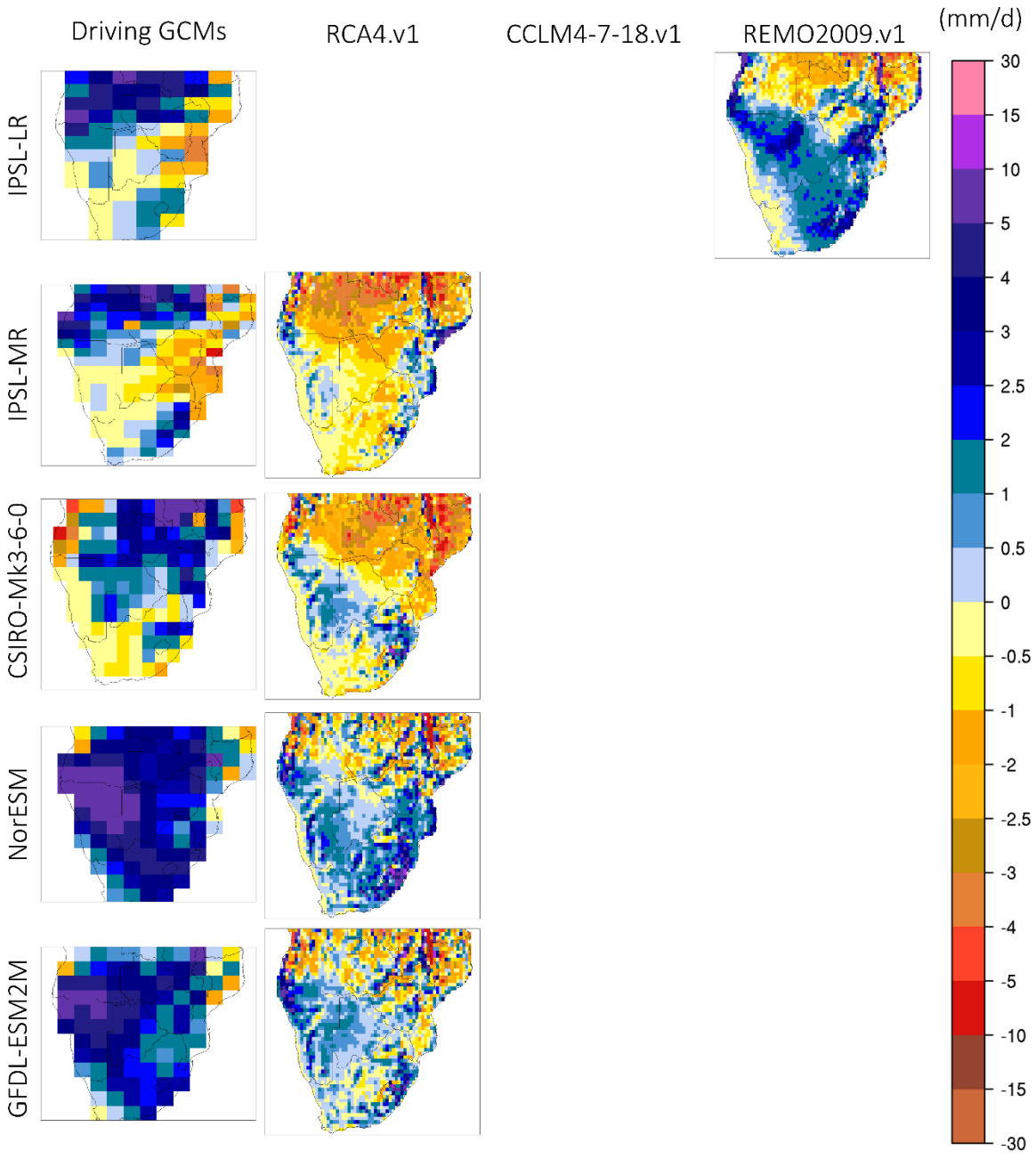

Fig. S9: Continued

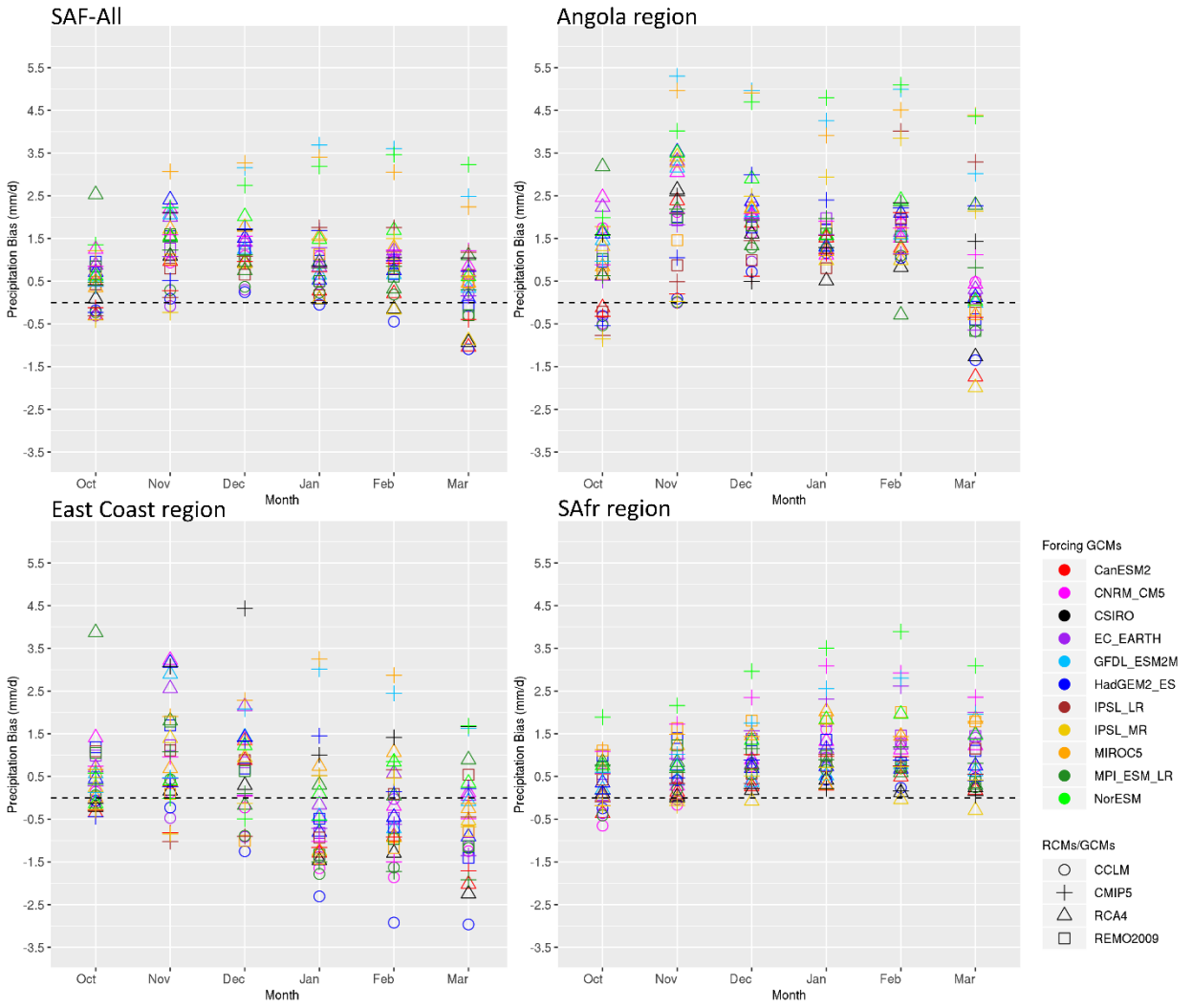

Fig. S10: Spatial average of precipitation bias (mm/d) from RCMs and their driving GCMs over southern Africa and the three sub-regions examined.

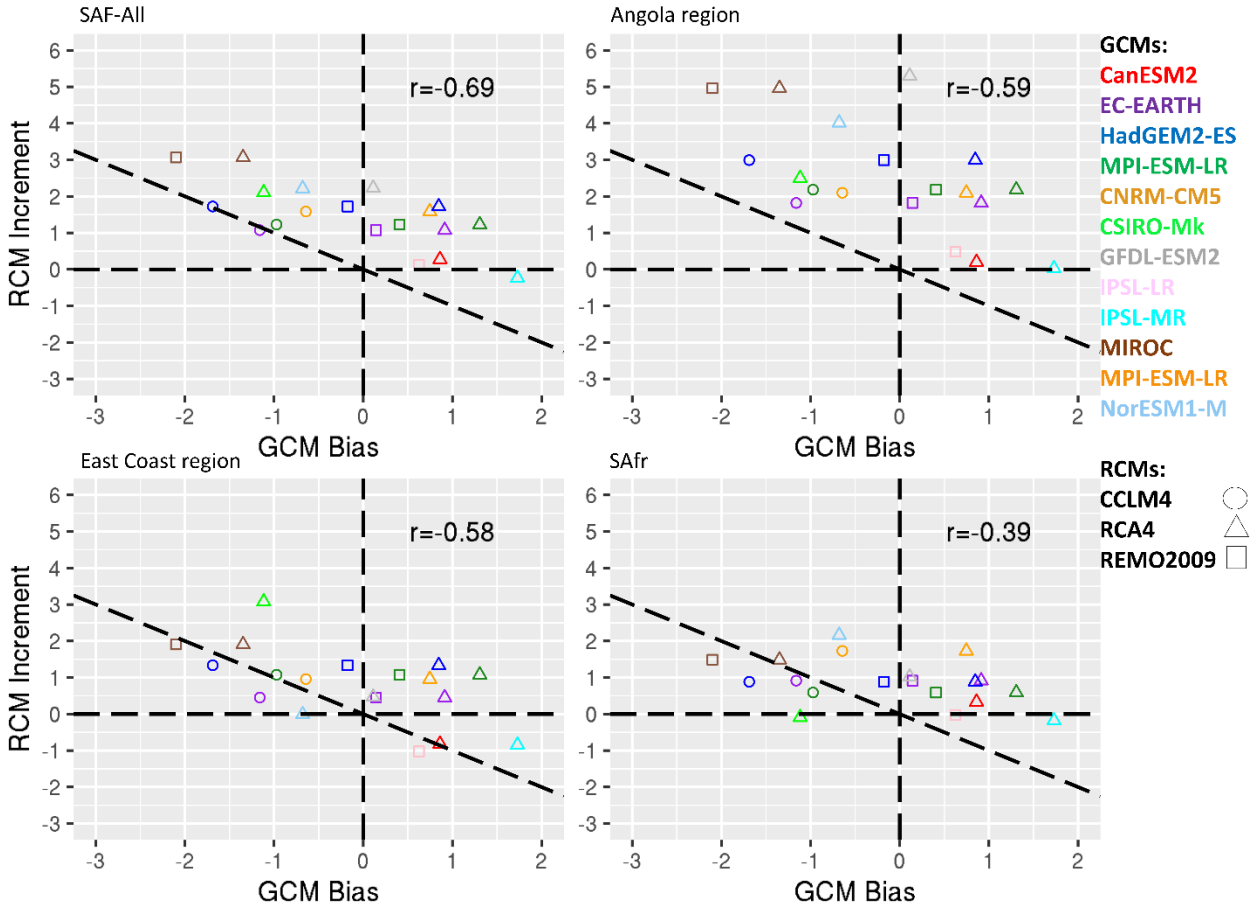

Fig. S11: Scatterplots of the RCM increment (RCM-GCM) for precipitation (mm/day) as a function of the GCM bias (GCM-OBS) for November. Colors indicate the driving GCM and shapes indicate the downscaling RCMs. The four panels indicate spatial averages over southern Africa (Region A), the Angola Low region (Region B), the Mozambique region (Region C) and South Africa region (Region D).

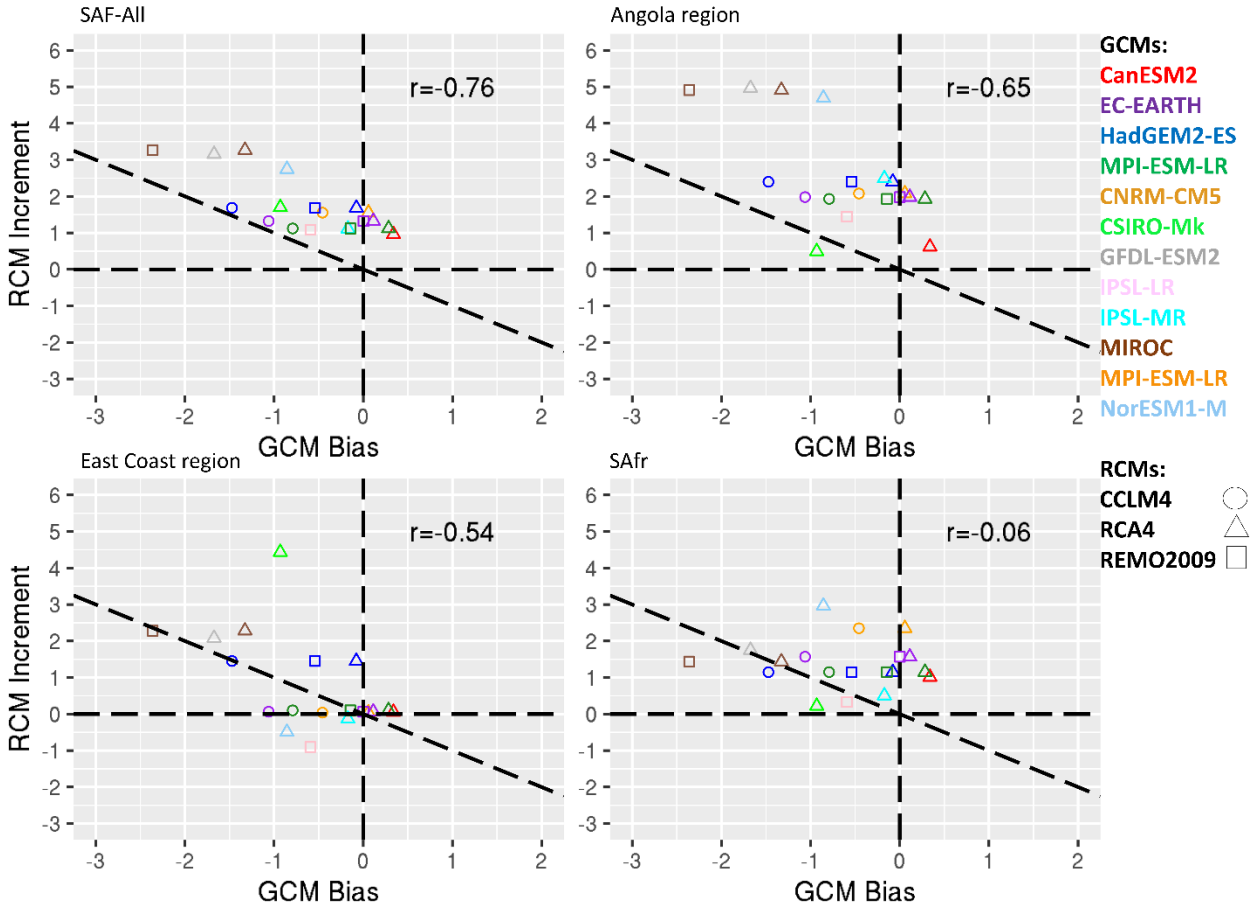

Fig. S12: Scatterplots of the RCM increment (RCM-GCM) for precipitation (mm/day) as a function of the GCM bias (GCM-OBS) for December. Colors indicate the driving GCM and shapes indicate the downscaling RCMs. The four panels indicate spatial averages over southern Africa (Region A), the Angola Low region (Region B), the Mozambique region (Region C) and South Africa region (Region D).

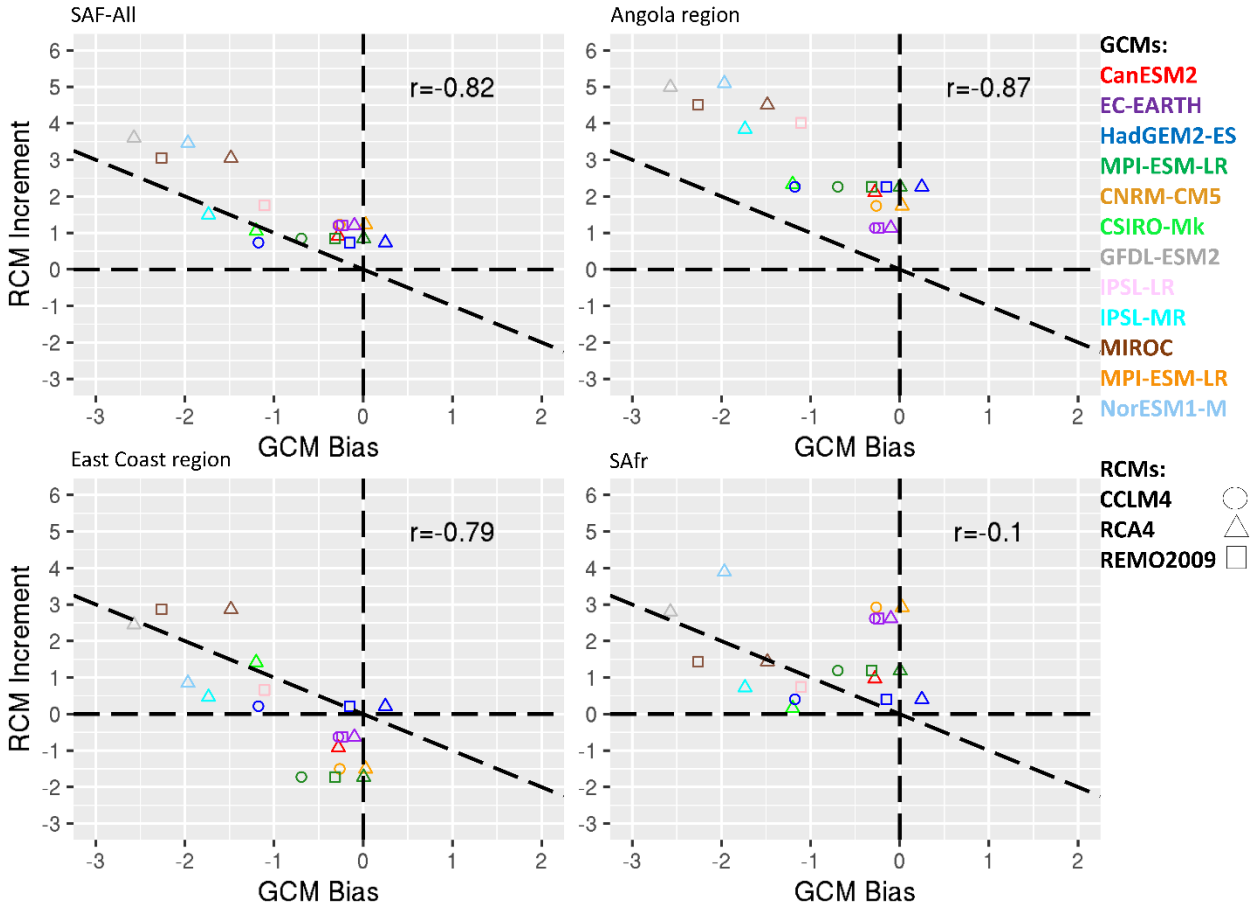

Fig. S13: Scatterplots of the RCM increment (RCM-GCM) for precipitation (mm/day) as a function of the GCM bias (GCM-OBS) for February. Colors indicate the driving GCM and shapes indicate the downscaling RCMs. The four panels indicate spatial averages over southern Africa (Region A), the Angola Low region (Region B), the Mozambique region (Region C) and South Africa region (Region D).

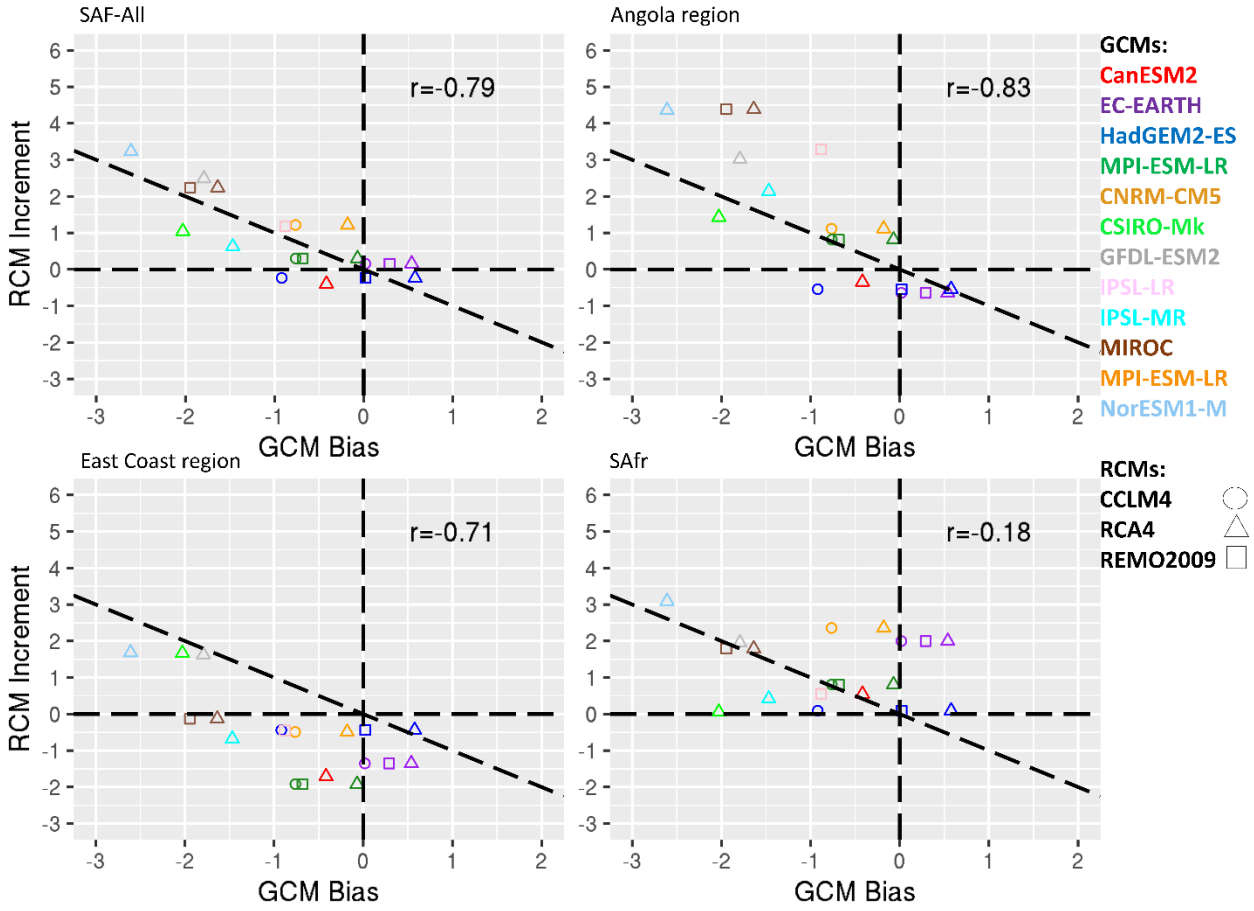

Fig. S14: Scatterplots of the RCM increment (RCM-GCM) for precipitation (mm/day) as a function of the GCM bias (GCM-OBS) for March. Colors indicate the driving GCM and shapes indicate the downscaling RCMs. The four panels indicate spatial averages over southern Africa (Region A), the Angola Low region (Region B), the Mozambique region (Region C) and South Africa region (Region D).

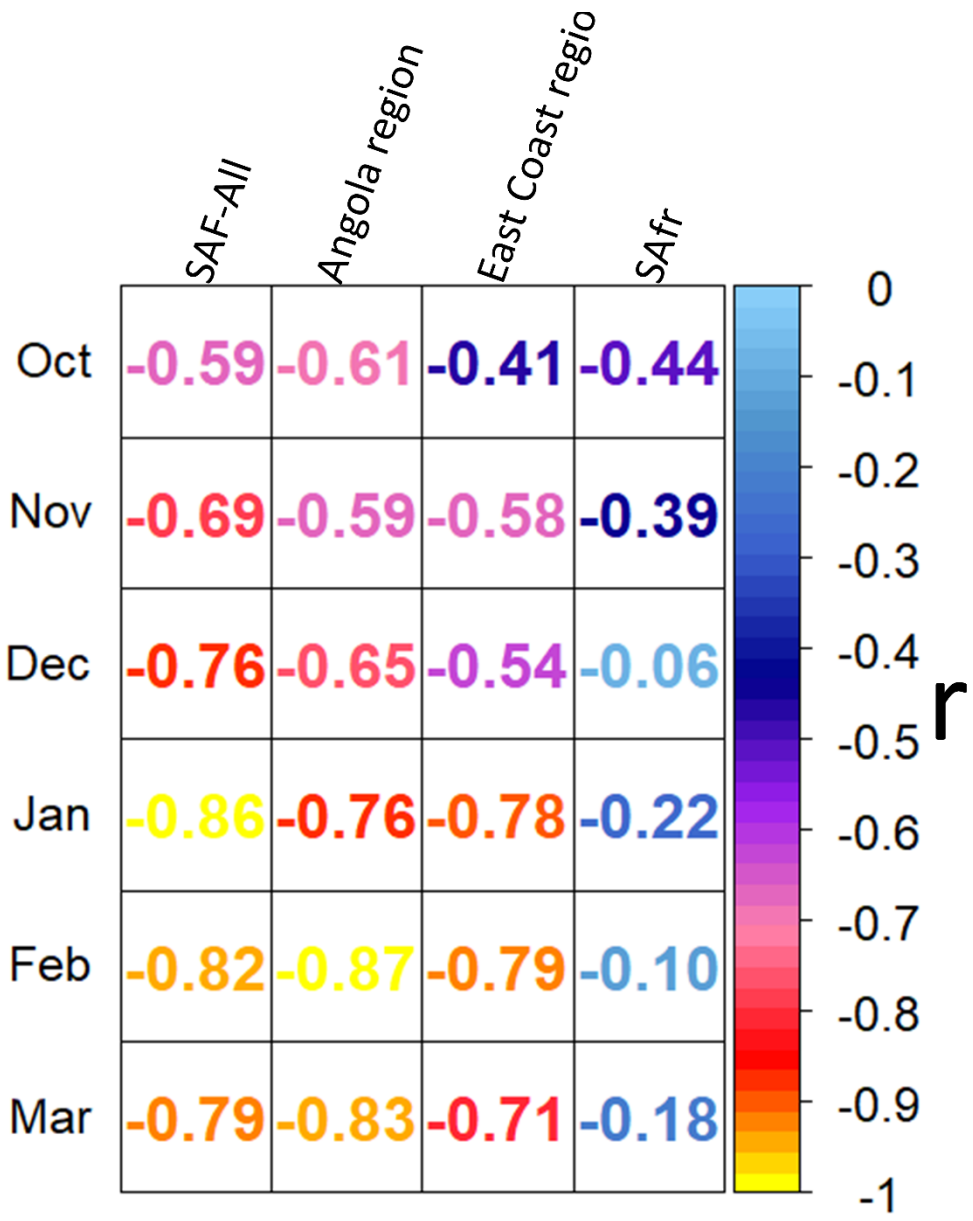

Fig. S15: Correlation coefficient of the RCM increment with the GCM bias for Region A (southern Africa), Region B (Angola low region), Region C (greater Mozambique region) and Region D (South Africa region) for each month of the rainy season (Oct-Mar).

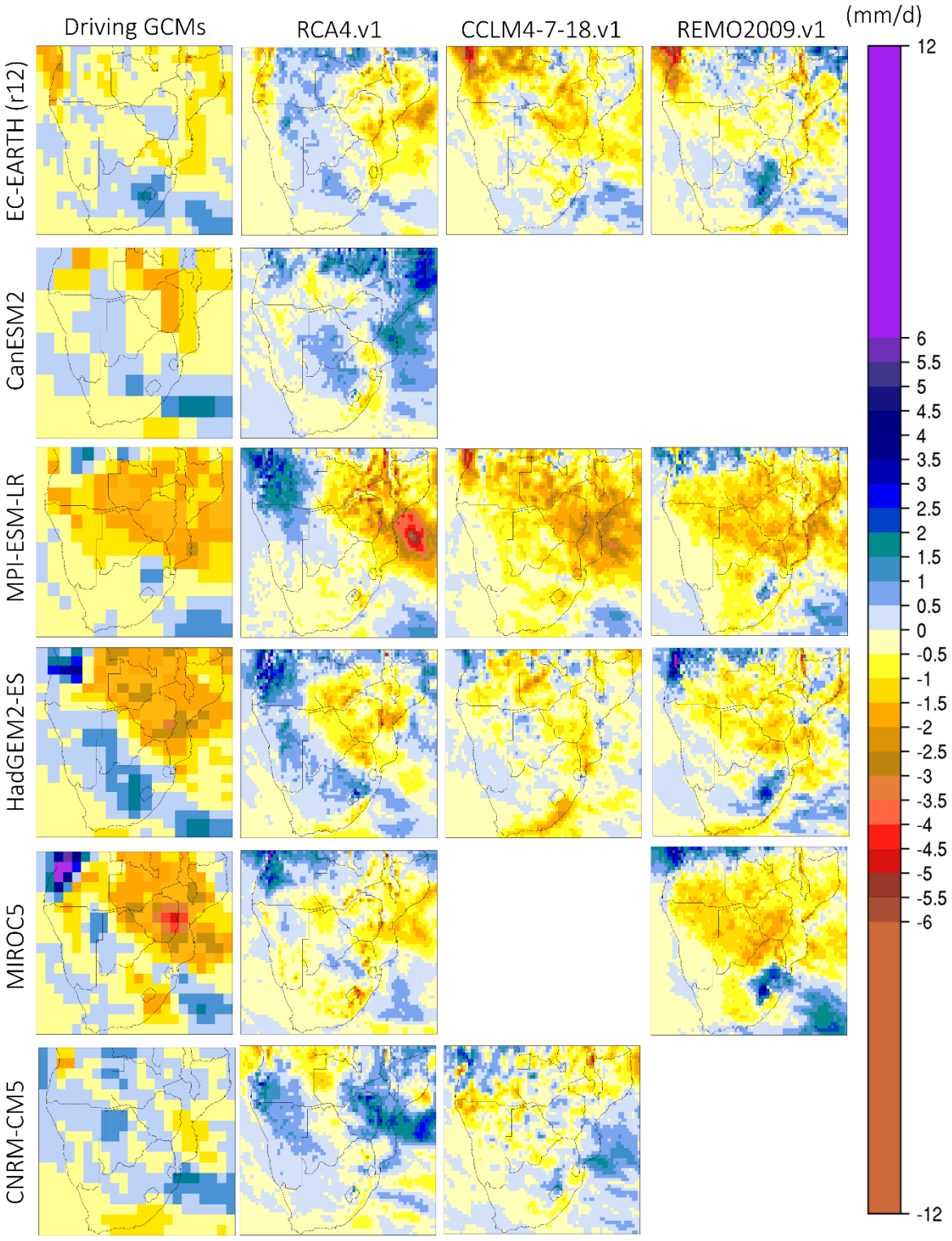

Fig. S16 Monthly precipitation change (future – present in mm/d) during November for the period 2065-2095 relative to 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

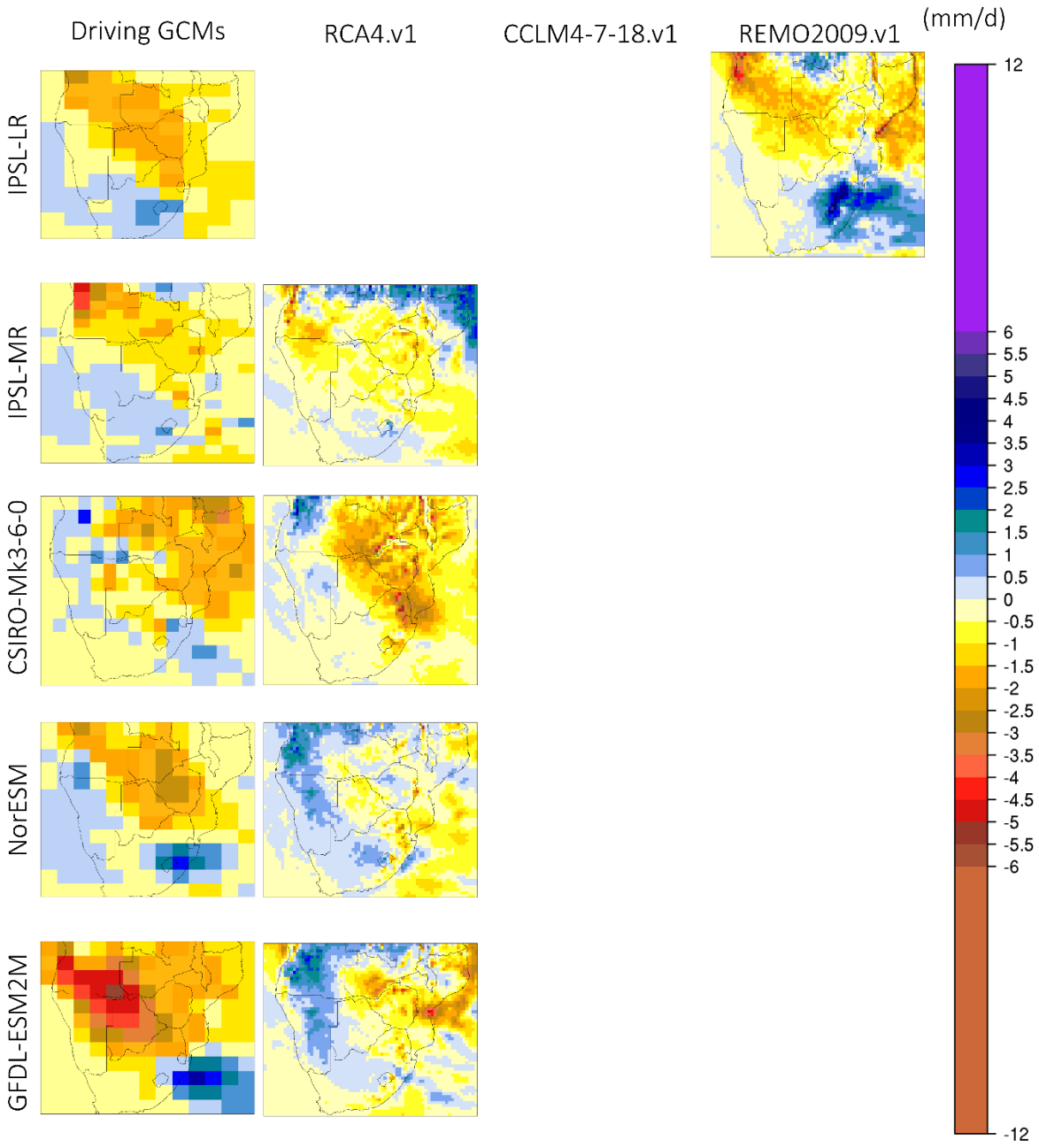

Fig. S16: Continued

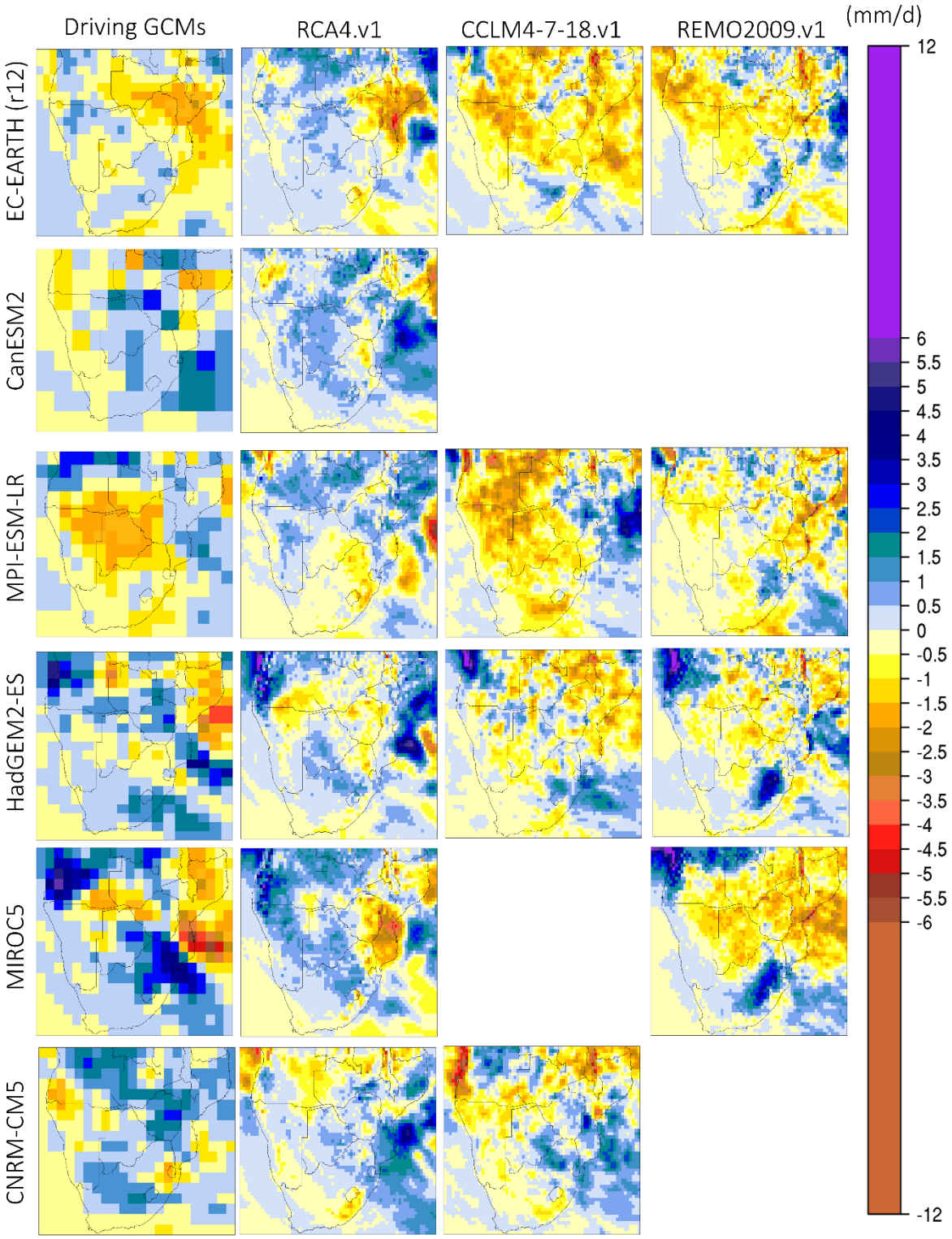

Fig. S17 Monthly precipitation change (future – present in mm/d) during December for the period 2065-2095 relative to 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

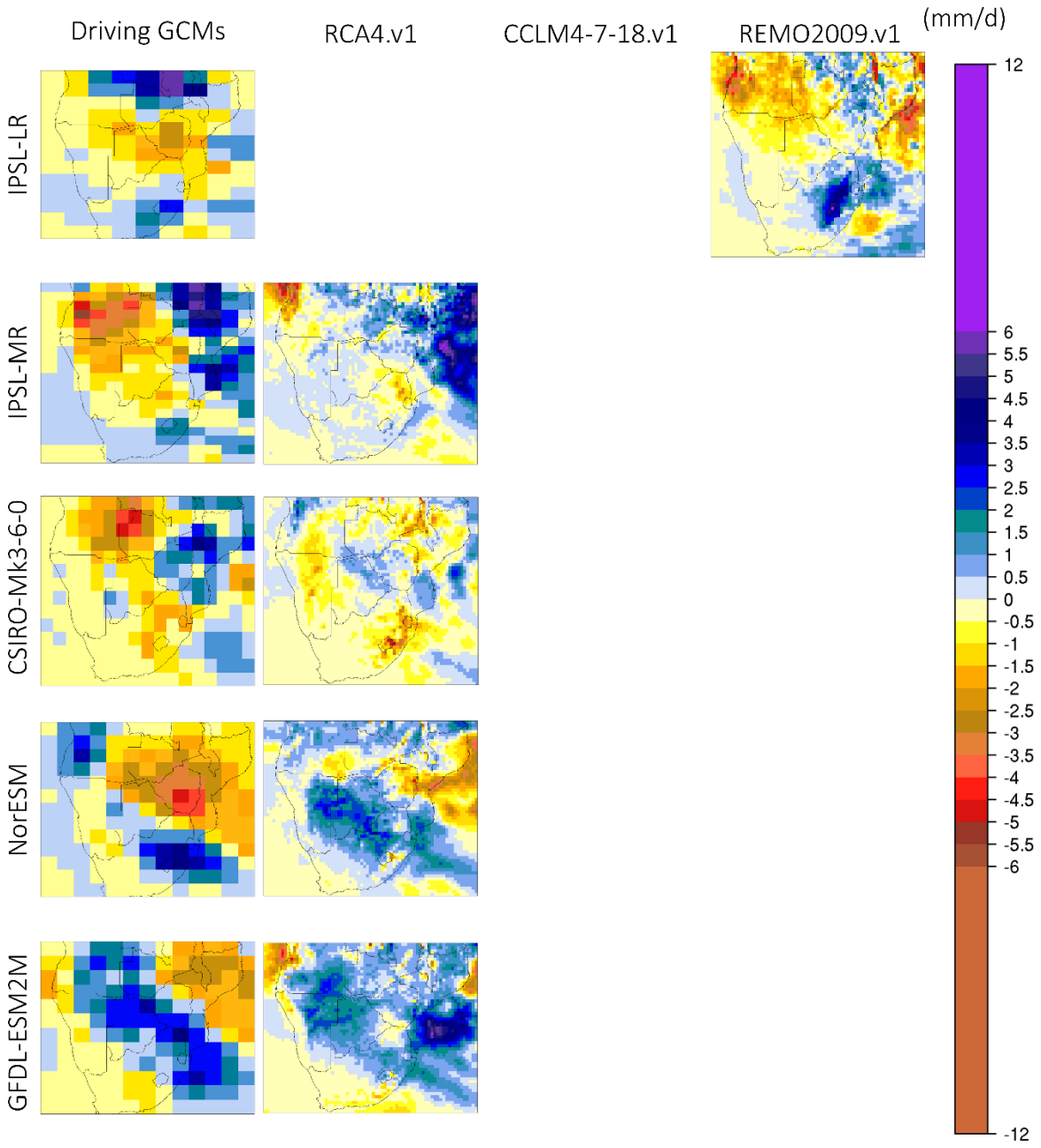

Fig. S17: Continued

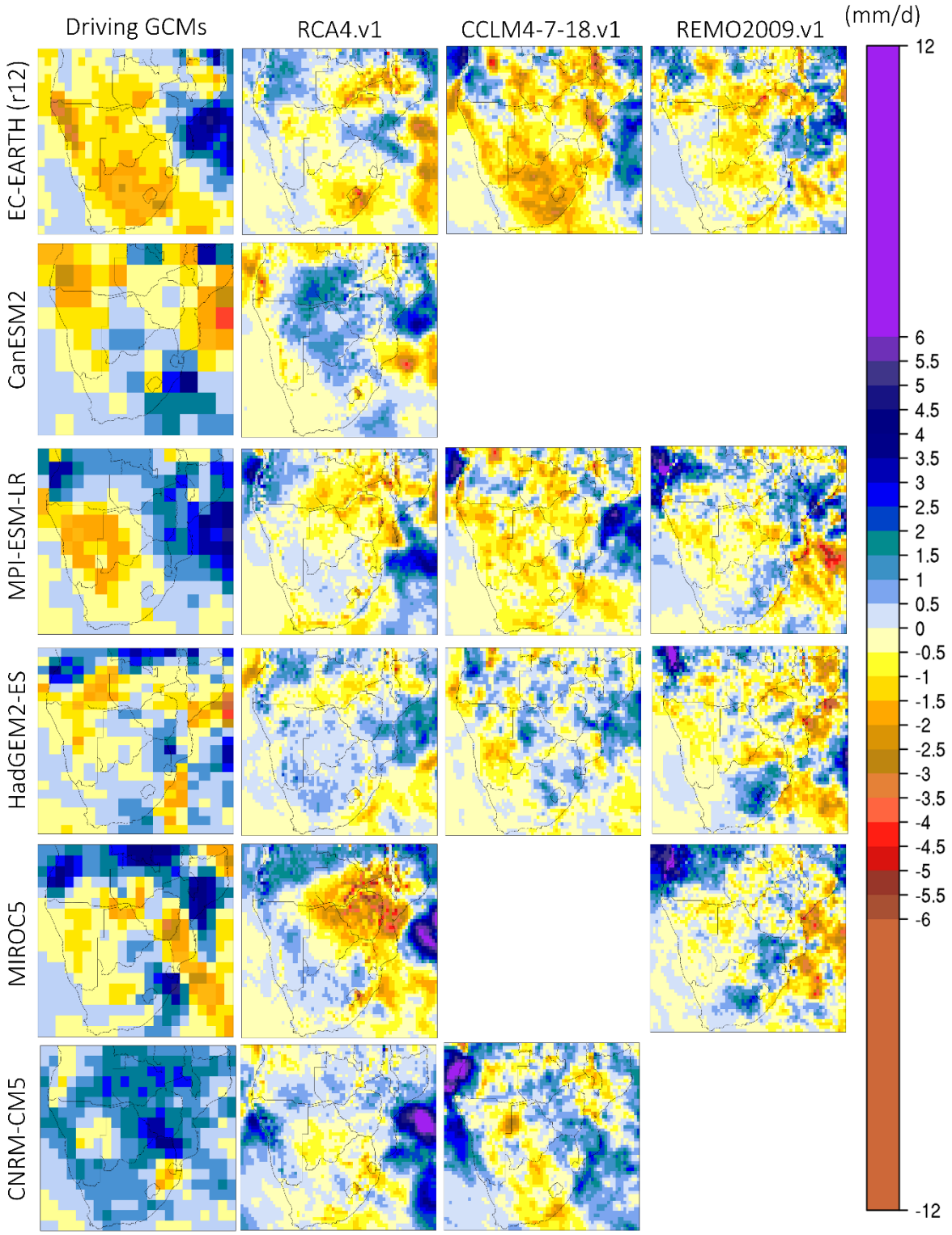

Fig. S18 Monthly precipitation change (future – present in mm/d) during February for the period 2065-2095 relative to 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

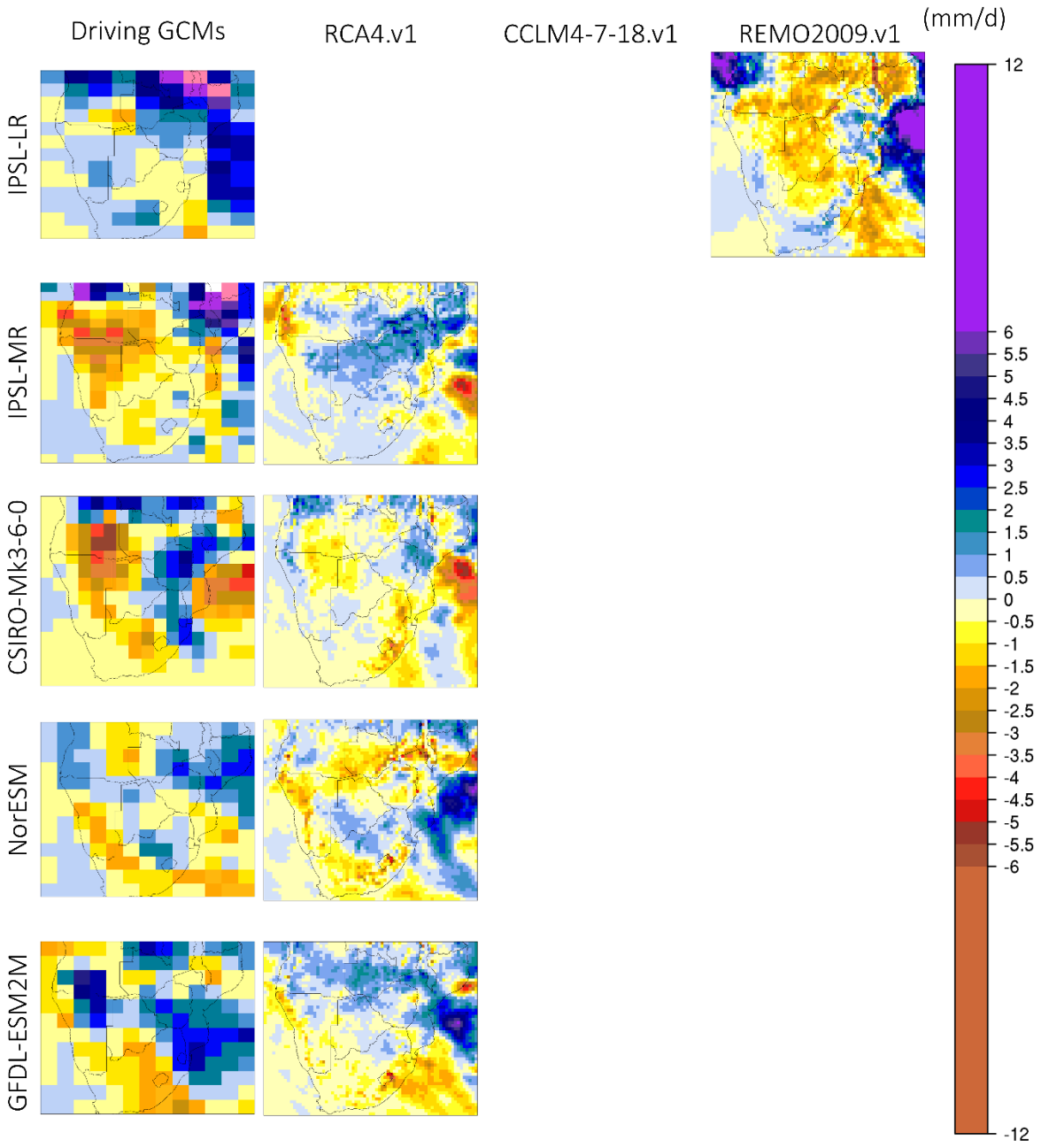

Fig. S18: Continued

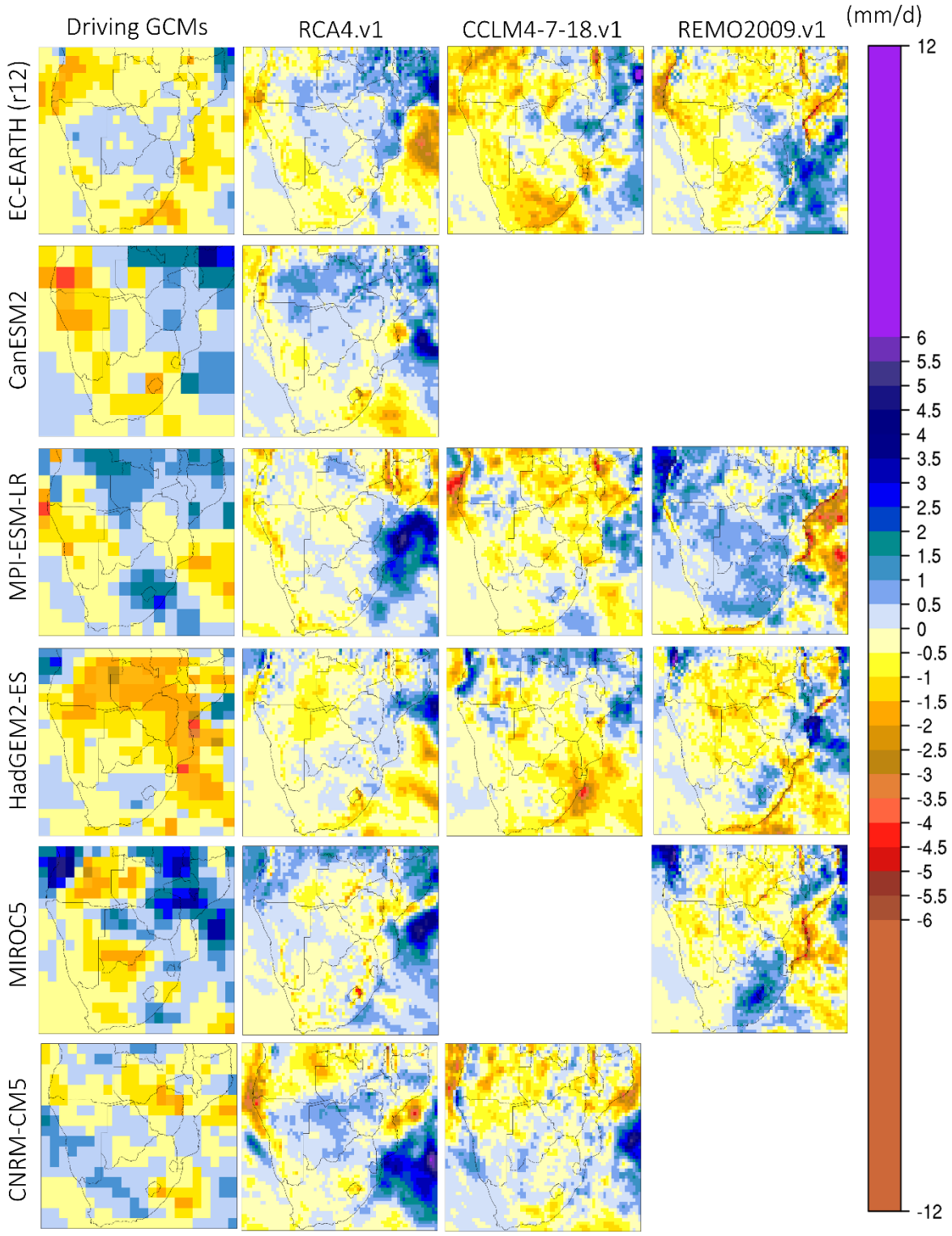

Fig. S19 Monthly precipitation change (future – present in mm/d) during March for the period 2065-2095 relative to 1985-2005. Fist column (from the left) displays the driving GCMs used and columns 2-4 display the downscaled products according to RCA4.v1, CCLM4-8-17.v1 and REMO2009.v1

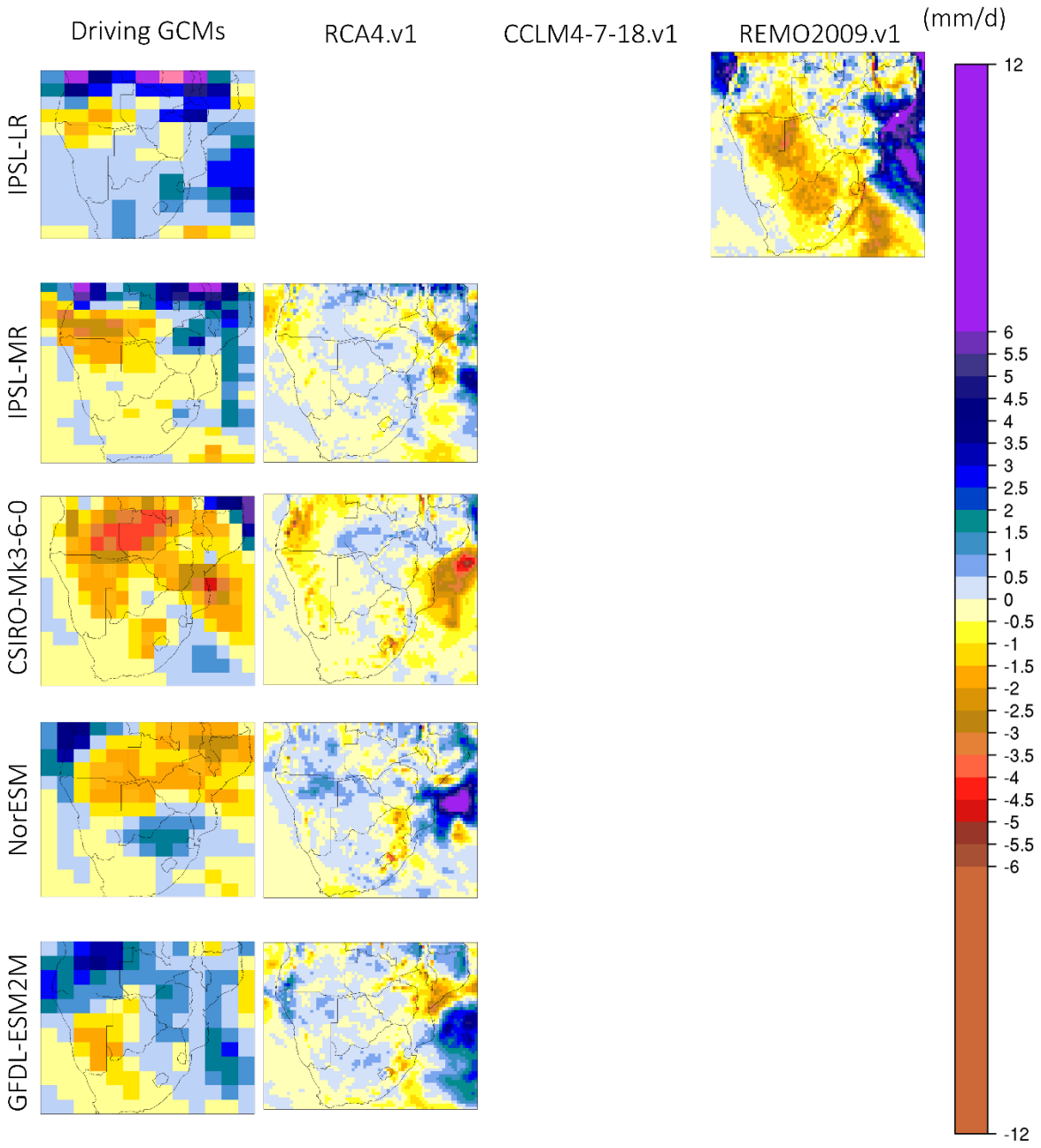

Fig. S19: Continued