

supplementary information

Evaluation of Atmospheric moisture transport to the Tibetan Plateau from 33

CMIP6 models

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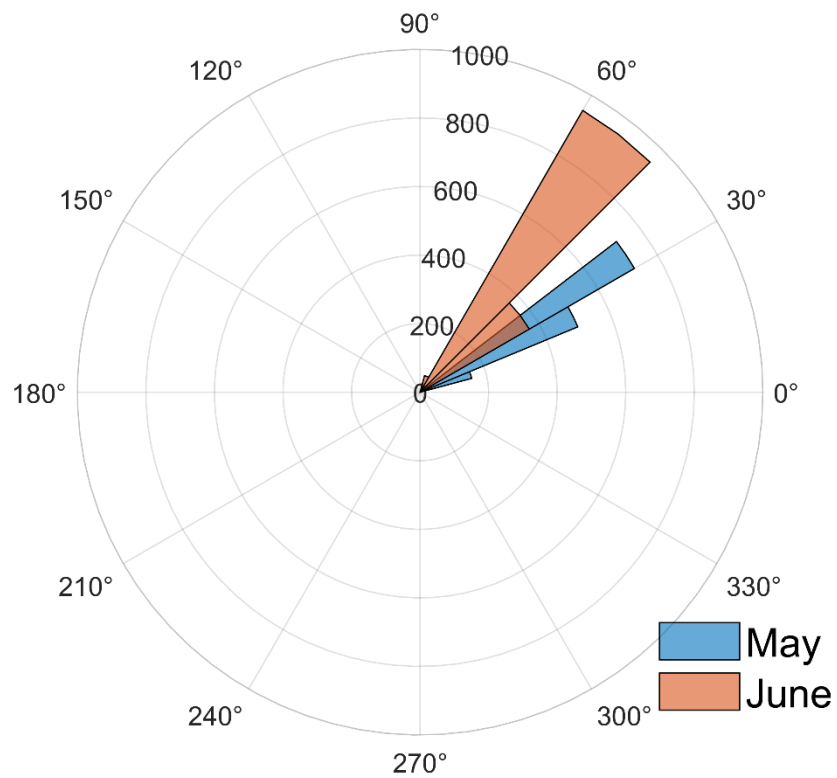
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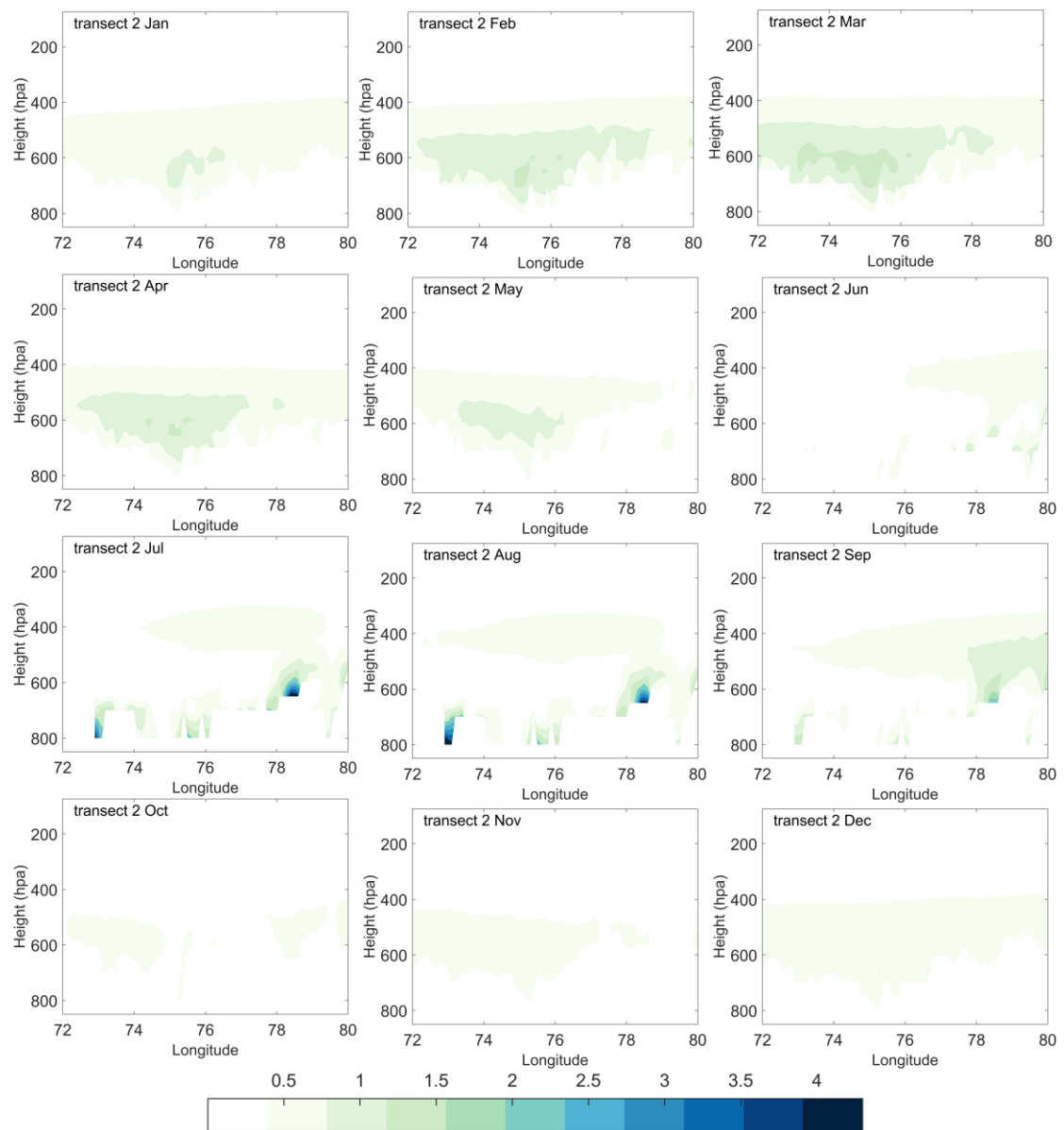
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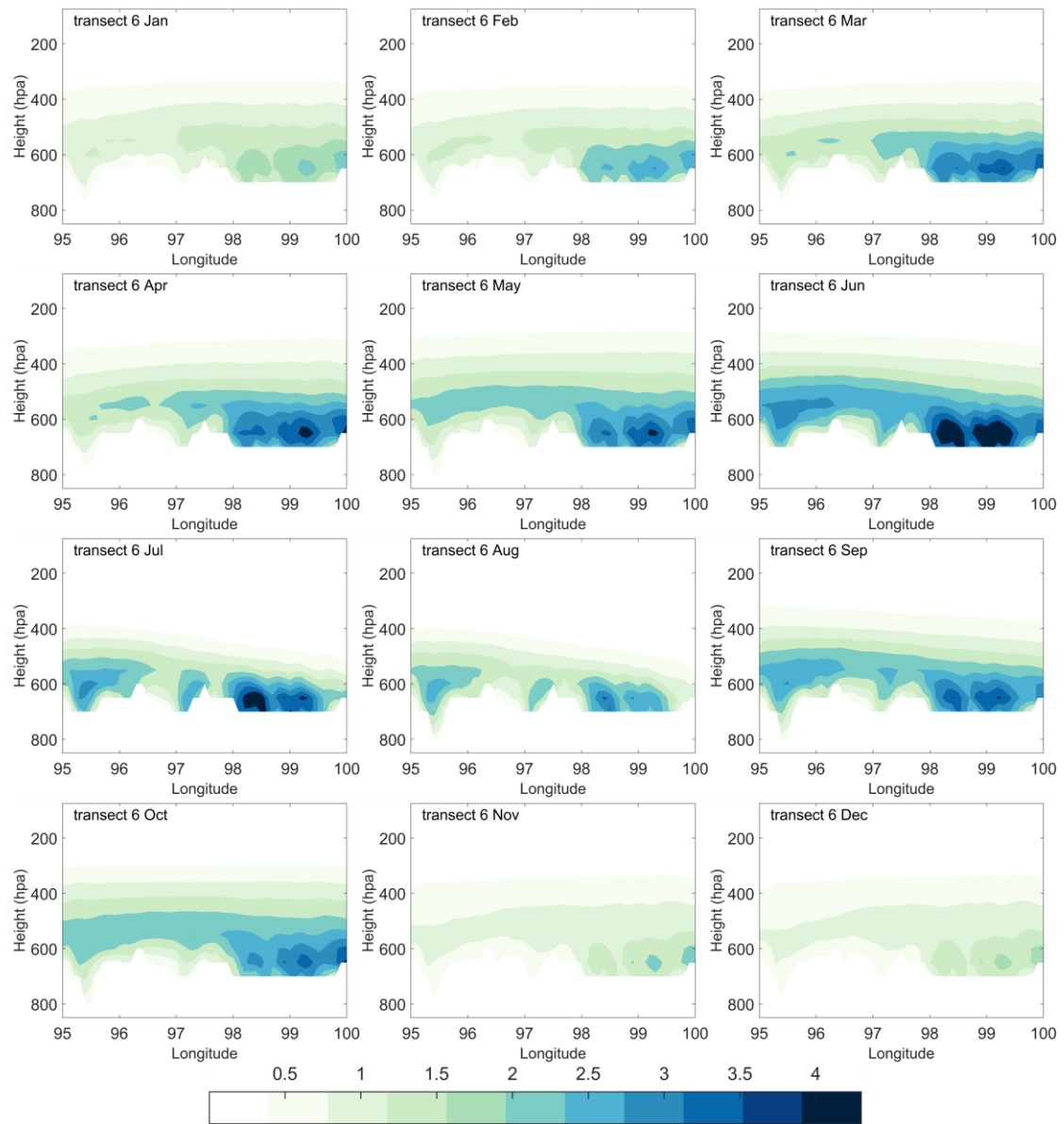
Supplementary Figures



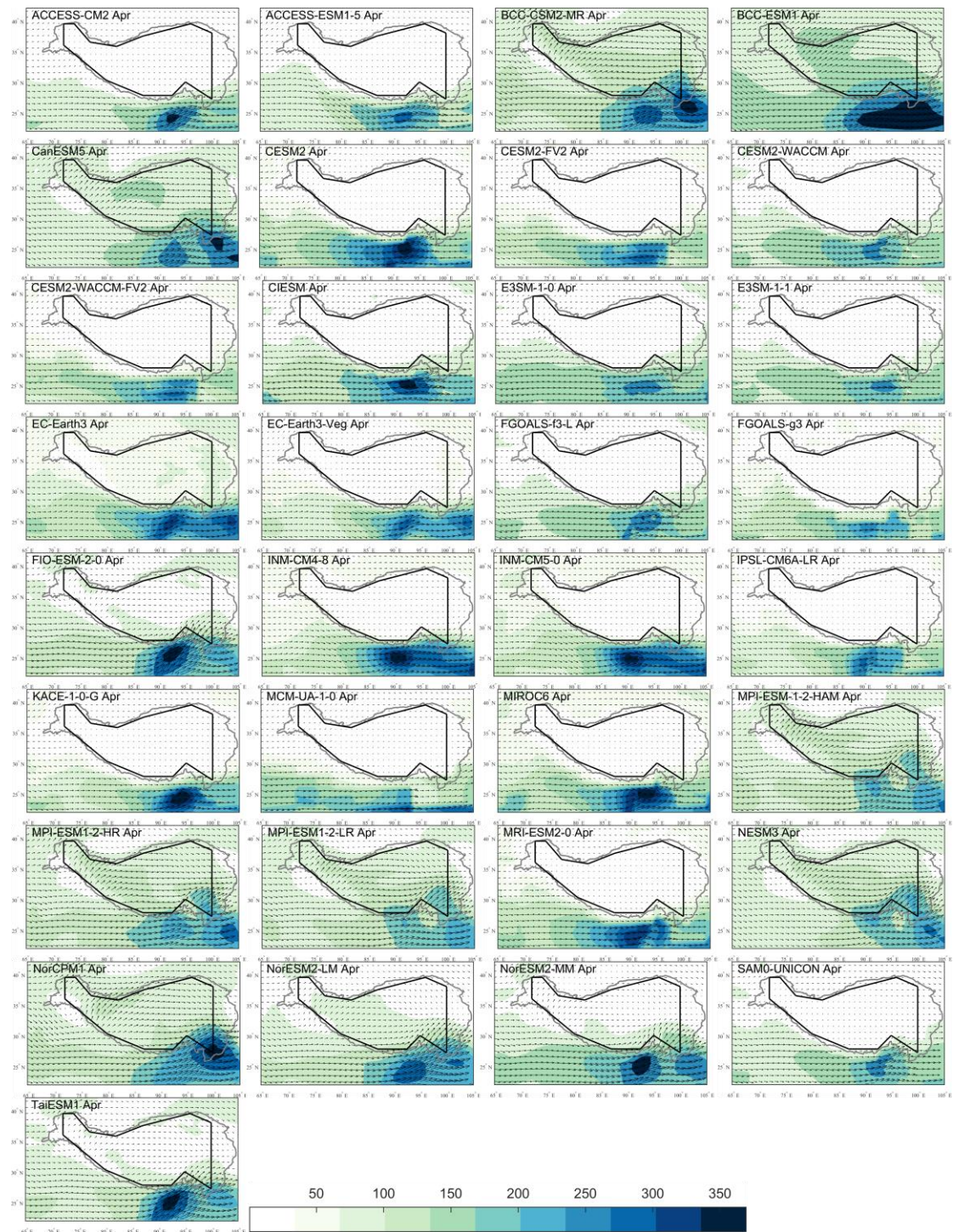
Supplementary Fig. 1: Distribution of the directions of atmospheric moisture transport toward Yarlung Tsangpo Grand Canyon from May to June by Har V2.
Direction toward the positive X-axis is set to 0 degree.



Supplementary Fig. 2: Inflow profiles [$10^{-2} \cdot \text{kg} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$] on transect 2 from January to December.

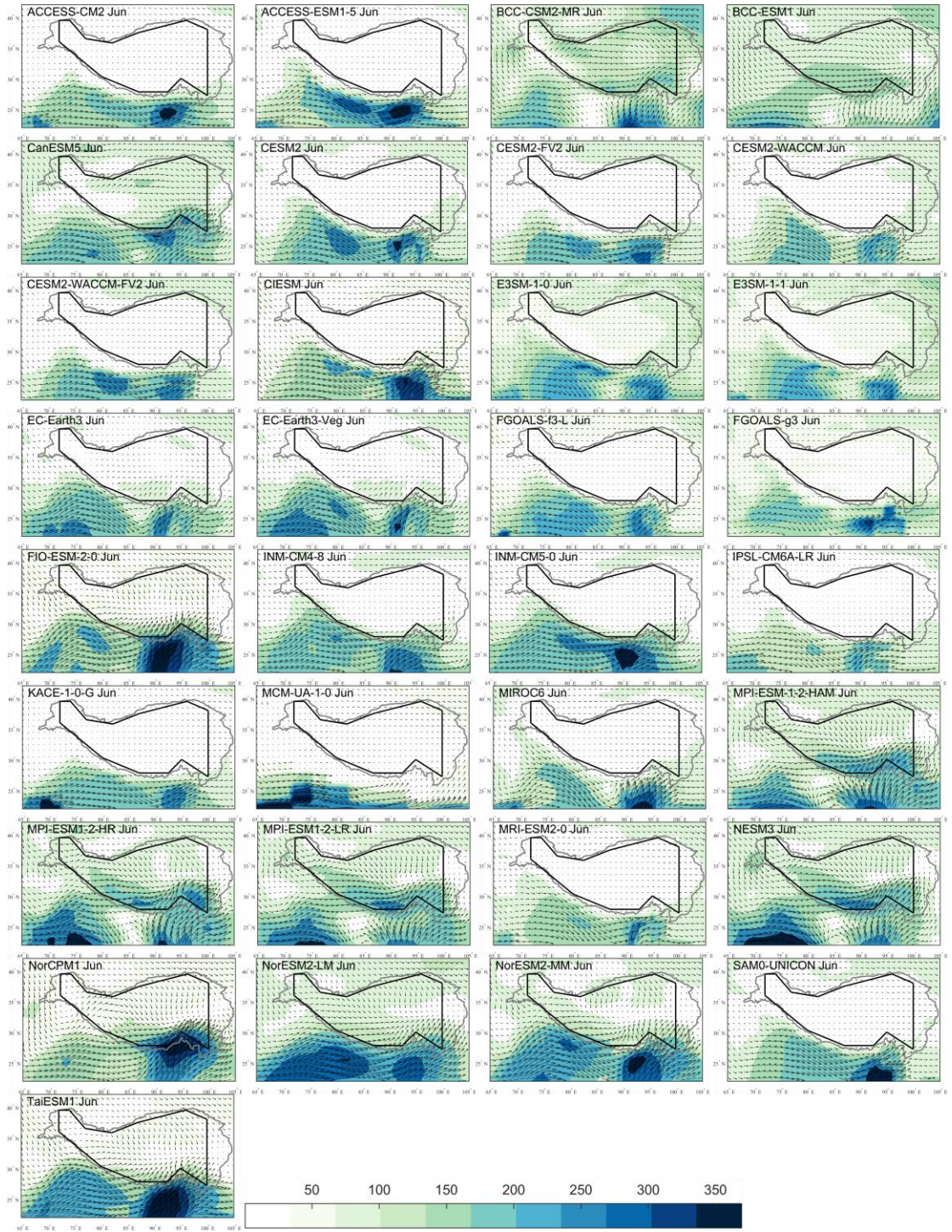


Supplementary Fig. 3: Inflow profiles [$10^{-2} \cdot \text{kg} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$] on transect 6 from January to December.



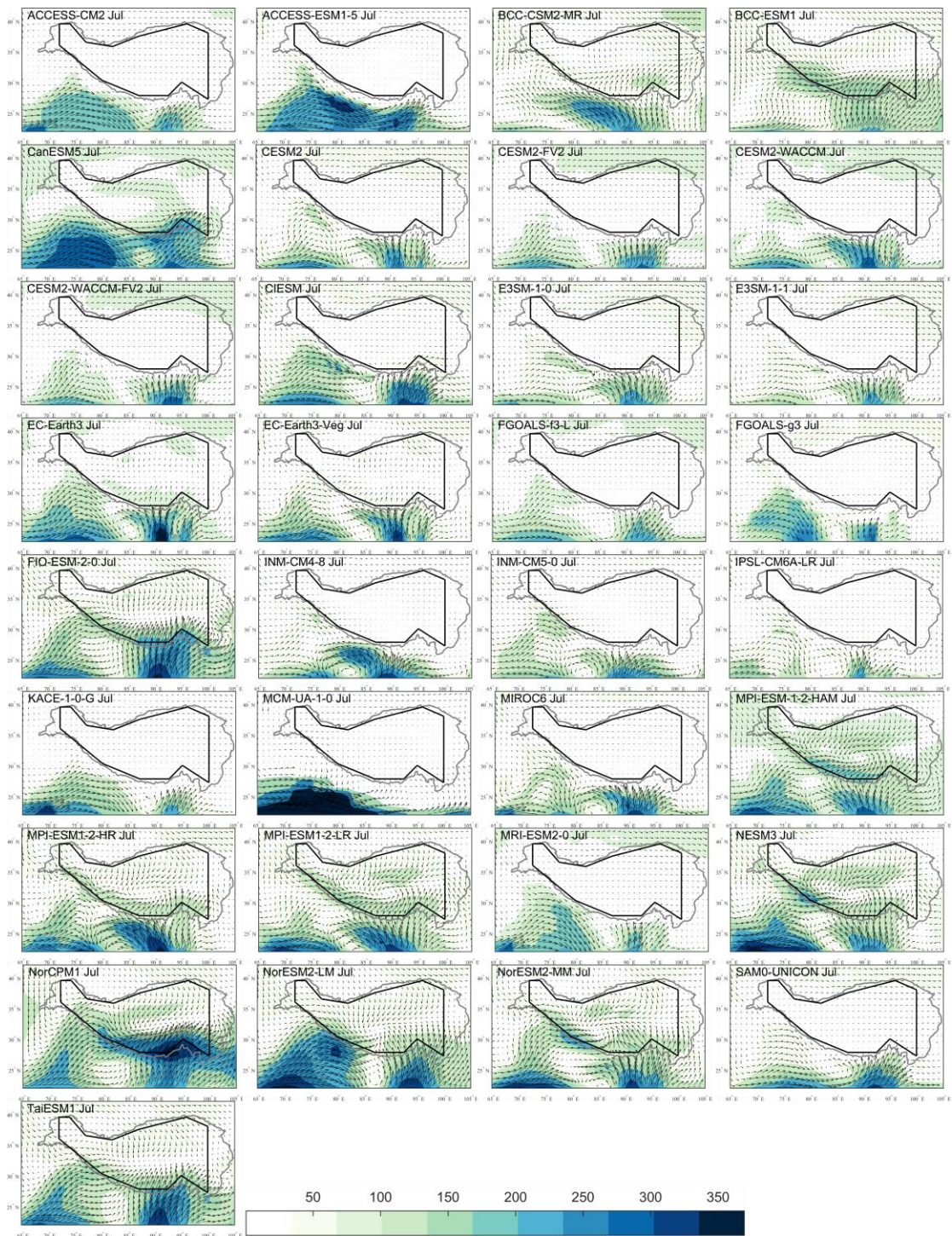
Supplementary Fig. 4: Multi-year average (1985-2014) of monthly atmospheric moisture transport in April from 33 CMIP6 models [$\text{kg} \cdot \text{m}^{-1} \cdot \text{s}^{-1}$] (colors).

Arrows denote transport direction while black lines show the location of the 13 transects, grey line polygon represents the TP border.



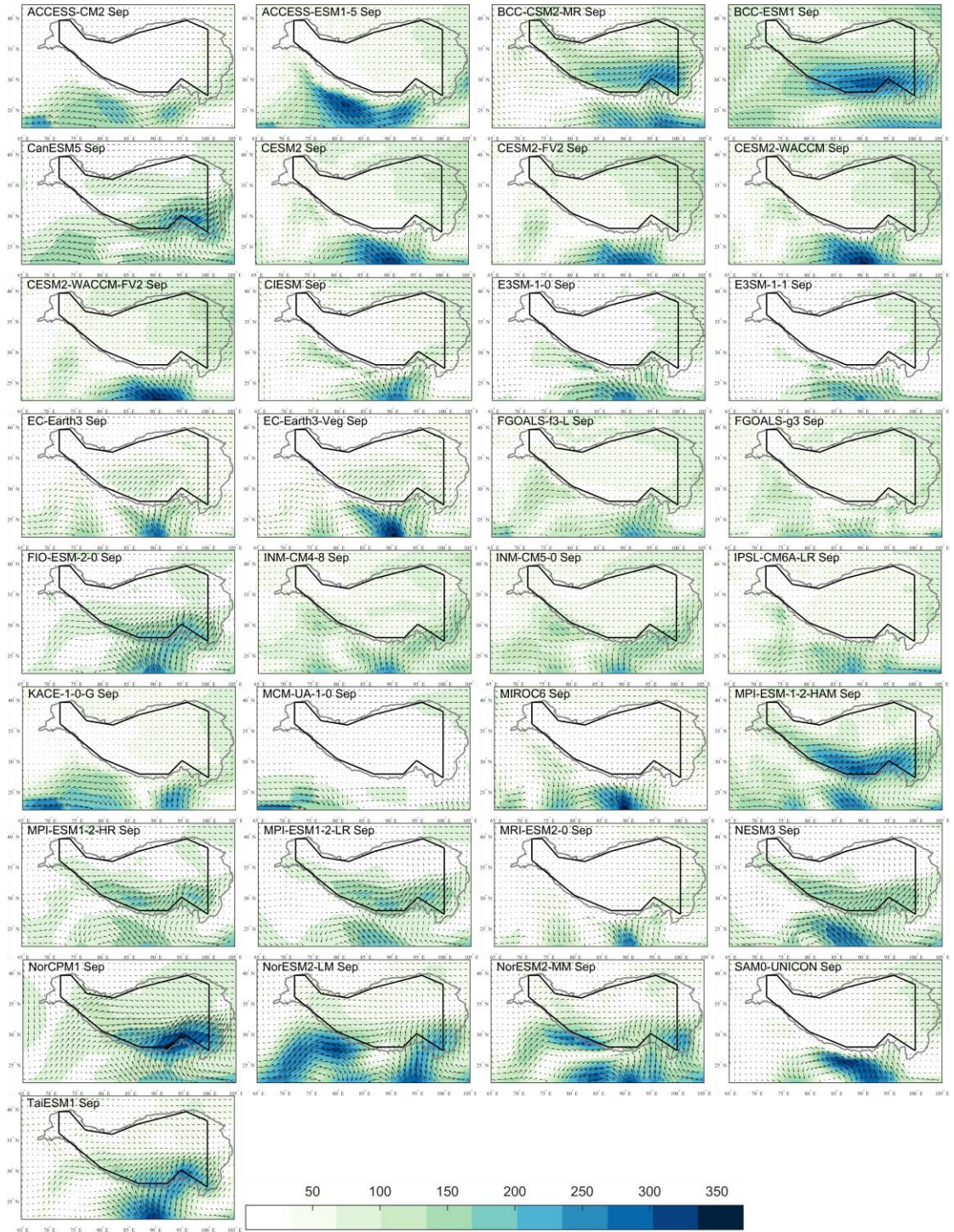
Supplementary Fig. 5: Multi-year average (1985-2014) of monthly atmospheric moisture transport in June from 33 CMIP6 models [$\text{kg} \cdot \text{m}^{-1} \cdot \text{s}^{-1}$] (colors).

Arrows denote transport direction while black lines show the location of the 13 transects, grey line polygon represents the TP border.

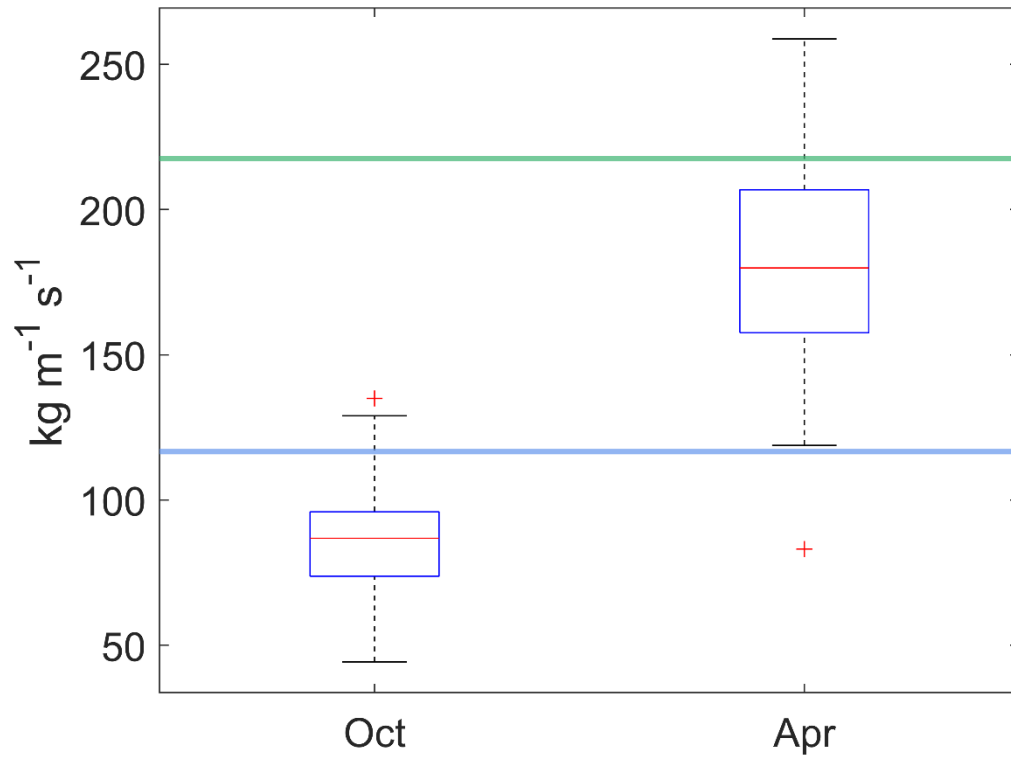


Supplementary Fig. 6: Multi-year average (1985-2014) of monthly atmospheric moisture transport in July from 33 CMIP6 models [$\text{kg} \cdot \text{m}^{-1} \cdot \text{s}^{-1}$] (colors).

Arrows denote transport direction while black lines show the location of the 13 transects, grey line polygon represents the TP border.



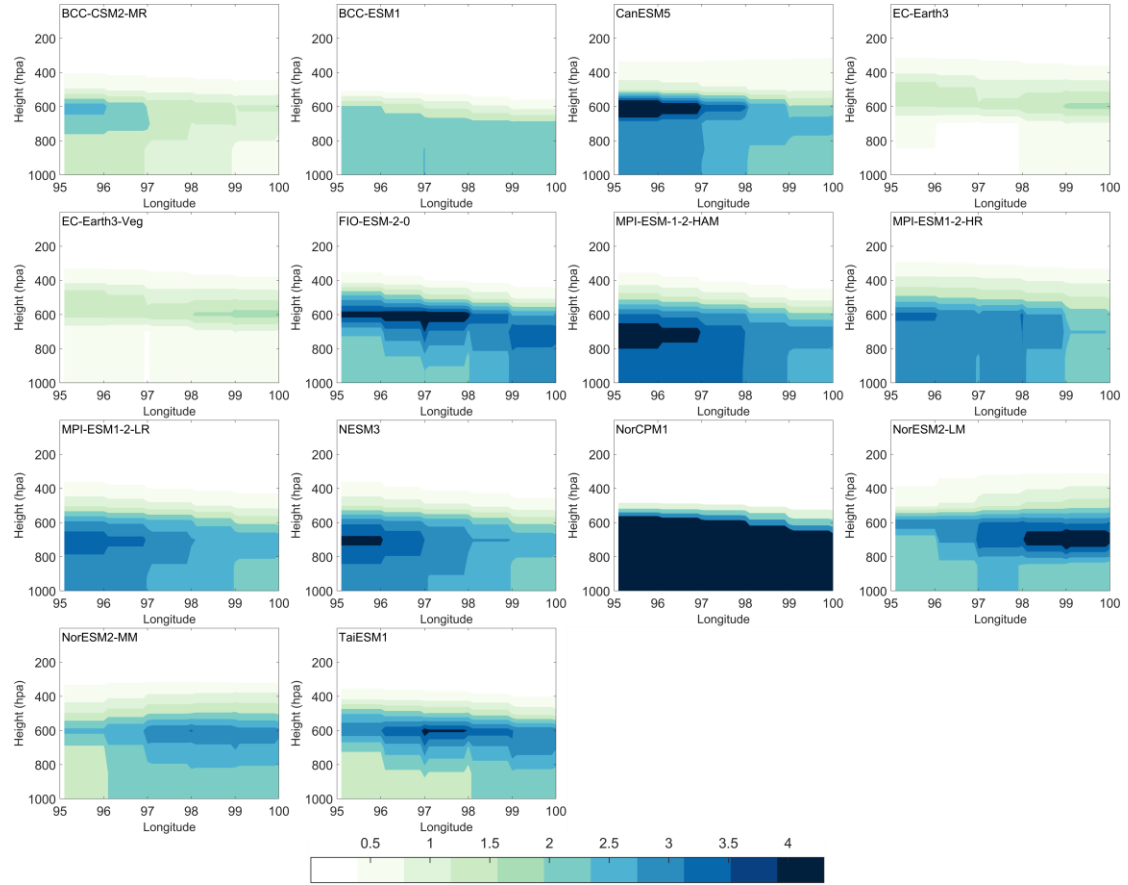
Supplementary Fig. 7: Multi-year average (1985-2014) of monthly atmospheric moisture transport in September from 33 CMIP6 models [$\text{kg} \cdot \text{m}^{-1} \cdot \text{s}^{-1}$] (colors). Arrows denote transport direction while black lines show the location of the 13 transects, grey line polygon represents the TP border.



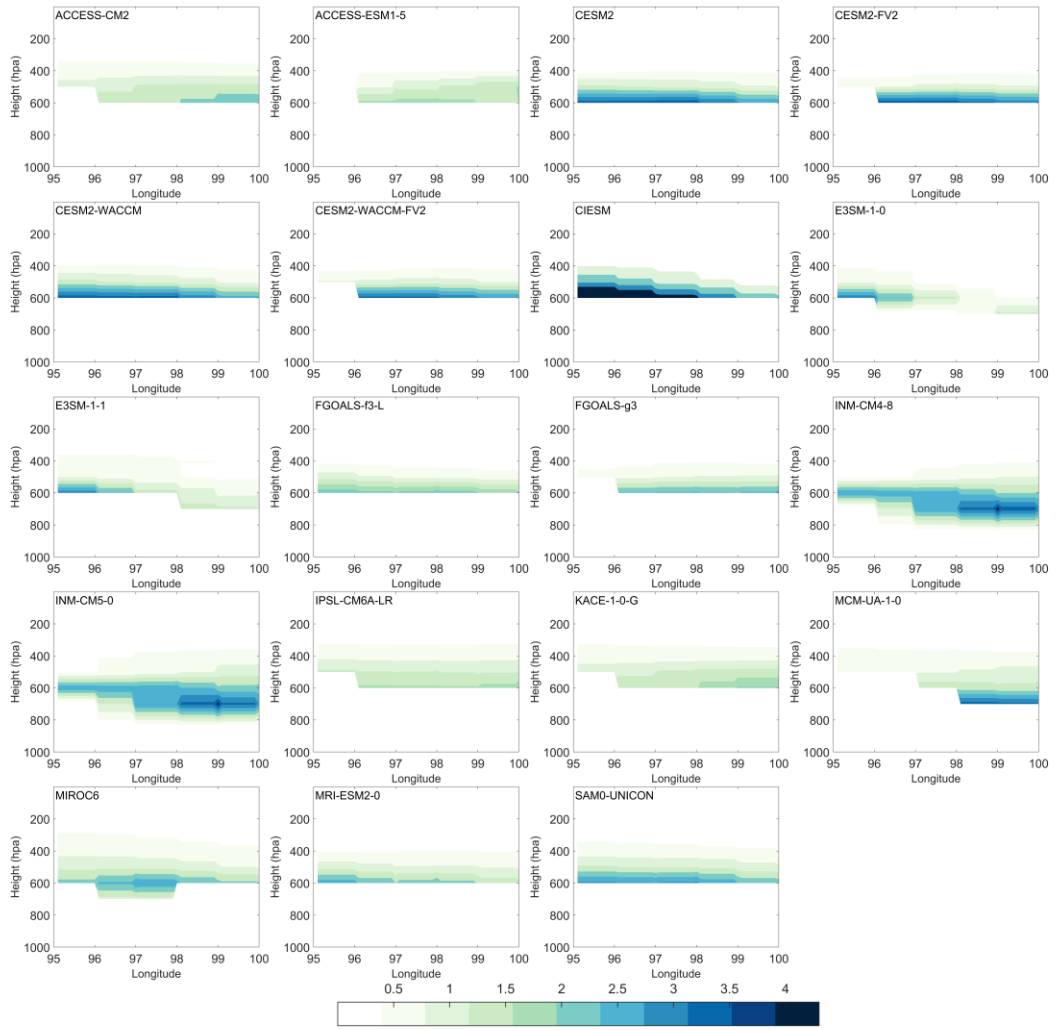
Supplementary Fig. 8: Simulated atmospheric moisture carried by the southern branch when arriving Yarlung Tsangpo Grand Canyon in October and April, present from 33 CMIP6 models. Blue line represents the value in October from HAR v2 and green line represents value in April from HAR v2.



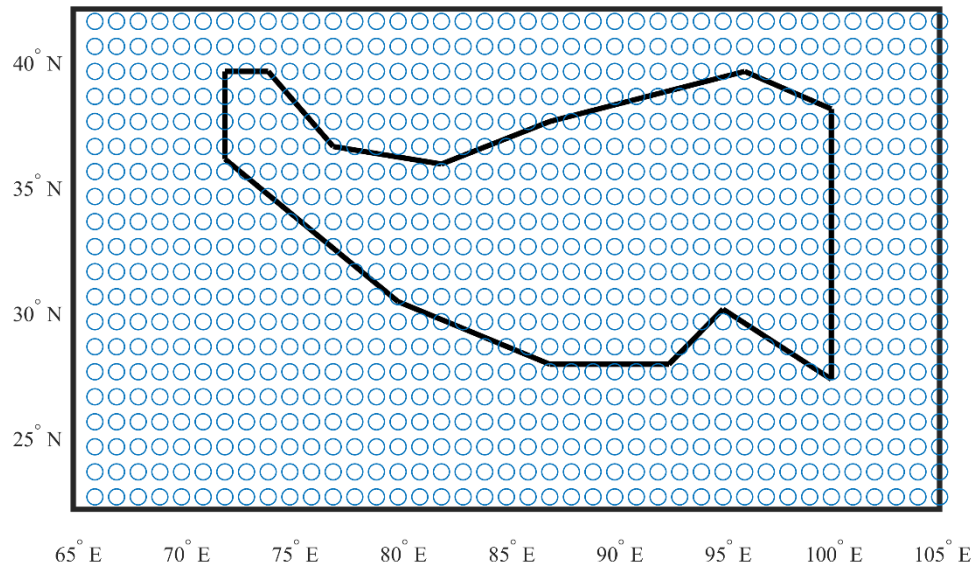
Supplementary Fig. 9: Distribution of the directions of atmospheric moisture transport arriving Yarlung Tsangpo Grand Canyon from May to June by 33 CMIP6 models.



Supplementary Fig. 10: Simulated inflow profiles [$10^{-2} \cdot \text{kg} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$] on transect 6 in June, produced by models that do not accurately account for the terrain blocking on atmospheric moisture transport.



Supplementary Fig. 11: Simulated inflow profiles [$10^{-2} \cdot \text{kg} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$] on transect 6 in June, produced by models that account for the terrain blocking on atmospheric moisture transport.



Supplementary Fig. 12: Distribution of the 13 transects in model grid cells. black lines show the location of the 13 transects. Blue transparent dots are the model grid cells.