Supplement of

Unravelling Disparities in Eulerian and Lagrangian Moisture Tracking Models in Monsoon- and Westerlies-dominated Basins Around the Tibetan Plateau

5 Ying Li et al.

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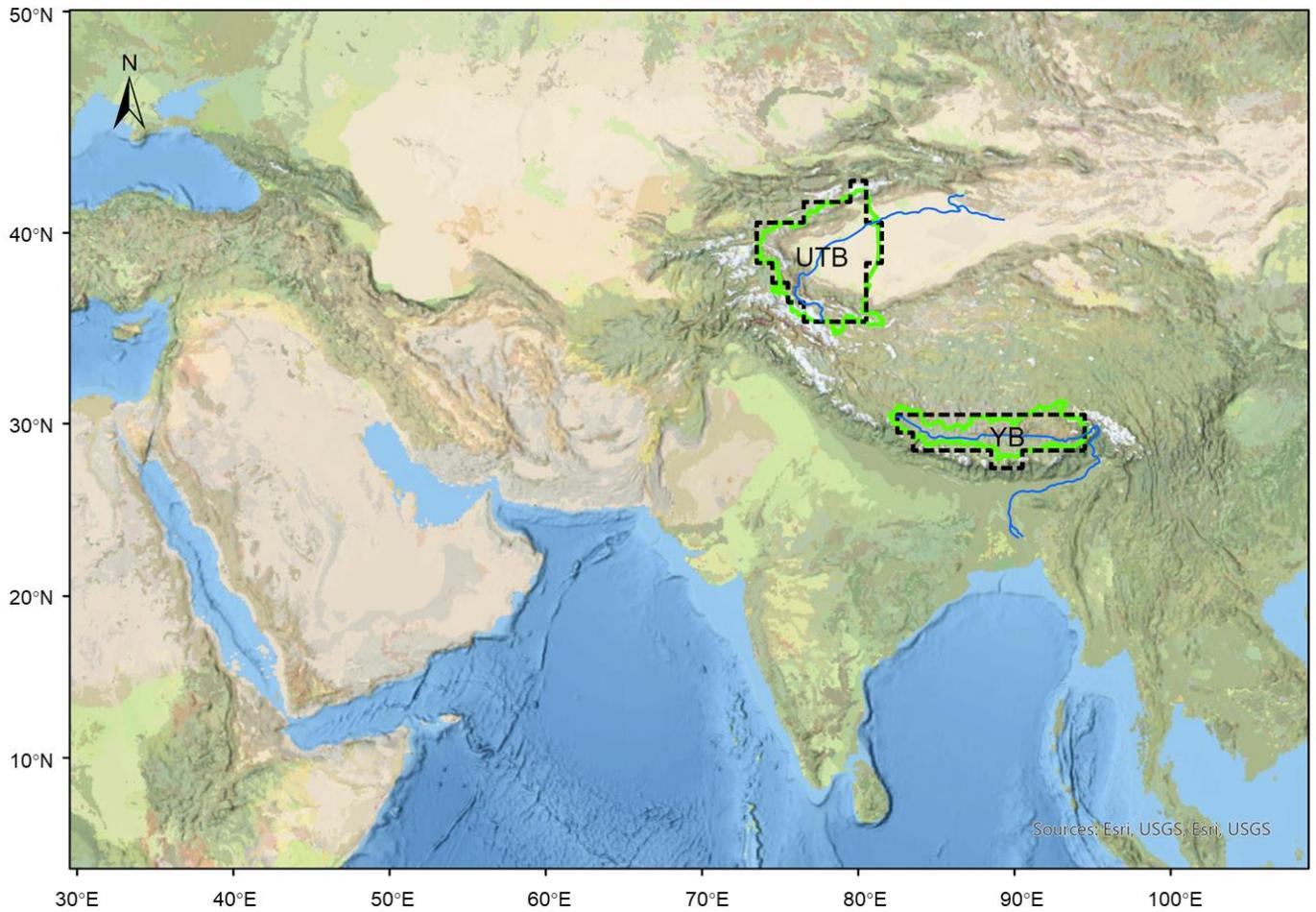
Figure S1. Topography of the Yarlung Zangbo River Basin (YB) and the upper Tarim River Basin (UTB). Cyan solid lines represent the actual watershed boundaries. Dotted black lines depict the computational boundaries. Blue lines represent the rivers.
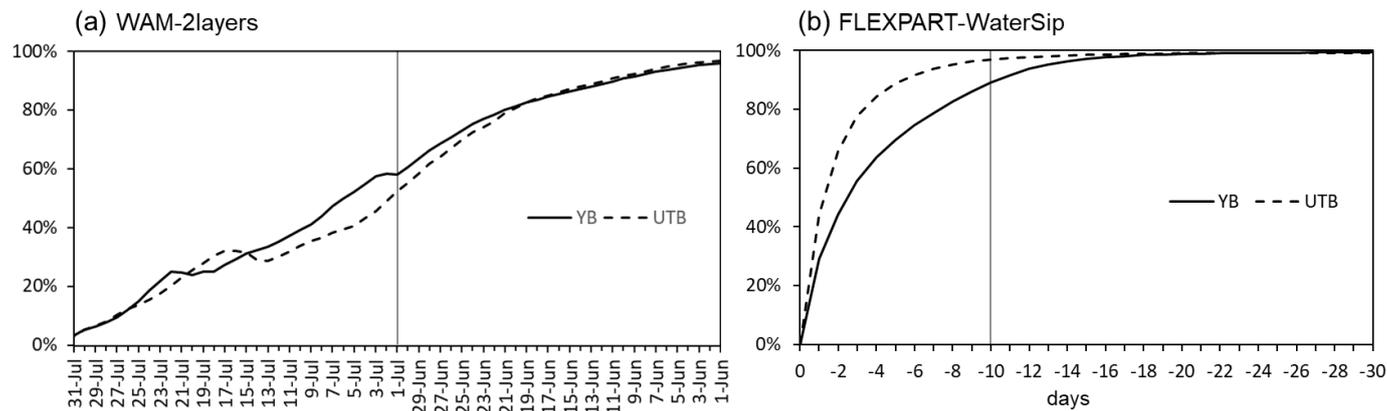
Figure S2. Backward moisture tracking periods and accumulated moisture uptake from all sources. (a) for WAM-2layers and (b) for FLEXPART-WaterSip. Solid lines represent YB and dotted lines represent UTB.

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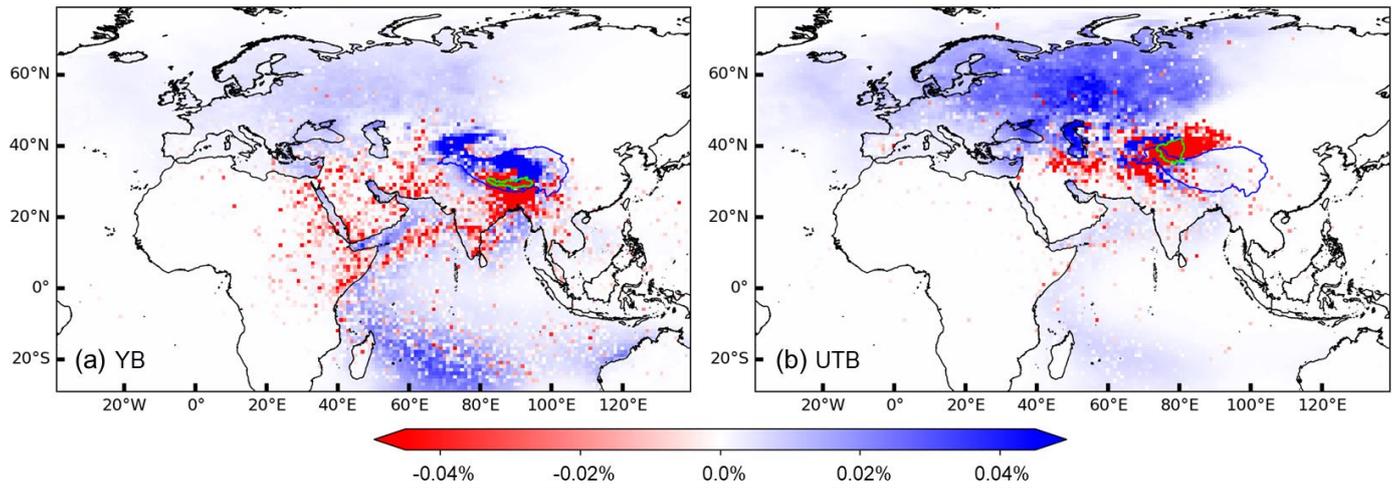
Figure S3. Relative differences in moisture contributions between the two simulations (WAM-2layers minus FLEXPART-WaterSip) for the YB (a) and UTB (b).

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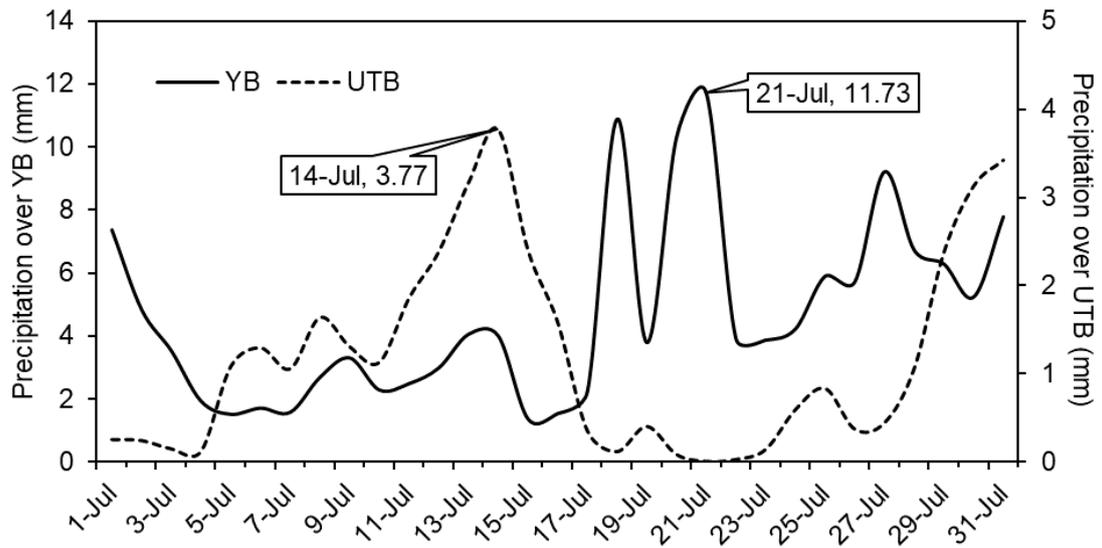
Figure S4. Time series of daily precipitation over the YB (solid line) and UTB (dashed line) during July 2022.
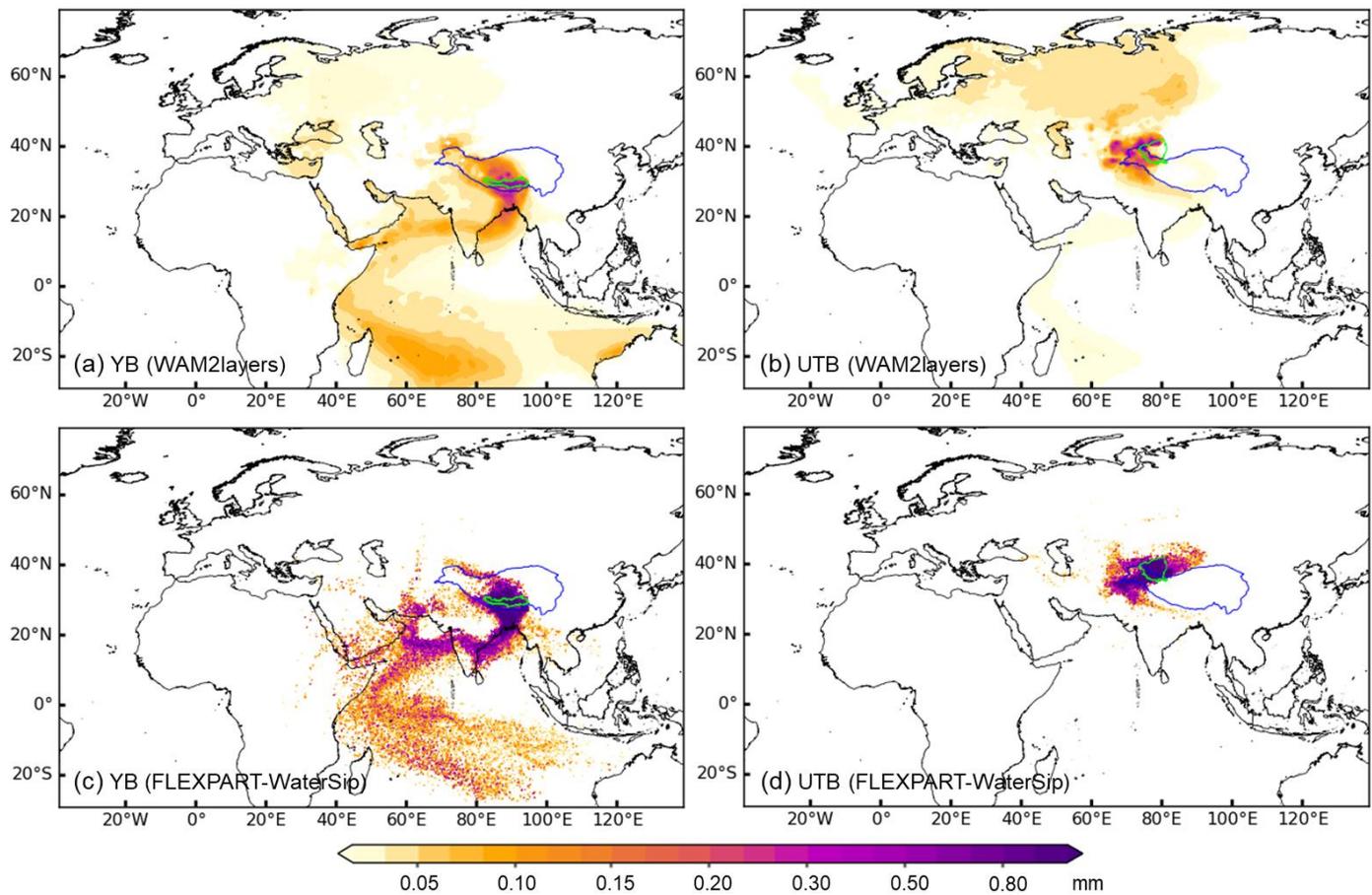
Figure S5. Spatial distributions of moisture contribution (equivalent water height over source areas) to precipitation during two extreme precipitation events on 21-July in the YB (a and c) and 14-July in the UTB (b and d), simulated by WAM-2layers (a and b) and FLEXPART-WaterSip (c and d). Blue lines represent the TP boundary and cyan lines represent the boundaries of the two basins.
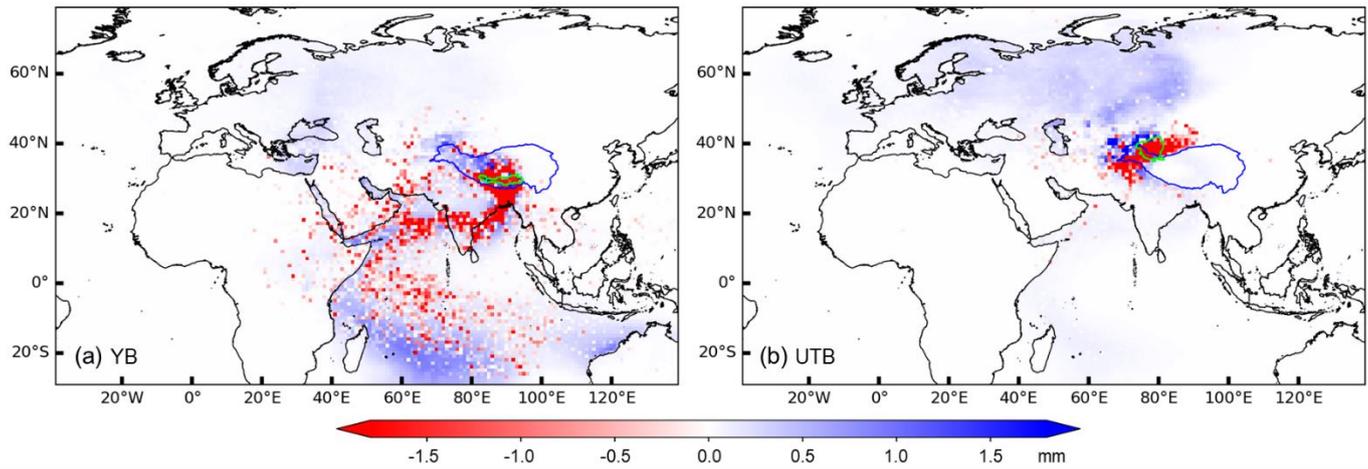
Figure S6. Absolute differences in moisture contributions during extreme precipitation events between the two simulations (WAM-2layers minus FLEXPART-WaterSip) for the YB (21-July) and UTB (14-July).
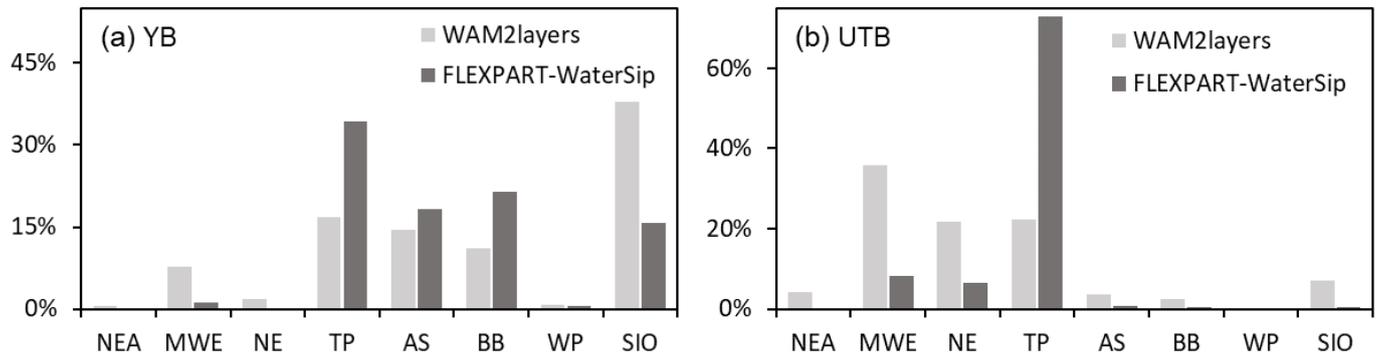
35 **Figure S7.** Relative moisture contributions (%) to extreme precipitation over the YB (21-July) and UTB (14-July) from the eight source regions, simulated by WAM-2layers and FLEXPART-WaterSip.
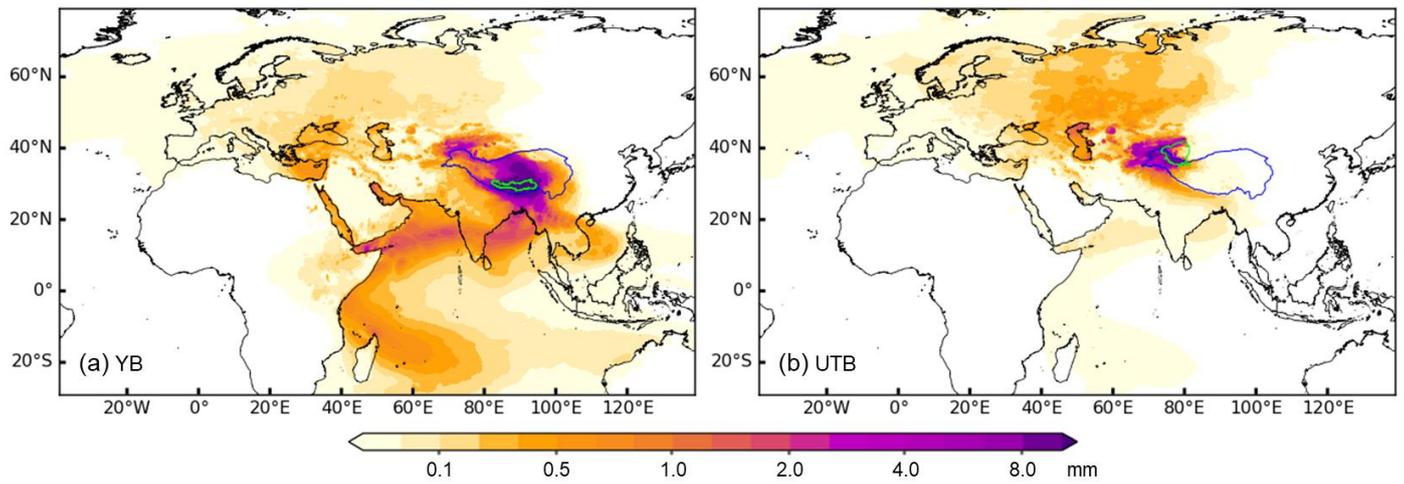
Figure S8. Same as Figs. 2a and b but for Experiment 1 (replace the 1°×1° and 3-hourly forcing data with 0.25°×0.25° and
40   hourly ERA5 data).
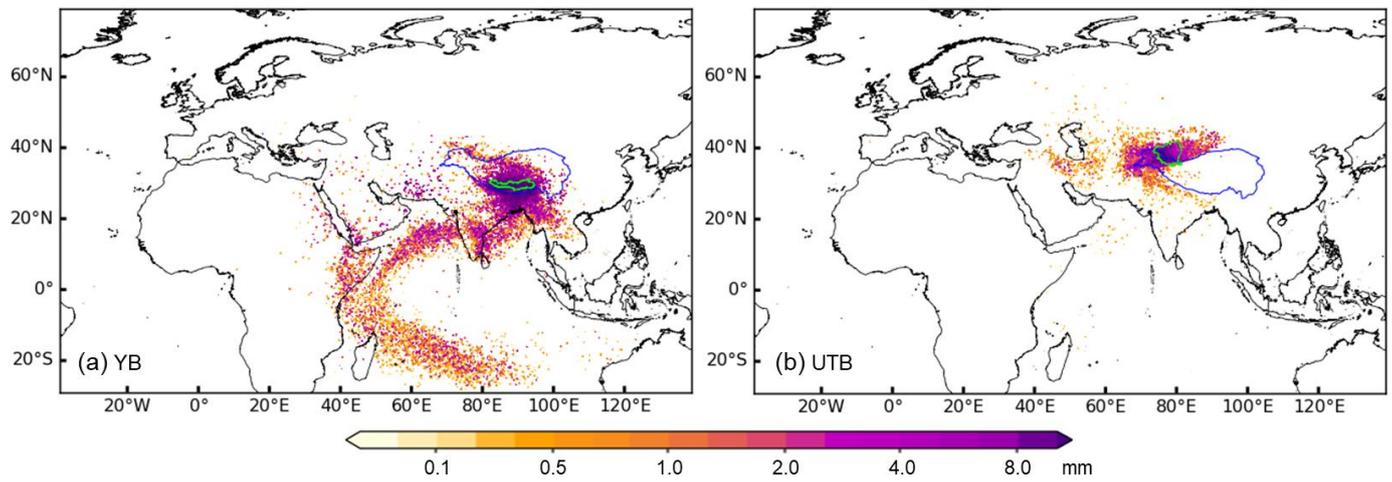
Figure S9. Same as Figs. 2c and d but for Experiment 2 (decreasing the number of particles initially released in FLEXPART from five million to one million).

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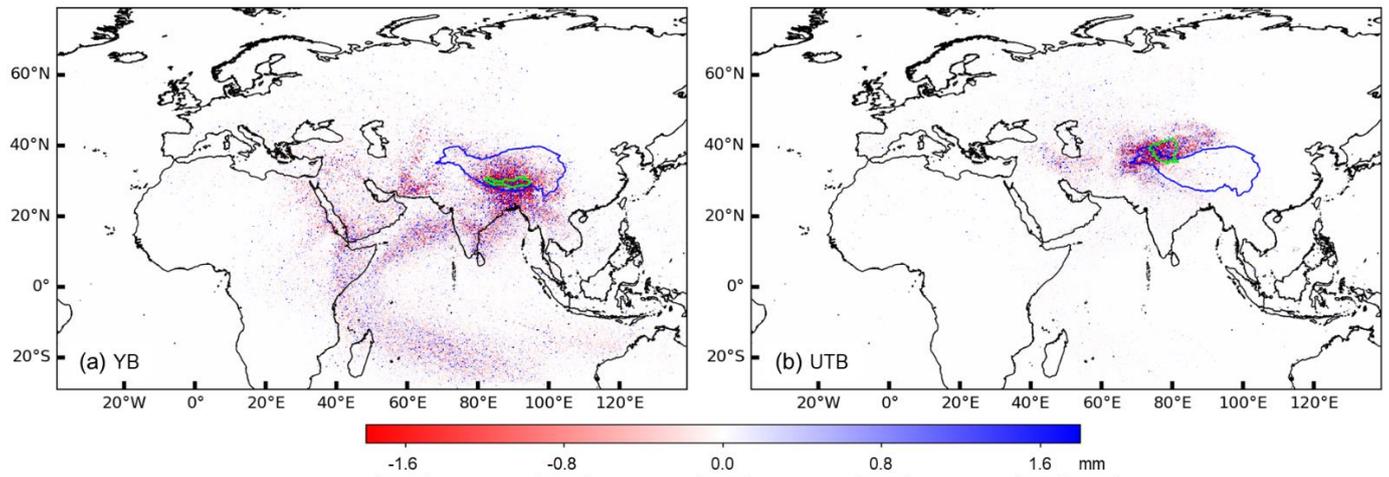
Figure S10. Absolute differences in moisture contributions between Experiment 2 and original FLEXPART-WaterSip simulations (Experiment 2 minus original FLEXPART-WaterSip simulation) for the YB (a) and UTB (b).
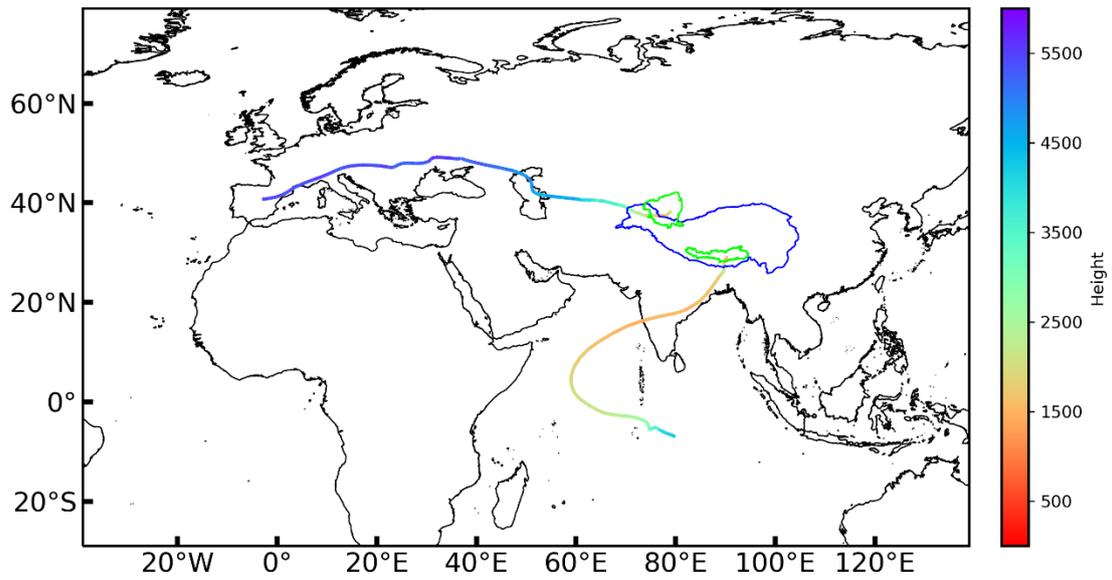
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Figure S11. The two selected moisture transport trajectories originating from the SIO and NEA that lead to precipitation in the YB and UTB, respectively. Colors correspond to the heights of the trajectories.