Improved Scaling and Impact Metrics for Euro-Atlantic Atmospheric Rivers

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Supplementary information

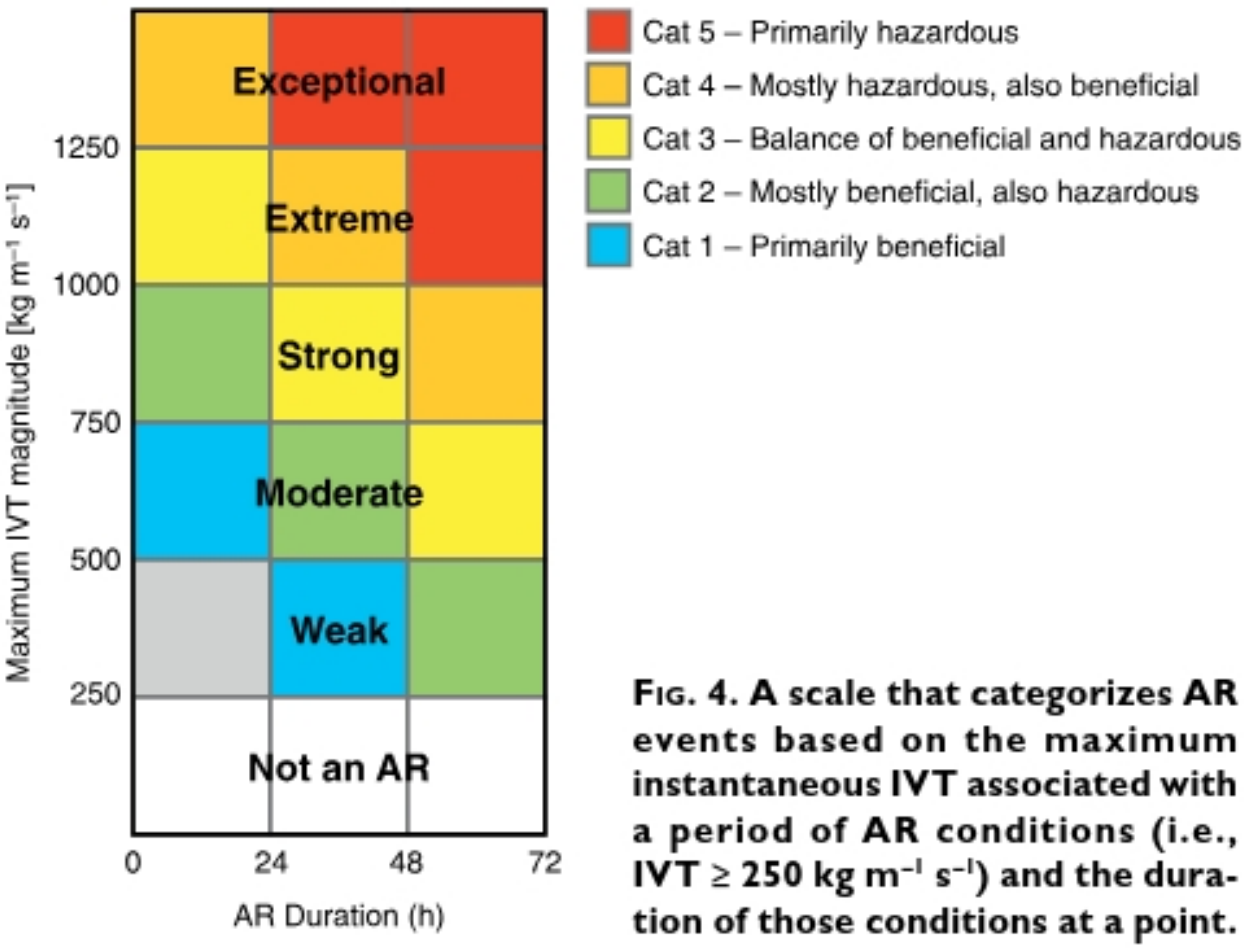

Figure S1: The original AR scale developed by Ralph et al.,[1]

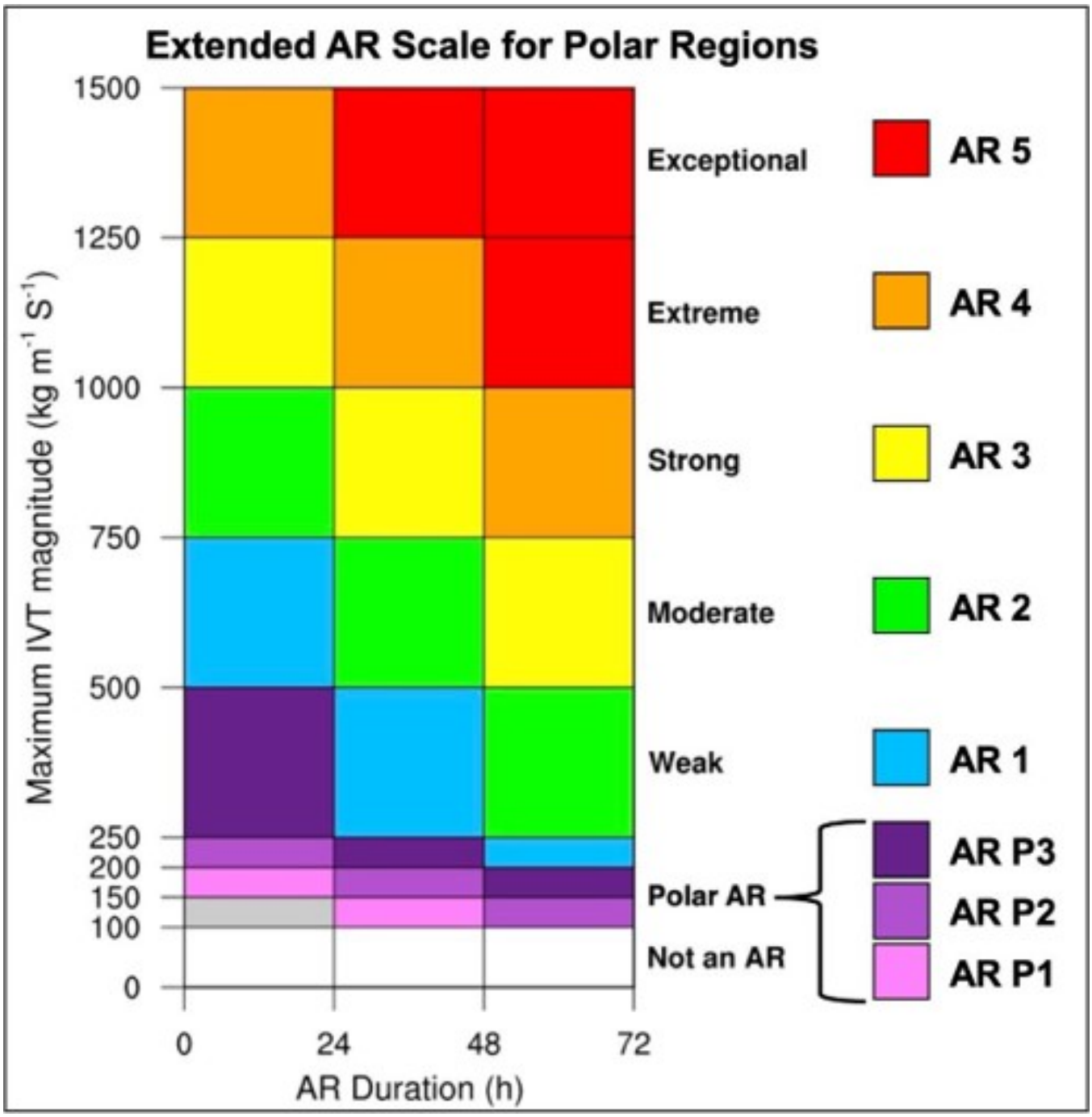

Figure S2: Extended AR scale for polar regions [2]

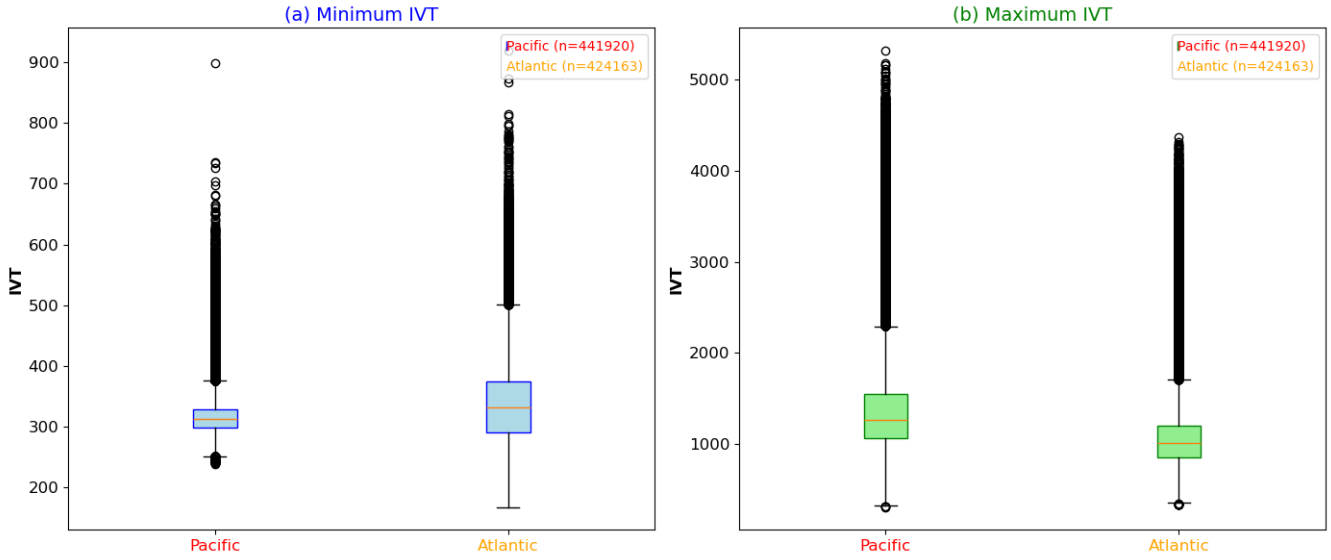

Figure S3: Comparison of (a) minimum and (b) maximum IVTs observed in each AR during the study period in the Pacific and Atlantic.

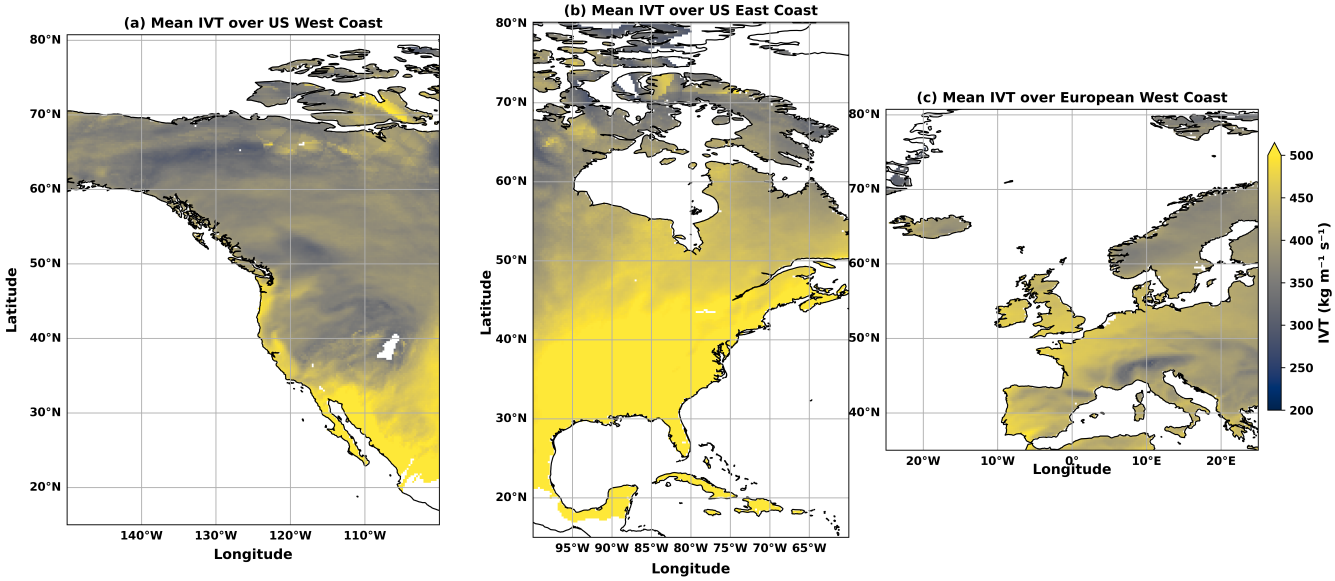

Figure S4: Mean AR IVT between 1970-2022 over (a) The western North American coast, (b) the Eastern North American coast, and (c) Europe.

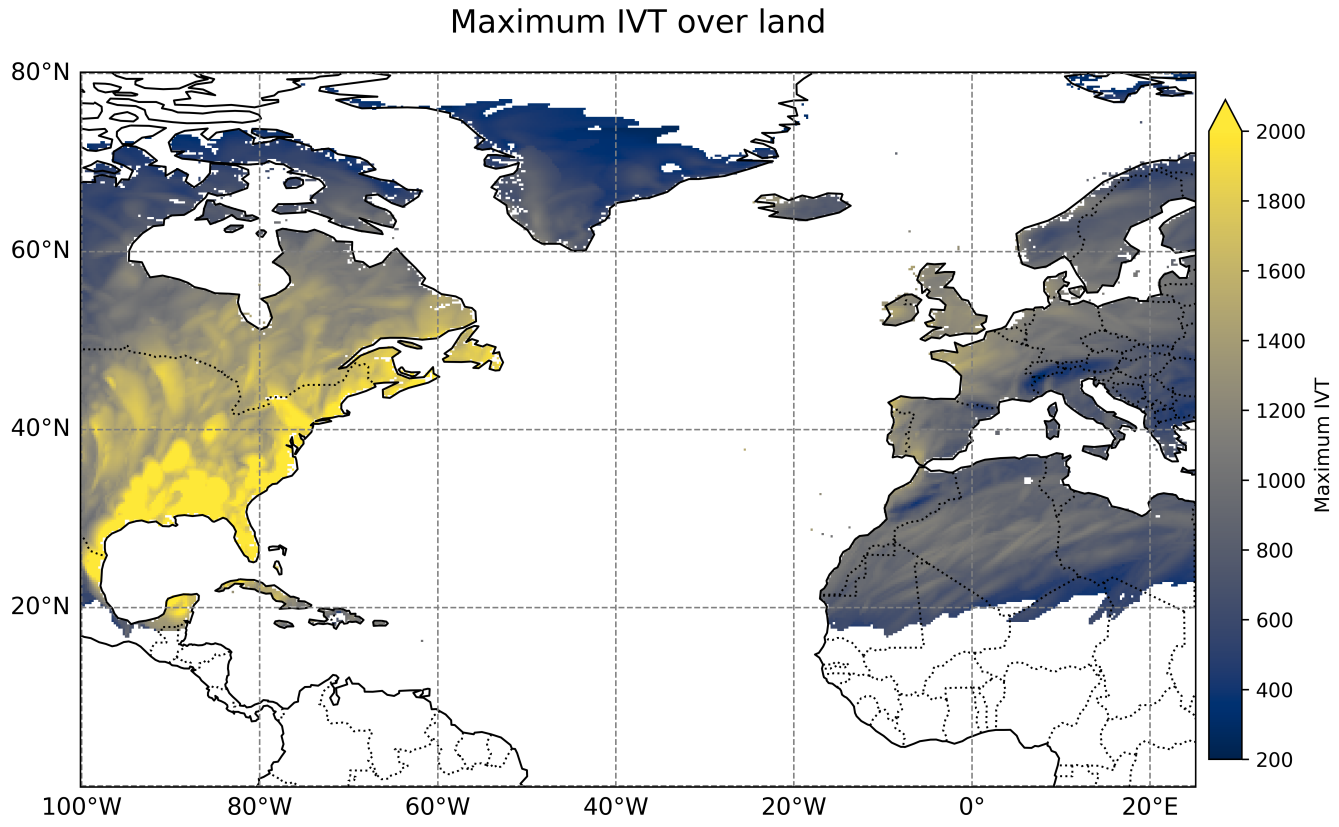

Figure S5: Maximum AR IVT over land in the study region from 1940 to 2022.

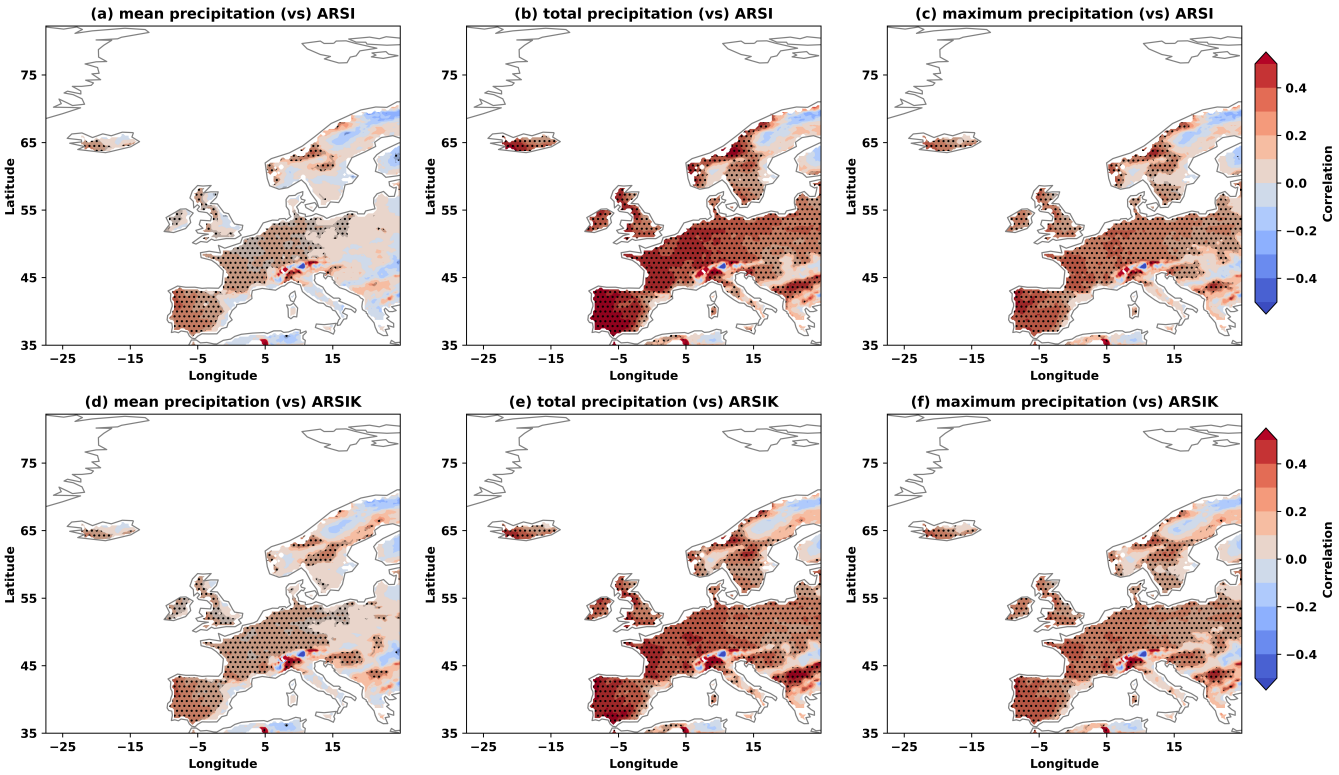

Figure S6: Correlations of 3-day ARSI (1st row), and ARSIK (2nd row) with 3-day mean precipitation, 3-day total precipitation, and 3-day maximum precipitation over Europe during 1950-2022. Black hatches show the areas with a significance of 95%.

References

[1] F Martin Ralph, Jonathan J Rutz, Jason M Cordeira, Michael Dettinger, Michael Anderson, David Reynolds, Lawrence J Schick, and Chris Smallcomb. A scale to characterize the strength and impacts of atmospheric rivers. *Bulletin of the American Meteorological Society*, 100(2):269–289, 2019.

[2] Zhenhai Zhang, F Martin Ralph, Xun Zou, Brian Kawzenuk, Minghua Zheng, Irina V Gorodetskaya, Penny M Rowe, and David H Bromwich. Extending the center for western weather and water extremes (cw3e) atmospheric river scale to the polar regions. *The Cryosphere*, 18(11):5239–5258, 2024.