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Jet waveguides - links to persistent surface weather and sub-seasonal predictability

Olivia Romppainen-Martius¹, Kai Kornhuber², Alexandre Tuel¹, Kathrin Wehrli³, Rachel White⁴, and Volkmar Wirth⁵

¹University of Bern, Institute of Geography, Institute of Geography, Bern, Switzerland (olivia.martius@giub.unibe.ch)

²Lamont-Doherty Earth Observatory, Columbia University, New York, United States

³Institute for Atmospheric and Climate Science, Department of Environmental Systems Science, ETH Zurich, Zurich, Switzerland

⁴Department of Earth, Ocean and Atmospheric Sciences, University of British Columbia, Vancouver, Canada

⁵Institute for Atmospheric Physics, Johannes Gutenberg-University Mainz, Mainz, Germany

Midlatitude synoptic-scale Rossby waves propagate along narrow bands of enhanced potential vorticity gradients co-located with the jet streams – the jet waveguides. These waveguides influence where and how efficiently the waves can propagate. The structure and location of the waveguides further affects how boundary wave forcing e.g., from the tropics or the surface forces and interacts with the midlatitudes waves. Very persistent waveguides can lead to persistent surface weather, a recent example is the flow situation over the Atlantic in summer 2021. Persistent waveguides potentially offer increased sub-seasonal predictability.

Alas, the story becomes more complicated as the jet waveguides do not exist in isolation, but rather form in response to midlatitude dynamics and boundary forcing and these two-way interactions need to be considered when investigating sub-seasonal predictability. This overview presentation will introduce the key characteristics of the jet waveguides, provide some illustrative examples and close with an overview of open questions and suggestions for ways forward.