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Making Foehn Diagnostics Reproducible, Comparable and Scalable With foehnix

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Foehn winds that descend and accelerate as they blow past obstacles are both a global and local phenomenon. Global due to the ubiquity of topographic obstacles on earth and local due to the strong dependence on the particular topographic shapes. However, foehn climatologies across the globe are in general not comparable since different, sometimes ad-hoc criteria are applied for classification.

We propose a classification method that can be globally applied by incorporating the defining criteria of crossing an obstacle, descent and acceleration. Additionally, the method honors the local nature by being completely data-driven using a machine learning algorithm avoiding the need for hard thresholds. It has the desirable properties of being reproducible, scalable to large data sets and flexible to adjust to local topographic peculiarities and data availability.

In order for the method to be deployed by a wide range users the software package *foehnix* was developed. It is available in two languages extensively used in the community: Python and R. We will demonstrate its capabilities using data from different continents.