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## **Spatial delineation of a new fog-driven ecosystem in the tropical lowlands**

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A recent review about diversities of epiphytes in tropical forests of the Neotropics revealed an unexpected high diversity at lower elevations in an area in French Guiana where the formation of nocturnal radiation fog, intensified by katabatic drainage flows from the surrounding terrain fosters epiphytic growth. Consequently, the new diversity hotspot has been termed 'Tropical Lowland Cloud Forest' (TLCF) in analogy to the well-known Tropical Montane Cloud Forests. In this new project funded by the German Research Foundation, we test the hypothesis that the new forest type is widespread in the Tropics if the local terrain allows the formation of nocturnal radiation fog. For example, tropical lowland forest areas in western Ecuador may serve as an area similar to that in French Guiana for possible TLCF occurrence.

The presented study is based on satellite data because no operational fog measurements from natural rain forests are available. Since fog in TLCFs is a nocturnal / early morning phenomenon, we use all available overflights by the MODIS Aqua platform with 1 km resolution of the MODIS images. Therefore, a new sub-pixel fog classification retrieval is developed in the first part of the project. With use of an affiliated radiative transfer model fog / low stratus contaminated pixels are identified. From 2004 until 2017 fog frequencies will be derived for lowland forest areas in western Ecuador. The Validation of the fog prediction is carried out on the basis of in situ installed fog detectors.

Potential lowland forest areas will be derived from ASTER Global Digital Elevation Model Version 2 and Landsat Vegetation Continuous Fields at the target resolution of 30 meters