



## **UAV-based Remote Sensing of vegetation patterns in the coastal fog zone of Pan de Azúcar National Park, Atacama Desert, Chile**

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The coastline of the southern Atacama Desert is under a constant influence of incoming fog from the seaside. This phenomenon results in a vegetation-rich landscape whilst being in one of the globally driest places in this desert. In order to understand the transition of the vegetation patterns and dependencies in this area, we determined three transects each reaching from west to east to study the following questions: (1) How do the vegetation patterns develop along the W-E gradient on a length of 1000 m and how are these patterns influenced? (2) What species occur along this gradient and are abundance, cover and diversity affected by certain factors like distance, elevation and topographic position index (TPI)? Along the transects, we investigate the vegetation patterns using plant survey plots and execute a supervised pixel-based image classification approach to detect the vegetation cover of the designed sites. The classification is based on self-made UAV-based orthographic photographs. The findings of the plant survey data revealed that, (1) 39 species were identified along the three sites. (2) The obtained data indicates that plant-communities from all transects are not coherent and confirm prior vegetation analysis findings of typical “Loma-formations” in the Atacama Desert. (3) There is a pattern along the defined West-East gradients of 1000 m length by 200 m width. (4) The influencing factor are the distance to the escarpment. The distance to the escarpment is negatively correlated to the cover of green vegetation.