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# The role of wind for fog deposition intensity in the Sudety Mts.

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The wind speed in mountain areas is determined by an array of factors: general circulation, dynamic effect of orography and has characteristics typical for a given area. It is of practical significance for various branches of economic activity: power industry, telecommunication, tourism and above all forest management.

The Sudety Mts. are exposed predominantly to western, SW and NW winds and humid maritime air masses. The Giant Mts. (the highest NW part of the Sudety Mts.) is the windiest area in the continental part of Europe. The average annual wind speed at Mt. Śnieżka (1602 m a.s.l.) and Mt. Szrenica (1364 m a.s.l.) exceeds 12,5 and 9,5 m/s respectively. On the other hand fog is the most frequently observed atmospheric phenomenon, being present on average 45% of the time, with 250-300 days with fog per year. In this circumstances deposition processes of liquid or soil cloud water particles on the surface are very intensive.

Landuse expressed by roughness is the most important factor responsible for huge differentiation of fog deposition in a local/micro scale. The efficiency of fog/cloud droplets deposition varies in dependence on size and amplification of the receptor surface (rocks, grass, dwarf pine, forest). In the mountainous area vegetation gives an important contribution to hydrological inputs, particularly in forested areas where the vegetation efficiently cleans out the fog droplets. Taking height and surface area index (SAI) into consideration the highest efficiency of horizontal precipitation is characteristic for spruce trees which are typical in the Sudety mountains. Fog precipitation rate varies over short distances because of different tree height, structure and size, and frequency of gaps in the forest canopy. The greatest throughfall occurred near edge of forest stand and decreased consequently inside the forest. That phenomenon is defined as “edge effect”. Trees on the edge of forest stand are good exposed to the wind and may collect more fog water than trees inside the forest, which screen each other.

Direct deposition of fog droplets to vegetation strongly dependent on wind speed can make also an important contribution to chemical inputs, particularly in forested areas where vegetation efficiently cleans out heavy polluted fog. It is an important pathway to explain a huge spatial variability of forest destruction in the western Sudety Mountains over short distance.