

Dynamic FLC Detection from GOES Satellite Data for the Galapagos Archipelago

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Drizzle and fog deposition are essential sources of freshwater for fragile endemic ecosystems, such as those found in the Galapagos archipelago. In order to monitor drizzle and fog deposition effectively and understand the impact of global warming on the islands' water balance, a fog and low cloud (FLC) mask with high temporal continuity and robust calibration is required, as drizzle precipitation is predominantly associated with persistent low-level cloud and fog layers. Unfortunately, existing cloud mask products with similar characteristics, such as the GOES Advanced Cloud Mask (ACM), perform poorly in detecting FLC under local conditions.

We therefore develop a new physical rule-based FLC detection algorithm with adaptive thresholds for Galapagos using available geostationary GOES satellite data. In addition to typically used satellite channels and methods, the algorithm incorporates local synoptic elements, such as the trade-wind inversion or local sea surface temperatures, to adapt to local conditions. Current results show major improvements over existing satellite derived cloud or FLC products.