

**Topic :** Data collection & remote sensing applications

**Title :**

**A MULTIPLE FINE-SCALE SATELLITE-DERIVED APPROACH TO MODEL BLUETONGUE IN CORSICA (FRANCE)**

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**Abstract :**

The effects of climate change on vector-borne diseases are currently widely discussed. Special attention has been focused on the unprecedented emergence of Bluetongue (BT) in Europe. In previous studies, low-resolution (1km<sup>2</sup>) satellite-derived data have been used to model the distribution of *Culicoides imicola*, the major vector in south-western Europe. To understand local differences in distribution of BT outbreaks in southern Corsica, the environment of BT-free and BT-infected sheep farms was described at a finer scale using high resolution remote sensing data (SPOT satellite, pixel of 10x10 m) and a digital elevation model (DEM). From the DEM, topographic variables such as mean altitude, slope, sunshine and aspect were obtained. Land-cover information was produced by classifying the satellite image with a supervised object-oriented nearest-neighbour method. Finally, landscape metrics were calculated to evaluate the number, diversity, length of edge and connectance of vegetation patches. A geographical information system was developed to extract these data in the neighbouring of sheep farms. As little is known on the flight range and bionomics of *C. imicola*, the environment was described at three scales: within a 500 m, 1 km or 2 km radius buffer around the sheep farms. Models highlighted the role of environmental variables such as latitude, sunshine, and some vegetation types such as prairies. The model developed at 1 km had the highest AUC receiver operating characteristic (ROC AUC = 0,90) which represents the best trade-off between specificity and sensitivity. Validation of this model was carried out on the same data set (sensitivity and specificity = 85%) as well as on a new data set originating from the region of Ajaccio (Corsica) situated 40 km north of the study area. Data, methods, results, possible applications in disease-free areas and limits of this approach are discussed.