

Use of Satellite Imagery to Predict the Distribution of Bluetongue Vector *C. imicola* in Corsica

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Due to climatic changes and human activities, many ecosystems are acquiring the capacity to shelter major pathogens. Because environmental parameters impact insects bionomics, vector and vector-borne disease distributions have significantly changed during the past years. Our aim is to study the conditions required for the establishment of a new vector in a new ecosystem, taking as example *Culicoides imicola*, one of the main vectors of bluetongue, in Corsica.

The favorable environment for *C. imicola* is described using remote sensing and Geographical Information Systems (GIS). Parameters likely to influence vector distribution were extracted from a SPOT image (10 meters pixel) and from a digital elevation model (DEM). The normalized difference vegetation index was calculated and a supervised classification was carried out. Slope, altitude, sunshine, and orientation of study sites were extracted from the DEM.

Two types of epidemiological data were used to model the distribution of favorable sites for *C. imicola*. Data on sheep disease cases (farm descriptors and health status) highlighted the impact of environmental variables such as latitude and some types of vegetation. Another model was established using entomological data collected during one-night catches in a hundred sites in June 2005. The neighborhood of farms and trapping sites was compared to build logistic models on bluetongue and vector occurrence. Data, methods, results, applications and limits of the two approaches are discussed here.