Tuesday – 24.05.2022

10:40 am

D2.05.1 Earth Observation data in Vector Borne Diseases

Chair(s)

Dr. Annamaria Conte (Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise)
Dr. William Wint (Environmental Research Group Oxford Ltd)

Room:
H2-02

Topic:
Empower the Green Transition

Form of presentation:
Oral

Duration:
100 Minutes

11:40 am

ARBOCARTO: an operational spatial modeling tool to predict the dynamics of Aedes mosquito species from weather and environmental variables

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Aedes albopictus and Aedes aegypti mosquitoes have a worldwide distribution and are well adapted to urban environments. Because they are the main vectors of dengue, chikungunya and Zika viruses, these two species constitute a threat for public health both in tropical and temperate regions. To better target surveillance and control of Aedes-borne diseases, there is a need for tools with the capacity to predict the spatially distributed dynamics of mosquito vectors at a local scale. In addition, to be used by public health authorities and vector control services, such tools need easy-to-use interfaces allowing a customization by the user according to the geographical and entomological contexts.
Various approaches exist to model the dynamics of mosquito populations and to predict their spatial distribution. As mosquitoes depend closely on climatic and environmental conditions, satellite-based information (e.g. vegetation, urbanization type) can prove to be valuable input data for the model. Here, we provide both the scientific community and the operational stakeholders an efficient way for implementing a generic mosquito life cycle-based model, driven by meteorological variables (temperature and rainfall). The implementation of 'ARBOCARTO' considers the landscape context described from very high spatial imagery and/or ancillary data provided by the user. We present its application in various geographical contexts (mainland France and its overseas departments) and for two Aedes mosquitoes species population (Aedes albopictus and Ae. aegypti).
In highly diverse environments and latitudes, the comparison between the model outputs and observed entomological data demonstrated the ability of 'ARBOCARTO' tool to provide valuable complementary information to existing entomological surveillance programs. The different functionalities allow the user to test different scenarios, such as the impact on mosquito dynamics of prevention measures (e.g., reduction of the number of breeding sites) or control actions (e.g., pulverization of insecticides). Thanks to its user-friendly interface, 'ARBOCARTO' could be adopted by a broad community of managers involved in vector control.