

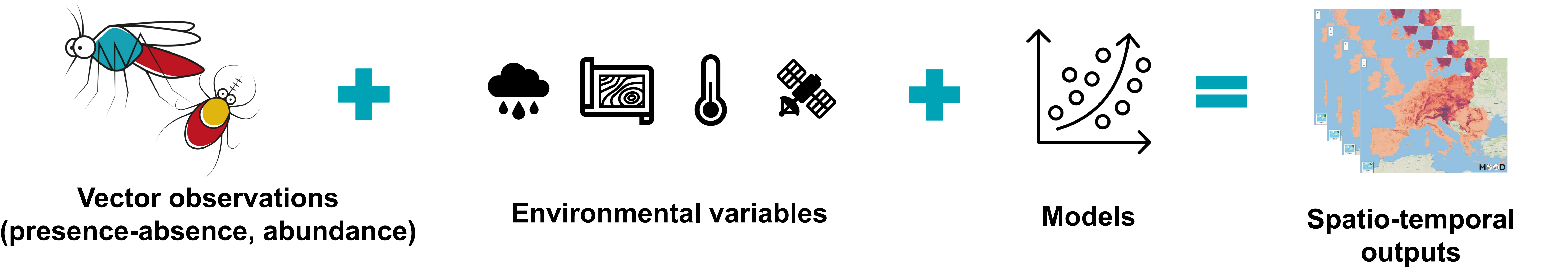
Integrating Models and Co-Developed Dashboards for Enhanced Arthropod Vector Management

Daniele Da Re¹, Francesca Dagostin¹, Marharyta Blaha², Kamil Erguler³,

Alessandro Albieri⁴, Paola Angelini⁵, Annapaola Rizzoli¹, Giovanni Marini¹

¹Research and Innovation Centre, Fondazione Edmund Mach, S. Michele all'Adige, Italy; ²Center Agriculture Food Environment, University of Trento, San Michele all'Adige, Italy; ³Climate and Atmosphere Research Centre (CARE-C), The Cyprus Institute, Nicosia, Cyprus; ⁴Centro Agricoltura Ambiente "G.Nicoli", Crevalcore, Italy; ⁵Emilia-Romagna Region, Bologna, Italy

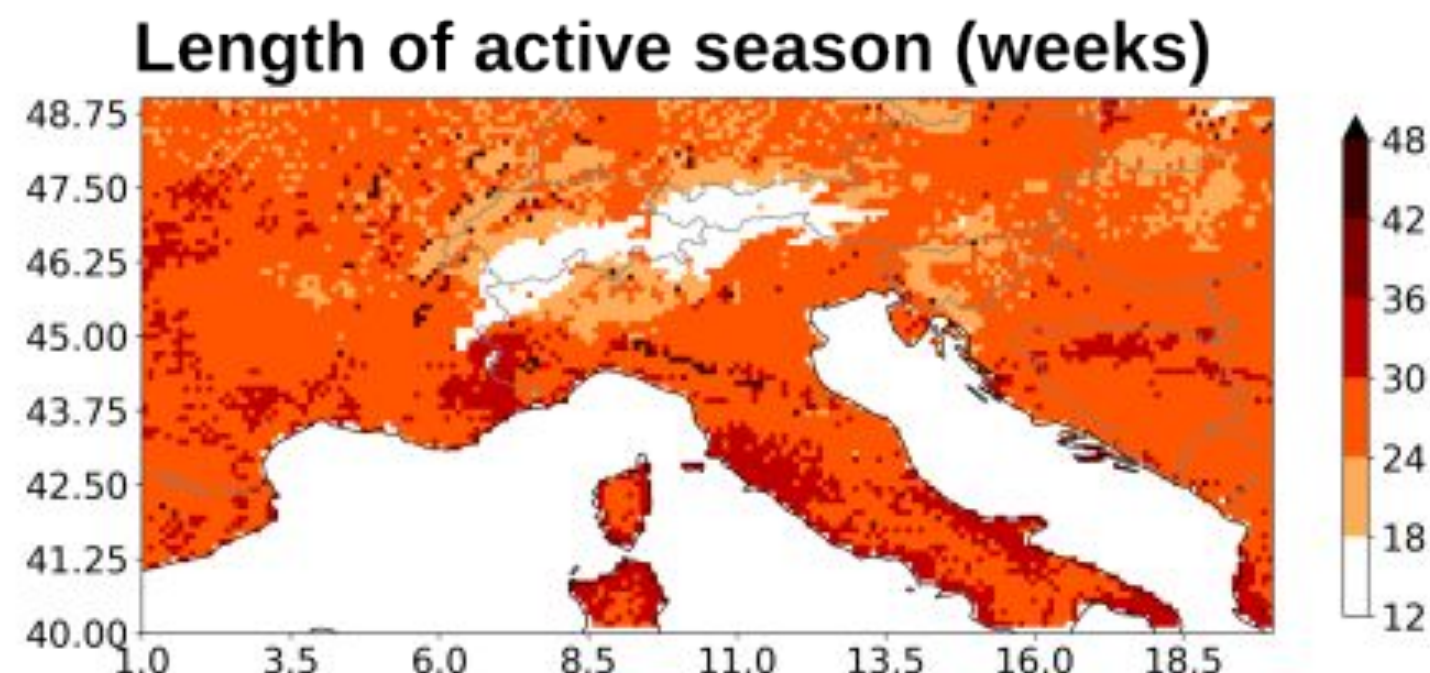
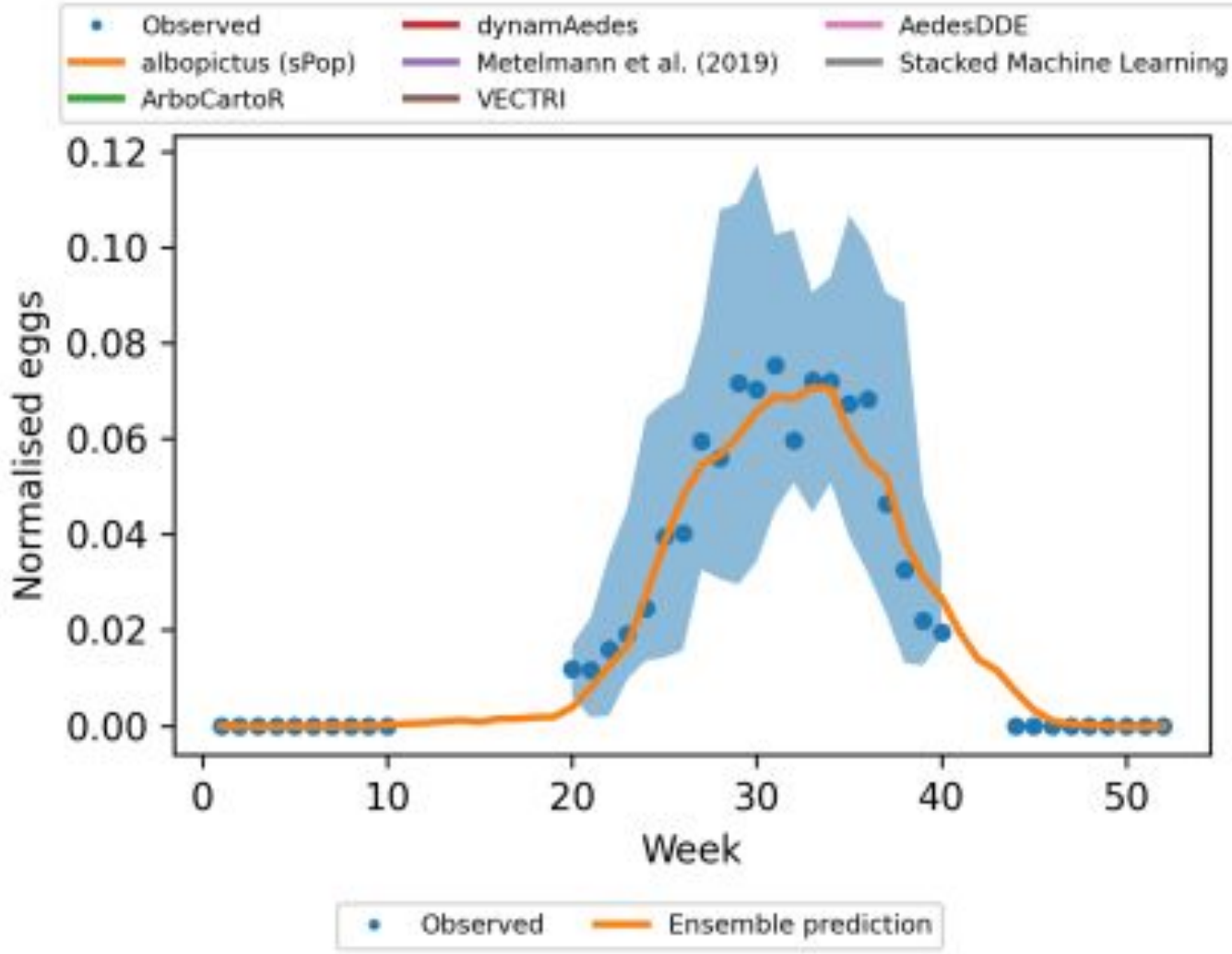
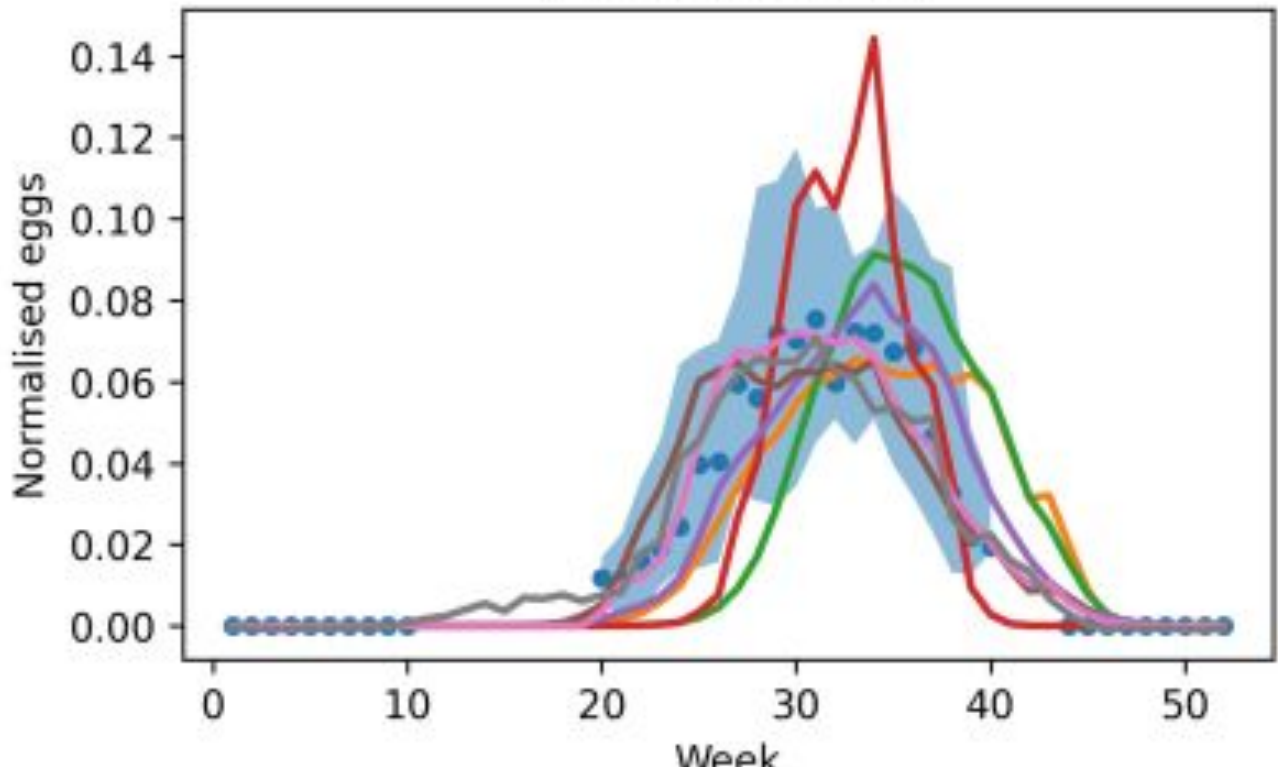
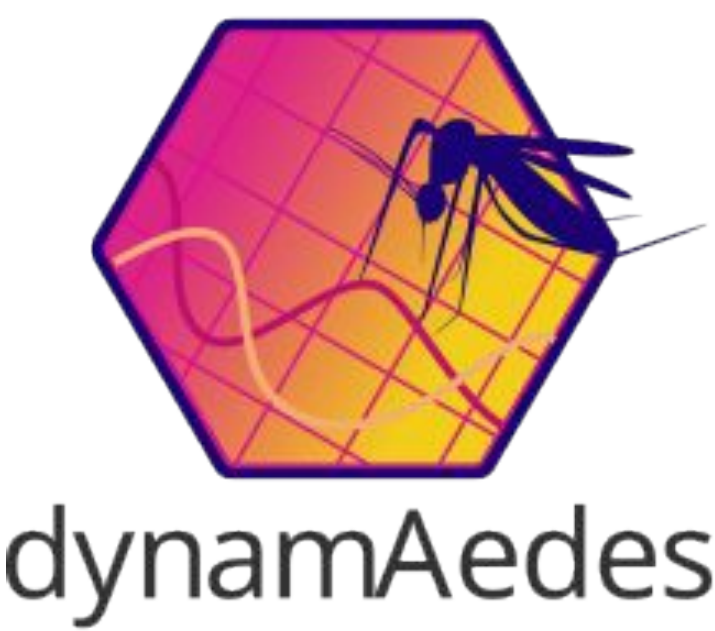
Vector-borne diseases pose significant **public health challenges**. Advances in mathematical modelling and machine learning are needed to drive the **development of novel tools to better anticipate vector dynamics and disease transmission** and support targeted control and elimination efforts.



We present **ongoing initiatives** that **combine advanced Artificial Intelligence (AI) and machine learning techniques with mechanistic models** to **forecast mosquito and tick activity**.

AI models leverage high-resolution climate data, including satellite observations, to predict vector dynamics, while mechanistic models simulate biological processes to capture seasonal patterns and population trends.

Preliminary results highlight the **strengths and limitations of each approach**, with **ensemble modelling showing promise for improving prediction accuracy**, particularly in complex or data-scarce environments.



CURRENT AVAILABLE DASHBOARDS

A key outcome of these efforts are **user-friendly, real-time dashboards, co-developed with public health stakeholders**, ensuring that the tools are tailored to operational needs. These **dashboards provide intuitive visualisations of vector activity** along with practical, context-specific recommendations to support public health responses and personal protective behaviours.

This co-development process empowers local authorities and decision-makers to implement proactive interventions, such as targeted vector control and awareness campaigns, based on timely and relevant information.