

Monitoring Mosquito Abundance and Distribution to Assist Vector-Borne Disease Management in Western Europe

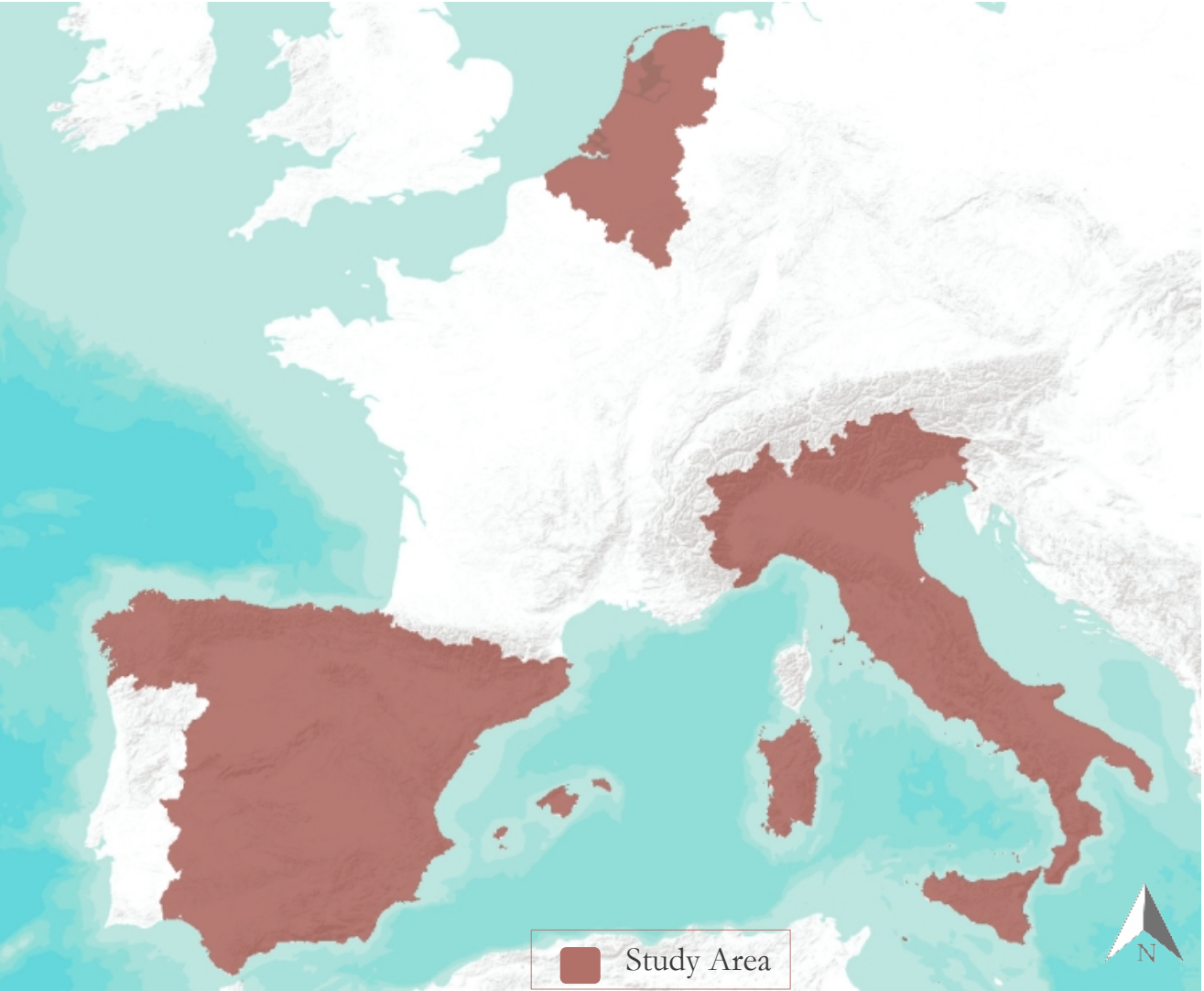
Abstract

Vector-borne diseases, caused by pathogens and parasites, are transmitted through living organism carriers known as vectors. Mosquitoes, the most common disease vectors, transmit illnesses such as Zika, West Nile, chikungunya, malaria, dengue, and yellow fever, which affect millions of people across the world and kill more than one million people each year. While vector-borne disease outbreaks are difficult to predict, the Global Mosquito Alert Consortium strives to monitor and mitigate outbreaks through research and citizen science. This approach presents several challenges, including a lack of data standardization across different regions. The NASA DEVELOP team utilized NASA Earth observations and Global Mosquito Alert Consortium citizen science data from countries in Western Europe in order to create a methodology and habitat suitability map to improve prediction models for vector-borne diseases. The MaxEnt habitat modeling software was used to combine different environmental factors and citizen science data to determine which variables are correlated with the presence of mosquitoes. These products will be implemented in an interactive, open-source platform in the subsequent term for easier visualization and representation of habitat suitability.

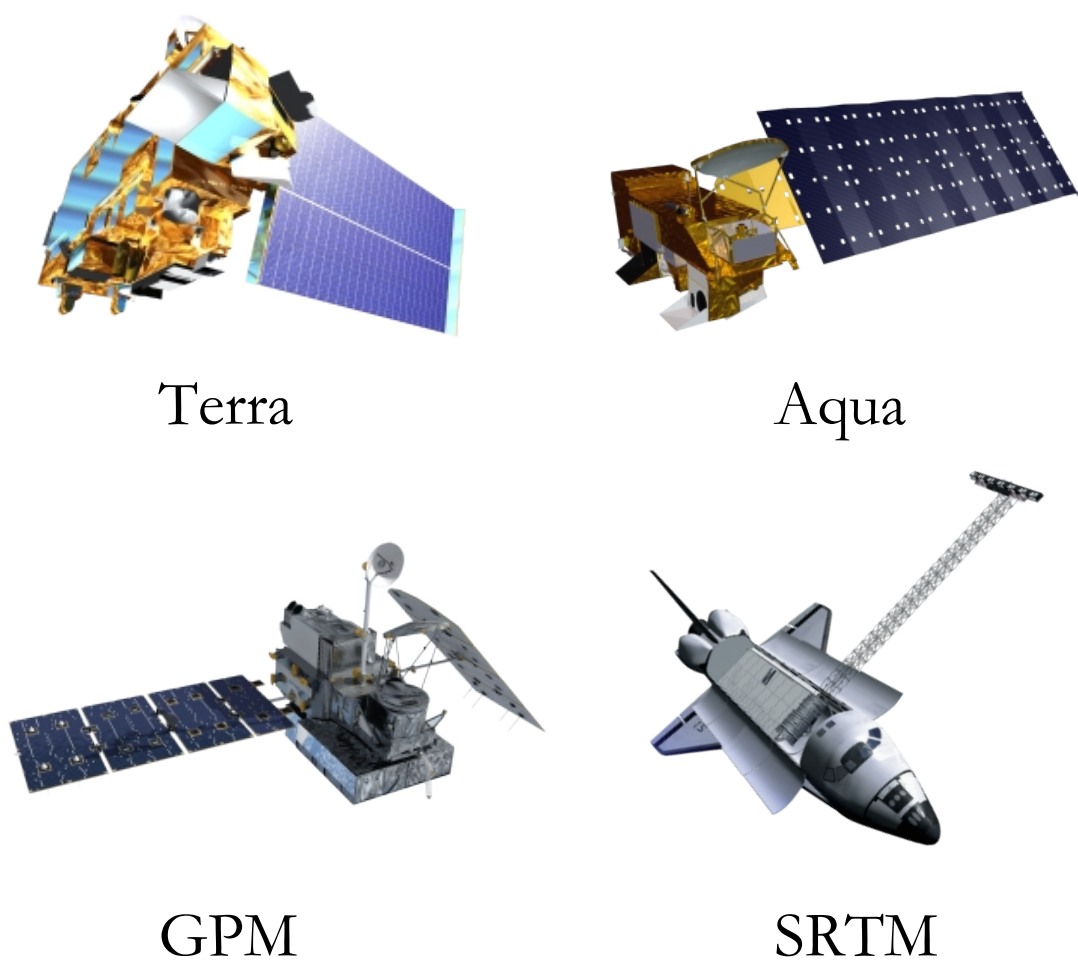
Objectives

- **Integrate** NASA Earth observations with citizen science data in countries across Western Europe
- **Determine** environmental variables that influence mosquito habitats and breeding grounds
- **Create** a methodology to improve prediction models for vector-borne diseases
- **Visualize** results through a habitat suitability map

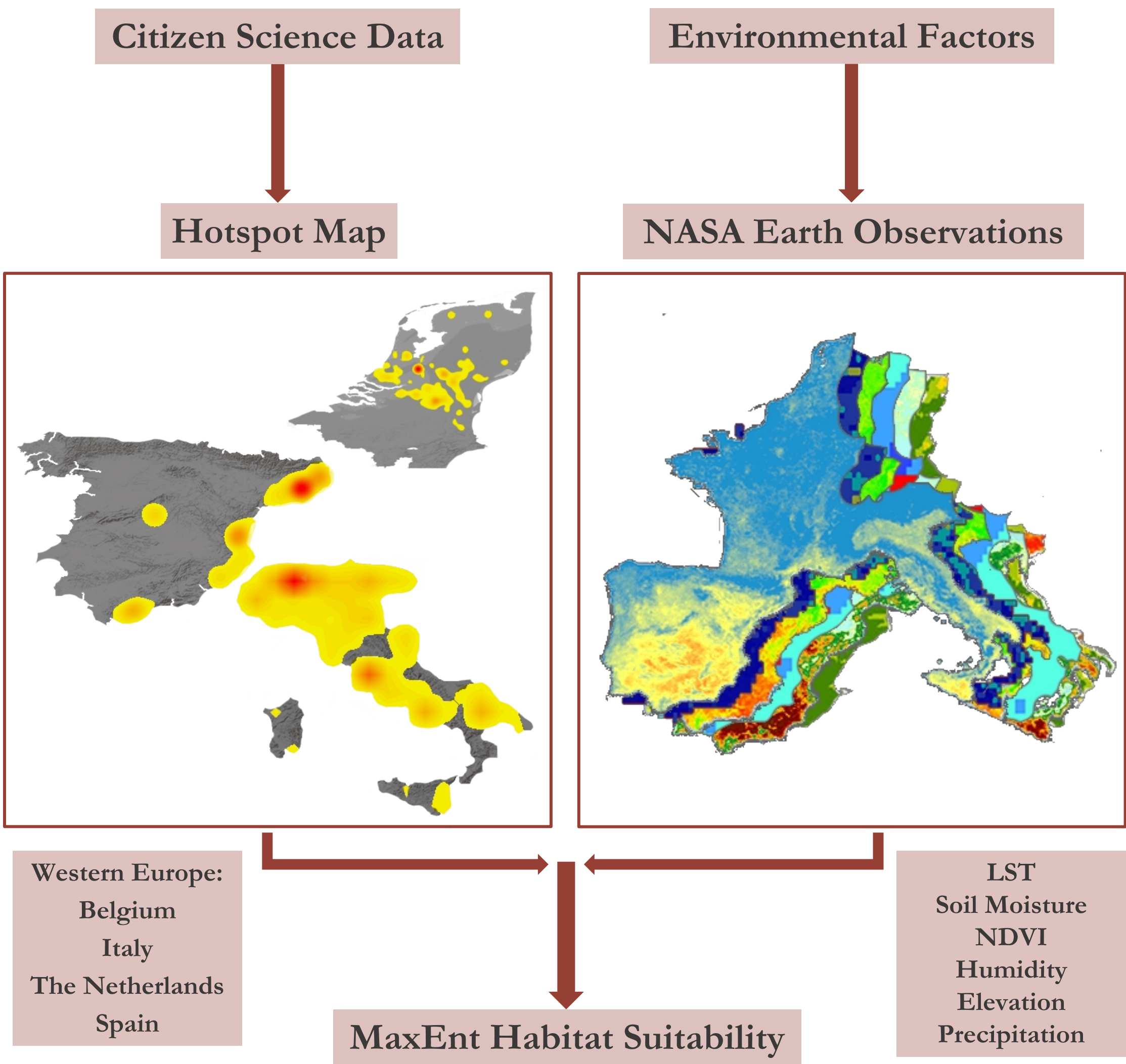
Study Area



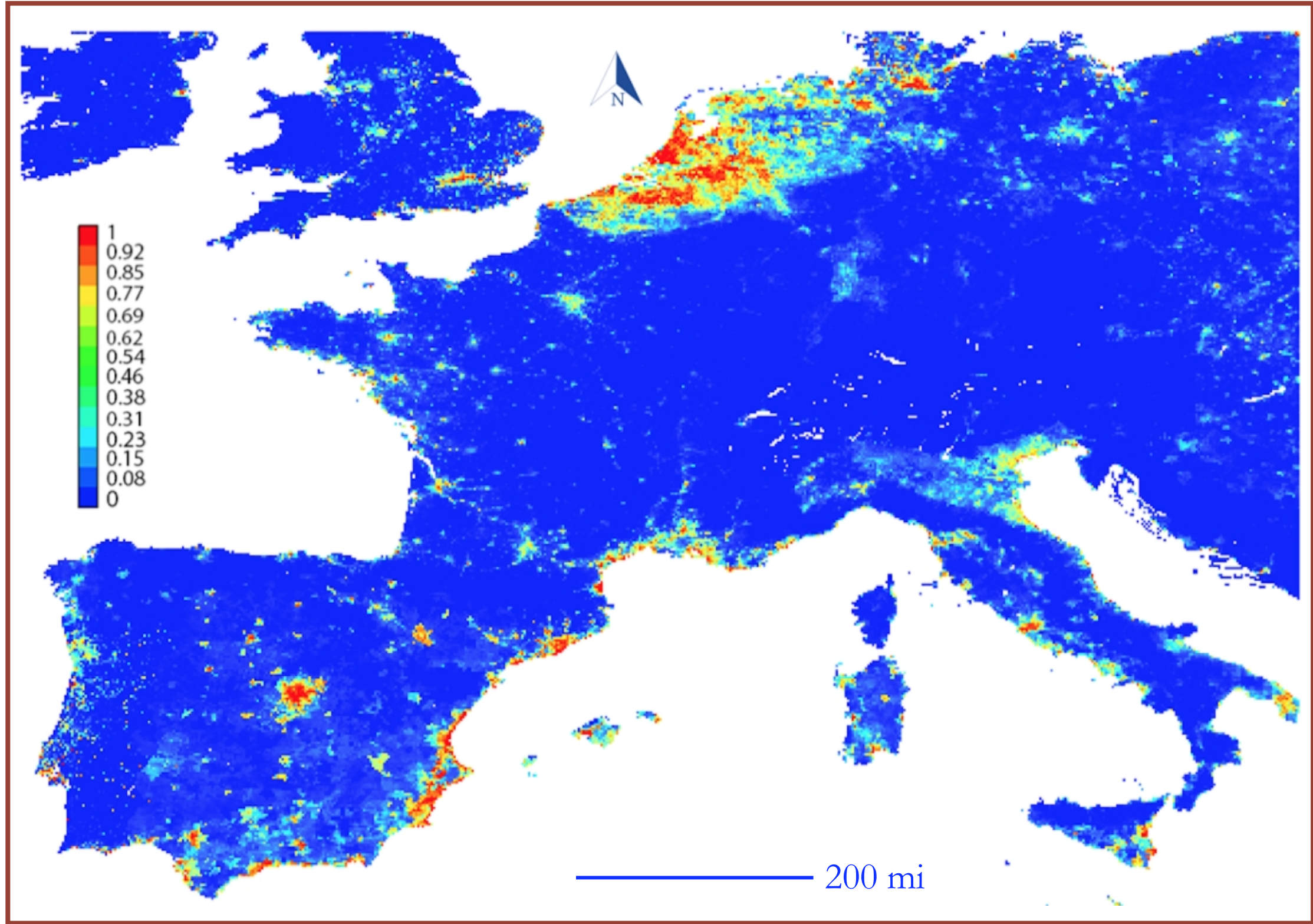
Earth Observations



Methodology



Results



Project Partners

Global Mosquito Alert Consortium
The Woodrow Wilson International Center for Scholars
Citizen Science Association
European Citizen Science Association
Institute for Global Environmental Strategies
Wageningen University
Sapienza Università Di Roma

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Conclusions

- Mosquito activity occurrence is correlated with areas of high population density and low elevation.
- Mosquito activity increases and is more widespread during the summer months.
- The Global Mosquito Alert Consortium and participating organizations would benefit from standardizing citizen science data collection questionnaires in order to readily compare datasets across time and space.

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Western Europe Health & Air Quality

