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

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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Methodology

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.

Acknowledgements

Assaf Anyamba, PhD, Universities Space Research Association, NASA
Goddard Space Flight Center
John Bolten, PhD, NASA Goddard Space Flight Center
John Palmer, PhD, Global Mosquito Alert Consortium
Anne Bowser, PhD, Woodrow Wilson International Center for Scholars
Greg Newman, PhD, Citizen Science Association
Martin Brocklehurst, European Citizen Science Association
Russanne Low, PhD, Institute for Global Environmental Strategies
Arnold van Vliet, PhD, and Sander Koenraadt, PhD, Wageningen University
Beniamino Caputo, PhD, and Alessandra Dellatorre, PhD, Sapienza Università Di Roma

Results

Western Europe’s Health & Air Quality

Maryland – Goddard
Fall 2017