

# GEOSTATISTICS: PROJECT

UHasselt - academic year 2025-2026

**Deadline: January 4, 2026**

## Practical information

Dengue is a viral infection transmitted by multiple mosquito species. The Vector Occurrence (VO) index is a continuous index measuring the joint abundance of these species at a location. It is based on mixed information coming from light and sentinel traps. A larger VO indicates a larger joint abundance of these species. This project examines the spatial variation of the VO in Cambodia. The VO is likely influenced by environmental factors. The data contain the following information:

Variable	Description
X	longitude at location $i$
Y	latitude at location $i$
VO	the Vector Occurrence index at location $i$
elevation	the elevation at location $i$ (meters above sea level; a proxy for environmental variables)

For this assignment, you should do the following:

- Check whether VO showcases spatial correlation.
- Check whether your analysis suggests that there are unobserved explanatory variables (possibly at a very small spatial scale) that are associated with variation in VO, other than elevation.
- Make a map of model-based predictions of the mean VO in Cambodia, as a function of elevation (if important) and other latent variables (if important).
- High-risk areas are those with a VO of 6 or larger. In their quest to understand which part of the country is considered high-risk, the Cambodian government wants to fund a campaign to collect data on VO at 10 additional locations. Choose a batch of 10 new locations, using an adaptive sampling design based on the currently available data.

Two tips for the analysis:

- The map of Cambodia can be obtained via the *sf* package:

```
library(sf)
data("world")
cambodia <- world[world$name_long == "Cambodia", ]
```

- Elevations for all Cambodian locations can be obtained via the *get\_elev\_point()* function in the *elevatr* package.