Introduction

• Malaria is a parasitic infection that is spread by female mosquitoes of the *Anopheles* genus.
• It is acutely prevalent in Sub-Saharan Africa where—90% of all malaria deaths occur—killing approximately 400,000 people each year (Centers for Disease Control and Prevention 2018).
• Ethiopia has historically been impacted by malaria.

Background

• Remote sensing offers health researchers an alternative technique for studying the geography of disease.
• Remote sensing enables researchers to acquire information about a location without physical contact or conducting laborious amounts of field work.
• Previous scientific research has studied the relationship between malaria prevalence and climatic/environmental variables (Ebhuoma and Gebresalasie 2016).

Study Area

• The Gilgel Gibe III Hydroelectric Dam is located in the Southern Nations, Nationalities, and Peoples’ Region in southeastern Ethiopia, on the Omo River.

Methods

• A model in ArcGIS 10.6 ModelBuilder that identifies mosquito breeding habitats using remotely sensed data.
• Calculate the total number of pixels identified at each risk level.
• Identify the estimated population living within the entire Study Area (Technique 1) and compare it to populations living near areas of high risk pixel concentrations (Technique 2).

Weights and scale values were determined based on expert opinion and scholarly literature. Weights were assigned based on expert opinion and analytical hierarchical process calculation.

Results: Populations at Greater Risk of Malaria

• Technique 1 identifies all populations living within 3 km of the Gilgel Gibe III Hydroelectric Dam as being at greater risk.
• 29,418 more people than Technique 2.

Results: Mosquito Breeding Habitats

• A total of 1.1 million upland and 1.7 million lowland pixels were identified.
• 10,142 high risk pixels.

Acknowledgements

I thank the University of North Alabama Department of Geography and College of Arts and Sciences for helping fund this research and conference travel. I also thank my thesis advisor, Dr. Susan Timms who has aided in the development of this research.

Presented at UNA Scholars Week, Florence, Alabama, April 22-24, 2019.

References


