**March 13, 2020**

**Modeling the factors that affect mosquito abundance which promotes malaria spread**

**Temperature**

1. Building a temperature-dependent, stage-specific, DDE that incorporates diapause and mortality due to other factors (density-dependence and competitions) apart from temperature?
2. Analysis of possible shifts in malaria spread in response to climate warming.
3. Calculating the basic reproduction number (R\_0) at different temperatures in a given year.

**Moisture/Rainfall**

1. Anopheles usually develop in natural water bodies, such as puddles, pools or streams. The model will take into account two critical parameters in a water body, the temperature and the volume of water.

**Treatment:**

1. Analyses of stage-specific treatment effects on controlling adult mosquito abundance.

**References:**

1. Beck-Johnson, L. M., Nelson, W. A., Paaijmans, K. P., Read, A. F., Thomas, M. B., & Bjørnstad, O. N. (2013). The effect of temperature on Anopheles mosquito population dynamics and the potential for malaria transmission. *PLOS One*, *8*(11).
2. Beck-Johnson, L. M., Nelson, W. A., Paaijmans, K. P., Read, A. F., Thomas, M. B., & Bjørnstad, O. N. (2017). The importance of temperature fluctuations in understanding mosquito population dynamics and malaria risk. *Royal Society open science*, *4*(3), 160969.
3. Ewing, D. A., Cobbold, C. A., Purse, B. V., Nunn, M. A., & White, S. M. (2016). Modeling the effect of temperature on the seasonal population dynamics of temperate mosquitoes. *Journal of theoretical biology*, *400*, 65-79.
4. Parham, P. E., & Michael, E. (2010). Modeling the effects of weather and climate change on malaria transmission. *Environmental health perspectives*, *118*(5), 620-626.