Title Page

Affects of wetlands on the population of Anophelous Mosquitos and the spread of Malaria!

New Mexico Supercomputing Challenge Final Report

April 2, 2014

Team 45 Cottonwood Valley Charter School

Team members: Catalina S. Petrie and Samantha T. Hurtgen

Mentor: Erick Chavez, student, New Mexico Tech, department of engenering.

Correspondence: catson1231@gmail.com

Running title: Using StarLogo to analize population density in wetlands!

Describing Model

We used StarLogo to create a basic enviroment to simulate the conditions in which Malaria flourisious. We bagan by creating the breeding grounds simuated by a simple modification to the terrian. The patch colors were changed from blue to green in order to give the Anophelous agent its breeding grounds and a sorce for the Malaria virus to begin its spread. We created simple human agents who had several variables that helped decide if they were septible



The first of the variables that we used was giving them a chance of contracting the virus by having a low immune system and this was decided by random value between one and onehundred. The next variable that helps decide whether the human becomes sick is the possibility of the moquito transfering the virus. According to our research we found that peolpe could overcome the illness and we modled this by giving the humans a possibility to recover.



The way we programed this value from one to onehundred. Aside from the human we also created a basic representation of the Anopheles mosquito. The first thing we had to do is simplify the Anopheles mosquito to be all femals because they are the only carriers of the malaria virus and the only ones who feed on blood.



Knowing that the female mosquito requires blood to reproduce we set them to hunt humans to feed on them and possibly infect them with the Malaria virus. For both humans and mosquitos we set an energy variable to have them die if they run out of energy. This encompases the frame of our model and how we test it for our question.

Verifying and Validating model

We researched that mosquito's like damp and humid environments and can adapt very easily. Female Anopheles mosquito's are the only ones who can transmit the Malaria virus because they're the only ones who feed on blood and can get their saliva mixed into the human bloodstream. It takes 6-17 days for the malaria virus to incubate. Malaria symptoms come in waves or stages of 48,72 and 27 hours. A person with the malaria virus can reach a fever of 106 degrees. If a healthy human were to hypothetically get infected with the virus their body can kill 90% of the virus. It takes 7 days for mosquito larva to mature and they can only reproduce 20-24 hours after fully matured.

Results

At the current state of our model the results are not in complete detail. What we can derive from the model is that the size of the breeding grounds do affect the rate at which malaria spreads. The way we were able to see this is because the mosquito's took longer to die when the breeding grounds were larger thus having more interactions with the humans.

Conclusion

From the results that we were able to obtain we concluded that our simple environment supports our initial hypothesis this being that a larger humid environment will better cultivate the malaria virus.

Biggest accomplishments

Getting through everything up to this point. Finishing the lake. Making the mosquito's hunt the humans.

Work sited

Cunningham, Kevin (2009). Diseases in History: Malaria. Greensboro, North Carolina. Morgan Reynalds publishing inc.

Eisner, Thomas & Wilson O Edward (1977). The Insects: readings from Science American. San Franciso Calafornia. W. H. Freeman.

Unknown Author, (November 9, 2012). About Malaria. CDC.gov