How Does Controlled Flooding Affect The Environment Around It?

New Mexico

Supercomputing Challenge

Final Report

April 1, 2021

Group 33

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We began our project by researching beavers and their behavior. This led us to the idea of dams and therefore controlled flooding. We then began talking about our project with our sponsor teacher, Mr. Vigil. With him we were able to begin developing our ideas for this project. We wanted to make a simulation in NetLogo of how controlled flooding affects the environment around it as well as uncontrolled flooding.

We began our project by creating the water and the world it moves around in. We decided not to add elevation as it made the water behave more like rain than a flood from a dam. We then began to add rabbits to represent wildlife and simulated how they would react to a flood. We made wheat to represent a field of crops and trees to represent mangroves and orchards.

Later, we added the more complex elements of the simulation. We made the rabbits want to try and run away from the water as well as trees falling down and blocking rabbits from escaping the flood waters. We programmed the rabbit's, crop's, and tree's drowning rates and had them die when in water for an extended period of time. Finally we coded in a way for rabbits to escape the flood as hiding in trees to escape the water. However, if the tree falls down then all the rabbits inside would die.

After we finished coding the simulation, we began to run it and record our results. We found that many more organisms survived in the smaller floods (simulating a smaller, controlled flood) than did those who survived the larger floods (simulating the larger uncontrolled floods that get out of hand). Our hypothesis was correct. We predicted that the controlled flood would be less devastating than the uncontrolled flood and we were correct. We learned that controlled flooding does work and is better for the environment.

In conclusion, we learned much about controlled floods and what they do for the environment, people, and property. We learned that controlled flooding is significantly better than uncontrolled flooding for the land and animals it would affect. After analysis of our results we also learned that most rabbits who survived the flood survived in the trees. This led us to the conclusion that more rabbits would live while hiding in trees, burrows, etc. Finally, we would like to thank Mr. Vigil, and Mr. Daugherty.