Human effects on natural ecosystems

New Mexico

Supercomputing challenge

Final Report Team 28

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Table of Context

Executive Summary

The program helps to provide visual representation of the effects humans have on their environment. Through the program, we learned that key species extinction is more detrimental to environmental stability than habitat loss. The program uses energy values and energy gain to help determine reproduction and death for our animals. Using this as a tool, we hope to determine the consequences of human exploitation upon nature.

Problem

We are investigating how human activates effect the balance of nature; the effects of human activities, like hunting or habitat destruction on the local wildlife

Method

We first established a predator-prey module, adjusted the energy gain and reproduction to get an approximately “correct” number of animals in our area, then we added several human actions that could be performed, such as removing the predators, turning half of the area into a “farm” which herbivores could not gain energy from, fences which allow small animals to pass through but not larger ones, and other possibilities of human interactions. All of these processes can help to show the consequences for human actions on the local life.

Verification

We based the program on surveys of rabbit populations in the grasslands of California. Knowing the approximate amount of usable energy per acre, we correlated this to other biomes.

Results

In the majority of the tests, the removal of a species is worse in the long term than habitat destruction. Although habitat destruction would cause sudden drops in the population, almost always over time the system would reestablish in the smaller area, but the removal of the species caused various effects, most notably complete collapse of animal life, or In some better cases, a very fluctuate-prone system, with population spikes followed by massive drops where the consumers rapped increase in population would over eat and drain the area of food.

Conclusion

We conclude that humans could reduce their environmental impact by using less land, and more importantly, not over hunting or exterminating a species in an area. Doing so may help ecosystems sustain and preserve themselves longer. This would create a better environment for all animals to live in.

Software

We programed using Net Logo; it is a good program for beginners and provides immediate visual recreation to help show the consequence or human actions

Achievement

The greatest achievement we gained from the project is a greater knowledge of the programing language, and a better frame of mind to help programing endeavors in the future. Being able to use these programs to map out what may happen in an ecosystem may help in the future to map out problems that are currently occurring.

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