

Team number:

School name: Santa Fe High School

Area of science: Environmental science

Project title: The real Bee movie

What is the problem?

As we've seen or heard in media sources, news, radio talk shows, memes and almost every other thing that the bee population is dropping, some media outlets will say "the bees aren't in immediate trouble, so we shouldn't worry too much" and I couldn't disagree more. Although the bees aren't extinct at the moment I think it's completely necessary to worry because if we don't worry now, it'll be too late when we do start to worry. As we could see in global research "What's Killing the World's Bees? The Role of Fungicides" by Rt News (https://www.globalresearch.ca/whats-killing-the-worlds-bees-the-role-of-fungicides/5624598?utm_campaign=magnet&utm_source=article_page&utm_medium=related_articles) some of factors in the decline of the bee population could be pesticides, destruction of their habitats, disease and climate change. You might ask yourself "why should I care about the bees?", 75% of the earth's crops are pollinated by the bees and if the bees die off we might as well tie our nooses as well because there will be famine and more disease, because plants also clean our oxygen and make this earth inhabitable. Even some of the brightest minds till today state that without bees there would be hardly any life of this earth, for example "If the **bee** disappeared off the face of the Earth, man would only have four years left to live" said by Albert Einstein. This is more than my problem but the world's problem.

How are we going to solve this problem computationally?

The language we're going to be using is netlogo, most of us in our team are really familiar with Netlogo and feel like we're fresh in the mind when it comes down to Netlogo. We're not sure if we're going to be using the 3D version or 2D. We're going to be breed the bees and make them a species, then we'll make flowers to represent the pollination host, we'll place the plants on the ground then we'll have the bees move in a random manner but get closer to the flowers, when they get on the flowers we'll have some kind of tick that'll give them time to pollinate then that go on for a little bit then we'll add one of the the elements that contributes to the death of bees such as a pesticide then after a while we'll add another element such as climate change which kills the flowers which then leads to more deaths then after I'll add another element which will be a bee with a sickness that will spread the disease, then we'll see the results from their. I'm going to make emitters to represent the pesticide then for the flowers we'll put less living time then for the sick bee we'll add a variable which count as sick equal to true.

How much progress have you made?

The progress we have made in our project hasn't been much but we did our full research and we're writing notes on how we can make some of the functions work, such as talking about them in class researching the netlogo dictionary to make sure the functions have a possibility. We have also assigned the roles of what specific members want to do, for example if a member

is specifically good at making the placements of certain things, we'll assign them to what they're most comfortable with. We have made some thorough research on some of the ideas, hypothesis and research, some of us in the group have watched videos on bees and how their movement pattern is and how they pollinate, so we have a really good idea on how we're going to make some of the functions. We have also created the file and named it. Although we have not made too much progress inside the actual code but we're ready, set and starting.

What results do you expect from this project?

When we finish our project we expect the simulation to work. By work I mean we want the simulation to fully comply with our code, we want the bees to be flying towards the flowers and stay there for the ticks we ask for then we need the flowers to give the bees more life when done, then when we introduce the pesticide we need the emitters to stick to the flowers and decrease their health and decrease the bees health, then when we change the climate we want to put the flowers to last less by setting the tick limit lower, and then when we release the sick bee we want the disease to spread when it touches other bees for more than 2 seconds, we hope to make this project work and comply with our code. We could definitely manage this by working together and researching. But when it comes down to a social construct, we expect to learn from this and see how we can work under a little pressure, we also hope this could help us learn how to work in groups or with other people so when the time comes, we have the patience and knowledge to get the work done.

Team members

David Chamberlain, Ricky Martin, Noah Snow and David Salazar-Reyes

Sponsor teacher

Brian Smith.

Bibliography

<http://www.pnas.org/content/108/2/662.full>

"Patterns of widespread decline in North American bumble bees" by Sydney A. Cameron, Jeffrey D. Lozier, James P. Strange, Jonathan B. Koch, Nils Cordes, Leellen F. Solter, Terry L. Griswold
Published on January 3, 2011

<http://knowyourmeme.com/memes/bees-are-dying-at-an-alarming-rate>

"Bees Are Dying at an Alarming Rate" by My name Jeff Published May 2017

https://en.wikipedia.org/wiki/Colony_collapse_disorder

"Colony collapse disorder" by Wikipedia

<https://www.globalresearch.ca/death-and-extinction-of-the-bees/5375684>

"Death and Extinction of the Bees" by Joachim Hagopian published November 08, 2017

https://www.globalresearch.ca/whats-killing-the-worlds-bees-the-role-of-fungicides/5624598?utm_campaign=magnet&utm_source=article_page&utm_medium=related_articles

"What's Killing the World's Bees? The Role of Fungicides" by RT News Published 30 December 2017