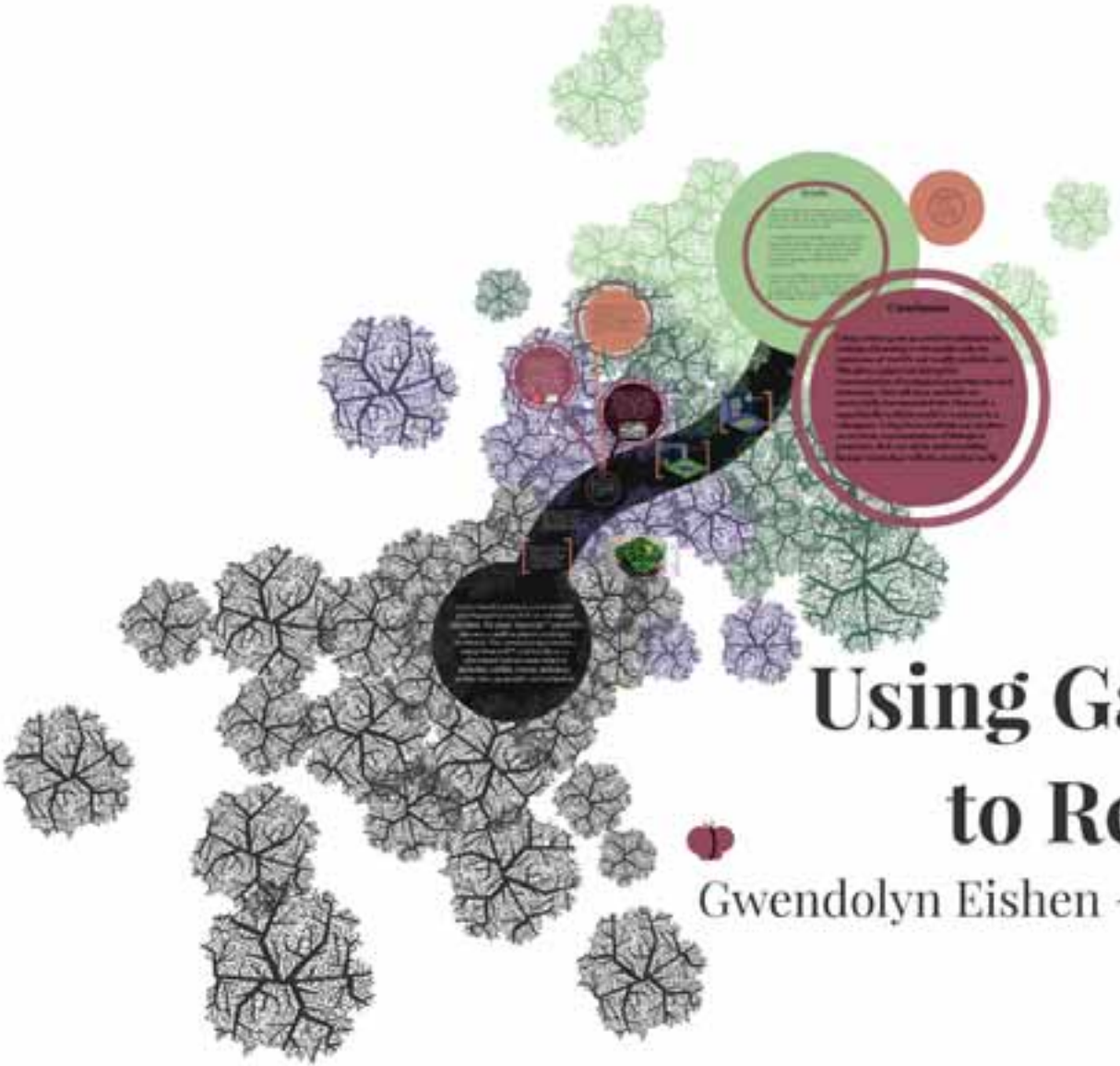
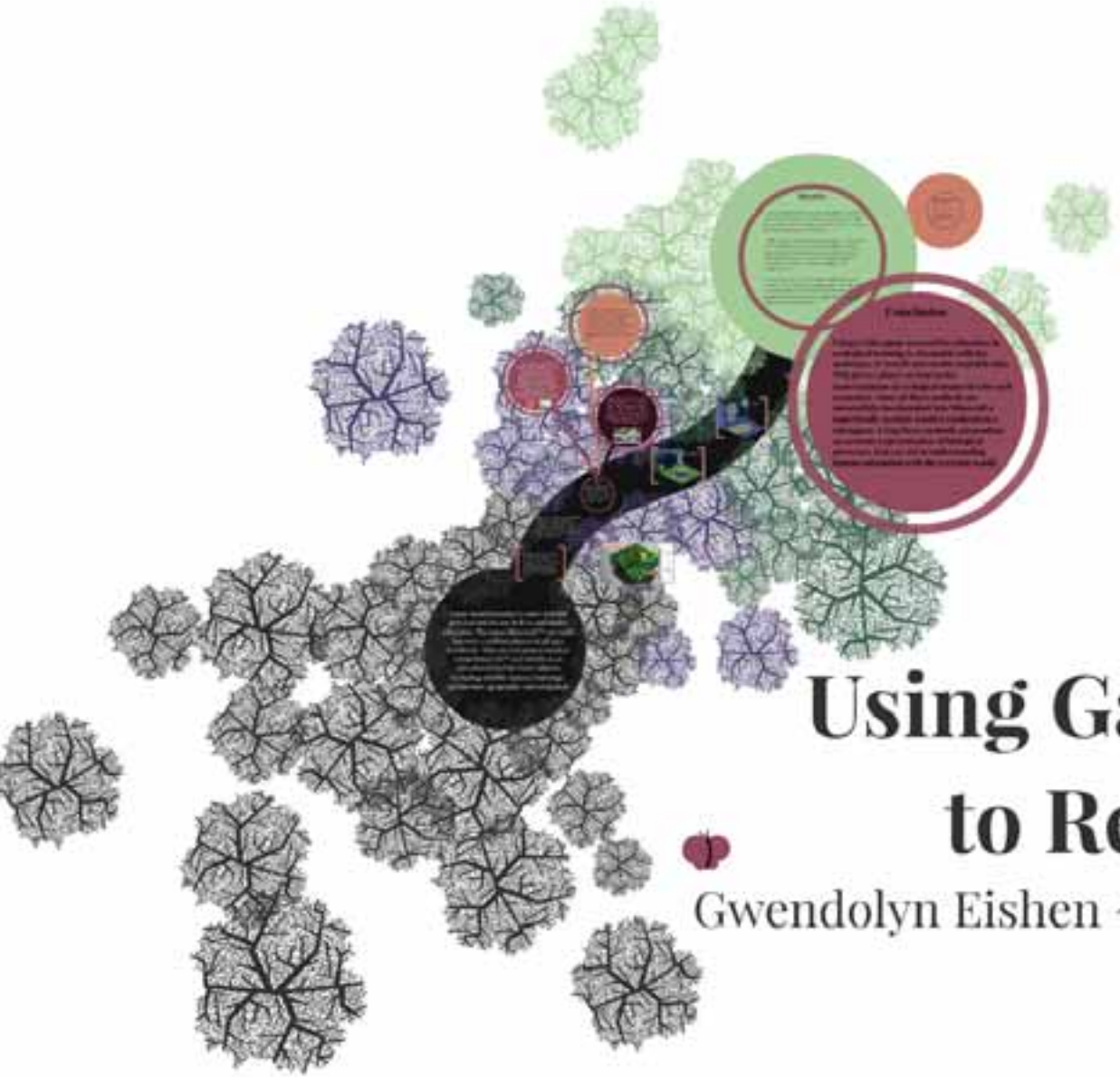


Using Game Based Learning to Rebuild Education

Gwendolyn Eishen ~ Texas A&M University-Commerce



Using Game Based Learning to Rebuild Education

Gwendolyn Eishen ~ Texas A&M University-Commerce

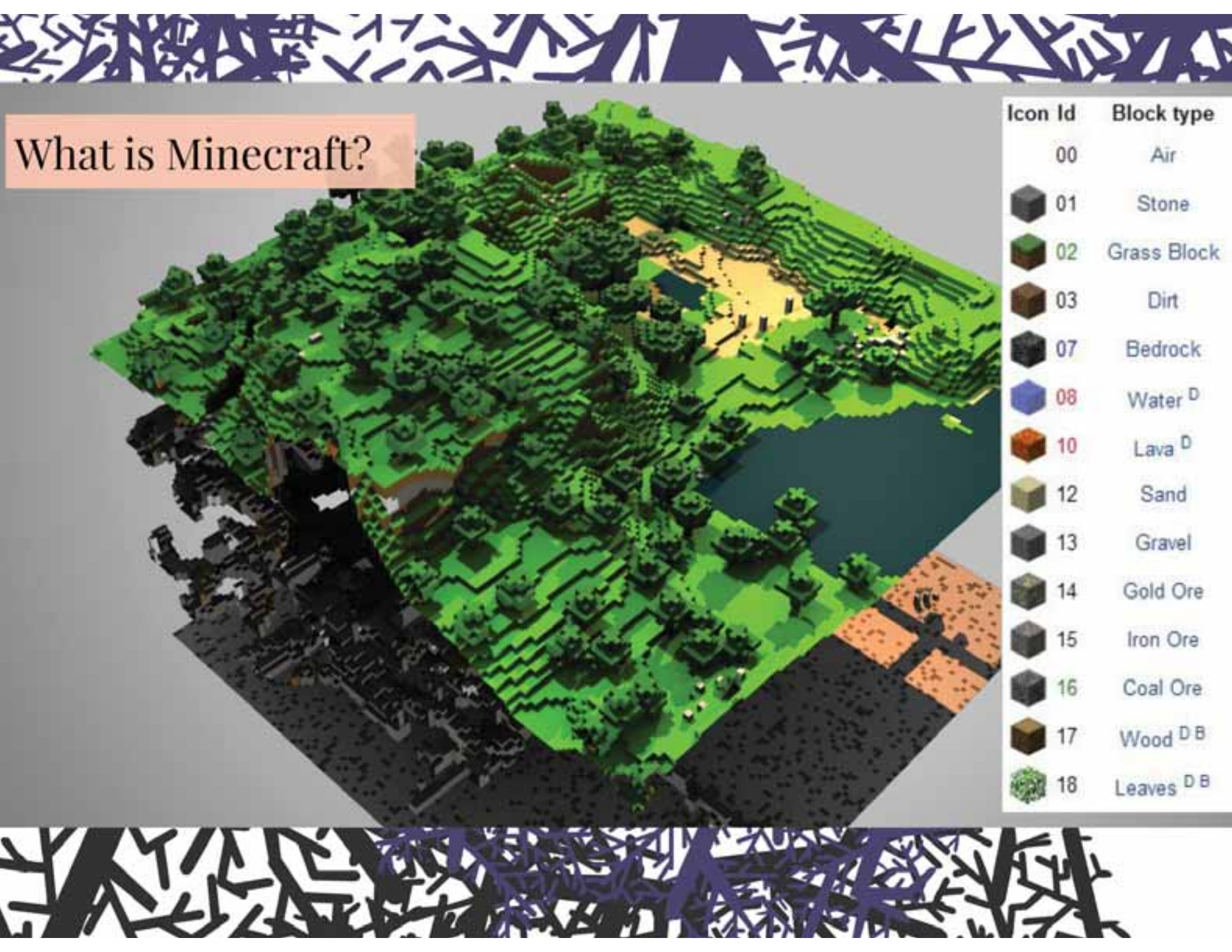
develop a deeper cognitive understanding of how ecological processes interact and respond to disturbances.

Game-based learning is a new and fast growing tool for use in K-12 and higher education. The game Minecraft™ currently has over 12 million players of all ages worldwide. This current project involves using Minecraft™ and ArcGIS as an educational tool for many subjects including; wildlife, botany, hydrology, architecture, geography, and navigation.

- Using the game's ability to alter the graphics and simple coding enables a manipulation for a variety of parameters(animals and plant species, soil types, natural ore, building materials).
- These are used to represent real world organisms and environmental variables at a level that any player can comprehend and interact with.
- This sets up a situation in which the user can develop a deeper cognitive understanding of how ecological processes interact and respond to disturbances.

This, in turn, could assist in bridging the gap in between understanding the physical world and human impacts on it. Assisting students understand these variables at an earlier stage could progress the basic foundation we set for every level of learning.

What is Minecraft?



Icon	Id	Block type
	00	Air
	01	Stone
	02	Grass Block
	03	Dirt
	07	Bedrock
	08	Water [D]
	10	Lava [D]
	12	Sand
	13	Gravel
	14	Gold Ore
	15	Iron Ore
	16	Coal Ore
	17	Wood [D B]
	18	Leaves [D B]

Method

This project is directed towards specific ecological biomes with significant biological characteristics . Using GIS data from sources such as USGS.com and TNRIS.org, layers with geology, species distribution, and surface water are produced in ArcGIS. Maps are made with data pertaining to the ecological locations to be represented in Minecraft. Analysis of geography and placement of variables are conducted to insure that the version made in the game is as functionally realistic as possible.

1.Pixelated graphics of certain individual blocks were modified by color and pattern. This process gives the opportunity to signify a specific plant /animal species or natural ore through its texture in Minecraft. (in progress)

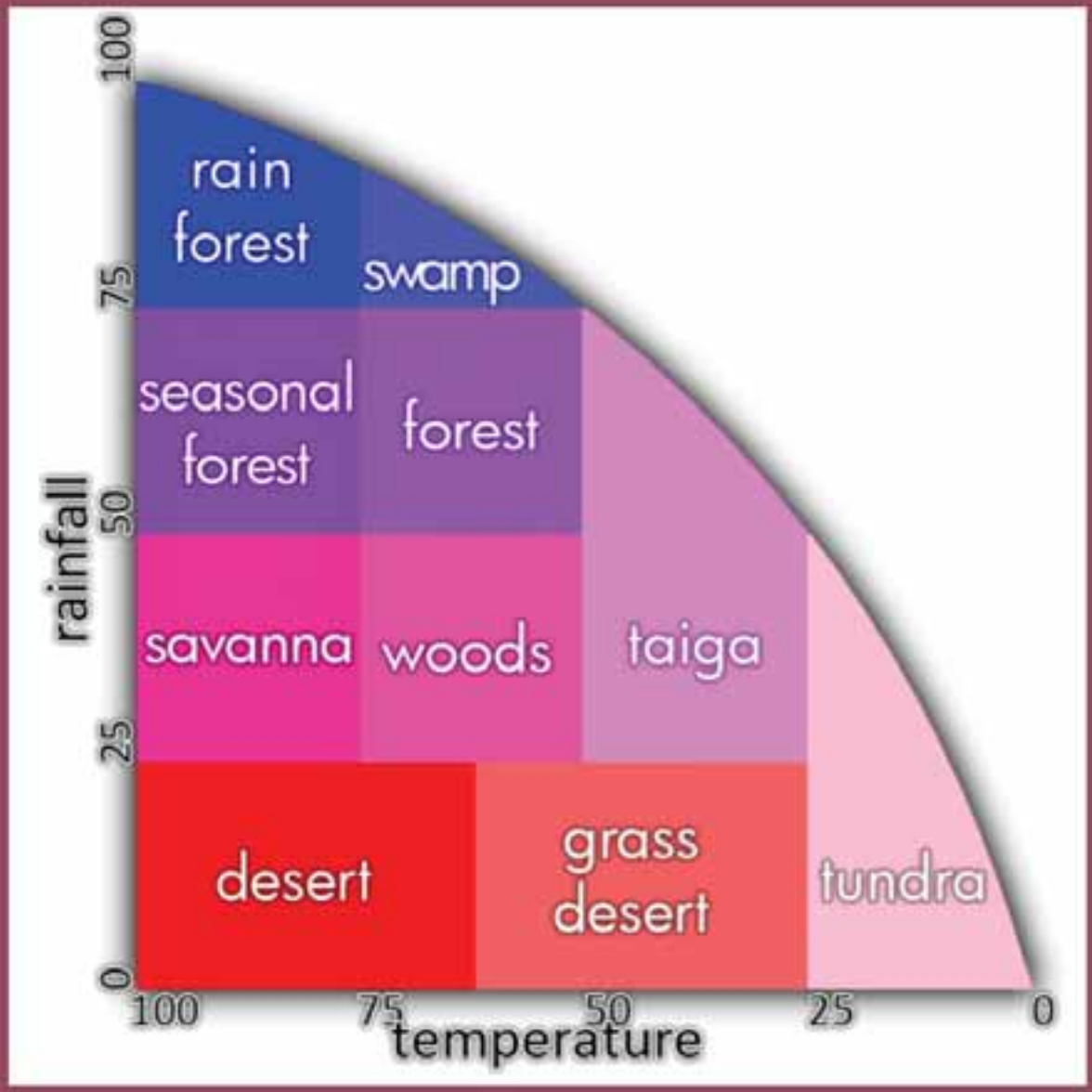
Jaguarundi
Puma yagouaroundi

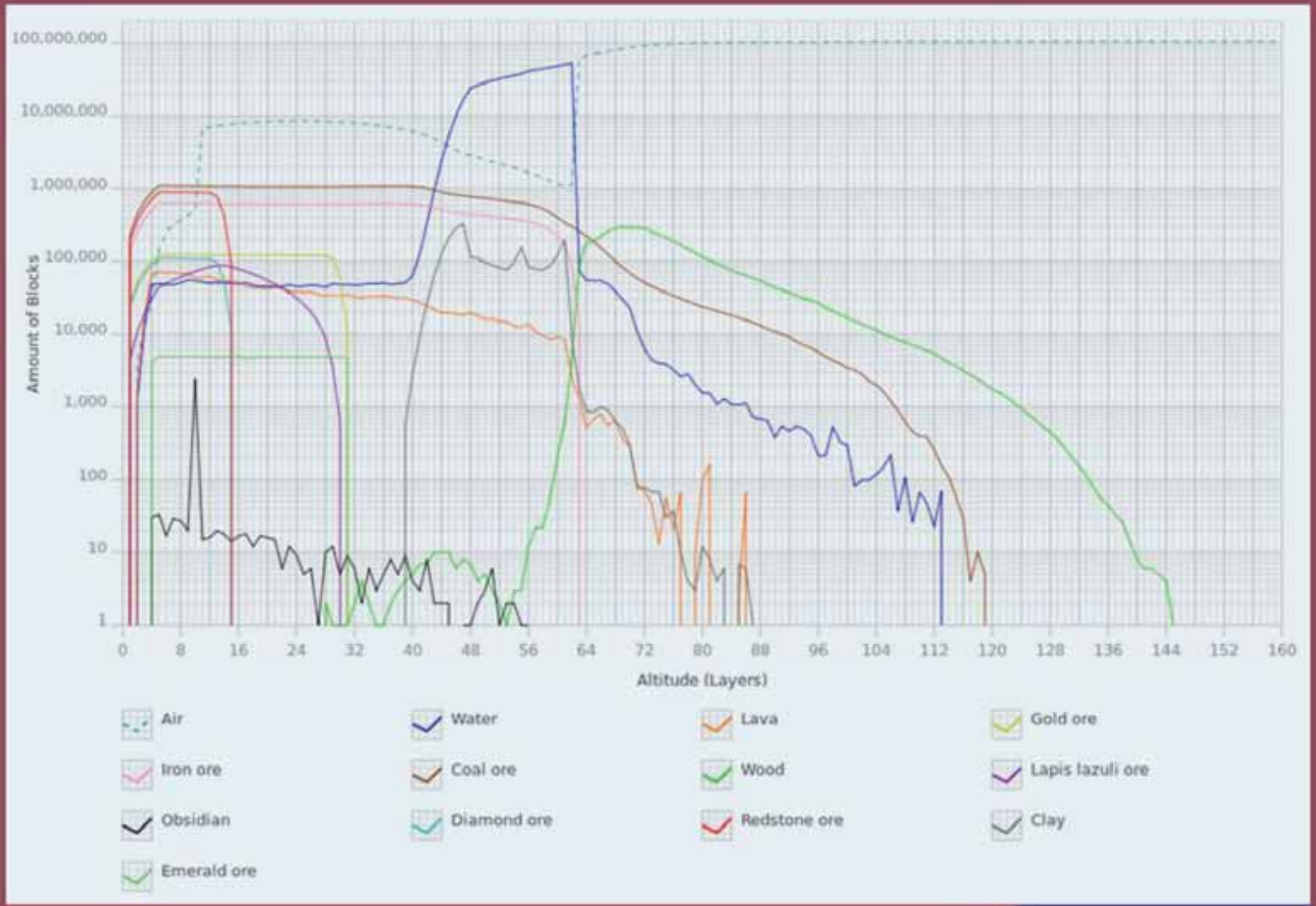
Ocelot
Leopardus pardalis

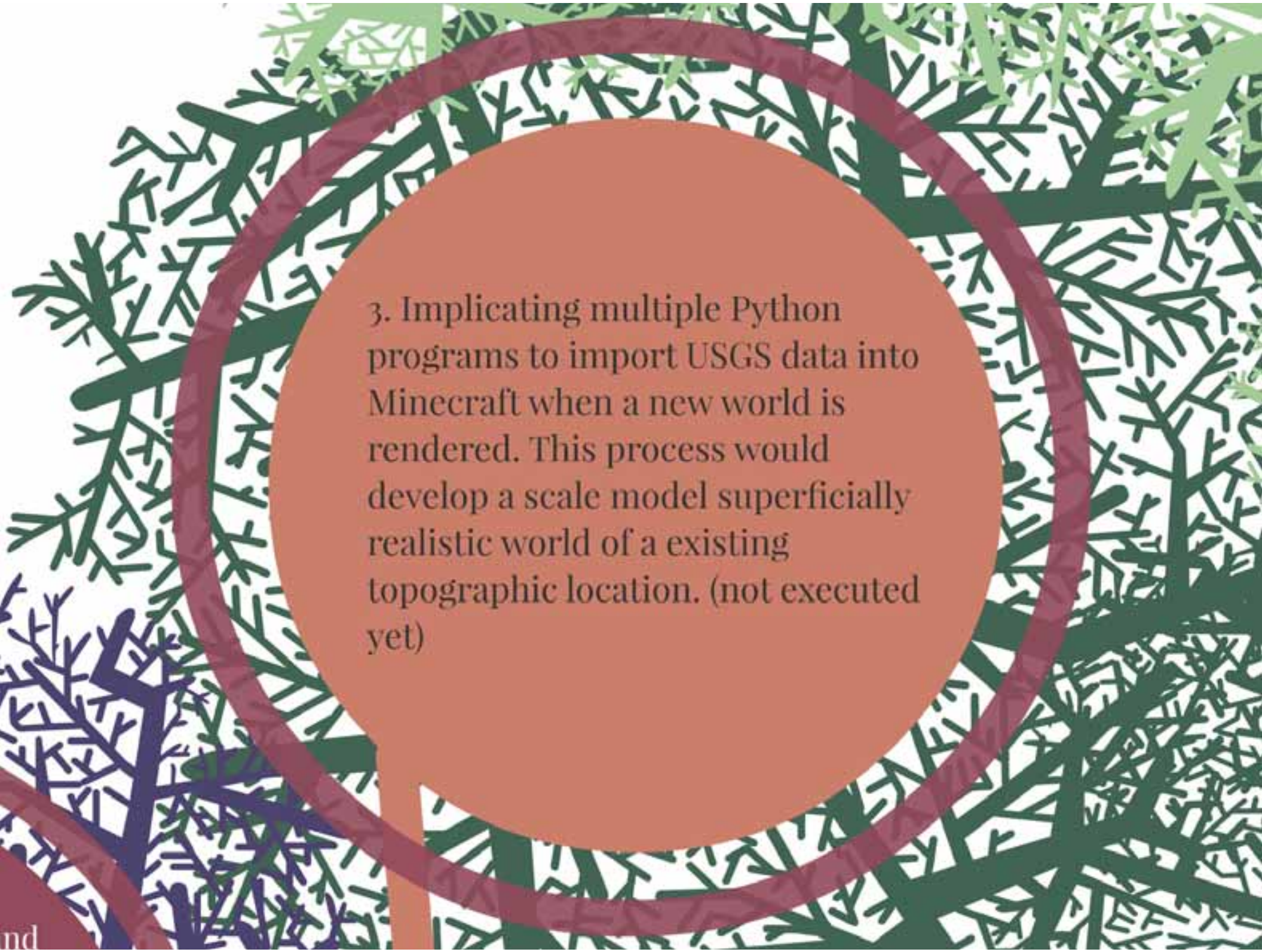
Grey Wolf
Canis lupus

Attwaters Prairie Chicken
Tympanuchus cupido attwateri

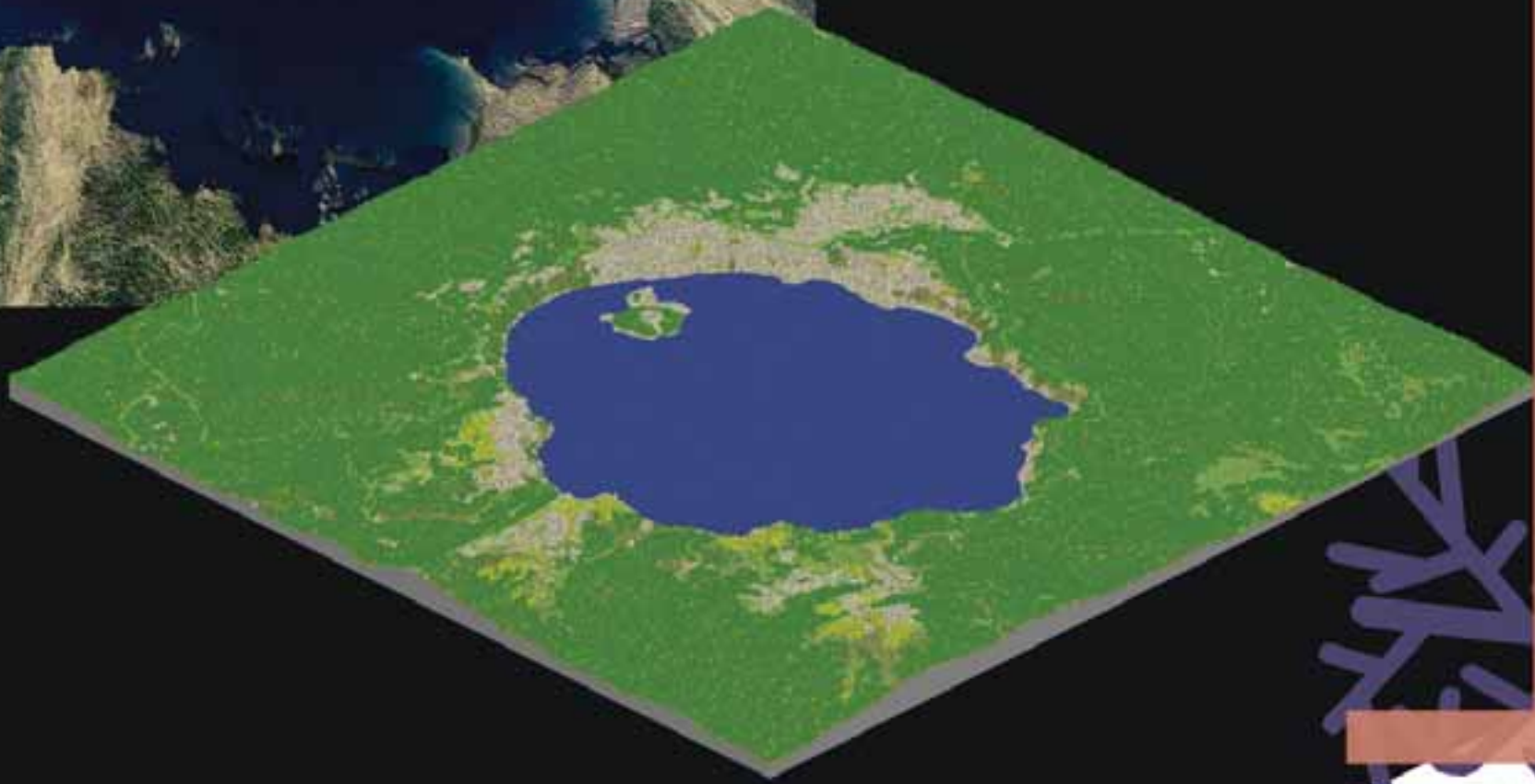
2. A conversion of the graphic and rendering code of the basic games' software allows control over placement and percentage of inhabitance for each parameter. Minecraft gives each block an algorithm in which they must follow in growth, movement, and distribution, and this process offers manipulation to each.(in progress)


rain forest
swamp
seasonal forest
forest
savanna
woods
taiga
desert
grass desert
tundra
rainfall
100
75
50
25
0
100
75
50
25
0
temperature


100,000,000
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
Amount of Blocks
0
8
16
24
32
40
48
56
64
72
80
88
96
104
112
120
128
136
144
152
160
Altitude (Layers)
Air
Water
Lava
Gold ore
Iron ore
Coal ore
Wood
Lapis lazuli ore
Obsidian
Diamond ore
Redstone ore
Clay
Emerald ore


3. Implicating multiple Python programs to import USGS data into Minecraft when a new world is rendered. This process would develop a scale model superficially realistic world of a existing topographic location. (not executed yet)

Crater Lake, OR




San Francisco, CA

Results

1. This method of data incorporation offers a strictly visual-only change to the blocks which represent the parameters. Thus allowing a limited but basic medium for physical alteration in the game.

2. This method of data incorporation allows a broader way in which parameters can be modified. Coding conversion gives access to physical and mechanical alterations for each variable changed by altering Minecraft's algorithm for block altitude and disbursement.

3. Once the third method is successfully executed, a "world" can be generated in Minecraft as a scale model of a geographical area on Earth, producing a instant modification of land & water topography that would need no further alterations.

Conc

3. Once the third method is successfully executed, a "world" can be generated in Minecraft as a scale model of a geographical area on Earth, producing a human modification of land & water topography that would need no further alterations.

Conclusion

Using a video game as a tool for education in ecological learning is obtainable with the assistance of ArcGIS and readily available data. This gives a player an interactive representation of ecological properties for each ecosystem. Once all three methods are successfully incorporated into Minecraft a superficially realistic world is rendered in a videogame. Using these methods can produce an accurate representation of biological processes, that can aid in understanding human interaction with the everyday world.

THANK YOU!

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Thank you to Minecraft for allowing me to use their software, Dr. Jeff Kopachena, Amanda Turley, Bear Trust International, Corey Weeks, Joshua Gibbs and Texas A&M- Commerce