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Project Topic Area: Instrumented biological simulation
Project Name: coral-reef-simulation
Github repository: https://github.com/arlysswest/coral-reef-simulation
The repo will have a `README.md` describing the project.
License: MIT + Apache2.0

Project Vision

- Kind of like those gardening games but for coral reef restoration
- Time is discrete
- Rust based
- Run locally on computer
- Use visual studio

How it would work

Main map
- Would display a portion of the overall coral reef
- Would increase with images of corals and decrease as they corals grow and die

Map
- User would click on the map to expand the map
- Once expanded the user can click on a different portion of the map to work on a different portion of the map

Tools
- The user would click on a tool to use it
- The tools would increase the amount of coral displayed and improve the statistics

Message Box:
- It would display congratulatory messages when the coral reef improves
- It would display problem messages when a problem randomly occurs

Statistics
- Would improve when tools are applied
- Would suffer when problems occur

Coral Cover %:

Improve=increase
suffer=decrease
range= 0-100% (healthy Indo-Pacific reefs can be 25–50%; >40% now is considered quite good in 2020s)

starting point: 30–40%

Algae cover %

improve=decrease
suffer=increase
range=0–100% (really sick reefs go 40–70% algae)
starting point: 10%

Water PH

improve= increase
suffer= decrease
range=0–14 (ocean acidification is moving surface ocean toward 8.0 and lower)
starting point: 8.1

Water Temperature (C)

starting point: 26–28°C
improve=stays here
suffer= increase >30–31°C
range= 0–40°C

Tools

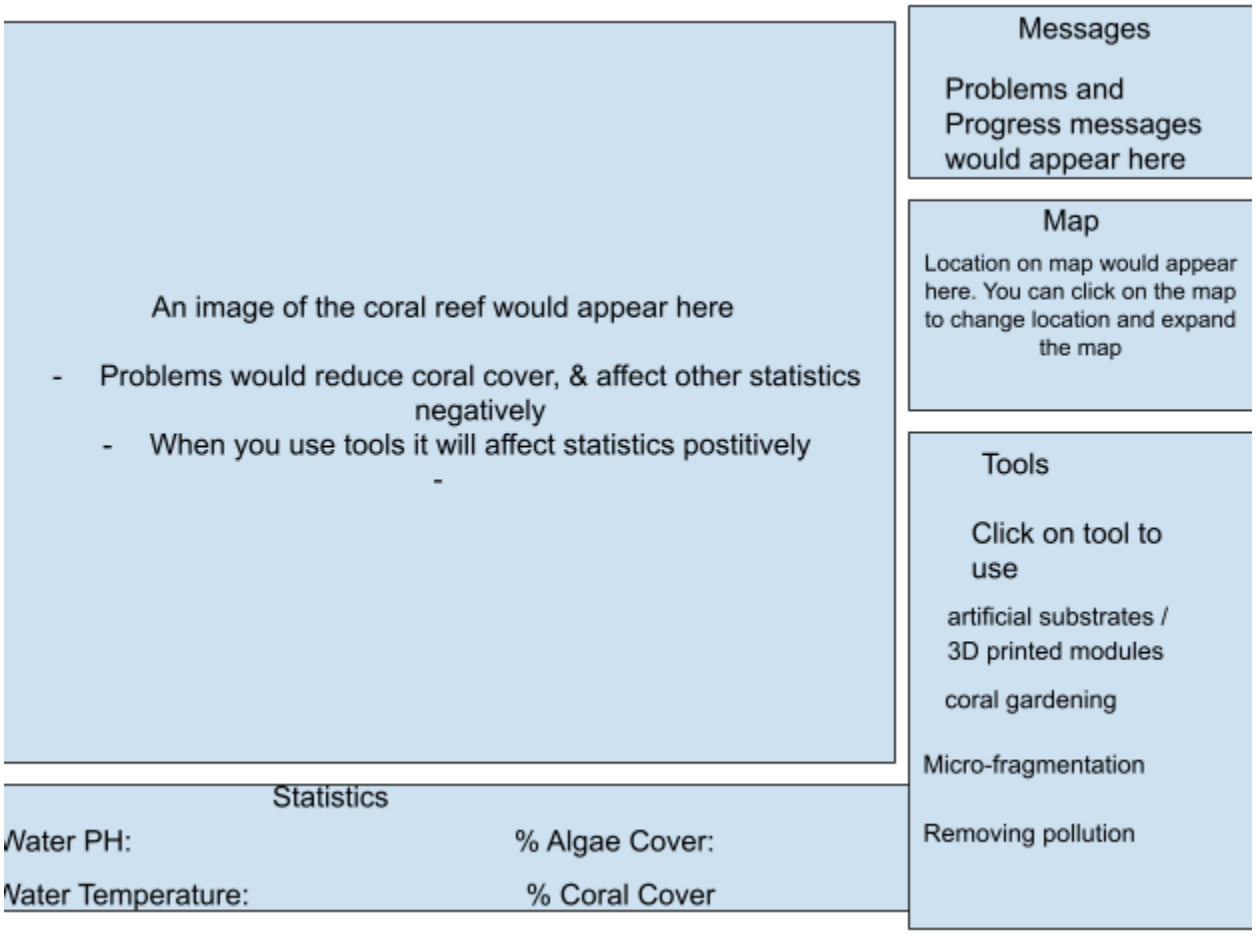
- artificial substrates / 3D printed modules
- coral gardening
- Micro-fragmentation
- Removing pollution

Problems:

- Pollution
- Invasive species
- Co2 emissions
- Storm or physical damage
- Over fishing

Running Statistics

- Water ph & temperature
- % coral cover
- % Algae cover



Project Concerns

- I need to do research about how I want to structure it and what tools I may need
- I think it would be fun to do some basic visuals so that's something I want to look into