Tri-C's Extreme Green Ecosystems Experience

Spring 2017 Independent Study Project by Steven Fairley
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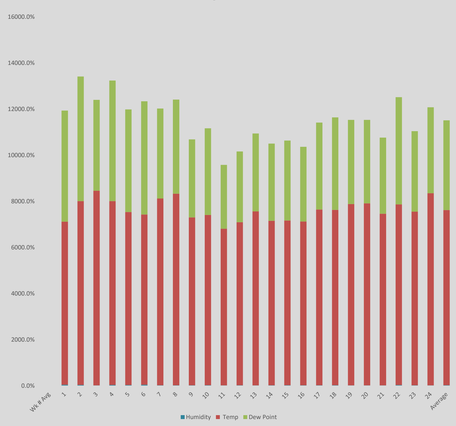
Abstract

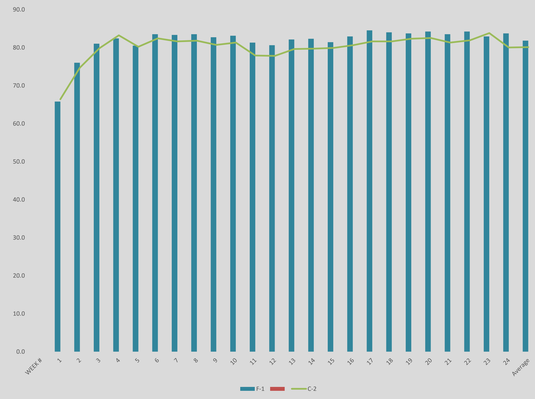
I am researching an eXtreme Green solution that can potentially optimize the world's water and food resources. EXtreme Green is a concept originally developed at NASA's GreenLab Research Facility where renewable, alternative, and sustainable techniques were researched and implemented. I am utilizing two portable, self-sustaining renewable ecosystems containing three plant species (*Lima camelina, Salicornia europea,* and *Salicornia subterminalis*). I am also investigating a climatic adaption technique by salinitizing each ecosystem from freshwater to beyond seawater levels and only use *Poecilia* species fish (Freshwater Mollies) as a natural fertilizer to provide essential nutrients for the plants. I am conducting a 24-week study with a goal of developing reliable, portable, self-sustainable, renewable ecosystems that can be implemented worldwide.

Project Objective: Utilize Tri-C Metro's Greenhouse to expose students to a hands on STEM project that provides real-world laboratory experience.

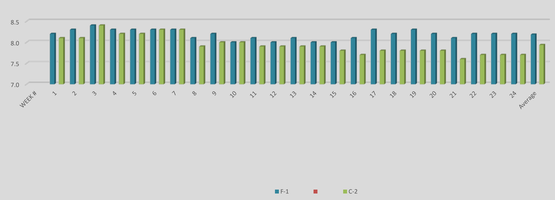
Atmospheric Data



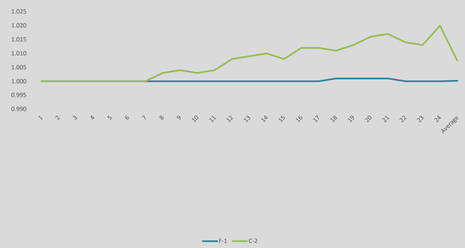
Temperature Data



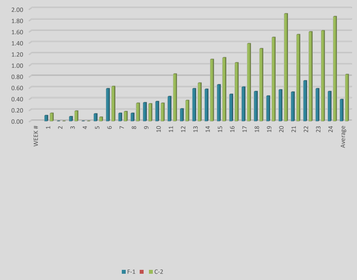
Ph Data



TSG Data



Phosphate Data



Future Goal: We hope to climatically adapt our ecosystem to saltwater levels and have these ecosystems replicated in STEM classrooms across the United States to promote eXtreme Green Concepts.

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REFERENCES

Bomani McDowell, B. M., Hendricks, R. C., Elbulik, M., Okon M., Lee, E., Gigante, B. (2011). NASA's GreenLab Research Facility: A Guide for a Self-Sustainable Renewable Energy Ecosystem. NASA Technical Publication (NASA/TP-2011-217208).