

Impact of Reliability Techno- economics

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Acknowledgements



David Quiroz



Jonah Greene



U.S. DEPARTMENT OF
ENERGY

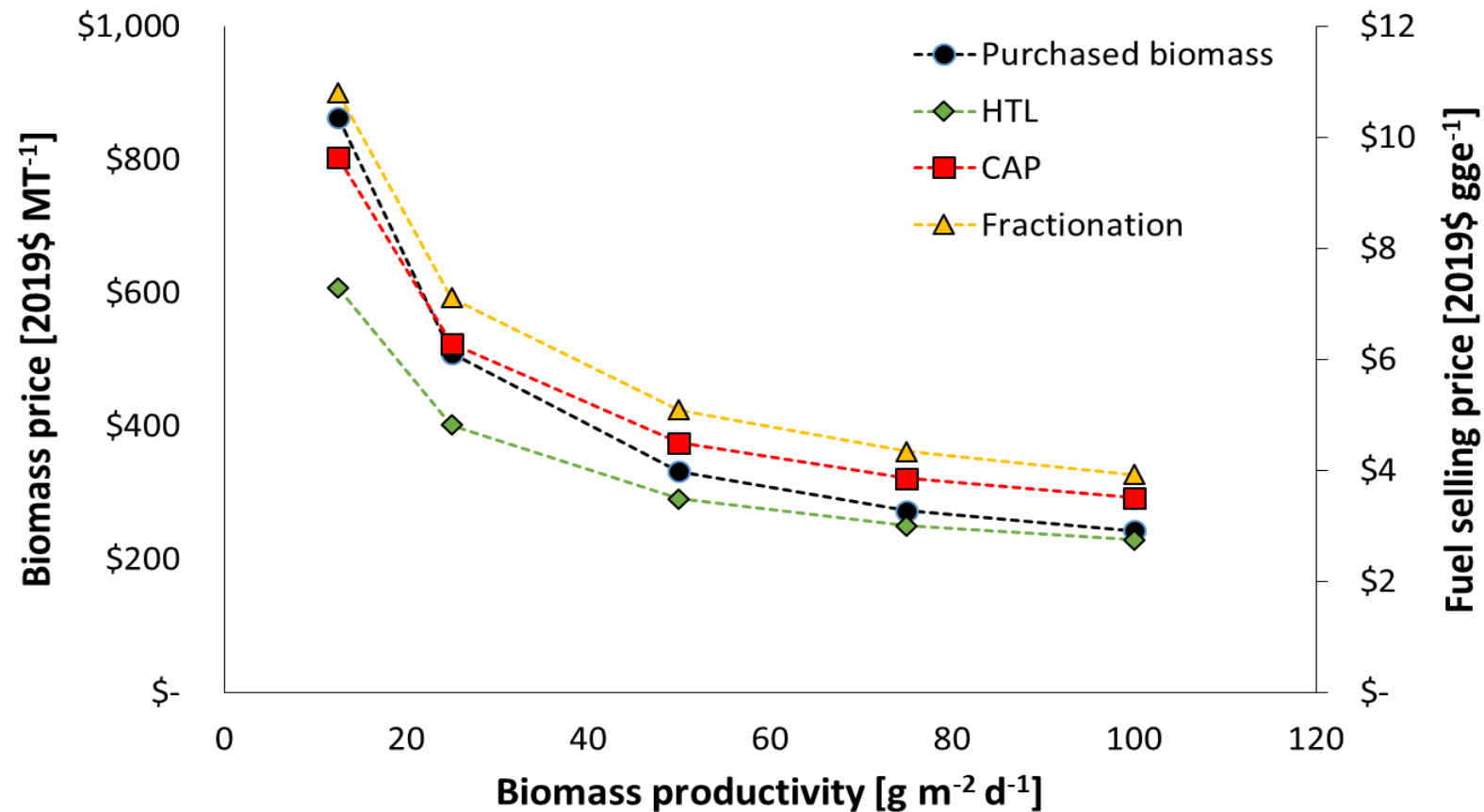
AzCATI

Arizona Center
for
Algae Technology *and* Innovation



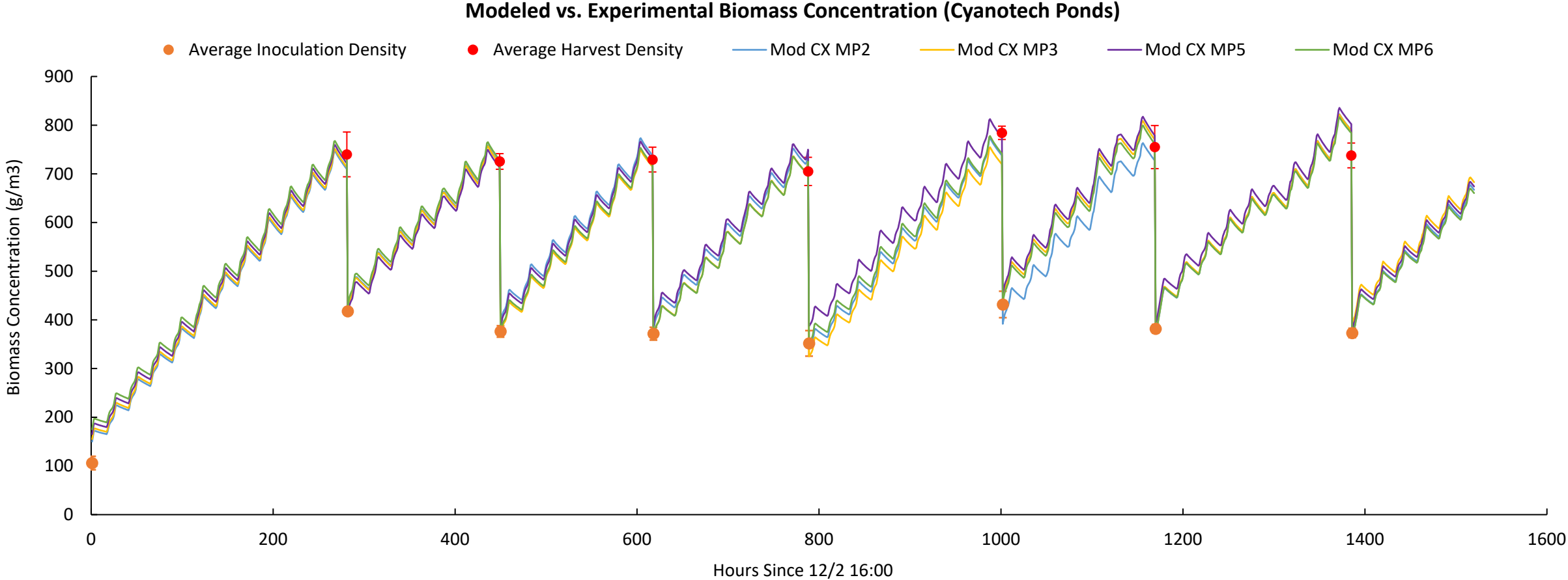
POWERHOUSE
ENERGY CAMPUS
Colorado State University

Short Story: Anything that hits productivity hits the economics



Cruce, Jesse R., et al. "Driving toward sustainable algal fuels: A harmonization of techno-economic and life cycle assessments." *Algal Research* 54 (2021): 102169.

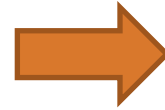
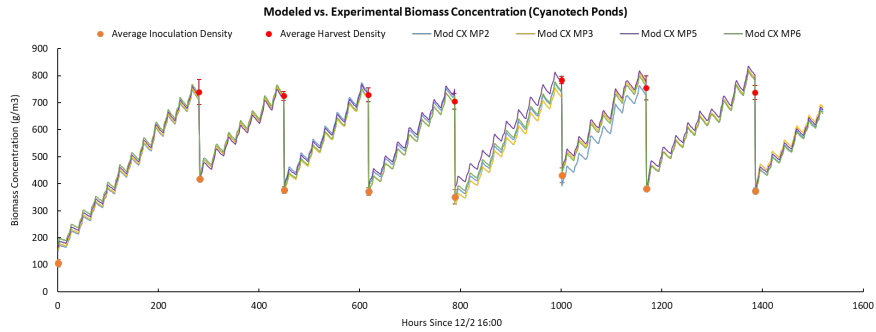
Growth Modeling Including Crashing



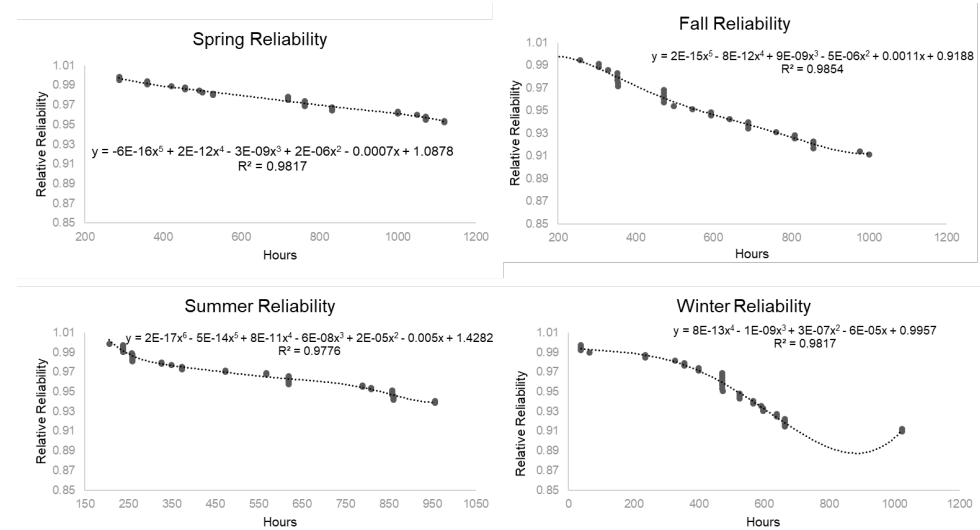
Greene, Jonah M., et al. "A validated thermal and biological model for predicting algal productivity in large scale outdoor cultivation systems." *Algal Research* 54 (2021): 102224.

Growth Modeling Including Crashing

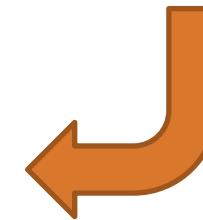
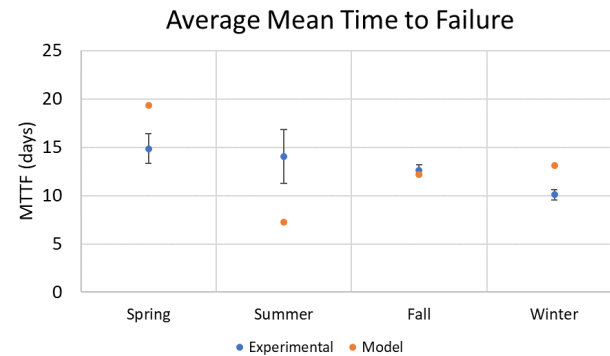
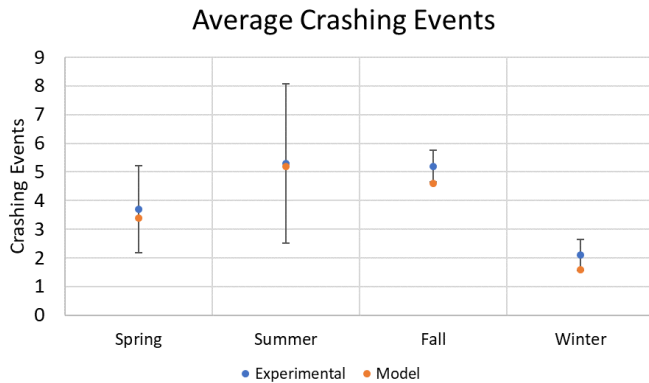
Validated Growth Modeling



Reliability Data

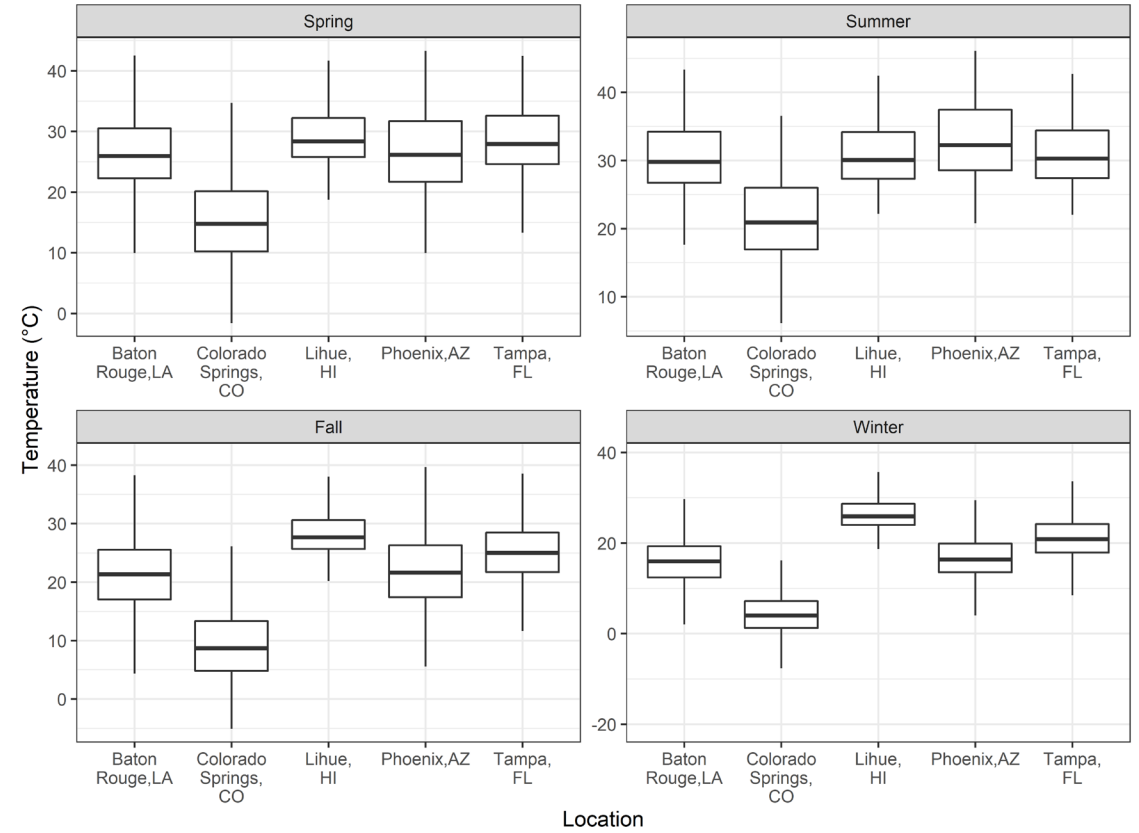
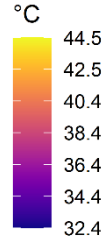
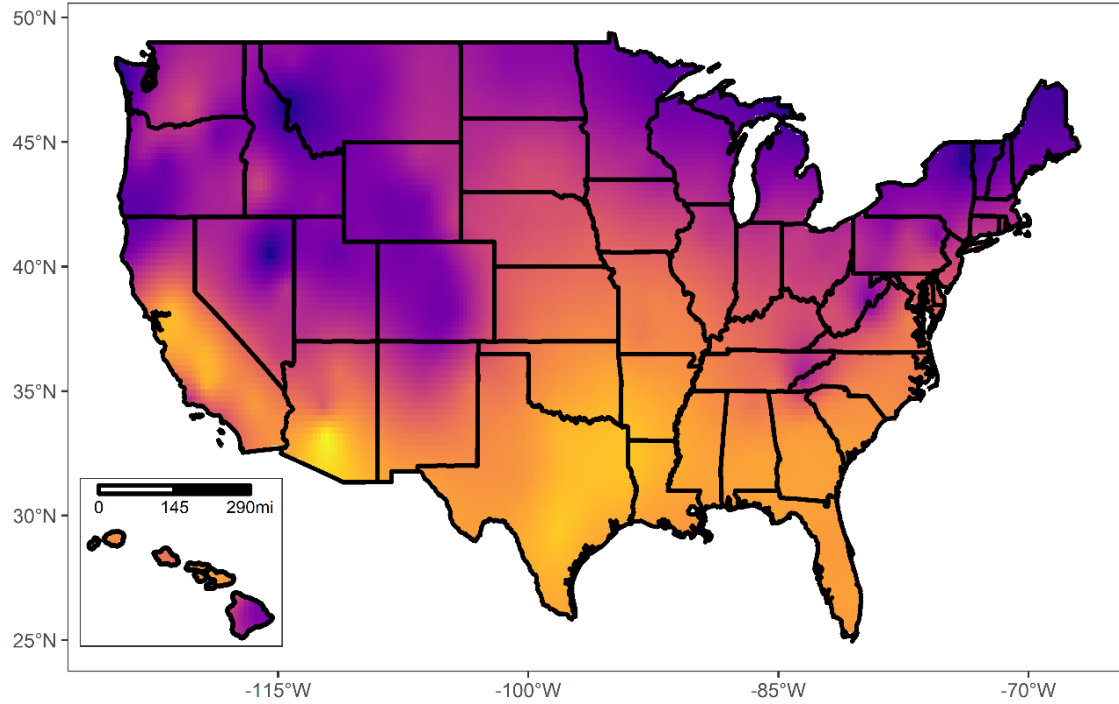


Validated Growth Modeling Including Crashing



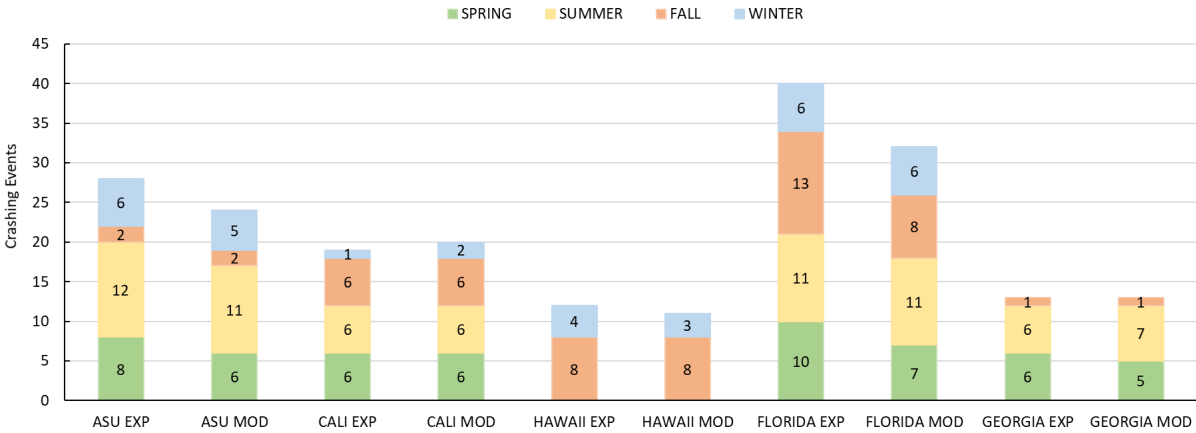
Temperature

Mean maximum pond temperatures



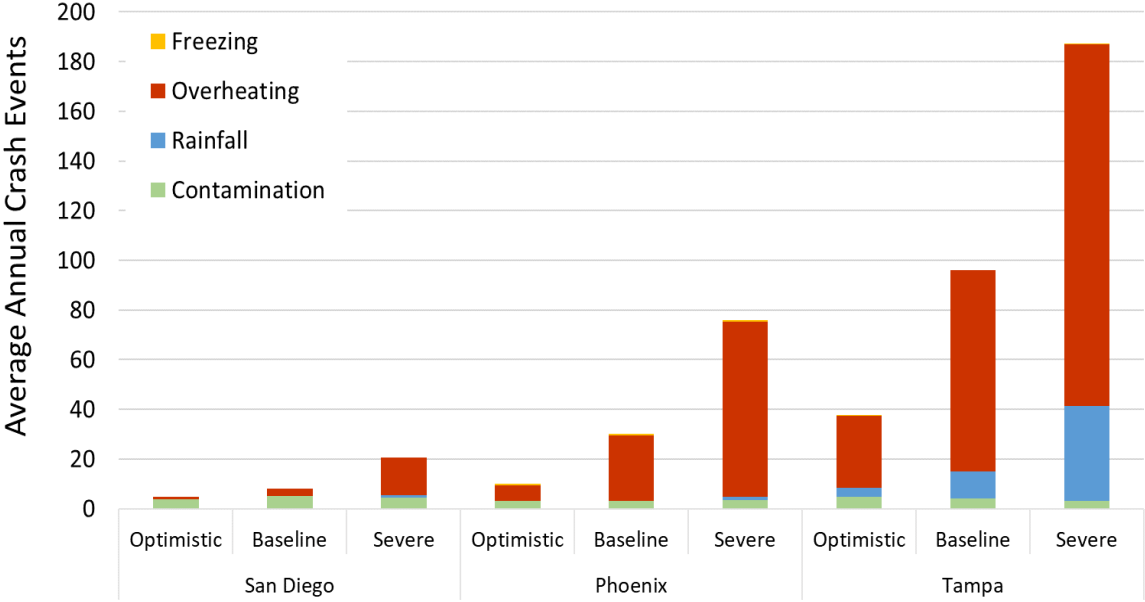
Case Studies Results – Crash Model

Modeled vs. Experimental Pond Crashing Events (Crash check interval = 8 hours)



Culture crashing events

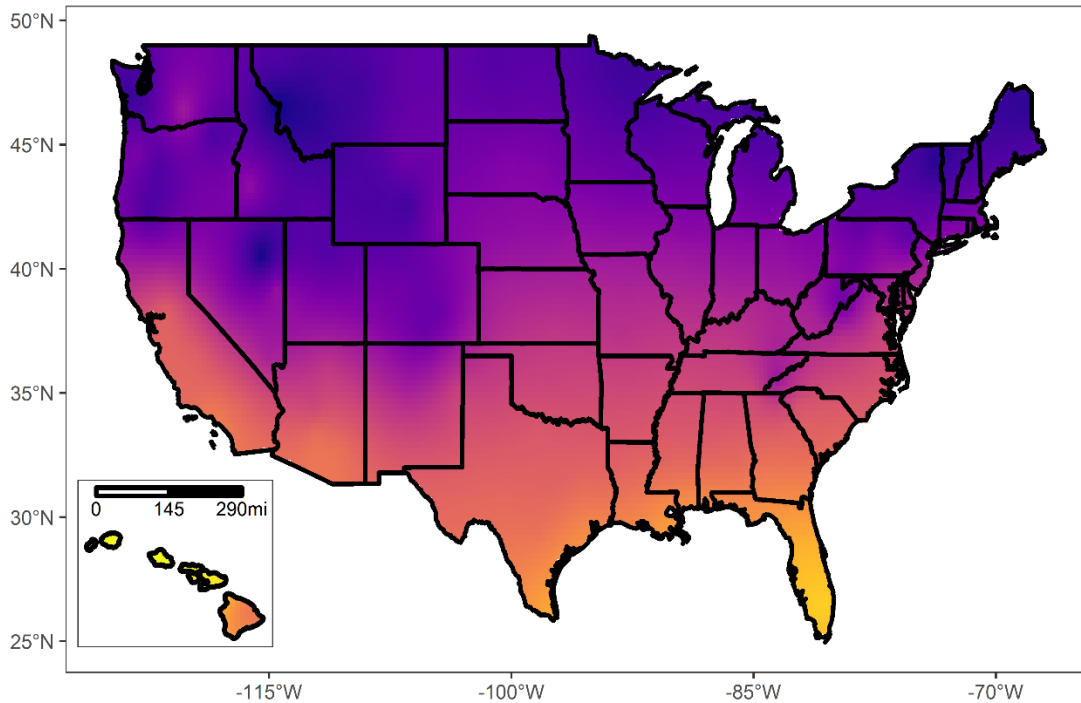
Crash Events



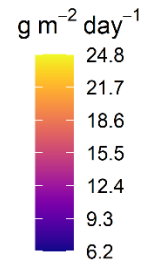
Overheating events predominate, followed by contamination crashing is second main contributor

Next Steps:

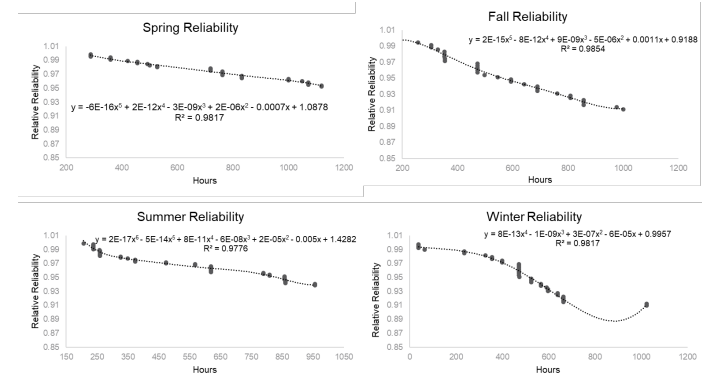
Updated Growth Modeling



Mean annual biomass productivity (UTEX 393)



Updated Reliability Modeling



Temperature Tolerance

