

Department of Ocean & Resources Engineering

Seminar

PROPOSED MP3 PHOTOBIOREACTOR FACILITY

by

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Abstract

One of the barriers to the development of the marine bioproducts industry is the lack of state of the art enclosed photobioreactor production systems. Several different designs have been investigated at bench scale and small pilot-scale, however, no successful commercial-scale designs have been implemented. A proposed microalgal photobioreactor pilot plant (MP3) facility will develop the next generation of photobioreactors suitable for scale-up for commercial production activities. The facility will consist of: 1) several different designs of outdoor photobioreactors, each at three different scales (10s, 100s, 1000s of liters), 2) Piping/metering systems for moving and measuring inocula, nutrients, gases, and cleaning fluids, 3) sensing and control instrumentation and models, and 4) harvesting equipment. The MP3 facility will be utilized for multidisciplinary research to optimize existing designs, develop new designs, and develop scale-up methodologies based upon fundamental studies of light regime, hydrodynamics, mass transfer, growth kinetics, and environmental conditions such as pH, pCO₂, pO₂, nutrients, and temperature.