SUPERVISOR/S: Rebecca Lawton and Marie Magnusson

PROJECT TITLE: Temperature tolerance and seasonal variation in growth of NZ macroalgae: implications for land-based aquaculture and bioremediation.

FIELD: Aquaculture, Environmental Science, Ecology

DIVISION/SCHOOL: HECS - School of Science

PROJECT LOCATION: Tauranga

PROJECT ABSTRACT:
Land based systems for the production of macroalgae have large potential for providing bioremediation services for the removal of N and P from nutrient rich water, and for delivering biomass for product development. A wide range of environmental conditions can influence biomass productivity, and therefore also the bioremediation performance, of macroalgae in these systems. Some of these conditions, such as nutrient availability and water flow rate, can be easily manipulated in large scale cultivation systems. However, others conditions, such as temperature, photoperiod and light intensity, are often difficult and/or costly to manipulate. Understanding how species targeted for cultivation respond to variations in temperature, photoperiod and light intensity is therefore critical to enable prediction of seasonal variations in biomass productivity and bioremediation capacity and provide insights into which species will be suitable for commercial scale cultivation in different environments. This project will investigate how 3 species of macroalgae identified as targets for cultivation in land-based systems respond to seasonal variation in abiotic conditions and determine the upper and lower temperature tolerances of these species. This project is based at the UoW field station in Tauranga, and will utilise species of macroalgae that we currently have in culture, leveraging off the Entrepreneurial Universities Macrolagal Biotechnologies Programme.

STUDENT SKILLS:
• Written and verbal communication skills
• Self-motivated and pro-active
• Ability to work independently
• Experimental design
• This project would suit either a student with an applied interest in seaweed aquaculture, or someone with a more ecological focus

PROJECT TASKS:
• Experimental design for robust testing of effects of temperature, light intensity and photoperiod on growth of cultivated macroalgae
• Quantify growth of selected species under varying seasonal conditions
• Establish upper and lower temperature tolerance boundaries for these species
• Statistical analysis of results
• Potential analysis of water quality to determine effects on bioremediation capability

EXPECTED OUTCOMES:
• Student’s Research Poster (as per clause 6 of the Scholarship regulations)
• Final report
• Quantified growth rates under summer, autumn, spring and winter environmental conditions for 3 species of macroalgae
• Quantified temperature tolerance ranges for 3 species of macroalgae