QR Code

DO NOT REMOVE

SMARTSAT COOPERATIVE RESEARCH CENTRE

Satellite Monitoring of Australia's Kelp Forests

Introduction

Blue Carbon has been identified as an essential component of the global carbon cycle with the power to reduce inequities amongst nations through a global Blue Carbon economy. Able to fix carbon at rates above 3000 g/m^2*yr, kelp must be included in Blue Carbon budgets for these to be accurate. Methods for mapping and monitoring kelp extent and biomass for national scale inventory and accounting are lacking.

Earth Observation data and analysis approaches potentially provides the appropriate scale, high quality, periodic data needed to effectively map kelp from site to national scales. There is a gap in our abilities to do this and deliver suitable information on kelp for Blue Carbon research and accounting.

Aims

Develop the knowledge required to map and monitor relevant properties of kelp (*Macrocystis spp.*) for use in Australian environmental accounts, including Blue Carbon monitoring. This aim will be addressed by:

1) Developing, and testing a methodology using earth observation and field data for kelp extent and biomass monitoring in Australia at a test site ;
2) Scaling up the test site method using earth observation and field data for kelp extent and biomass monitoring in Australia to a continental scale; and
3) Applying the operational method using earth observation and field data for kelp extent and biomass monitoring across Australia.

Proposed Methods

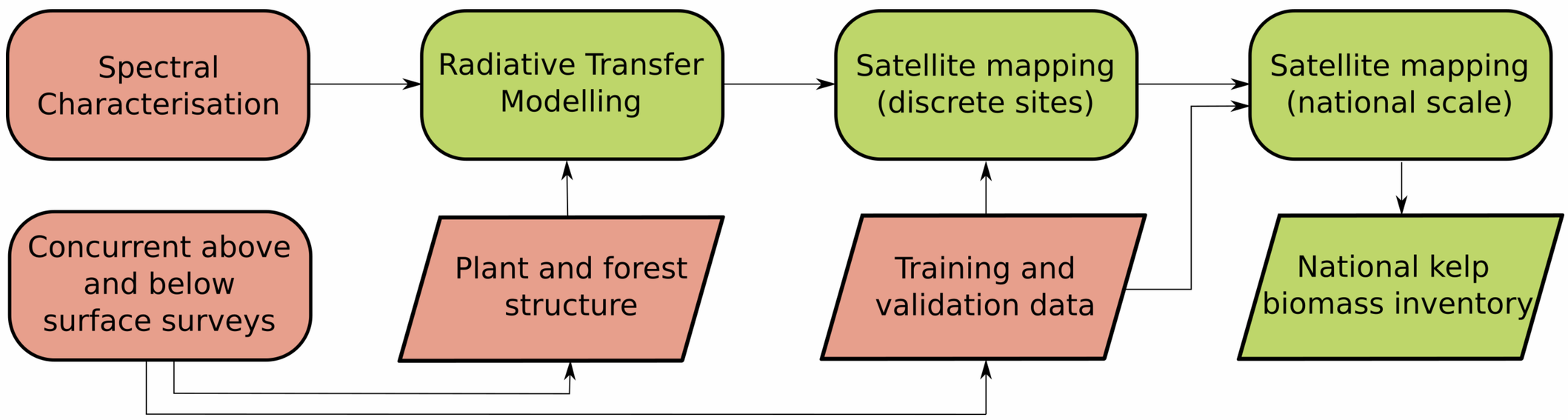

Figure 1: Anticipated overall project workflow. Activities (rounded rectangles) in red will involve field work. All data products (parallelograms) will be made open access with accompanying materials suited to a general, non-academic audience.

Figure 2: Proposed methods to: (a) collect and transfer field based kelp measurements of kelp extent and biomass; (b) along the transect line of surface buoys (marked by different colours); and (c) to high spatial resolution satellite data of kelp forests at two scales of observation. These data drive the models shown in Figure 3.

Expected Results

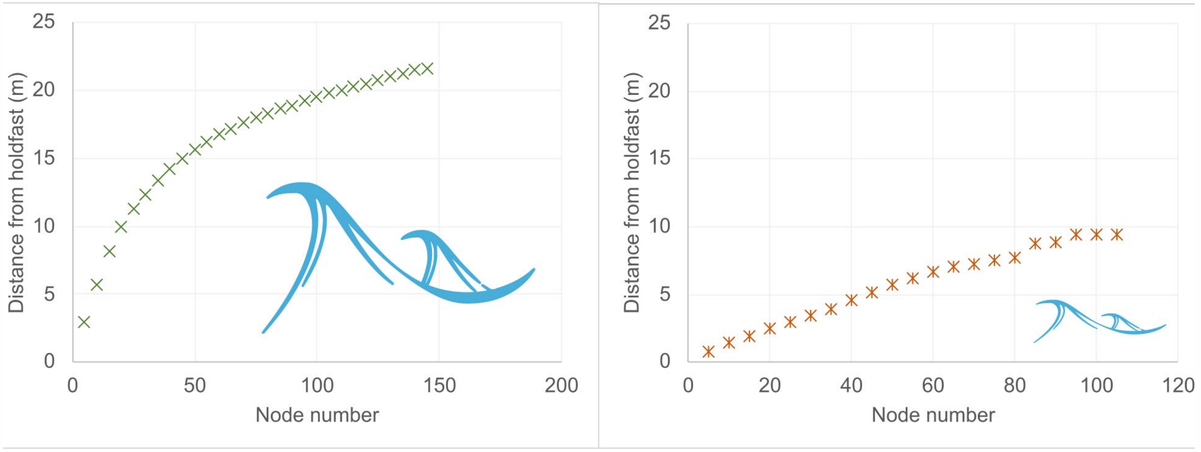

Figure 3: It is expected that morphological consistent relationships can be defined according to environmental conditions, which would allow biomass to be reliably modelled according to site traits.

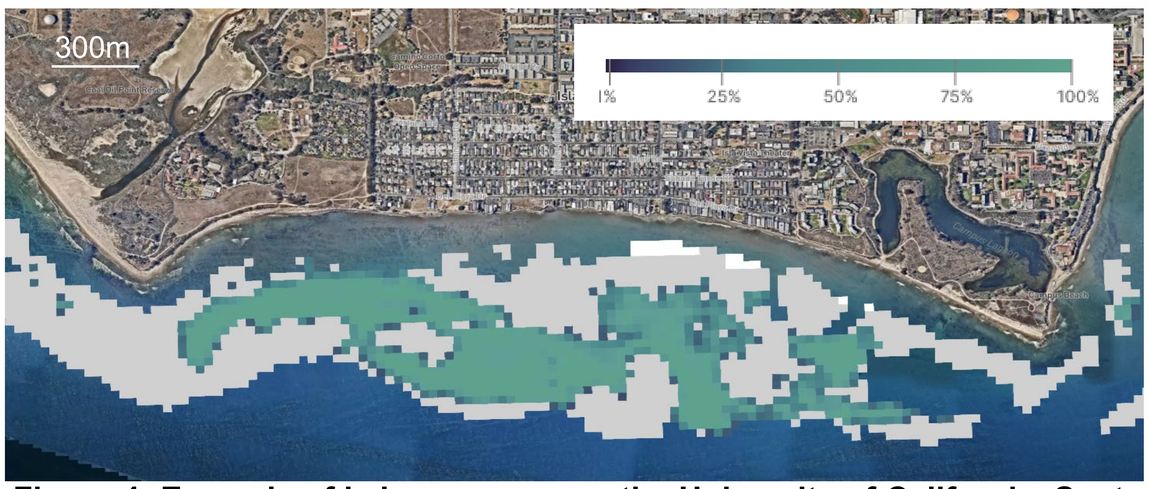

Figure 4: Example of kelp canopy near the University of California, Santa Barbara as mapped with satellite imagery showing both unoccupied kelp habitat (grey) and kelp canopy extent at time of imaging (colour gradient). This project will produce similar maps for kelp biomass along the entire Australian coast. From *www.kelpwatch.org/map*

Gillian Rowan. G.Rowan@uq.edu.au
School of the Environment
The University of Queensland

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

Remote Sensing RESEARCH CENTRE

Fonds de recherche Nature et technologies Québec

Australian Government Department of Industry, Science, Energy and Resources

AusIndustry Cooperative Research Centres Program