**Utilizing remote sensing to quantify biophysical characteristics and health of mangroves: Rapid Creek, Darwin, Australia**

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Urban and industrial development in estuarine areas impact mangrove communities through land clearance, agriculture, dredging, and waterfront developments. For example: land clearing throughout catchments and, in urbanized areas, the increased volume of water can be entered to watercourses carrying peculiar substances such as topsoil, chemicals, rubbish, nutrients, oil and grease off roads. They are a significant problem for the health of aquatic habitats. Having noted ongoing development around Darwin harbor and its catchment area, it is necessary to ensure effective mangrove conservation and sustainable development is progressed. To set the balance between them, one of the vital roles of monitoring and ultimately managing mangroves is to create accurate and up-to-date quantitative analysis of the health of mangroves. However, an extensive field surveying is impossible. Although the advanced technological nature of remotely sensed images demands solutions for such applications, little has been adapted to mangroves than other ecosystems. This project will use high resolution remotely sensed images for quantifying standing characteristics and mangrove health. Field observations will be used for training and validation purposes only. Once the relationships between remotely sensed data and field observations have been calculated, step‑wise regression will be done using random forest algorithm to generate individual maps of biophysical properties such as biomass, chlorophyll content and leaf area index of trees. By examining these maps, scenarios will be developed to discriminate healthy, stressed and dead mangroves. When combining spatial information about isolated trees, the results can be presented to the individual canopy level. In conclusion, this project sheds new light on the issue of assessing health of mangrove from remotely sensed data for eco-system oriented natural resources management.