**Description (1000chars)**

Very High Resolution Mapping of Carbon Stocks in Subtropical Thicket

The Subtropical Thicket biome is found in the Eastern Cape and Little Karoo in South Africa. Poorly managed livestock browsing, particularly by goats, has resulted in substantial degradation of thicket habitat throughout much of its range. Severely degraded thicket is not able to recover spontaneously when livestock pressure is removed.   
  
Spekboom is an important species in the Subtropical Thicket biome. It acts as a nurse plant, creating a favourable environment for the establishment of other species and is particularly effective at sequestering carbon dioxide. There is considerable interest in actively restoring degraded thicket habitat through the planting of Spekboom. There is a need for very high resolution (VHR) carbon stock maps to assist in the planning and monitoring of thicket restoration. Manual allometric techniques for measuring carbon stocks are costly and time consuming. The impracticality of allometry for large areas is confounded in the Subtropical Thicket biome due to its density, heterogeneous nature and complex growth forms.

This research aims to develop an automated remote sensing technique for mapping above ground carbon stocks in Subtropical Thicket. A comprehensive carbon stock ground truth data set, consisting of 191 plots, was captured in the Baviaanskloof, Eastern Cape in 2005. Using this ground truth, we aim to develop a regression model for estimating carbon stocks from multi-spectral satellite imagery.

**Research Benefits (200chars)**

Subtropical Thicket provides an important source of food for many herbivores. Re-establishment of Spekboom in degraded areas will help improve soil fertility, prevent erosion and reduce flood severity. Restoration is also attractive from an employment perspective; potentially creating thousands of jobs in impoverished areas. Carbon captured through thicket restoration can be traded as credits on the international carbon market and used to offset restoration costs.

**Publication Plan**

31 Dec 2017 - Complete a paper on the carbon stock mapping technique to be published in a peer-reviewed journal.

28 Feb 2018 - Complete the write-up of my PhD thesis.