



# Mapping Sequestration of Carbon by Forests

## Quarry Rehabilitation at the Waitakaruru Arboretum

### Author(s)

Lex Chalmers and Andrew Hansford

### Software

Arc Mobile, ArcGIS

### Platform

Desktop

### Printer

HP Designjet

### Data Source(s)

Terralink NZ, Land Information NZ  
Ministry of Agriculture and Forestry

In a major commitment to sustainability, the Ministry of Agriculture and Forestry in New Zealand introduced a carbon emissions trading scheme for forested areas in 2008. The scheme requires applicants for internationally tradable carbon credits to submit a digital map with an aerial photography base. Attribute data for the qualifying forest is required, and the sequence of management practices also needs to be documented.

Good map accuracy is expected, with field inspection and survey recommended. Mobile GIS has been used effectively to capture the detail of qualifying forest coverage, with the data processing determining the rates of carbon sequestration for different forest types. The Ministry of Agriculture and Forestry provides regionally based models for the carbon stock held in each hectare of five forest types.

The map shows the Waitakaruru Arboretum, a permanent forest sink that sequesters significant amounts of carbon annually. John and Dorothy Wakeling run the Arboretum and they have significantly rehabilitated a dis-used quarry within 20km of Hamilton in the Waikato region of New Zealand.

 **Property of Interest - 17 hectares**

 **Pinus radiata (20 yr old)**

36 tonnes per hectare, per year over 5 hectares = 180

 **Exotic hardwoods (18 yr old)**

23 tonnes per hectare, per year over 6 hectares = 138

 **Exotic softwoods (19 yrs old)**

17 tonnes per hectare, per year over 4 hectares = 68

 **Indigenous forests**

3 tonnes per hectare, per year over 2 hectares = 6

---

**Total carbon sequestered in 2010 = 392 tonnes**

---



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*



[www.waikato.ac.nz](http://www.waikato.ac.nz) and [www.sculpturepark.co.nz](http://www.sculpturepark.co.nz)