



New Zealand's Carbon Accounting System for the Kyoto Protocol

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The NZCAS Project 'Team'

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Plus expert advice/guidance from

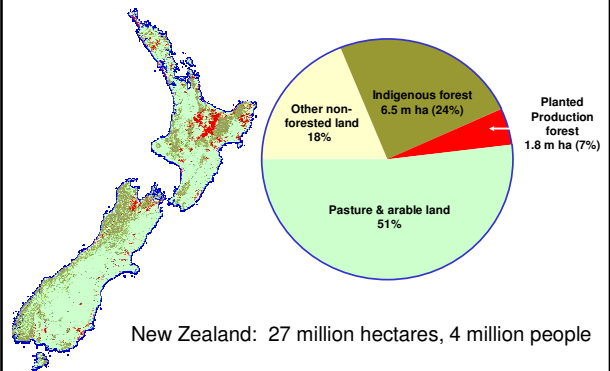
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Overview

1. New Zealand's forests
2. Forecast carbon sequestration
3. Existing data
4. LULUCF mapping
5. Forest inventory
6. International reporting – the primary rationale to enhance monitoring

Forestry & Land Use in New Zealand



New Zealand's Forests

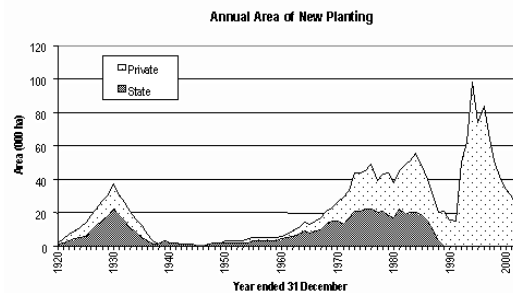
Indigenous
6.5 million ha

Shrubland
2.6 million ha

Plantations
Pre-Kyoto 1.2
Kyoto 0.6
1.8 million ha

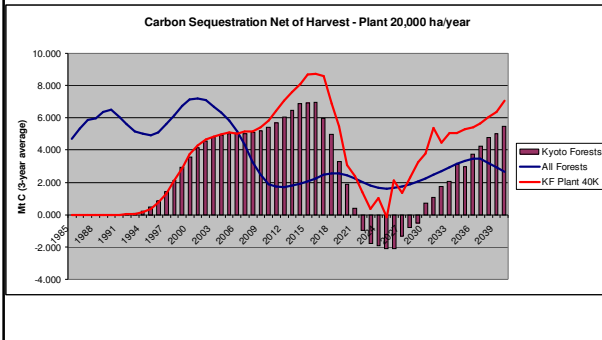


Plantation Forest Expansion



•Afforestation since 1990 (650,000 ha)

Projected carbon sequestration plantation forests



National Exotic Forest Description (NEFD)

- Only covers plantations
- Based on forest owner surveys
 - >1000 ha, annually (99% response)
 - 40 -1000 ha biennially (90%)
- Larger owners, data quality is high
- Small-scale owners, data quality not as robust
- Historically no NFI for indigenous forests

New resources to monitor C

- UNFCCC and Kyoto reporting requirements have provided valuable opportunity to enhance forest monitoring in NZ. In addition to forest carbon the system is providing:
 - Wall to wall mapping of land cover
 - Forest biodiversity assessment
 - Forest health and condition
 - Sampling of forest soils

Mapping LULUCF activities under Kyoto

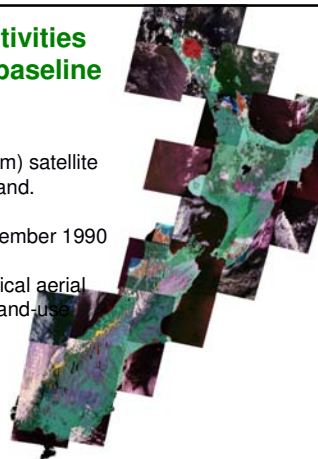
- Wall-to-wall mapping (Approach 3) of LULUCF activities
- 1996 & 2001 Land Cover Databases already exist
- Mapping based primarily satellite imagery
- Use of existing aerial photography where available

Mapping LULUCF activities under Kyoto – 1990 baseline

Thumbnails of Landsat 4 (30 m) satellite imagery coverage, New Zealand.

Most images acquired in December 1990

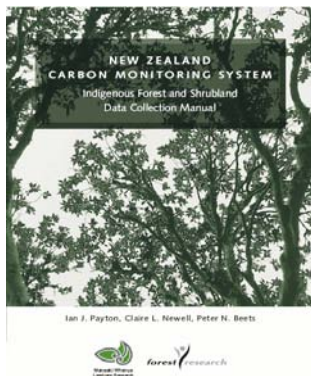
Ancillary data including historical aerial photography, field work and land-use history will also be used



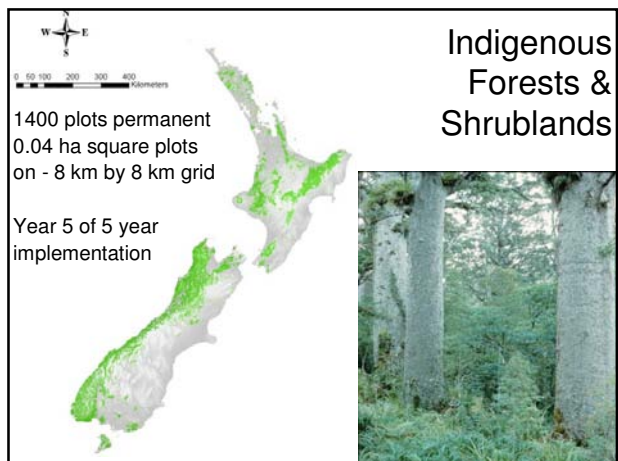
Planned LULUCF mapping 2008 & 2012 SPOT 5 (10 m)



Indigenous Forest Inventory



Indigenous Forests & Shrublands



Planted Forest Inventory

- Permanent sample plots (each cluster has 4 plots, each 0.04 ha) on 4 km grid system – 400 for Kyoto Forests
- Measurements from either field visits and/or LiDAR to input into planted forest growth model (basal area, mean height, management regime, species)
- Use C_Change model to convert stem volume forest into carbon pools
- 3 year measurement cycle

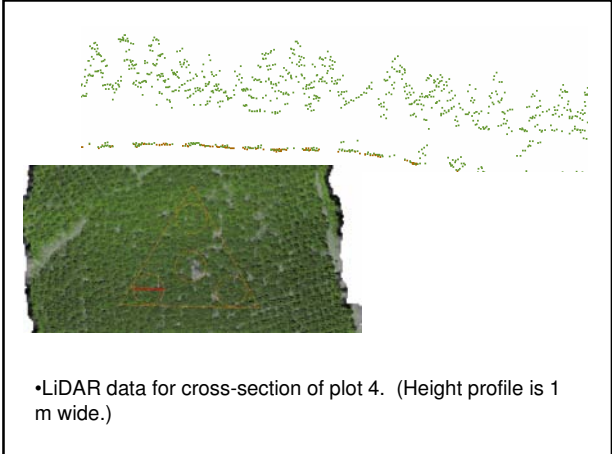
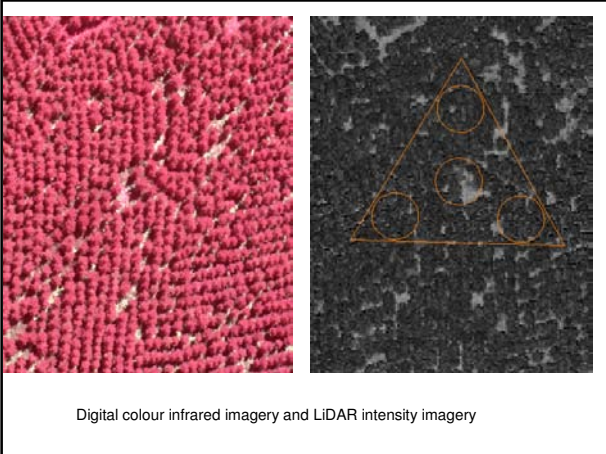
Pilot Study Completed in 2004

Aims:

- Gain operational, practical experience
- Refine procedures
- Make recommendations based on
 - Precision
 - Costs
 - Logistics
- Demonstrate the system

Implementation

- Pilot study provided
 - Cost estimates
 - Field manuals
 - Confidence interval, $< \pm 7\%$ stocks
- Currently, issues on access to private land have delayed start-up
- LiDAR is being trialled where plots are unable to be installed



International reporting

- In addition to UNFCCC / Kyoto Protocol other international processes and agreements that NZ is a party to include:
 - The Montreal Process
 - Global forest resource assessments (UNFAO)
 - Convention on Biological Diversity
- New Zealand does not have a history of long term observation-based national forest monitoring system
- The proposed carbon monitoring system provides an opportunity to implement such a system
- This system is being designed to meet LULUCF GPG and provide long-term forest monitoring for a range of other purposes

