




Applications for GIS in Forestry

Ministry of Agriculture & Forestry

Forestry GIS Conference
Wairariki Institute of Technology
School of Forestry, Rotorua
Wednesday, 6th October 2010



Overview of forestry GIS at MAF

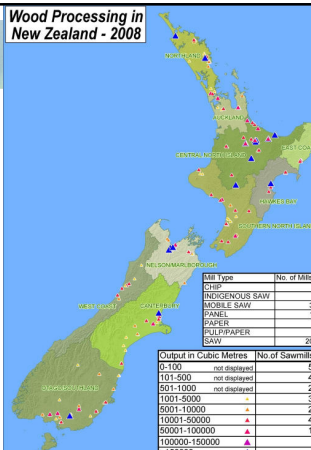
- Analysis
 - Policy advice
- Administration of programmes
 - ETS, AGS, PFSI, Crown Forestry
- Biosecurity purposes
 - Assessing risk, incursion response
- Publications
 - Internet and published documents
- Data building
 - Land Use Mapping

Policy Support

- Why use GIS/maps?

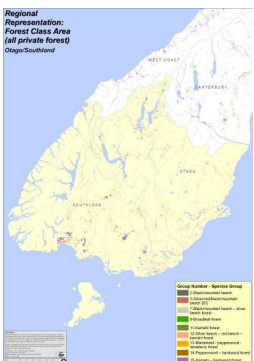
Powerful presentation tool in dealing with senior managers and Ministers

Wood Processing in New Zealand - 2008




Mill Type	No. of Mills
CHIP	2
INDIGENOUS SAW	0
MIDDLE SAW	37
PANEL	15
PAPER	1
PULP/PAPER SAW	200

Output in Cubic Metres	No. of Sawmills
0-100	not displayed
101-500	42
501-1000	not displayed
1001-5000	28
5001-10000	37
10001-50000	25
50001-100000	46
100000-150000	12
>150000	1




Regional Representation: Forest Class Area (all private forest) Otago/Southland



GIS uses for forest layers

- Calculate area of forest by different administrative levels – region, district
- Isolate ownership type (public, Maori, private)
- Isolate/analyse species type and location estimating areas and volume
- Suitability studies by species and land capability
- International reporting
- Climate change reporting

Administration of Programmes



ETS – GIS is a significant component
Online tool allows applicants to load .shp directly into GDB at MAF

PFSI & AGS – more of a manual approach, applicant submits .shp and/or paper map for Programmes staff to load and review

- All three programs are visible to MAF-GIS staff for cross-checking
- Inadvertently increasing GIS skills of forest owners by requiring submissions in GIS format
- GIS data becomes official record

Automating workflow

Automating workflow (Afforestation Grant Tool)

Problem
–Reviewing grant applications is repetitive

Solution
–Use Python to automate geoprocessing, table and folder tasks to create data packages for review

INPUTS
The tool requires two inputs - a polygon (shp or fc) of the area in question, and the NZDEM0.15 metre raster dataset which has been 're-coded' per the script. NZDEM0.15 is a model that estimates the erosion rate in tonnes of sediment/yr, as a function of mean annual precipitation, a land cover factor and an erosion coefficient which depends upon the land type (i.e. erosion terrain).

Simply run the script, add the application polygon, output folder location and file name and press 'OK'.

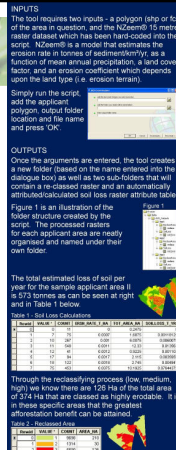
OUTPUTS
Once the arguments are entered, the tool creates a new folder (based on the name entered into the dialogue box) as well as two sub-folders that will contain a re-classified raster and an automatically georeferenced tool loss raster erodible table.

Figure 1 is an illustration of the folder structure created by the script. The processed rasters for each application area are neatly organised and named under their own folder.

The total estimated loss of soil per year for the sample applicant area II is 37.2 tonnes as can be seen at right and in Table 1 below.

Element	Area (ha)	Loss (tonnes/yr)	Total (tonnes/yr)
Area I	100	1000	1000
Area II	100	37.2	37.2
Total	200	1037.2	1037.2

Through the reclassifying process, low, medium, high we know there are 10% of the total area of 37.4 Ha that are classed as highly erodible. It is in these specific areas that the greatest afforestation benefit can be attained.




MAF Biosecurity

KAURI DIEBACK DATA - Auckland Region

- Incursions that can affect forest health – Passiflora

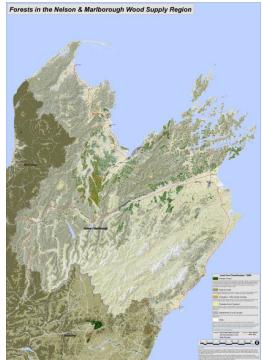
Known Locations of Batwing Passionflower

New postings on our internet site



Forests in the Nelson & Marlborough Wood Supply Region

- New series of forest mapping to be posted on MAF's internet site based on Wood Supply Regions (Nov. 2010)
- Two levels of detail and content:
 - regular A4 sized map series
 - large format A1 map series
- High level of detail has proven useful to forestry community in Nelson/ Marlborough WSR
- Hoped to be used as communication and identification tool
- Also updating Large Forest Owners mapping, Nov. 2010



Publications/Reporting

BEST

- Use of both methods of reporting give the user a better understanding of the statistics
- GIS as a tool for visualising forest harvest data

ROUNDWOOD REMOVALS for 2008 by WOOD SUPPLY REGION

Wood supply regions	Year ended 31 March					
	2003	2004	2005	2006	2007*	2008
Northland	8.8	9.3	8.4	8.5	9.6	10.3
Auckland	3.5	3.3	3.6	3.3	2.7	3.1
Central North Island	50.2	49.9	48.1	47.3	45.3	44.9
East Coast/Hawke Bay	11.5	10.3	10.9	11.3	12.0	12.6
Southern North Island	4.3	4.1	4.8	4.9	4.8	4.5
Total North Island	78.3	76.9	75.7	75.2	74.4	75.5
Nelson/Marlborough	9.7	10.7	11.7	11.8	11.7	11.2
West Coast	1.1	1.1	1.2	1.2	1.1	1.1
Canterbury	3.9	4.2	4.0	4.4	5.2	4.9
Otago/Southeast	7.0	7.2	7.4	7.4	7.5	7.4
Total South Island	23.7	23.1	24.3	24.8	25.6	24.5
Total New Zealand	102.0	100.0	100.0	100.0	100.0	100.0

Data building & Maintenance - LUM Review

- MAF assists with creation of national GIS layers with a forest focus
- LUCAS/LUM is a national level GIS layer
- Undertook a review of the exotic/indigenous forest classes in MfE's Land Use Mapping layer
- Detailed analysis revealed some limitations at a fine level of detail. *LUCAS/LUM is a national level GIS layer
- Used to fill in gaps for small forest owners
- Special note: high quality data for NEFD reporting is always appreciated.

Forest/Farm Screening Layers

Improving accuracy of data & analysis

MAF access to forest company's data

- On a final note, I would like to thank forest company staff and individual forest owners for their continuing support of MAF-initiated surveys as well as their willingness to share data with us.

