

Spatial techniques for multi-source national planted forest assessment and reporting

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**Presented at SIRC NZ 2013 – GIS and Remote Sensing Research Conference
University of Otago, Dunedin, New Zealand
August 29th – 30th 2013**

Keywords and phrases: national reporting, data accuracy, visualisation, dashboards, sustainability, forestry

The national assessment of New Zealand's planted forests is required for economic and environmental monitoring and for international reporting to organisations such as FAO and the Montreal Process. Spatial techniques can aid in determining national planted forest information; two approaches are described in this presentation. Firstly a number of national spatial datasets were investigated for their potential to contribute to the reporting on forest sustainability indicators. Secondly, spatial data was combined with non-spatial data to develop visual representations for enhanced reporting.

For the investigation of national spatial datasets for reporting, one of the issues was to determine how well national datasets meet sustainability reporting requirements. One method to determine this is to compare national data with data at a higher resolution; from this the error margins in the reporting can be estimated. For example, one of the Montreal Process (MP) indicators (4.3.a) requires reporting on the proportion of forest management activities that meet best practice for protecting water resources. Riparian strips around waterways is one such practise; by overlaying GIS data of different resolutions for a number of case study areas and summing the differences in the riparian areas of each data set, it was determined that the resolution of the national datasets would be inadequate for reporting on riparian practices. Using the same case study data, the effect of deducting the riparian areas from the national planted forest area (MP 2.a Area of forest land for wood production) indicated that the national datasets could over-estimate the land under productive forestry by up to 6%.

Monitoring based on sampling provides another avenue for generating reporting data; national datasets were used to guide the locations of national monitoring sites. A sampling approach developed by Environment Waikato for monitoring significant soil erosion, based on aerial photography evaluations of sample points on a 2km grid, was applied to the whole country. The grid points were overlaid in GIS with land cover and erosion susceptibility data, and the sampling intensity of particularly the highly erodible forest lands was determined. This verified that the approach would be useful for national soil reporting (MP 4.2.b Area of forest land with soil degradation) though implementation of the approach on only areas of high risk could miss impacts elsewhere.

Water quality monitoring is another field that relies on a sampling approach; planted forest water quality reporting (MP 4.3.b water bodies in forest areas with significant changes) is based on those national water quality monitoring sites specifically for monitoring water flows from exotic forest catchments. The locations of these monitoring sites were assessed based on national GIS datasets. Land cover, river and catchment data were combined to analyse whether the existing water monitoring sites are representative of exotic forest catchments, and to identify potential additional sites. The analysis determined that a number of the existing planted forest monitoring sites have other production land uses up-stream from their locations, such as grazed pasture. In addition, different types of river environments were found to be underrepresented in the national approach for monitoring water from planted forest. A number of new sites were recommended for this monitoring.

Finally, a number of visual representations of the sustainability data were explored for the reporting of national forest data. The aim was to provide a quick overview of the state of sustainability indicators. The approach needed to cope with such issues as mixing quantitative and qualitative data, and variable numbers of indicators

for different sustainability criteria.

The assessments covered in this presentation have made valuable contributions to substantiating and presenting the information in New Zealand's national planted forests reporting, including for a proposed new planted forests portal.