Biogeosciences Discuss., 9, C7426–C7428, 2013
www.biogeosciences-discuss.net/9/C7426/2013/

Biogeosciences Discussions

Interactive comment on "Climate suitability estimates offer insight into fundamental revegetation challenges among post-mining rehabilitated landscapes in eastern Australia" *by* P. Audet et al.

D. Norton (Referee)

david.norton@canterbury.ac.nz

Received and published: 17 January 2013

This manuscript develops an index of climate suitability/susceptibility for mine-site rehabilitation in eastern Australia. The authors argue that this index will be of use for rehabilitation planning as it will identify sites that are less suitable for rehabilitation and hence require more effort/funding. While the general question that this manuscript addresses is of some interest, I feel that as presented the manuscript is fundamentally flawed and is of little benefit for mine-site rehabilitation.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

The major flaw I see in this manuscript is the development of a generic suitability index – this is defined using a range of rainfall parameters and used to identify climates that are "highly suitable (ideal), moderately suitable (adequate), or unsuitable (susceptible)" for rehabilitation. These are then applied to nine active mine sites with rehabilitation programmes (listed in Table 1). The problem I have with this is that the definition of highly suitable, moderately suitable and unsuitable (Table 2) is the same for all seven sites notwithstanding the sites spanning major latitudinal and climatic gradients (extending from central NSW to the very north of Queensland). As a result, and as the authors readily acknowledge, the sites include a wide range of biotypes including desert, temperate, subtropical and tropical. Given this range and given that individual plants will be adapted to the environments they grow in (and species composition will be very different across this range of sites), I find it difficult to understand how then there can be one scale for defining what is highly suitable, moderately suitable and unsuitable – surely a rainfall depth of 500 mm per annum, which is defined as unsuitable, is actually likely to be suitable for plant growth in a desert environment that receives 476 mm per annum (Ernest Henry site), while obviously it is unsuitable in a wet subtropical environment that receives 1604 mm per annum (N Stradbroke Island).

I also feel that the correlations between climate and the NDVI data are misleading. It is hardly surprising that a desert environment will have a lower plant biomass (NDVI) and a lower rainfall than a moist tropical environment – these correlations seem spurious to me and add nothing to the manuscript.

Finally, I can see no benefit from the approach advocated by the authors for rehabilitation planning. Planning of rehabilitation programmes should always take into account the constraints of the local environment including climate and substrate, and species selection for rehabilitation is then based on these considerations. Use of a generic suitability scale does not assist this at all. It seems self evident to me that rehabilitation in an environment were rainfall is limiting will obviously be more challenging than one in which rainfall is not limiting. I don't see this conclusion as presented in this manuscript

BGD

9, C7426–C7428, 2013

as offering anything new to restoration practice. It is also not clear to me what the link is between the suitability index and monitoring requirements as suggested in the discussion. Monitoring is something that is required in all rehabilitation projects as it provides feedback on how well rehabilitation efforts are working (and hence if the methods being used are appropriate to the site or require modifying) and in many cases it also provides the necessary assurance to regulators that rehabilitation has been carried out and has been successful (presumably by becoming self sustaining) – this is often required before bonds will be released. However, monitoring has northing to do with generic site suitability.

For all the above reasons I believe that this manuscript is fundamentally flawed and that it therefore does not warrant publication.

Professor David Norton School of Forestry University of Canterbury Christchurch, New Zealand

---

Interactive comment on Biogeosciences Discuss., 9, 18545, 2012.