Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09413, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09413
EGU General Assembly 2008

Integrating a priori in-situ information within satellite based LAI products.

R. Fernandes, F. Canisuis, N. Rochdi and S. Khurshid

Canada Centre for Remote Sensing, Earth Sciences Sector, Natural Resources Canada

588 Booth St., Ottawa, Ontario, Canada, K1A 0Y&

(Richard.fernandes@nrcan.gc.ca/ Fax: 001 613 947 1292)

Leaf area index is an important biophysical parameter required for both mpnitoring and modelling applications. CEOS has specified the requirement for global LAI products at better than 1km resolution with total uncertainty of under 10%. Currently, a number of LAI maps have been produced on both an experimental and operational basis from optical polar orbiting sensors. However, saturation of these measurements at high LAI values together with biases due to unspecified variables such as soil reflectance, clumping of vegetation, and leaf level spectral properties have limited the performance of these products so that even regionally tuned products rarely meet the performance specification. Instead, the Global Climate Observing System has suggested that a network of in-situ LAI measurements be performed.

We suggest an alternate strategy of using the in-situ measurements to both adjust for biases in remote sensing retrieval algorithms and to allow for estimates of LAI beyond the point of signal saturation. Two approaches are presented: the first uses the in-situ measurements to regularize the inverse solution of a radiative transfer model while the second uses in-situ measurements to compute the joint a priori probabilities of radiative transfer simulations used to populate both look-up-table and neural network algorithms. The performance of these approaches is evaluated over an extensive network of North American in-situ LAI sites. The requirements for on-going in-situ sampling as well as potential for deriving North American LAI maps using these integrated approaches are discussed.