Visible and Near-Infrared Leaf Reflectance Spectra, 1992-1993 (ACCP)

Summary:

The leaf spectra data sets contain visible and near infrared reflectance spectra data for both fresh and dry leaf samples collected in the ACCP. These samples are from Blackhawk Island, WI, Harvard Forest, MA, Howland, ME, Jasper Ridge, CA field sites and the Douglas fir and bigleaf maple seedling canopy study sites. Data reported for each sample is absorbance [log(1/Reflectance)] from 400-2498nm at 2nm intervals and a resolution of 10nm. These data were collected for the purpose of determining the relationship of foliar chemical concentrations with visible and near infrared wavelength reflectance spectra. Both multiple linear regression and partial least square regression techniques have been used to relate lab chemistry data to spectral reflectance.

ORNL DAAC maintains information on the entire ACCP.

Data Citation

Cite this data set as follows (citation revised on September 30, 2002):

Aber, J. D., and M. E. Martin. 1999. Visible and Near-Infrared Leaf Reflectance Spectra, 1992-1993 (ACCP). [Visible and Near-Infrared Leaf Reflectance Spectra, 1992-1993 (Accelerated Canopy Chemistry Program)]. Data set. Available on-line [http://www.daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/424.

References:

Bolster, K. L., M. E. Martin, and J. D. Aber. 1996. Interactions between precision and generality in the development of calibrations for the determination of carbon fraction and nitrogen concentration in foliage by near infrared reflectance. Canadian Journal of Forest Research 26:590-600.

McLellan, T, M. E. Martin, J. D. Aber, J. M. Melillo, K. J. Nadelhoffer, and B. Dewey. 1991. Comparison of wet chemical and near infrared reflectance measurements of carbon fraction chemistry and nitrogen concentration of forest foliage. Canadian Journal of Forest Research 21:1689-1693.

Data Format:

Available data files:

bhi_d_sp.dat
hf_d_sp.dat
how_d_sp.dat
jr_f_sp.dat
map_f_sp.dat
df_d_sp.dat
df_f_sp.dat
df_p_sp.dat

Data file naming conventions:

All leaf spectral reflectance data files follow this naming system: [site or species] _ [sample prep] _ [spectra data] . dat

Site or species --

hf=Harvard Forest, Petersham, MA, latitude 42.4950, longitude -71.7981

bhi=Blackhawk Island, WI, latitude 43.6333, longitude -89.7583

how=Howland, ME, latitude 45.2222, longitude -68.7356

jr=Jasper Ridge, CA, latitude 37.4111, longitude -121.7631

map=bigleaf maple (from seedling canopy study)

df=Douglas fir (from seedling canopy study)

Sample preparation --

d=dry

f=fresh

p=powdered

Spectra data --

sp=spectra data

Variables: (column headings)

band=index for wavelength

wavelength=wavelength of light, from 400-2498 nm at 2 nm intervals and a resolution of 10nm
units=nm

'92BHS10BW1'=example of leaf sample identifier used as column heading for spectral reflectance values.

spectral reflectance (as absorbance [log(1/Reflectance)])
units=unitless

Please note that sample identifiers in these files key to sample identifiers in related leaf chemistry data files.

Data file format:

The data files contain one header record of variables/column headings. The data records are numerical fields. The fields are space delimited. Missing values are desingnated by -1.

Sample records:

band wavelength 92BHS10BW1 92BHS10BW2 92BHS10BW3 ... 92BHS9SM5
1 400 0.865 0.873 0.85 ... 0.834
2 402 0.895 0.904 0.88 ... 0.865
3 404 0.923 0.93 0.907 ... 0.893
...
1050 2498 0.575 0.593 0.56 ... 0.557

band wavelength PSME_SC1 PSME_SC2 PSME_SC3 PSME_SC4 ... PSME_SC96
1 400.0 1.0032 0.9494 0.9524 ... -1
2 402.0 1.0175 0.9616 0.9669 ... -1
3 404.0 1.0326 0.9726 0.9793 ... -1
...
1050 2498.0 0.9766 0.9856 0.9461 ... -1

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