

ORNL DAAC Home


ORNL DAAC
 DISTRIBUTED ACTIVE ARCHIVE CENTER
 FOR BIOGEOCHEMICAL DYNAMICS


About Us

Get Data

Submit Data

Data Management

Tools

 Sign in
[DAAC Home](#) > [Get Data](#) > [Field Campaigns](#) > [Boreal Ecosystem-Atmosphere Study \(BOREAS\)](#) > User guide

BOREAS RSS-04 1994 JACK PINE LEAF BIOCHEMISTRY AND MODELED SPECTRA IN THE SSA

Get Data

Feedback

Summary:

The BOREAS RSS-04 team focused its efforts on deriving estimates of LAI and leaf chlorophyll and nitrogen concentrations from remotely sensed data for input into the Forest BGC model. This data set contains measurements of jack pine (*Pinus banksiana*) needle biochemistry from the BOREAS SSA in July and August 1994. The data contain measurements of current and year-1 needle chlorophyll, nitrogen, lignin, cellulose, and water content for the OJP flux tower and nearby auxiliary sites. The data have been used to test a needle reflectance and transmittance model, LIBERTY (Dawson et al., in press). The source code for the model and modeled needle spectra for each of the sampled tower and auxiliary sites are provided as part of this data set. The LIBERTY model was developed and the predicted spectral data generated to parameterize a canopy reflectance model (North, 1996) for comparison with AVIRIS, POLDER, and PARABOLA data.

A guide document which includes more information about this data set can be found at http://daac.ornl.gov/daacdata/boreas/RSS/rss4lib/comp/RSS04_Leaf_Chem_Liberty.txt.

ORNL DAAC maintains information on the entire [BOREAS Project](#).

Data Citation

Cite this data set as follows (citation revised on July 17, 2003):

Plummer, S. E., and P. J. Curran. 1998. BOREAS RSS-04 1994 Jack Pine Leaf Biochemistry and Modeled Spectra in the SSA. 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/ORNLDAC/292.

References:

- Bolster, K.L., M.E. Martin, and J.D. Aber. 1996. Determination of carbon fraction and nitrogen concentration in tree foliage by near-infrared reflectance - A comparison of statistical methods. *Can. J. Forest. Res.* 26,590-600.
- Curran, P.J. and J.A. Kupiec. 1994. The remote sensing of foliar chemistry Final Report to the Natural Environment Research Council. March 1994.
- Dawson, T.P., P.J. Curran, and S.E. Plummer. 1995. Modelling the spectral response of coniferous leaf structures for the estimation of biochemical concentrations. RSS'95. Rem. Sens. Soc. Nottingham, UK. 587-594.
- Dawson, T.P., P.J. Curran, and S.E. Plummer. 1996. A model approach to the biochemical analysis of coniferous forests from AVIRIS data. Proc. Second Int. Airborne Rem. Sens. Conf. ERIM. Ann Arbor, MI. Vol. I, 221-227.
- Dawson, T.P., Curran, P.J. and Plummer, S.E., 1996, LIBERTY - Towards the estimation of foliar biochemical concentration using high spectral resolution airborne sensors, RSS'96, Rem. Sens. Soc., Nottingham, UK, 79-86.
- Dawson, T.P., P.J. Curran, and S.E. Plummer. 1997. LIBERTY - modelling the effects of leaf biochemistry on reflectance spectra. *Rem. Sens. Env.* (in press).
- Hosgood, B., S. Jacquemoud, G. Andreoli, J. Verdebout, G. Pedrini, and G. Schmuck. 1995. Leaf optical properties experiment 93 (LOPEX93). Joint Research Centre European Commission publication no. EUR 16095 EN, Luxembourg.
- Kupiec, J.A. and P.J. Curran. 1994. The chemical and spectral variability in a slash pine canopy. Final Report to NASA Accelerated Canopy Chemistry (New Observations) Program. UNH Subcontract 93-20, Vol II.

- Lichtenthaler, H.K. 1987. Chlorophylls and carotenoids: pigments of photosynthetic biomembranes. *Methods in Enzymology*. 148, 350-382.
- Mackinney, G. 1941. Absorption of light by chlorophyll solutions. *J. Biol. Chem.* 140, 315-322.
- North, P.R. 1996. A three-dimensional forest light interaction model using a Monte-Carlo method. *IEEE Trans. Geosci. and Rem. Sens.* 34, 946-956.
- North, P.R. and S.E. Plummer. 1994. Estimation of conifer bi-directional reflectance using a Monte Carlo method. *IGARSS'94*, IEEE. Piscataway, NJ. Vol. I, 114-116.
- North, P.R., S.E. Plummer, D.W. Deering, and Leroy, M. 1996. Validation of a BRDF model for boreal forest. *IGARSS'96*, IEEE. Piscataway, NJ. Vol.III, X, 1654- 1656.
- Sellers P.J. and F.G. Hall. 1994. Boreal Ecosystem-Atmosphere Study: Experiment Plan. Version 1994-3.0 NASA BOREAS Report (EXPLAN 94).
- Sellers P.J., F.G. Hall, H. Margolis, B. Kelly ,D. Baldocchi ,G. den Hartog, J. Cihlar, M.G. Ryan, B. Goodison, P. Crill, K.J. Ranson, D. Lettenmaier, and D.E. Wickland. 1995. The boreal ecosystem-atmosphere study (BOREAS): an overview and early results from the 1994 field year. *Bulletin of the American Meteorological Society*, 76, 1549-1577.
- Sellers P.J., F.G. Hall, and K.F. Huemmrich. 1996. Boreal Ecosystem-Atmosphere Study: 1994 Operations. NASA BOREAS Report (OPS DOC 94).
- Sellers P.J., and F.G. Hall. 1996. Boreal Ecosystem-Atmosphere Study: Experiment Plan. Version 1996-2.0 NASA BOREAS Report (EXPLAN 96).
- Sellers P.J., F.G. Hall, and K.F. Huemmrich. 1997. Boreal Ecosystem-Atmosphere Study: 1996 Operations. NASA BOREAS Report (OPS DOC 96).
- Sellers, P.J., F.G. Hall, R.D. Kelly, A. Black, D. Baldocchi, J. Berry, M. Ryan, K.J. Ranson, P.M. Crill, D.P. Lettenmaier, H. Margolis, J. Cihlar, J. Newcomer, D. Fitzjarrald, P.G. Jarvis, S.T. Gower, D. Halliwell, D. Williams, B. Goodison, D.E. Wickland, and F.E. Guertin. (1997). "BOREAS in 1997: Experiment Overview, Scientific Results and Future Directions", *Journal of Geophysical Research (JGR)*, BOREAS Special Issue, 102(D24), Dec. 1997, pp. 28731-28770.

Data Format:

For information on Parameter/Variable Names, Variable Description/Definition, Units of Measurement, and Data File Format see this companion file
<http://daac.ornl.gov/daacdata/boreas/RSS/rss4lib/comp/rss4lib.def>

Document Information:

16-Nov-1998 (data citation revised on 26-Sep-2002)

Document Review Date:

16-Nov-1998

Document Curator:

uso@daac.ornl.gov

Document URL:

<http://daac.ornl.gov>



[Privacy Policy](#) | [Feedback](#) | [Help](#)



Home

About Us

[Who We Are](#)

[Partners](#)

[User Working Group](#)

[Data Citation Policy](#)

[Workshops](#)

[News](#)

Contact Us

Get Data

[Complete Dataset List](#)

[Search for Data](#)

[Field Campaigns](#)

[Land Validation](#)

[Regional/Global](#)

[Model Archive](#)

Submit Data

[Submit Data Form](#)

[Data Scope and Acceptance](#)

[Data Authorship Policy](#)

[Data Publication Timeline](#)

[Detailed Submission Guidelines](#)

Data Management

[Best Practices](#)

[Data Management Plan](#)

[How-to's](#)

Tools

[MODIS](#)

[THREDDS](#)

[SDAT](#)

[Daymet](#)

[CARVE Data Viewer](#)

[Soil Moisture Visualizer](#)

[Land - Water Checker](#)

Help

[FAQs](#)