

ORNL DAAC BOREAS FOLLOW-ON DSP-10 REGRIDDED FPAR AND LAI MAPS FOR 1994

BOREAS FOLLOW-ON DSP-10 REGRIDDED FPAR AND LAI MAPS FOR 1994

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Summary:

Existing BOREAS AVHRR derived FPAR and LAI maps were reprocessed and are now available at multiple resolutions (2 km, 10x5 minutes, and 0.5 degree). These data were regrided for use by the BOREAS Follow-on Carbon and Hydro-Meteorological modeling groups. Characteristics of the individual products are described below.

Maps included in this data set:

[Regridded LAI Maps for 1994, 2 kilometers](#)

[Regridded LAI Maps for 1994, 10 by 5 minutes](#)

[Regridded FPAR Maps for 1994, 10 by 5 minutes](#)

[Regridded LAI Maps for 1994, 54 km](#)

Data Citation:

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

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Processing:

If there are any questions about how this aggregation was done, please contact Dave Knapp (David.Knapp@gsfc.nasa.gov).

These regridDED maps may utilize class numbers that correspond to Lou Steyaert's AFM-12 classification or include data that cover the same area as the land cover classification. When referenced in the regridDED map description, please refer to the following Land Cover Classification table. For more information, please access the following BOREAS data set and documentation.

[BOREAS AFM-12 1-km AVHRR Seasonal Land Cover Classification](#)

This regional land cover data set was developed as part of a multitemporal 1-km AVHRR land cover analysis approach that was used as the basis for regional land cover mapping, fire disturbance-regeneration, and multiresolution land cover scaling studies in the boreal forest ecosystem of central Canada (Steyaert et al., 1997). This land cover classification was derived by using regional field observations from ground and low-level aircraft transits to analyze spectral-temporal clusters that were derived from an unsupervised cluster analysis of monthly NDVI image composites (April-September 1992). This regional data set was developed for use by BOREAS investigators, especially those involved in simulation modeling, remote sensing algorithm development, and aircraft flux studies. Based on regional field data verification, this multitemporal 1-km AVHRR land cover mapping approach was effective in characterizing the biome-level land cover structure, embedded spatially heterogeneous landscape patterns, and other types of key land cover information of interest to BOREAS modelers.

Lou Steyaert's Land Cover Classification	
Class ID	Class Name
1	Wet Conifer (Low Stand Density)
2	Wet Conifer (Medium Stand Density)
3	Wet Conifer (High Stand Density)
4	Upland Conifer/Fen
5	Rock Outcrops/Bare Ground/Sparse Vegetation/ Slow Regeneration Burn Areas
6	NA
7	Open Water
8	NA
9	Regeneration (North: Within Canadian Shield Zone)
10	NA
11	Recent Visible Burn
12	Rangeland/Pasture/Hay/Aspen Patches
13	Mixed Agriculture/Predominately Grains
14	Mixed Agriculture/Predominately Pasture/Hay
15	Grassland Marshes
16	Mixed Forest (80% Coniferous)

17	Mixed Forest (50% Coniferous)
18	Mixed Forest (80% Deciduous)
19	Regeneration (South: generally south of Shield Zone)
20	Unknown

Regridded LAI Maps for 1994, 2 kilometers

These images were produced by averaging the 1-km LAI maps by Jing Chen to a 2-km pixel size. See the document [BOREAS RSS-07 Regional LAI and FPAR Images From Ten-Day AVHRR-LAC Composites](#) for more information on the original data product that this is based on.

Image Specifications

Each image is 431 pixels by 336 lines and contains no leading header bytes. Each pixel in the image is represented by one-byte. The DN for each pixel can be converted to LAI with the following equation:

$$\text{LAI} = (\text{DN} - 1) / 10$$

The following files contain the percentage of each class within each 2-km pixel. The pixel values will be either 0, 25, 50, 75, or 100, since exactly four 1-km pixels are nested within a 2-km pixel.

LAI Maps, 2km
94-05-21_lai_2km.img (May 21-31, 1994)
94-07-21_lai_2km.img (July 21-31, 1994)
94-09-01_lai_2km.img (September 1-10, 1994)

Spatial Coverage

These data cover the same area as the land cover classification from Lou Steyaert.

Corner	X	Y	Longitude	Latitude
Upper Left	174.0707	785.4531	108°03'09.30" W	58°01'07.68" N
Upper Right	1036.0707	785.4531	93°48'17.52" W	56°53'52.87" N
Lower Left	174.0707	113.4531	108°27'59.25" W	51°59'32.04" N
Lower Right	1036.0707	113.4531	96°08'36.17" W	51°01'20.43" N

The X and Y coordinates are the BOREAS grid coordinates which are based on an Albers Equal Area Conic (AEAC) projection with the following parameters:

Origin: 111.00 deg W, 51.00 deg N

Standard Parallels: 52.5 deg N, 58.5 deg N

Regridded LAI Maps for 1994, 10 by 5 minutes

There are two sets of images associated with this document. These images were produced by averaging the 1-km LAI maps by Jing Chen to a 10' (horizontal) by 5' (vertical) pixel size in a straight latitude/longitude grid. See the document [BOREAS RSS-07 Regional LAI and FPAR Images From Ten-Day AVHRR-LAC Composites](#) for more information on the original data product that this is based on.

Image Specifications

Each image is 66 pixels by 60 lines and contains no leading header bytes. Each pixel in the image is represented by one byte. The DN for each pixel can be converted to LAI with the following equation:

$$\text{LAI} = (\text{DN} - 1) / 10$$

The first image product is the "Average LAI Maps", where each pixel represents the average LAI of the 1-km pixels that fall in each 10' by 5' pixel.

Average LAI Maps, 10 by 5 minutes
94-05-21_lai_10by5min.img (May 21-31, 1994)
94-07-21_lai_10by5min.img (July 21-31, 1994)
94-09-01_lai_10by5min.img (September 1-10, 1994)

The second image product is the "Average LAI by Land Cover Class Maps", where each pixel DN represents the average LAI of the 1-km pixels of the given land cover class that falls in each 10' by 5' pixel.

Average LAI by Land Cover Class Maps, 10 by 5 minutes		
LAI from 21-31 May 1994	LAI from 21-31 Jul 1994	LAI from 01-10 Sep 1994
94-05-21_lai_class00.img	94-07-21_lai_class00.img	94-09-01_lai_class00.img
94-05-21_lai_class01.img	94-07-21_lai_class01.img	94-09-01_lai_class01.img
94-05-21_lai_class02.img	94-07-21_lai_class02.img	94-09-01_lai_class02.img
94-05-21_lai_class03.img	94-07-21_lai_class03.img	94-09-01_lai_class03.img
94-05-21_lai_class04.img	94-07-21_lai_class04.img	94-09-01_lai_class04.img
94-05-21_lai_class05.img	94-07-21_lai_class05.img	94-09-01_lai_class05.img
94-05-21_lai_class06.img	94-07-21_lai_class06.img	94-09-01_lai_class06.img
94-05-21_lai_class07.img	94-07-21_lai_class07.img	94-09-01_lai_class07.img
94-05-21_lai_class08.img	94-07-21_lai_class08.img	94-09-01_lai_class08.img
94-05-21_lai_class09.img	94-07-21_lai_class09.img	94-09-01_lai_class09.img
94-05-21_lai_class10.img	94-07-21_lai_class10.img	94-09-01_lai_class10.img
94-05-21_lai_class11.img	94-07-21_lai_class11.img	94-09-01_lai_class11.img
94-05-21_lai_class12.img	94-07-21_lai_class12.img	94-09-01_lai_class12.img
94-05-21_lai_class13.img	94-07-21_lai_class13.img	94-09-01_lai_class13.img
94-05-21_lai_class14.img	94-07-21_lai_class14.img	94-09-01_lai_class14.img
94-05-21_lai_class15.img	94-07-21_lai_class15.img	94-09-01_lai_class15.img
94-05-21_lai_class16.img	94-07-21_lai_class16.img	94-09-01_lai_class16.img
94-05-21_lai_class17.img	94-07-21_lai_class17.img	94-09-01_lai_class17.img
94-05-21_lai_class18.img	94-07-21_lai_class18.img	94-09-01_lai_class18.img
94-05-21_lai_class19.img	94-07-21_lai_class19.img	94-09-01_lai_class19.img
94-05-21_lai_class20.img	94-07-21_lai_class20.img	94-09-01_lai_class20.img

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Example: The file "94-05-21_lai_class18.img" represents the average LAI of the 1-km pixels (from 21-31 May 1994 LAI image) that are of class 18. The class numbers correspond to the class numbers from Lou Steyaert's AFM-12 classification. There is no class 6, 8, or 10 in Lou Steyaert's classification, thus there are no images representing the average LAI for those class numbers.

The Pixel-Area Image

The file "0_pixel_area_10by5min.img" is an image that provides the area for each of the 10 by 5 minute cells. The area for each pixel is given in hectares. One hectare equals 10,000 square meters.

Each pixel value is represented as a 2-byte integer. This image has the low-order byte first. On some systems, the bytes may need to be swapped in order to read the 2-byte integers correctly. On UNIX systems, this can be done with the following command.

```
dd if=input_file_name conv=swab of=output_file_name
```

Spatial Coverage

These data cover the same area as the regional meteorological parameters assembled by Val Pauwels. The data are in a straight latitude/longitude grid. The BOREAS grid coordinates listed below are simply given for reference purposes. The corner coordinates are identical to the upper left corner of Val's regional data set.

Corner	X	Y	Longitude	Latitude
Upper Left	242.697	675.191	107°00'00.00" W	57°00'00.00" N
Upper Right	903.583	765.939	96°00'00.00" W	57°00'00.00" N
Lower Left	274.686	119.043	107°00'00.00" W	52°00'00.00" N
Lower Right	1022.683	221.752	96°00'00.00" W	52°00'00.00" N

The X and Y coordinates are the BOREAS grid coordinates which are based on an Albers Equal Area Conic (AEAC) projection with the following parameters:

Origin: 111.00 deg W, 51.00 deg N

Standard Parallels: 52.5 deg N 58.5 deg N

Units of Measure: kilometers

Regridded FPAR Maps for 1994, 10 by 5 minutes

These images were produced by averaging the 1-km FPAR maps by Jing Chen to a 10' (horizontal) by 5' (vertical) pixel size in a straight latitude/longitude grid. Each pixel DN represents the average FPAR of the 1-km pixels of the given land cover class that falls in each 10' by 5' pixel. See the document [BOREAS RSS-07 Regional LAI and FPAR Images From Ten-Day AVHRR-LAC Composites](#) for more information on the original data product that this is based on.

Image Specifications

Each image is 66 pixels by 60 lines and contains no leading header bytes. Each pixel in the image is represented by one byte. The DN for each pixel can be converted to FPAR with the following equation:

ORNL DAAC BOREAS FOLLOW-ON DSP-10 REGRIDDED FPAR AND LAI MAPS FOR 1994

$$\text{FPAR} = (\text{DN} - 1) / 100$$

A DN of 255 indicates that there were no 1-km pixels of the given class within the 10' by 5' pixel area. Therefore, there is no average LAI value for that class.

FPAR Maps, 10 by 5 minutes		
21-31 May 1994	21-31 Jul 1994	1-10 Sep 1994
94-05-21_fpar_class00.img	94-07-21_fpar_class00.img	94-09-01_fpar_class00.img
94-05-21_fpar_class01.img	94-07-21_fpar_class01.img	94-09-01_fpar_class01.img
94-05-21_fpar_class02.img	94-07-21_fpar_class02.img	94-09-01_fpar_class02.img
94-05-21_fpar_class03.img	94-07-21_fpar_class03.img	94-09-01_fpar_class03.img
94-05-21_fpar_class04.img	94-07-21_fpar_class04.img	94-09-01_fpar_class04.img
94-05-21_fpar_class05.img	94-07-21_fpar_class05.img	94-09-01_fpar_class05.img
94-05-21_fpar_class06.img	94-07-21_fpar_class06.img	94-09-01_fpar_class06.img **
94-05-21_fpar_class07.img	94-07-21_fpar_class07.img	94-09-01_fpar_class07.img
94-05-21_fpar_class08.img	94-07-21_fpar_class08.img	94-09-01_fpar_class08.img **
94-05-21_fpar_class09.img	94-07-21_fpar_class09.img	94-09-01_fpar_class09.img
94-05-21_fpar_class10.img	94-07-21_fpar_class10.img	94-09-01_fpar_class10.img **
94-05-21_fpar_class11.img	94-07-21_fpar_class11.img	94-09-01_fpar_class11.img
94-05-21_fpar_class12.img	94-07-21_fpar_class12.img	94-09-01_fpar_class12.img
94-05-21_fpar_class13.img	94-07-21_fpar_class13.img	94-09-01_fpar_class13.img
94-05-21_fpar_class14.img	94-07-21_fpar_class14.img	94-09-01_fpar_class14.img
94-05-21_fpar_class15.img	94-07-21_fpar_class15.img	94-09-01_fpar_class15.img
94-05-21_fpar_class16.img	94-07-21_fpar_class16.img	94-09-01_fpar_class16.img
94-05-21_fpar_class17.img	94-07-21_fpar_class17.img	94-09-01_fpar_class17.img
94-05-21_fpar_class18.img	94-07-21_fpar_class18.img	94-09-01_fpar_class18.img
94-05-21_fpar_class19.img	94-07-21_fpar_class19.img	94-09-01_fpar_class19.img
94-05-21_fpar_class20.img	94-07-21_fpar_class20.img	94-09-01_fpar_class20.img

Example: The file "94-05-21_fpar_class18.img" represents the average FPAR of the 1-km pixels (from 21-31 May 1994 FPAR image) that are of class 18. The class numbers correspond to the class numbers from Lou Steyaert's AFM-12 classification. There is no class 6, 8, or 10 in Lou Steyaert's classification, thus there are no images representing the average FPAR for those class numbers.

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Corner	X	Y	Longitude	Latitude
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The X and Y coordinates listed above are the BOREAS grid coordinates which are based on an Albers Equal Area Conic (AEAC) projection with the following parameters:

Origin: 111.00 deg W, 51.00 deg N

Standard Parallels: 52.5 deg N 58.5 deg N

Units of Measure: kilometers

Regridded LAI Maps for 1994, 54 km

These images were produced by averaging the 1-km LAI maps by Jing Chen to a 54-km pixel size. 54-km roughly equals one-half a degree (30 minutes) of latitude. See the document [BOREAS RSS-07 Regional LAI and FPAR Images From Ten-Day AVHRR-LAC Composites](#) for more information on the original data product that this is based on.

Image Specifications

Each image is 16 pixels by 12 lines and contains no leading header bytes. Each pixel in the image is represented by one-byte. The DN for each pixel can be converted to LAI with the following equation:

$$\text{LAI} = (\text{DN} - 1) / 10$$

The following files contain the average LAI within each 54-km pixel.

Average LAI Maps, 54 km
94-05-21_lai_54km.img (May 21-31, 1994)
94-07-21_lai_54km.img (July 21-31, 1994)
94-09-01_lai_54km.img (September 1-10, 1994)

Spatial Coverage

These data cover the same area as the land cover classification from Lou Steyaert. The upper left corner is identical to the upper left corner of Lou Steyaert's classification. Due to rounding off to the nearest 54-km pixel, the other corners are in slightly different locations.

Corner	X	Y	Longitude	Latitude
Upper Left	174.0707	785.4531	108°03'09.30" W	58°01'07.68" N
Upper Right	1038.0707	785.4531	93°46'22.83" W	56°53'37.06" N
Lower Left	174.0707	137.4531	108°27'13.26" W	52°12'28.30" N
Lower Right	1038.0707	137.4531	96°02'33.91" W	51°13'46.60" N

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The X and Y coordinates are the BOREAS grid coordinates which are based on an Albers Equal Area Conic (AEAC) projection with the following parameters:

Origin: 111.00 deg W, 51.00 deg N

Standard Parallels: 52.5 deg N 58.5 deg N

Units of Measure: kilometers

References:

Steyaert, L.T., F.G. Hall, and T.R. Loveland. 1997. Land Cover Mapping, Fire Disturbance-Regeneration, and Multiresolution Land Cover Scaling Studies in the BOREAS Forest Ecosystem with Multiresolution 1-km AVHRR. *J. Geophys. Res.*102: 29581-29598.

Citation:

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