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Vegetation, Land-Use and Seasonal Albedo Data Sets : Documentation of Archived Data Tape

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VEGETATION, LAND-USE AND SEASONAL ALBEDO DATA SETS: DOCUMENTATION OF ARCHIVED DATA TAPE

MAY 1984

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*NOTE: This is a revised version of the documentation provided to NCAR in July 1983.

GENERAL DESCRIPTION

Global data bases of vegetation, land use, and land cover have been compiled for use in climate studies at a 1° latitude x 1° longitude resolution, drawing on approximately 100 published sources complemented by a large collection of satellite imagery. A series of 6 datasets has been prepared and archived at NCAR. The first is a vegetation data set (VEGTYPE) representing natural (pre-agricultural) vegetation based on the UNESCO classification system. The second, derived from the land-use compilation is a cultivation intensity data set (CULTINT) defining the areal extent of presently cultivated land in the 1° cells. The last four are present integrated surface-albedo data sets (January, April, July, October) for snow-free conditions except for permanently snow-covered continental ice, incorporating natural vegetation and cultivation characteristics from the vegetation and cultivation-intensity data sets. These 6 data sets include non-zero data for permanent land only, including continental ice; water, including oceans and lakes, is zero.

This paper includes documentation of the data-tape format, brief descriptions of the individual data sets and a regional map of several of the data sets as examples.

For complete discussion of the vegetation and land-use data sets see E. Matthews, 1983, Global vegetation and land use: new high-resolution data bases for climate studies, J. Clim. Appl. Meteor., 22, 474-487. Tape prepared by E. Matthews, NASA-Goddard Space Flight Center, Institute for Space Studies, 2880 Broadway, New York, N.Y. 10025, (212) 678-5500, FTS 664-5500.

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Tape: 9 track, 1600 bpi, ASCII, BLP, RECFM = F

GRID: all (i,j) arrays are (360,180), 1 degree (lon,lat) resolution
j = 1,180 -- j = 1: 1 degree band from 90 degrees south to 89 degrees south ...
j = 180: 1 degree band from 89 degrees north to 90 degrees north
i = 1,360 -- i = 1: 1 degree band from 180 (dateline) to 179 degrees west ...
i = 360: 1 degree band from 179 degrees east to 180 (dateline)

FILE #	FILE NAME*	ARRAY SIZE	TYPE	FORMAT/RECORD LENGTH/BLOCKSIZE	DESCRIPTION
1	VEGTYPE	(360,180)	I*2	do 100 j = 1,180 read (ntape,1000) (IVEG(i,j),i=1,360) 100 continue 1000 format (250I2,110I2) RECORD LENGTH = 720 BLOCKSIZE = 720	land points: 1-32 include continental ice water points: 0 include lake & ocean see Table 1, Fig. 1
2	CULTINT	(360,180)	I*2	do 100 j = 1,180 read (ntape,1000) (ICULT(i,j),i=1,360) 100 continue 1000 format (250I2,110I2) RECORD LENGTH = 720 BLOCKSIZE = 720	land points: 1-5 include continental ice water points: 0 include lake & ocean see Table 2, Fig. 2
3	ALBEDO	(360,180)x4	R*4	do 200 n = 1,4 do 100 j = 1,180 read(ntape,2000) (ALBEDO(i,j),i=1,360) 100 continue 200 continue 2000 format (250F6.2,110F6.2) RECORD LENGTH = 2160 BLOCK SIZE = 2160	land points: 1.-100. include continental ice water points: 0. include lake & ocean albedo arrays for 4 months: January,April,July,October snow-free conditions except for permanently snow-covered continental ice See Table 3, Fig. 3

* File names are not on the tape

Table 1. VEGTYPE: The thirty two vegetation types described in Col. 3 are identified in VEGTYPE as 1 to 32, as shown in Col. 1. Col. 2 lists the 32 associated map symbols used to map VEGTYPE in Fig. 1

1	2	3
Vegetation Type	Map Symbol	Description
1	1	tropical evergreen rainforest, mangrove forest
2	2	tropical/subtropical evergreen seasonal broadleaved forest
3	3	subtropical evergreen rainforest
4	4	temperate/subpolar evergreen rainforest
5	5	temperate evergreen seasonal broadleaved forest, summer rain
6	6	evergreen broadleaved sclerophyllous forest, winter rain
7	7	tropical/subtropical evergreen needleleaved forest
8	8	temperate/subpolar evergreen needleleaved forest
9	9	tropical/subtropical drought-deciduous forest
10	A	cold-deciduous forest, with evergreens
11	B	cold-deciduous forest, without evergreens
12	C	xeromorphic forest/woodland
13	D	evergreen broadleaved sclerophyllous woodland
14	E	evergreen needleleaved woodland
15	F	tropical/subtropical drought-deciduous woodland
16	G	cold-deciduous woodland
17	H	evergreen broadleaved shrubland/thicket, evergreen dwarf-shrubland
18	I	evergreen needleleaved or microphyllous shrubland/thicket
19	J	drought-deciduous shrubland/thicket

Table 1. (continued)

1	2	3
Vegetation Type	Map Symbol	Description
20	K	cold-deciduous subalpine/subpolar shrubland, cold-deciduous dwarf shrubland
21	L	xeromorphic shrubland/dwarf shrubland
22	M	arctic/alpine tundra, mossy bog
23	N	tall/medium/short grassland with 10-40% woody tree cover
24	O	tall/medium/short grassland with <10% woody tree cover or tuft-plant cover
25	P	tall/medium/short grassland with shrub cover
26	Q	tall grassland, no woody cover
27	R	medium grassland, no woody cover
28	S	meadow, short grassland, no woody cover,
29	T	forb formations
30	U	desert
31	V	ice
32	W	cultivation

Fig. 1. VEGTYPE mapped for North America using map symbols from Table 1. The region includes VEGTYPE(I,J), I = 1,120, J = 100,180.

Table 2. CULTINT: Cultivation intensities, ranging from 0 to 5 in CULTINT translate into % cultivated and % natural vegetation as shown.

Cultivation Intensity	Description		
	land/water	% cultivated	% natural vegetation
0	water	-	-
1	land	0	100
2	land	20	80
3	land	50	50
4	land	75	25
5	land	100	0

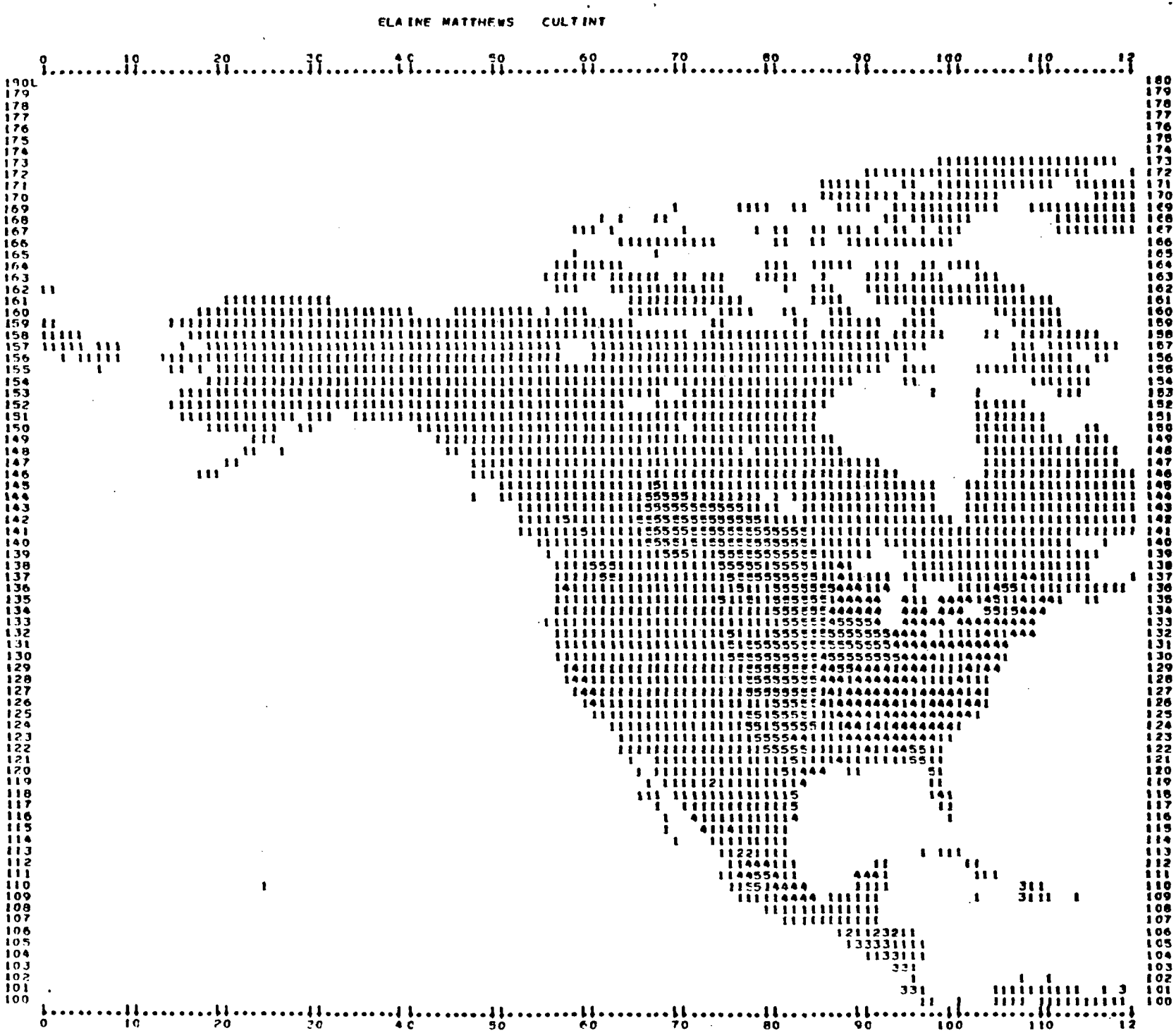

Fig. 2. CULTINT mapped for North America using map symbols from Table 2. The region includes CULTINT(I,J), I = 1,120, J = 100,180.

TABLE 3A. Seasonal snow-free, integrated albedos for 32 vegetation types listed in Table 1. The winter, spring, summer and fall values correspond to January, April, July and October in the northern hemisphere and to July, October, January and April in the southern hemisphere. The appropriate seasonal values were used, in conjunction with the VEGTYPE and CULTINT data bases, to produce albedo data sets for January, April, July and October.

VEGETATION	WINTER	SPRING	SUMMER	FALL
1	11	11	11	11
2	11	11	11	11
3	11	11	11	11
4	12	12	12	12
5	12	13	14	13
6	17	14	13	14
7	13	14	16	13
8	11	12	15	12
9	18	16	15	16
10	12	15	18	13
11	12	15	18	13
12	28	32	28	28
13	15	13	12	13
14	14	14	16	14
15	20	18	17	18
16	14	14	17	14
17	15	15	18	15
18	15	15	18	15
19	17	20	20	17
20	17	20	20	17
21	28	32	28	28
22	12	12	17	15
23	14	15	17	15

TABLE 3A. (continued)

VEGETATION	WINTER	SPRING	SUMMER	FALL
24	14	15	16	14
25	16	18	25	20
26	17	17	20	17
27	16	20	20	18
28	16	20	20	18
29	16	20	20	18
30	30	30	30	30
31	75	75	75	75
32	16	18	20	18

Table 3B. Symbols used to map January albedos in Fig. 3.

Albedo	Map Symbol
0. (water)	blank
1.	1
2.	2
3.	3
4.	4
5.	5
6.	6
7.	7
8.	8
9.	9
10.	A
11.	B
12.	C
13.	D
14.	E
15.	F
16.	G
17.	H
18.	I
19.	J
20.	K
21.	L
22.	M
23.	N
24.	O
25.	P
26.	Q
27.	R
28.	S
29.	T
30.	U
31.	V
32.	W
33.	X
34.	Y
35.	Z
>35.	+

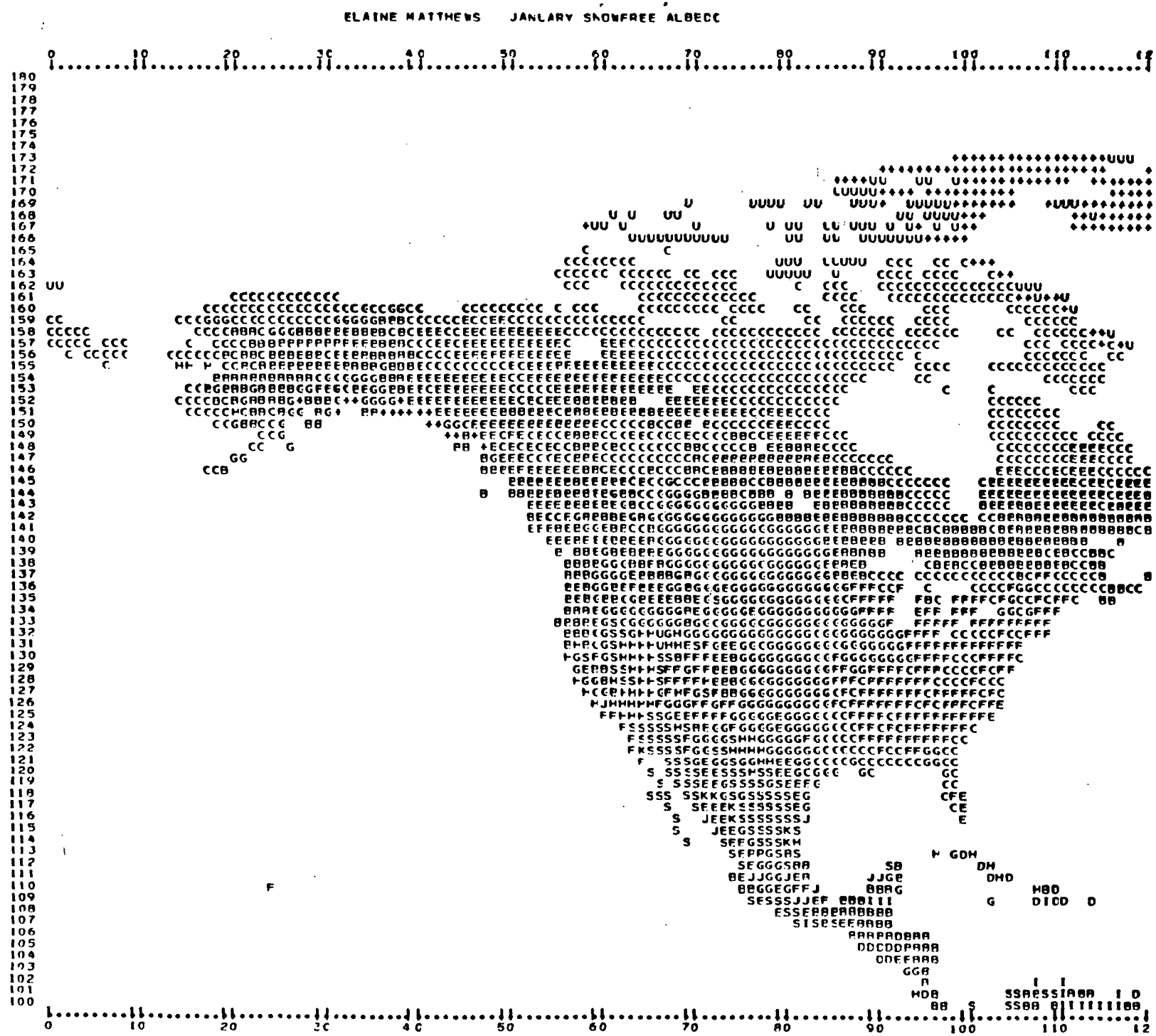

Fig. 3. ALBEDO (January) mapped for North America using map symbols from Table 3B. The region includes ALBEDO(I,J), I = 1,120, J = 100,180.

BIBLIOGRAPHIC DATA SHEET

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15. Supplementary Notes

16. Abstract

Global digital data bases of natural vegetation and land use were compiled, for use in climate studies, at 1° resolution from over 100 published sources. A series of 6 data sets, derived from the original compilations, was prepared and archived on tape at the National Center for Atmospheric Research (NCAR). The first is a vegetation data set (VEGTYPE) representing natural (pre-agricultural) vegetation based on the UNESCO classification system. The second, derived from the land-use compilation, is a cultivation-intensity data set (CULTINT) defining the areal extent of presently cultivated land in the 1° cells. The last four are present, integrated surface-albedo data sets (January, April, July, October) for snow-free conditions, incorporating natural-vegetation and cultivation characteristics from the vegetation and cultivation-intensity data sets. Each of these data sets covers the entire surface of the earth. They include non-zero data for permanent land only, including continental ice; water, including oceans and lakes, is zero.

This report includes documentation of the data-tape format, brief descriptions of the individual data sets, and a regional map of several data sets as examples.

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