SEMI-ANNUAL REPORT FOR CONTRACT
NAG - 1 - 661

"ANALYSIS OF NIMBUS-7 SOLAR AND EARTH RADIATION BUDGET"

FROM

DEPARTMENT OF ATMOSPHERIC SCIENCE
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PROJECT SUMMARY

With the addition of ERB data from 1985, the Nimbus-7 Earth Radiation Budget data set has been expanded to seven years. This remarkable data set includes almost three years of Nimbus-6 data as well. Supplimenting the N7 ERB data set is the new ERBS data. Incorporating the ERBS data into the Nimbus time series is the topic of study presented by G. Garrett Campbell.

Interannual variability is continued as a topic of study. The additional years contribute greatly to broading the scope of this work. Laura Smith presents results from the latest investigation.

Many Studies have used the Nimbus-7 monthly averaged ERB data fields. Numerous other studies relating ERB results to clouds and circulation data are possible when we use ERB data on time scales of less than a month. David Randel presents results of a study on the minimum temporal and spatial scales available from the Nimbus-7 WFOV data. It was found that 6 day averages producing four time periods can be used with reasonable accuracy.

Figures 1,2,3 present the time-latitude cross sections of the Nimbus-6 and Nimbus-7 data sets, incompassing over ten years of data from nearly identical instruments. Table 1 presents zonal and annual averages for the ERB NFOV scanner during the best data period June 1979 - May 1980. Tables 2-7 show the zonal and annual averages for all seven years, for each ERB parameter, from the WFOV non-scanning instrument.

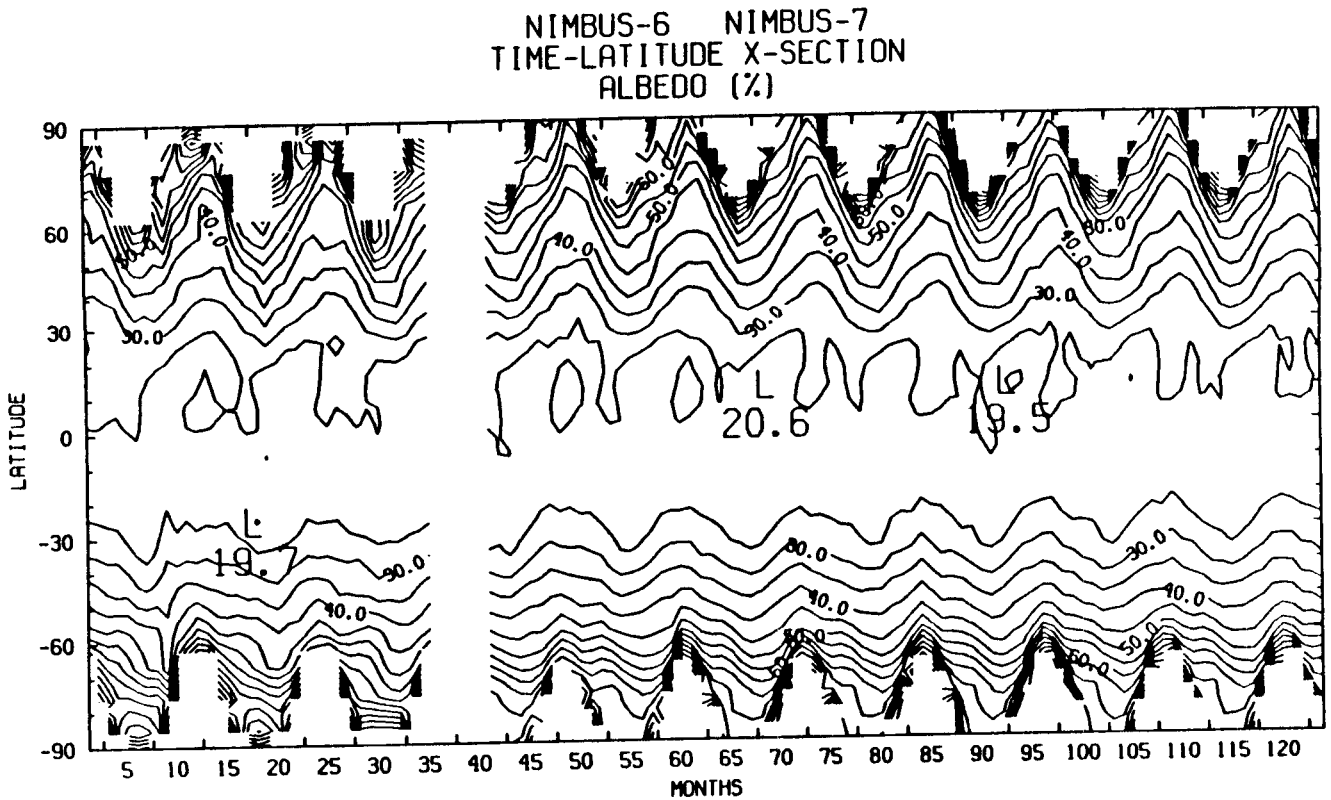

FIGURE 1. NIMBUS-6 AND NIMBUS-7 JULY 1975 - OCTOBER 1985

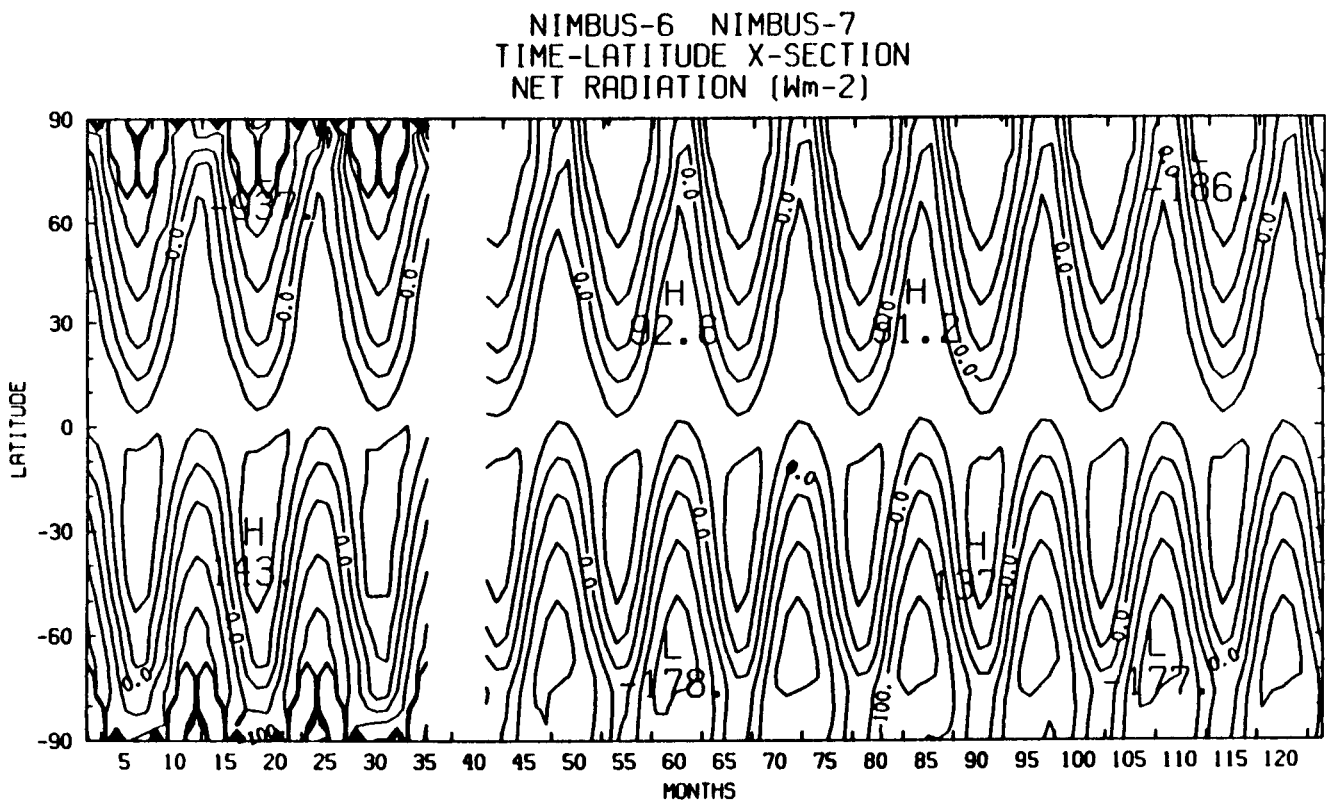

FIGURE 2. NIMBUS-6 AND NIMBUS-7 JULY 1975 - OCTOBER 1985

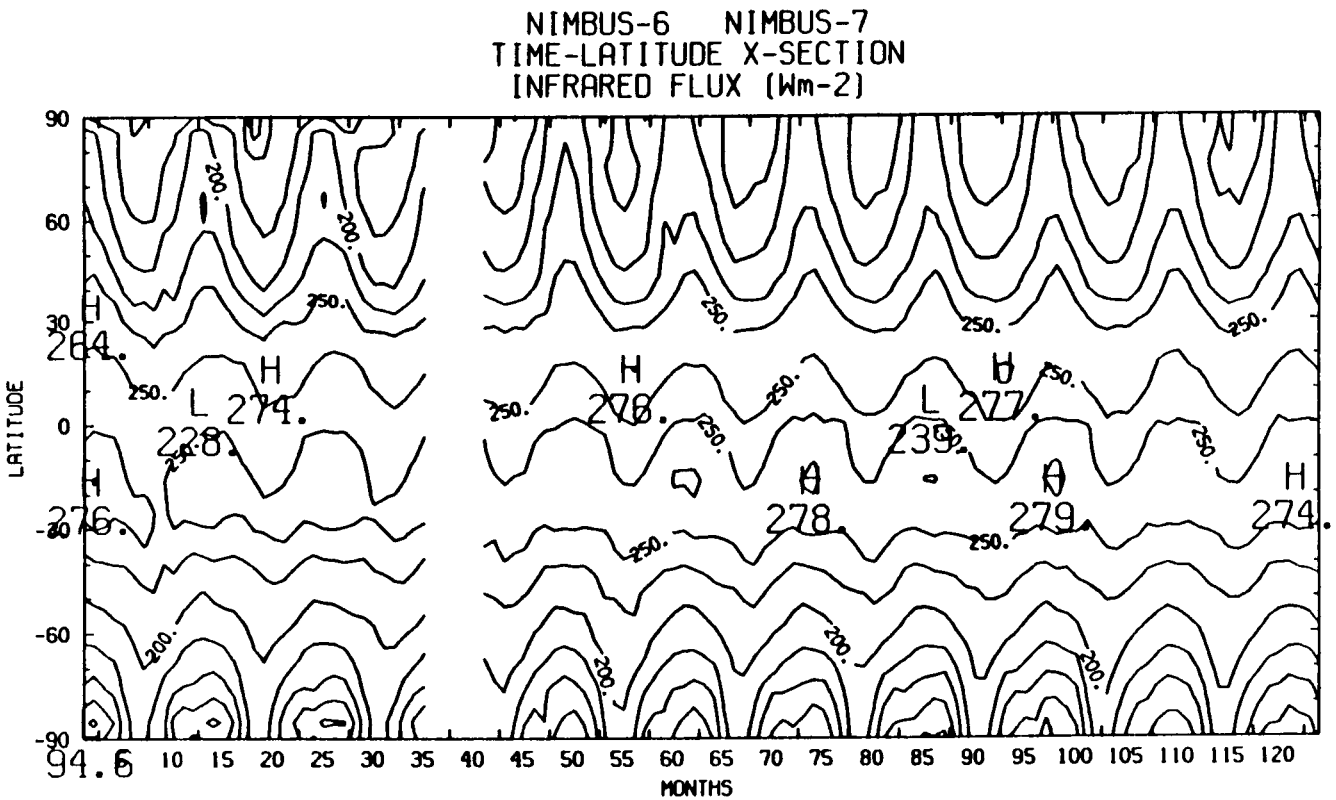

FIGURE 3. NIMBUS-6 AND NIMBUS-7 JULY 1975 - OCTOBER 1985

JU79MA80: ANNUAL AVERAGE JUNE 79 - MAY 80

ZONE#	IR(AN)	IR(DN)	IRT	ALB	NET	INC	ABS	REF
1	184.6	185.3	184.8	0.642	-123.2	174.2	68.7	122.9
2	183.9	184.2	184.3	0.627	-118.5	176.5	76.1	127.9
3	184.6	184.8	184.9	0.609	-114.3	181.2	84.3	131.5
4	187.9	187.5	188.0	0.585	-109.7	188.6	93.4	131.5
5	193.9	192.7	193.7	0.548	-103.7	199.2	107.7	130.6
6	199.8	197.2	198.9	0.505	-92.5	214.5	119.5	122.2
7	203.7	201.4	202.8	0.473	-78.7	234.9	123.8	111.1
8	208.0	205.5	206.9	0.455	-66.8	256.5	139.9	116.7
9	213.5	209.5	211.7	0.436	-54.5	278.3	156.9	121.4
10	220.5	214.9	217.9	0.414	-42.2	299.4	175.6	123.9
11	227.5	220.9	224.3	0.387	-28.6	319.5	195.7	123.8
12	235.2	227.5	231.5	0.359	-14.7	338.2	216.7	121.5
13	245.9	237.0	241.4	0.330	-3.0	355.3	238.3	117.1
14	259.3	248.9	254.2	0.307	2.9	370.7	256.9	113.8
15	268.3	257.9	263.3	0.275	15.3	384.1	278.4	105.7
16	269.8	259.4	264.8	0.261	27.6	395.5	292.3	103.2
17	263.7	253.8	258.9	0.249	44.9	404.6	303.9	100.7
18	248.3	239.6	244.0	0.263	59.2	411.6	303.5	108.1
19	233.8	228.8	231.4	0.309	56.0	416.3	287.6	128.6
20	239.9	235.4	237.8	0.279	63.4	418.6	301.6	117.0
21	245.6	240.3	243.0	0.262	65.6	418.5	308.7	109.8
22	249.3	244.8	247.1	0.264	58.6	416.2	306.1	110.0
23	256.9	252.4	254.7	0.254	52.2	411.4	307.1	104.4
24	264.9	258.3	261.7	0.245	43.8	404.4	305.4	99.0
25	268.5	260.6	264.6	0.247	32.8	395.2	297.4	97.8
26	264.9	256.2	260.6	0.258	23.8	383.7	284.6	99.2
27	255.4	249.0	252.2	0.281	14.0	370.3	266.3	104.0
28	243.2	240.5	241.9	0.309	3.4	354.9	245.4	109.5
29	232.6	231.1	231.8	0.347	-11.4	337.7	220.7	117.0
30	222.7	222.3	222.5	0.385	-26.7	318.9	196.2	122.8
31	214.8	214.4	214.6	0.417	-40.8	298.8	174.1	124.7
32	208.1	208.2	208.2	0.443	-53.8	277.6	154.7	122.9
33	202.3	202.3	202.4	0.473	-68.0	255.8	134.7	121.1
34	196.6	196.7	196.7	0.515	-83.4	234.1	113.6	120.6
35	190.0	189.9	190.0	0.576	-99.9	213.8	101.3	138.0
36	176.8	175.5	176.5	0.663	-110.2	198.4	80.1	157.5
37	160.7	158.8	160.4	0.690	-102.5	187.8	65.8	146.4
38	151.3	149.8	151.1	0.703	-98.5	180.4	63.9	151.6
39	148.1	147.7	148.1	0.712	-98.2	175.7	59.8	148.0
40	142.4	141.3	141.4	0.727	-95.2	173.4	55.0	146.1
N.HEMI	236.5	229.9	233.3	0.333	-4.4	343.1	230.5	116.2
S.HEMI	234.3	230.6	232.5	0.327	-2.0	342.7	231.8	114.2
GLOBAL	235.4	230.2	232.9	0.330	-3.2	342.9	231.2	115.2

TABLE 1. NIMBUS-7 SCANNER ZONAL AND ANNUAL AVERAGES FOR MOST IDEAL 12 MONTH PERIOD.

FIELD TYPE= IRFAN ANNUAL AVERAGES NOVEMBER-OCTOBER

ZONE#	78-79	79-80	80-81	81-82	82-83	83-84	84-85
1	187.2	185.3	179.5	180.1	176.1	179.8	181.9
2	188.7	187.6	182.2	182.5	179.2	182.2	183.6
3	190.2	189.8	185.0	184.9	182.3	184.6	185.4
4	191.6	192.1	187.8	187.3	185.4	187.0	187.1
5	194.6	195.2	191.4	190.6	189.2	190.7	190.0
6	198.7	199.4	196.2	194.9	194.1	195.3	194.2
7	203.3	203.8	201.6	199.8	199.5	200.2	198.6
8	208.5	208.4	207.3	205.6	205.4	205.4	203.7
9	214.9	214.1	213.5	212.2	212.0	211.5	209.9
10	222.2	221.6	221.0	219.9	219.9	219.1	217.8
11	230.8	230.1	229.5	228.2	228.3	227.6	227.0
12	240.0	239.6	238.7	236.9	237.1	236.9	236.6
13	249.8	249.4	248.2	246.0	246.3	246.5	246.2
14	259.0	258.5	256.8	254.5	255.5	255.5	255.0
15	265.3	265.0	263.0	260.7	262.8	261.7	261.0
16	266.6	266.4	264.8	262.9	266.3	263.7	262.4
17	262.8	262.7	261.5	259.8	265.0	261.4	259.4
18	255.4	255.8	255.5	253.9	259.9	255.5	253.9
19	249.7	250.4	250.8	248.8	253.5	250.5	249.7
20	248.7	249.9	250.9	249.4	250.4	250.3	250.3
21	252.0	253.4	254.3	253.4	251.8	253.1	253.3
22	256.3	257.9	258.7	258.4	256.4	256.5	257.1
23	261.7	262.7	263.2	263.6	262.5	261.2	261.6
24	265.7	266.9	267.1	267.5	267.7	265.6	265.8
25	266.2	268.1	268.1	268.2	268.7	266.6	266.8
26	262.8	264.6	265.3	264.9	264.9	263.1	263.6
27	255.3	257.4	257.9	257.7	257.1	255.4	256.5
28	245.7	247.4	248.1	248.3	247.2	246.1	247.0
29	235.9	236.8	237.3	237.8	236.7	236.4	236.8
30	226.5	226.3	226.8	227.5	226.5	227.1	227.1
31	217.9	217.1	217.4	218.0	217.1	218.2	218.0
32	209.9	209.0	209.3	209.2	208.9	210.1	209.9
33	203.0	202.0	201.7	201.1	200.9	202.7	202.1
34	195.8	194.8	194.1	192.8	192.9	195.3	194.4
35	187.3	186.6	185.0	183.0	183.5	186.6	185.7
36	177.2	176.4	174.3	171.4	172.2	176.2	175.3
37	167.6	166.7	164.0	160.6	161.5	166.0	165.0
38	159.1	158.6	155.4	151.7	152.0	157.5	156.6
39	150.7	150.5	146.8	142.8	142.6	149.0	148.2
40	142.2	142.4	138.1	133.9	133.1	140.5	139.7
N.HEMI	239.5	239.5	238.3	236.7	238.3	237.3	236.4
S.HEMI	236.5	237.2	237.3	236.9	236.4	236.5	236.7
GLOBAL	238.0	238.4	237.8	236.8	237.3	236.9	236.5

TABLE 2. NIMBUS-7 NON-SCANNER ZONAL AND ANNUAL AVERAGES FOR EACH YEAR IN THE SEVEN YEAR DATA SET
Infrared Flux (Wm-2) Ascending Orbits

FIELD TYPE= IRFDN ANNUAL AVERAGES NOVEMBER-OCTOBER

ZONE#	78-79	79-80	80-81	81-82	82-83	83-84	84-85
1	191.7	191.7	177.0	177.1	173.3	179.1	181.1
2	192.4	190.9	179.7	179.5	176.1	181.7	183.2
3	193.1	190.0	182.4	181.8	178.8	184.4	185.2
4	193.9	189.2	185.1	184.2	181.6	187.0	187.3
5	195.6	192.8	189.1	188.0	186.0	190.4	190.1
6	198.9	196.1	193.4	192.0	190.5	194.6	193.5
7	203.4	200.0	198.9	197.4	196.0	199.5	198.0
8	208.0	204.7	204.4	202.7	202.4	204.9	203.1
9	211.4	208.1	210.0	208.5	208.7	210.6	208.8
10	217.2	215.0	216.3	214.9	215.0	216.6	215.2
11	223.7	221.5	223.8	222.5	222.3	223.2	222.4
12	230.7	230.6	232.2	230.5	231.0	230.5	230.0
13	238.5	239.4	240.3	239.1	239.3	238.9	238.6
14	246.8	248.1	248.4	246.8	247.6	247.2	246.8
15	253.5	254.8	254.2	252.8	254.8	253.3	252.5
16	255.7	257.3	256.6	255.1	258.7	255.8	254.4
17	253.6	255.1	254.4	253.2	258.2	254.0	251.8
18	248.4	249.5	249.4	248.1	253.3	249.1	247.0
19	243.9	244.5	245.2	243.9	247.8	244.5	243.5
20	243.7	244.1	245.3	244.1	244.9	243.5	243.3
21	246.4	247.0	248.0	247.2	245.4	245.3	245.3
22	250.5	251.0	251.7	251.6	248.8	248.3	248.5
23	255.3	255.6	255.7	255.9	253.9	252.6	252.6
24	258.4	259.1	258.5	258.7	258.1	255.8	255.5
25	258.3	259.8	259.0	259.0	259.0	256.5	256.3
26	255.4	257.0	256.6	256.3	256.2	253.6	254.0
27	249.5	251.5	251.5	251.2	250.8	248.3	249.2
28	242.5	244.2	244.7	244.3	243.7	241.6	242.4
29	235.2	236.7	236.3	236.5	235.9	234.0	234.7
30	227.1	228.0	227.1	227.3	226.9	226.2	226.6
31	218.4	219.6	218.3	219.0	218.7	218.7	218.8
32	210.8	213.0	211.0	211.1	211.7	211.5	211.5
33	203.2	205.8	202.8	202.0	203.0	204.7	204.4
34	195.4	198.8	194.6	193.3	194.1	197.5	197.0
35	187.0	190.7	184.9	183.1	183.7	188.9	188.2
36	177.9	180.4	175.3	172.0	172.8	178.7	178.0
37	167.4	169.1	162.6	159.1	159.1	168.0	167.3
38	160.4	161.1	151.9	148.1	149.4	158.3	157.6
39	153.3	153.1	141.3	137.2	139.6	148.7	147.8
40	146.2	145.1	130.6	126.2	129.9	139.0	138.1
N.HEMI	233.0	232.6	232.5	231.1	232.5	232.1	231.0
S.HEMI	232.9	234.4	233.1	232.6	232.1	231.9	232.0
GLOBAL	233.0	233.5	232.8	231.9	232.3	232.0	231.5

TABLE 3. NIMBUS-7 NON-SCANNER ZONAL AND ANNUAL AVERAGES FOR EACH YEAR IN THE SEVEN YEAR DATA SET
Infrared Flux (Wm-2) Decending Orbits

FIELD TYPE= INCID ANNUAL AVERAGES NOVEMBER-OCTOBER

ZONE#	78-79	79-80	80-81	81-82	82-83	83-84	84-85
1	173.6	172.5	173.2	173.6	172.0	172.5	173.1
2	175.9	175.0	175.4	175.7	174.5	174.8	175.4
3	180.4	179.9	180.1	180.3	179.3	179.5	180.1
4	187.7	187.5	187.5	187.8	186.8	187.0	187.6
5	197.9	198.2	198.1	198.5	197.5	197.7	198.2
6	212.8	213.6	213.5	213.9	213.1	213.1	213.6
7	232.9	234.0	233.8	234.3	233.5	233.5	234.0
8	254.6	255.7	255.6	256.0	255.3	255.2	255.7
9	276.3	277.5	277.4	277.8	277.1	277.1	277.5
10	297.4	298.7	298.6	299.0	298.4	298.3	298.7
11	317.6	318.9	318.7	319.1	318.6	318.5	318.8
12	336.4	337.7	337.5	337.9	337.4	337.3	337.6
13	353.7	354.9	354.7	355.1	354.6	354.5	354.8
14	369.1	370.3	370.1	370.5	370.1	370.0	370.2
15	382.7	383.8	383.6	383.9	383.6	383.5	383.7
16	394.2	395.2	395.1	395.3	395.1	395.0	395.1
17	403.6	404.5	404.4	404.6	404.4	404.3	404.4
18	410.8	411.5	411.4	411.6	411.5	411.4	411.5
19	415.6	416.2	416.2	416.3	416.2	416.2	416.2
20	418.2	418.6	418.6	418.6	418.7	418.6	418.6
21	418.4	418.7	418.6	418.7	418.8	418.7	418.6
22	416.2	416.4	416.3	416.3	416.5	416.4	416.3
23	411.8	411.7	411.7	411.6	411.9	411.8	411.7
24	405.0	404.8	404.8	404.7	405.0	404.9	404.8
25	396.0	395.6	395.6	395.4	395.8	395.8	395.6
26	384.8	384.2	384.3	384.1	384.5	384.5	384.2
27	371.6	370.8	370.9	370.6	371.1	371.1	370.8
28	356.5	355.5	355.6	355.2	355.8	355.8	355.5
29	339.5	338.4	338.5	338.1	338.7	338.8	338.4
30	321.0	319.6	319.8	319.3	320.0	320.1	319.7
31	301.2	299.5	299.7	299.2	299.9	300.0	299.6
32	280.3	278.4	278.6	278.0	278.8	278.9	278.5
33	258.8	256.6	256.9	256.3	257.0	257.2	256.7
34	237.4	234.9	235.3	234.5	235.3	235.6	235.1
35	217.4	214.6	215.0	214.2	215.0	215.2	214.8
36	202.7	199.2	199.6	198.7	199.5	199.9	199.4
37	192.6	188.5	189.0	188.0	188.9	189.3	188.8
38	185.4	181.0	181.7	180.6	181.4	181.9	181.4
39	180.9	176.1	177.0	175.9	176.5	177.1	176.6
40	178.6	173.6	174.8	173.8	174.1	174.8	174.3
N.HEMI	341.7	342.6	342.5	342.8	342.4	342.3	342.6
S.HEMI	344.3	343.2	343.3	343.0	343.5	343.5	343.2
GLOBAL	343.0	342.9	342.9	342.9	342.9	342.9	342.9

TABLE 4. NIMBUS-7 NON-SCANNER ZONAL AND ANNUAL AVERAGES FOR EACH YEAR IN THE SEVEN YEAR DATA SET
Incident Radiation (Wm-2)

FIELD TYPE= ALBED ANNUAL AVERAGES NOVEMBER-OCTOBER

ZONE=	78-79	79-80	80-81	81-82	82-83	83-84	84-85
1	9.999	9.999	9.999	9.999	9.999	9.999	9.999
2	9.999	9.999	9.999	9.999	9.999	9.999	9.999
3	0.810	0.890	0.801	0.812	9.999	0.904	0.895
4	0.759	0.677	0.660	0.672	0.741	0.772	0.766
5	0.576	0.569	0.557	0.566	0.568	0.570	0.567
6	0.490	0.484	0.476	0.484	0.486	0.483	0.487
7	0.459	0.455	0.447	0.455	0.457	0.454	0.459
8	0.433	0.433	0.422	0.430	0.432	0.431	0.436
9	0.411	0.412	0.401	0.407	0.408	0.408	0.413
10	0.386	0.387	0.377	0.382	0.383	0.383	0.387
11	0.358	0.358	0.352	0.356	0.356	0.355	0.358
12	0.331	0.330	0.326	0.331	0.332	0.329	0.331
13	0.306	0.305	0.303	0.309	0.309	0.305	0.307
14	0.283	0.283	0.283	0.289	0.287	0.285	0.286
15	0.264	0.262	0.263	0.270	0.265	0.267	0.266
16	0.248	0.246	0.248	0.253	0.247	0.251	0.251
17	0.240	0.238	0.239	0.243	0.235	0.239	0.242
18	0.242	0.239	0.238	0.242	0.233	0.237	0.240
19	0.246	0.243	0.241	0.245	0.238	0.239	0.241
20	0.244	0.241	0.237	0.241	0.241	0.234	0.235
21	0.238	0.234	0.231	0.234	0.240	0.229	0.230
22	0.233	0.231	0.228	0.230	0.236	0.227	0.228
23	0.229	0.228	0.227	0.227	0.230	0.225	0.227
24	0.228	0.227	0.226	0.227	0.226	0.224	0.227
25	0.232	0.229	0.229	0.231	0.229	0.228	0.231
26	0.241	0.238	0.236	0.239	0.238	0.238	0.239
27	0.256	0.252	0.250	0.252	0.252	0.254	0.253
28	0.276	0.272	0.270	0.272	0.270	0.274	0.273
29	0.303	0.300	0.298	0.299	0.296	0.300	0.300
30	0.335	0.335	0.331	0.332	0.328	0.331	0.330
31	0.371	0.370	0.364	0.366	0.362	0.365	0.365
32	0.408	0.406	0.398	0.401	0.396	0.400	0.399
33	0.445	0.446	0.437	0.439	0.435	0.438	0.438
34	0.493	0.495	0.485	0.486	0.483	0.485	0.486
35	0.559	0.558	0.547	0.550	0.547	0.549	0.549
36	0.691	0.689	0.672	0.679	0.675	0.679	0.677
37	0.840	0.878	0.840	0.858	0.888	0.871	0.883
38	0.921	0.934	0.918	0.920	0.898	9.999	9.999
39	9.999	9.999	9.999	9.999	9.999	9.999	9.999
40	9.999	9.999	9.999	9.999	9.999	9.999	9.999
N.HEMI	0.310	0.308	0.304	0.310	0.303	0.308	0.310
S.HEMI	0.300	0.297	0.294	0.296	0.294	0.290	0.291
GLOBAL	0.305	0.302	0.299	0.303	0.299	0.299	0.301

TABLE 5. NIMBUS-7 NON-SCANNER ZONAL AND ANNUAL AVERAGES FOR EACH YEAR IN THE SEVEN YEAR DATA SET
Albedo

FIELD TYPE= NET	ANNUAL AVERAGES NOVEMBER-OCTOBER						
ZONE#	78-79	79-80	80-81	81-82	82-83	83-84	84-85
1	-134.1	-133.9	-122.5	-125.5	-121.8	-126.4	-124.9
2	-128.3	-127.5	-117.6	-119.9	-117.1	-120.9	-119.9
3	-121.3	-119.6	-111.4	-113.2	-111.2	-114.2	-113.3
4	-112.2	-109.3	-102.5	-103.6	-101.9	-104.8	-104.3
5	-102.1	-99.6	-93.7	-94.2	-93.3	-95.5	-95.0
6	-90.7	-87.9	-83.4	-83.4	-83.3	-84.7	-84.3
7	-77.8	-74.8	-71.4	-71.3	-71.3	-72.4	-71.7
8	-64.4	-62.0	-58.6	-58.7	-59.2	-59.9	-59.1
9	-50.7	-48.3	-46.0	-46.1	-46.7	-47.1	-46.5
10	-37.4	-35.5	-33.2	-33.1	-33.7	-33.8	-33.2
11	-24.0	-21.6	-20.5	-20.3	-20.7	-20.2	-20.0
12	-10.7	-9.4	-8.5	-8.3	-9.2	-7.3	-7.3
13	0.7	1.6	2.5	2.3	1.7	3.7	3.4
14	11.1	11.5	12.4	12.1	11.8	13.3	13.5
15	21.9	22.6	23.5	23.1	22.6	23.6	24.8
16	34.6	35.4	35.9	35.9	34.5	36.2	37.4
17	48.0	48.9	49.3	49.2	47.3	49.9	50.9
18	59.0	60.0	60.4	60.4	58.7	61.5	62.3
19	66.0	67.0	67.3	67.3	66.2	69.3	69.3
20	69.4	70.3	70.7	70.6	69.7	73.7	73.2
21	69.3	69.8	70.0	69.7	69.1	73.7	72.9
22	65.2	65.4	65.7	64.8	65.2	69.6	68.4
23	58.6	58.1	58.4	58.0	58.4	62.4	61.1
24	49.9	49.4	49.9	49.2	49.9	53.6	52.3
25	41.2	40.3	40.7	40.1	40.7	44.0	42.6
26	32.6	31.5	32.2	31.3	32.0	34.7	33.6
27	23.7	22.5	23.1	22.1	23.2	25.0	24.2
28	13.6	12.3	12.7	11.9	13.6	14.5	13.8
29	0.7	-0.3	0.4	-0.7	1.6	2.0	1.2
30	-13.9	-15.1	-13.4	-14.5	-12.2	-12.4	-12.8
31	-29.3	-30.1	-27.8	-29.3	-26.9	-27.9	-28.1
32	-44.8	-46.1	-42.9	-44.0	-42.3	-43.6	-43.4
33	-60.0	-62.1	-58.0	-58.2	-57.1	-59.3	-59.1
34	-75.7	-78.6	-73.6	-72.9	-72.2	-75.1	-74.9
35	-91.6	-94.2	-87.9	-87.0	-86.6	-90.6	-90.2
36	-103.5	-105.3	-98.6	-97.1	-96.8	-101.7	-101.1
37	-107.4	-109.2	-101.5	-99.7	-99.2	-105.5	-105.0
38	-106.0	-108.3	-99.5	-97.2	-97.4	-103.0	-102.5
39	-102.9	-104.9	-94.8	-91.9	-92.7	-98.3	-97.9
40	-98.7	-100.6	-89.4	-86.0	-87.2	-92.6	-92.3
N.HEMI	-0.2	1.2	2.9	2.7	2.0	3.2	3.7
S.HEMI	5.7	4.7	6.5	6.0	7.0	8.0	7.4
GLOBAL	2.7	2.9	4.7	4.4	4.5	5.6	5.5

TABLE 6. NIMBUS-7 NON-SCANNER ZONAL AND ANNUAL AVERAGES FOR EACH YEAR IN THE SEVEN YEAR DATA SET
Net Radiation (W/m-2)

FIELD TYPE= IRFAD ANNUAL AVERAGES NOVEMBER-OCTOBER

ZONE#	78-79	79-80	80-81	81-82	82-83	83-84	84-85
1	189.9	188.9	178.6	179.0	175.0	179.4	181.5
2	190.9	189.6	181.3	181.4	178.0	182.0	183.4
3	192.0	190.3	184.1	183.8	180.9	184.5	185.3
4	193.1	191.0	186.8	186.2	183.9	187.0	187.2
5	195.5	194.4	190.7	189.7	188.0	190.6	190.1
6	199.2	198.1	195.2	193.9	192.7	195.0	193.9
7	203.7	202.3	200.7	199.1	198.2	199.8	198.3
8	208.7	207.0	206.2	204.6	204.3	205.2	203.4
9	213.6	211.6	212.2	210.8	210.8	211.1	209.3
10	220.2	218.7	219.1	217.9	217.9	217.8	216.5
11	227.7	226.3	227.1	225.8	225.8	225.4	224.7
12	235.9	235.6	235.9	234.2	234.5	233.7	233.3
13	244.6	244.9	244.7	243.0	243.3	242.7	242.4
14	253.4	253.9	253.1	251.2	252.1	251.4	250.9
15	259.9	260.4	259.1	257.3	259.3	257.5	256.7
16	261.7	262.4	261.2	259.5	263.1	259.8	258.4
17	258.8	259.4	258.5	257.0	262.1	257.7	255.6
18	252.4	253.2	253.0	251.5	257.1	252.3	250.5
19	247.3	248.0	248.5	246.9	251.2	247.5	246.6
20	246.7	247.5	248.6	247.3	248.2	246.9	246.8
21	249.7	250.7	251.7	250.8	249.1	249.2	249.3
22	253.9	255.0	255.7	255.5	253.1	252.4	252.8
23	259.0	259.7	260.0	260.3	258.7	256.9	257.1
24	262.6	263.5	263.4	263.7	263.5	260.7	260.6
25	262.8	264.5	264.1	264.2	264.4	261.5	261.6
26	259.7	261.4	261.5	261.1	261.1	258.4	258.8
27	252.9	255.0	255.3	255.0	254.5	251.8	252.9
28	244.6	246.3	246.9	246.8	246.0	243.8	244.7
29	236.0	237.2	237.3	237.6	236.8	235.2	235.7
30	227.2	227.6	227.4	227.9	227.2	226.6	226.8
31	218.6	218.8	218.3	218.9	218.3	218.5	218.4
32	210.8	211.4	210.6	210.6	210.7	210.8	210.7
33	203.6	204.3	202.7	202.0	202.3	203.7	203.3
34	196.0	197.2	194.7	193.4	193.9	196.4	195.7
35	187.5	189.0	185.4	183.4	184.0	187.8	187.0
36	177.9	178.7	175.2	172.0	172.8	177.4	176.7
37	167.8	168.3	163.6	160.2	160.6	167.0	166.2
38	160.1	160.2	154.0	150.2	151.0	157.9	157.1
39	152.3	152.1	144.3	140.3	141.4	148.8	148.0
40	144.5	144.1	134.7	130.4	131.8	139.7	138.9
N.HEMI	236.8	236.6	235.9	234.4	235.9	234.7	233.7
S.HEMI	235.2	236.3	235.7	235.3	234.7	234.2	234.4
GLOBAL	236.0	236.4	235.8	234.8	235.3	234.4	234.0

TABLE 7. NIMBUS-7 NON-SCANNER ZONAL AND ANNUAL AVERAGES FOR EACH YEAR IN THE SEVEN YEAR DATA SET
Total Infrared Flux (Wm-2)