

**2003 ANNUAL STATISTICS AND HIGHLIGHTS REPORT FOR
THE
NATIONAL SPACE SCIENCE DATA CENTER**

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PREFACE

The [National Space Science Data Center](#), as noted in its [charter](#), serves as the permanent archive for NASA's Office of Space Science (OSS). A major component of its mission is to ensure future data accessibility and usability. NSSDC also provides current data access, complementary to the efforts of other NASA/OSS "active archives," in support of the NASA and international astrophysics and space physics research enterprises. Finally, NSSDC is a conduit for the general public and education community to acquire NASA space science data that may interest them.

The year 2003 brought a more distinct separation between NSSDC and the Sun-Earth Connection Active Archive (SECAA) of the Space Physics Data Facility (SPDF). NSSDC and SPDF are organizational peers within the GSFC Space Sciences Data Operations Office. As such, they are co-located and have often shared resources, but currently are funded from separate offices within NASA. In recognition of this reality, the scope of this report is only on the activities of the NSSDC.

NSSDC is pleased to issue this 2003 Annual Report describing (1) the 2003 growth and evolution of NSSDC's data archives, access pathways, and other tools and services, and (2) the 2003 access to those data and services by NSSDC's customer communities. This report has been made WWW-accessible in the hope that readers will avail themselves of the opportunity to link to the services reported herein.

I welcome suggestions from users for improvements to this Annual Report and to NSSDC services.

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1. INTRODUCTION

This report characterizes NSSDC's data holdings, metadata holdings, access pathways, and value-added data products, tools, and services at the end of 2003, with a focus on the 2003 activities leading to that end-of-year state. In addition, this report characterizes the nature and amount of 2003 access to NSSDC's data and services by its many users from various communities. It is assumed the reader will have a general familiarity with NSSDC and its mission. The top NSSDC web page is at <http://nssdc.gsfc.nasa.gov/>.

As the designated permanent archive for the Office of Space Science, with over 30 years experience in managing and preserving digital information now comprising thousands of data sets, NSSDC is acutely aware of the need to acquire and preserve adequate documentation to ensure the associated data are independently understandable and usable to current and future researchers. This remains our primary mission. But in this era of virtual observatory concepts for more seamless access to data, NSSDC must also play a larger role, especially for data which is not available from the Active Archives. It is NSSDC's intent to expend considerable effort becoming part of the Virtual Observatories, starting with work to reach an OSS wide consensus on minimum standards for associated documentation in order to raise the overall quality of OSS's archived information.

2. SOME SELECTED STATISTICS

Shown below are key statistics for 2003 or totals as of 12/31/03 (statistics following in parentheses are similar numbers for 2002):

Volume of data at NSSDC: 29.1 TB (24.9 TB)
Distinct data sets: 4443 (4417)
Distinct digital media volumes: 56,105 (56,161)
Media Volumes arriving in 2003: 2041 (3832)
Data volume reaching NSSDC during 2003: 4.2 TB (2.3)
Data sets with 2003-arriving data: 69 (56)
Files downloaded from NSSDC via ftp: 2,755,149 (2,537,900)
 From Photo_Gallery specifically: 1,633,333 (1,516,658)
Executions of geophysical models Ephemerides: 124,168
Number of offline requests satisfied: 342 (664)
Number of refereed papers published citing NSSDC: > 107

3. HIGHLIGHTS

Our goal with this report is to streamline the discussions and showcase the 15 Tables which summarize the activities of 2003. In most cases these numbers speak for themselves, though it is irresistible to address a few highlights.

The most important result of NSSDC's 2003 activities is the continuing preservation of growing space science data volumes, ensuring their continuing and future accessibility to the space science, education, and general public communities. The statistics to follow reveal that NSSDC's archive has now grown to 25.8 TB of space science data and an additional 3.3 TB of Earth science data. During 2003, 4.2 TB of data were added to the NSSDC.

NSSDC's data dissemination leads to the publication of significant new science. In 2003 more than 107 papers in scientific journals acknowledged NSSDC data or services as contributing to their analyses and that is just the papers that have come to the attention of our staff. Most science journals in which NSSDC data or services may have been used are not routinely reviewed by our staff, and several authors do not cite use of NSSDC data/services, so the list represents a lower limit on papers enabled or benefited by NSSDC. Nonetheless, we have appended the list of the 107 publications we know cite NSSDC at the end of this report.

In 2001 NSSDC began using its reengineered data management approach, which stores data as Archive Information Packages (AIPs; bundles of data files and companion attribute files as prescribed by the ISO/CCSDS Archive Reference model) written to DLTs. Its first application was for migration of NSSDC Data Archive and Dissemination System (NDADS) data files, which was essentially completed in 2003. About half the AIPs constituent data and attribute files also were written to a unix-based RAID magnetic disk environment for external user access. The IMAGE spacecraft project continued to use NSSDC-provided software to prepare AIPs for submission to NSSDC and ingestion to the permanent archive on DLTs. This facilitates an automated NSSDC data ingest and management pipeline. The approach will hopefully be replicated with other missions and individuals preparing data for NSSDC submission to support the rapidly growing data ingest volumes. During 2003 we began planning for the creation of AIP's from the offline digital archive and their ingestion to the nearline DLT jukebox.

The NSSDC continues to lead within the Consultative Committee for Space Data Systems for the widespread adoption of the Reference Model for an Open Archival Information System (OAIS). This standard provides a conceptual model of a digital archive, including a functional view and an information view. The model establishes initial criteria for recognition of a true archival function and should lead to improved archival implementations, provide a basis for further standardization, and provide more cost-effective vendor support. Its use has been considered by an ever growing variety of organizations including data centers, libraries, national archives, and commercial organizations around the world.

In 2003, the NASA Sun-Earth Connection Education Forum (SECEF) team, with major NSSDC participation, prepared for and orchestrated Sun-Earth Day held in March, 2003. The theme was "Live from the Aurora" and highlighted Solar Activity's effect on the earth and its inhabitants. Ten thousand packets of information were sent to teachers, scientists, etc. for Sun Earth Day programs, reaching hundreds of thousands of people. SECEF also sponsored a number of workshops and teacher professional development events reaching thousands of teachers, girl scouts, amateur astronomers, and the general public in partnership with SEC missions, museums, science centers, and planetariums as well as science and educational professional societies. The SECEF web site is available at <http://sunearth.gsfc.nasa.gov/>

4. DATA MANAGED AT NSSDC, AND 2003 INFLOW AND OUTFLOW

There are several ways to characterize the multi-disciplinary NSSDC archive. Byte counts are a common metric for modern archives, and will be reported herein. Numbers of distinct data sets and numbers and diversity of media volumes managed are also very important. (In NSSDC's terminology, a data set is typically all the data from a given source at a given processing level in a given format.) The diversity of data sets and of media types relate to the intellectual heterogeneity and technical heterogeneity of the archive, respectively, and we shall report on these also.

For the remainder of this section we will present this variety of statistics in tables, similar to prior years' reports, and brief discussions highlighting occasional specifics from individual tables.

Table 1. Counts of NSSDC Datasets (December 31, 2003)

Discipline	Digital	Non-Digital	Totals
Astronomy	245	75	320
Space/Solar Phys	1280	660	1940
Planetary	645	749	1394
Earth	130	124	254
Other (incl Ephem)	97	438	535
TOTAL	2397	2046	4443

At the end of 2003, NSSDC was managing 4,443 distinct data sets and accompanying documentation packages. Table 1 indicates the disciplines from which these data sets come and whether the data sets are digital or non-digital. By data set count, space physics is the dominant discipline, accounting for nearly half of NSSDC's data sets. This reflects that in its early years, NASA launched a preponderance of space physics missions and also that space physics spacecraft typically carry more independent experiments than do astrophysics missions.

NSSDC manages almost as many non-digital (film, microfilm and microfiche) data sets as digital data sets, though in recent years new data has been essentially all digital. NSSDC also has generated digital versions for some of its film archive, often in response to requests.

Table 2. State of the NSSDC Archive December 31, 2003

All Digital Data (TB)	
Astro	5.4
Space Physics	14.8
Planetary	5.4
Earth	3.3
Other	0.2
TOTAL	29.1

Table 2 is a different characterization of the NSSDC archive, showing byte counts for the entire archive and for the portion stored as media-independent, platform-independent AIPs. The byte counts are estimates, involving assumptions about the mean numbers of bytes on various media types for some data sets.

Table 3. Data Ingested to Nearline Permanent Archive

	2001		2002		2003	
	Files/1000	GB	Files/1000	GB	Files/1000	GB
IMP8	0.9	1.6	0.01	0.02	12.69	7.40
ISIS	594.2	328.4	243.43	122.4	136.19	75.08
DE	71.6	193.3	4.52	2.93	.22	1.98
IMAGE	5.5	77.5	4.62	57.38	3.51	49.27
IRAS	12.6	14	144.96	80.56	0	0
ISEE	4.2	1.6	1.03	0.09	1.07	1.60
SAMPEX	6.8	44.2	0.95	5.83	.79	5.09
OSO-8			3.65	4.06	0	0
PIONEER			0.28	0.520	0	0
SANMARCO			0.01	0.010	0	0
ULYSSES			13.22	0.830	30.36	6.17
VOYAGER			8.65	20.650	0	0
WIND			1.94	1.090	1.09	0.88
MARINER					0.29	.02
RHESSI					10.89	856.39
Totals	695.8	660.6	427.27	296.37	197.1	1003.9

Data are also being moved from NSSDC's traditional offline archive to a nearline archive based on a DLT jukebox attached to a unix server. Data are newly archived in "Archive Information Packages" AIPs, which hold data files and companion attribute files as per the AIP concept of the ISO/CCSDS Open Archival Information System reference model. Table 3 shows the volumes of data ingested to this new portion of the archive for 2001-3.

Table 4. Space Physics Data Electronically Accessible from NSSDC
December 31, 2003

Spacecraft/Ground Station	ftp://nssdcftp/spacecraft_data GB
ACE	7.63
CRRES	33.96
DE	182.78
IMAGE	160.46
IMP 8	17.68
ISEE	7.77
ISIS 1&2	147.68
MAGSAT	1.87
SAMPEX	53.97
SWAS	5.31
Ulysses	12.51
Voyager	21.92
Wind	11.01
Other	6.61**
Totals	671.16 GB

** includes <1Gb spacecraft data from AE-C,-D,-E, AEROS, Alouette, ARCAD, Explorers 22 and 31, Galileo, Helios 1 and 2, Hinotori, Mariner 10, OGO, OMNI, Pioneer 10 and 11, Prognoz 6,7, and 9, San Marco, SNOE, and several additional Soviet spacecraft.

About half of the data stored in AIPs are made network-accessible from NSSDC for the convenience of some portions of the user community. Table 4 lists by project NSSDC's network-accessible astrophysics and space physics data as of 31 December 2003.

Table 5. Counts of Volumes* at NSSDC Archive on Dec 31, 2003.

	Astro Physics	Space Physics	Planetary Science	Earth Science	Total
4-mm Tape	24	77	3	97	201
8-mm Tape	95	510	74	0	679
9-Track Tape	560	2657	8294	17301	28812
3480 Cartridges	766	1746	977	2912	6401
DLT	92	94	0	0	186
CD-ROM	38	401	1070	25	1534
CD-WO	285	14785	2561	0	17631
DVD	0	0	3	0	3
DVD Write Once	18	246	0	0	264
12" Worm	0	54	0	0	54
M-O Disk	260	0	0	0	260
Floppy Disk	1	27	10	42	80

Totals	2139	20597	12992	20377	56105
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* Backup volumes and those not attributable to these 4 disciplines not included.

Table 5 characterizes the digital media types managed at NSSDC, not including back up copies. It should be noted that most volumes are replicable and have one backup volume. However, for "CD-ROM," commercially pressed CDs, NSSDC typically holds extra copies. If more are needed, a CD duplicator has been obtained for the task.

Table 6. Photographic Data Products at NSSDC by Discipline

Discipline	Micro film	Micro fiche	Film (feet)	Film (Frames)	Reels	Slides
Astrophysics	6,020	18,524	100	63,459		121
Earth Science	1,430		4,200	236,066		
Planetary Science	3,294	6,345	143,214	392,122	259	25
Space Physics	20,195	14,669	4,640	4,379		41,509
Communications	183					
Other	162					
Totals	31,284	39,538	152,154	696,026	259	41,555

Table 6 lists NSSDC's non-digital archive holdings by disciplines and by form factor. This is unchanged for the third year. NSSDC has begun digitizing some of its Apollo film products to systematically generate computer-readable versions of some of its film products, though it is so far a level of effort task spurred by occasional student help.

4.1 Data Inflow

Tables 7 and 8 show two aspects of data arriving at NSSDC during 2003.

Table 7. Media Arriving at NSSDC During 2003*

	Astro Physics	Space Physics	Planetary Science	Total
DLT	0	31	0	31
CD-ROM (Titles)	0	26	1	27
CD-WO	60	993	683	1736
DVD-WO	0	156	69	225
M-O Disk	0	22	0	22
Totals	60	1228	753	2041

* Ephemeris and Other data not included.

Table 7 characterizes the in-flowing media types by discipline. As in recent years, CD-WO media clearly dominate input media type overall.

Table 8. Data Arriving at NSSDC During 2003

Astrophysics	GB	Planetary	GB	Space Physics	GB
		-			
ASTRO 1	12.46	Clementine	22.15	ACE	10.52
ASTRO 2	18.04	Galileo	0.78	AMPTE/IRM	0.36
		Mars Global			
ORFEUS-SPAS I	0.98	Survy	491.61	DE	1.98
ORFEUS-SPAS II	1.62	MARS Odyssey	11.81	FAST	408.01
		NEAR	161.19	IMAGE	84.24
		Viking 1	0.02	IMP	14.22
				INJUN-5	1.59
				ISEE	16.33
				ISIS	12.73
				ISTP	
				Geotail	188.56
				Polar LO	396.34
				Wind	34.41
				Cluster	296.07
				Mariner	0.02
				RHESSI	1886.08
				S-Cubed A	1.94
				Sampex	16.20
				Ulysses	147.04
TOTALS	33.10		687.56		3516.64
		Grand Total	4237.30		

Table 8 shows that NSSDC received approximately 4.2 TB of new data in 2003, via a combination of electronic deliveries and hard media. Table 8 shows data volumes by project. Dominating the counts are Level-0 data from the IMAGE missions plus data from the ISIS and RHESSI missions. During 2003, NSSDC received approximately 1 TB of data electronically, in addition to the data arriving on the media reported above in Table 7.

4.2 Data Outflow

Much of the data outflow discussed in previous years' NSSDC Annual Reports is actually activity within SPDF, which maintains the Active Archive for NASA Space Physics missions.

Recognizing this distinction, the activities of CDAWeb, etc, previously discussed in this section are covered in SPDF reports elsewhere.

NSSDC provides user access to its data holdings with network-accessible data for chosen datasets and, in addition, through a user support infrastructure for the mailing of offline digital and non-digital data volumes. Most electronic interfaces are accessible through NSSDC's WWW home page and include (1) special WWW-based interfaces to specific data sets or groups thereof and (2) ftp pathways to a range of data files maintained permanently on NSSDC magnetic disk. The CDF-formatted data underlying CDAWeb are at <ftp://cdaweb.gsfc.nasa.gov/> while all other data are at <ftp://nssdcftp.gsfc.nasa.gov/>. Because NSSDC and SPDF have been co-located since the latter's inception, nssdcftp is and remains a shared resource.

Table 9. 2003 Access Statistics to Geophysical Models & Services

Geophysical Models	Accesses*
Corrected Geomagnetic Coordinates, and Related Parameters	16,025
International Reference Ionosphere Model (IRI)	38,367
MSIS Atmospheric Model	25,212
International Geomagnetic Reference Field Model (IGRF)	19,484
User-Oriented Service Based on External (T_89,T_96)and Internal (IGRF) Geomagnetic Field Models	21,731
Trapped Particles Model	3,349
Total, Geophysical Models and Ephemerides	124,168

* These counts are software executions, yielding results for user-specified criteria. They do not include ftp-downloads of corresponding software.

Table 9 reports statistics on the usage of NSSDC's executable geophysical models services and its services for magnetospheric and heliospheric orbits. The models service lets users specify a model, a spatial point of interest, and any other parameters on which the model depends, and have the model parameters computed at the point or along a profile through the point of interest. Table 9 shows that there were about 124,000 such computations done by NSSDC customers in 2003, with geomagnetic, ionospheric and atmospheric models dominating. Table 9 assesses a slightly different list of models than in 2002, so year-to-year comparison of the statistics should be done with care.

Table 10. Number of Files Downloaded via FTP

	1999	2000	2001	2002	2003
Photo Gallery	1,381,000	1,918,000	2,888,000	1,516,658	1,633,333
Spacecraft Data	113,000	76,000	155,000	746,008	572,791
Geophysical Models	N/A	N/A	95,000	95,957	110,191
All others on nssdcftp	229,000	290,000	195,000	179,277	438,834
Total	1,723,000	2,284,000	3,333,000	2,537,900	2,755,149

A great many NSSDC data sets and other information services are held permanently on magnetic disk for ftp access. The reader is invited to review all these services from the ftp link on the NSSDC home page. Table 10 gives the annual counts of files downloaded, both overall and for selected directories with high activity. Note that the Photo Gallery, of high public interest, dominates the individual category statistics with about half of the total downloads from nssdcftp. However the researcher-downloading via ftp of data files from the spacecraft_data subdirectory amounts to 20% and shows the high interest in and great value of these services. Ftp access to models' software (over 110,000 file downloads in 2003) is also included here.

WWW access statistics are frequently misleading, insofar as they usually individually count the many files (buttons, etc.) that make up a page. Nevertheless, the count of WWW accesses is indicative of the continuing use of the WWW-provided services. In 2003 there was an average of 12.8 million hits monthly to NSSDC's web pages, down slightly from 2002's 13.6 million hits/mo.

Table 11. NSSDC User Community (Offline Requests Only) for CY 2003

Affiliation Category	Total Requests	Percent of Total
No Affiliation [General Public]	126	36.8
Non-US	87	25.4
US Academic Institutions	58	17.0
US Private Industry	32	9.4
NASA/GSFC	12	3.5
NASA Centers, Excluding GSFC	7	2.0
Other Government Agencies	12	3.5
Miscellaneous	8	2.3
Total	342	100

The dominant mode of dissemination of data to the research communities is via the internet, so that offline data dissemination has decreased, but is still significant. For 2003 Table 11 shows that NSSDC responded to 342 (compared to 660 in 2002) distinct requests for "traditional" products. Table 11 also characterizes the user community of NSSDC's offline services. To a very large extent it is the U.S. and international general public, the education enterprise, publishers, etc. and their desire for NASA imagery on CD-ROM and as film products that account for most of NSSDC's offline request activity.

Table 12. Number of Requests for Offline Satellite Data from NSSDC by Discipline *

Discipline	Data Set Requests 1968 - 2003	Data Set Requests 2003
Astrophysics	11373	5

Earth Science	7137	2
Planetary Science	46803	291
Space Physics	9017	69
Ephemeris	88	0
Other	23	2
Total	74441	369

* One request for all or parts of two distinct data sets adds two to these Table 14 statistics, but only one to the Table 13 statistics.

Table 12 gives the counts of requests for offline data sets from various disciplines in 2003, and as integrated over NSSDC's history. Note particularly the dominance of planetary data over both time scales. This is largely associated with lunar and planetary image data that are widely requested by the general public. The high level of previous astrophysical offline activity reflects requests by the amateur and professional astronomical communities for ADC catalogs on CD-ROM. Most offline space physics request activity was for copies of the IMAGE-based "Solar Storms" video tape.

Table 13. NSSDC Offline Data Dissemination Statistics 1999-2003

Offline	1999	2000	2001	2002	2003
-----	-----	-----	-----	-----	-----
DVDs					46
CDs	7014	4387	2241	1741	1813
Films	1520	6573	2494	1114	215
Videotapes		231	280	211	112
Magnetic tapes				5	0
TOTAL Units Sent	8534	11191	5015	3071	2186

Table 13 shows the most recent 5-year history of NSSDC's offline satellite data request activity by media type. Several points are noteworthy. The dominant mode of offline digital data dissemination continues to be by CD-ROM. The CD numbers are up slightly from 2002, but down from earlier years, as more members of the general public are able to access NSSDC's data electronically. Presumably growth of public internet access is a major contributor to the decline in all the other categories for distribution.

5. ADDITIONAL NSSDC SERVICES

In addition to its archive of scientific data and the variety of data interfaces characterized in the preceding sections, NSSDC offers a number of additional services, which are described below.

5.1 NSSDC Information Management System

The NSSDC Information Management System (NIMS) encompasses most of the separate databases that NSSDC has used to track data and information through the years. The NSSDC is

in the process of incorporating its off-line data inventory system into NIMS, a task which began in earnest in 2002, showed major progress in 2003 and is expected to be completed in 2004.

Table 14. NIMS/JEDS Database Statistics for CY 2003

Subpartition	Number of Records as of 12/31/03	Number Added in 2003
Spacecraft	6,000	96
Experiment	5,160	61
Data Set	5,025	57
Totals	16,185	214

Number of spacecraft with experiment records - 1,037
 Number of experiments with data sets at NSSDC - 1,535
 Additional datasets associated only with spacecraft, not experiments - 334

Table 15. NIMS Bibliographic Partition Statistics as of Dec 31, 2003

Total Number of Records	44,619
Number of Records Inserted in 2003	981

NIMS identifies virtually all launched spacecraft, the experiments carried by many of these spacecraft, and data sets from these spacecraft primarily as archived at NSSDC. This portion of the database is the source of information for many of NSSDC's WWW information pages. The NSSDC Master Catalog (NMC) dynamically generates WWW pages so that the latest information is presented to the user. A number of discipline and project pages are based on information derived from NIMS or utilize the NMC to generate such information.

5.2 NASA/Science Office of Standards and Technology (NOST) at NSSDC

NOST's mission is to facilitate the recognition and use of standards to reduce cost/benefit ratios in the exchange and management of scientific data among NASA entities and the scientific communities they serve. NOST's Web Home Page is at <http://ssdoo.gsfc.nasa.gov/nost/>. The NOST strategy is to play a coordinating role in helping the science disciplines identify new standards requirements. NOST participates in partnerships with them, other agencies, and industry on facilitating the adoption of leading-edge technologies with national or international visibility that can be tailored to meet NASA science information management and exchange requirements, and it assists in the process of moving these technologies toward standards with commercial support.

NOST operates NASA's highest level Control Authority office in accordance with the applicable [Consultative Committee for Space Data Systems \(CCSDS\)](#) and ISO standards to formally archive data descriptions for interchange and long term preservation. NOST also participated in the development of draft CCSDS/ISO standards applicable to multi-discipline and sub-discipline information interchange. The WWW is the ideal forum for the worldwide standards work. The reader is referred to <http://www.ccsds.org/> for specifics.

Glossary

ACE	Advanced Composition Explorer
ADC	Astronomical Data Center
AE	Atmospheric Explorer
AEROS	AEROnomy Satellite
AIP	Archive Information Package
ARCAD	Arc Aurorale et Densite
CANOPUS	Canadian Auroral Network for the OPEN Program Unified Study
CCSDS	Consultative Committee for Space Data Systems
CD-ROM	Compact Disk-Read Only Memory
CD-WO	Compact Disk-Write Once
CDAW	Coordinated Data Analysis Workshop
CDF	Common Data Format
COBE	Cosmic Background Explorer
CRRES	Chemical Release and Radiation Effects Satellite
DARN	Dual Auroral Radar Network
DE	Dynamics Explorer
DLT	Digital Linear Tape
DTD	Data Type Description
DVD	Digital Versatile Disk (originally, V = video)
DVD-WO	Digital Versatile Disk-Write Once
FAST	Fast Auroral SnapshoT
FTP	File Transfer Protocol
GB	Gigabyte
GOES	Geostationary Observational Environmental Satellite
GSFC	Goddard Space Flight Center
IDA	Interactive Data Archive
IMAGE	Imager for Magnetopause-to-Aurora Global Exploration
IMP	Interplanetary Monitoring Platform
ISEE	International Sun-Earth Explorer
ISIS	International Satellite for Ionosphere Studies
ISO	International Organization for Standardization
ISTP	International Solar-Terrestrial Physics
JEDS	Java Experiments, Data sets, Spacecraft
JRAND	Java Request and Name Directory
KP	Key Parameters
LANL	Los Alamos National Laboratory
MAGSAT	MAGnetic field SATellite
M-O	Magneto-optic
MSIS	Mass Spectrometer and Incoherent Scatter
NASA	National Aeronautics and Space Administration
NDADS	NSSDC Data Archive and Distribution System
NEAR	Near Earth Asteroid Rendezvous
NIMS	NSSDC Information Management System
NMC	NSSDC Master Catalog
NOST	NASA/Science Office of Standards and Technology
NSSDC	National Space Science Data Center

NVO	National Virtual Observatory
OAIS	Open Archival Information System
OMNI	Interplanetary Medium Data (not an acronym)
OSO	Orbiting Solar Observatory
OSS	Office of Space Science
RAID	Redundant Array of Independent Disks (originally, “I” was “Inexpensive”)
SAMPEX	Solar Anomalous and Magnetospheric Particle Explorer
SEC	Sun Earth Connection
SECAA	Sun Earth Connection Active Archive
SECEF	Sun Earth Connection Education Forum
SNOE	Student Nitrogen Oxide Explorer
SOHO	Solar and Heliospheric Observatory
SSC	Satellite Situation Center
SWAS	Submillimeter Wave Astronomy Satellite
TB	Terabyte
TRF	Technical Reference File
WORM	Write-Once, Read-Many
WWW	World Wide Web
XDF	eXtensible Data Format
XML	eXtensible Markup Language

NSSDC Acknowledged 2003 Publications

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