PCDS OVERVIEW

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A brief overview of the philosophy, design, and organization of the PCDS was presented. The design has evolved, over time, to deal with numerous data sets, provide appropriate tools for the manipulation and display of such data, and support a wide variety of users.

The user interface to the system is provided by the Transportable Applications Executive (TAE). A user can choose one of the five major subsystems from the root menu display. These subsystems are CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. Each subsystem was discussed and examples were given, demonstrating the flexibility provided by the existing PCDS software, Version 3.3.

Three of these subsystems are presently being redesigned to provide a more flexible and friendly structure, to allow more consistency and facilitate the ability to support new data sets. Ongoing developmental efforts to migrate from the Version 3.3 prototype phase of PCDS to the "operational" Version 4.0 stress increased flexibility and data independence.

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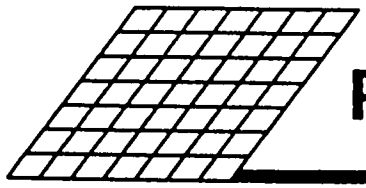
PCDS Overview

Lloyd A. Treinish

National Space Science Data Center

NASA/Goddard Space Flight Center



PILOT CLIMATE DATA SYSTEM (PCDS)

DATA SOURCES

CLIMATE DATA SETS

DATA SYSTEM

ENVIRONMENTAL SATELLITES

OZONE
AEROSOLS
RADIATION

SURFACE TEMPERATURE

RAINFALL

CLIMATE DATA

CATALOGS & INVENTORIES

DATA BASES

USER SERVICES

BROWSE
SELECT
DISPLAY
MANIPULATE
COPY

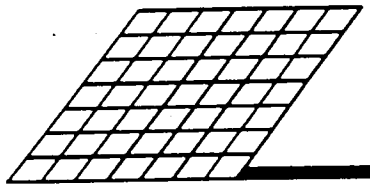
OUTPUTS

GRAPHICS DISPLAY

ALPHANUMERIC DISPLAY

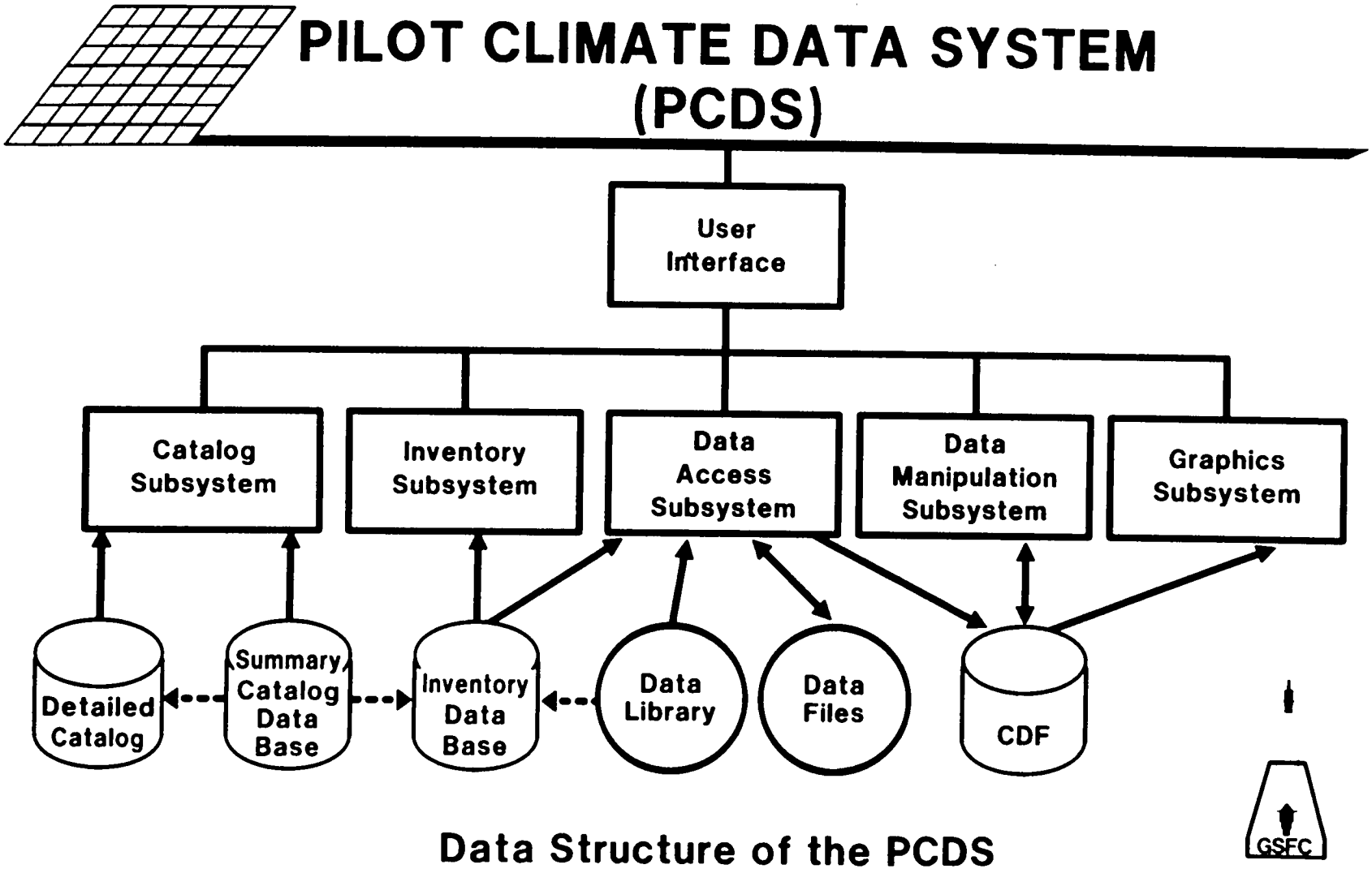
SURFACE STATIONS

NASA/GSFC



PCDS DESIGNED TO SUPPORT A VARIED GROUP OF USERS

- Researchers
  - Browse Data for Significant Features
  - Graphically Display a Variety of Parameters
  - Determine What Data to Select
  - Intensively Analyze Small Portions of a Data Set
- Data Producers
  - Quality Check/Validation
  - Inventory of Archives
  - Accounting of Processing and Distribution
- Occasional Users
  - Quick Response
  - Remote Access
  - Low Volume University Support
- Management Information for Planning
  - Data Coverage



Data Structure of the PCDS

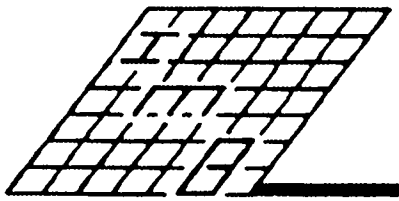
Menu: "ROOT", library "PCDS$LIB:"

PCDS Version 3.3 Subsystems Menu

1)	CATALOG Subsystem Menu	[CATALOG]
2)	INVENTORY Subsystem Menu	[INVENTORY]
3)	DATA ACCESS Subsystem Menu	[DACCESS]
4)	DATA MANIPULATION Subsystem Menu	[CDFUTIL]
5)	GRAPHICS Subsystem Menu	[GRAPHICS]

NEWS last updated on 1/13/86.

Enter: selection number, HELP, BACK, TOP, MENU,
COMMAND, or LOGOFF.
?

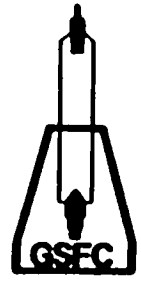


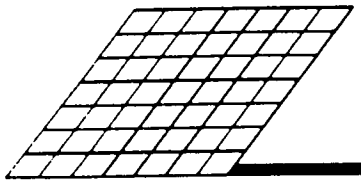
CATALOG SUBSYSTEM

Provides a Uniform Set of Descriptions for over 200 Climate-Research-Related Data Sets and Keyword Queries of Its Contents

Capabilities:

- Browse an Introduction to the Catalog
- List a Summary of the Cataloged Data Sets
- Browse Descriptions of Climate Parameters
- Browse Descriptions of Climate Sensors



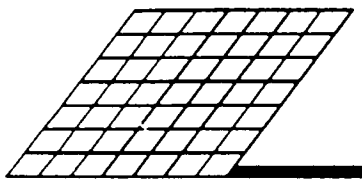


INVENTORY SUBSYSTEM

Describes the Data Holdings of the PCDS and Supports Keyword Queries of Its Contents

Capabilities:

- List Available Climate Parameters & Data Types
- List a Summary of the Data Types
- List Tapes/Files by Data Type
- Show the History of the Tape Inventory
- Graphically Summarize the Inventory Contents

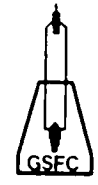


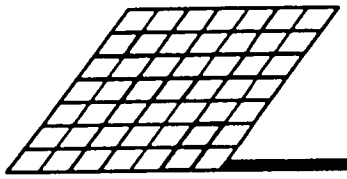
DATA ACCESS SUBSYSTEM

Provides Uniform Access to PCDS Data for Subset Selection on Spatial or Temporal Criteria and Employs the PCDS Inventory to Locate Data

Capabilities:

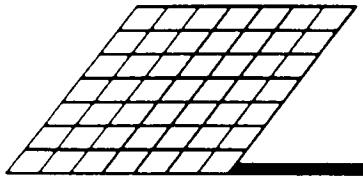
- Copy, List or Subset a PCDS Data Set
- Create a Data-Independent Climate Data File





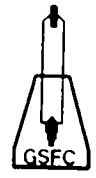
UTILIZATION OF CDF

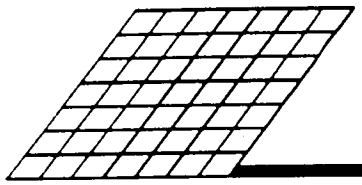
- Initiated by the PCDS Data Access Subsystem or Non-PCDS Custom Software
- Supports the PCDS Data Manipulation Subsystem, which Can Generate a New CDF from an Extant CDF
- Supports the PCDS Graphics Subsystem, which Provides Visual Representations of a CDF's Contents
- Causes the PCDS Data Manipulation and Graphics Subsystem to Be Fully Data-Independent
- Interfaces in Applications Software Via a Library of Software Tools



DATA MANIPULATION SUBSYSTEM

- List a Climate Data File
- Produce a Subset of a Climate Data File
- Merge Two Climate Data Files
- Ungrid a Climate Data File Map
- Grid Data into a Climate Data File Map
- Apply Statistics to Climate Data File Elements
- Combine Climate Data File Elements Algebraically



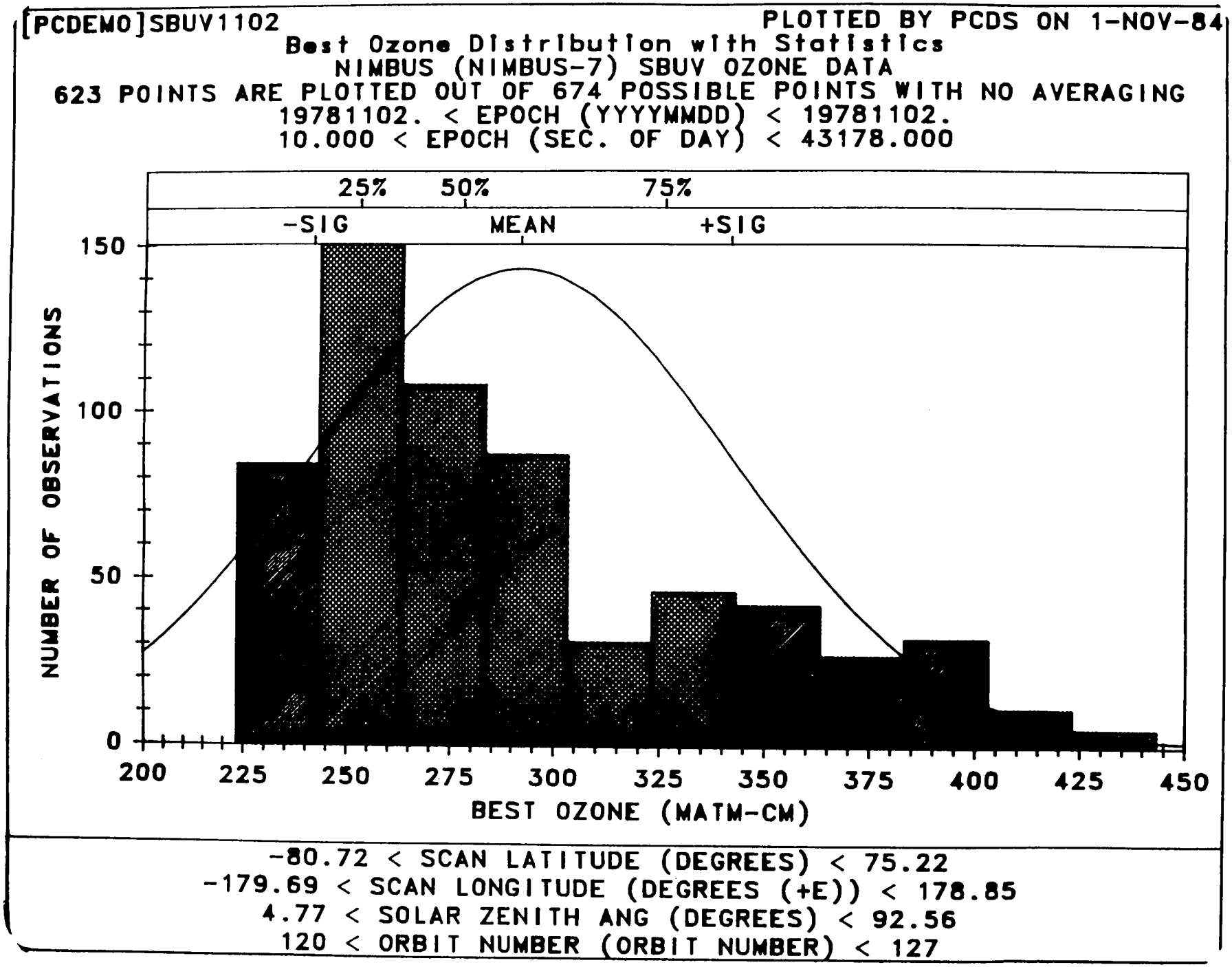


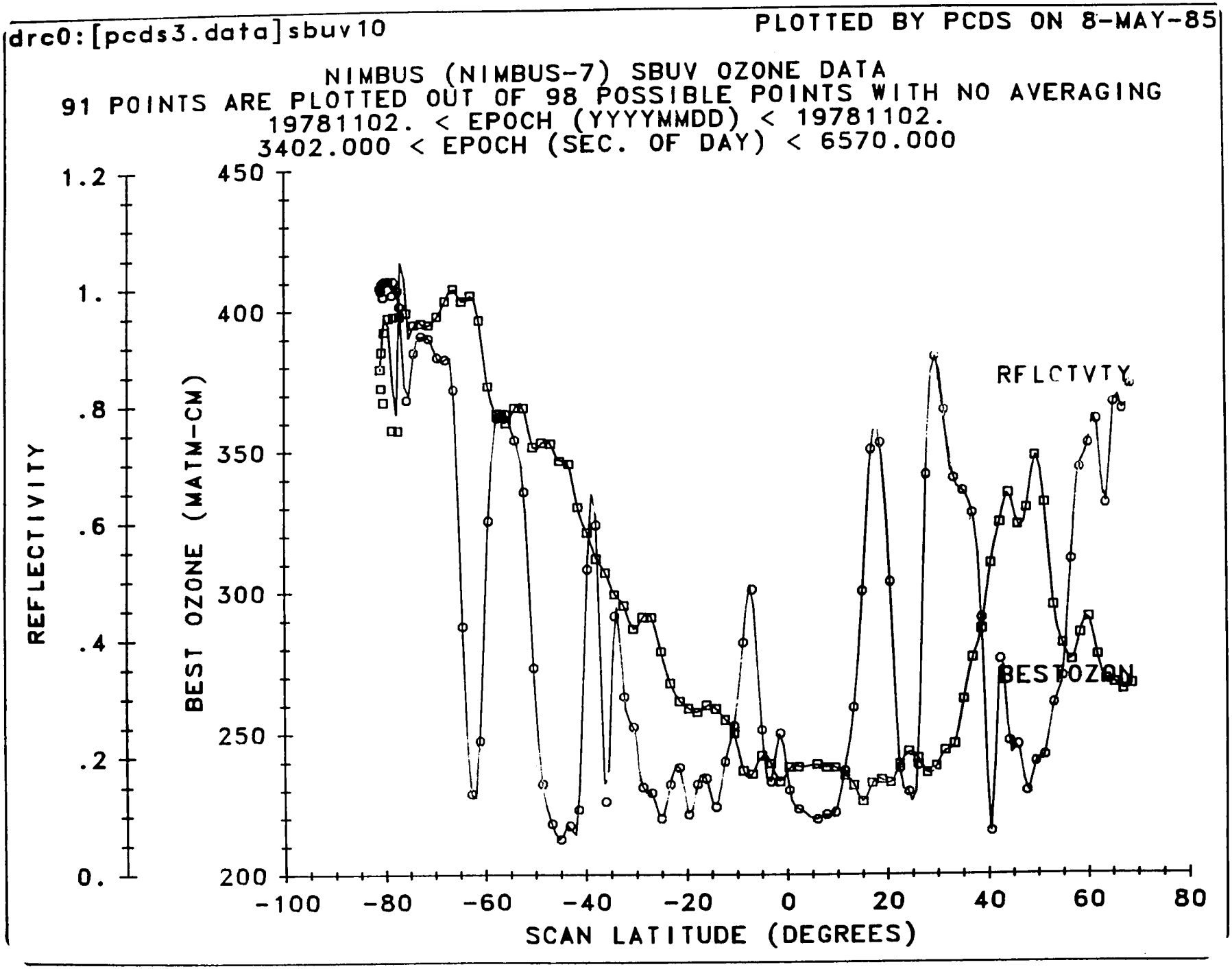
GRAPHICS SUBSYSTEM

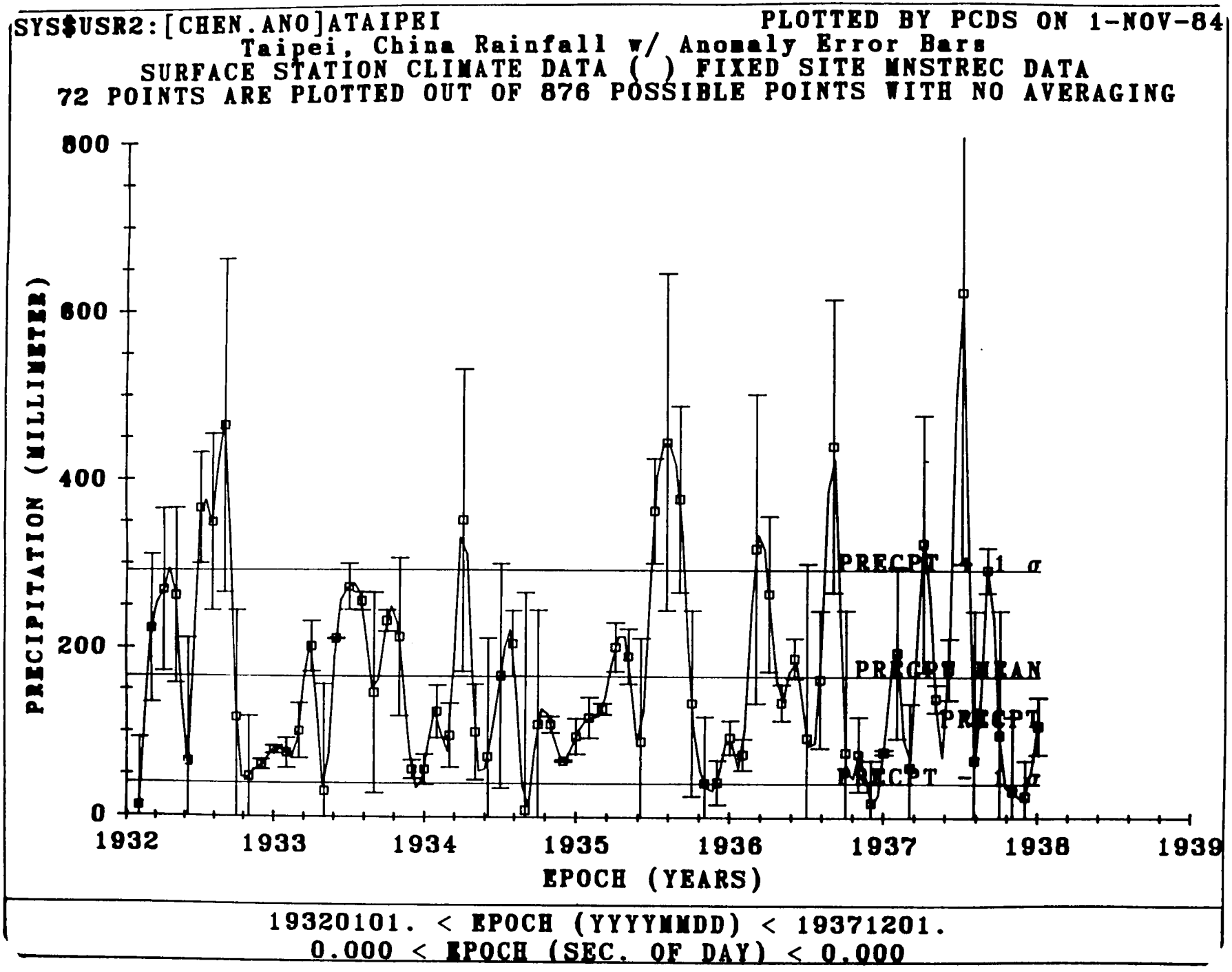
Provides Graphical Representation of ANY Data Stored Within a Data-Independent Climate Data File Including Non-PCDS Data Sets

Capabilities:

- **Create Two-Dimensional Representations of Data**
- **Create Three-Dimensional Representations of Data**
- **Create Text Charts**
- **Provide Post-Processing of Graphical Displays**

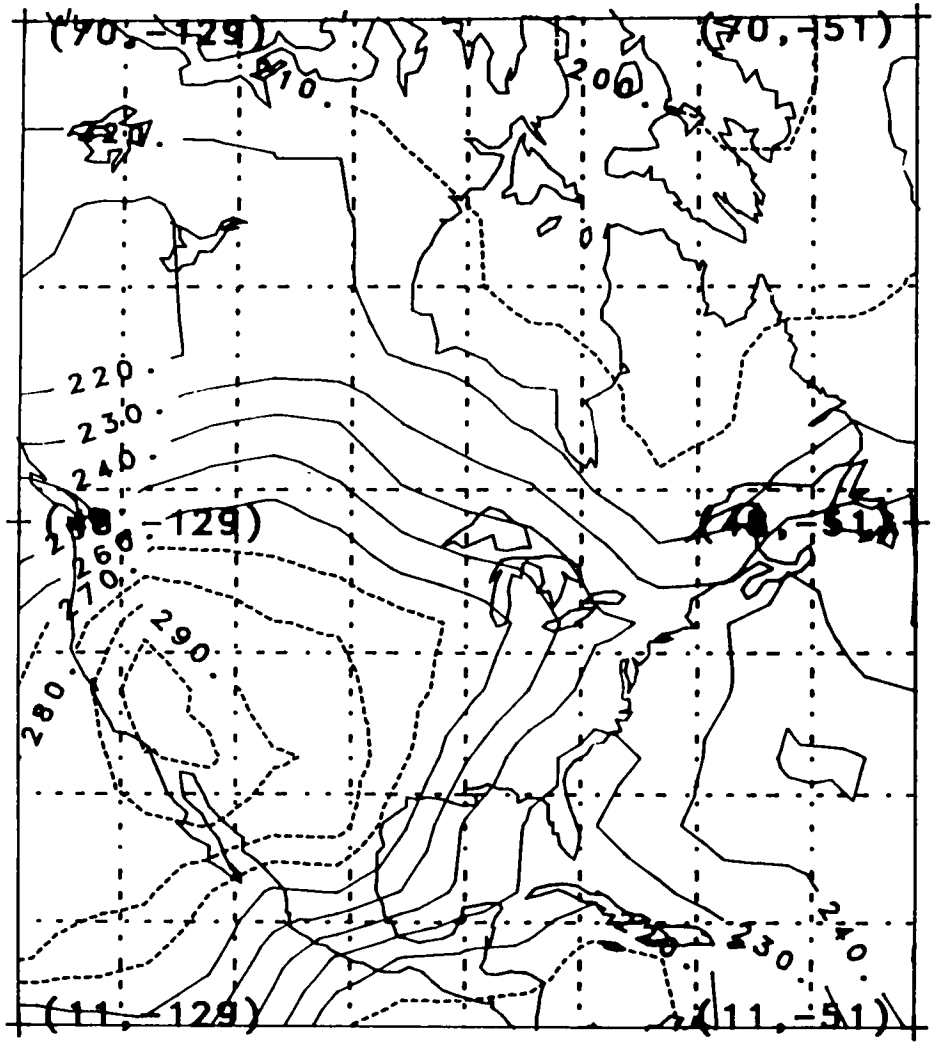

[PCDEMO]SBUV1102
PLOTTED BY PCDS ON 1-NOV-84
Best Ozone Distribution with Statistics
NIMBUS (NIMBUS-7) SBUV OZONE DATA
623 POINTS ARE PLOTTED OUT OF 674 POSSIBLE POINTS WITH NO AVERAGING
19781102. < EPOCH (YYYYMMDD) < 19781102.
10.000 < EPOCH (SEC. OF DAY) < 43178.000
25%
50%
75%
-SIG
MEAN
+SIG
NUMBER OF OBSERVATIONS
150
100
50
0
200
225
250
275
300
325
350
375
400
425
450
BEST OZONE (MATM-CM)
-80.72 < SCAN LATITUDE (DEGREES) < 75.22
-179.69 < SCAN LONGITUDE (DEGREES (+E)) < 178.85
4.77 < SOLAR ZENITH ANG (DEGREES) < 92.56
120 < ORBIT NUMBER (ORBIT NUMBER) < 127


drc0:[pcds3.data]sbuv10
PLOTTED BY PCDS ON 8-MAY-85
NIMBUS (NIMBUS-7) SBUV OZONE DATA
91 POINTS ARE PLOTTED OUT OF 98 POSSIBLE POINTS WITH NO AVERAGING
19781102. < EPOCH (YYYYMMDD) < 19781102.
3402.000 < EPOCH (SEC. OF DAY) < 6570.000
REFLECTIVITY
BEST OZONE (MATM-CM)
SCAN LATITUDE (DEGREES)
RFLCTVTY
BESTOZON
1.2
1.
.8
.6
.4
.2
0.
450
400
350
300
250
200
-100
-80
-60
-40
-20
0
20
40
60
80


SYS$USR2:[CHEN.ANO]ATAIPEI
PLOTTED BY PCDS ON 1-NOV-84
Taipei, China Rainfall w/ Anomaly Error Bars
SURFACE STATION CLIMATE DATA ( ) FIXED SITE MNSTREC DATA
72 POINTS ARE PLOTTED OUT OF 876 POSSIBLE POINTS WITH NO AVERAGING
800
600
400
200
0
PRECIPITATION (MILLIMETER)
PRECPT + 1 σ
PRECPT MEAN
PRECPT
PRECPT - 1 σ
1932
1933
1934
1935
1936
1937
1938
1939
EPOCH (YEARS)
19320101. < EPOCH (YYYYMMDD) < 19371201.
0.000 < EPOCH (SEC. OF DAY) < 0.000

SYS$USR1:[RAY]SEPMON PLOTTED BY PCDS ON 1-NOV-84

ASCENDING NODE NARROW FOV LONGWAVE FLUX
NIMBUS (NIMBUS-7) ERB RBUDG DATA
THERE ARE 185 DATA VALUES USED OUT OF 2070 POSSIBLE VALUES
1979/10/01 00:16:40 < DATE TIME < 1979/10/01 00:16:40



STANDARD DEV. = 28.18438
MEAN VALUE = 241.5735

MERCATOR PLOT OF AN NFOV LW FLUX (W/M**2)

DRCO:[TREINISH]NMCGHT PLOTTED BY PCDS ON 25-JUN-84

SURFACE MAP AS VIEWED FROM THE NORTH POLE

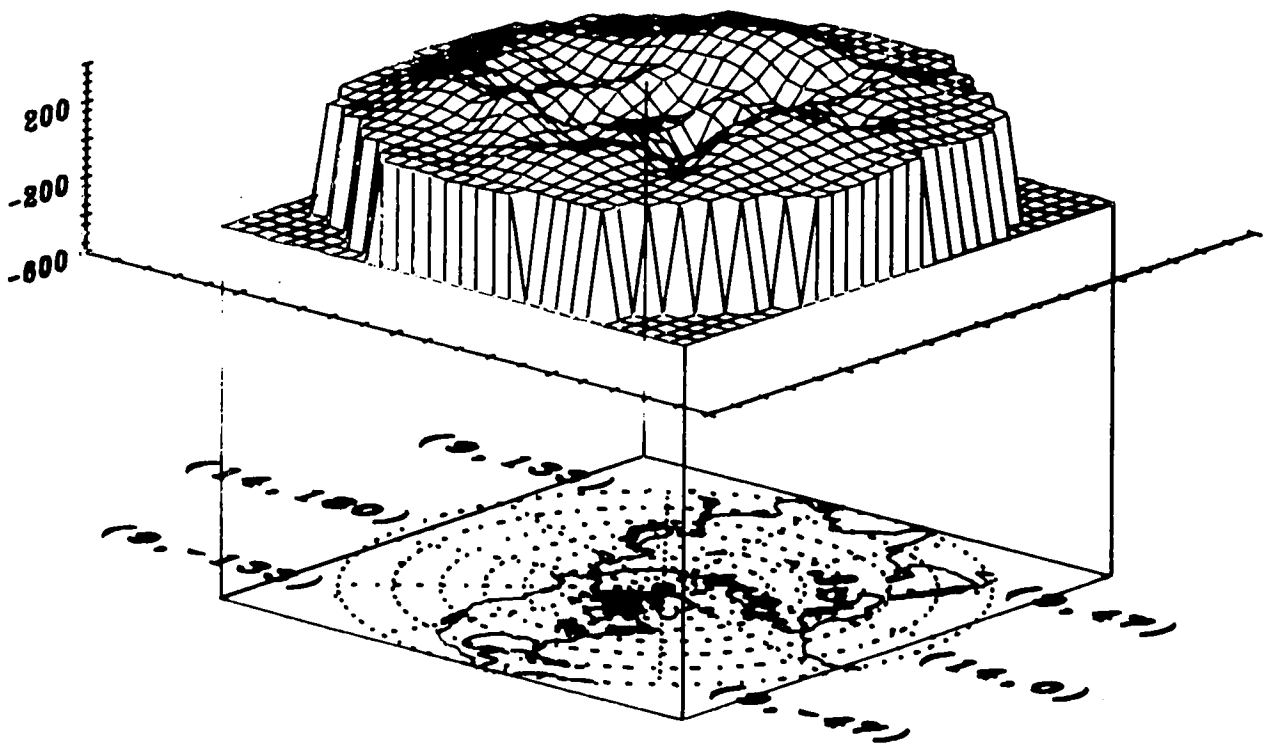
( ) NMC/NCAR ALL DATA

THERE ARE 1977 DATA VALUES USED OUT OF 1977 POSSIBLE VALUES

1975/01/01 00:00:00 < DATE TIME < 1975/01/01 00:00:00

STANDARD DEVIATION = 0.8115E+02

MEAN VALUE = 0.1423E+03



N POLAR STEREOGRAPHIC PLOT OF GEOPOTENTIAL HGT (M)

Current PCDS (System) Software Development Efforts (Version 4.0)

- Full CDF Implementation – Including Interface Library
- Subsystem Reorganization for Data Access, Data Manipulation & Graphics
- Easier–to–use Consistent Interface for All Subsystems
- Improved Data Access for Faster Data Set Implementation
- Improved Graphics – Upgraded Mapping, Greater Flexibility & Animation