Several Main Data Goals for Data Support
(DSS at NCAR)

DATA IS MOSTLY DIGITAL

These slides were for a presentation to our Data Support Group on Sep 14, 2000.

• Establish a good data content
• Keep enhancing the data content
• Provide easy and low-cost data access for users
• Design so that data & services can last 50 years
• Take advantage of better hardware
• Keep the costs constrained

- Part of talk for library archives people.
- This will be scanned.

Aug 2000
A Visit By Four NASA People  
(On August 29, 2000)  

Roy Jenne  
13 Sep 2000

A. Why?  
- To study “Best Practices” data systems in the USA.  
- They visited on Tuesday, Aug 29, 2000.  
- They presented NCAR with a recent big satellite picture of this area.  
- They got information about our Data Support work.

B. About Data Support  
- We gave talks and gave them a bunch of papers.

C. About SCD  
- Al Kellie gave an overview talk.  
- George Fuentes talked about the big computer systems.  
- Gene Harano talked re the mass store.  
- Marla Meehl talked about network activities at NCAR/UCAR.  
- They got a brief (10 min) tour of computer room.

(Good talks: And NASA got a set of slides from the NCAR talks. Also, Jenne has a copy.)
Improve the Data Content for Reanalysis

- Use the forecast scores for some guidance

- Add more data for the 1970s
  - These projects are 70% done (in Apr 00)
  - Want 85% done by Jul 00

- Add more data for 1960s
  - Projects are 50% done (in Apr 00)
  - Want 70% done by Aug 00

- Add more data for 1980 – 95
  - This period already quite good
  - A data merge (NCEP plus ECMWF) will happen

- Do recent data updates for 1990 – 2000
  - This is about 50% done (Apr 00)
  - Want 60% done by Aug 00 and 80% by Aug 01

- More dataset projects for reanalysis (work 08/2000 – on)
  - A list of 30 projects is available (dated Apr 00)
  - Try to do 70% of these by May 2002

Roy Jenne
Apr 2000
### Data to Send for Reanalysis

<table>
<thead>
<tr>
<th>Main Upper Air Data</th>
<th>Data Period</th>
<th>% Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Navy raobs from GTS</td>
<td>1971 – 73</td>
<td>90%</td>
</tr>
<tr>
<td>b. Navy raobs</td>
<td>1974 – 75</td>
<td>Dropped, lower need</td>
</tr>
<tr>
<td>c. Navy raobs from GTS</td>
<td>1966 – 70</td>
<td>10%</td>
</tr>
<tr>
<td>d. Russian North Pole raobs</td>
<td>1951 – 91</td>
<td>95%</td>
</tr>
<tr>
<td>- The documents</td>
<td></td>
<td>50%</td>
</tr>
<tr>
<td>e. NCEP UA, V3 library</td>
<td>1980 – 98</td>
<td>0%</td>
</tr>
<tr>
<td>f. Pacific Profilers, 8 stns</td>
<td>1986 – 98</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UA Library Work</th>
<th>Data Period</th>
<th>% Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Make checks, late years</td>
<td>1994 – 99</td>
<td>0%</td>
</tr>
<tr>
<td>b. Get stn non-dupe inventories</td>
<td>1945 – 99</td>
<td>90%</td>
</tr>
<tr>
<td>c. Do a master report inventory</td>
<td>1946 – 99</td>
<td>0%</td>
</tr>
<tr>
<td>d. Define and group a set of UA</td>
<td>1946 – 99</td>
<td>50%</td>
</tr>
<tr>
<td>station archives for others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surface Hourly Data</th>
<th>Data Period</th>
<th>% Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Get hourly from Asheville</td>
<td>1940 – 67</td>
<td>5%</td>
</tr>
<tr>
<td>- Get all (maybe?)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Get part (yes)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Roy Jenne  
13 Sep 2000
Complications about Reanalysis Observations

- NCEP and ECMWF reanalysis observations will be merged (1980 – 2000).
  - This means we don’t have all data now.

- The archive observations from NCEP/NCAR reanalysis (50 yrs).
  - They only formatted part of data from sfc observations.

- The model tags.
  - A selection of these are useful.
  - But the bad sfc bogus in Southern Hemisphere hurt these.

- We probably have too many small pieces for the long archives.

- So: We will need to get reanalysis observations back from some future runs.
  - For 1972 – 99, use NCEP-2 (not NCEP-1).
  - Monitor the merge of NCEP/ECMWF observations.

Roy Jenne
Sep 2000
Achieve Enough Data Simplicity for Users
  • Also try to reduce the cost for the archive

1. Use simple binary for big datasets
   • Users get a small access subroutine

2. Or use ASCII formats
   • These are still most popular
   • Because they are very easy

3. The trend is to use ASCII more
   • For smaller datasets

4. During 2000 – 2005
   • About 85% of new data will be in WMO Grib format
   • We will use an easy access routine for it

5. We are trying to insulate users from complexity
   • Usually possible
   • But not always

Roy Jenne
Aug 2000
History: Selected Projects by Data Support, NCAR


Develop an archive of analyses

Hemisphere
So. Hemis. Climate
Motion pictures of weather
Start tropical analyses
Help plan for GATE & FGGE

At Nat'l Clim Program Office
At WMO

Work on COADS (surface ocean)
CEDAR data (70-1000 km)
Rescue satellite TOVS
Support climate assess. work
Start more ocean research data

Develop archives of observations

Data Exchange

India
India
China

Data exchange with Russia

This signifies intense work.

Also: We keep adding datasets and giving data services.

Figure 1

Roy Jenne
Aug 2000
Approximate SCD Budgets

Roy Jenne
13 Sep 2000
Rev 2 Oct 2000

SCD Budgets:

The total SCD budget is about $23m. It was about constant from FY99 to FY00. It will probably be constant for FY01, but the NCAR budget could go up 5 or 10% if Congress becomes extra generous with NSF.

The $23m does not include $1m in overhead pass back funds that pay administrative people and the front office. The Networking section has 18 staff. UCAR pays $3,072,700 in FY2000 (not in SCD budget). SCD pays $198,400.

Some items

<table>
<thead>
<tr>
<th>Item Description</th>
<th>FY 2000</th>
<th>FY 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Mass store equipment, not staff</td>
<td>$2.9m</td>
<td>$2.4m</td>
</tr>
<tr>
<td>Also has data park gear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Community compute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment + 0.5 MSS</td>
<td>$5.0m</td>
<td>$5.25m</td>
</tr>
<tr>
<td>Less ½ of MSS</td>
<td>$3.55m</td>
<td>$4.05m</td>
</tr>
<tr>
<td>c. CSL compute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment &amp; maintenance</td>
<td>$4.5m</td>
<td>$4.5m</td>
</tr>
<tr>
<td>d. Smaller equipment and servers</td>
<td>~$1m or less</td>
<td>~$1m or less</td>
</tr>
</tbody>
</table>

Total SCD budget

less UCAR pay and
less overhead pass backs

~$23m est ~$23m

Electricity note: Electricity was $28k/mo when the Cray C90 was here. Now it is $16k/mo ($192k/year).

Summary: Consider the big computers and mass store hardware and maintenance. SCD spends about $11m per year on this.
Taking Care of Hardware in COLA

1. What is the main hardware?
   - 6 nodes of Compaq ES40 processors, 667 MHz
     - 4 processors each, 667 MHz
     - Total real power of 24 processors (~10 Gflop)
   - A 16-processor SGI Origin with R12000 chips
     - All 16 processors in shared memory
     - Total power 2 to 2.5 Gflop
     
     So, total real power is about 12.3 Gflops.

   - They have 2.6 TB of mag disks and 0.5 TB of this is raid
   - A DLT robot tape silo (for ~570 tapes) (Holds 20 TB)
     - Each tape holds 35 GByte uncompressed

   Note: From 1993 to 2000 they have doubled the disk capacity each year, and annual disk spending is about constant.

2. Cost and workforce for the above
   - The cost of the above gear was $1.4m
   - They plan, install, and administer the gear with 1.5 FTE
   - Plus a part-time student for the desktops
   - Information from Jim Kinter at COLA in Maryland (Aug 2000).

   Roy Jenne
   28 Aug 2000
High Performance Simulation Strategic Plan
Opportunities and Challenges
Internal Workshop Agenda
8:30 to 5:00  August 31, 2000
Main Seminar Room - Mesa lab

8:30-8:40  Tim Killeen: Opening Remarks
           Goals and Objectives

8:40-9:15  Cliff Jacobs: Keynote Address
           Themes in ITR & GEO (we have a copy)

Theme 1  Software Engineering Practices and Model Development

9:20-9:40  Cecelia DeLuca:
           Building Community Software
           The Earth System Modeling Framework

9:40-10:00  Tom Bettge:
            The ACPI Avant Garde Project:
            Toward the Next Generation CCSM

10:00-10:20  John Michalakes:
              WRF Model Design & Development

10:20-10:40 BREAK (Coffee, tea & pastries)

Theme 2  DATA Issues

10:40-10:50  Michael Knoelker – Introduction

10:50-11:20  Laurence Buja
              Data Issues and Challenges

11:20-12:00  Discussion (scope, prototypes, identifying external
efforts, potential collaborators, funding sources, defining
cooperative proposals, cross-institutional buy in)
Outline

1. Historical Background of ITR
2. ITR in Fiscal Year 2000
3. ITR in FY 2001 and Beyond

Response to PITAC

- President Clinton & VP Gore proposed IT² (Information Technology for the Twenty-first Century) initiative
  - 1 year, $366M increase ($146M for NSF)
- Congressman Sensenbrenner introduced NITR&D (Networking & Information Technology Research & Development) Act
  - 5 year, $326M increase ($241M for NSF) in FY’00
- Congress passed a balanced Federal Budget
  - 1 year, IT² name eliminated, NSF gets $126M increase for IT

Talk by Cliff Jacobs of NSF
on Aug 31, 2000 at NCAR
Digital Data and Books

1. Digital methods open up a world of possibilities.
   - How to handle large datasets.
   - Give better distribution and drive down costs.
   - Handle many old documents.

   Data storage is getting cheaper
   Data compression is getting mature
     - So things can still get better.
     - If we make the right choices. Will we?

2. But I still argue for books.
   - People do a better job on content, layout, and illustrations.
   - Books are easy to handle, move, and read.
   - Books will last a long time.

   But a selection of books should also have a digital copy.

3. The old written history of the world.
   - Tablets were carved in stone; they survived.
   - Can whole civilizations be forgotten (Yes!)
   - How will we pass on information for the people who live in the year 2800?

Roy Jenne
13 Sep 2000
The Increasing Volume of Data

- The amount of data is increasing rapidly. There are many stories about this.
- It does take work to deal with lots more data.
- People now use data stories to sell huge new programs.
- The level of data “hype” is much too high. The hype can get in the way of good data programs and good management.
- And hype can be used to build data empires.
- We want interesting data stories and we want good programs to handle the data.

Note: People make decisions about how much data to generate. People should not be allowed to generate lots of data and then use the most expensive methods to take care of it.

Roy Jenne
12 Sep 2000
Aspects of Data Volume

DSS has a lot of data (14 TB) but rapid advances in technology are making it easier to handle this data. For example, a few tapes now hold 60 GB native. Therefore, one Terabyte can be put on only 17 tapes. And one cheap hard disk ($575) will now hold 77 GBytes.

We have over 500 datasets. Our biggest datasets are given below. Some of our most important large datasets are on the next page. Technology is making it easier for us to handle large volumes of data.

<table>
<thead>
<tr>
<th>VOLUME</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL DATA IN DSS ARCHIVES</td>
</tr>
</tbody>
</table>

Some big subsets:

1. All data from NCAR/NCEP 50-year reanalysis - 51.3 years
   2530 GB
2. TOVS satellite sounder data - 13.4 years
   631 GB
3. Mesoscale model data for GCIP
   500 GB
4. NOAA satellite, 4 km GAC - 6 years
   2100 GB

Roy Jenne
Sep 2000
Volume of Data

A. Some Upper Air Observations

<table>
<thead>
<tr>
<th>Data</th>
<th>Period</th>
<th>Years</th>
<th>Reports</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCEP UA</td>
<td>1962-72</td>
<td>11.8</td>
<td>?</td>
<td>3.36 GB</td>
</tr>
<tr>
<td>NCEP UA</td>
<td>1973-12/97</td>
<td>25</td>
<td>?</td>
<td>29.1 GB</td>
</tr>
<tr>
<td>- Only raobs, pibals</td>
<td></td>
<td></td>
<td></td>
<td>15.2 GB</td>
</tr>
<tr>
<td>TD54 raobs</td>
<td>~1946-71</td>
<td>~26</td>
<td>5.08m</td>
<td>1.0 GB</td>
</tr>
<tr>
<td>MIT raobs</td>
<td>1958-63</td>
<td>5</td>
<td>1.03m</td>
<td>319 MB</td>
</tr>
</tbody>
</table>

B. Some Surface Datasets of Observations

<table>
<thead>
<tr>
<th>Data</th>
<th>Period</th>
<th>Years</th>
<th>Reports</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCEP sfc synop ADP</td>
<td>1/76-8/00</td>
<td>24.7</td>
<td>456m</td>
<td>82.2 GB</td>
</tr>
<tr>
<td>- ~50,000/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TD13 sfc synop</td>
<td>1940-71</td>
<td>~32</td>
<td>103m</td>
<td>17 GB</td>
</tr>
<tr>
<td>Hrly US Obs (303 stns)</td>
<td>1948-92</td>
<td>45</td>
<td>e119m</td>
<td>~8 GB</td>
</tr>
<tr>
<td>Hrly N. America (TDL, 1000 stns)</td>
<td>12/76-12/96</td>
<td>20</td>
<td>e149m</td>
<td>7.1 GB</td>
</tr>
</tbody>
</table>

C. Part of Reanalysis Output

<table>
<thead>
<tr>
<th>Data</th>
<th>Period</th>
<th>Yrs</th>
<th>GB/Yr</th>
<th>GB in 52 Yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure stack (2.5°)</td>
<td>1948-99</td>
<td>52</td>
<td>2.54</td>
<td>132</td>
</tr>
<tr>
<td>Flux grids (Gaussian 208 km)</td>
<td>1948-99</td>
<td>52</td>
<td>2.0</td>
<td>104</td>
</tr>
<tr>
<td>Sigma stack</td>
<td>1948-99</td>
<td>52</td>
<td>4.93</td>
<td>256</td>
</tr>
</tbody>
</table>

D. Technology

a. A tape drive (costs $(900)
   - One tape holds 33 GB, native, cost $80
   - Native speed is 3 MB/sec
b. A disk drive in Sep 2000 (holds 77 GB, costs $575)
c. But max tape mounts on one NCAR silo
   - Now (& last ~5 years) is 350 mts/hr, or 1 ea 10.3 sec (max)
# The Price of Low-Cost Disk Drives
(Typical prices from *Computer Shopper* Magazine)

<table>
<thead>
<tr>
<th>Date</th>
<th>Drive</th>
<th>GByte</th>
<th>Cost</th>
<th>Cost/GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/1997</td>
<td>3</td>
<td></td>
<td>$270</td>
<td>$90</td>
</tr>
<tr>
<td>06/1997</td>
<td>9</td>
<td></td>
<td>$1270</td>
<td>$141</td>
</tr>
<tr>
<td>06/1997</td>
<td>Seagate</td>
<td>23.2</td>
<td>$3810</td>
<td>$164</td>
</tr>
<tr>
<td>04/2000</td>
<td>20</td>
<td></td>
<td>$160-180</td>
<td>~$8.50</td>
</tr>
<tr>
<td>04/2000</td>
<td>IBM</td>
<td>37.5</td>
<td>$325</td>
<td>$8.70</td>
</tr>
<tr>
<td>04/2000</td>
<td>Maxtor</td>
<td>40</td>
<td>$300</td>
<td>$7.50</td>
</tr>
<tr>
<td>09/2000</td>
<td>30</td>
<td></td>
<td>$155-200</td>
<td>~$6</td>
</tr>
<tr>
<td>09/2000</td>
<td>61</td>
<td></td>
<td>$265-460</td>
<td>$4.4 to 7.5</td>
</tr>
<tr>
<td>09/2000</td>
<td>IBM</td>
<td>76.8</td>
<td>$575</td>
<td>$7.50</td>
</tr>
</tbody>
</table>

Roy Jenne  
Sep 2000
A Data Center Needs To Be Visible

- A lot of “usually quiet” users getting what they need.
  - DSS has done this.

- Solve several big science data problems for “usually quiet” science data managers in US and world.
  - DSS has done this.

- Also, help other countries obtain the data they need.
  - DSS has done this.

- Help poor people in the world get cheap, easy data
  - We are leader in doing this.
  - Many opportunities to give more service.

- Give people information and data via the Web.
  - Doing more of this.

- Need some visibility in science meetings.
  - Getting somewhat weaker (time).

- Need packages of data to hand out on media.
  - NCEP/NCAR CD-ROMs an enormous success.
  - Need to create more data packages.

- What about short information flyers?
  - We are too weak on this.
  - But too much hype and splash is bad.

Roy Jenne
13 Sep 2000
The History of Data Competition

1. We have started things before they are popular.
   ▪ When popular, they may be taken over.

2. If we lack time to stay in front.
   ▪ Then others will move ahead.

3. It all depends on:
   a. Lots of data content
   b. Good service
   c. Low costs

4. Keep enough data versions:
   a. To fix future problems
   b. To have good 50-year archives
   c. And use enough error control
   d. Give confidence that our data can be trusted

Roy Jenne
Sep 2000
Some Very Important Tasks
(Next 1-6 Months)

1. Finish the present observations for reanalysis.
   - Do GATE ships

2. Gather a lot of documents on reanalysis, etc. (Jenne)


4. Make a bunch of data backups.

5. Prepare 3 or 4 data clusters.

6. Put TDL hourly into report format.

7. Get output from NCEP-2. (30% done)

   Roy Jenne
   14 Sep 2000
Important Tasks for Next 1-5 Years

1. Bring in reanalysis output.

2. Probably get results of NCEP LDAS runs.
   - Land data assimilations (LDAS)
   - Inputs: Precip, radiation, snow, clouds
   - Outputs: Radiation, soil, temps, etc.

3. Precip will be more popular.
   - Get radar precip composites
   - Good files of daily and hourly precip
   - Get new daily precip grids from countries
     - For N. America from NCEP
     - About 10 degree grids (Brazil, India, etc.)
   - Gather a cluster of the daily station precip
     (India, China, etc.)

4. Surface radiation (down solar) more important.
   - Get calc sfc rad from ISCCP radiances
   - Get calc rad from ISCCP project
   - This drives the surface energy budget

5. Surface albedo will be more important.
   - Changes in albedo and vegetation affect sfc energy
   - A lower sfc albedo; then planet absorbs more energy

Roy Jenne
14 Sep 2000
The current organizational structure of the Scientific Computing Division is given in the chart, below. You may go directly to each section by clicking on the section name at the top of each column in the chart.

SCD Organization Chart

### Division Office
- Al Kellie, Director
- Pete Peterson, Deputy Director
- Bernie O’Lear, Associate Director
- Tom Engel, HPC Env.
- Janice Kaurav, AA
- Rachel Daily, AA
- Joan Fisher, AA

### Sections

#### Computational Science
- Steve Hammond, Mgr.
  - Jennifer DeLaurent, AA
  - C. DeLuca, SE
  - J. Dennis, SE
  - R. Herlaches, SE
  - R. James, SE
  - N. Jorden, SA

#### Data Support
- Roy Jerome, Mgr.
  - Cecilia Banner, AA
  - R. Barnes, SE
  - J. Cotter, SE
  - C. DaCoste, SE
  - D. Joseph, SE, ASM
  - C. Shev, SE
  - W. Spangler, SE
  - G. Walters, SE
  - S. Worley, SE

#### Networking Engineering & Technology
- Maria Hecht, Mgr.
  - Susan Grand, AA
  - B. Caldwell, SA
  - S. Colburn, NE
  - J. Custard, SE
  - C. Fair, NE
  - F. Guerrero, NT
  - D. Harris, NE
  - D. Hayden, NE
  - B. Housewright, SE
  - B. Ink, NE
  - D. Mitchell, NE
  - D. Motes, NT
  - P. Siemens, NE
  - E. Snyder, NE
  - J. VanDyke, NE, ASM
  - J. White, NT

#### High Performance Systems
- Gene Harano, Mgr.
  - Bj Heiler, AA
  - B. Anderson, SE
  - B. Beteman, SE
  - J. Covey, SE
  - J. Kelly, NE
  - G. Fuentes, SE, GH
  - P. Gilmour, SE
  - R. Kirby, SE
  - M. Love, SE
  - J. Merril, SE
  - C. Ruff, NE
  - E. Thanhardt, SE
  - G. Williams, SE

#### Operations & Infrastructure Support
- Aaron Andersen, Mgr.
  - D. Buntamato, A
  - S. Albaretto, CO
  - M. Breedlove, CO
  - G. Gerd, CO
  - J. Harris, CO
  - E. Jeffries, SA
  - A. Kohler, CO
  - J. Kokes, CO
  - L. Labrie, CP GH
  - S. McLaughlin, CFT
  - K. Smith, CO
  - L. Soller, SE
  - I. Thompson, CO
  - L. Wynn, CO

### Users Support Section
- Ginger Catchell, Mgr.
- Janie Young, AA
- D. Anderson, SE
- E. Arnold, SE
- B. Bevert, WE
- B. Campbell, SE
- J. Chabin, DA
- G. Cornell, CO
- J. Fox, CO
- J. Fruehe, CO
- S. Grooms, SE
- S. Hays, SSA, GH
- R. Johnson, SSA
- J. Kuehn, SE, GH
- L. Lester, WE
- G. McArthur, SE, GH
- P. Morrel, CO
- H. Popp, SE
- J. Russ, SE
- M. Uris, SSA, GH
- D. Velent, SE
- G. Woods, SE

### Visualization and Enabling Technologies
- Dan Middleton, Mgr.
- Tamara Ritter, AA
- E. Aplet, SE
- J. Boote, SE
- D. Brown, SE
- F. Clare, SE
- J. Cramer, SE
- T. Cross, EC
- M. Haley, SE
- D. Kenison, SE
- A. Radonov, SE
- T. Schellen, SE

### Casual Staff
- Cindy Adornetto
- Mary Barile
- Abishua Moea
- Betty Thompson
- Rosemary Mitchell
- Laura Morreale
- Gene Schumacher

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Oct 28, 2000

Note: Harano is now head of systems. Engel is moved from systems to the front office.

Operations: Four years ago they had 15 operators. Now it is 9. This seems to be working OK.
Problems to Solve
- in order to deliver -

Good Data Support for Research

Much money will be spent on information technology
• Will it help solve any of these problems?

Roy Jenne
Sep 2000
Some Questions We Are Asked

- Reanalysis: The atmosphere is cooler in 1970s. Is this real?
  - We do tests
  - And compare with Angell raob temp index.
  Answer: It is true.

- There is a change in China pressure in 1960s. True?
  - Suspicious; we don't know yet.

- I need real surface monthly anomalies for 40 years over USA.
  - To look at trends (temp, wind, precip, etc.)
  - To compare with seasonal forecasts
  - This should be easy; it isn't.

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A NASA Study On Best Practices Data Centers

A NASA team of four people visited NCAR on Aug 29, 2000. We gave talks about our Data Support Section, mass store, fast computers, etc.

I showed this slide. They were surprised that the questions would be this scientific in nature.

Roy Jenne, 29 Sep 2000
Meetings for Jenne

September 19 – 22, 2000, NOAA & NCEP business, Washington DC
- Sep 21: NOAA Long-Term Climate Council
- Sep 22: NCEP Panel on Mesoscale Reanalysis

October 14 – 21, 2000, ECMWF, Reading, UK
- Oct 16 – 18: About NCAR, NCEP, ECMWF observations plans
- Oct 19: The panel for ERA-40 reanalysis

Nov 12 – 17, 2000, Go to Asheville
- Nov 13 – 15: US – USSR
- Nov 16: Other topics
Plans for Data Support, 2000 – 2002

Road maps for data
- For atmospheric sciences and related disciplines
- Some questions we are asked

Maintain the main flows of input data

More observations for reanalysis

Also give data services for three science areas
- COADS and other ocean data
- High atmosphere (CEDAR), data for 70 – 1000 km
- What we will do for mesoscale research

Delivery of DSS data to users in 1999

Projects for documents and the Web

Long archives, technology use, staff time by project

Summary for Data Support, 2000 – 2002

SCD is preparing plans for the next year or two. On May 2, I presented these plans for the Data Support Section to the SCD Executive meeting.

Roy Jenne
NCAR
1 May 2000