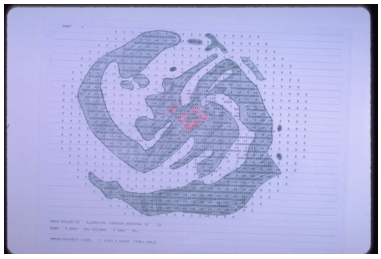
Graphical Packages



Cindy Bruyère

Mesoscale & Microscale Meteorology Division of NCAR

Topics:

- **Available graphical packages**
- **Which package is best for you**
- **Samples of graphics**

- **Details**
  - GRAPH (Now)
  - RIP (Tomorrow)
  - MM5toGrADS (Thursday)

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Available Packages:

- **GRAPH**
  - Original package supported by NCAR
- **RIP**
  - Developed by Mark Stoelinga (UW / NCAR)
  - Very popular under MM5 users
  - Supported for a number of years already
- **MM5toGrADS**
  - Converter developed by George Bryan from PSU
  - Popular under MM5 users
  - Supported since January 2002

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Features: GRAPH

- **Easy to use**
- **Nice for a quick look at output**
- **Runs fast**
- **Does not create extra (large) data files**
- **No shaded plots (contours only)**
- **Only 2 overlaid fields possible**
- **Need NCAR Graphics to run**
- **Adding diagnostic variables require code changes**
- **Must rerun if new images are needed**

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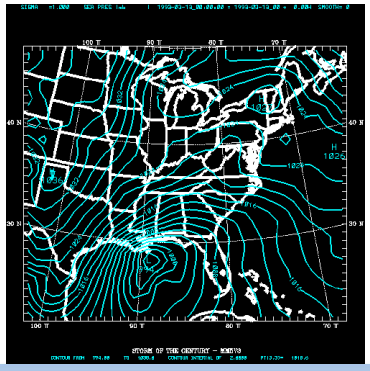

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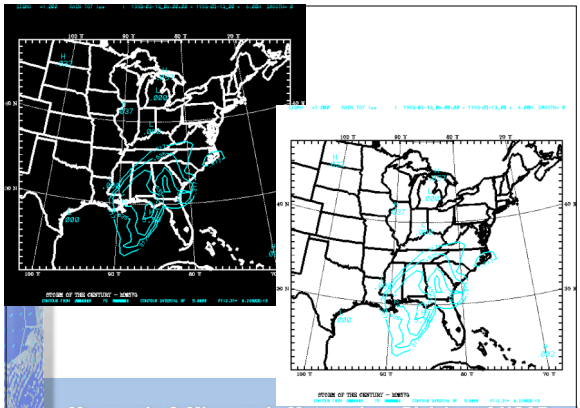

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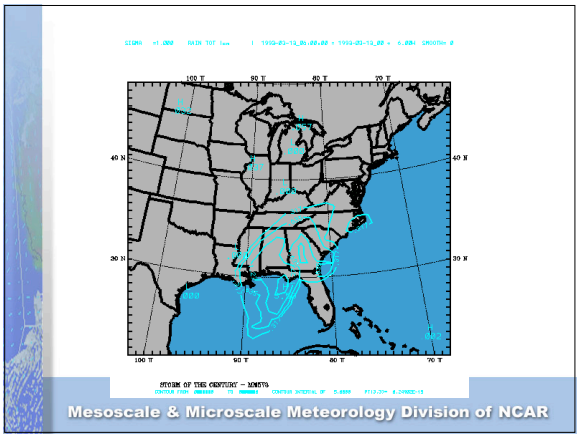

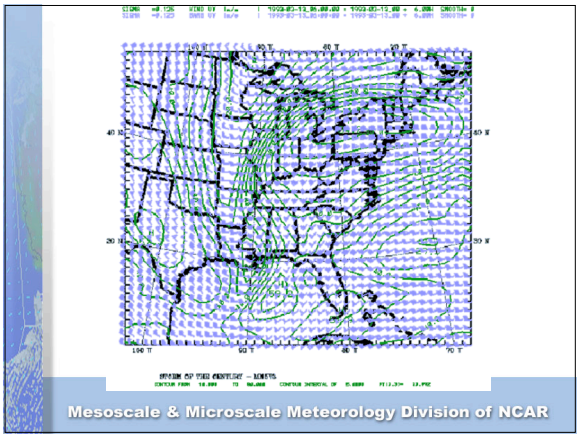

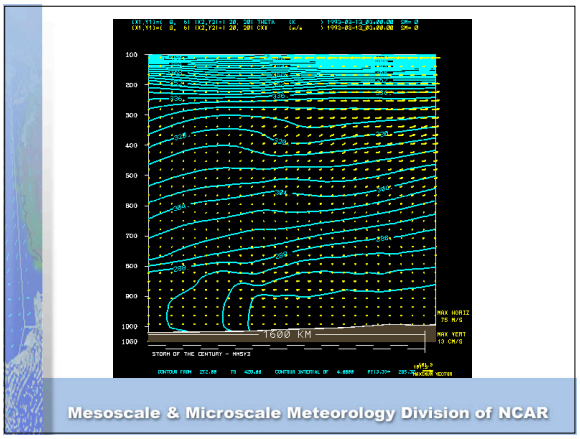

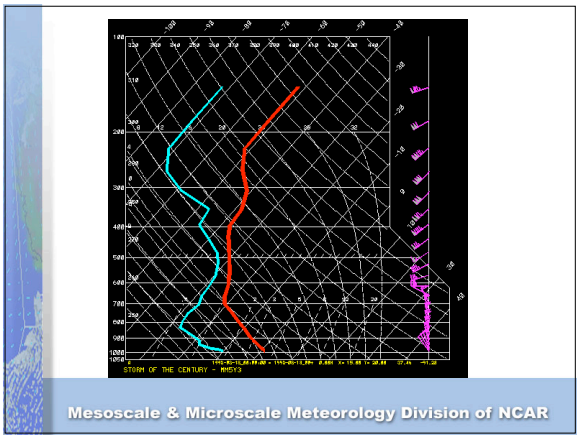

Features: RIP

- Quality slides (publish quality)
- Can do shaded plots
- More than 2 overlays
- Lots of diagnostics
- Relatively easy to use
- Not as easy as GRAPH, but one can get up to speed fast
- Makes LOTS of extra data files
- Need NCAR Graphics
- Adding diagnostic variables require code changes
- Must rerun if new images are needed

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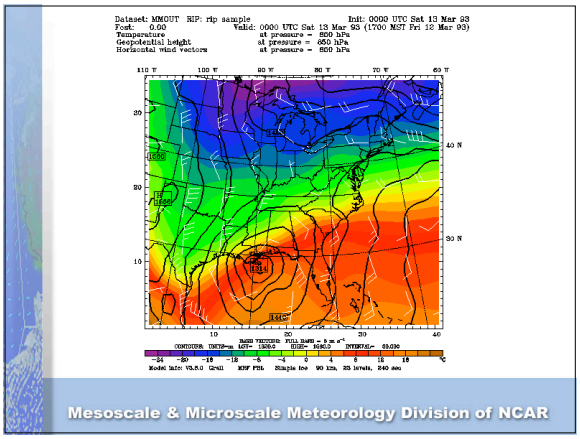

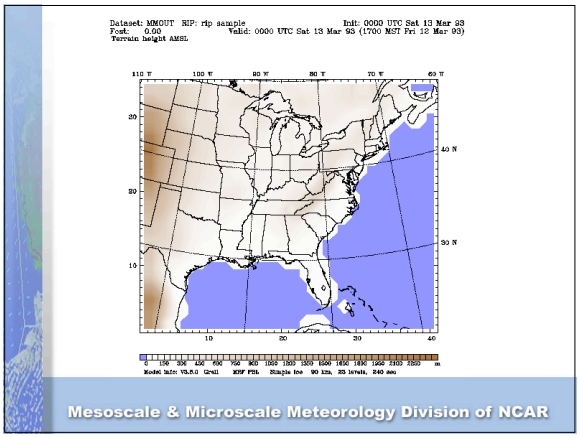

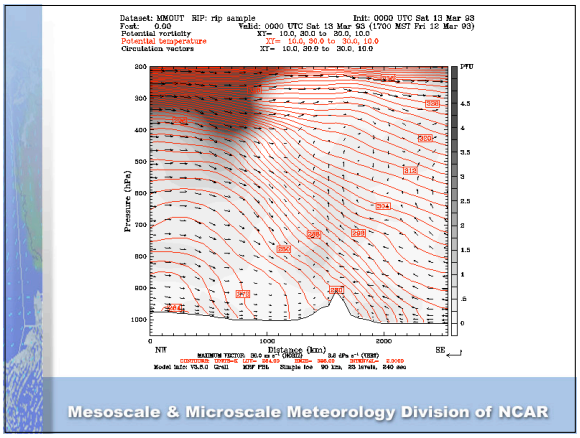

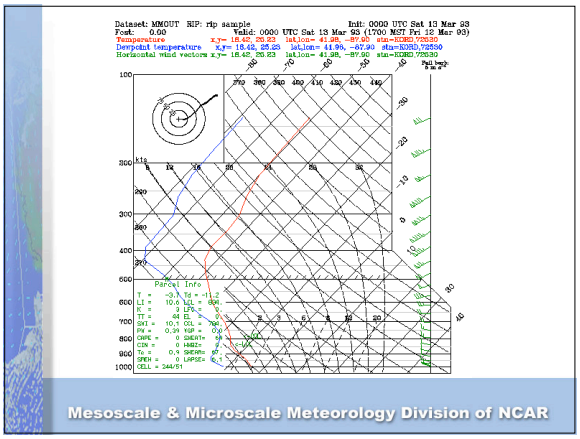

Features: MM5toGrADS

- Quality slides (publish quality)
- Can do shaded plots
- More than 2 overlays
- Not as easy to use, but can also get up to speed fast
- Take some time to learn the commands that is needed to generate the pictures
- Good online documentation
- Create large data files
- Interactive (nice feature)
- Adding diagnostics on the fly
- Animations in XYZT
- Don't have to rerun to generate new images
- Need GrADS (free)

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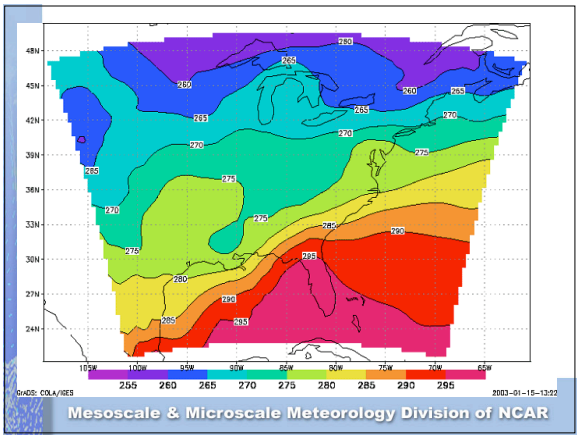

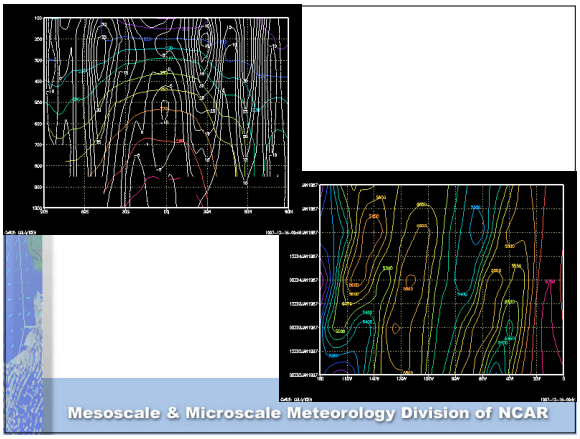

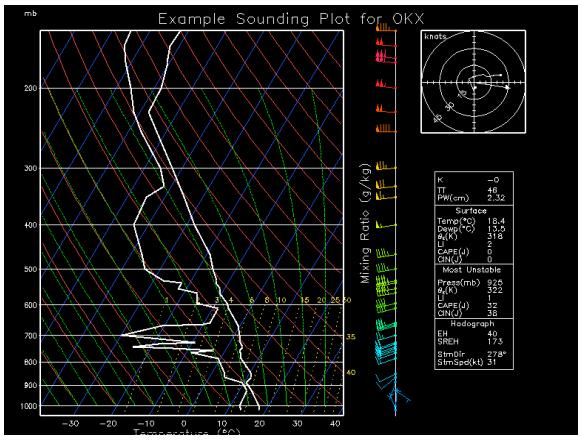

GRAPH – Chapter 12

- **Plot output variables**
- **Plot some diagnostics**
- **Input either σ or p-levels in V3 format**
  - not boundary data (BDYOUT_DOMAINx)
- **Requires NCAR Graphics ngwww.ucar.edu**

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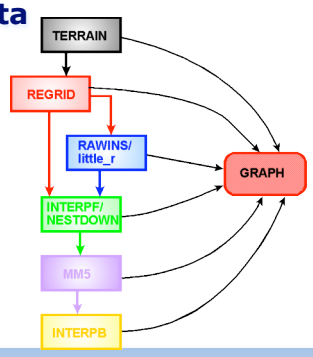
Input Data



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GRAPH Tables

- **g_plots.tbl (page 12-5)**
  - Define times, levels and fields to be processed
- **g_defaults.nml (page 12-7)**
  - Namelist file to specify colors/labels (*optional*)
- **g_map.tbl (page 12-8)**
  - Map background specifics
- **g_color.tbl (page 12-10)**
  - Define colors (eg, change background to white)

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g_plots.tbl

```
TIME LEVELS: FROM 1993-03-13_00 TO 1993-03-14_00 BY 6
PRESSURE LEVEL MANDATORY: FROM SFC TO PTOP
PRESSURE LEVEL NON STANDARD: FROM SFC TO PTOP BY 3
SIGMA LEVEL: FROM 23 TO KMAX BY 5
TITLE: MM5 Tutorial
```

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g_plots.tbl

```
TIME LEVELS: FROM 1993-03-13_00 TO 1993-03-14_00 BY 6
PRESSURE LEVEL MANDATORY: FROM SFC TO PTOP
PRESSURE LEVEL NON STANDARD: FROM SFC TO PTOP BY 3
SIGMA LEVEL: FROM 23 TO KMAX BY 5
TITLE: MM5 Tutorial
```

A) TIME – units of date and interval must match

Time format:

YYYY-MM-DD_HH

YYYY-MM-DD_HH:MM

YYYY-MM-DD_HH:MM:SS

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g_plots.tbl

```
TIME LEVELS: FROM 1993-03-13_00:00:00 TO 1993-03-
    14_00:00:00 BY 21600
PRESSURE LEVEL MANDATORY: FROM SFC TO PTOP
PRESSURE LEVEL NON STANDARD: FROM SFC TO PTOP BY 3
SIGMA LEVEL: FROM 23 TO KMAX BY 5
TITLE: MM5 Tutorial
```

A) TIME – units of date and interval must match

Time format:

YYYY-MM-DD_HH

YYYY-MM-DD_HH:MM

YYYY-MM-DD_HH:MM:SS

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g_plots.tbl

```
TIME LEVELS: FROM 1993-03-13_00 TO 1993-03-14_00 BY 6
PRESSURE LEVEL MANDATORY: FROM SFC TO PTOP
PRESSURE LEVEL NON STANDARD: FROM SFC TO PTOP BY 3
SIGMA LEVEL: FROM 23 TO KMAX BY 5
TITLE: MM5 Tutorial
```

A) TIME – units of date and interval must match
B) P-level input, mandatory levels to plot, in mb
C) P-level input, new levels to plot, increment by level numbers
D) Theσ-level input, top-down, integer level increment
E) Title under plot, no imbedded ":"

Format very important

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g_plots.tbl

```
-----------------------------------------
PLOT | FIELD| UNITS| CONTOUR | SMOOTH ||..
T/F  |      |      | INTERVAL| PASSES ||..
-----------------------------------------
  T  | TER  | m    | 100     | 0      || …
TP500|HEIGHT| m    | 30      | 0      || …
TI305| PV   | PVU  | 1       | 0      || …
```

FIELDS: Pages 12-14 to 12-18

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g_plots.tbl

```
-----------------------------------------
PLOT | FIELD| UNITS| CONTOUR | SMOOTH ||..
T/F  |      |      | INTERVAL| PASSES ||..
-----------------------------------------
  T  | TER  | m    | 100     | 0      || …
TP500|HEIGHT| m    | 30      | 0      || …
TI305| PV   | PVU  | 1       | 0      || …
T |WIND |m/s| 5 | 0 || BARB | m/s | 2 | 0
```

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g_plots.tbl

```
-----------------------------------------
PLOT  | FIELD | UNITS | CONTOUR | SMOOTH
T/F   |       |       | INTERVAL| PASSES
-----------------------------------------
T | SKEWTLL | 72469| 39 .75 | -104.87 ||…
T | SKEWTXY | LOCATION | 19 | 30 || …
```

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g_plots.tbl

```
-----------------------------------------
PLOT  | FIELD | UNITS | CONTOUR | SMOOTH
T/F   |       |       | INTERVAL| PASSES
-----------------------------------------
  X | 5 | 5 | 23 | 8 | PSLV | mb | 2 | 0
  X | THETA | K | 3 | 0 || …
```

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How to Run GRAPH:

- **ftp ftp.ucar.edu NCAR's anonymous ftp**
- **Login as ftp, email address as password**

cd mesouser/MM5V3
binary
get GRAPH.TAR.gz
quit

How to Run GRAPH:

- **gunzip GRAPH.TAR.gz**
- **tar –xf GRAPH.TAR**
- **May need to edit src/scratch.incl and src/data.incl *(200x200x40)***
- *make*

How to Run GRAPH:

- **Edit:**
  - g_plots.tbl
  - g_defaults.nml (*optional*)
- **Run GRAPH script (page 12-12)**
  - graph.csh 1 1 *filename*
  - graph.csh 1 3 *file_00 file_01 file_03*
- **idt gmeta**
- **ctrans –d ps.mono gmeta >! gmetabw.ps**
- **ctrans –d ps.color gmeta >! gmetaco.ps**

Hints:

- **NCARG_ROOT environment variable**
- **Use .incl files if larger than 200x200x40**
- **Vertical interpolation for σ-levels only**
- **New architectures may require fiddling with direct access file counter length (bytes or words)**

Hints:

- **Only one input file type permitted per GRAPH run**
- **NCAR Graphics 4.1 is default, but can run with earlier and later versions of NCAR Graphics**
  - Change –DNCARG41 to –DNCARG42 (v4.2)
  - Delete –DNCARG41 (v4.0)
- **Change ncgm file in other formats**
  - **http://ngwww.ncar.edu/info/faq.html#ConvertGif**