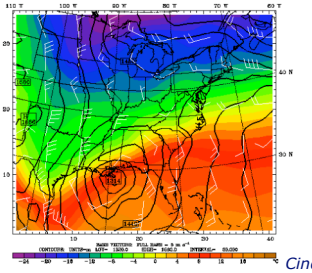
RIP: Appendix G Read/Interpolate/Plot



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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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General:

- Requires NCAR Graphics ngwww.ucar.edu
- Documentation:
  - In program tar file under the Doc/ directory
  - http://www.mmm.ucar.edu/mm5/documents/ripug.html
  - http://www.mmm.ucar.edu/mm5/documents/ripug_V4.html

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Purpose:

- Horizontal plots on σ, pressure, height, θ, θ_e, or PV surfaces
- Vertical cross sections
- Skew-T/log p soundings
- Forward and backward trajectories
- Generate input data for Vis5D

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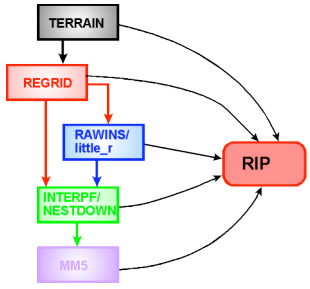
Input Data:

- MM4 or MM5 output, MM5 input and pre-processors
- RIP4 can also input WRF data



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RIP on Your Computer:

- setenv NCARG_ROOT /usr/local/ncarg
- set RIP_ROOT environment variable
  - setenv RIP_ROOT /usr/$USER/RIP
- make *<machine type>* (it'll make suggestions)
  - make dec (*example*)
- RIP has 2 parts (RIPDP and RIP)

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RIP4 on your computer:

set RIP_ROOT environment variable
- setenv RIP_ROOT /usr/$USER/RIP4

new
- **Edit *src/Makefile* to define paths to netCDF library and include file on your computer:**
  NETCDFLIB and *NETCDFINC*
- **make <machine type> (*it'll make suggestions*)**
  - make dec (*example*)
- **RIP4 has 2 parts (RIPDP and RIP)**

ripdp_mm5 ripdp_wrf

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RIPDP:

- **RIPDP is RIP Data Preparation**
- **RIP does not read MM5 system data directly**
- **Pre-processor runs to put data into RIP input format**
- **RIP puts each variable at each time into a separate file – LOTS of files**

HINT:
mkdir storm_case

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Running ripdp:

Optional *ripdp_sample.in*

- **ripdp –n namelist-file **
  **<model_data_name> **
  <input_file1 input_file2>

use directory as part of the model_data_name

- **Example: ripdp -n ripdp_sample.in storm_case/MMOUT ../MM5/Run/MMOUT_DOMAIN1**

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Running ripdp_mm5:

- **ripdp_mm5 [–n namelist-file]** new ****
  **<model_data_name> [basic/all] **
  <input_file1 input_file2>

Example
ripdp_mm5 -n ripdp_sample.in storm_case/MMOUT basic mm5out

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RIPDP Namelist:

```
&userin
  ptimes=0,-72,1,ptimeunites='h',tacc=90.,
            discard='LANDMASK',H2SO4',
  iexpandedout=1
&end
```

- **ptimes – times for RIPDP to process**
  - 0,1,2
  - 0,-72,1
  - 0, 3,-24,3, 48
- **ptimeunits – 'h', 'm', 's'**
- **tacc – tolerance (s) for times defined by ptimes (time accuracy)**

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RIPDP Namelist:

```
&userin
  ptimes=0,-72,1,ptimeunites='h',tacc=90.,
            discard='LANDMASK',H2SO4',
  iexpandedout=1
&end
```

- **discard – list of variables that will not be processed *(RIP4 - only if 'all' is selected on the command line)***
- **iexpandout – 1=expanded domain, 0=nonexpanded domain (only for TERRAIN and REGRID)**

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RIP:

- read the output generated by RIPDP
- read User Input File (UIF) *(rip_sample.in)*
  - First section is a list of general parameters (namelist format)
  - Second section is a series of plots in the Plot Specification Table (PST)
- generate meta file (same as for GRAPH)

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Running RIP:

- rip [-f] model-data-set-name \
  rip-execution-name

created by ripdp / ripdp_mm5

User Input File (UIF)

Example

rip -f storm_case/MMOUT rip_sample.in

use directory as part of the model_data_set_name

output ; metacode

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RIP UIF

```
&userin
 ......        Namelist controlling general parameters
&end
&trajcalc
 ......        Namelist for trajectory calculations
               Only used if itrajcalc=1, in userin namelist
&end
=======================================
———          Plot Specification Table          ———
=======================================
feld= .........   Frame specification
feld= .........   group (FSG)                Plot
=======================================      Specification
feld= .........   Plot specification line (PSL)   Table (PST)
feld= .........
=======================================
```

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RIP namelist - *userin*

- Use namelist to control
  - processing times, intervals
  - title information
  - text quality on a plot
  - whether to do time series, trajectory, or to write output for Vis5D
- Full explanation for namelist variables is available in the user document

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RIP namelist - *userin*

- idotitle – first part of first title line
- titlecolor – color of title lines
- ptimes, ptimeunits – times to process
- tacc – tolerance for processing data
- timezone –display of local time
- iusedaylightrule – 1 applied, 0 not applied
- iinittime – plotting of initial time
- ivalidtime – plotting of valid time
- inearsth – plot times as 2 / 4 digits
- flmin, frmax, fbmin, ftmax – frame size
- ntextq – text quality

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RIP namelist - *userin*

- ntextcd – text font
- fcoffset – 12 means hour 12 of the MM5 forecast is considered hour 0 by you
- idotser – generate time series output
- idescriptive – more descriptive titles
- icgmsplit – split metacode into several files
- maxfld – reserve memory for RIP (10-15)
- itrajcalc – 0, 1 ONLY when doing trajectory calculations *(use also namelist trajcalc)*
- imakev5d – 0, 1 generate Vis5D data

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RIP PST:

```
================================================
feld=tmc; ptyp=hc; vcor=s; levs=b1; cint=2; >
  cmth=fill ;cosq=-32,light.violet, >
  -16,blue,0,yellow, 16,orange, 32,light.gray
feld=slp; ptyp=hc; cint=2; linw=2
feld=uuu,vvv; ptyp=hv; vcmx=-1; >
  colr=white; intv=5
feld=map; ptyp=hb
feld=tic; ptyp=hb
================================================
```

Appendix A has a list of all of the keywords

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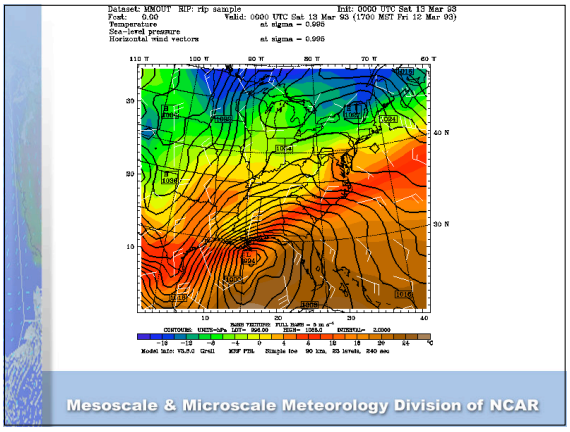

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RIP PST:

```
==========================================
feld=tmc; ptyp=hc; vcor=p;
  levs=850; cint=2; >
  cmth=fill ;cosq=-32,light.violet, >
  -16,blue,0,yellow, 16,orange, >
  32,light.gray
feld=ght; ptyp=hc; cint=30; linw=2
feld=uuu,vvv; ptyp=hv; vcmx=-1; >
  colr=white; intv=5
feld=map; ptyp=hb
feld=tic; ptyp=hb
==========================================
```

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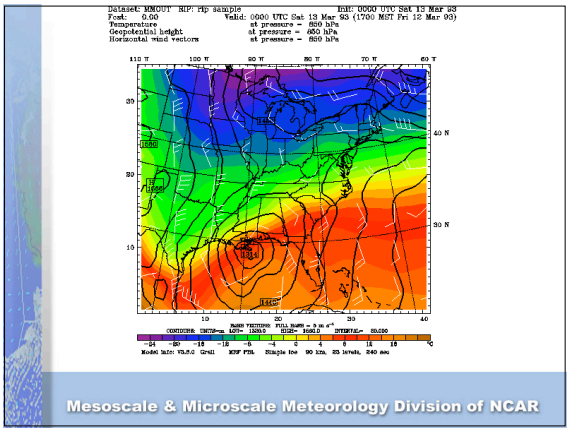

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RIP PST:

```
==========================================
feld=tmc; ptyp=hc; vcor=p;
  levs=850; cint=2; >
  cmth=fill ;cosq=-32,light.violet, >
  -16,blue,0,yellow, 16,orange, >
  32,light.gray
feld=ght; ptyp=hc; cint=30; linw=2
feld=uuu,vvv; ptyp=hv; vcmx=-1; >
  colr=white; intv=5
feld=map; ptyp=hb
feld=tic; ptyp=hb
==========================================
```

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RIP PST:

```
==========================================
feld=tmc; ptyp=hc; vcor=p; levs=850; cint=2; >
  cmth=fill ;cosq=-32,light.violet, >
  -16,blue,0,yellow, 16,orange, 32,light.gray
==========================================
feld=ght; ptyp=hc; cint=30; linw=2
==========================================
feld=uuu,vvv; ptyp=hv; vcmx=-1; > colr=white;
  intv=5
==========================================
feld=map; ptyp=hb
==========================================
feld=tic; ptyp=hb
==========================================
```

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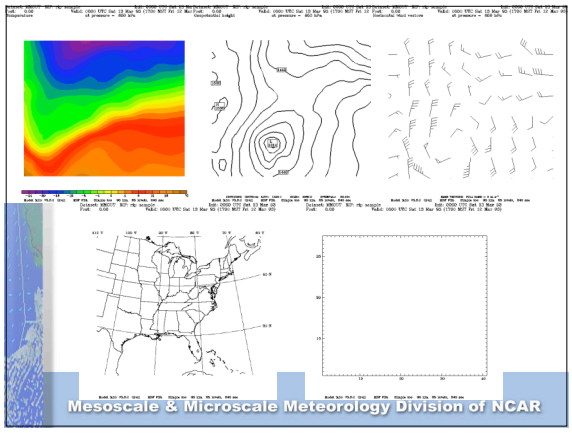

RIP PST:

```
=========================================
feld=tmc; ptyp=hc; vcor=p; >
  levs=850,700,-300,100; cint=2; >
  cmth=fill ;cosq=-32,light.violet, >
  -16,blue,0,yellow, 16,orange, >
  32,light.gray
feld=ght; ptyp=hc; cint=30; linw=2
feld=uuu,vvv; ptyp=hv; vcmx=-1; >
  colr=white; intv=5
feld=map; ptyp=hb
feld=tic; ptyp=hb
=========================================
```

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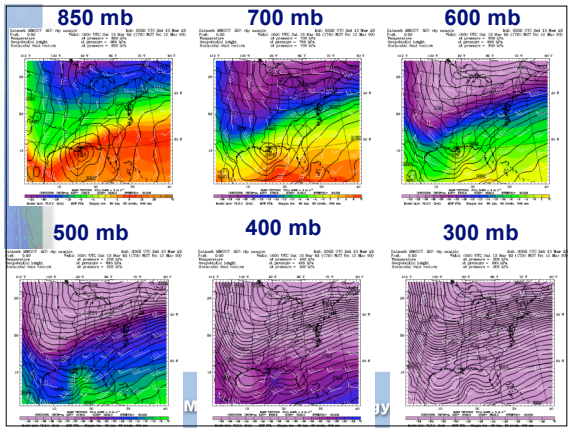

RIP PST – *different color fill*:

```
=========================================
feld=ter; ptyp=hc; cint=50; >
  cmth=fill ;cosq= -1e-5,light.blue, >
  1e-5,white, 3000, brown
feld=map; ptyp=hb
feld=tic; ptyp=hb
time=0
=========================================
```

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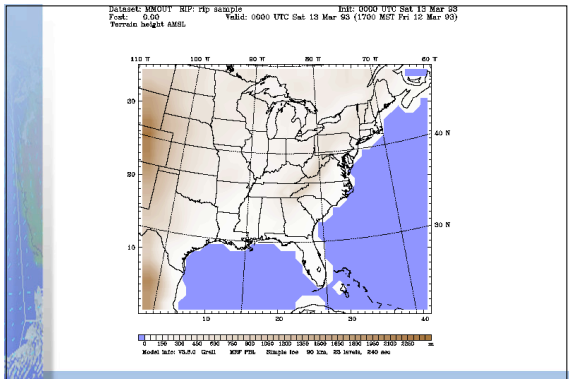

RIP PST – *different color fill*:

```
=========================================
feld=xlus; ptyp=hh; chf| cosq=1,dark.gray,2,light.yellow, >
  3,light.green,4,yellow,5,yellow,6,light.green,>
  7,light.yellow,8,light.green,9,light.green,>
  10,light.yellow,11,green,12,dark.green,13,green,>
  14,dark.green,15,green, 16,blue,17,green,18,green,>
  19,light.gray,20,light.gray,21,dark.green, 22,light.gray,>
  23,light.gray,24,white
feld=map; ptyp=hb
feld=tic; ptyp=hb
time=0
=========================================
```

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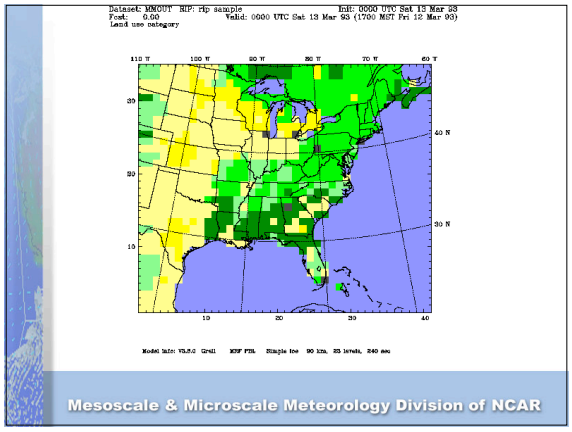
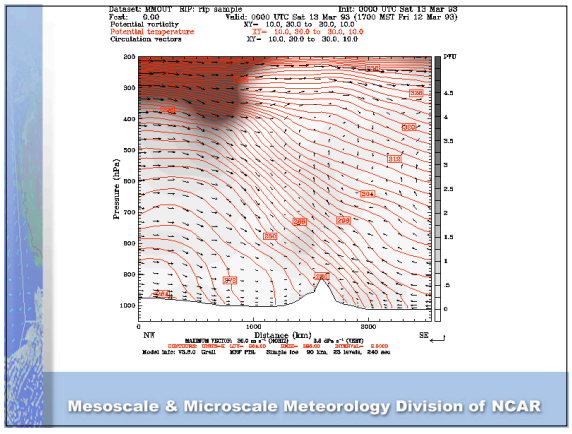


RIP PST – *cross section*:

```
=========================================
feld=pvo; ptyp=vc; crsa=10,30;
  crsb=30,10;
  vcor=p; vwin=1050,200; cint=.25; >
  cmth=fill ;cosq=0,white,4,dark.gray;  >
  cbeg=0; cend=5
feld=the; ptyp=vc; cint=2; colr=red
feld=uuu,vvv,omg; ptyp=vv
feld=tic; ptyp=hb
=========================================
```

RIP PST – *skew*-T:

```
=========================================
feld=tic; ptyp=sb; sloc=KORD; hodo; sngdg
feld=tmc; ptyp=sc; colr=red
feld=tdp; ptyp=sc; colr=blue
feld=uuu,vvv; ptyp=sv; colr=dark.green >
  hodo; sndg
=========================================
```