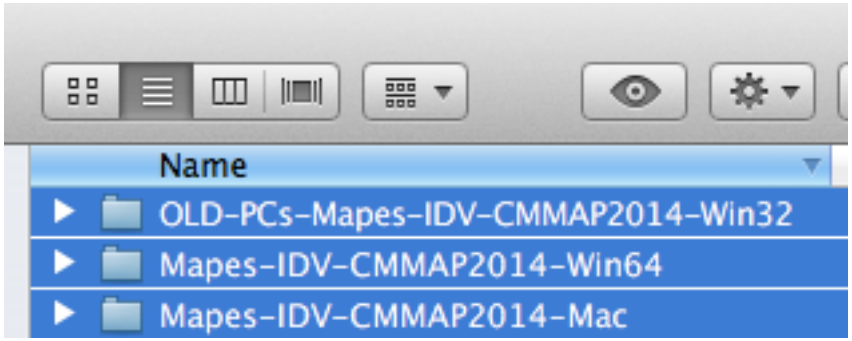
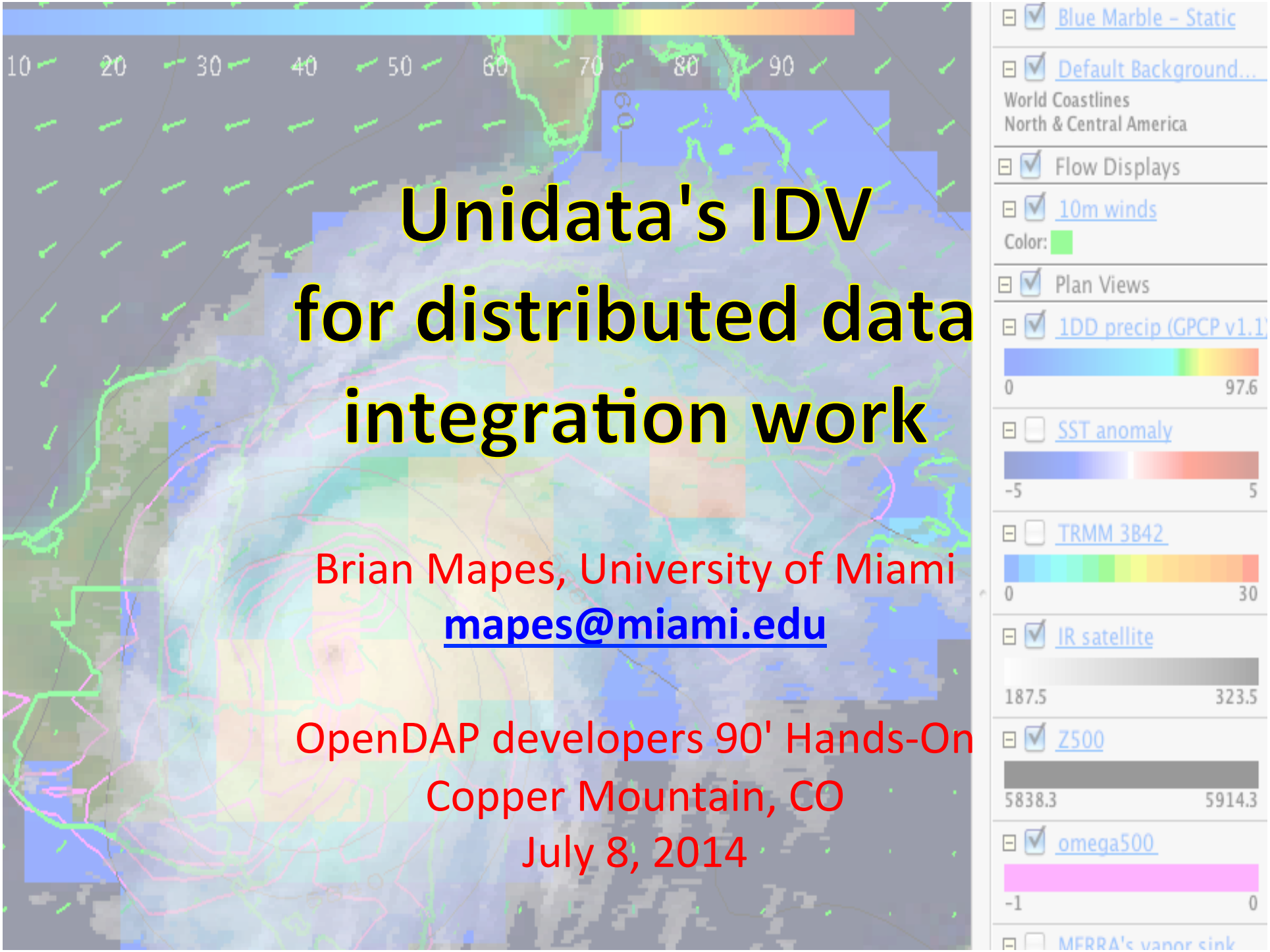
Grab Folder From USB Stick

- Mapes_IDV_CMMAP2014_(system)



- Drag whole folder to desktop
- Pass it on

  – (at leisure: Double click installer, Follow prompts)



Unidata's IDV for distributed data integration work

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OpenDAP developers 90' Hands-On
Copper Mountain, CO
July 8, 2014

Today's outline (45', trailing off...)

1. Install and launch The IDV. Open a zipped bundle. Poke n play while I talk about intro stuff.
   - DYNAMO data in Indian Ocean

2. Close. Install Mapes IDV Collection. Restart.
   - "Collection" = a URL address of a *plugin*
     - every IDV launch you get my latest plugin (from Miami web site)
   - *plugin* = a bundle of resources at many levels
     - curated bundles in favorites bar & catalog area
     - color tables, display settings, formulas, etc.

3. Play with Web-served bundle (gulp... all of us?)
   - dial a time range, box a region -- CAREFUL with size!
   - this is the trailing off part... Web slam?...

Install and launch

- You should have a folder (from USB sticks) Mapes_IDV_CMMAP2014_(system)
  - Double click installer
  - Follow prompts

- CLEAR MEMORY (CLOSE LARGE APPLICATIONS)

- Launch The IDV. Two windows will come up.
- In either: File→Open
  - choose DYNAMO_for_CMMAP_noIR.zidv

What is The IDV?

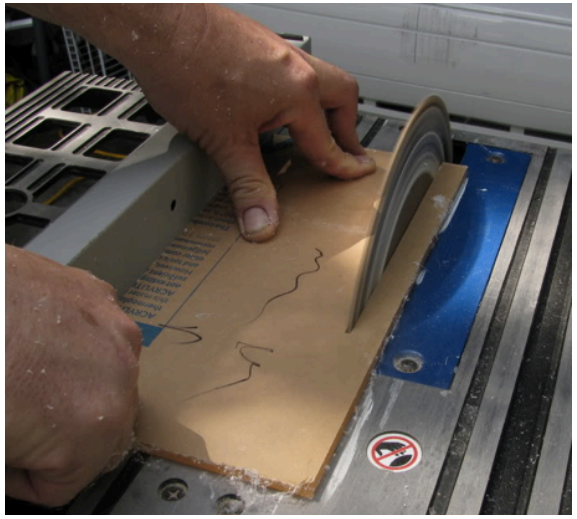
- NSF-supported UCAR/Unidata's Integrated Data Viewer
  - and previewer, and preprocessor, and processor, and ...
- Free, supported, improving software (in Java)
  - product of **decades** of thoughtful development
    - » nothing is non-sensible ... within its history...
- Roots in Meteorology
  - → specialty displays, our derived quantities, etc.
- More than Met now -- geoscience-inclusive

Don't let "errors" worry you

- Multi-threaded, each w/ many dependencies
  - » remote servers, etc. etc.
  - **IGNORE** (OK,OK,OK) whatever errors it throws
    - they are inscrutable (to me)
    - sup/dev team doesn't want raw error reports
  - Lots of goodies will still come up - maybe enough

Expectation management

- ***Complicated***, *by necessity*... it does a lot
- All in menus, within much-pondered GUI
  - » Bears up to thought, once you internalize nomen-culture
- Get a mouse
  - » right-click has menus; scroll to zoom
- Measure twice, cut once
  - » *Think before you click!*
  - – Some maddening 'Simon Says' games
  - – Unstoppable 'Download Internet'
  - – No auto-save or back button



Simple toolbox will suffice

Build a birdhouse: tips

A birdhouse is easy to build. *(Brandon Laufenberg)*

It's fun to build a birdhouse. If you're a parent, your children will enjoy it, too. Here are some tips about building and hanging a birdhouse. (Go here for birdhouse dimensions and simple plans.)

Birds who use birdhouses (also called nest boxes) are cavity-dwellers. A cavity, such as a hollow tree limb or trunk, a crevice or cave, offers protection from the elements and some safety.

Unless you're a skilled woodworker, keep it simple to avoid frustration. Not only that, but it isn't necessary to create a work of art. There are thousands of intricately designed, beautiful birdhouses on the market that often go ignored by birds, because they don't look or feel natural to them. This isn't to say you shouldn't hang a lovely birdhouse or that it'll never attract an occupant. It isn't necessary, though; "Natural" is what they look for first, a nesting place that blends into the surroundings. Even an elaborate birdhouse is best when colored in earth tones -- brown, tan, gray -- such as the one pictured below.

Build the house to dimensions you know will be used by birds in your area. For example, building and positioning a nest shelf for Barn Swallows will give discouraging results if your yard is full of trees. (This page lists the birds who most commonly use birdhouses and their natural habitats.)

It's best to use wood, especially cedar, because it will be long lasting. It isn't imperative, but wood with some bark left on it is especially appealing to birds. You can also glue or nail strips of bark to the outside.

This birdhouse is stained a natural color to make it appealing to birds. *(Xyno)*

Need workshop

Orientation to The IDV:

Take a breath, think like a programmer (from menus)

←It is like this

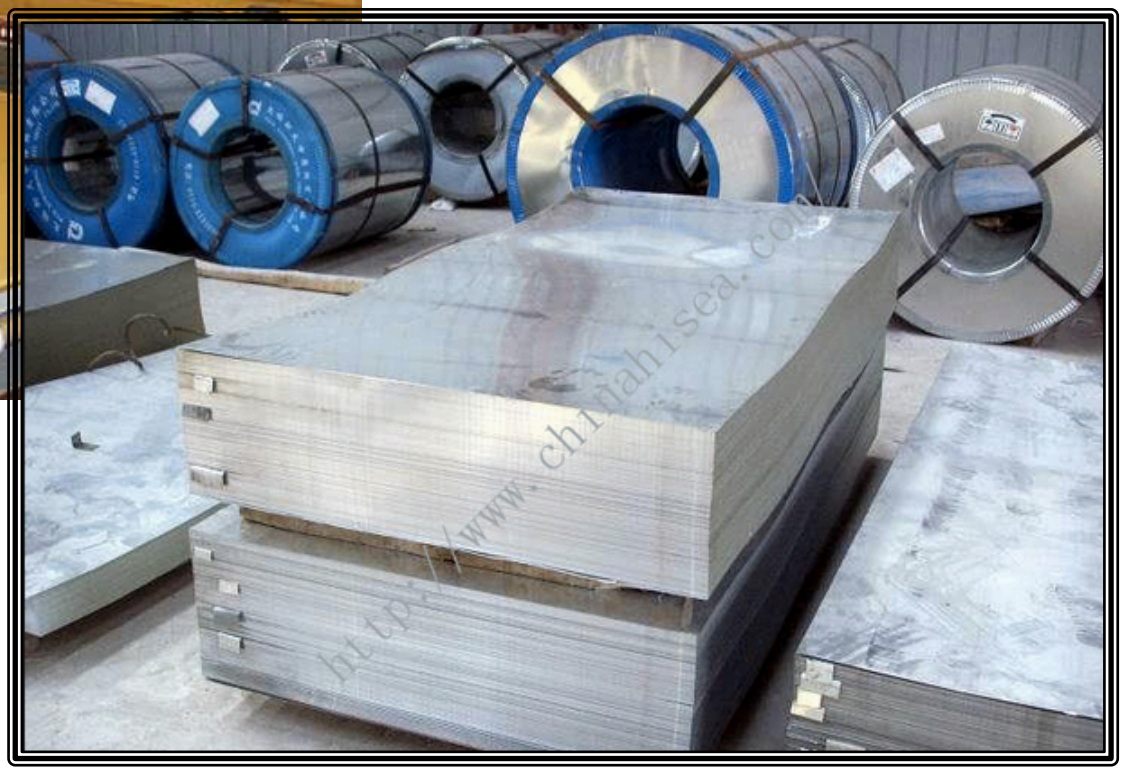
←(with a few parts more like this...)

Not this→

Menus within menus

- *Tools are available in more than one place*
- Right-click often pulls up menus
  - Everything was created and named thoughtfully
    - during those decades of programming
  - Be patient, read, try to think like a programmer/ craftsman

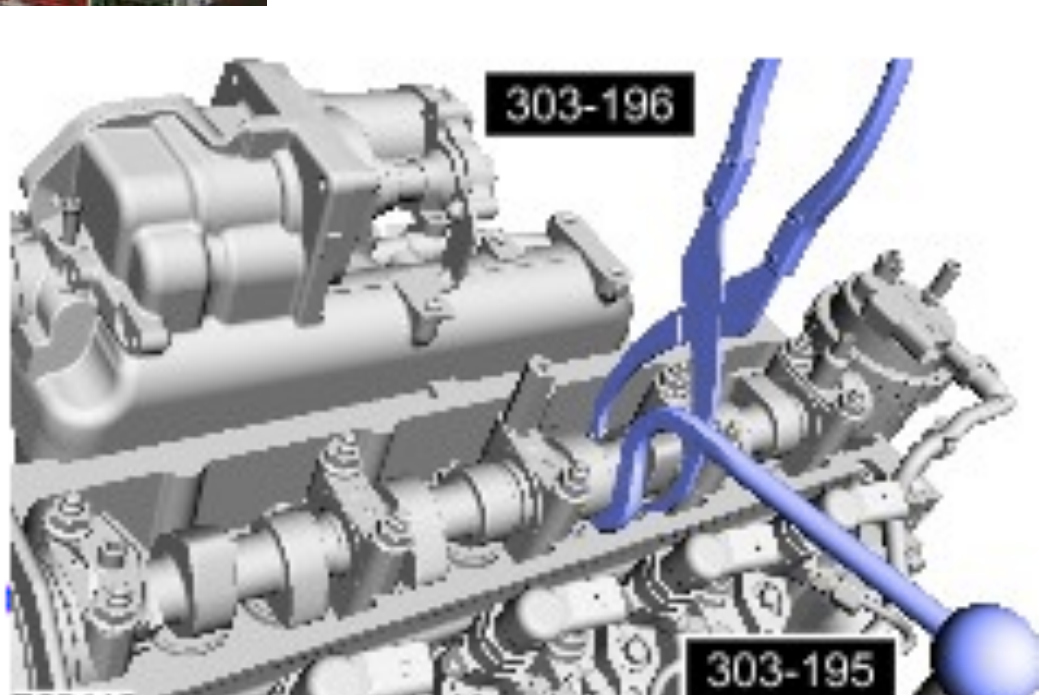
You *can* start from raw data…
but that is often frustrating and slow.



"Powerful" software

- Powerful software can do a million things
- *999,900 of those things don't make any scientific sense to do!*
- *Many of them will ruin your IDV session!*
  - like exceeding RAM memory limits

Instead, let's learn to examine and adjust a rich ***bundle*** of data+displays



Later in the training, you will learn to create (add) your own field displays, and then to add whole new datsets. You can easily delete any of the initial template that you don't want any more.

Three kinds of Help:

- **Reference** manual:
  - http://www.unidata.ucar.edu/software/idv/docs/**userguide**/toc.html
    - (this is also under the IDV's Help menu)
- From the IDV training **workshop**:
  - http://www.unidata.ucar.edu/software/idv/docs/**workshop**/
- Tutorial **screencasts** on YouTube:
  - http://www.unidata.ucar.edu/blogs/news/entry/new_idv_**tutorial_videos**_available

Key computer resource: RAM

- MEMORY (RAM):
  - 2GB is a minimum for reasonable IDV performance
  - 4GB or 8GB are *much better*
  - IDV reserves about 75% of system RAM on launch
    - CLOSE OTHER LARGE APPLICATIONS for best results
    - *Update 2014*: it only grabs 3GB even if you have 8G
      - trash collection is more efficient with bounds, I heard?
  - Exceeding memory limits can cause "STRANGE, UNPREDICTABLE" errors!
    - (just freezing up, most commonly)

Performance (speed)

- Slow processes: data reading, rendering
  - Be patient. It will finish, if memory is sufficient.
    - many sub-processes, not possible to monitor in detail.
    - *Stretch, breathe, do something else.*

- JAVA is multi-threaded
  - The "STOP" button is just another process
    - doesn't reliably work
    - kill IDV if you see "loading hi-res data 1/1000...2/1000..."

What is a Bundle?

- myfile.**z**idv is a bundle with data zipped into it
  - allows faster access, and offline work
- myfile.**x**idv is a bundle of xml code only
  - just instructions, including *pointers* to data files/servers

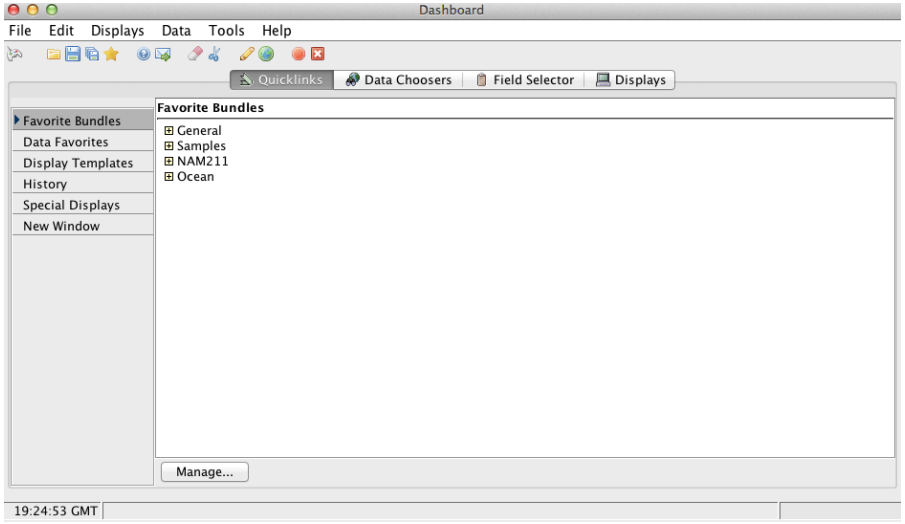
- You see exactly what the bundle's creator saw when they saved it.
- File→Save a bundle of your IDV state any time
- Save often! There is no autosave, no Back button!

READY FOR EXERCISE 1!

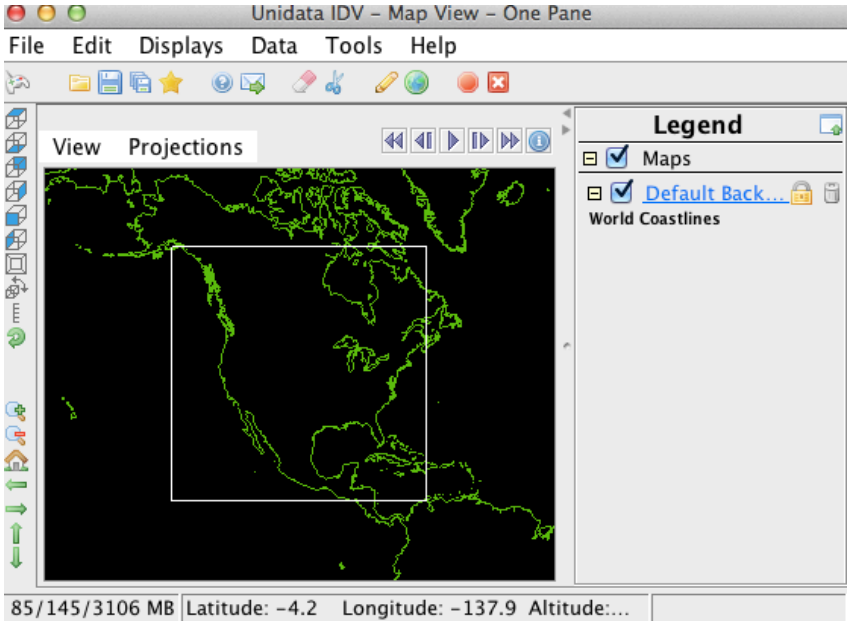
- Got the .zidv loading? Accept any errors

The IDV's **windows**

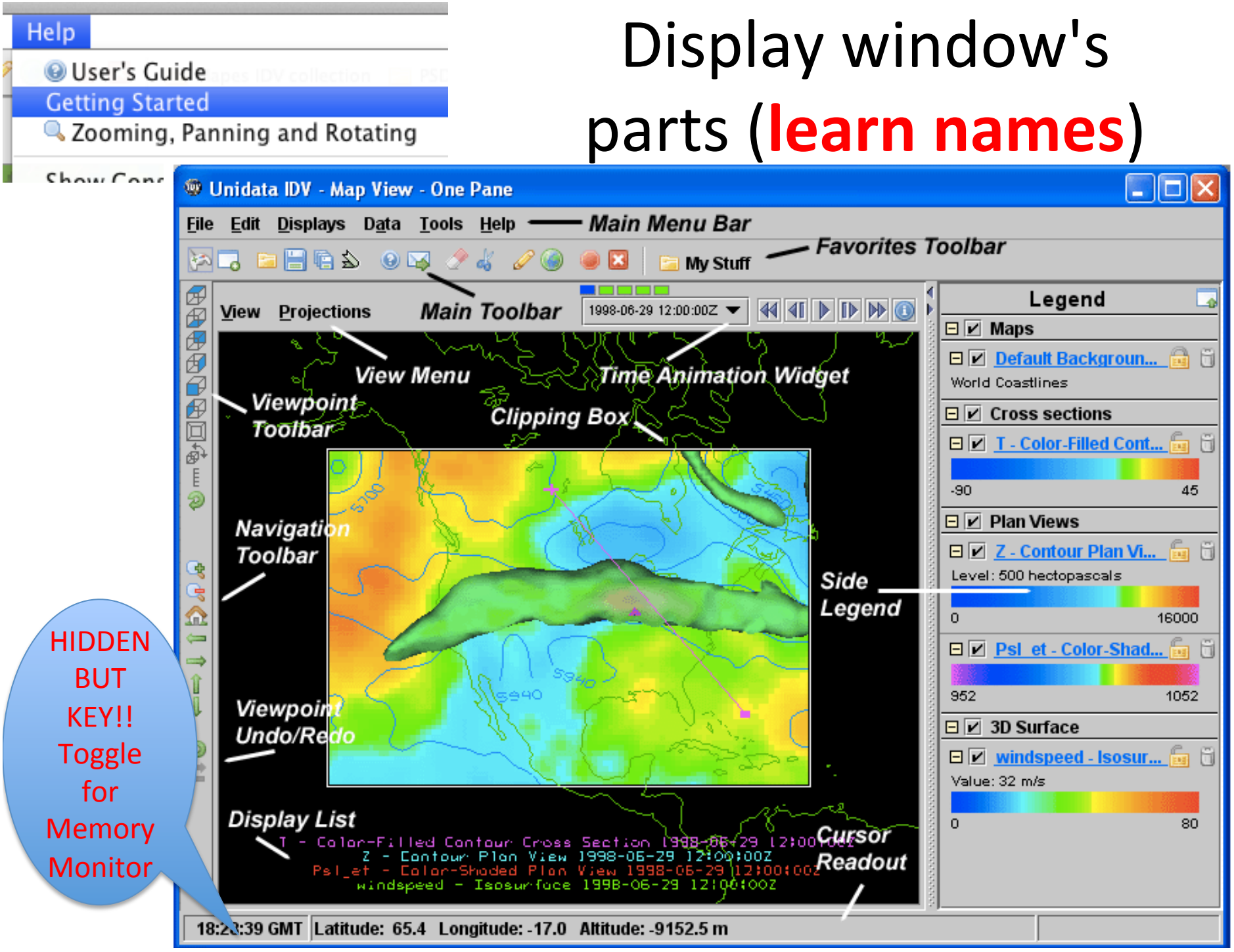
- Two main windows:
  - **Dashboard window**



  - **Display window**
    - (may be more than one)



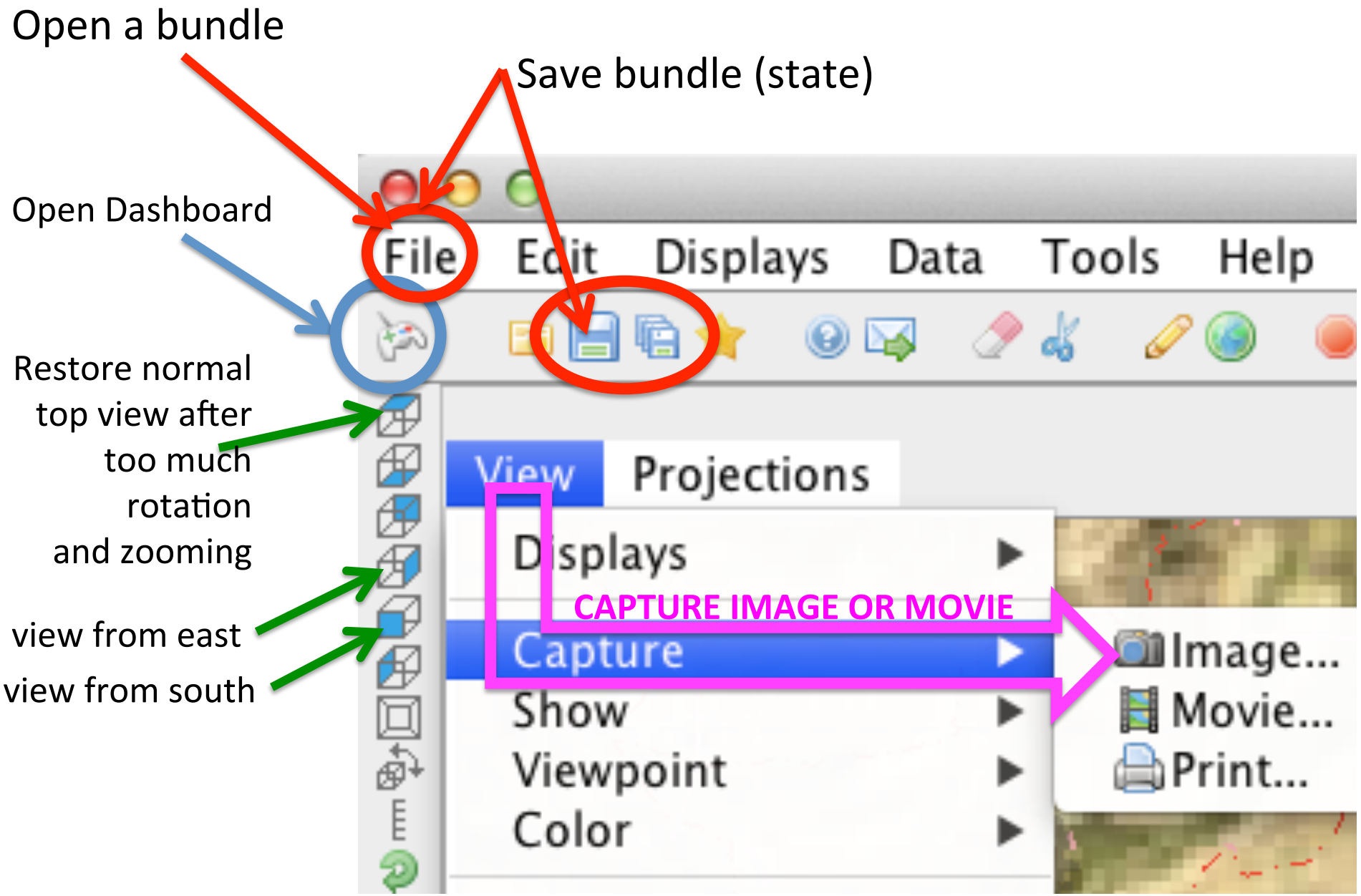
Display window's parts (**learn names**)



Recovering the Dashboard

- If you close the dashboard, click here in the display window to get it back

A very important corner:



Beyond the canned USB bundle

- Install the Mapes IDV collection

Relaunch and you will see many resources.

Nowhere near enough wifi to do much here...

Installing Mapes IDV Collection plugin with many resources

- Put these files in ~/.unidata/idv/DefaultIdv
  - idv.properties and mapes.rbi
  - don't let the system mangle suffixes...
  - by terminal may be easiest if .unidata/ hidden

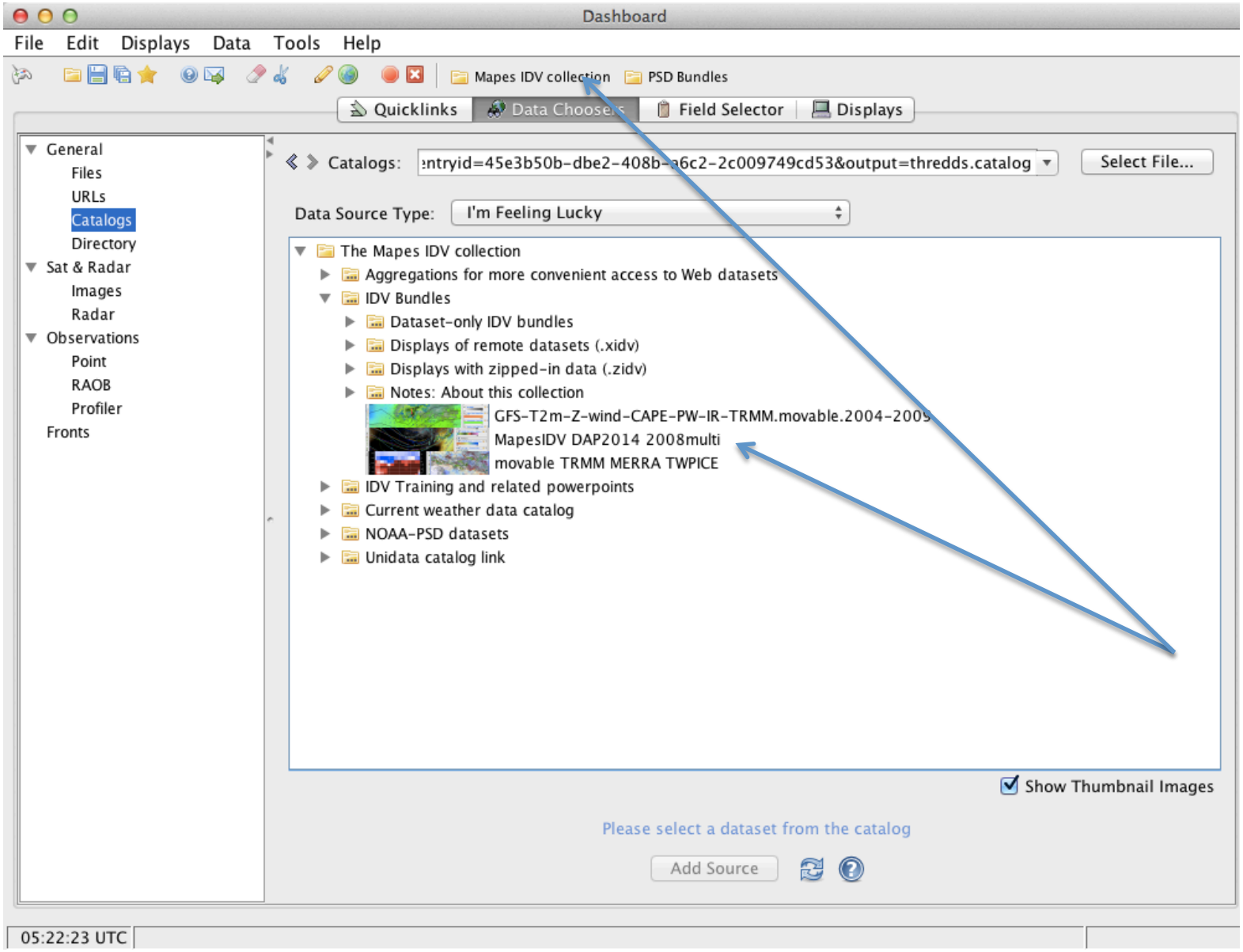
- Kill and restart The IDV

The Mapes IDV collection

- Self-installs a plugin from my Web site whenever you launch The IDV while connected to the Internet

- I keep improving it – suggestions welcome!

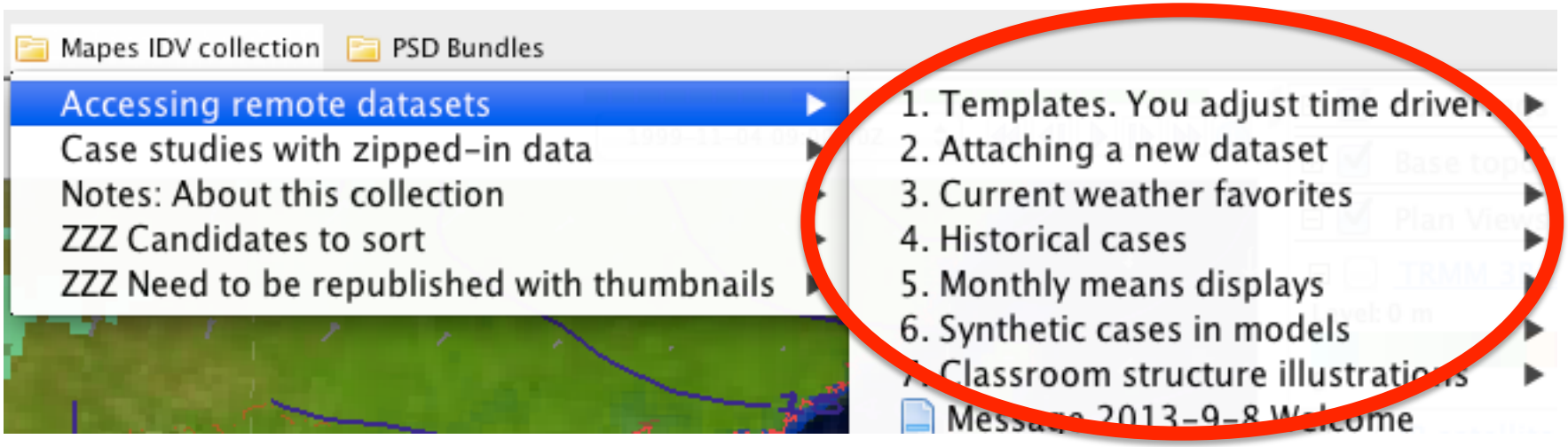
Load bundle: MapesIDV DAP2014...xidv from Catalog or from Favorites folder

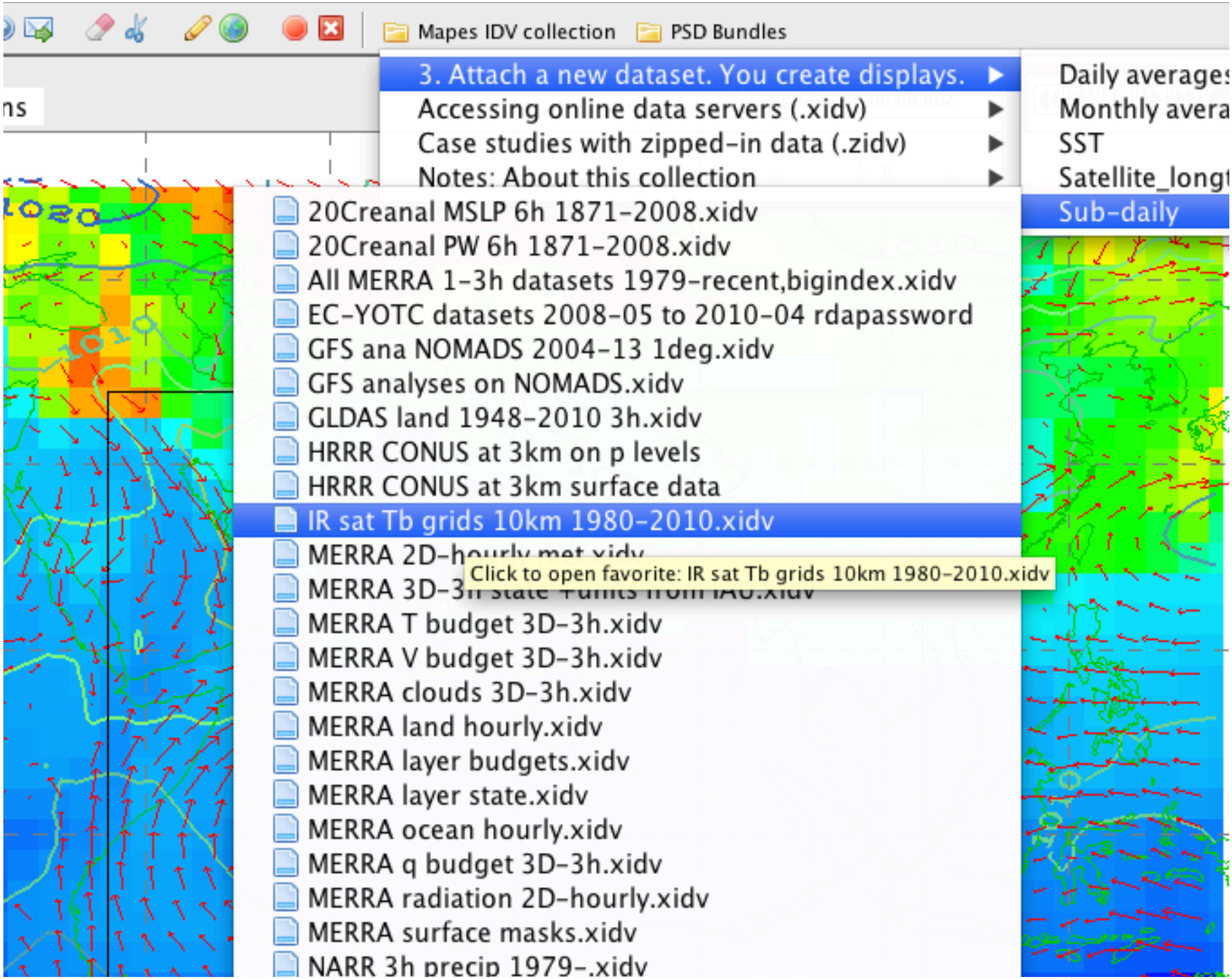


A *plugin*: my favorites, colorbars, etc.

What is The Mapes IDV Collection?

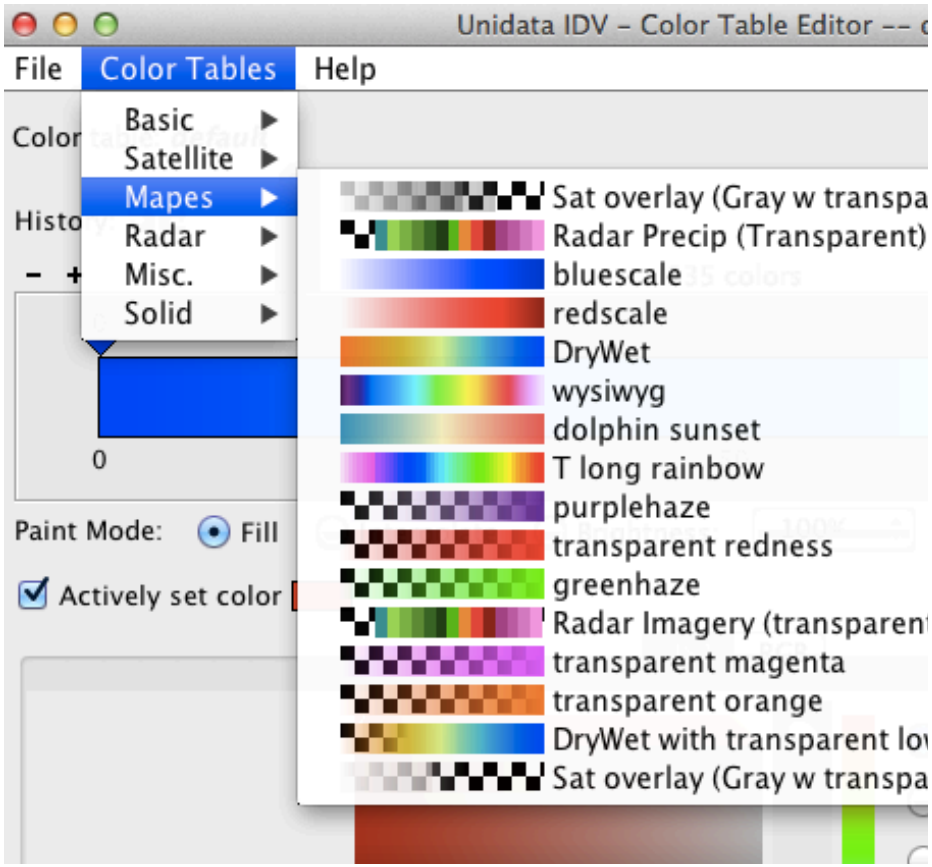
- 1. A curated collection of "bundles"
  - In the toolbar of The IDV
  - In the Catalog view of IDV (with thumbnail images)
  - Also at http://bit.ly/MapesIDVcollection

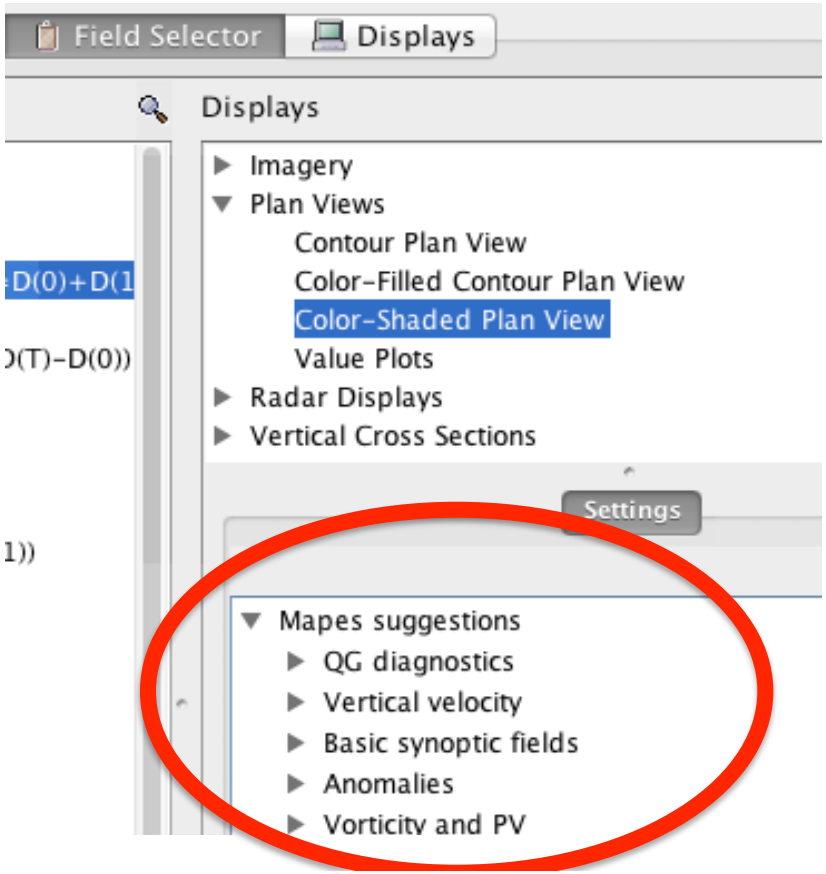



Mapes IDV collection
PSD Bundles
3. Attach a new dataset. You create displays.
Accessing online data servers (.xidv)
Case studies with zipped-in data (.zidv)
Notes: About this collection
Daily averages
Monthly avera
SST
Satellite_longt
Sub-daily
20Creanal MSLP 6h 1871-2008.xidv
20Creanal PW 6h 1871-2008.xidv
All MERRA 1-3h datasets 1979-recent,bigindex.xidv
EC-YOTC datasets 2008-05 to 2010-04 rdapassword
GFS ana NOMADS 2004-13 1deg.xidv
GFS analyses on NOMADS.xidv
GLDAS land 1948-2010 3h.xidv
HRRR CONUS at 3km on p levels
HRRR CONUS at 3km surface data
IR sat Tb grids 10km 1980-2010.xidv
MERRA 2D-hourly met.xidv
Click to open favorite: IR sat Tb grids 10km 1980-2010.xidv
MERRA T budget 3D-3h.xidv
MERRA V budget 3D-3h.xidv
MERRA clouds 3D-3h.xidv
MERRA land hourly.xidv
MERRA layer budgets.xidv
MERRA layer state.xidv
MERRA ocean hourly.xidv
MERRA q budget 3D-3h.xidv
MERRA radiation 2D-hourly.xidv
MERRA surface masks.xidv
NARR 3h precip 1979-.xidv

What is The Mapes IDV Collection?

- Other resources:
  - Custom color tables
  - Display Settings suggestions for various fields





RSMAS-UM Repository for atm-ocean data and its science > **The Mapes IDV collection**

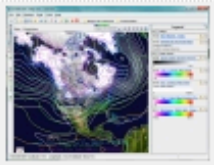
The Mapes IDV collection

Welcome to the "back office" of the Ma

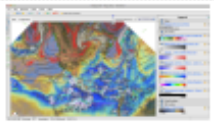
Please see http://www.rsmas.miami.ed

for the project's front face (a normal We

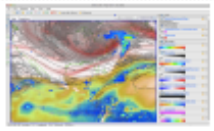
- Aggregations for more convenie
- IDV Bundles
  - 3. Attach a new dataset. You
  - Accessing online data servers
    - 1. Favorite current-weather
    - 2. Templates at 1 time. You
      - Current weather sources
      - Past weather archives
        - Americas-North



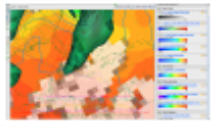
1888 "Schoolhouse Blizzard" 20Cv2 reanalysis



GFS 1deg vort PW SfcT TRMMrain 1999-now



MERRA,IR,TRMM



Subtropical upper jet-front in MERRA 2002-05-23

Data Sources:

- Formulas
- pr wtr.eatm.2008
- Cached data
- units fixer for MERRA 3-h
- 3 day trajectories for June

Fields

- Maps
- Grids
- Mapes
  - Advection of scalar S by vector C
  - Average across the levels of a grid at all points
  - Average along a grid column
  - Average along a grid row
  - Average along a grid row
  - Average of 2 scalars
  - Create Relative Humidity from Temperature, mix
  - Divide
  - Frontogenesis function from theta and the wind
  - Gaussian weighted hor. smoothing (default N=6

Stride | Settings

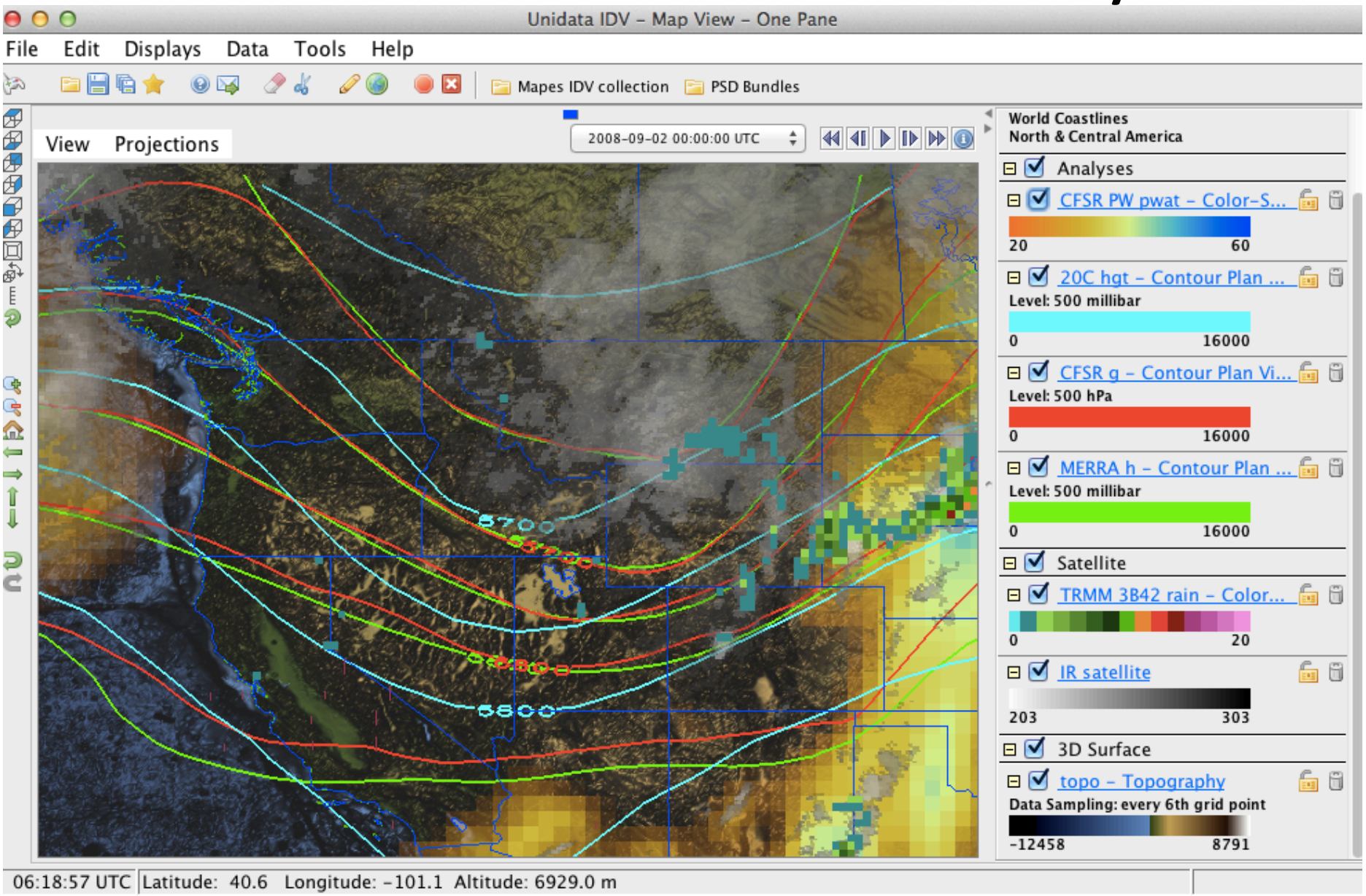
- Mapes suggestions
  - QG diagnostics
  - Vertical velocity
  - Basic synoptic fields
    - Temperature -30 to 35 <local>
    - SLP Blue thick 5mb <local>
    - Z contours thick=2 <local>
    - Big pink vectors <local>
  - Anomalies
    - SST anomalies bluered centered 4C <local>
    - SST anomalies rainbow 4C <local>
  - Vorticity and PV
    - thin abs. vort. contours <local>
    - Abs Vort blue-red centered <local>
    - Rel Vort blue-red -10 to 10 E-5 <local>
    - PV positive values <local>
    - Abs. Vort. 0-40 E-5 redscale <local>
  - Clouds and rain
  - Column water

Load bundle: MapesIDV DAP2014...xidv

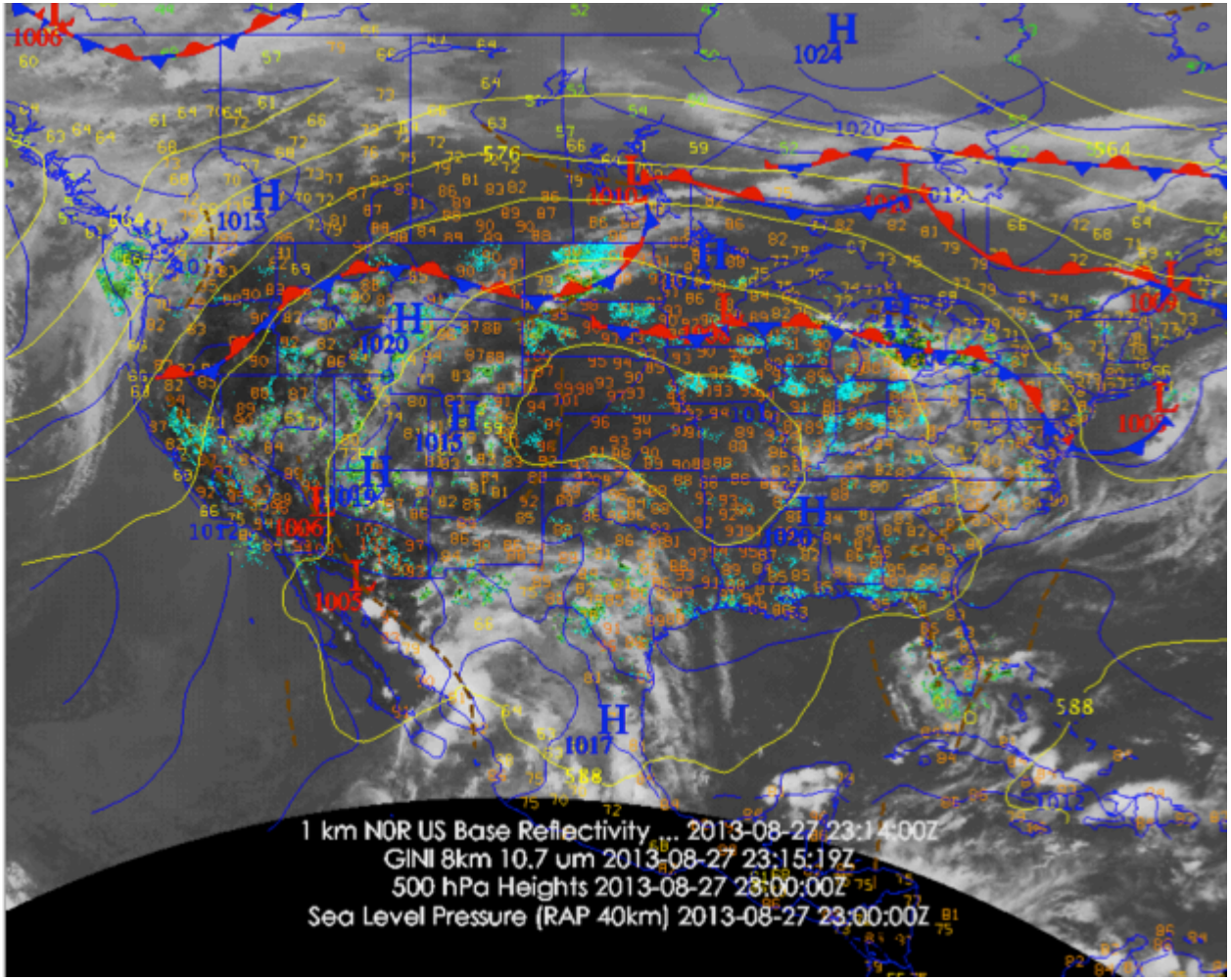
YOTC: anywhere, anytime in 2008

- ECMWF data at NCAR
  - requires rda.ucar authentication
- CFSR data at Albany
  - but Miami .ncml aggregates fields
- 20C data at NOAA PSD
  - Miami .ncml aggs fields
- MERRA at NASA-GSFC (great GDS server)
  - Miami .ncml adds units & valid_range
- Satellite (IRWIN) at NOAA NCDC -- huuge agg!
- TRMM satellite from NASA -- to present!
- Topography from USGS - adaptive res.

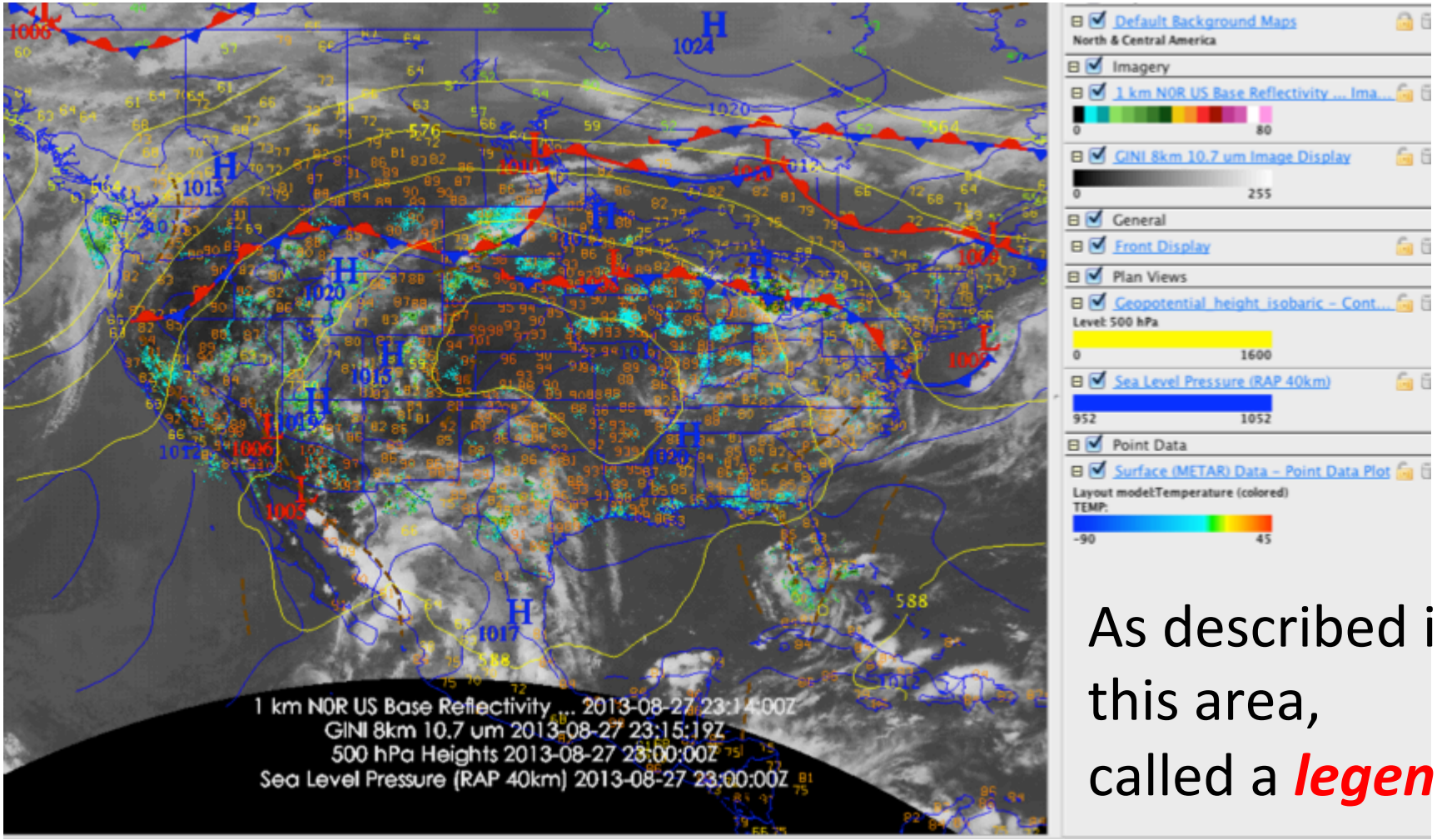
What's in Louisiana this day?



This is a view

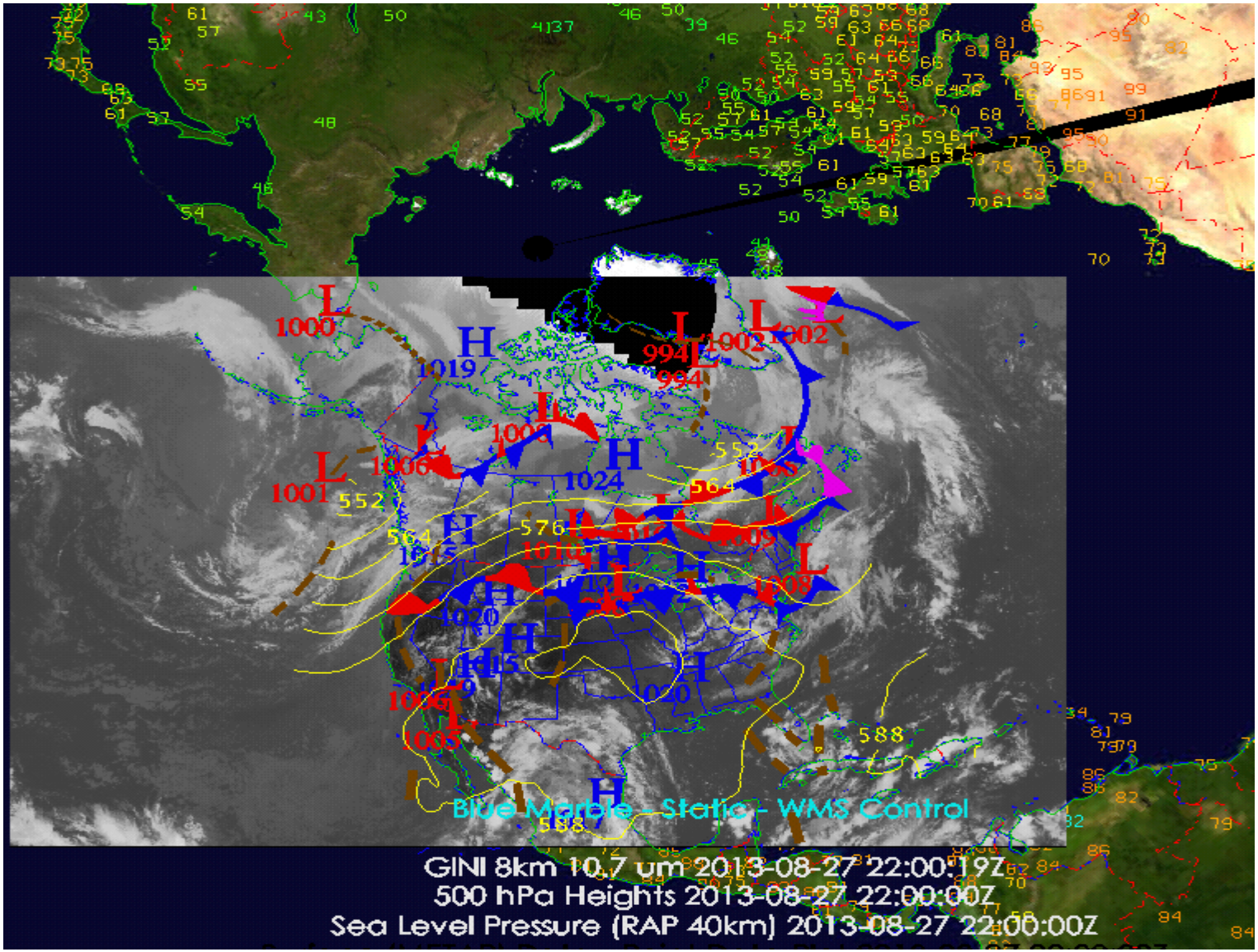


This view has several displays



As described in this area, called a ***legend***

Same **view** and **displays**, different (polar) ***projection***



Unidata: home of The IDV

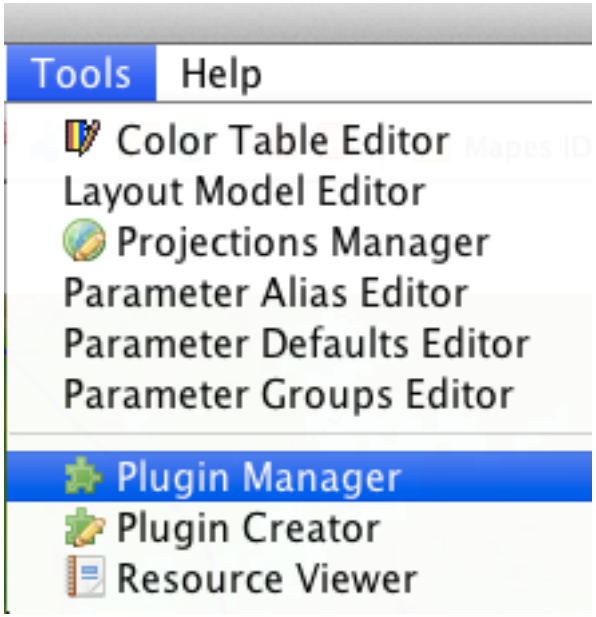
www.unidata.ucar.edu/software/idv

- Part of Unidata's larger suite of free software
  - netCDF, THREDDS, RAMADDA, LDM, ...

Unidata (current and former)

Installing plugins

- A useful tool for customizing your IDV is a ***plugin***.



  - Plug in some color tables
  - Plug in the RAMADDA Publisher
  - Plug in MapesIDVcollection...jar from USB drive, if internet is not accessible (it will only work online, though).