

IRIS 8.13.3 RELEASE NOTES (3 DECEMBER 2013)

These notes cover changes made in IRIS since release 8.31.2 of 18 March 2013. If you are upgrading from an earlier release, please read those notes also. In these release notes, we use the word “RVP” to a feature which is in both the RVP900 and RVP8.

Important Upgrade Notes

1. In this release we are switching our default factory operating system to CentOS 6.x. CentOS is a free enterprise class computing platform which is 100% binary compatible with RHEL. This release will introduce a CentOS installation guide and kickstart. For those customers required to use RHEL, we will also continue to provide a separate kickstart CD for that environment.
2. The sigconfig installation script now uses ‘yum’ instead of the ‘rpm’ command to install RPMs during installation. The sigconfig command line is the same and there is no need for additional user interaction. Yum makes it easier to handle rpm dependency issues by automatically installing the dependent RPMs at same time.

New Features

1. IRIS can now ingest OPERA ODIM HDF5 files and convert them into IRIS data formats for processing and display. This ‘hdf52iris’ pipe will need proper configuration of the hdf52iris.conf and sites_map.conf files. These can be found in the templates directory.
2. Based on user feedback about the Surface Weather Station product layer introduced in version 8.13.2, we have now added the capability to display the METARS in a decoded message as pictured.

```
WMO code: 2970
ICAO station: EFMA
Latitude: 60.11;Longitude: 19.88
Height: 6 meters ASL
Priority: 6
Report:
Type: METAR
Time: 2013-Apr-16 17:20:00
Message: METAR EFMA 161720Z 17011KT 5000 -RA BR FEW006 OVC026 03/03 Q1
Wind direction: 170 deg
Wind speed: 5.65888 m/s
Temperature: 3 C
Dewpoint: 3 C
Sea Level Pressure: 1015 mbar
Visibility: 5000 meters
Weather: light rain
Weather: mist
Clouds: cover: 1 okt (few clouds) at 182.88 meters
Clouds: cover: 8 okt (overcast sky) at 792.48 meters
```

Bug Repairs

1. ‘Exit’, ‘New’, and ‘Delete’ buttons in pop-up menu’s had been missed when adding language localization feature to IRIS. These text strings will now be translated to the target language. IRIS-219.

2. Removed some fields not needed in the Exec style of the task configuration menu. IRIS-736
3. When converting METAR ascii text files for use with the IRIS surface weather layer, files originating from Microsoft Windows were not converting correctly due to the differences in the end of line character conventions between Windows and Linux. The metar2iris pipe will now correctly manage files originating from Windows systems. IRIS-747
4. The cross-section tool on multi-level CAPPI's wasn't producing an complete cross section if part of a hybrid scan was present on the system. The cross-section tool should have been smart enough to generate the slice from the multi-level CAPPI instead. This is now fixed. IRIS-772
5. In the QWL the additional legend which can be added to the product display area was not always showing the correct date, while the legend always in view was showing the correct date. This was due to an obscure error in accounting for daylight savings time when the files were stored in Local time vs GMT. IRIS-775
6. The timeout function was not working properly when an IRIS server was expecting to receive a STAT product from another node. This was limited to systems in the eastern hemisphere using local time versus UTC time. IRIS-783
7. In the "IIA" filenames convention, the VIL data type contained a typo. IRIS-794
8. The product display area in the IRIS QWL would sometimes get garbled if the QWL was re-sized and data animated. IRIS-849
9. The Setup utility is shared by both IRIS and RDA. When RDA only is installed onto a computer the Setup utility user interface should display only the areas pertaining to RDA configuration. Since release 8.13.1 Setup was showing all configurable areas for any type of install but is now fixed. IRIS-750

IRIS 8.13.2 RELEASE NOTES (18 MARCH 2013)

These notes cover changes made in IRIS since release 8.13.1 of 30 August 2012. If you are upgrading from an earlier release, please read those notes also. In these release notes, we use the word “RVP” to refer to a feature which is in both the RVP900 and RVP8. Revised to svn 29191.

Important Upgrade Notes

1. If you are upgrading or installing IRIS, and wish to run the legacy **IRIS/Web** server be sure to install a new version of **IRIS/Web**. You will find instructions for how to do this in the extras directory. This is accessible on our ftp site, and via the **manuals** utility after a new 8.13.2 installation. After an upgrade, you will need to copy the files with the following command:

```
# cd /usr/sigmet
# cp -p config_template/extraspdf/* config/extraspdf
```

2. To improve your data quality on an IRIS Radar computer please consider doing the following after you upgrade to 8.13.2:

- Turn on the Clutter MicroSuppression on your **RVP**. Do this by running **dspx**, entering the “mp” command to enter the “Processing Options” section. Then hit a few Enter keys to get to “Clutter MicroSuppression”. Set this to 2 for “Always”. This improves data quality when you are doing range averaging. The feature is unchanged, but was broken in PPP mode, and may have been overlooked.
- Turn on the **2D Clutter filter** in all your IRIS Task Configurations. This is a new button. Previously this feature was controlled by the **RVP’s** non-volatile configurations accessed via **dspx**. If you wish to see how it was configured before, you can search your **RVP900** config file with a command like:

```
$ grep force_2Dpass /usr/sigmet/config/rvp9.conf
```

If the value was 0, the feature was off, if the result was 1 or 2, the feature was on. This is also an old feature, which was broken in PPP mode.

- Turn on **point clutter filter** in all your IRIS Task Configurations. This is a filter which removes very short range spikes in power, and replaces the data with averages from the neighboring range bins. Such spikes are not normal for weather signals, but are common with returns from airplane and tower targets. You should set the bin offset to 2 (for range bin spacings matching the pulse width) and the threshold to 5 to 10 dB. Yet another old feature which was broken in PPP mode.
- Turn on the **dual-polarization attenuation correction** in your IRIS Task Configurations. This is a new button labelled “DP AttnCor Z ZDR” in the processor configuration section. This is only applicable to dual-polarization radars.

- If you are displaying the IRIS menus on a low resolution monitor (that is a 75 dpi monitor) the font size of the scrolling text may be wrong. This causes a problem because it will not align with the titles at the top of the list. And right-clicking on the text will often not bring up the correct pop-up. This affects the Product Output Menu, Product Scheduler Menu, Ingest Summary Menu, etc. The solution is to fool the system by overriding the resolution of the monitor. Do this in Gnome as follows: From the “System” menu select “Preferences→Appearance”. From the pop up window select the “Fonts” tab, then click on “Details” button. Change the resolution to 93 or more on the top left corner of the window. You must restart the IRIS menu bar for the change to take effect. This changes lots of fonts in the user interface, so experiment with the size to get the best trade off. IRIS–702

New Features

1. IRIS now supports a new product type **SWS** (short for Surface Weather Stations). This is data from a network of weather stations, and can be displayed on the Quick-Look Window. These are displayed using the fairly standard “station plot”, which consists of a wind barb surrounded by various numbers showing the current temperature, pressure, visibility, etc. We supply a new input pipe **metar2iris** which can read in either a file full of METAR reports, or a file full of SYNOP reports. When you click the right button on the display near a station, it will pop-up a window showing the RAW station reports. IRIS–569, IRIS–601, IRIS–602, IRIS–603, IRIS–619, IRIS–634, IRIS–635, IRIS–685, IRIS–691
2. IRIS support for **Russian** is now complete in both the Quick-Look Window, and in the IRIS menus. Previously we had done just a subset of the menus. IRIS–127, IRIS–163
3. We added a button to the IRIS Task Configuration Menu to turn on/off the dual-pol intervening **attenuation correction** feature. This feature has been in the **RVP**’s for a while, but was not explicitly controlled. IRIS–637, IRIS–701
4. We added a button to both the IRIS Task Configuration Menu, and **ascope** to control the 2D (Also known as “3x3”) **speckle filter** in the **RVP**. Previously, this feature was turned on or off in the **RVP** using the dspix “mp” command. IRIS–649
5. The legacy **IRIS/Web** Java applet has been improved and tested to be able to handle 500 simultaneous users without getting errors. IRIS–686
6. The online **manuals** supplied with IRIS and RDA are now shipped as single PDF files, and are built using modern tools, so more features, like a side-panel Table of Contents are available. IRIS–700

Bug Repairs

1. In the QLW, the **Live Action Tool** had a lot of problems when generating products from **hybrid** input tasks. Generally it would get stuck in the “Running” state, and would not work after. The problem was always seen if, for example, you started viewing data from the “B” portion of a volume, then switched to “AB”. It is now able to search forwards and backwards as needed from the starting task to find the correct full volume scan. IRIS–553

2. The range was scaled wrong in all Polar Stereographic projection products. IRIS–582
3. The **SRI** product was crashing when the input data contained a blanked sector. As part of this repair, we modified all IRIS products to show data beyond the maximum height cut off to be “area-not-scanned”. IRIS–599
4. The ingest process would crash if the antenna control was not working. This happened for any time the error message “El Position not reached”, “AZ Position not reached”, “EL velocity not settled”, or “AZ velocity not settled” should be signaled. This would happen, for example, if you shut off the **RCP8**. Bug introduced in 8.13.1. IRIS–607
5. The **VIL** and **LAYER** products were broken when they were configured to output VIL or VIL density outputs. They would generate the maximum possible data value when there was any data at all. This bug was only in release 8.13.1, and there is a patch for this for 8.13.1 on our ftp site. IRIS–614
6. We found some bugs in the QLW Animation Loops. The loop speed would slow after running overnight. This was due to allocating 1 color in X each time a frame was displayed. Also excessive CPU time was consumed by Xorg and metrocity daemons while looping. This was enough to slow down the maximum possible loop speed by about a factor of 2. These bugs were introduced in release 8.13.0. We have patches on our ftp site to fix this for 8.13.0. IRIS–707
7. The **HClass** data frequently has bad ray segments with data type set to NoMet. These segments usually are half the range interval. This happens more frequently on the **RVP8**, less often on the **RVP900**. IRIS–577
8. The **IRIS3DView** program was displaying radar data flipped in the North-South direction. IRIS–623 Since this is a stand-alone program, this can be upgraded separately from IRIS. So, if you have this bug on your existing **IRIS 3DView**, you can download version 1.0.2–1 from:

ftp://ftp.sigmet.vaisala.com/outgoing/patches/iris3d/RHEL6/

Also the background daemon process of **IRIS3DView** was crashing on RHEL6 only. This was caused by a bug in the vtk code package. IRIS–624 You can fix this by installing version 5.8 of vtk. RPM packages for vtk 5.8, and dependent packages are all found at:

ftp://ftp.sigmet.vaisala.com/outgoing/patches/iris3d/RHEL6/RPMS/
9. Fixed many bugs in the **PictureToIris** pipe. This is used by **IRIS3DView** to feed 3D image views back into IRIS for distribution. The logging feature was broken, and it was always writing an empty log file. It now also logs an informative message if an unknown file format is fed in. It can now handle an input file name with contains embedded spaces. A similar change was made to the IRIS input process, which could not handle an input file with embedded spaces. IRIS–688
10. The **grib2iris** and **iris2grib** pipes were broken in release 8.13.1. When run, they got an error caused by the new environment variable added to specify the location of the new *IRIS/RDA Dual-Polarization Manual*. IRIS–611

11. There were several bugs fixed in the **KnmiHDF5ToIris** pipe. If the image was not square, the image was not converted correctly because the dimensions were reversed in the code. And the time was off by the local time offset. IRIS-620
12. Fixed a bug in the **AsciiToGage** pipe. It was not correctly parsing the “—device=” command line argument. This bug dates back to svn [23843], so this pipe has not worked since release 8.12.6. IRIS-621
13. In the IRIS menus, the Output Options Tool, and all the product specific Output Options tools would pop-under the menu, not pop-over. This happened anytime except the first launch, and it would pop-over on a second click. IRIS-638
14. The new **DMRLToIris** pipe was missing from the release media on release 8.13.1. IRIS-651
15. The **IrisToOdinHdf5** pipe was getting an error on RAW hybrid data if the site name has a space in it. It was confusing because the error said there was a syntax error in the state file. IRIS-670
16. We had a problem with **acoread** which is used by default to display the online help. When launched from a daemon program, such as the Quick-Look Window, it was writing its private config file as owner root. This caused **acoread** launched from other applications to be unable to read the saved config. We have fixed this to not write as owner root, and to save the daemon state in the /usr/sigmet/config directory. IRIS-703
17. When using the IRIS **print** mechanism to print to a file, there was a problem. It was trying to write the file always in the /home/operator directory. This causes a problem on systems which do not have such a directory. This is changed to use the actual user's home directory, if available. If the program was a daemon, such as the Quick-Look Window (which has no home directory), then it writes the file in the \${IRIS_PRINT_DIR} location, or if this is not available, then in /usr/iris_data/print_out. Also printing was failing if the print queue name was longer than 16 characters. This limit is raised to 99 characters. Also increased the maximum number of print queues shown in the print GUI from 4 to 6. IRIS-705
18. If you requested data types SNR and either Zv or Tv, the data values were switched. IRIS-713

IRIS 8.13.1 RELEASE NOTES (30 AUGUST 2012)

These notes cover changes made in IRIS since release 8.13.0 of 24 February 2012. If you are upgrading from an earlier release, please read those notes also. Revised to svn [28449].

Important Upgrade Notes

1. There were changes in the recommended template dualpol.conf file. Please after upgrading to 8.13.1 copy that file with the following command:

```
$ cp /usr/sigmet/config_template/dualpol.conf $IRIS_CONFIG
```

New Features

1. The release includes the new *IRIS and RDA Dual Polarization User's Manual*. This covers Dual Pol related topics, including: RVP900 dual-pol signal processing; Attenuation correction using KDP; HydroClass; Wide-Dynamic range; Calibration. IRIS-551

Bug Repairs

1. Fixed a memory leak in the Quick-Look Window. It lost memory every time a picture was displayed. If looping, memory would be used up in a few days. This bug was in 8.13.0, and there is a patch available for 8.13.0 on our ftp site. IRIS-548
2. Fixed a long standing problem in the way IRIS and RDA changes pulse widths and PRFs. The fundamental problem is that the controls to set the PW (pulse width) and the PRF (Pulse Repetition Frequency) have variable delays, and we do not want to ever exceed the duty cycle of the transmitter. There are two transitions of interest: 1) Long PW / Low PRF to Short PW / High PRF, and 2) Short PW / High PRF to Long PW / Low PRF.

We have always handled case 1 correctly, which is to change the PW first, wait a small delay, then raise the PRF. However case 2 was not handled correctly. We changed the PW and PRF at the same time. This assumed that the delay was always greater for the PW control. This is not true. In the **RVP900**, if the major mode was changed from FFT to PPP at the same time, the PRF control had a delay. Case 2 is now repaired to set the PRF low, wait the delay, then set the PW long. This may lengthen the time required to start IRIS tasks a bit. IRIS-510

3. On analysis/display systems, you could get a system lockup in which you see data files piling up in the input directory, and RPC time out messages from the IRIS menus. This happens only when the operator configures product overlays. This bug was introduced in release 8.13.0. Customers running 8.13.0 can upgrade to 8.13.0.2 to fix this. IRIS-549
4. Fixed a bug of when overlaying FCAST, WARN, SLINE, TRACK or VVP over a CAPPI. Doing so would cause some of the following errors: 1) Invalid color set number. 2) requested an invalid number of colors. 3) Invalid custom data seam. The problem is there isn't any color scale associated with these type of products, but in the function where the layers are combined it failed to check correctly. IRIS-427

5. Fixed several problems in the dual-pol attenuation correction implementation. ECR–3687
 - Occasionally in individual rays, or in short sequences of rays, attenuation correction appeared partially applied, leading to distinct rays in which dBZ was biased downwards.
 - Occasionally in individual rays, distinctly too high attenuation correction was applied, leading to abruptly very high dBZ.
 - The dualpol.conf file was reorganized to make the attenuation correction parameters separate and more understandable. Also set the default values correctly for typical conditions in warm climates.
6. Fixed missing installation of new rpms in **sigconfig** on RHEL5 systems. The rpms added are: acread, blas, lapack-devel, proj, libgeotiff, jasper, and grib_api. IRIS–529
7. Enhanced the **UfToIris** pipe to allow the user to override the polarization stored in the UF file. This was motivated by UF files with incorrect polarization. To enable, edit your UfToIris.conf file. Add to the TASK line an 8th parameter which could be blank or one of the following: FORCE_VERT, FORCE_HORZ, FORCE_ALT, FORCE_HV, NO_CHANGE. IRIS–511
8. The IRIS Task Configuration Menu will now allow a maximum sample size of 1024 samples. The previous maximum was 256. IRIS–484
9. Fixed some bugs in the **iris2grib** and **grib2iris** pipes. The IRIS site name was not being used by **iris2grib** to set site information. The log messages were improved, and errors were not always signalling an error to IRIS. The bitmap used to mark area-scanned was not implemented. The PPI elevation angle was not stored and retrieved in GRIB2 files. Improved the comments in the template config files. Fixed errors when converting RAIN1 products. Added accumulation time for RAIN1/RAINN products. Version was increased from 1.0 to 1.1. IRIS–543
10. The **QPE** code no longer will crash if an old or badly formatted qpe.conf file is read. IRIS–256 and IRIS–481
11. The BASE, CAPPI, HMAX, LAYER, MAX, SRI, TOPS, VIL, and XSECT products now use input PPIs down to –10 degrees elevation. Previously they stopped at 0 degrees. IRIS–462
12. The IRIS QLW cursor tool was showing the wrong values for data for XSECT products. It turned out that there was a bug when the top and bottom margins about the data window are different size. This only is possible for a few products, like XSECT, RHI, and BEAM. IRIS–552
13. The **show_availability** utility was enhanced by adding start time, stop time, and output type options. It also now works with a mix of the old and new logrotate file naming conventions. IRIS–547

14. The radar location was set wrong vertically in some products made by IRIS. It was wrong only on horizontally georeferenced non-square products. IRIS-563
15. Modified the UALF input to accept new VALF data format which is used in Turkey. The config file is now called **UalfRelayIn.conf** to match the name of the program it configures. IRIS-561
16. The IRIS menubar “Connect” pulldown will now force in “localhost” as the first choice. This allows a user to easily connect after a new install, without having to configure their system. IRIS-169
17. We removed the tabulations feature from the QLW and POM. IRIS-364
18. Fixed broken QLW colors on a 16-bit display. IRIS-579
19. Fixed the bug in the QLW of not switching modes from “USER” to “AUTO” after 5 minutes of no activity. IRIS-406
20. There was a bug in data type in the cross section window. Products TOPS, BASE, HMAX and THICK all displayed a data type of Height, but what should have been displayed was the data type that was selected by the user i.e. dBZ, dBT, V, Vc and W. IRIS-410
21. The **restart_iris** program is removed. If you need the features previously provided by **restart_iris**, you can get them with the following commands. IRIS-583

To restart crashed IRIS daemon threads:


```
$ sudo /sbin/service iris refork
```


To reload the color scale configuration:


```
$ sudo /sbin/service iris colors
```


To scan the product directories for possible new files:


```
$ sudo /sbin/service iris scan
```
22. When IRIS made an unnamed Mercator projection, it drew the data with a vertical position offset. IRIS-565
23. **Productx** now has a new command line option “-geolocation”. This causes the output of the latitude and longitude of every pixel displayed for Cartesian products. IRIS-570
24. The **IrisToOdimHdf5** pipe was not handling 3D CAPPIs. It was only outputting one layer. This is now fixed. IRIS-592

25. There were mistakes in the messages signaled when a network connection to a target computer goes up and down. There are two different possible problems, IRIS turning on/off, and the network turning on/off. When IRIS is turned off, you should get the message “Network server has been stopped on node <hostname>”. When IRIS is back, similar message “Network server has resumed on node <hostname>”. When the network goes down, you should get “Remote host is unreachable <hostname>”. Similarly, “Remote host is reachable <hostname>” when the network resumes. We were instead getting the message “Remote host is reachable” when IRIS was turned off. This was technically correct, since the host was reachable, but it is not the correct message. IRIS-593
26. The new **QPE** mechanism to configure Rainrate calculations is now enhanced to allow disdrometer based $R(Z)$ coefficients to be used. Also, if the algorithm is $R(Z)$ only, then we now fill in the Z/R constant and exponent in the IRIS header meta-data. IRIS-594

IRIS 8.13.0 RELEASE NOTES (24 FEBRUARY 2012)

These notes cover changes made in IRIS since release 8.12.9 of 15 July 2011. If you are upgrading from an earlier release, please read those notes also. Revised to svn [27877].

Important Upgrade Notes

1. *RHEL5 systems only*: The openmotif rpm patch for RHEL5.* mentioned in the 8.12.9 release notes is changed. If you are upgrading from a pre-8.12.9 system, you need to install these:

```
openmotif-2.3.1-6.el5.i386.rpm
```

```
openmotif-devel-2.3.1-6.el5.i386.rpm
```

These are supplied on our installation media in the RHEL5/extras/RPMS directory, and are also available on our ftp site. To install:

```
# rpm -Uhv openmotif-*
```

Also, if you are upgrading from a pre-8.12.9 installed IRIS system, you need to edit your /etc/sysconfig/i18n file. It should read similar to the following:

```
LANG="en_US.UTF-8"
```

```
SYSFONT="latarcyrheb-sun16"
```

2. **Sigconfig** will now edit the /etc/sudoers file to give radarop and operator permission to execute /sbin/service and /sbin/chkconfig. This is important because starting and stopping IRIS and antenna daemons are now done with a command which translates into “sudo /sbin/service iris start”, for example. If you are upgrading be sure to make these changes manually. IRIS-478

Comment out the line so it reads:

```
# Defaults requiretty
```

Uncomment the line so it reads:

```
Cmd_Alias SERVICES = /sbin/service, /sbin/chkconfig
```

And add the following two lines to the end:

```
operator ALL=(ALL) NOPASSWD: SERVICES
```

```
radarop ALL=(ALL) NOPASSWD: SERVICES
```

You need to use the program “visudo” to edit the sudoers file.

3. The C++ boost libraries are now required for various IRIS programs. This should automatically install on new systems. If you are upgrading, you may need to install them. If missing, you will get a message similar to: “error while loading shared libraries: libboost_system.so.5: cannot open shared object file: No such file or directory”.

RHEL5 systems only: These are supplied on our installation media in the RHEL5/extras/ RPMS directory, and are also available on our ftp site. To install:

```
# rpm -Uvh boost-*
```

4. Many feature changes in this release will force the IRIS menus not to connect correctly between pre-8.13.0 and 8.13.0 (and later) releases.

Setup Changes

1. In **setup**/General in the File and System Quotas section there is a new question “Maximum number of output devices”. This controls the maximum number you can select in the output button. It will default to 24 (the old maximum). Set this to just a few larger than the number you expect to use. See New Features 3.
2. Also in **setup**/General in the File and System Quotas section there is a new question “Maximum Product Configurations”. This is the maximum number of product configuration header lines you expect in the product inventory. The default value of 1000 should be reasonable on most systems.
3. In **setup**/Ingest in the Z: Clutter Suppression via Clutter Map section there is a new question “Cluttermap in ReIngest”. Set this to “Enabled” if you wish to use this feature. See New Features 9. for more details.
4. In **setup**/Product in the Product Transmission and Display section there is a new question “Display options menu for Web display”. Set this to “Enabled” if you wish to use the old IRIS/Web application. See Bug Repairs 7. for more details.

New Features

1. A major new feature in this release is continuous opacity control for product overlay layers. The Display Options Tool launched from the Product Output Menu now includes opacity slide bars for each product in the Product Overlays section. Other layout changes to the Display Options Tool were made at the same time. In the Quick-Look Menu changes were different. We move the Product Overlays section from the Display Options Tool, to the new Product Overlay Tool. See the next bullet for details on this. IRIS-376, IRIS-375, IRIS-377
2. We added a new Overlay Tool launched from the Quick-Look Menu’s top row buttons. The main purpose is displaying legend information (including the color scales) about the product overlays in use. It made sense to also move the Product Overlay selection and opacity controls here from their old location in the Display Options Tool. IRIS-371
3. We have enhanced IRIS to support up to 200 output devices. The old maximum was 24. All of the output selection dropdowns are now scrolled lists. We have removed the previous “unit number” from the output configuration to simplify configuration. In all cases where we refer to an output by a number, it is just the output device index. Because of the large time it requires to launch the **setup**/output window when there are a lot of outputs configured, we have added a maximum number of outputs in the **setup**/general section. IRIS-430

Part of this change involved refactoring the product inventory to place the header lines (one for each product configuration name) into a separate table. There is now a new setup question for the maximum product configuration names in the product inventory. IRIS–432

4. Our Meteogram pop-ups from the **rain gage** display have always shown the time history of rainrate from the specified rain gage. We now can also show the rainrate calculated from the radar returns over the same time range. These radar rainrates can be generated on the fly when the user specifies a RAIN1 product to pull them from.

To implement this we changed the pop-up to add a “Radar Rain” section at the top which includes a push button and a textfield. Pressing the push button will pop-up a list of RAIN1 products that can be used instead of the default overlaid RAIN1 product. IRIS–353, IRIS–348, IRIS–392

Also fixed a bug in the rain gage pop-up window. After you popped-up 10 such windows, you cannot pop-up any more, even when you close the others. IRIS–360

5. There were significant changes made to the way VVP data is thresholded and displayed in IRIS. We have enhanced the output options for VVP to now allow you to threshold velocity based data on any or all of the following:

- Maximum horizontal velocity standard deviation (was there before)
- Maximum and Minimum Horizontal velocity values
- Maximum magnitude of vertical velocity
- Maximum average reflectivity value
- Minimum number of velocity data samples.

For Average reflectivity and RhoHV, thresholding is just on the Minimum number of data samples.

A significant part of this feature is that all outputs can have these thresholds applied. This includes outputs to other data formats, and outputs to other IRIS systems. This allows us to meet higher quality standards for wind profile output to data models, and at the same time move towards display-time thresholding, rather than generation-time thresholding. We are including meta data indicating which thresholds were applied, so there were changes to the data format, to **productx**, and to the VVP specific output options menus in both the Quick-Look Window, and the Product Output menu. If you use VVP products, then after upgrading be sure to launch the output options, and set the Max Horz Velocity STD to a reasonable value near 1.3 m/s, and a Max Mag Vert Velocity to something like 20 m/s, and save it. The other thresholds are not as useful. See poster 112 from the 35th AMS Weather Radar conference for more information. IRIS–287, IRIS–397

6. The **THICK** product now stores two different data fields: Echo thickness, and average reflectivity in that region. We now have display time output options to specify which to display. So there is a new product specific output options tool for the

THICK product. The IRIS product format was changed to support extended product headers, using the new field `iExtendedHeaderOffset` in the `product_end` structure. IRIS-84, IRIS-83, IRIS-82, IRIS-354, IRIS-85

7. We have new pipe programs to convert to and from GRIB Edition 2 format. These are called **iris2grib** and **grib2iris**. See the config files for more details. If you are upgrading, and you wish to use these pipes, you need to install some additional support rpms.

For RHEL6:

```
# rpm -Uvh ksh*.el6.i686.rpm
# rpm -Uvh jasper*.el6.i686.rpm
# rpm -Uvh grib_api*.el6.i686.rpm
```

For RHEL5:

```
# rpm -Uvh jasper*.el5.i686.rpm
# rpm -Uvh grib_api*.el5.i686.rpm
```

This pipe uses a slightly different config file scheme. Site mapping between IRIS and the foreign format is configured in the `sites_map.conf` file. Other GRIB specific information is configured in the `iris2grib.conf` and `grip2iris.conf` files as usual. IRIS-24

8. Added new **dBTe** and **dBZe** data types. The “e” stands for “enhanced”. This is the dual-polarization cross-correlation power measurement. In other words, this is $|T_{0hv}|$ and $|R_{0hv}|$. These types are added to the task configuration menu, and support is added throughout the IRIS and RVP900 processing chain. IRIS-316, IRIS-313, IRIS-442

The dBZe has several advantages over the conventional dBZ based on horizontal polarization only. These advantages are:

- It effectively allows you to recover the sensitivity loss caused by splitting half the transmit power to vertical polarization. This is true when the ZDR of the target is near 0, and the differential attenuation is also near 0.
- It is dramatically less sensitive to errors in the noise level. On most radars, the signal-to-noise threshold has to be set artificially high to remove false positives due to noise level variations caused by (for example) elevation angle changes, random drifts, and mistakes in the calibration. This can give you many dB of added sensitivity.

9. We have added a new feature which allows the IRIS clutter map to be applied by an analysis system to data from any radar. There is a new **setup/ingest** question, “Apply clutter map on Reingest”. If this is turned on, and if RAW data arrives from another radar, and that RAW data did not already have a clutter map applied to it, IRIS will apply the map, and thus modify the dBZ values. For this to work, there must be an ingest file from that radar site, with the same task name, which is marked as a clutter

map. If no such file exists, an error message is signalled. If the customer wants some data clutter map modified, and other data not, they will need to modify their SIGNALS.DAT file to disable the messages for the sites without clutter map files. Also repaired the clutter map feature to work on 2-byte data in addition to 1-byte. **Rays** is enhanced to now display the cluttermap-on-Z flag to help with debugging. IRIS-293

10. We have added a new utility to IRIS which allows sending commands to the socket server from the command line. The initial intent of this program is twofold:
 - To allow command line generation of a specified product over a specified time interval.
 - To allow output of a specified product to a specified output over a specified time interval. The program is called **sclient**, and “sclient —help” will give the command options to do those two cases. IRIS-37, IRIS-469
11. We have a new input pipe program **DMRLtoIris**. This is an input pipe which converts LEMZ DMRL scan data into an IRIS RAW product.
12. We have a new input pipe called **IMDSatToIris**. This was written by Fritz O’Hora (from Vaisala) together with Rekha and Sai from Indian Meteorological Department. It converts an IMD Satellite format to IRIS satellite format.
13. IRIS inputs can now take input files with a name matching *.zip, and will automatically unzip them. IRIS-457
14. Enhanced the **UfToIris** pipe to allow assigning task name based on maximum range (in addition to the elevation of the first sweep). IRIS-294
15. As part of getting help working from IRIS 3DView, we are now installing **acroread** when we install 3DView. IRIS-450
16. We now ship a documented mechanism to start up an ssh tunnel to read **UALF** lighting data from a data server. See the current UalfToIris.conf file for details. IRIS-458
17. IRIS WARN products made from radial velocity inputs will now threshold on the absolute value of the velocity. IRIS-283
18. The IRIS/RDA antenna daemons are now also started and stopped with a service script. You can now type: “sudo /sbin/service antennad start”, etc. This is explicitly run by programs which previously implicitly did this, such as antenna, and service iris start. The **qant** program is modified to call this, and we added a new script **sant** for starting the antenna daemons explicitly. IRIS-500

Bug Repairs

1. The VVP time-height display was black below the 0-km height. This was a problem because you could not see black wind barbs if the wind was from the south. This was fixed by using a lighter background color. IRIS-237

2. Fixed a bug in our velocity displays. For the last year or so, there was a purple line on the displays where the Doppler fold was. IRIS–332
3. Fixed several bugs in the **GeoTIFF** output: Added GeographicTypeGeoKey = WGS–84 in all cases, override the ellipsoid if different. TIFFTAG_DATETIME time format was not correct, now it is YYYY:MM:DD HH:MM:SS in all cases. Added Natural Origin Longitude to Polar Stereographic projection. Fixed some miscellaneous wrong ellipse values. Correctly handle blank areas when the IRIS product does not exactly fill the TIFF image. IRIS–307
4. Increased the maximum buffer size for data sent from an **LLWAS** system to 400 from 200 characters. This was needed for IIA. Also the runway names at IIA were changed. The problem was fixed when we removed all use of the RCP8 IO-62 card timer interrupts. We also added a new 'help debug' command to print the mutex state. This may be useful in future lockup problems. IRIS–400
5. There was a bug in the Quick-Look Window color legend. On RHEL6 machines, the vertical text (which shows the data type) was missing. This was because the font we used for this was renamed from RHEL5. IRIS–388, IRIS–429
6. It turned out that when we changed our command line argument format for input pipes in 8.12.5, and output pipes in 8.12.7, it caused problems for some of our customers. We have now added two new script files called **post_8.12.5_wrap** and **post_8.12.7_wrap** which allow you to run older pipes on the current system. The reverse scripts to allow newer pipes on older systems were previously supplied. Please read the script for instructions on how to use. IRIS–414
7. We added some support back in for the old **IRIS/Web**. This mainly consisted of adding more to the web display options menu. We can now specify if overlays and legends are added to the image. This is enabled if we enable “Display options menu for Web display” in setup. IRIS–443
8. IRIS RHEL6 systems were having a problem authorizing IRIS windows to be displayed on their own display. We were temporarily fixing this by asking customers to type “xhost +” on their computers. This is now fixed. There are new lines in the /etc/profile.d/sigmat.sh file, which will automatically be installed on upgrade. IRIS–491
9. The **runways** utility has it’s own authorized operators list in runways.conf. We have added radarop to the template list, and improved the error message to clarify where to look when you are not authorized. IRIS–492
10. The **siris** and **qiris** programs have been replaced by scripts which simply run “sudo /sbin/service iris start” and “sudo /sbin/service iris stop” respectively. The old programs are now called start_iris and stop_iris, and must be run with root privilege. IRIS–358
11. The **iris** service startup script was writing error messages to files iris_out and iris_err in /tmp. We moved that to /usr/iris_data/log.

12. To help users running `csh` or `tcsh`, we have fixed a syntax error in the `/etc/profile.d/sigmet.csh` which caused problems when `ssh`'ing into the system.
13. Fixed a bug in **iris** init script which causes it to say "[OK]" when starting, even when it failed to start correctly.
14. We raised the maximum number of Sub-catchments in the CATCH product from 512 to 1024, IRIS-352
15. We have changed our horizontally geo-referenced products to default to be marked as using the WGS84 ellipsoid. This means products made by IRIS which do not use a named projection configuration file. Previously these products were marked as using a circular earth. Note that the radar location entered in **setup** should be a WGS84 location, which is unchanged.