



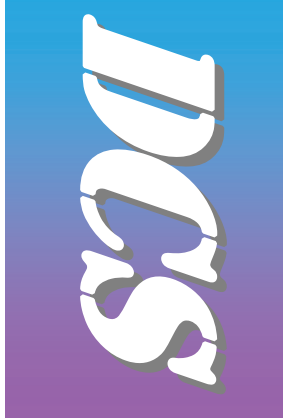
NEWSLETTER

December 2013
Volume I Issue I

GOES Data Collection System (DCS)

NOAA/NESDIS/Office of Satellite and Products Operation (OSPO)

GOES DCS Data Path



Special points of interest:

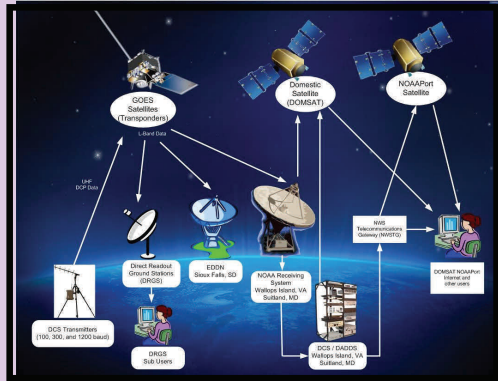
- How does your DCS data get from the sensor to you?
- New Pilot Subsystems Installed at Wallops
- DOMSAT status.
- Version II transmitters are here!!
- 100 BPS Transmitters are DONE!
(well....almost....).
- Ionospheric Scintillation

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Have you ever wondered how the data that you are collecting at your site gets sent back to you? Your platform (and about 24,000 others) transmits at scheduled intervals on one of 266 channels. Depending on platform location, it is received by one of two GOES satellites - East or West. These satellites relay the message to ground receivers, including those operated by NOAA. NOAA's ground system processes data into a single stream and sends it out through various distribution methods. Data goes out over

the Internet, via DADDIS and LRGS systems (see page 2 to find out how to get an account). Data also go out through satellite rebroadcast services, including NOAA's Low Rate Information Transfer (LRIT) and a commercial DOMSAT broadcast. Finally, a network connection to Silver Spring, MD (from both Wallops CDAS and NSOF) carries data to the National Weather Service Telecommunications Gateway (NWSTG), which distributes it to other NWS offices and to the Global Telecommunications System (GTS).

Wallops CDAS New Pilot Subsystems

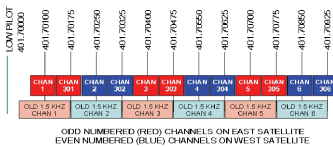
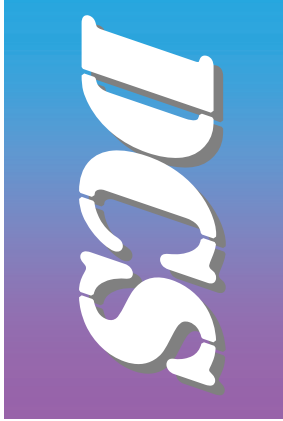
Installation and acceptance testing of the Wallops GOES Data Collection System (DCS) Pilot antennas was completed in March, 2013. The three new, 3.8 meter Ultra High Frequency (UHF) antennas replaced the operational Omni antenna to provide satellite specific transmitters and antennas for support of the GOES East & West DCS Pilot signals. The antennas, 2 operational and 1 spare, also include UHF receive systems to support DCPC Operations. The Pilot transmitters were moved from the Operations floor to the 8 meter shelter to reduce the cable length runs, and the associated RF losses, to the antennas. DCS workstations, on the Operations floor, remotely control and monitor the transmitter parameters. Backup capabilities facilitate a switch of antennas, transmitters or both within a short period of time.

Wallops CDAS Pilot Antennas East, Spare & West





Version II Transmitter Status



Comparison of Version I channels to Version II channels. Existing Version I channels will remain the same in the new Version II schema. New Channels will be inserted between the existing channels when 2 adjacent channels are completely populated with Version II transmitters. The new channel number will be the old channel number +300. You'll be able to operate your Version I transmitters until May 31, 2025.



What is a Version II Transmitter: A version II Transmitter (also called a Certification Standard 2 (CS2) transmitter, or a Narrow Band Transmitter (NBT)) is certified to a new standard that allows the transmitter to use a smaller bandwidth . Version I 300 bps transmitters use 1.5 khz of bandwidth, Version II 300 bps transmitters use 0.75 khz of bandwidth. Version I 1200 bps transmitters use 3.0 khz of bandwidth, Version II 1200 bps transmitters use 2.25 khz of bandwidth. How does this benefit the DCS user: Eventually, when enough Version II transmitters are deployed, and we are using less bandwidth for transmissions, we will insert new channels between the existing channels. This will increase system capacity, allowing more transmitters to use the

system, and/or perhaps allow more frequent transmissions by existing transmitters (when required and justified :-). **EVENTUALLY!** Transmitter status: All of the existing HDR manufacturers have now certified at Version II. NOAA policy (endorsed by the Satellite Telemetry Interagency Working Group (STIWG)) is that no manufacturer shall sell new Version I transmitters. Users may deploy Version I transmitters already purchased until May 31, 2015. Ground System Status: NOAA ground systems (DAMS-NT) at both Wallops Command and Data Acquisition Station (WCDAS) in Wallops, Virginia and the NOAA Satellite Operations Facility (NSOF) in Suitland, Maryland have been upgraded to process messages using the Square

Root Raised Cosine Filter (SRRC) recommended by the Filter Study of 2005 for Version II and the Bessell filter for Version I messages. The DCS Administration and Data Distribution System (DADDS) is able to distinguish between Version I and Version II, and marks the message in the DADDS database. Schedule: Users will be able to use their existing Version I transmitters until May 31, 2025. Users purchasing new transmitters must begin purchasing Version II transmitters right away (as of May 31, 2013). Users may deploy already purchased Version I transmitters until May 31, 2015. Version I and Version II 300 baud transmitters may be placed on the same channels, so users may use existing assignments. 1200 baud transmitters need a new assignment.



Ionospheric Scintillation



Data are being lost due to the effects of solar flares on the ionosphere. Changes in the density of the ionosphere cause phase or amplitude shifts in radio waves, meaning they are not received properly by the ground system when these solar storms are occurring. Maximum activity is expected between fall of 2013 and spring of 2014.

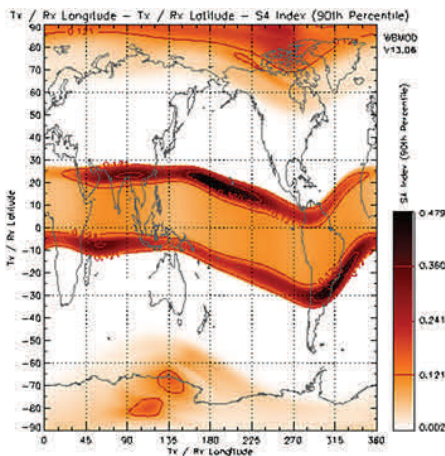


Figure 1: S4 Scintillation in constant local time (2300) at all longitudes.

Have you been experiencing unexplained data losses? It could be due to increased solar activity. Solar cycles last about 11 years, and the period called the “solar maximum” is expected to occur between the end of 2013 and the beginning of 2014. The solar fluctuations cause changes in the density of the ionosphere that creates phase and/or amplitude shifts in radio waves when they are travelling through. This effect, called “ionospheric scintillation” is impacting GPS as well. That normally means that the data are either lost (if the shift happens at the beginning and we don’t capture an address) or garbled in the middle and at the end if it happens at the end of the message.

This is a random event. It was first noticed by a DCS user in October 2011. NOAA, and our support contractor, spent several days investigating, and were JUST ABOUT to announce “It MUST be your PLATFORM”!! (You’ve heard that one, before, right?) Minutes before making that telephone call (or sending that email), we got a similar report from another user, on a different channel. After a little more research we discovered the literature on the effect of solar flares on radio waves.

The primary symptoms are extended periods of outages (several minutes to several hours) at approximately the same time every day (usually right after sunset), and usually for several days. Most of the losses occur near the equator in the Southern Hemisphere. If you are having problems of any sort, call our Wallops Help Desk at 757-824-7450 and they will look into it for you.

Here are 2 helpful websites with information on Ionospheric Scintillation:

- <http://www.swpc.noaa.gov/info/lono.pdf>
- <http://www.ips.gov.au/Satellite/6/3>

NOAA will continue to study this phenomenon to investigate possible mitigation for future cycles.

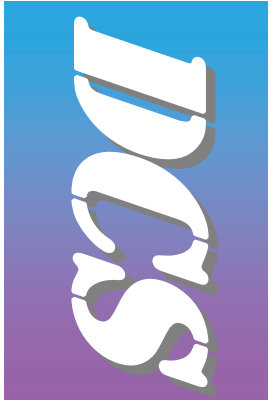




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DCS Administration and Data Distribution System (DADDS) NOAA's System for Managing and Providing Access to Data from GOES DCS



DADDS is currently optimized to work best with Internet Explorer 8 (IE8). Many users (including most of us at NOAA) have upgraded to IE9 or IE10, and DADDS doesn't work with those versions, especially when using the filters. Fortunately, you can work around this:

HIT F12, and click on "Browser Mode" when the banner pops up. From the drop down list select "IE8". The "Document Mode" should switch to "IE8" also, but if not, change that to IE8 in the same manner. If the F12 key does not give you the window, click on the Tool button in the top right (looks like a gear wheel), click on "F12 Developer Tools", and select Browser Mode from that window.



The DCS Administration and Data Distribution System (DADDS) has operated at NOAA since October 2009. DADDS is a database driven system, with a web-based interface to allow ease of use for data and information updates and downloads.

For 2013 our focus in DADDS has been in security and in browser upgrades. In order to meet security requirements most of 2013 was spent integrating the system into an "Active Domain Controller" environment. An active domain controller manages the entire network from one server. This not only makes it more secure (every machine has to go through the controller to gain access to the network), it makes it easier to manage, since all permissions for all machines are managed in one place. Browser upgrades were also needed to keep pace with changing web technology. We first tried to implement some standards with the use of HTML 5.0, but found that not all browsers were compliant with that presumed standard (most notably, Internet Explorer). So, based on advice from other web developers within NOAA, in 2014 we plan to develop our web interfaces into a framework (Bootstrap is the intended choice), which should make it easier to keep all browsers in sync. Once again, the advantage of a Framework tool is that all information is managed in one location. When something changes, the software team changes the framework configuration, which then automatically manages the compatibility for the most popular browsers (Internet Explorer, Mozilla Firefox, and Google Chrome at a minimum.)

While the DADDS system has been growing, the user base has grown as well. There are currently 1400+ registered users in DADDS. Other activities planned for 2014 include: making use of that user base to send automated emails to the entire list, or to any subset of that list; implementing the automated System Use Agreement (SUA) application process (again); implementing network lists to make it easier to download data from large groups of platforms; and (FINALLY!!!) implementing the machine to machine interface to allow users to automatically update information and/or download data.

DADDS can be reached at these URL's (if one doesn't work, try the next, we currently don't automatically forward except for planned outages):

<https://dcs1.noaa.gov>

<https://dcs2.noaa.gov>

<https://dcs3.noaa.gov>

<https://dcs4.noaa.gov>

If you are a new user, register yourself (REMEMBER THE 4 DIGIT PIN THAT YOU WILL SELECT FOR YOURSELF), and email Letecia.Reeves@noaa.gov to tell her if you need Master User privileges (permission to change records) for any of the groups you select to join. Letecia may ask for further verifications or information before activating your account.



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Operational Information



Don't forget to change your 100 baud random transmissions to 300 baud at your next maintenance visit.

Suggestions for articles in this newsletter? Send an email to <kay.metcalf@noaa.gov>

We hope to publish quarterly.

Want to be on our mailing list? Make sure to register in DADDS. We are currently taking our mailing list from the registration list, and hope to automatically generate emails in the future.



The High Data Rate Transition Officially Ended on May 31, 2013.

But, they're not all QUITE gone. Out of 24,623 active Data Collection Platforms (DCP's) on the system, **134** are still 100 baud. Thanks to all of you who worked so hard to clear the system of most of the remaining 100 baud transmitters. Many of you have been in contact with Letecia to make plans to finish your transition. We thank you as well. A few of you still need a plan (not many, I am pleased to say). If you have a transmitter still operating at 100 baud, and you are having problems replacing or removing it, please contact Letecia at Letecia.Reeves@noaa.gov.

Also, remember to check to make sure that all of your RANDOM transmissions have been changed to 300 baud. At the beginning of the transition we asked you to keep your secondary random messages at 100 baud to save channels, but all random channels have now been revised to auto mode. Please reprogram your transmitters on your next maintenance cycle if needed.

New DOMSAT Contract in Place Middle of 2014.

NOAA extended the existing contract last year, at its own expense, to combine it with a larger DOMSAT contract. The new contract is expected to be 1 base year and at least 4 option years. The DCS portion of the contract is a separate option, so NOAA can continue to exercise that option as long as the users are willing and able to pay for it. In the meantime, NOAA continues to investigate the use of the Low Rate Information Transfer (LRIT) broadcast from GOES as a viable replacement. **We are seeking funding for the next option year, and will be contacting some of you to request funds.**

TWG/STIWG Planned for May 7-9, 2014 in Austin, TX.

A GOES DCS Technical Working Group (TWG) and Satellite Telemetry Inter-agency Working Group (STIWG) is planned for May 7-9, 2014 in Austin, Tx. The event will be hosted by the USGS Water Science Center in Austin. More information will be provided in the January timeframe. **HOPE TO SEE YOU THERE!!**

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**Wallops CDA 24 Hour Troubleshooting
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