

# GOES DCS Technical Working Group Spring 2024 Meeting

## April 2-3, 2024

### **Administrative notes:**

- All meeting materials available at the NOAAASIS website [Spring 2024 TWG Meeting Information](#)
- These minutes are intended to be used in conjunction with slide and audio presentations
- Please contact Customer Support for documents if any links are not working at [habtam.ayalew@noaa.gov](mailto:habtam.ayalew@noaa.gov)

## **TWG Session 1 - Apr 2, 2024**

### **[Audio TWG Meeting Session 1](#)**

### **[Agenda - Session 1](#)**

*This presentation begins at 52:49:00 on the audio file [Audio TWG Meeting Session 1](#)*

### **Welcome and Introduction – William “Skip” Dronen, NOAA DCS Program Manager**

Skip Dronen opened the meeting at 9:00AM [EDT]. He presented the program agenda/schedule, went over the meeting logistics and asked that if anyone attending virtually would like to participate, please use the chat function.

## [GOES DCS Program Updates](#)

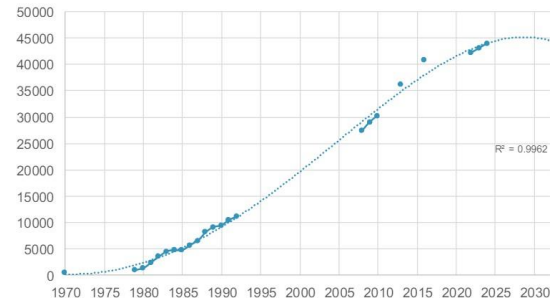
### DCS Program Updates – William “Skip” Dronen, NOAA DCS Program Manager

This presentation begins at 55:27:00 on the audio file [Audio TWG Meeting Session 1](#)

Skip reviewed the list of topics to be covered. All meeting materials will be available at the NOAAASIS website [Spring 2024 TWG Meeting Information](#)

- GOES DCS Overview with statistics - 728 Agreements in 42 Countries
  - DCS Growth as ~2% every year. DCS Certification Standard may affect growth
  - Newer initiatives continue to cause additional growth
  - Presentation of DCS Uses and Users – see slide for detail
- 
- CS1 to CS2 Transition period ending 2026
    - Certification Deadline as of **May 31, 2026**
    - No waivers will be issued
    - Operators that continue with CS1 will be outside of the **legal** framework for GOES DCS access
    - Reach out to customer service if you have any concerns or issues

Registered GOES DCS DPCs (1970-present)



Skip discusses the RFI issues and asks users for case management, research and modeling and presents a diagram with scintillation. There are no tools at this time to mitigate. We can work on scheduling and changing configurations, but not much else.

When it comes to human-caused uses, there are no issues with L-BAND, but there are with UHF as illustrated with pictures – see slides. NOAA has an interference monitoring system, other users may not.

UHF is affected daily with voice and other interference. To identify issues, we depend on users to report via 24-hour support or email to customer service. We don't have a spectrum analyzer minute by minute and that would be helpful in the future. In the meantime, we continue to depend on the users to alert us to interference issues.

Occasionally there is a blockage on one and can move to another. Wallops has a tool / demod / to do that. We can also manually change assignments by working with Letecia.

On the DADDS system, we are working on a software change - where you have a cross ingest on data from 1 – 2 with 3 -4.

GOES 17 is being used as an alternate way to receive signals in a central location that can mitigate some issues and commercial options are available.



- Testing is ongoing
- Main RFI interferer is outside the US
- GOES 17 v GOES East – proving that users would have better results
- Building evidence will bolster the argument for using GOES 17
- See display on chart for comparison of GOES 17 v GOES East

During the break, there was a discussion on GRB. Later Travis gave a link to the University of Wisconsin, who does have their own products with Level 1 data.

[UoWisconsin app](#)

[UofW GOES East](#)

## **Customer Service Update**

*This presentation begins at 1:21:17 on the audio file [Audio TWG Meeting Session 1](#)*

### **Customer Service Update – Letecia Reeves, NOAA DCS Customer Service Manager**

Letecia opens with a reminder of the Channel Timeslot Assignment Policy

- Time Slot assignments only requested for definite deployments within 6 months
- Any unused IDs can be reclaimed within 1 year
- IDs that have been inactive for 3 years are being reclaimed
- 450 time slots have been reclaimed since the last TWG meeting
- Users can look in DADDS to see parked channels to reclaim
- Contact Letecia Reeves for any additional information

See slide for stats

Letecia then demonstrated how to determine the status of your DCP IDs.

Some assignments are seasonal, so the March 2024 Statistics may not reflect all users in total – it's a slice in time.

Letecia asks users to keep up the effort in transitioning to CS2 when all must be compliant by May 31, 2026.

She emphasized the importance of having accurate metadata associated with your platform. Asking users to make it a priority throughout the year as well as PDT week to have accurate data at all times.

By submitting your SUA to NOAA, users are obligated to provide accurate and current information. Our goal is to have the entire column populated with Ys, indicating a COMPLETE record.

June 10 and Dec 2 are the planned/upcoming weeks for PDT updates. Users can contact us at any time for help, and especially during that week.

User Accounts –

- NOAA Security requires review of user accounts in DADDS
- Inactive or invalid email addresses will result in account deactivation
- Log in regularly to stay active
- Password reset tips
  - Default answer is your last name + 4 digit pin that you selected on account creation
- You can call Wallops Desk 24/7 – 757-824-7450

## [Wallops Command and Data Acquisition Update](#)

*This presentation begins at 1:43:08 on the audio file [Audio TWG Meeting Session 1](#)*

### **Wallops Command and Acquisition Station Update - Matt Sullivan, NOAA DCPRS Certification Official**

Matt opened with the locations of GOES Satellites as follows:

#### **GOES R Series**

- GOES-16: Prime East S/C @ 75.2° W Longitude
- GOES-18: Prime West S/C @ 137.0° W Longitude
- GOES-17: Storage @ 105° W Longitude – G17 DCPR downlink was temporarily activated on Feb 5 to mitigate RFI being experienced on G16
  - GOES 17 was purely storage until recently. Came out of storage just for DCS, no other operations are available

#### **GOES N Series**

- GOES-14: Storage @ 108.2° W Longitude
- GOES-15: EWS-G2 (Electro-optical Infrared Weather System Geostationary) – Replaced G13 (EWS-G1) on September 8, 2023 as the operational EWS satellite for the USSF in the Indian Ocean theater
  - GOES 15 is referred to as GOES Indian Ocean as it is being used by Space Force by the Indian Ocean Theater
  - **GOES 13** – currently in a deorbit process

#### **GOES U (19) Launch – Summer 2024**

- Launch planned for June 25
- Goes U will be called GOES 19, taking over for GOES 16 and called GOES East
- GOES 18 will remain as GOES West

Matt shows GOES Series footprints and view range, showing overlap of all 3 spacecraft, which assists to mitigate RFI.

He then presents GOES R Frequency Plan with Downlinks and Uplinks with ranges - see slide for full list of frequencies.

On the ground side, the primary GOES DCS Receive site at Wallops is the primary antenna for all goes products – 16.4 meter Hurricane Rated Parabolic Antenna – which operates in up to 150 mph winds.

Three HR antennas at Wallops are the primary GOES Support antennas and support the entire DCS spectrum. Other antennas primarily support other operations and have been retrofitted to support DCS if necessary.

The spare motorized pilot antenna, that can be used to face either east or west, is being used to support the GOES 17 testing.

NOAA NESDIS also operates backup sites or co-primary sites and much of the same functionality is present at Fairmont West Virginia and Suitland Maryland.

There were tentative plans to move all ground equipment to CBU – on hold until after the GOES U launch. Will wait to see what inventory we have.

Pilots can be swapped between sites, with some flexibility to maintain primary and backup pilots with built-in redundancy to provide full availability and 24/7/365 access to DCS message data.

Matt offers more detail of these antennas and locations - see slides.

There is an overview of the GOES DCS Data Service methods of data distribution - aside from building your own DRGS, with a note that they will be discussed in more detail later in the meetings:

- National Weather Service Telecommunication Gateway (NWSTG)
  - Skip mentions that there was an international user that showed downstream connection to the NWSTG
  - NWS HADS [Hydrometeorological Automated Data System] is a user of NWSTG
- Local Readout Ground Station (LRGS)
  - Server configurations on slides
- High Rate Information Transmission (HRIT)
  - Users can use HRIT with a relatively small receiver system

- DCS Administration and Data Distribution System (DADDS)
  - Website to view and export message data
  - Overview of system screens and functions
    - System performance statistics
    - Trouble shooting for data, platforms
    - Measure effects of RFI
    - Four Web Servers: DCS#1,#2,#3 & #4
    - Field test capability

Matt emphasizes that the DADDS website contains information on DCS Programs with navigation tips and highly recommends browsing the site.

### [NOAA DADDS](#)

He also noted that if you don't find something there, you will find it in NOAAISIS, and Skip gave a brief demo of:

### [NOAISIS](#)

He encourages using the 24/7 help desk for user technical support - contact info on slide.

### [HRIT EMWIN Update](#)

*This presentation begins at 2:37:56 on the audio file [Audio TWG Meeting Session 1](#)*

### **HRIT/EMWIN Update – Ian Avruch, NOAA HRIT/EMWIN Program Manager**

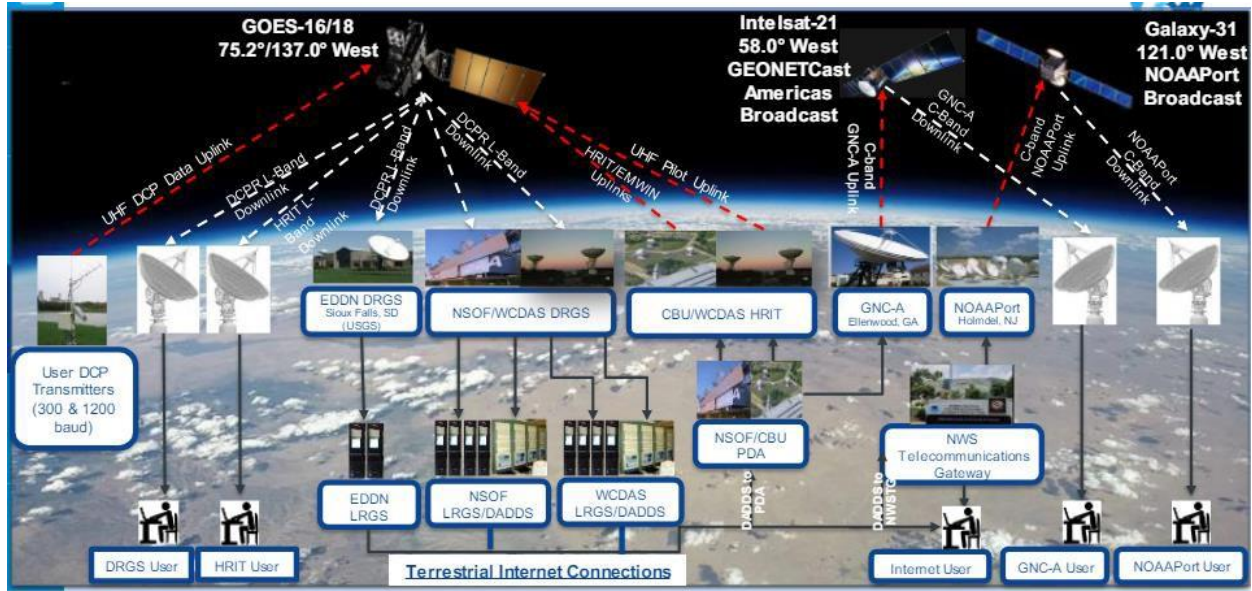
Ian begins with displaying the GOES constellation of satellites.

Data services are managed by NESDIS, and he presents a slide with the descriptions of:

- GRB
- HRIT/EMWIN
- GNC-A

There are 2 PDA Instances as data sources that HRIT/EMWIN can source from to fill the Broadcast.

## GOES Data Collection System



There are a lot of redundancies that can lead to complications, but the data is always there.

He then reviews the Virtual Channel Listing - see chart - and discusses the differences in curating in the East and West Broadcasts so that it is appropriate for the users.

Priorities are given to different data:

- EMWIN - 8%
- DCS - 5%
- All other imagery - 87%

Broadcast peaks at 96% bandwidth in the afternoon, and shows a plot with number of messages / time

Green – when the message comes in

Red – when message ends

Each message 2-8 seconds to finish

Then they get bundled

In terms of total latency end-to-end, from DADDs to PDA hasn't changed

Recently there was a 3 second delay in the DADDs System

For statistics – he added 3 seconds to the details from last year

Typical latency is 15 seconds [12+3]

99.5% of all messages have less than 20 seconds latency



## Upcoming HRIT/EMWIN Broadcast Changes

- A map of flash lighting - working on simulations now for testing - Planning to add images without changing current operations, and will reach out to the community for more information prior to implementing
- GOES-15 will no longer be available for supplemental operations – role is now GOES-17 and GOES-14
- GLM [Geostationary Lightning Mapper] has been requested, we're evaluating the feasibility of including a gridded GLM FED product
- Any changes to virtual channels will be announced well in advanced
- DCS Cross-Ingest will benefit HRIT by leveling quality between the two DCS ground systems (WCDAS and NSOF)
- Microcom's HRIT receiver Data Quality Features will allow more detailed message-level end-to-end statistics for DCS on the HRIT broadcast

Ian leaves us with a reference slide for ESPC Notifications, Status, and Contacts.

Lysanias asked if there is a standard product for HRIT. He was asking because the University of Wisconsin has snowpack and reflectivity data and he thought they were getting the information from the HRIT feed.

Ian says we don't broadcast that product or even a variety of products that can produce that.

## [GOES and GeoXO Update](#)

*This presentation begins at 3:07:50 on the audio file [Audio TWG Meeting Session 1](#)*

### **GOES and GeoXO Update – Daniel Gillies – NASA GOES-R and GeoXO Deputy Program Systems Engineer**

Daniel opens with the scheduled launch of GOES U - set for Launch June 25<sup>th</sup> 2024, with launch details, subject to conditions.

Post launch information outlined:

- GOES-19 will undergo checkout in 89.5W location
- Following Post Launch Testing & Handover → 79.2W
- Co-located with GOES-16 @ 79.5W
- GOES-19 operational late March 2025
- GOES-16 will go into storage
- Future of GOES-14 and -17 in discussion

He then discusses the GOES End of Life Inclination Drift with the following items, as he gives a figure 8 image of how the coverage area is being impacted:

The Geo Program is evaluating the potential to increase the operational life of the GOES-R series spacecraft by ceasing North-South Station-keeping (NSSK) as spacecraft approach end of life

- A significant amount of fuel can be saved on NSSK, both in storage or in operational mode, extending the life of the mission. Protects against alternative: coverage gaps in event of GeoXO delay for any reason
- Has been done in the past on previous missions (e.g. GOES-10, EWSG)
- 5-degrees has been determined to be a 'sweet-spot' between fuel savings and operational/technical complexity
- Spacecraft will take approximately 6 years to drift to 5-degree inclination
- East-West station-keeping is maintained; Spacecraft performs yaw-steering to maintain 'normal' E-W scan pattern

Earliest operational implementation would be on GOES-16 in late 2029 (in storage location, current EoL projected to be Q1 2033), followed by GOES-18 and GOES-19 in 2030s

- Spacecraft will appear to perform a thin figure-8 relative to ground track around nominal equatorial slot
  - Results in adjustments to imager field of regard and user facing RF comms coverage areas
- Testing to be performed on GOES-17 in near term

Slide to show Field of Regard comparison at max inclination - see deck.

Q: [Lysanias Broyles] How much slippage in schedule to the current satellites have fuel to accommodate?

A: First launch is scheduled for 2032 with an imager, so there is overlap there but you risk not having a spare spacecraft initially if there were any delay. We are looking at very dynamic budget conditions and are doing everything we can to extend the life of every GOES satellite.

Daniel has been working very closely with OSPO and Direct Services Branch in regards to user facing comms and concerns. He is investigating impact on each of the services:

- Data Collection System (DCS)
- GOES Rebroadcast (GRB)
- High Rate Information Transmission / Emergency Managers Weather Information Network (HRIT/EMWIN)
- Search and Rescue Satellite-Aided Tracking (SARSAT)

Daniel then gives a demonstration of the impact to User Services with 3 different Case Scenarios:

- A - Locations well within coverage area
- B – Locations near Northern / Southern Edges of Coverage Area
- C – Locations at Northern / Southern Edges of Coverage Area

We are still doing analysis on imaging and RF Services as we drop North / South stations. Users may be outside of coverage areas at certain times of day that they need to be aware of.

The line shows 5 degree marks in our official coverage area, it could be more.

Users may also have to manage their own local conditions [going through a building, terrain etc.].

Daniel emphasizes that we are willing to work with users with any questions, please reach out.

Q: [Skip Dronen] If you are a DRGS, is it the same problem?

A: If you are an L-Band antenna, yes. You are essentially impacted by Case A and there could be something in your local configuration that could cause an issue that changes with this margin.

Q: [Matt Sullivan] Is there a timeframe for where GOES R spacecraft transitions before GeoXO

Is there a need to bring out another GOES spacecraft out of storage?

A: Ideally not. Assuming everything goes as planned. It's likely you have link margin bandwidth – you will not have any issues – but you have to do your own testing. As always, reach out for more info.

Daniel then shows the GeoXO Constellation and explains the features.



In addition to the storage backup system, GEO-Central, Partners that would like to fund a Partner Payload are welcome to contact Daniel.

Daniel goes through the Timeline, noting that costs go up exponentially with delays.

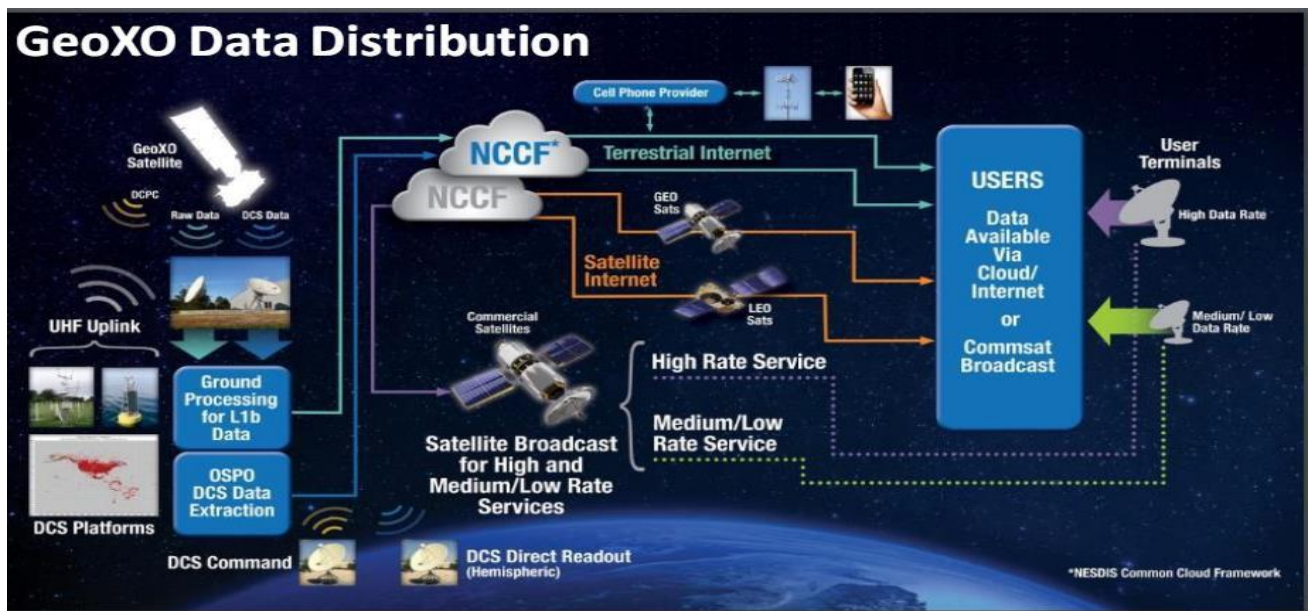
See slide for details on timeline of:

- Lifecycles Update
- Procurement Updates
- Spectrum Updates

Just cleared with comment NASA DODDC Coordination meeting  
Should go off to SPS soon  
State 2 is required prior to PDR  
Currently no major comments on architecture

No space weather data on GeoXo – that will be handled entirely by Weather

Daniel then showed the GeoXO Data Distribution as it relates to DCS



No major changes other than frequency, shifting up on frequency to get as far away from L-Band as possible – this is still an active discussion. It is a good idea – and we can talk more about what that means to your receiving stations.

He then shows a recap of frequencies and a comparison of services between GOES-R and GeoXO, while providing continuity on all services and working to ensure that there will be a low-cost solution.

HRIT/EMWIN is different in that users can be a professional class of systems, and we welcome input from users.

DCS will remain free to all users and new features are expected with User Experience improvements.

The goal is to demonstrate a fieldable DCPC receiver and release an engineering reference design for later manufacturer development for GOES-R & GeoXO.

Forward Link Development for GeoXO -  
For Goddard Modulator & Receiver - Updates – see slides.

Bench Level testing of modulator and receiver – went well

Microcom signal is transmitting on GOES 16 today, we can adjust for demo

Q: [Lysanias Broyles] Will there be a cost?

A: No cost

Video of pilot antenna set up at Wallops

Daniel reviewed the GSFC Receiver Major Task Schedule - see slide

USGS has been very interested in getting into testing, and we are looking into that.

For Commercial Command Link Development, Daniel displayed equipment being evaluated in the room.

There are 3 systems in development:

- SpaceX Swarm Development Kit w/ M138 Modem - no longer available
- Orbcomm ST2100 Modem Dev Kit (uses Inmarsat GEO link)
- CLS Argos MELOA Modem (Argos DCS Leo)

DCS Direct Cell is something we will have to consider

Q: Can you test Iridium?

A: The challenge with Iridium is cost, we were looking for an IoT system with Data as you go. They don't have a command-only plan we can buy

We know that Iridium works, lots of folks are using it - and any feedback on that is appreciated.

Q: Will you test Global Star?

A: Global Star did not have command-only plans. There are other systems that have dev-cards, but we want to work with Out of the Box solutions that will be cost effective. Additionally, we will look at Starlink network when it is commercially available.

Daniel offers to lend systems to any user interested that can give feedback.

Skip has released a memo to agency users and commercial users requesting commitment [available at NOAASIS].

New DCPC Equipment will not be readily available by the time they make a commitment.

We will need user commitment from agencies and users to establish interest.  
See Commitment memo asking how many you are using; how many would you use.  
There are 2 forms - for Federal Users and for non-government users.

### [For Federal Users](#)

### [All other Agencies](#)

Please consider submitting these as soon as you are able. Without this feedback, we cannot prove interest as this needs to be in hand as evidence to continue. The more rationale we have the better. Even if you have to leave some parts blank, please fill in the form with as much information as you can as it would still be valuable.

### [DCS Wildlife Application Joint Venture](#)

*This presentation begins at 3:58:00 on the audio file [Audio TWG Meeting Session 1](#)*

#### **DCS Wildlife Application Joint Venture – Daniel Gillies, NASA GOES-R and GeoXO Deputy Program Systems Engineer**

Daniel introduces the MOTUS / DCS Integration Project as a NOAA NESDIS Joint Ventures effort to enable the integration of MOTUS radio receiver base stations into GOES DCS DCPs to enable connectivity in offshore environments, with a specific application in monitoring the interactions of migratory birds and offshore wind developments.

He notes that US Fisheries leads the project for MOTUS. A slide shows small UHF transmitters [VHF available as well, depending on manufacturer] used as a wildlife tracking system, especially migratory birds.

This project is proposed to add a single small channel receiver with RF Link, completely terrestrial, that can pick up data from tagged birds.

There is a use case for wind farms, as well as buoys, where DCS can use the link to get that data. There have been enough changes in DCS that would support using this system in offshore environments.

Operated by NOAA Fisheries, they are integrating units to DCPs as a sensor source in offshore environments, both stationary and nonstationary. With an 8-character ID and which antenna it's on, these are very small packets. They can add pressure data on the tag to determine the altitude of the bird.

We will cast a wide net to get DCS back onto buoy operations to enable a wide variety of uses for DCS users.

ARGOS is not the right solution for this as it is moving to commercial from federal operation.

The final slide shows the partners involved in the program.

### [Manufacturer Report – Microcom Environmental](#)

*This presentation begins at 5:23:40 on the audio file [Audio TWG Meeting Session 1](#)*

### **Manufacturer Report – Microcom Environmental - Brett Betsill – Microcom Design**

Brett reviews NOAA DCS Projects:

- Binary Protocol
  - Will provide backward compatibility
  - You can add more data as you are not transmitting as long
  - Will be deployed this year
- Lat/Lon/TxID
  - Also planning on deployment this year
- DCPC Implementation –
  - Previously referred to as the 2-way
  - Current focus is on the DADDs interface
- SmallSat DCS Project
  - CubeSats/SmallSats in space can transmit; proof of concept has been done
  - Currently on hold [de-manifested]
  - May launch on schedule summer and November 2024
- Enhanced DCP Standard
  - No hardware changes – only software
  - Working with EUMETSAT to talk through NOAA

- Microcom DigiTrak Receivers
  - 20<sup>th</sup> anniversary of DAMS-NT
  - Rack and Desktop versions
  - Upgrading USACE Sites
  - Recently developed new LNB for both DCS and HRIT to address product discontinuance by Quorum
- DigiRIT HRIT Receive System
  - May 2024 - 2nd USGS DigiRIT Install at the HIF2 in Tuscaloosa, AL
- The XPress
  - On the Uplink side, fully integrated GOES DCS Data Collection Platform
  - Graph of the inside of the antenna – very similar to the Tophat
  - Deployment Options
  - Example XPress Deployments
- GTX-2.0 and GTXO-2.0
  - GTXO-2.0 - just the transmitter
  - Sending 200 units to Tanzania
- SDI-12 Interfaces and Sensors
  - MagShaft – Absolute Magnetic Shaft Encoder
  - Low torque and inertia due to no mechanical connections

Q: Are you selling HRIT LNBS [ Low-Noise Block downconverters] separately?

A: They are the exact same piece, just a little bit of programming difference and they are programmable – and will convert an HRIT to DCS and back and forth. When frequency changes from 1680 to 1690 they can be re-programmed and you can swap them out.

Brett finishes this section with a slide of contact information for Microcom.

## [USDA User Report](#)

*This presentation begins at 5:54:01 on the audio file [Audio TWG Meeting Session 1](#)*

### **USDA User Report - Lucas Zukiewicz, Physical Scientist at National Water and Climate Center**

Lucas begins his presentation with the USDA-NRCS Snow Survey and Water Supply Forecasting Program [SSWSFP] and GOES Telemetry Upgrade Overview and explanation of the network. He mentions that a bulk of programs are moving to DCS, 1200 weather stations altogether. This is one of the – if not the - largest mountain snowpack measurement organizations in the world.

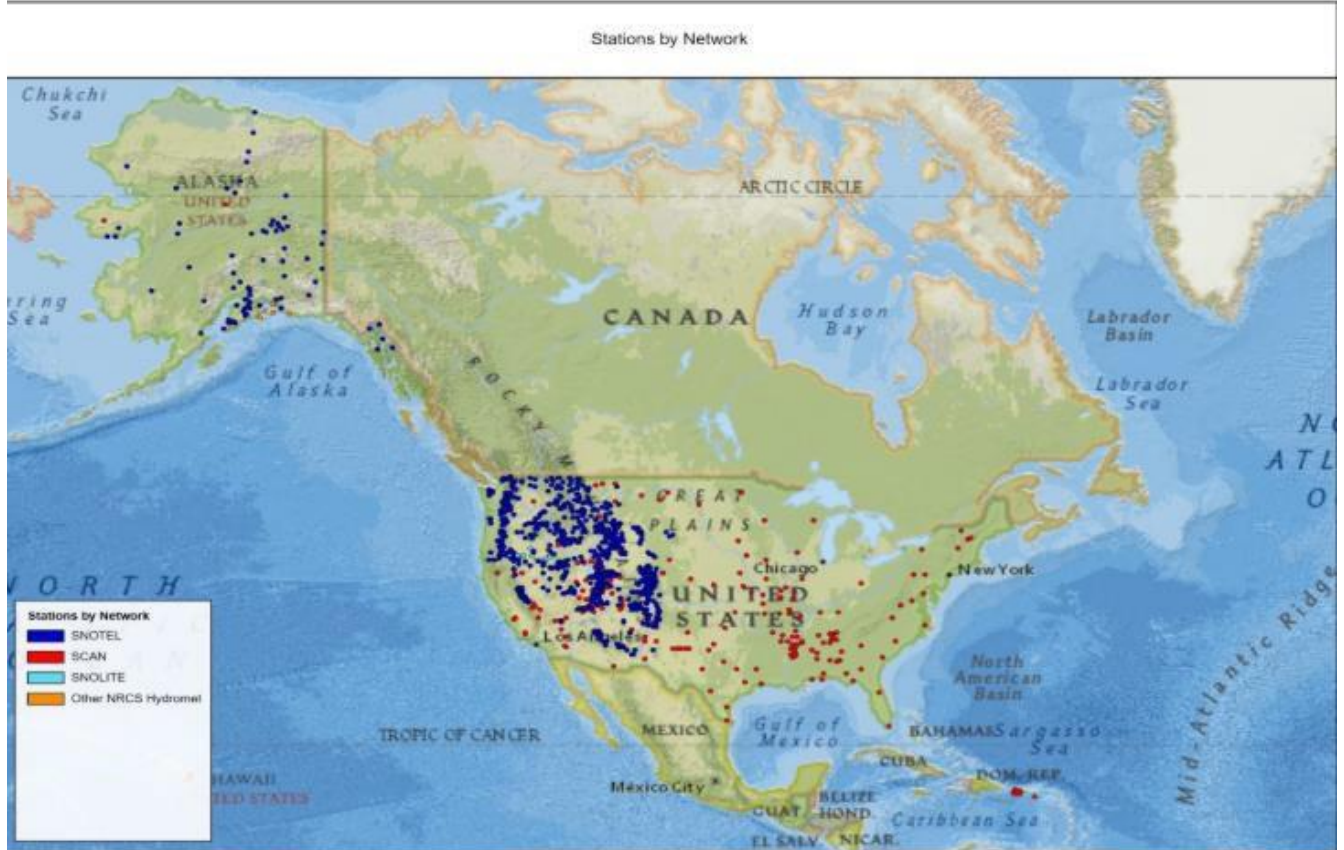
There are 3 primary weather station types operated

- SNOwpack Telemetry (SNOTEL): 900 stations
- SNOLITE: 47 stations
- Soil Climate Analysis Network (SCAN): 212 stations

These are used with a high value for water supply across the US in a variety of methods.



## Stations Map:



Lucas gave a briefing of the SNOTEL Telemetry History, starting in the 1910's.

The concept of databasing came in the 80s, handling data from 4 master stations operating both slave and master systems internally. Data is collected hourly.

He describes how remote installations can make access difficult with weather conditions, and some terrain if very steep. It may take 5 days in/out to get to locations in the wilderness – so the equipment must be very robust and reliable.

These are fully solar powered stations providing snow temperature, air temperature, rh, wind, etc – as examples of data collected and they are able to transmit information through GOES reliably.

Getting it right was important, and they came in about 3 years early on their project plan timeline.

He then goes into the Equipment review with ID Management, how DCP are assigned – which gives control over management, seeing what equipment is out in the field, and helps with transition and migration.

Having a sophisticated system for site monitoring allows for data stream issues to be minimal and can be resolved easily. It has proved to be a good system.

He showed and described the pictures of varying conditions and locations of Snotels and Weather Stations.

He finished with Lessons Learned during the Major Telemetry Upgrade:

GOES is Much more reliable and less power hungry as compared to other systems

The Decodes portion of OpenDCS has suited our needs well, but as options of direct importing of Iridium data is explored (currently done through a 3rd party), a more complete version, or more subcomponents, of OpenDCS may be integrated

Network wide transitions can be difficult, especially with 6 offices but it went well

There are windows where data doesn't go out with events – due to weather. Operating in mountain environments with heavy snowfall can prove challenging. High-gain directional antennas, with exposed elements, have proven unreliable during the winter due to snow load signal attenuation

Multi-hour transmissions, and different antennas, have helped to solve some of the signal attenuation issues and has improved the hourly reporting at trouble sites, yielding more serially complete records

Lucas closed with contact information.

## [USACE User Report](#)

*This presentation begins at 6:17:04 on the audio file [Audio TWG Meeting Session 1](#)*

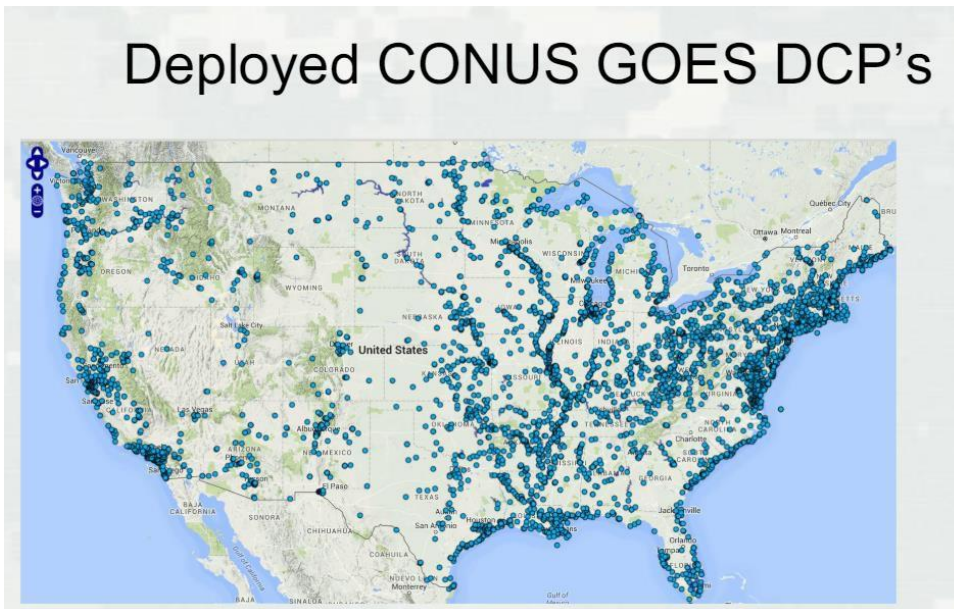
### **USACE User Report – Lysanias Broyles, USACE**

Lysanias opened with a map of 8 divisions and 3,100 IDs [see slide] continuing to employ new platforms as they are managing water quality as well as water quantity and provided statistics for the US Army Corps of Engineers Projects as follows:

- **257 USACE Navigation Projects**
  - \$250B/ year benefit
  - 12,000 miles of navigable channel
  - 50% oil imports
  - 67% of US consumer goods

- **400 USACE Reservoir Projects**
  - 132 multi-use water resource projects
  - Avg. \$90B/year flood damage reduction
  - 75 hydro-electric plants
  - 24% of US hydro-power generation
  - 9M ac/ft of water storage
  - Recreation, water supply, fish, etc.
  - 4B gal/day used from USACE projects

## Deployed CONUS GOES DCP's



Lysanias reports that they will be deploying more stations to get more accurate data, so that the model is not guessing as much. In 2014 they began deploying HRITs to provide on-site capability and they now have 8 DRGS and 40 HRITs.

Purchased and installed the HRITs in case equipment could not access the internet. Most critical data is transmitted through GOES.

He reviewed the

- 2024 USACE Summary
- Summary USACE DRGS Modernization

He gave an example of Water Quantity and Water quality monitoring for backflow of water from the Chicago River into Lake Michigan.

On a daily basis, USACE has to determine the distribution of water discharged from outlets at different elevations on high head dams to avoid disrupting downstream dissolved oxygen, water temperature and other water quality properties to protect fish and aquatic life.

GOES DCS allows them to execute their life-safety mission during floods and other weather events.

The USACE Water Management has a 2 trillion dollar economic impact, and GOES DCS is vital for responsible Water Resource Management.

He mentions future projects including more frequent transmission and ensuring that there are security measures to ensure that DCPs only respond to authenticated commands from the secure gateway.

Q: How does USACE/G6 [IT Group] feel about Two-Way?

A: We have talked to the Corps about this with the Spectrum Management Group and they are very well aware of what it is. We have had to dispel the misconception that DCPs control Water Management and that is not the case and have had to distinguish between DCPs and other products. We have been talking with Microcom to ensure that the DCPs only respond to messages from a secured gateway. To date, they are in support of what we are doing.

## **Wrap Up**

*This presentation begins at 6:39:44 on the audio file [Audio TWG Meeting Session 1](#)*

Wrap Up – William “Skip” Dronen, NOAA DCS Program Manager

Skip wrapped up the day by reminding participants that the program agenda is set up based on user sign-up sheets and the information you give us. The floor is open if anyone would like to submit a suggestion for the next meeting.

In-person attendees then went on to a demonstration of an HRIT set up by Daniel Gillies.

## TWG Session 2 - Apr 3, 2024

### [Audio TWG Meeting Session 2](#)

#### [Agenda - Session 2](#)

#### **Welcome and Introduction – William “Skip” Dronen, NOAA DCS Program Manager**

*This presentation begins at 28:05:00 on the audio file [Audio TWG Meeting Session 2](#)*

Skip Dronen opened the meeting at 9:00AM [EDT]. He reminded folks of rules of engagement and for virtual attendees to use the chat in the meeting. He presented the program agenda and noted that we will continue presentations back to back for the morning, and will be on schedule for training in the afternoon.

He again reminds the group that all materials are all posted on the NOASIS site - link at top.

#### [Latitude & Longitude](#)

*This presentation begins at 30:12:00 on the audio file [Audio TWG Meeting Session 2](#)*

#### **Latitude & Longitude – William “Skip” Dronen, NOAA DCS Program Manager**

Skip introduces a system that is under development where DCPs would report positions automatically. This would be implemented with a software update and would be sent on a random channel to update your PDT [Platform Description Table] without negatively impacting existing operations.

Your platform’s position is a condition of use per the SUA. Having that position in DADDS is important, and we have thousands and thousands of blank entries in the database.

These data points matter when we need the information for GeoXO, or to troubleshoot RFI, among other reasons. Currently we rely on users and the data is not accurate, formatted correctly or even there in many cases.

An additional benefit could also include a new user that registers and notices other nearby Platforms, and they may not need one in that location.

Nathan Holcolm welcomes the automation and would like to add a station ID if that is available. Any additional information would be tremendously helpful.

In the discussion on 'When to send' this information, Nathan brought up that it should be sent on startup, to ensure that the set-up has been done properly. Brett said that it could be sent on multiple random channels. Nathan says he'd like to see it operate on its assigned channel before we go to other channels, thinking that he might not have good signal strength or have other issues. Brett assures that these ID messages will take lowest priority and will not override any other message. They will not be on any scheduled time slots. The documentation shows what the load would be.

Further discussion about frequency or conditions to trigger additional Lat/Lon messages will be noted when continuing development.

Skip notes that if users are employing the compacted messages, they may have more time available and can send more frequently.

Accurate DCP Locations will resolve any issue with buoys or other constantly moving locations, although this is not meant to be a tracking device.

Q: Would this have a different header from our normal data messages?

A: Yes. It's a binary message, so it's different and it could contain such information as: Lat/Lon, Manufacturer ID / Serial No / primary Channel / Baud Rate / Format / Secondary Channel.

Users can log into DADDS to confirm that the information was received.

As it is binary, messages won't be readable, but we are working on a decoder.

Q: Will this apply to wildlife?

A: No, this is only being used as a radio relay for DCP Locations.

Q: Could this data be collected without users' knowledge?

A: That is not the plan or intent.

Q: What happens if the data is incorrect, or different from where it was deployed?

A: Before the system goes out in the field, there will be plenty of testing. We will have to have fields for auto collection in DADDS, and a schedule or conditions for over-writing.

We may also be able to capture low power/battery warnings, Brett reference the study doc again and this scenario is addressed.

Where folks are concerned about the physical security of their equipment, users can opt to use a 'close to' address, and a PDT table may be able to re-code the actual with an agreed upon factor.

This project is meant to work with the current CS2 Standard as an extension.

Encryption can be used by each manufacturer or NOAA, with the reminder that DCS is an open and public system. We will work on the balance of data integrity and masking addresses when requested.

Lysanias added that his experience is that most people that see sensors out in the field are respectful of the equipment. Therefore security is not an issue for them, although he understands that some locations may need more security, not just in the form of adding flexibility with the precision of the location via DADDS, or if it is publicly available.

A suggestion was raised to use the office location, rather than the DCP, which would not provide the data of platform location and does not help with the goal of having locations mapped.

There was some discussion around using random channels and for scheduled only DCPs there would be two assigned channels. These details will be worked out with testing.

Although there was not a demo, you would see that the Lat/Lon message is distinguishable from other messages.

Feedback is welcome and the study document and specs are available here:

[Lat/Lon/TxID Study](#)

[Lot/Lon/TxID Spec](#)

## **Communication Protocols**

*This presentation begins at 1:38:05 on the audio file [Audio TWG Meeting Session 2](#)*

### **Communication Protocols – William “Skip” Dronen, NOAA DCS Program Manager**

Skip gives a brief history of the Protocol Specifications Proposal and continues with how we will provide 5 optional formats to better utilize assigned time blocks and reduce message size. They are encoded at the DCP and decoded at the modulator. These are optional formats that can be used in the future and will not affect anyone negatively downstream.

The process would start with NOAA identifying the protocols, manufacturers would use the guide to write software updates, protocols would be selected as they are brought on-line, demodulators would be updated, compact messages would work as usual, binary messages may be ignored, and would need to be tested.

## Communication Protocols and Binary Message Standard and Full ASCII Demo

*This presentation begins at 1:42:23 on the audio file [Audio TWG Meeting Session 2](#)*

### **Communication Protocols and Binary Message Standard and Full ASCII Demo – Brett Betsill, Microcom**

Picking up where Skip left off, Brett further described the Protocols -

- Open/Standard Message Format
- Compact Pseudo Binary Message Format
- Compact Numeric ASCII Message Format
- Compact SHEF Alphanumeric ASCII Message Format
- Compact Full ASCII Message Format

\*Compacting ratios vary based on option selection

Brett then started his demonstration showing a test transmission, with a normal SHEF encoded message, sending as ASCII - sending from the Pilot/Test Transmitter located at Microcom. The test message took nearly 8 seconds to send 267 bytes. He then resends in binary, compact SHEF format and it takes 5.5 seconds with 178 bytes - showing the same exact message/data in the portal. Next, he sent as full printable ASCII. He has tested some user messages, with success.

Logging into DADDs, they will be shown normally, and you will see the advantage of the compression in the message time stamps.

All of the development is complete, and they are preparing to deploy to Wallops over the next few months, there will be testing behind firewalls and a release over the summer.

NOAA and Microcom have been in contact with NOS and NWS for testing and working out the kinks. Next steps will be working with manufacturers and requesting feedback on the spec, and finally amending the certification standard. Once that is done, manufacturers can start implementing in DCS transmitters and then users can start deploying and using it.

In order for this to work, it will require a firmware update, which should be at a minimal cost.

The Demod code has already been updated. There will be 3 NOAA Test Sets for manufacturers to work with and move forward with certifying.



Current CS2 spec is a maximum of 16K bytes. This message length is supported. The max observed is 2-3K. Maximum transmission time is 110 seconds. A 300bps message could send approximately 4K bytes.

Lysanias asks about the availability of 1,200 baud assignments once this is set up. Letecia welcomes users to contact her with your needs as they are available in a limited number.

Nathan mentions that he has a test case with a site that is continuously over by a second. Brett will coordinate with Habtam to find the messages and look at them in DADDs.

### [DCP/Two-Way Communication \(DCPC\)](#)

*This presentation begins at 2:19:06 on the audio file [Audio TWG Meeting Session 2](#)*

#### **DCP/Two-Way Communication (DCPC) – William “Skip” Dronen, NOAA DCS Program Manager**

The DCP Commanding concept has been discussed for many years, and now that the system has grown so much - there are approx. 40K DCPs - that any change is a large effort. We have become inflexible, not dynamic.

Commanding will be the cornerstone of DCS in terms of managing spectrum and DCPs.

Currently we are facing logistical challenges, in that we cannot truly respond to emergent threats.

In Chile, our partners are beginning to reprogram their DCPs and are on a channel being hit with voice interference on a tsunami alert system. Ideally, we would coordinate with them and resend the commands, reconfigured. It's possible and happening in the industry and we'd like to make this program accessible to anyone in the future.

Commanding could potentially allow users and manufacturers to update DCPs remotely, with unique commands.

Additional features to be discussed and there are questions on the table to be considered.

Q: Can the listening windows be open all the time?

A: Users can decide, based on needs and resources such as battery time. An option in the command set could be to change that schedule remotely. DADDS has to know that the DCP has a receiver and the set listening window so that it can command it.

Commands can overlap and will be queued based on priority.  
A transmission window could be limited in the future.

The command list is preliminary. Who sends commands now is NOAA, who will in the future is TBD.

Q: What command should you be able to send, or not send?

A: Example: You should not be able to or have to change your channel. Users should reach out to Customer Support rather than going out to the field.

Q: What has been done to address security? Are there restraints?

A: Considering security, DCS is an open pipe system. Our mission is to ensure data integrity and improve the system - not security. Logic would dictate that the odds of an unintentional disruption are very low.

Security continued to be a topic as there are various levels of concern and comfort.

Discussing specific use cases and concerns about having to involve IT Departments, N-Wave or other information in the packet boiled down to each user managing security for their instance.

Encryption is possible throughout the system; it has not been a part of the spec as it may not be necessary and not worth NOAA's resources.

We can analyze and respond to requests regarding timing and continue investigating options.

We will rely on feedback from the community to fine tune the specs and the Command List.

For the Commanding Group - see page 27 of the [DCPC Spec](#)

## [DCPC End-to-End Over the Air Demonstration](#)

This presentation begins at 2:59:37 on the audio file [Audio TWG Meeting Session 2](#)

### **DCPC/Two-Way Communication & Demo – Brett Betsill & Matt Ceanfaglione, Microcom**

Brett gives an analogy of DCPC to texting and walks through how the system works with a message path overview. This feature will reduce work and trips to the field.

The demonstration begins with Matt working via his computer at Wallops, the modulator does the scheduling then the message goes down from the satellite and to the DCP, into the DRGS and then up on the website. The demo takes 1-3 minutes with a random report. Operationally, this time will vary, based on schedules and is expected to take 5-15 minutes.

Matt takes over from there and walks through how the messages are sent and received in the app.

There was a discussion about providing ‘optional’ commands for specific manufacturers in addition to required commands.

Skip assures users that there is no intent whatsoever to control the DCPs or shut them off if there is a problem without the users knowledge. We will collaborate with users to create inter-agency agreements in an effort to get this up and running in its simplest form.

Skip follows up with a request for input from the users regarding restraints or concerns and reminds folks to fill out the forms to express interest.

*The DCPC capability is intended as a voluntary option for users. However, the future of this capability on the GeoXO constellation (planned replacements for the GOES) will be predicated on acceptance and use on GOES. It is highly recommended that users who desire DCPC signal their commitment to this capability so this capability can be supported by NOAA.*

Please send forms to: [William.Dronen@noaa.gov](mailto:William.Dronen@noaa.gov)

[For Federal Users](#)

[All other Agencies](#)

## Updating a Platform Table in DADDS

This presentation begins at 4:58:00 on the audio file [Audio TWG Meeting Session 2](#)

### Updating a Platform Table in DADDS – Letecia Reeves, NOAA DCS Customer Service Manager

Letecia begins her demonstration session with a definition of the term PDT [Platform Description Table] that contains the metadata associated with your account. She issues a reminder that your User Agreement states that you will keep PDT information complete and current.

She notes that the user would need Master Privileges to update tables. If this is your job and you are a Standard User, you must contact Customer Support to be assigned Master Privileges to complete this task.

Once logged in, you go to the Platforms Tab, and the column on the left is labeled ADDRESS, also referred to as DCP ID, and these entries are hyperlinks to the PDT.

For each entry, you can see the record on that line item - all fields/columns should be full.

ADDRESS	GROUP	LOCATION	PTYPE	PCHAN	STYPE	SCHAN	RATE	CNTRY	STATE	FIRST	PERIOD	WINDOW	COMPL	STATUS	LAST ACTIVE	UPDATED
FFE000A4	TECIAP	SUNSHINE STATE	S	PARKED	U	0	300	US	USCA	00:33:35	01:00:00	00:00:10	Y	U	---	04/03/2024
FFE090D8	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:28:00	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE090EA	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:33:45	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE07634	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:33:55	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE0B32A	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:34:05	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE0BDF8	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:34:15	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE0C6BA	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:34:25	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE0C6B8	TECIAP	SUNNY CALIFORNIA	S	PARKED	R	124	300	US	USCA	00:52:50	01:00:00	00:00:10	Y	D	12/13/2022	03/27/2024
FFE0D6CC	TECIAP	SUNNY CALIFORNIA	S	196	R	124	300	US	USCA	00:34:45	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE0D81E	TECIAP	SUNNY CALIFORNIA	S	196	R	124	300	US	USCA	00:34:55	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE0E356	TECIAP	SUNNY CALIFORNIA	S	PARKED	U	0	300	US	USCA	00:35:05	01:00:00	00:00:10	Y	U	---	03/27/2024
FFE12482	TECIAP	SUNNY CALIFORNIA	R	PARKED	U	0	300	US	USCA	00:44:00	01:00:00	00:00:10	Y	U	---	03/27/2024

The goal is to ensure that every line / PDT has a Y in the COMPL column that indicates a complete record.

The following fields are required to consider the record complete:

In the DETAILS Tab:

Location

Country

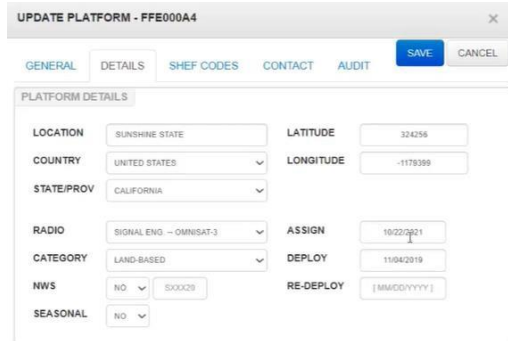
State/Prov

Radio/Manufacturer and Model No

Latitude\*

Longitude\*

Deploy Date



UPDATE PLATFORM - FFE000A4

GENERAL DETAILS SHEF CODES CONTACT AUDIT SAVE CANCEL

PLATFORM DETAILS

LOCATION: SUNSHINE STATE LATITUDE: 324256

COUNTRY: UNITED STATES LONGITUDE: -1179399

STATE/PROV: CALIFORNIA

RADIO: SIGNAL ENG - OMNISAT-3 ASSIGN: 10/22/2021

CATEGORY: LAND-BASED DEPLOY: 11/04/2019

NWS: NO SXXXXX RE-DEPLOY: [MMDDYYYY]

SEASONAL: NO

Lat/Lon - Entered in Degrees, Minutes, Seconds. You can use apps on line or Excel to convert

Deploy Date

SHEF Code: [aka Physical Element Code]

At least 1 SHEF Code must be entered

You can find SHEF Codes on page 72 of the manual —> [SHEF Codes](#)

Contact:

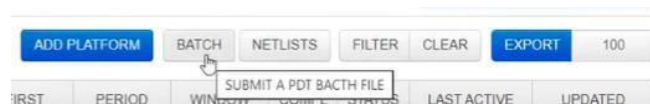
ALL fields in the Contact box are required and the person has to have an active DADDs account

Tip - be sure to click SAVE when working between tabs

Note - All of the fields in the GENERAL Tab are controlled by the system

If you have a large number of Platforms, you may elect to send a batch file to update your records in bulk by clicking on the BATCH Tab.

All Batch files must contain all fields and the RADIO field must be an exact match to the options in the system.



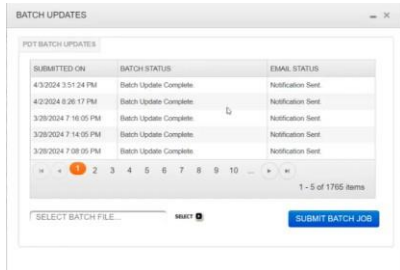
ADD PLATFORM BATCH NETLISTS FILTER CLEAR EXPORT 100

SUBMIT A PDT BATCH FILE

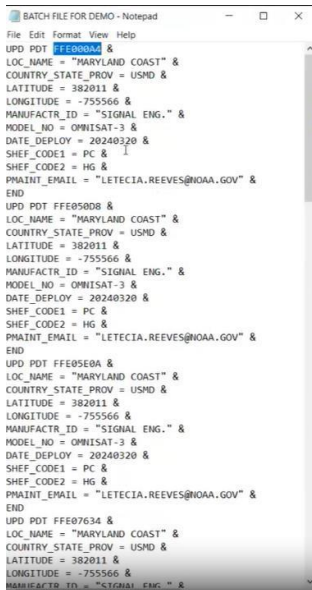
FIRST PERIOD WIN COM LAST ACTIVE UPDATED

Then you will see your previous uploads, if any.

Select your file, click on SUBMIT BATCH FILE.



Sample file [template available in instructions]



## [Applying and Saving a Filter or Netlist](#)

*This presentation begins at 5:16:02 on the audio file [Audio TWG Meeting Session 2](#)*

### **Applying and Saving Filters & Demo – Matt Ceanfaglione, Microcom**

Matt walks through the Training slide deck, reviewing how to manage Views and different ways to create Netlists and what they contain.

There is an option to create a Netlist from a filter that already exists by selecting the filter you want to use and adding a look-back period.

He then gives a demonstration of the instructions on his account in DADDS creating and saving a filter and creating a Netlist from a filter and from a .CSV file. You could also use an LRGS file.

To select your Netlist, go to the Messages tab and pick from the dropdown.

There is not a way to make changes at this time on a Netlist, the work around would be to create a new one.

## [DCS DADDS Troubleshooting DCS Messages](#)

*This presentation begins at 5:34:53 on the audio file [Audio TWG Meeting Session 2](#)*

### **Troubleshooting DCS Messages – Matt Ceanfaglione, Microcom**

Matt reviews the training slide deck on Basic Filtering, Filter Dialog options, Operands, Dateline Filter, Nested Filters for use on multiple channels, ARM Messages, Timing Messages and Missed Messages.

He then reviews ways to build queries to troubleshoot, and how to gather the data when you are attempting to analyze in these categories: Data, Messages, Performance, Channel, ARM Messages, Ionospheric Scintillation for examples.

He reviewed the conditions where you would receive ARM Messages, when problems are detected [see pages 13-15]

To start your Troubleshooting - Log into DADDS and use your filters / Netlists or create new ones.

You can export the resulting list to XLS files for off-line analysis or collaborating with others.

You will want to query all 4 DCS websites if there were issues with receiving hardware.

Performance analysis of your signal strength, channel and equipment tips are on pages 21-22.

South American and Canadian users can see missing messages and parity errors, these are Scintillation errors, and there is nothing they need to do as it is due to the equinox/solar maximum, and we just have to wait it out.

Matt reminds the group that there are situations where you may have to contact Customer Support for interference issues.

Q: Are there error flags or codes for messages affected by scintillation?

A: Not specifically, the same message processing statistics are applied like any other. Scintillation can result in one or more error codes.

Q: For timing errors - what is the smallest value it can be off by?

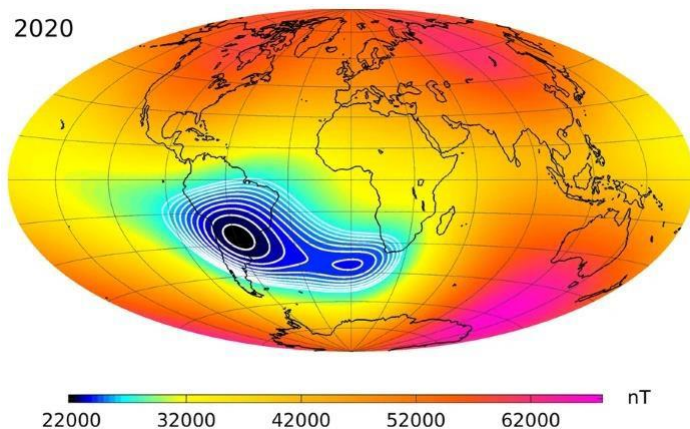
A: We are going to the millisecond, so - if you are completely off - you'll get a U, if it's touching the start time, you're outside the window, you'll get a T

Note - if DADDS knew where the DCP was, based on its position, it could calculate the path distance and then accommodate for travel paths.

Truncated messages do not have an informational message at the time, but this is in discussion.

With the sun's 11-year solar cycle we know that this will resolve in time. Solar flares will not necessarily affect just that area, it can cause outages in any latitude.

Matt showed a map where the geomagnetic anomaly is:



[By Christopher C. Finlay, Clemens Kloss, Nils Olsen, Magnus D. Hammer, Lars Tøffner-Clausen, Alexander Grayver & Alexey Kuvshinov - "The CHAOS-7 geomagnetic field model and observed changes in the South Atlantic Anomaly", *Earth, Planets and Space*, Volume 72, Article number 156 (2020), <https://earth-planets-space.springeropen.com/articles/10.1186/s40623-020-01252-9>, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=99760567>]



## [OpenDCS, LRGS](#)

This presentation begins at 6:28:25 on the audio file [Audio TWG Meeting Session 2](#)

### **OpenDCS, LRGS – Andrew Gilmore, Precision Water Resources Engineering**





Andrew brings us to GitHub to pick up the installer file [demo is on Linux, Windows would have minor differences]

[GitHub for files](#)

[Documentation](#)

When at GitHub, scroll down to Assets and select `opendcs-installer-7.0.12.jar` [ the largest file ] and begin the install process.

▼ Assets 12

 <code>opendcs-7.0.12-javadoc.jar</code>	9.41 MB	Feb 20
 <code>opendcs-7.0.12-javadoc.jar.asc</code>	659 Bytes	Feb 20
 <code>opendcs-7.0.12-sources.jar</code>	3.31 MB	Feb 20
 <code>opendcs-7.0.12-sources.jar.asc</code>	659 Bytes	Feb 20
 <code>opendcs-7.0.12.jar</code>	7.26 MB	Feb 20
 <code>opendcs-7.0.12.jar.asc</code>	659 Bytes	Feb 20
 <code>opendcs-7.0.12.pom</code>	9.12 KB	Feb 20
 <code>opendcs-7.0.12.pom.asc</code>	659 Bytes	Feb 20
 <code>opendcs-installer-7.0.12.jar</code>	153 MB	Feb 20
 <code>opendcs-installer-7.0.12.jar.asc</code>	659 Bytes	Feb 20
 Source code (zip)		Feb 20
 Source code (tar.gz)		Feb 20

When installing, you can select options or go with defaults.

You'll see the launcher GUI menu for OpenDCS, and he jumped right into the LRGS [Local Readout Ground Station] Status option to check the health of your system.

Andrew went through the LRGS Message Header demo in detail.

From there he went through Station Metadata - his example has existing data, but you could be starting out and entering information.

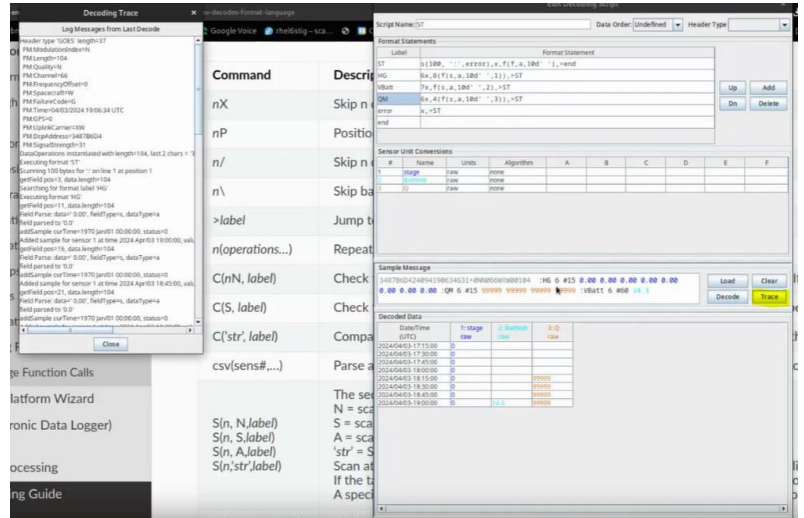
He then went on to Decoding. For decoding scripts to apply to incoming data, the most important part is your platform configuration. You will Add a Sensor [or Edit a Sensor] you will need the channel, the script, the address and the medium [characteristics of the platform].

Andrew gave an example of decode with a format statement scanning for sensor names and explaining each code, then showing the results. If you'd like to go deeper, you can click the TRACE button and see

the code behind it.

For messages in Pseudo Binary, there is more data than you can fit into this ASCII space, you will have to count and skip count characters, this being the trade-off for packing more characters in messages.

He encourages folks to use a repository for decode statements. This will be a consideration for Replacement DADDS.



LRGS Status links are on the DADDS Website [LRGS Status](#)

Note : To register for an LRGS user account, please contact the WCDAS DCS Operations staff at 757-824-7450

[LRGS Message Header Reference](#)

[Decoding Script Format Language](#)

[Code and Issues](#)

[Mailing List](#)

## OTT Hydromet

*This presentation begins at 7:17:39 on the audio file [Audio TWG Meeting Session 2](#)*

### **OTT Hydromet – Siva Telasula, Hydromet**

Siva opens with the long history of Hydromet starting in 1875, showing the different brands they have in vertical markets. They have applications for solving environmental challenges facing growing populations and extreme weather.

He went into each area of expertise: Climatology, Meteorological Observations, Renewable Energy, Agricultural Meteorology, Surface Water Quantity, Flood Warning, Groundwater and Water Quality.

He states that they partner with their customers to understand their needs, develop solutions to improve products and solve problems together.

The SatLink3 Family history was an example where some customers did not need all of the capabilities so they developed a new product SatLink3 LITE, which is designed for GOES. He explained the differences, mainly being that the LITE version is Transmitter only with no logging capability, no python scripting, and purports to have very little learning curve.

Projects were shown with various uses of equipment and conditions around the world and the impact it had on local residents such as cloud height prediction, flood warning and others.

## **Wrap Up**

*This presentation begins at 7:38:15 on the audio file [Audio TWG Meeting Session 2](#)*

### **Wrap Up – William “Skip” Dronen, NOAA DCS Program Manager**

Skip thanks all for their participation, mentions that the artifacts will be available on the website.

Another call for DCPC Commitment Letters, that should not be seen as a commitment, but an expression of interest.

He welcomed people to contact the Support Office for topics for a Virtual Training Day, TBD.

Letecia and Skip are interested in doing on-site outreach visits, and welcome suggestions for locations.

There will be an Open DCS Workshop September 17-19 at Western Illinois University - Hybrid in-person/virtual. More information at the GitHub page or contact [Nathan.Holcolm@noaa.gov](mailto:Nathan.Holcolm@noaa.gov).

## **Appendix I: Action Items**

- Security concerns regarding Lat/Lon Locations and using a 'close to' address or mask locations [upon request] on public facing portal
- Timing, frequency or conditions to trigger Lat/Lon messages
- DCP/Two-Way Communication Security

## Appendix II: Agenda

<b>GOES DCS Data Collection Platform (DCP) Standards and Certifications Workshop Video Presentations Timeline</b>		
<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
52:49:00	Welcome & Introduction	Skip Dronen
55:27-1:18:14	GOES DCS Update	Skip Dronen
1:21:17	GOES DCS Customer Service Update	Letecia Reeves
1:43:08-2:18:51	Wallops Update	Matt Sullivan
2:37:56-2:54:45	HRIT/EMWIN Update	Ian Avruch
3:07:50-3:56:30	GOES and GeoXO	Daniel Gillies
3:58:00-4:05:35	Motus Project DCS Integration	Daniel Gillies
5:23:40-5:48:01	Manufacturer Report – Microcom	Brett Betsill
5:54:01-6:14:23	USER Report - USDA	Lucas Zukiewicz

**GOES DCS Protocol and DCP Commanding (DCPC) Stakeholder Day Video Timeline**

<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
28:05-30:08	Welcome & Introduction	Skip Dronen
30:12-1:26:35	Latitude & Longitude	Skip Dronen
1:38:05-1:42:05	Communication Protocols	Skip Dronen
1:42:23-2:04:18	Communication Protocols & Demo	Brett Betsill
2:19:06-2:59:26	DCPC/Two-way communication	Skip Dronen
2:59:37-3:23:32	DCPC/Two-way communication & Demo	Brett Betsill/Matt Ceanfaglione
4:58:00-5:14:05	Updating a Platform Table in DADDS	Letecia Reeves
5:16:02-5:34:01	Applying and Saving Filters & Demo	Matt Ceanfaglione
5:34:53-6:22:32	DCS DADDS Troubleshooting & Statistics	Matt Ceanfaglione
6:28:25-7:17:00	OpenDCS /LRGS	Andrew Gilmore
7:17:39-7:38:07	OTT Hydromet	Siva Telasula

### Appendix III: Attendees

**In-Person attendance**

First Name	Last Name	Email Address	Organization
Aaron	Harris	<a href="mailto:aaron.harris@noaa.gov">aaron.harris@noaa.gov</a>	NOAA/NOS
Brett	Betsill	<a href="mailto:bbetsill@microcomdesign.com">bbetsill@microcomdesign.com</a>	Microcom Design Inc.
Christine	Kuhner	<a href="mailto:christine.j.kuhner@noaa.gov">christine.j.kuhner@noaa.gov</a>	NOAA NESDIS WALLOPS
Curtis	Generous	<a href="mailto:curtis.generous@aem.eco">curtis.generous@aem.eco</a>	AEM
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