Receiving Weather Satellite Images Using SatDump

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2 years ago · Updated

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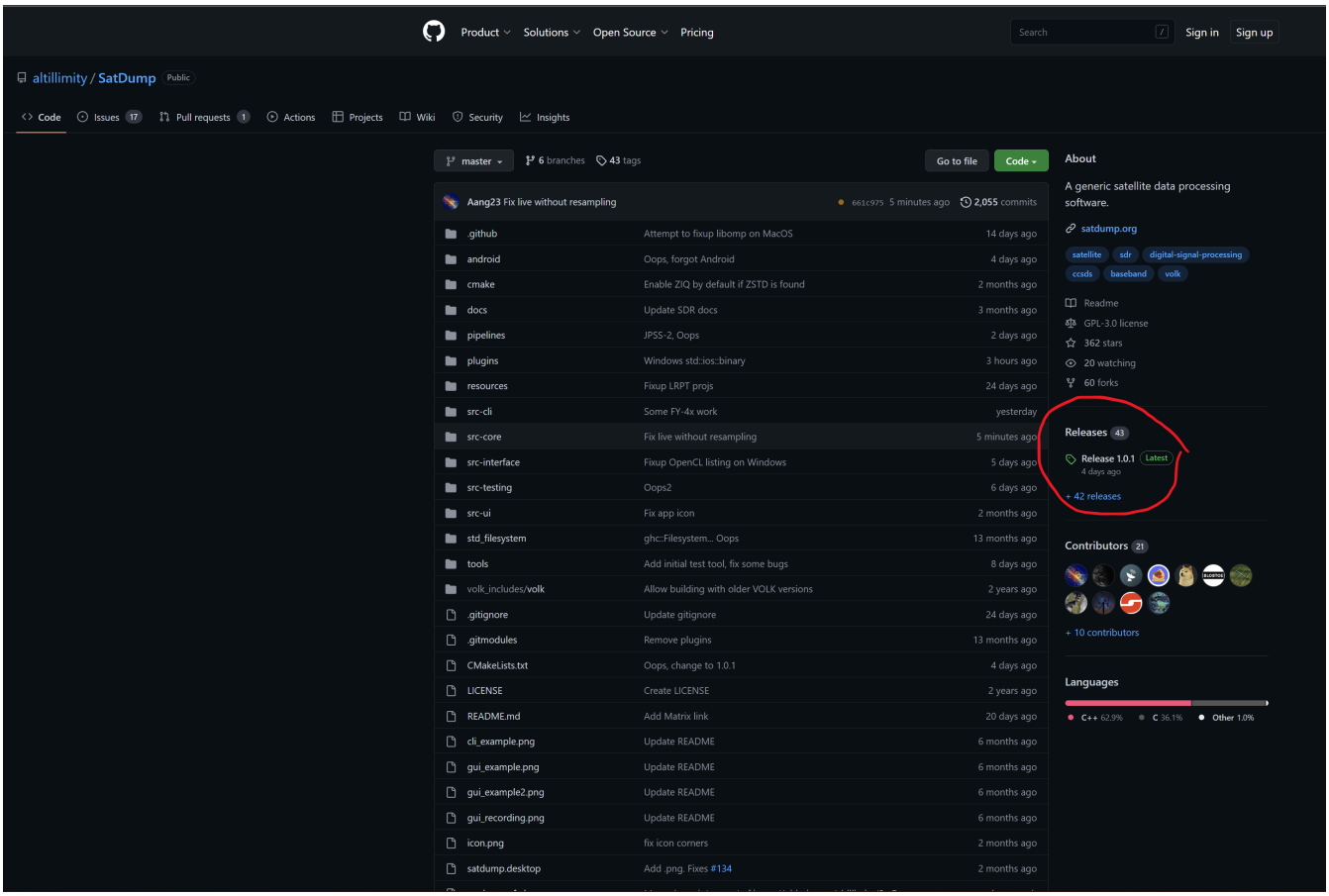
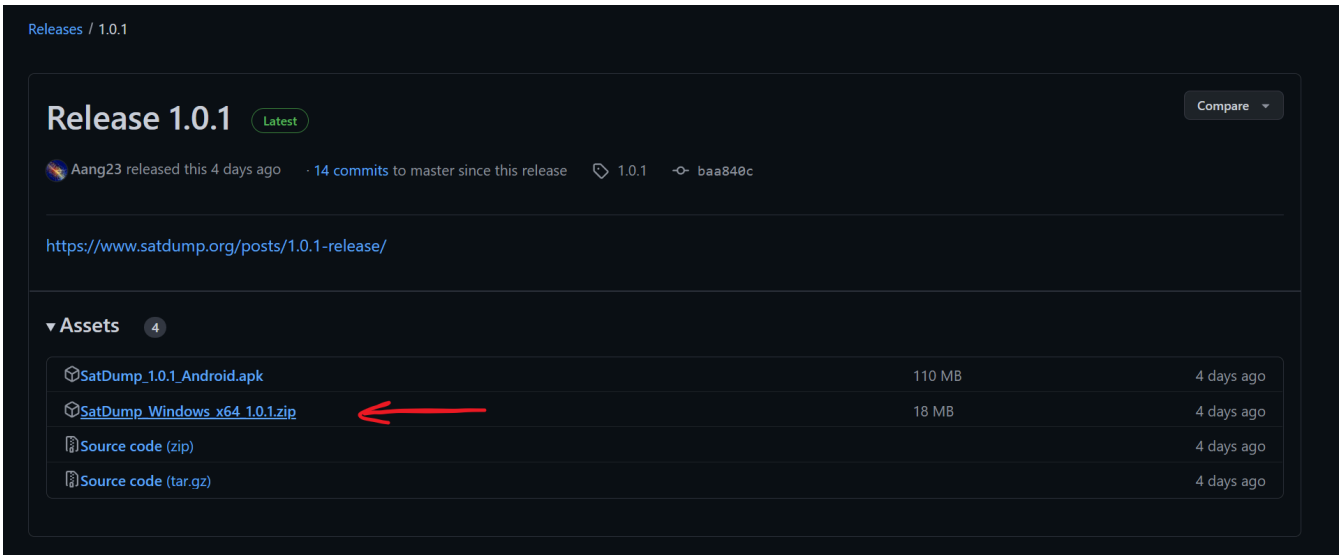
A generic satellite data processing software that can help you receive and decode weather satellite data and works very well with our GOES weather satellite SDR bundle.

Navigate here to download the free and open-source SatDump.

The latest release can be seen on the right-hand side under “Releases” as shown in the screenshot below.



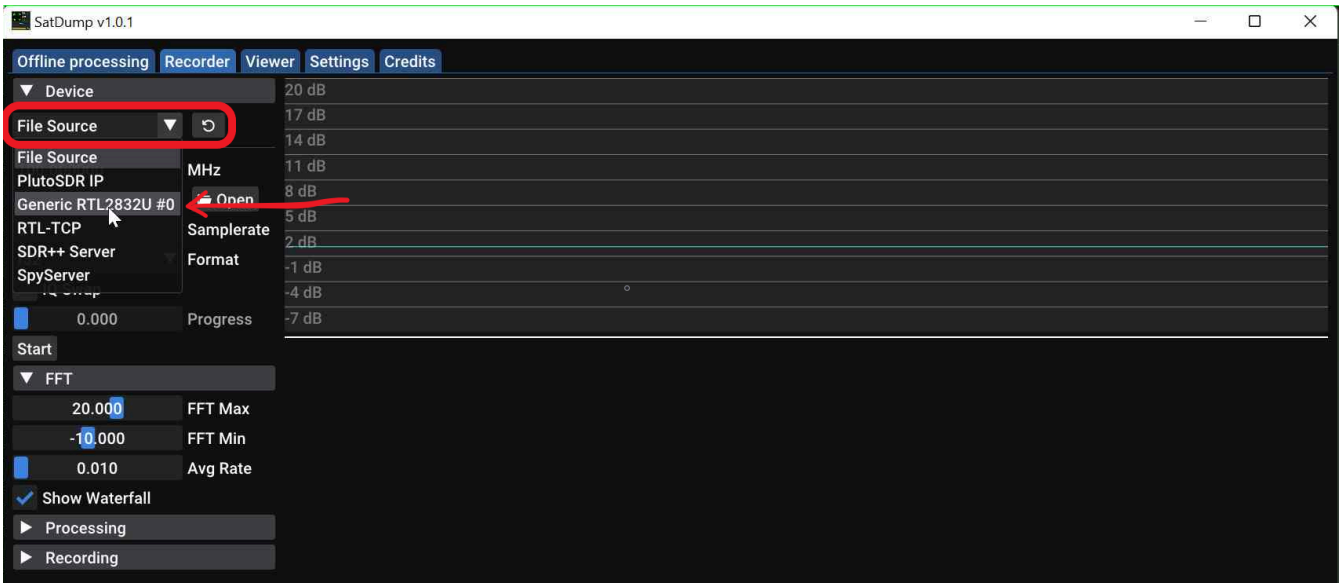


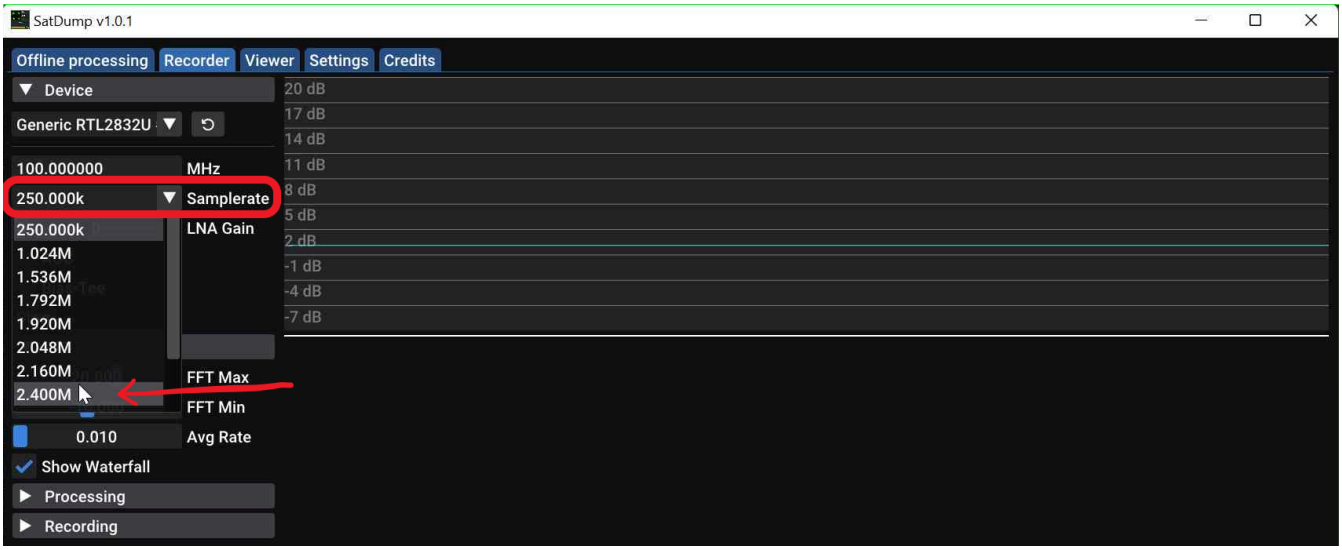
Download and extract the latest version to C:\ and run the application through *satdump-ui.exe*.

Note: *Before running the application, make sure you have plugged in your NESDR device and that you have set up the GOES antenna by following the hardware setup instructions.*

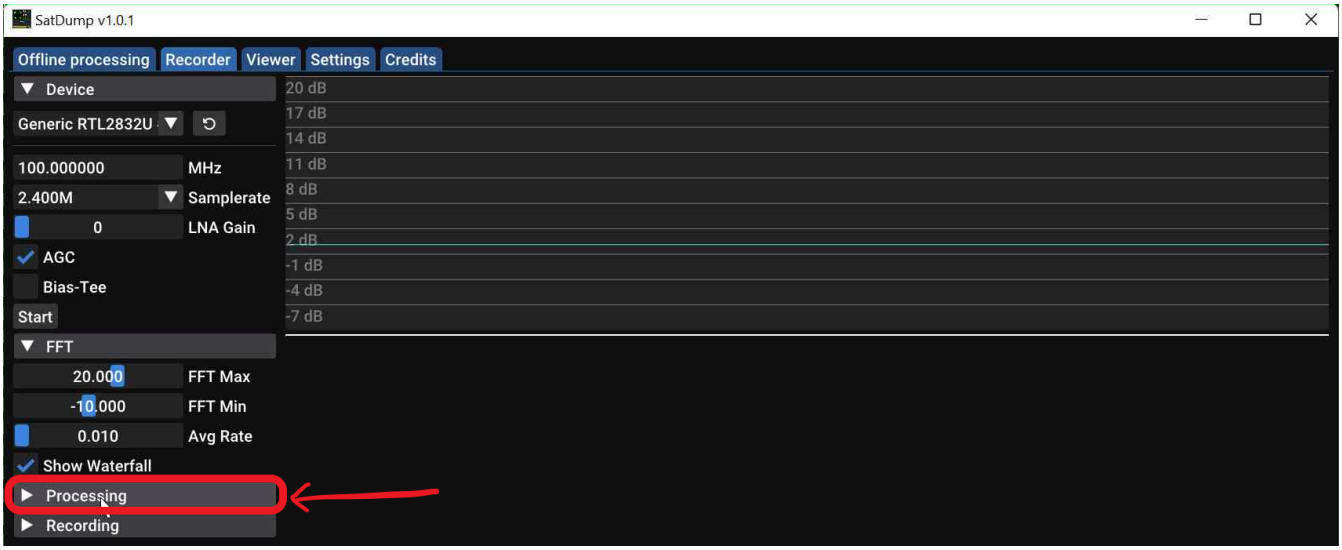
In this guide, we will use the “Recorder” tab in SatDump, which dumps weather satellite images in live mode while the NESDR device is running.

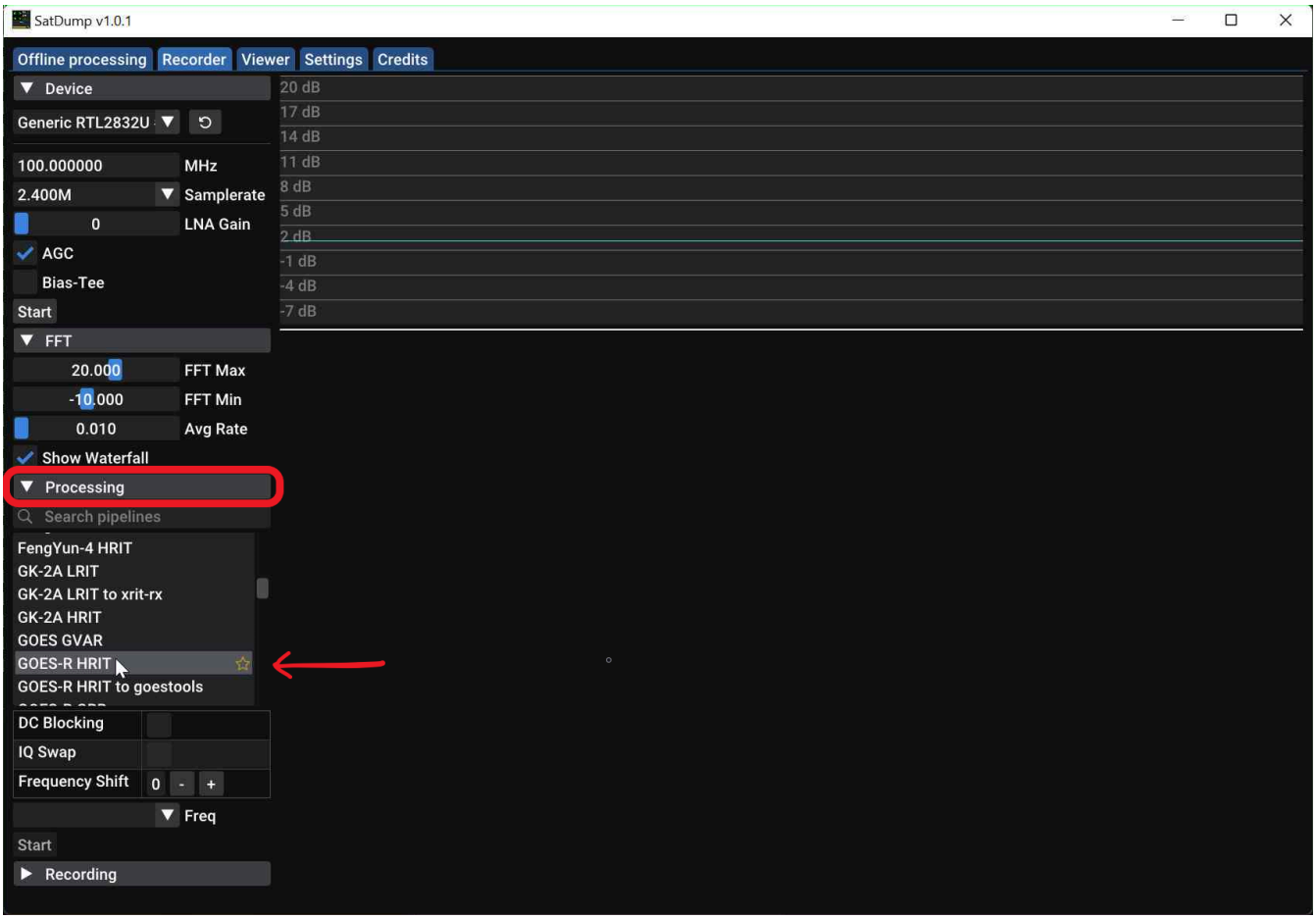
On the main window, make sure you choose your RTL2832U SDR device, select a proper sampling rate (2.4MSPS is safe), and check the “AGC” checkbox or simply drag the gain all the way up. That is necessary and will help improve signal reception.

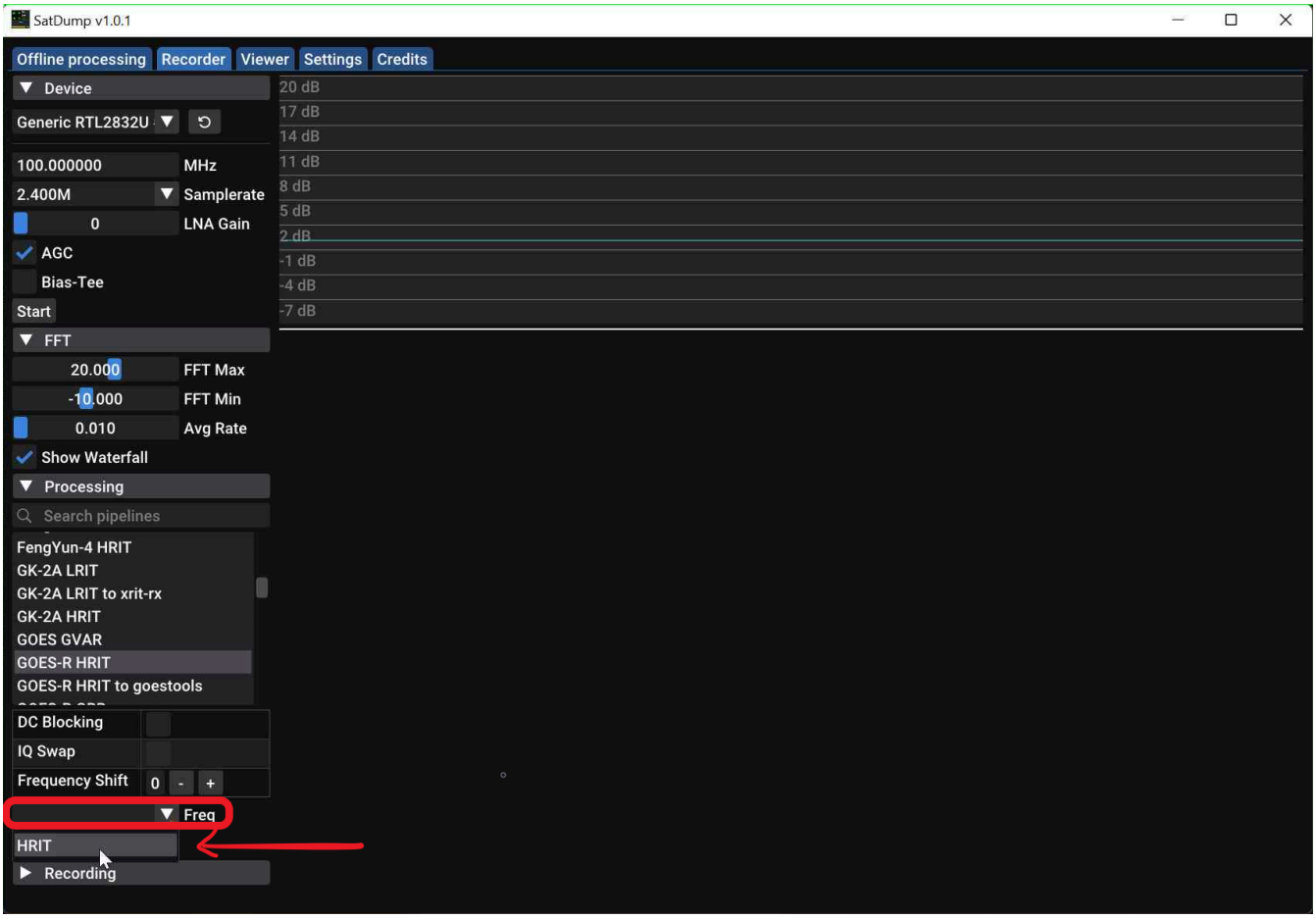




Once finished setting up the SDR of choice, gain, and sampling rate, expand the “Processing” tree and choose GOES-R HRIT from the long list. Next, expand the drop-down menu under “Freq” and select “HRIT”, as shown in the next few screenshots. You will notice that the main frequency “MHz” will change to 1694.1 MHz.




SatDump v1.0.1
Offline processing
Recorder
Viewer
Settings
Credits
Device
Generic RTL2832U
100.000000
MHz
2.400M
Samplerate
0
LNA Gain
AGC
Bias-Tee
Start
FFT
20.000
FFT Max
-10.000
FFT Min
0.010
Avg Rate
Show Waterfall
Processing
Search pipelines
FengYun-4 HRIT
GK-2A LRIT
GK-2A LRIT to xrit-rx
GK-2A HRIT
GOES GVAR
GOES-R HRIT
GOES-R HRIT to goestools
DC Blocking
IQ Swap
Frequency Shift
0
-
+
Freq
Start
Recording
20 dB
17 dB
14 dB
11 dB
8 dB
5 dB
2 dB
-1 dB
-4 dB
-7 dB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FFT
20.000
FFT Max
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Show Waterfall
Processing
Search pipelines
FengYun-4 HRIT
GK-2A LRIT
GK-2A LRIT to xrit-rx
GK-2A HRIT
GOES GVAR
GOES-R HRIT
GOES-R HRIT to goestools
DC Blocking
IQ Swap
Frequency Shift
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Recording
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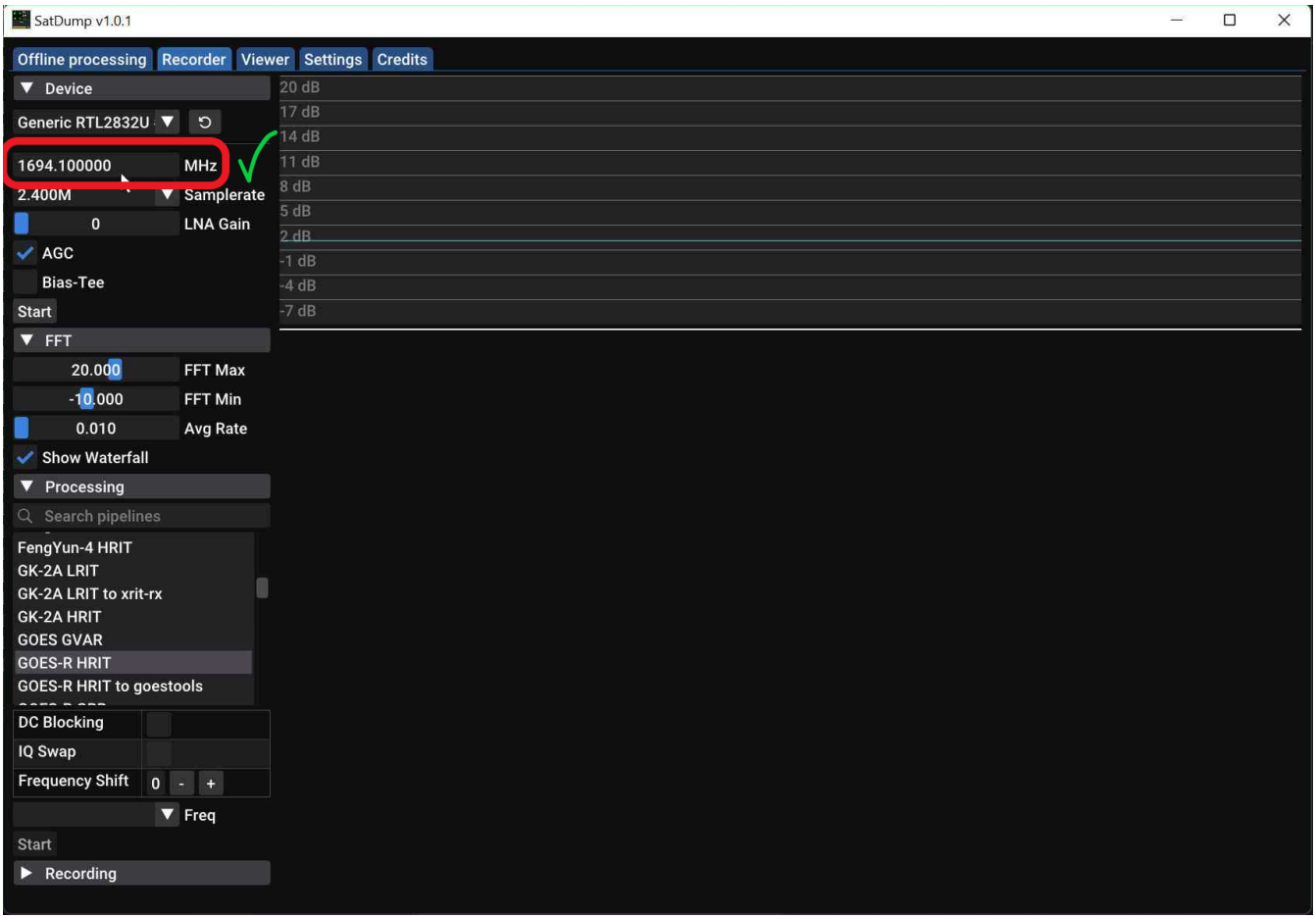
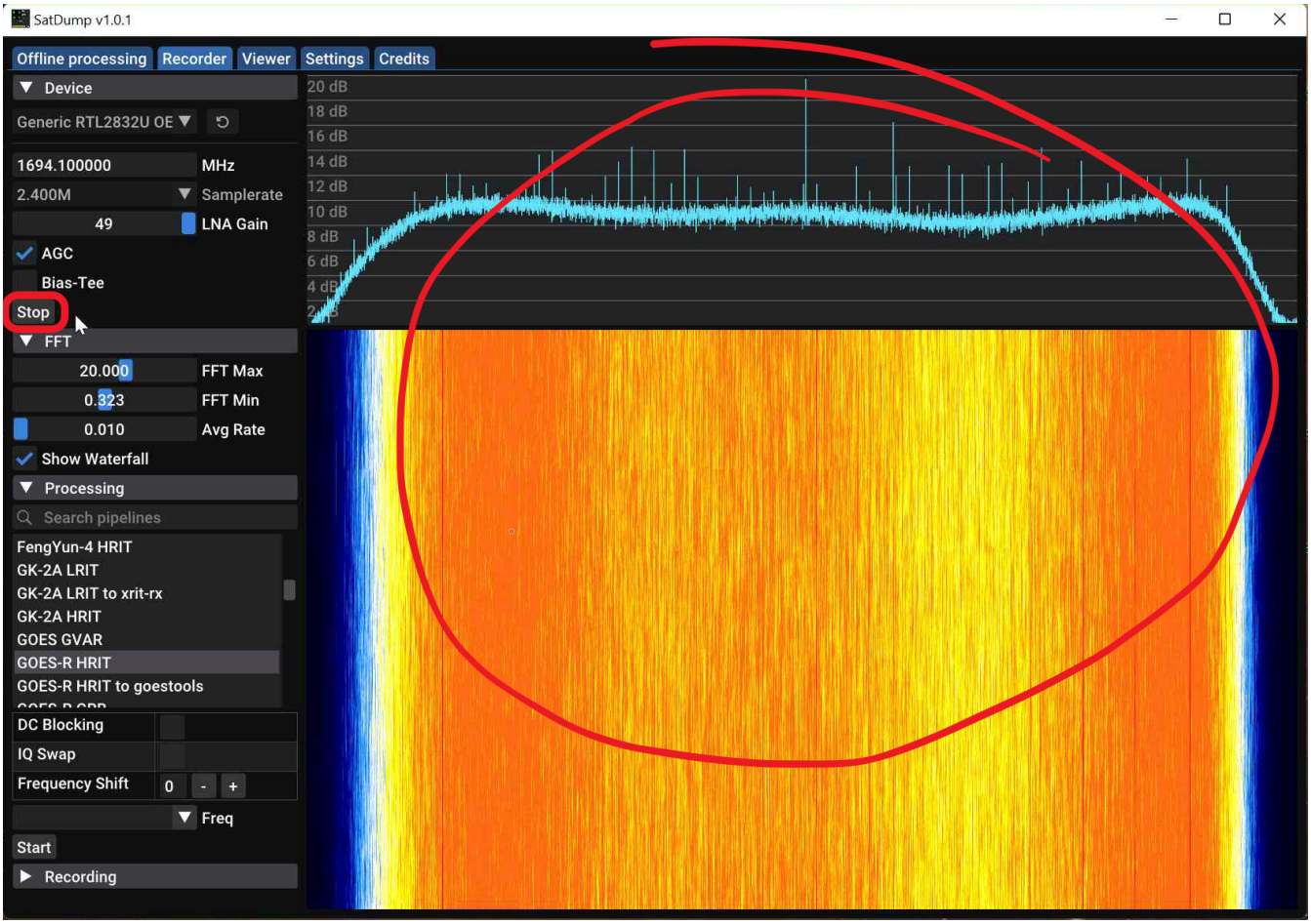
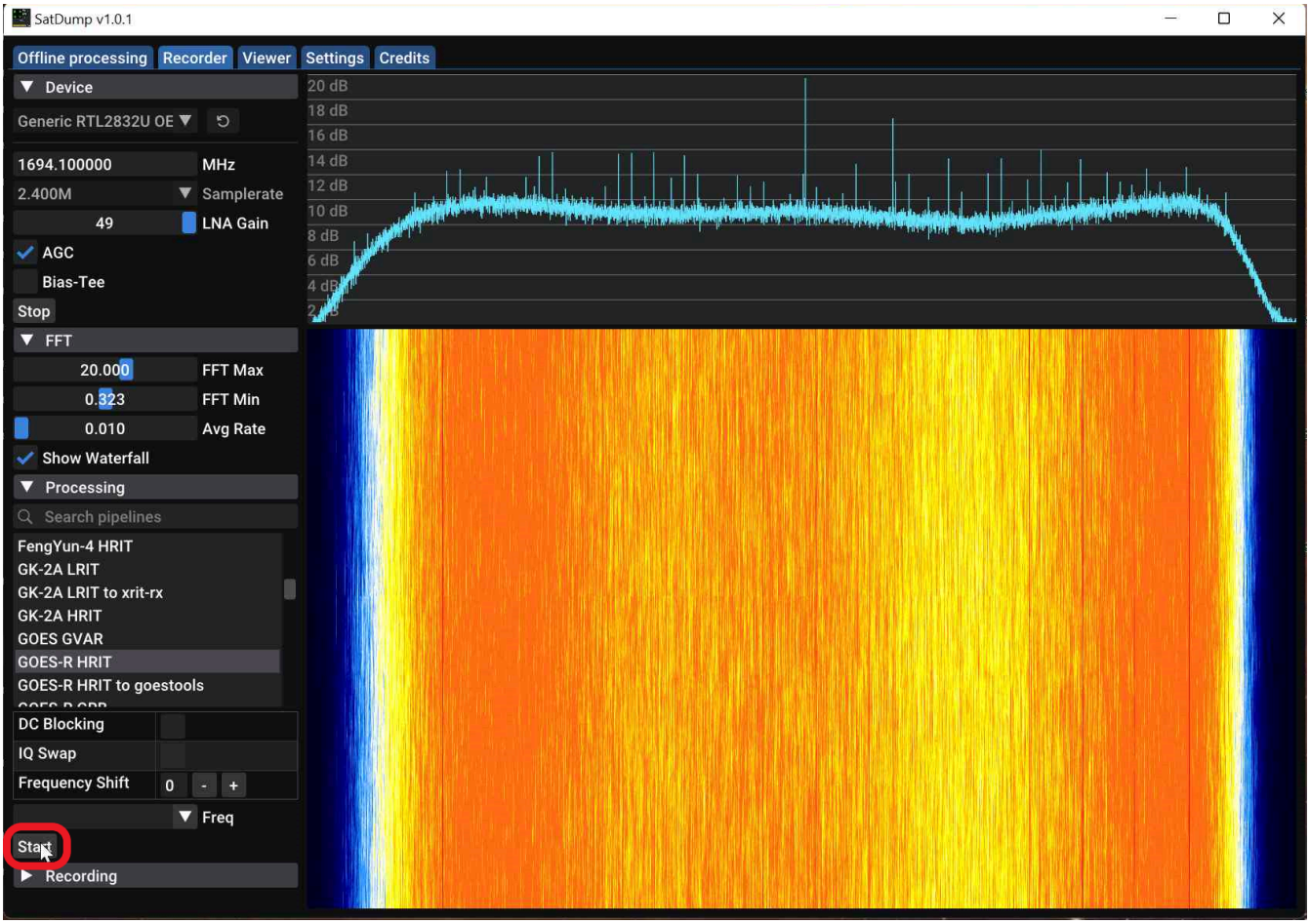
11 dB
8 dB
5 dB
2 dB
-1 dB
-4 dB
-7 dB



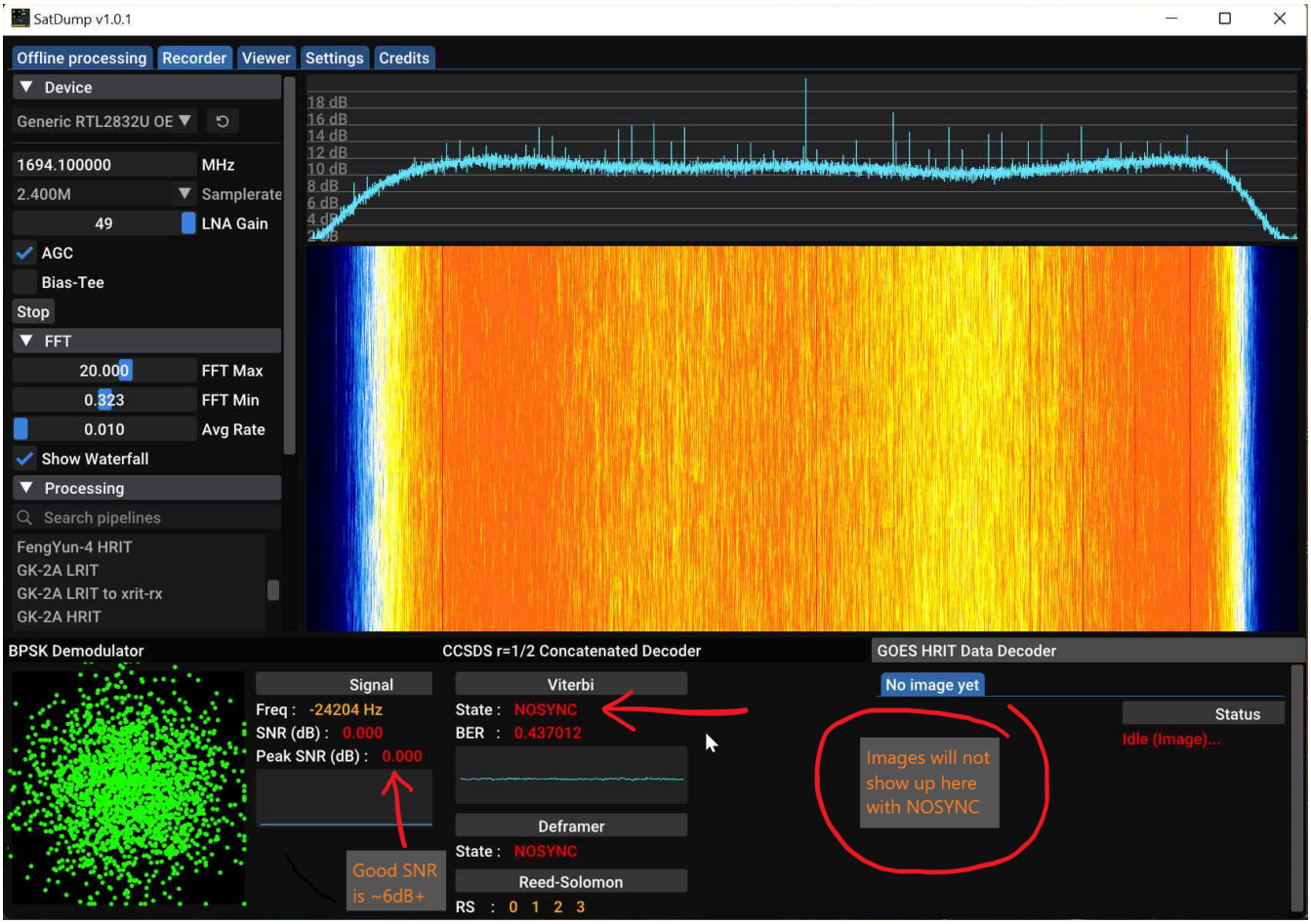
Once done, click start to start receiving. You should see a spectrum similar to the one in the screenshot.



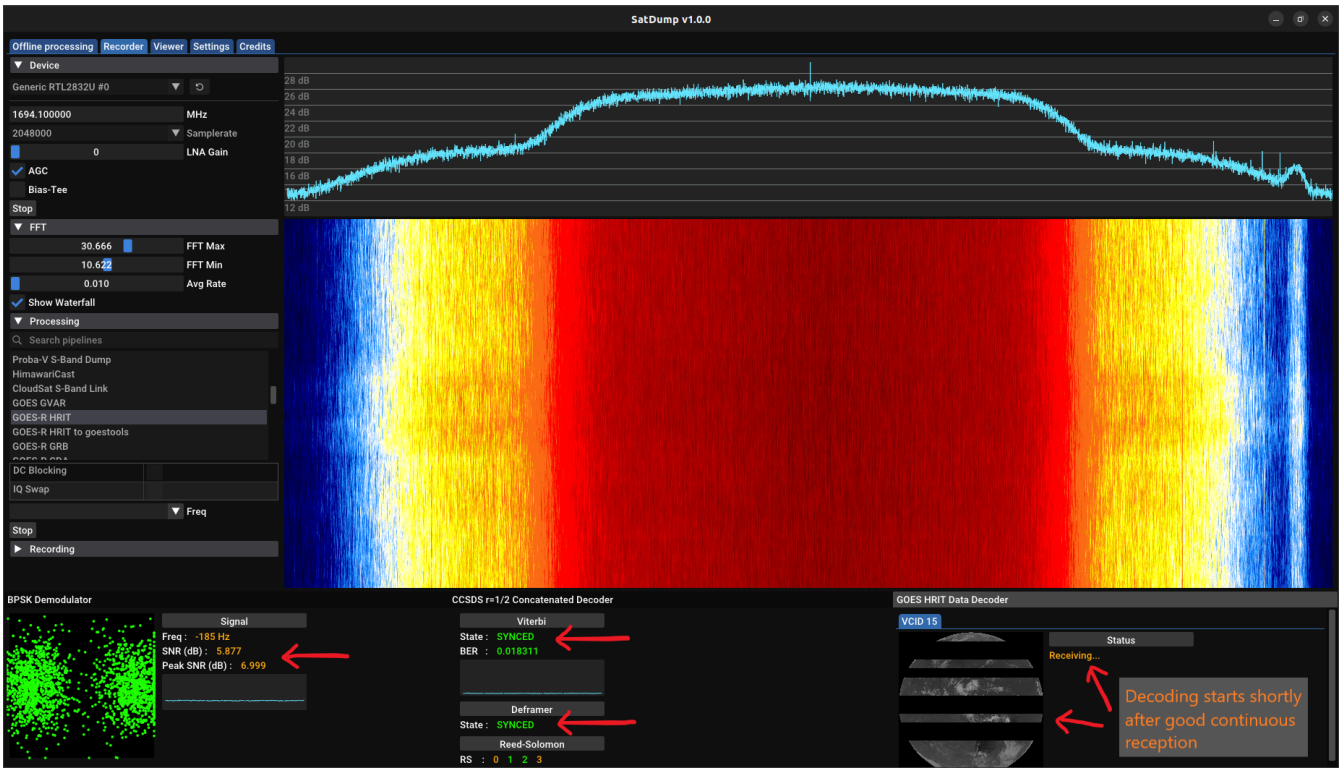
One more time, make sure LNA Gain is slid up or check the AGC checkbox. This is necessary when receiving GOES Weather satellite images. Also, try not to go below 2.048MSPS as a sampling rate for your NESDR device since you will be looking at a relatively wide bandwidth for this application.



Now navigate to the bottom of the "Processing" tree and hit the "start". This will start the decoding process. You need to make sure you have enough SNR (~6dB and more) for good reception. Below is an example of how SatDump looks without a proper GOES signal fed into the NESDR device.

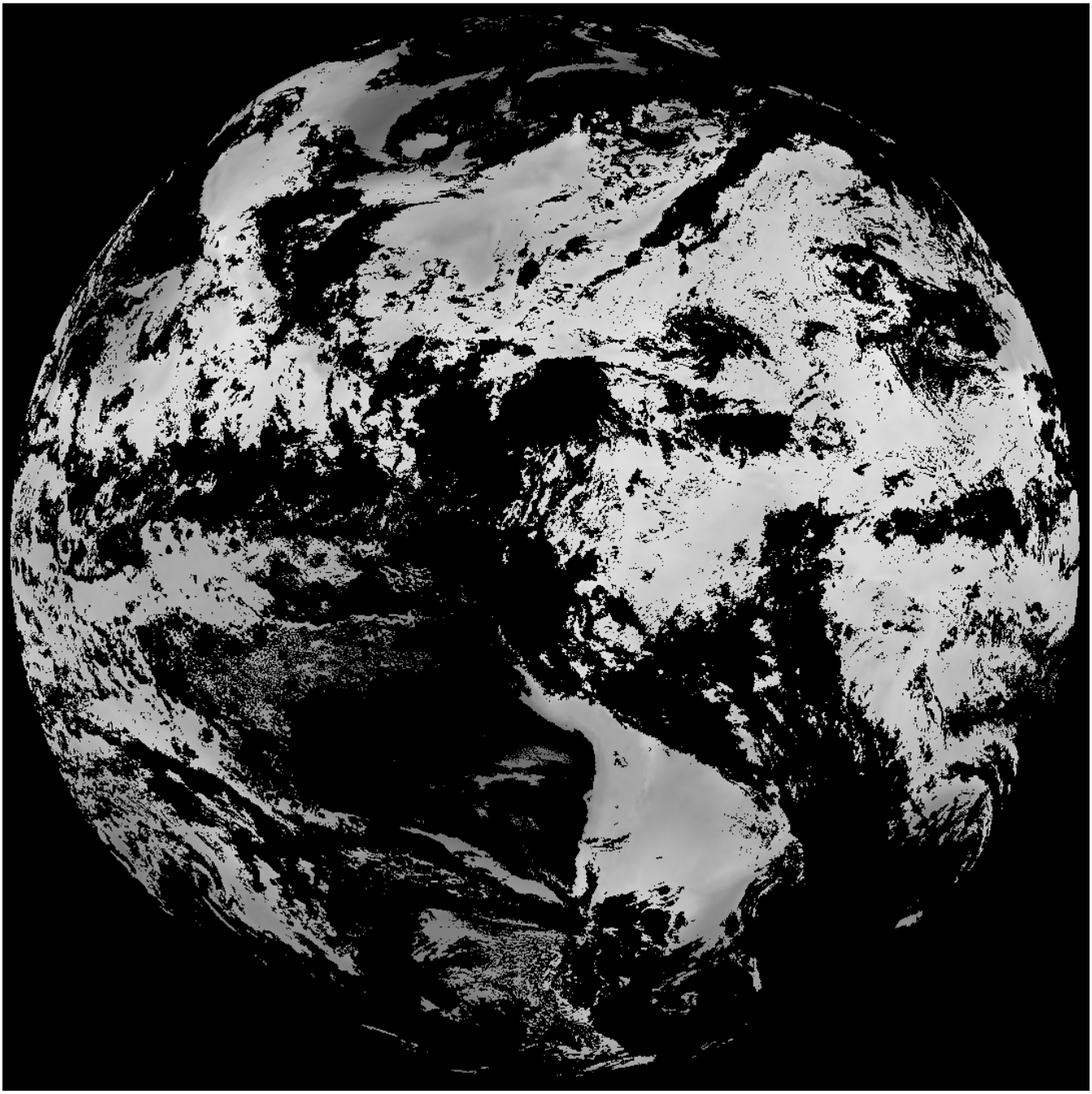


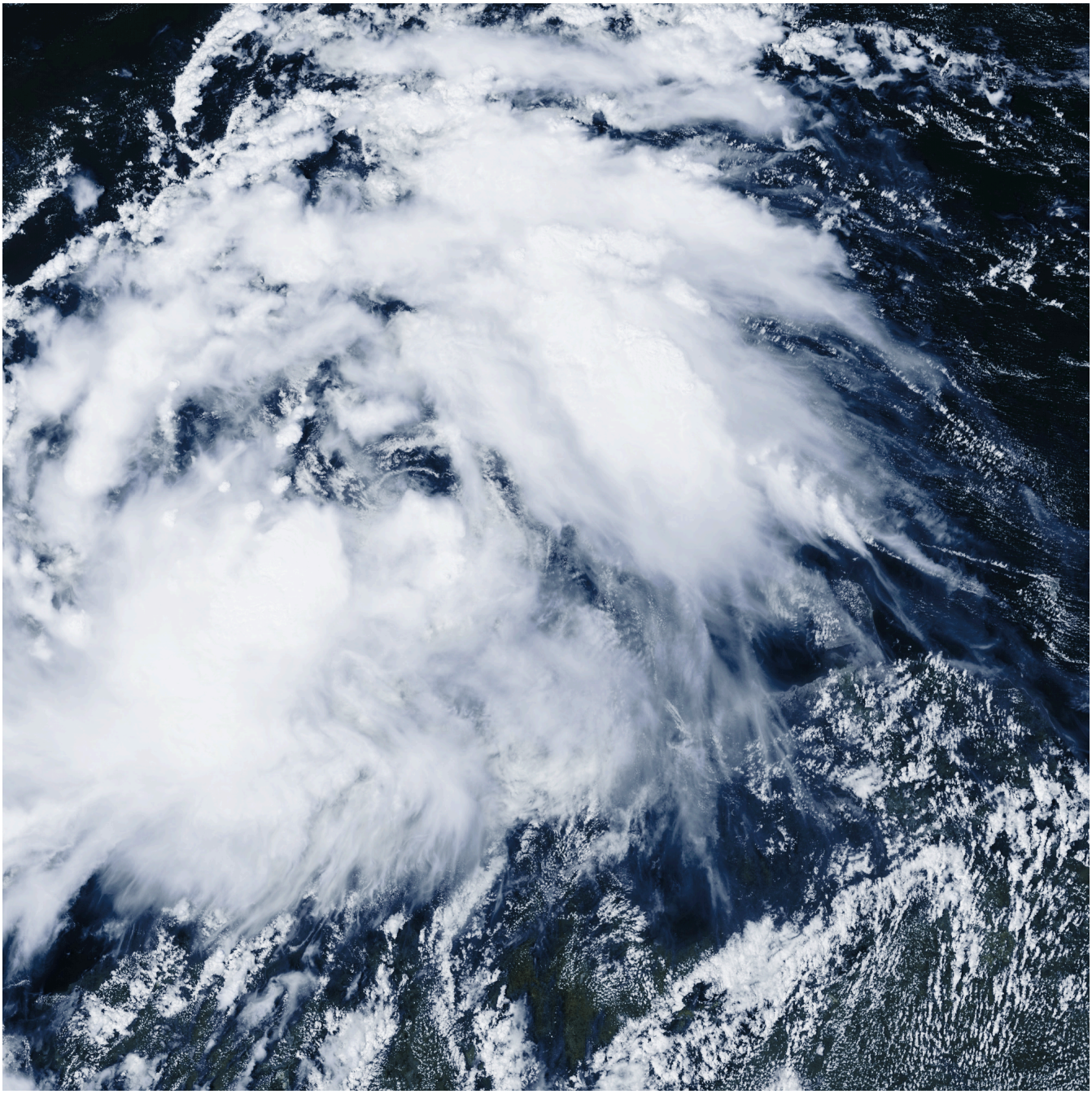
The next screenshot shows SatDump with good SNR and with a partially decoded "Full Disk" image for your reference.

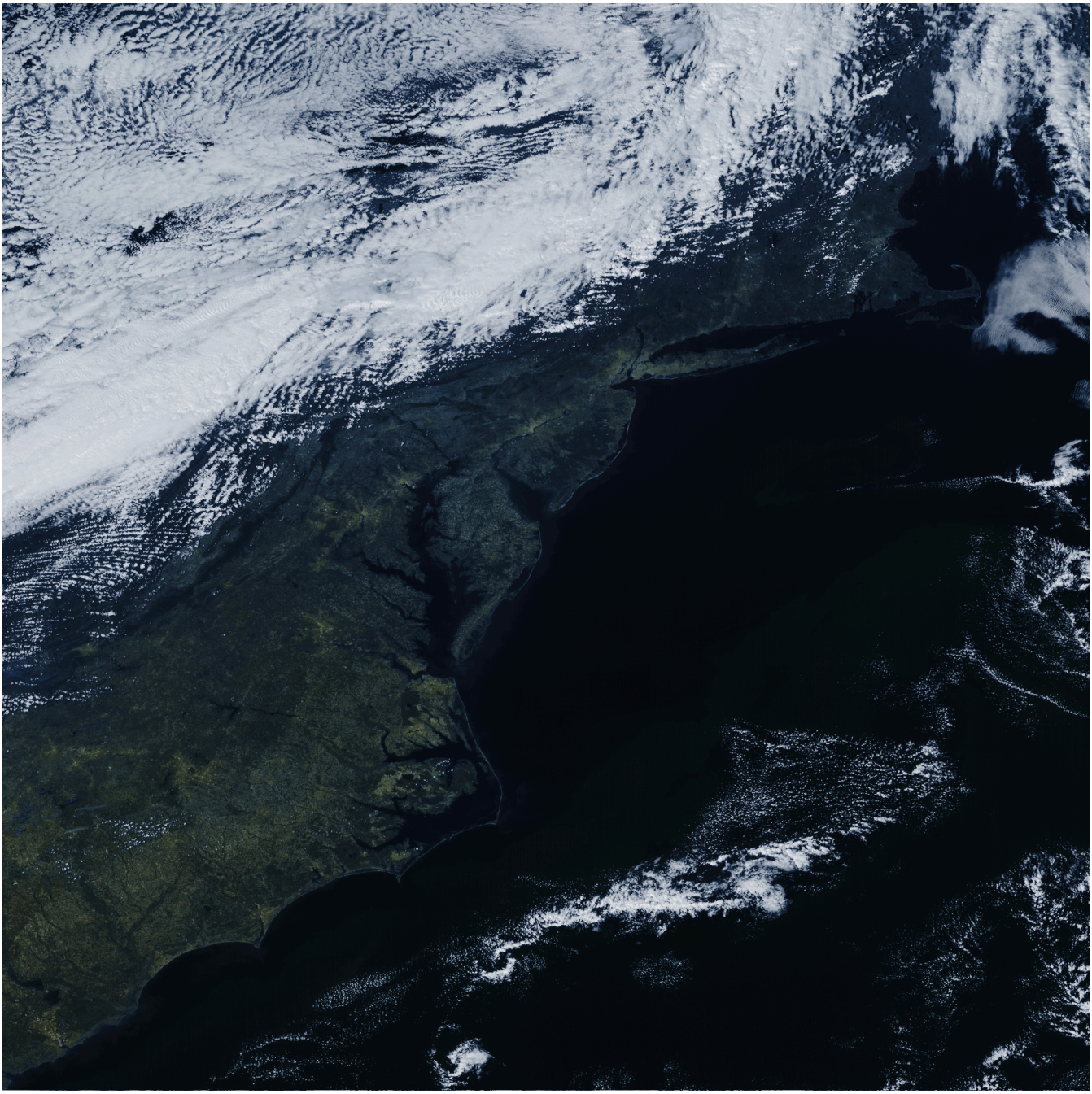


All images are saved to \IMAGES under SatDump folder.

Examples of successful readings:







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