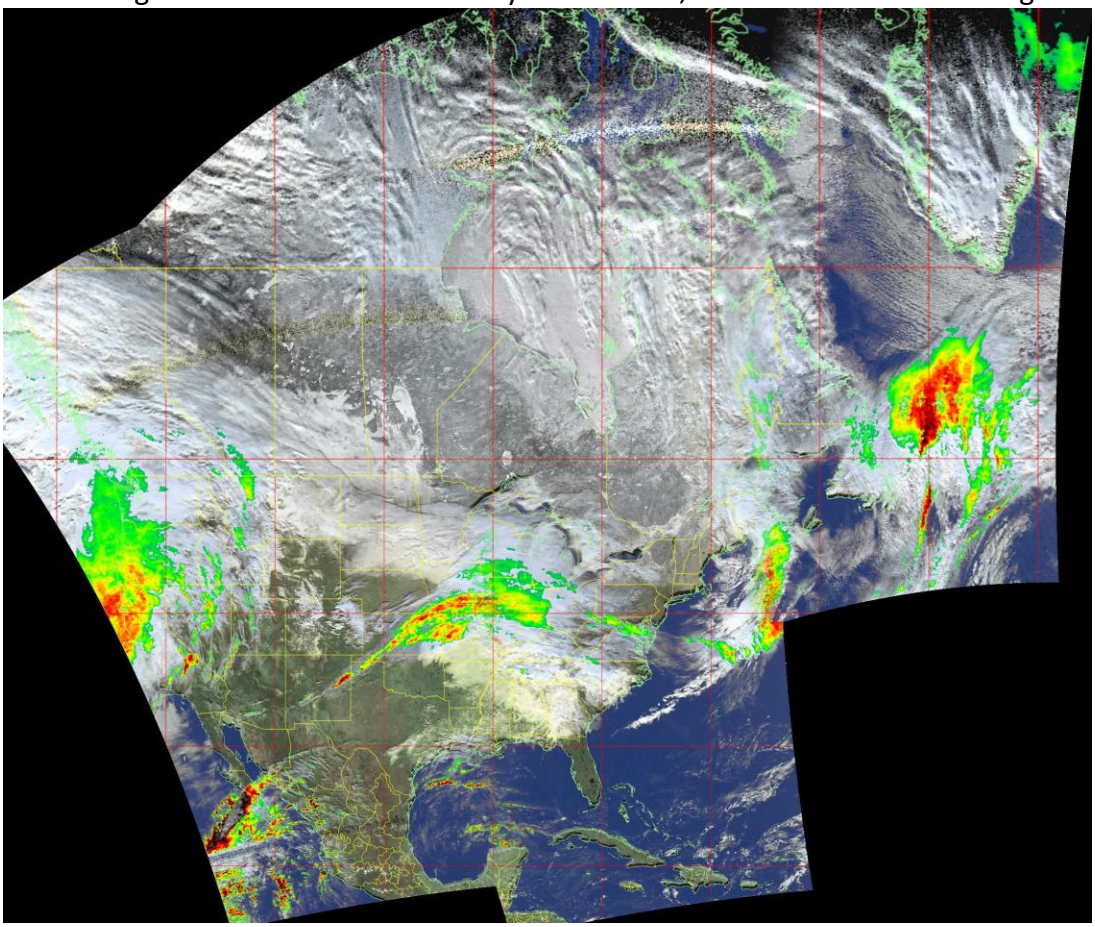
Q:
I was doing a demo of ham radio for my son's friend, and showed him this image.



He asked about how they were received and made, and I realized that I only have a general idea of the process. Is there a description of how these images are created that I can point people to?

A:
Great question by your students! Weather satellites like NOAA 19 carry instruments called radiometers (like cameras) that scan the Earth to form images. The satellite rotates and two cameras, one visible and one infrared, spins, collecting one line of data at a time. The measurements these instruments make are in the form of electrical voltages, which are digitized and then transmitted to receiving ground stations. Signals transmitted from passing NOAA weather satellites are received by specially designed turnstile, quadrifilar helix or other weather satellite antennas. These antennas are mounted on the roof of a house or other structures and connected with coax feed line to a weather fax receiver like the Hamtronics R-139 or the R-303 receiver. Demodulated audio from the R-139 or R-303 receiver is connected to the line-in of a computer's sound card. Using a program called WXtoImg, audio from the sound card is saved on the computer's hard drive as a wave file. The software then processes the wave file and converts it to an image. The image is then overlaid with a map and text, and then uploaded to the website or just saved on the computer's hard drive.