



TeraScan® Direct Reception of NPP: Post-Launch Results

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Abstract

With the launch of NPP in October, 2011, the first in a new series of U.S. direct readout satellites will be coming into operations. In 2015, this will be followed by another new series, GOES-R. SeaSpace Corporation has been making plans for the launch of NPP for over a year. This presentation will cover the preparations that SeaSpace undertook to ready itself, and the members of the direct broadcast community that are SeaSpace Customers, for direct reception and processing of NPP VIIRS data. Additionally, post-launch processing results will be shared, along with lessons-learned, to apply to the readiness planning of future direct broadcast satellites such as GOES-R.

Communication with Customers

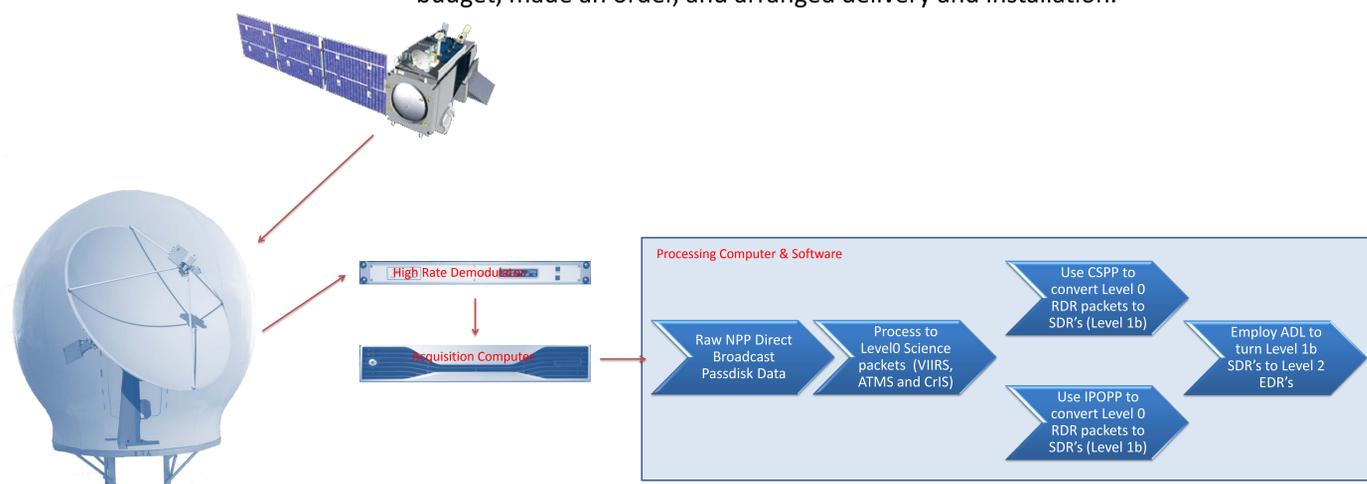
SeaSpace Corporation began a full-fledged communication campaign with customers two years prior to launch. This included an internal review of current customer systems, identifying approximately fifty direct readout ground systems that could currently be upgraded for NPP capability. In April 2010 we mailed out technical marketing material and budgetary quotations to this set of customers, urging them to plan for this upgrade. This upgrade would include both mandatory hardware and software items. SeaSpace also started informing the greater marketplace of the hardware and software necessary for the acquisition and processing of NPP. After this time SeaSpace continued contact with interested parties as they acquired the budget, made an order, and arranged delivery and installation.

Communication from the U.S. Government

Upgrades to SeaSpace's proprietary software, TeraScan®, occurred behind the scenes and required input from the U.S. government. In October 2010, SeaSpace applied to NOAA for access to VIIRS proxy data, which required a government sponsor, and an NDA and citizenship verification to be signed by all employees of SeaSpace that may have access to the data. Since 2010, SeaSpace has been running an early version of IPOPP (International Polar Orbiter Processing Package) from NASA that generated NPP prototype products based on MODIS. SeaSpace is still waiting for an IPOPP version that will process actual NPP RDR's to SDR's. In December 2011, SeaSpace became a beta test partner for the CSPP (Community Satellite Processing Package) from University of Wisconsin SSEC, which is currently integrated into TeraScan®.

Hardware Requirements

Acquisition of NPP requires an antenna with an X-band feed in combination with a high-rate demodulator. SeaSpace is complimenting these with a quality acquisition computer and an extremely high powered processing computer called REPS™. REPS™ is currently used at SeaSpace for processing of all MODIS products within five minutes. This processing scheme will be transferred to enabling processing of all NPP VIIRS products in a similar time.



Software Requirements

SeaSpace customers will eventually have the choice to run either CSPP or IPOPP processing of NPP data within TeraScan®. The first version of TeraScan® released will include the completed version of CSPP (CSPP expected to be available February 2012). The process is the same whether CSPP or IPOPP is used, and is transparent to the user. After reception, the raw NPP direct broadcast passdisk data is processed to Level 0 science packets for VIIRS, ATMS, and CrIS. The Level 0 RDR (Raw Data Record) packets are then fed through CSPP or IPOPP where it is converted to Level 1b SDR's (Satellite Data Record). TeraScan® then employs Algorithm Development Lab (ADL) to convert Level 1b SDR's to Level 2 EDR's (Environmental Data Record).

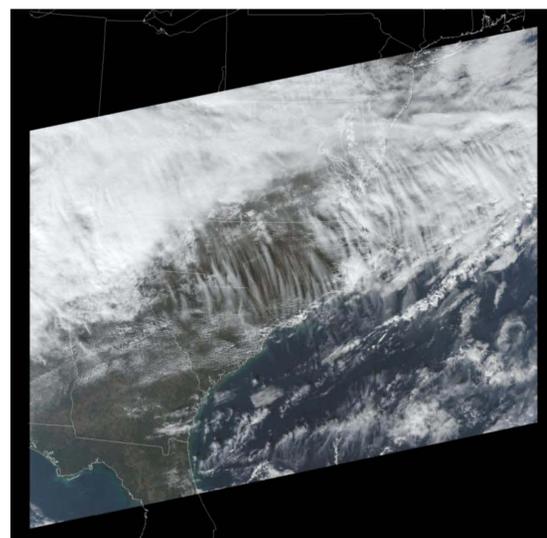
Current Status and Results

Twenty-two current SeaSpace customers have either received, or will imminently receive, the hardware necessary for NPP direct broadcast reception and processing. TeraScan® for NPP acquisition and processing, with the operational CSPP package, is expected to be available for installation approximately one to two months after the operational CSPP package is released. SeaSpace Corporation is eagerly awaiting the direct broadcast of NPP data to turn on. This was originally scheduled to take place January 11, 2012, but has since been postponed by NOAA and NASA to a date yet to be decided. When the direct broadcast is started, SeaSpace will then be able to test the processing scheme from acquisition of signal from the satellite through to production of level 2 products. Current TeraScan® processing results using data downloaded to the NOAA ground segment is shown on the right.

Recommendations

Based on our experience in introducing a direct readout solution to SeaSpace Customers, we have come up with a set of recommendations for future satellites.

- The government should view private industry providers, such as SeaSpace, as a conduit to reach a larger number of users
- The government should get private industry providers involved earlier in the alpha and beta testing of software
- The government should remove barriers (such as NDA's, citizenship requirements) to access non-sensitive data, and distribute them in a more open manner (such on the web)



NPP VIIRS Image Processed by TeraScan®



Please visit us online or at booth #333

SeaSpace has learned that customers require a three-year lead time for budget planning, and therefore we have already started to issue information and budgetary quotes for hardware and software, for the upcoming launch of GOES-R in 2015.