Abstract

Polar-orbiting multi-band meteorological sensors such as those on the Aqua, Terra, and Suomi NPP satellites pose substantial challenges for taking imagery the last mile to forecast offices, scientific analysis environments, and the general public. To do this quickly and easily, the Cooperative Institute for Meteorological Satellite Studies (CIMSS) at the University of Wisconsin has created an open-source, modular application system, Polar2Grid. This bundled solution automates tools for converting various satellite products like those from MODIS and VIIRS into a variety of output formats, including GeoTIFFs, AWIPS compatible NetCDF files, and NinJo forecasting workstation compatible TIFF images. In addition to traditional visible and infrared imagery, Polar2Grid includes three perceptual enhancements for the VIIRS Day-Night Band (DNB), as well as providing the capability to create sharpened true color, sharpened false color, and user-defined RGB images. Polar2Grid performs conversions and projections in seconds on large swaths of data. Polar2Grid is currently providing VIIRS imagery over the Continental United States, as well as Alaska and Hawaii, from various Direct-Broadcast antennas to operational forecasters at the NOAA National Weather Service (NWS) offices in their AWIPS terminals, within minutes of an overpass of the Suomi NPP satellite. Collaboration with the open source PyTroll group will provide the community with the functionality of Polar2Grid in a unified set of easy to use python packages. Four years after Polar2Grid development started, the Polar2Grid team has released version 2.0 of the software, supporting more sensors, generating more products, and providing all of its features in an easy to use command line interface.

Polar2Grid Software Processing Chain

Polar2Grid is partitioned into three major segments: a Front End which abstracts away the specifics of a given instrument and provides well-conditioned swaths and geolocation; a reusable transformation core using a variety of algorithms and implementations to convert swaths to grids; and a Back End which converts the gridded data to display ranges and exports in destination-system file formats.