CSPP Users' Group Meeting

Poster Abstracts

P1. **Reed**, Bonnie (NOAA/NESDIS/JPSS): *NOAA Level 2 Geophysical Products from JPSS VIIRS, OMPS, CrIS, and ATMS: Overview and status of releases via CSPP*

Bonnie Reed, STC; Lihang Zhou, JPSS

The Joint Polar Satellite System (JPSS) Suomi National Polar-orbiting Partnership (S-NPP) and NOAA-20 satellites provide global coverage of level-2 geophysical products from the Visible Infrared Imager Radiometer Suite (VIIRS), Cross-track Infrared Sounder (CrIS), Ozone Mapping and Profiler Suite (OMPS), and Advanced Technology Microwave Sounder (ATMS) instruments as well as the Advanced Microwave Scanning Radiometer-2 (AMSR-2) from the Global Change Observation Mission - Water (GCOM-W1). These imagery, cloud, aerosol, land, ocean and atmospheric products are available to users via the NOAA Product Distribution and Access (PDA) and the Comprehensive Large Array-data Stewardship System (CLASS). In addition to these dissemination systems, the JPSS program has been working with the Center for Satellite Applications and Research (STAR) and the Cooperative Institute for Meteorological Satellite Studies (CIMSS) at the University of Wisconsin (UW) to provide the JPSS algorithms to the Community Satellite Processing Package (CSPP) which supports the Direct Broadcast (DB) meteorological and environmental satellite community through the packaging and distribution of free open source science software. This talk will describe the algorithms that are currently available within CSPP and provide an outlook for what to expect for JPSS-2 and beyond.

P2. **Vakhnin**, Andrei (SSAI): *The Architecture of a Clouds Based Direct Broadcast Processing System*

Andrei Vakhnin (SSAI), Louis Nguyen (NASA), Thad Chee (SSAI), A. Jason Barnett (BAH)

Reducing the time that it takes to process direct broadcast weather satellite information is important because timely information is the foundation for good decision making in time sensitive situations. Systems that process this direct broadcast data thus require a flexible, reliable and highly customizable system architecture in order to be successful.

This work discusses our work to design and build the GSaaS direct broadcast processing system that leverages CSPP's processing capabilities. We detail the development process and system architecture of each of our iterations and how lessons learned and advantages discovered altered the design of the system.

P3. Knuteson, Robert (University of Wisconsin-Madison Space Science and Engineering Center): *Surface Temperature, Dewpoint, and Emissivity Assessment of CSPP HEAP v2 NUCAPS v3r0 Product*

Robert Knuteson, Callyn Bloch, Eva Borbas, Michelle Loveless, UW-Madison SSEC

Global daily vertical sounding profiles of air temperature, water vapor mixing ratio and trace gases are produced as Environmental Data Record (EDR) products from the NOAA Unique

Combined Atmospheric Processing System (NUCAPS) are produced operationally at the NOAA/NESDIS Office of Satellite and Product Operations (OSPO). After production the operational NUCAPS EDR products are archived in the NOAA Comprehensive Large Array-Data Stewardship System (CLASS). In October 2021 the NUCAPS software was upgraded in operations from version 2 to version 3. The NUCAPS v3 software includes important updates to the a priori infrared surface emissivity and other significant changes to the retrieval modules. In this paper we compare the surface products produced from the operational NUCAP v2 downloaded from NOAA CLASS to the NUCAPS v3 surface products produced by running the CSPP HEAP v2 software package. In particular, we will assess NUCAPS v3 improvements on a tornado outbreak in Iowa on 14 July 2021. The ability of NUCAPS to estimate the near surface air parcel temperature and dewpoint will be assessed using NOAA MADIS surface observations. The SHARPpy software will be used to assess improvements in the NUCAPS v3 estimates of the atmospheric stability paramters (CAPE, CIN, LI, etc.).

P4. **Bearson**, Nick (SSEC / CIMSS): *CSPP VIIRS Surface Reflectance and Vegetation Index*

Nick Bearson, UW-Madison SSEC

This poster introduces the CSPP VIIRS Surface Reflectance and Vegetation Index package. It provides a summary of the software along with techniques to grid, composite, and visualize the output.

P5. **Cureton**, Geoffrey (CIMSS / UW-Madison): *Near Real Time Active Fires and GAASP Level-2 Products Via Direct Broadcast Using the Community Satellite Processing Package*

Geoffrey Cureton, CIMSS/UW-Madison

The Cooperative Institute for Meteorological Satellite Studies (CIMSS) has a long history of supporting the Direct Broadcast (DB) community for various low-Earth-orbit (LEO) sensors, previously with the International MODIS/AIRS Processing Package (IMAPP) for the NASA EOS polar orbiters Terra and Aqua, and currently with the Community Satellite Processing Package (CSPP) for the NOAA polar orbiters Suomi-NPP and NOAA-20. CSPP has been significant in encouraging the early usage of Suomi-NPP data by US and international weather agencies, and this situation should continue with NOAA-20 and beyond.

This presentation will provide updates on new developments for the Active Fires and GAASP packages, which consist of maintenance updates for GAASP, and the addition of the Persistent Anomaly functionality for the Active Fires package.

P6. **Davies**, James (SSEC/UW-Madison): *Recent updates to CSPP implementations of NOAA Enterprise ACSPO, HEAP & MIRS*

James E Davies

Within the last year three CSPP packages have been updated to their latest NOAA Enterprise versions and delivered in Singularity containers. This poster summarizes their data products, supported missions and systems & ancillary data requirements.

P7. **Santek**, David (CIMSS/SSEC): *Satellite-derived Winds from VIIRS: Status and Outlook*

David Santek (CIMSS), Jeff Key (NOAA/NESDIS), Dave Stettner (CIMSS), Rich Dworak(CIMSS)

The properties of tropospheric winds – speed, direction, and pressure – are derived by tracking cloud features using visible/near-infrared/thermal infrared (IR) satellite imager data from both geostationary and low-earth orbiting satellites. In the high latitudes (poleward of 60 deg. latitude), winds are derived from three successive satellite passes using data from the Moderate Resolution Imaging Spectroradiometer (MODIS), the Advanced Very High Resolution Radiometer (AVHRR), and, most recently, the Visible and Infrared Imaging Radiometer Suite (VIIRS). These polar Derived Motion Winds (DMW) products are generated operationally by the National Oceanic and Atmospheric Administration /National Environmental Satellite, Data, and Information Service (NOAA/NESDIS) using an Enterprise algorithm.

Additionally, the high latitude winds are produced routinely in near real-time at the Cooperative Institute for Meteorological Satellite Studies (CIMSS) by the CIMSS/NOAA polar winds team using the heritage winds algorithm (WINDCO). WINDCO is used at CIMSS to prototype and test new satellite-derived winds products, as the software can easily be modified and reconfigured to use additional channels or satellite combinations. For example, a new product in development at CIMSS uses the short-wave IR (SWIR) channel for tracking clouds, which employs Polar2Grid to concatenate and reproject the VIIRS granules into a polar stereographic composite image. Also, we are evaluating the use of a triplet of alternating passes from polar orbiting satellites flying in tandem (NOAA20/SNPP/NOAA20) to derive winds, as the coverage extends more equatorward (to 45 deg. latitude). We are also testing the use of image doublets from alternating satellites, which provides winds globally from VIIRS.

We will report on the status and evaluation of the SWIR winds, and their use in numerical models. In addition, we will provide examples and discuss the doublet and triplet tracking from alternating satellites, and the implications for the DB community.