The SCSB staff is on furlough this week because of the government shutdown but CICS is still open for business so this week’s report focuses on our efforts.

- **VIIRS Sea-Ice Albedo Product**
  CICS-MD Scientists Jingjing Peng, Peng Yu and Shunlin Liang (STAR/SMCD/EMC) have a recent article, published in the November 2018 issue of the *Remote Sensing* journal, about the newly operational Sea-Ice Albedo Product. This product is derived from the Visible Infrared Imaging Radiometer Suite (VIIRS) on the Suomi NPP and JPSS/NOAA-20 satellites. This product will continue the long-term climate record for sea-ice albedo from AVHRR and MODIS. The new VIIRS version provides improved spatial resolution with a Bidirectional Reflectance Distribution Function (BRDF) algorithm, which will be able to differentiate sea ice types and mixing proportions among snow, ice and water. The article documents the validation of this product with ground measurements of sea ice. Results for Bias and Root Mean Square Error (RMSE) show good agreement with instantaneous and daily sea-ice albedo data.

- **GOES-R 3D Winds:**
  One of CICS-MD’s new tasks this year is a GOES-R Three-Dimensional Wind Project and it is led by CICS’ new partner, Carr Aeronautics. James Carr (STAR/SMCD) has a new article on MISR-GOES 3D Winds in the December 2018 issue of *Remote Sensing*. Most current satellite wind measurements are 2D direction and speed, where the two dimensions are the Earth’s surface (N-S/E-W). These are called Atmospheric Motion Vectors (AMVs) and are measurement by tracking the movement of clouds or water vapor. The height of the winds is calculated separately from infrared measurements of cloud top height, a technique with large uncertainties compared to AMVs. However, the new capabilities of the GOES-R satellites provide the opportunity to produce reliable fully 3D measurements. This article looks at one technique to increase the accuracy of wind height measurements using satellite stereo imaging, which uses geometric parallax for feature height determinations.

The figure above shows a full disk 3D wind field using stereo imaging from the old GOES-East (GOES-13) and GOES-16 (Testing Slot) on 17 September 2017, with the color scale representing wind height and the length of the lines representing wind speed. Carr and his colleague Houria Madani will follow up on this work through their current CICS Task. **Carr, James L.**, Dong L. Wu, Michael A. Kelly and Jie Gong, 2018: MISR-GOES 3D winds: Implications for future LEO-GEO and LEO-LEO winds. *Remote Sens.*, 10(12), 1885, [https://dx.doi.org/10.3390/rs10121885](https://dx.doi.org/10.3390/rs10121885). **Funding Source**: GOES-R AWG & POC: James Carr, jcarr@carrastro.com
**Proactive Quality Control**

In CICS-MD’s first publication of the new year, CICS-MD Scientists Tse-Chun Chen and Eugenia Kalnay (NESDIS/JPSSO) document the results of their continuing CICS task to use ensemble data assimilation techniques for real-time quality control over observations to be assimilated in a Numerical Weather Prediction models. This new article appears in the January 2019 issue of the *Monthly Weather Review*. Their method is called Proactive Quality Control (PQC) and the concept is shown in the simplified schematic below:

The oval in the center is the range of observations available for the model in that location/gridbox at the current time. To determine if the observations are potentially detrimental, PQC does a local ensemble projection from the past time cycle (dashed line) and from the current time (dash-dot line) to the next future time cycle. These calculations are then used to determine which observations are detrimental (red) or beneficial (blue) to the forecast. For this article, they use PQC in the simple Lorenz 1996 model to determine optimal configurations for the method. One of their many findings was that PQC improves the forecast even if there are no flawed observations. *Chen, Tse-Chun*, and *Eugenia Kalnay*, 2019: Proactive Quality Control: Observing System Simulation Experiments with the Lorenz ’96 Model. *Mon. Wea. Rev.*, 147, 53–67, http://dx.doi.org/10.1175/MWR-D-18-0138.1.