Ecological Forecasting:

CICS-MD Scientist Melissa Kenney (NWS/CPC & OAR/CPO) has a new article on ecological forecasting that was published in the February 2018 issue of the *Proceedings of the National Academy of Sciences (PNAS)*. The article posits that ecological prediction models are not progressing fast enough to meet the needs of policymakers who require this information to make critical decisions. The authors note that most of the existing models have a hundred-year time resolution and this prevents sufficient validation by observations. Ecological forecasting models will improve, just like weather models did, if they forecast on daily to decadal time scales. The iterative process of forecast-validation-improvement is the best approach to increase progress in the ecological forecasting models. The flow chart below, from the article, demonstrates that how decision-makers will have their own cycle of improved adaptive management as they can incorporate the results of better forecasts.


Importance: Ecological forecasting is one of NOAA strategic research priorities. POC: M. Kenney
**Ozone Mapping and Profiler Suite on JPSS-1/NOAA-20:**

CICS-MD Scientist Chunhui Pan (STAR/SMCD) is working on the Ozone Mapping and Profiler Suite (OMPS) Sensor Data Record (SDR) Team, which is testing the new instrument on the JPSS-1/NOAA-20 satellite. Pan has been working on the OMPS aboard the S-NPP satellite and that data will be compared with the NOAA-20 data as part of the preliminary testing. She has recently published two articles on the S-NPP OMPS, one on the Nadir Mapper (NM) and a second one on the Nadir Profiler (NP):


For the new OMPS, she is currently working on new calibration tables: field angle maps, wavelengths maps, and day-one solar flux tables. Separate versions of these three tables need to be developed for NP and NM. She also gave a talk on OMPS Beta Maturity Status at an open OMPS SDR Team Meeting.

The image above is the first global coverage image from the NOAA-20 OMPS Nadir Mapper, retrieved on January 5\(^{th}\). It shows data from the “cloud reflectivity” channel, one of the five primary channels used to estimate total ozone concentration.

*Importance*: Preliminary testing and validation of the new NOAA-20 is critical so that the products that use this data can be as accurate as possible. *POC*: C. Pan
• **Calibration of the Cross-Track Infrared Sounder**

CICS-MD Scientist Yong Chen (STAR/SMCD) leads a CICS task on calibration and validation of the Cross-Track Infrared Sounder (CrIS) on the S-NPP and new JPSS-1/NOAA-20 satellite. He has just published a new article in the February 2018 issue of *IEEE Transactions on Geoscience and Remote Sensing*. The article documents a new calibration algorithm that reduces the:

- inconsistencies among the nine fields of view;
- inconsistencies between the forward and reverse interferometer sweep directions by up to 0.5 K; and
- differences between observed and simulated spectra by up to 0.4 K.

To show one example from the article, below are the test results on forward and reverse sweep inconsistencies:

All four of these graphs show the mean Brightness Temperature (BT) differences between the forward and reverse sweep direction for the listed Fields of View (FOV). On the left (a & b) are the spectra calibrated using the old method and on the right (c & d) are those calibrated with the new method. You can see how the new method has reduced the BT differences. Han, Yong, and Yong Chen, 2018: Calibration algorithm for Cross-Track Infrared Sounder full spectral resolution measurements, *IEEE Trans. Geosci. Remote Sens.*, **56**, 1008–1016, [http://dx.doi.org/10.1109/TGRS.2017.2757940](http://dx.doi.org/10.1109/TGRS.2017.2757940)

*Importance*: Satellite instrument validation is an important test of the accuracy and utility of the data.

*POC*: Y. Chen