NOAA-20 Algorithm Maturity Review
December 17, 2020

Review Team Members: Satya Kalluri (chair), Mitch Goldberg, Lihang Zhou, Bonnie Reed, Alisa Young, Ingrid Guch, Jim Yoe, Kevin Schrab, Rick Stumpf, Michael Ford, Gary Wick, Tom Renkevens, Jim Gleason, Greg Frost

Summary

The NUCAPS science team did a great job presenting SNPP and NOAA-20 validation results and following prior review team guidance for the NUCAPS products.. The review panel recommends the NUCAPS CO_2 product to be designated at Validated Maturity pending completion of the action for quantitative OCO-2 comparisons.

NUCAPS CO_2 (SNPP & NOAA-20)

Good review of the RFAs from the previous maturity review, and plans for reprocessing.

While showing the Validated Maturity version (V3.0) and Provisional Maturity version (V2.7.2) CO_2 agree much better with OCO-2 than the Operational version (2.5.2.2), it also demonstrated the needs of the reprocessing NUCAPS using the Validated Maturity version to establish consistent data records, and the changes of the operational products related to the algorithms upgrades should be clearly documented in README files.

Comparisons with TCCON, AirCore, and ATom show good consistency between SNPP and NOAA-20 CO_2, both meet the requirements. Statistics for 12 focus days throughout the year demonstrate the stability of the performance, no seasonal dependencies of the errors.

Mitch Goldberg: Need to look at CO for COVID. -- EUMETSAT generated CO from IASI and showed a signature from COVID - recommend comparison of NUCAPS IASI CO with EUMETSAT IASI CO.

Good users' feedback from NASA/GMAO (Lesly Ott): suggested to make the CO_2 products compatible with OCO-2, to make it more user friendly. GMAO has the system set up to assimilate OCO-2 data.

While showing comparisons between 2019 and 2020 CO_2 for COVID it was not clear if this was all version V3.0 or V2.5.2.2? Assume V2.5.2.2?

RFA #1: More quantitative comparisons with OCO-2 needed (initiator: James Gleason)

Slide: Slide 40, one image of OCO-2 vs NUCAPS.

I would like to see more quantitative comparisons of the NUCAPS CO_2 vs the OCO-2 CO_2 product. OCO-2 CO_2 has become the std satellite CO_2 product and the first question everyone will ask is how does NUCAPS compare to OCO-2?

Correlations, monthly mean difference by latitude band, Land vs ocean, etc

The TCCON and AirCore comparisons are useful and indicate that the NUCAP OCO-2 comparison shouldn't be too bad.

The validated maturity would be pending on the more quantitative OCO-2 comparisons were done and found to be acceptable.

RFA #2: README Files update to reflect the changes of operational CO_2 products related to the algorithms upgrades

The results showed significant improvements of the provisional and validated versions of the algorithms, compared with those from the operational version. These changes and the timeline of implementation in operation need to be documented in the README files, to enable the users to differentiate the changes of the CO_2 products due to the atmospheric changes vs. those due to the algorithm updates.

RFA #3: Routine monitoring capability of the operational trace gas products
As the quality assurance of the products performance and long term stability, recommend to extend the routine monitoring capabilities for NUCAPS from temperature, moisture profiles to the trace gas products including CO_2 , under the long term science maintenance of the cal val efforts. These capabilities include trending of the statistics and routine monitoring of the product performance qualities.

Attendees' list:

Adetomiwa Ibironke
Alisa Young
Andy Jacobson
Awdhesh Sharma
Bianca Baier
Bigyani Das
Boonie Reed
Bruce Guenther
Changyi Tan
Christopher Barnet
Gabrielle Petron
Gregory Frost
Hua Xie
Ingrid Guch

James G Yoe
Jeffrey Weinrich
Jim Gleason
John Miller
Juying Warner
Ken Pryor
Lesley Ott
Lihang Zhou
Michael Wison
Mitch Goldbery
Murty Divakarla
Nick Nalli
Pingping Xie
Satya Kalluri
Susan Venter
Thomas Renkevens
Tianyuan Wang
Tong Zhu
Tony Reale
Xingpin Liu