Read-me for Data Users

MEMORANDUM FOR: The JPSS Program Record
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SUBJECT: NOAA-21 NUCAPS Provisional maturity status
DATE: 01/25/2024

Provisional maturity status declaration for NOAA-21 NUCAPS EDR Products
Maturity Review Date: **01/25/2024**
Effective Date: **09/25/2013**
Operational System: **NUCAPS, Version # HEAP 2.4**

1. Maturity stage definition (reference to the AMM webpage for maturity definition: http://www.star.nesdis.noaa.gov/jpss/AlgorithmMaturity.php
2. Algorithm Description:
   List of Products (Collection Short Name (CSN): 'NUCAPS-EDR')
   - Atmospheric Vertical Temperature Profile (AVTP)
   - Atmospheric Vertical Moisture Profile (AVMP)
   - Atmospheric Ozone Profile (O_3)
   - Outgoing Longwave Radiation (OLR)
   - Carbon Monoxide (CO)
   - Methane (CH_4)
   - Carbon Dioxide (CO_2)

   Product requirements/Exclusions (DPS): see artifact at TBD
   Quality flags (Table): See artifact at TBD
   Product evaluation/validation: See artifact at TBD
   Product availability/reliability:
   NOAA-21 EDR data have been produced with v3.0 since 03/24 using the 'NOAA-21 Ready' algorithm that employs NOAA-20 look-up tables (LUTs). The latest NUCAPS version 3.1 implemented for provisional maturity employs NOAA-21 specific LUTs (cloudy and clear regression LUTS, CrIS and ATMS radiance bias tuning, sensor noise). Qualitative and quantitative evaluation of all NOAA-21 EDR products with NOAA-20 products, model analysis fields (e.g. ECMWF), correlative satellite observations (e.g. AIRS, TROPOMI, OCO-2), and truth measurements (global RAOB collocations for AVTP, AVMP; NOAA-GML O3SNDs for ozone profiles; CERES OLR measurements for NOAA-21 CrIS OLR; TCCON measurements for CO, CH_4 and CO_2) show very good agreements meeting JPSS DPMS provisional maturity requirements.
   Algorithm performance dependence: None
   Known errors/issues/limitations: None
3. Changes since last maturity stage: NOAA-21 specific LUTs and Methane (CH4) *a priori update*
4. Review board recommendations: TBD

5. Path Forward/Future Plan for Validated maturity: Continue qualitative and quantitative validation of all EDR products with expanded data sets to validate products globally and seasonally following a hierarchy of validation data sets starting with matched model analysis fields, correlative satellite observations (e.g. TROPOMI, OCO-2), global RAOB observations (NPROVS system, Validation Archive, VALAR), O3SND collocations, and trace gas in-situ measurements (e.g. TCCON).
6. Additional Items to note

Additional information is available in the NUCAPS algorithm theoretical basis document (ATBD) and maturity review briefing, which can be accessed at:

http://www.star.nesdis.noaa.gov/jpss/Docs.php

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