



*Read-me for Data Users*

**MEMORANDUM FOR:** The JPSS Program Record  
**SUBMITTED BY:** JPSS SST Team Lead, Alexander Ignatov  
**CONCURRED BY:** JPSS Algorithm Management Project Lead Arron Layns  
JPSS STAR Program Manager Lihang Zhou  
**APPROVED BY:** JPSS Program Scientist Mitch Goldberg

**SUBJECT:** S-NPP/NOAA-20 SST Provisional Maturity Status  
**DATE:** 04/18/2018

**Provisional maturity status declaration for SST**

**Maturity Review Date:** 04/18/2018  
**Effective Date:** 04/18/2018  
**Operational System:** ACSPO Version 2.60

The JPSS Algorithm Maturity Readiness Review Board approved the release of the SST to the public with a Provisional maturity level quality as of 04/18/2018, based on JPSS Validation Maturity Review held on 04/18/2018 (link to review artifacts).

1. Provisional Maturity definition (<http://www.star.nesdis.noaa.gov/jpss/AlgorithmMaturity.php>)
  - a. Product performance demonstrated through analysis of a large, but still seasonally limited number of independent global in situ matchups
  - b. Product analyses are sufficient for qualitative and limited quantitative, determination of product fitness-for-purpose
  - c. Necessary documentation exists
  - d. Product is recommended for potential operational use (user decision) and in scientific publications. Consulting with SST Team recommended

2. Algorithm Description

Advanced Clear-Sky Processor for Ocean (ACSPO) v2.60

List of N20 SST Products (Collection Short Name (CSN)):

ACSPO L2P (original swath projection; 144 10min granules; total daily size 26GB/day)

ACSPO L3U (0.02° gridded global; 144 10min granules; total daily size 0.5GB/day)

Product Requirements/Exclusions (from L1RDS):

Accuracy (global mean bias wrt. in situ SSTs)  $\pm 0.2K$

Precision (global Std. Dev wrt. in situ SSTs)

Retrievals performed in full sensor swath

Internal waters (lakes, large rivers) included

Quality flags:

L2P: Two Quality Levels are reported: QL=0 and 5. QL=5 data should be used.

L3U: All grids with valid SSTs are recommended for use (gridded L2P data with QL=5)

Product evaluation/validation:

Continuously performed against quality controlled in situ data (from the NOAA in situ Quality Monitor system, *iQuam* [www.star.nesdis.noaa.gov/sod/sst/iquam/](http://www.star.nesdis.noaa.gov/sod/sst/iquam/)). Results are available in the



## Read-me for Data Users

NOAA SST Quality Monitor (SQUAM; [www.star.nesdis.noaa.gov/sod/sst/squam/](http://www.star.nesdis.noaa.gov/sod/sst/squam/))

### Product availability/reliability:

N20 SST data products were produced internally in STAR since 4 January 2018 (SDR Provisional maturity effective date). The SDR data prior to 2 April 2018 (SDR provisional review) may not be reliable due to the longwave IR anomaly and efforts to resolve it

### Algorithm performance dependence:

SST Algorithms requires good quality brightness temperatures (BTs) in 3 bands M14 (8.6 $\mu$ m), M15 (11 $\mu$ m), and M16 (12 $\mu$ m) during the daytime (solar zenith angle > 90°). At night, M12 (3.7 $\mu$ m) is additionally used. It is critically important that all these BTs are stable and the bands are well co-registered. Absolute calibration is less critical for the empirical regression approach. The BTs are obtained with 16 detectors and may show striping. For improved SST imagery, clear-sky mask, and pattern recognition analyses within the SST algorithm, the BTs are destriped (which slightly changes the values of BTs) and resampled (to minimize the bow-tie distortion and deletions, which may slightly change the lat/lon values for the pixels).

### Known errors/issues/limitations:

Thermal stability of the sensor (e.g. Warm-Up Cool-Down exercises) negatively affects SST product performance

3. Changes since last maturity stage
  - a. New Product
4. Review board recommendations
  - a. Declare the N20 SST Product Provisionally Validated
5. Path Forward/Future Plan
  - a. Complete testing ACSPO v2.60 and deliver to NDE
  - b. Reprocess available stable L1b time series in STAR
  - c. Distribute via Coast Watch
  - d. Work with PO.DAAC and NCEI to archive the data
6. Additional Items to note
  - a. To ensure stable and accurate SST data record, SST Team strongly recommends to ensure stable thermal regime of the VIIRS sensors onboard NPP and N20

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

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

### Point of Contact:

Name: Alexander Ignatov

Email: [Alex.Ignatov@noaa.gov](mailto:Alex.Ignatov@noaa.gov)

Phone: 301-683-3379