

## **NOAA-20 Algorithm Maturity Review**

**May 16, 2019**

**Review Team Members:** Mitch Goldberg (chair), Lihang Zhou, Satya Kalluri, Arron Layns, Jim Yoe, Kevin Schrab, Rick Stumpf, Michael Ford, Gary Wick, Tom Renkevens, Jim Gleason

### **Summary**

All science teams did a great job presenting N20 calval results and following prior review team guidance for their products.. The review panel recommends:

- I-Band Fires is at Provisional maturity scientifically pending completion of documentation updates
- All Cloud products reached Validated
- For the Cryosphere products, IST, Ice Concentration, Ice Age/Thickness have reached validated, and the Snow Cover products are at provisional
- Polar Winds have reached validated maturity.
- AOD and ADP have reached Validated.
- Volcanic Ash has reached Validated maturity
- SST is at Validated
- SFR is at Validated

### **I-Band Active Fires**

Meets **Provisional** scientifically. Still needs to complete the documentation updates for ATBD, Users Manual, System Maintenance Manual, and Cal Val plan; and verify results from NDE implementation.

This product aims to achieve closer to the Objective (DPOC) requirements. In other words, the current operational algorithm meets all requirements. This would be an enhancement to the current processing. However, the science team followed the correct process by submitting the project to the SPSRB, which did endorse the product in April 2019.

Science team reported little to no impact of saturation of I4 on the data product because the algorithm accounts for it.

Comparison results between SNPP and N20 and comparisons between M-band and I-band products are excellent. Limited comparisons with Landsat and NIROPS for new I-band product also look very good. Although VIIRS is consistently higher than NIROPS for the limited data shown (slide 24).

Science team noted that the HRRR-smoke model is being delivered to NCEP in November 2019, and it would be good to get the I-band product into NESDIS operations by November.

OSPO/HMS team is already using this product operationally.

Science team has done a good job listening to comments from the users. This is very evident with the problem of false alarms from things like solar farms, etc (persistent anomalies).

The science team is commended for following the NESDIS processes (SPSRB user request, SPSRB approval, user feedback through experimental feeds) for adding new data products or making major enhancements to existing data products. Please continue to work through these processes to operationalize but also retire the M-band fire product using the NESDIS data product retirement process.

### **Cloud Products**

All cloud products met all requirements for **Validated maturity**.

Comparisons of monthly means for the cloud products from NOAA-20 and SNPP (for April 2019) showing good consistency of these products. Large difference seen in DCOMP, likely to be driven by the difference of M5 between NOAA-20 and SNPP.

The monthly mean results are very interesting. The team might consider doing these for a different month (season) during the year and interrogating the results. Unclear if the differences between N20 and SNPP are statistically significant. Comments on CLASS interface is good feedback and should be brought to the JPSS-CLASS meetings for the consideration.

There was also a note about showing validation statistics for different seasons. Should not affect validated maturity declaration today.

Need to focus on collecting more direct user feedback.

### **Cloud Mask**

Team shows the NOAA-20 ECM meeting requirements by validation against CALIOP/CALIPSO. Night time SST analysis shows ECM meets required specs, and continuous improvements from Beta to Provisional to Validated maturity.

### **Cloud Phase/Type**

Validation of Cloud Phase and Type against CALIOP/CALIPSO showing meet specs. Questions from Ingrid for clarification on meeting the requirements have been cleared in the updated slides sent by Mike after the review:

<https://drive.google.com/open?id=1nw3jEnwR46dhKNyDHZsF91nk1zVV523DjP49pscEuPo>

### **Cloud Top Pressure/Cloud Top Temperature/Cloud Top Height**

All accuracy specs are met vs. Calipso, but Precision specs are only met with filtering and single layer cloud. This is likely due to the noise in VIIRS compared the Calipso.

## **Cloud Cover Layer**

### **Cloud Base Height**

### **Daytime Cloud Optical and Microphysical Properties**

The SNPP 5% “too bright” in M5 was raised again.

### **Nighttime Cloud Optical and Microphysical Properties**

## **Cryosphere Products**

IST, Ice Concentration, Ice Age/Thickness reached Validated maturity, and snow cover is at provisional

### **Snow Cover (Binary maps and snow fraction)**

No science team should be reviewing or analyzing IDPS EDR data. There has been no validation and adjustments or tuning of the IDPS EDRs since N20 launched.

Slide 9: Column headings need to corrected.

Does the Snow Cover team see something similar in the NPP cloud mask and its effects on the snow cover products? Has the snow cover team discussed with the Cloud team what they are seeing?

Slide 23: What is the cause of the “dips” in performance in terms of correct typing that appear in ~March/April?

### **Sea Ice concentration**

Slides 17-21 are excellent results compared with SNPP and AMSR2. Maybe meeting validated maturity in terms of performance?

### **Ice Surface Temperature**

Slide 28 shows interesting results of IST at the terminator vs MODIS. Very good agreement but some issue that should be resolved there.

Slide 32 showing results against KT19, the IST performance is excellent. Only 1 day of data, but still excellent results.

### **Ice Age/thickness**

Slide 45 (and a couple previous) do show noticeable differences between the “truth” data and N20. For example, N20 shows a lot more “0” m thickness data especially on the bottom part of the map (North Atlantic).

Good suggestion from Sean to include comparisons with the Canadian Ice Charts for validation.

## Polar Winds

Polar Winds reached **Validated maturity**.

As usual, the performance of Polar Winds well exceeds the requirements in all cases and clearly has reached validated maturity.

Maybe for FY20 and 21, the science team should look into what scientific improvements could possibly be done to get closer to or achieve the JPSS objective performance requirements.

## Aerosol products: AOD, and ADP

AOD and ADP have reached **Validated**.

AOD meets all specifications over the validation time period with the exception of the accuracy in the mid-value range. However, the performance is .06 whereas the requirement is .05. Over long-term, offline product, all requirements are met.

ADP meets all the requirements once the “bug” in NDE is fixed. The science team should submit that bug issue to the OSPO PALS as soon as possible.

## Volcanic Ash

Validation results presented were excellent in their detail and demonstrated that all requirements are met and **validated maturity** is reached.

Arron recommended Mike to work on a user’s request. The user request should include all the components of VOLCAT that are needed (well beyond just level 2 processing).

## Sea Surface Temperature

SST has reached **Validated maturity** showing great detail in meeting and exceeding the requirements.

Lihang noted that the SST team is a great example of working closely with the SDR team to make concerns known and getting issues resolved.

## Snowfall Rate

Seems like SFR has reached **Validated maturity** (maybe with a minor caveat that they haven't done global validation with in situ data, but they have with SNPP).

The team should continue to work with NWS to get SFR into AWIPS via the official dissemination channels (eg PDA) and not through

Has the team done any specific work on SFR performance in mountainous regions (especially as it may be used for flood forecasting). It can also be a good candidate product to collaborate with the National Water Center on the hydrology modeling and applications.