

WORLD METEOROLOGICAL ORGANIZATION

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COMMISSION FOR BASIC SYSTEMS  
OPEN PROGRAMME AREA GROUP ON INTEGRATED OBSERVING SYSTEMS

INTER-PROGRAMME EXPERT TEAM ON SATELLITE UTILIZATION AND  
PRODUCTS

ITEM: 5.4

THIRD SESSION

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## **Readiness of user communities to New-Generation Satellites**

### **NWP user community readiness for GOES-16 and FY4-A**

*(Submitted by Stephen English)*

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#### **Summary and Purpose of Document**

The two geostationary satellites launched since IPETSUP2, GOES-16 and FY4-A, bring important advance in capability, through improved imagery, and new sounding and lightning detection capability. This document reports on consultation with the wider NWP community on how well prepared the community is for this new data.

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#### **ACTION PROPOSED**

The third session is invited to note the information provided.

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## DISCUSSION

### 1. Introduction

In order to understand the level of user readiness of the NWP community an email was sent to the mailing list of the NWP working group of the ITWG and IWWG. Six centres responded:

- CPTEC (Brazil): Luiz de Goncalvez
- ECMWF (Europe): Niels Bormann and Philippe Lopez
- Met Office (UK): William Bell
- NOAA (USA): Andrew Collard, Steve Goodman, Jim Yoe
- JMA (Japan): Masahiro Kazumori
- NRL (USA): Ben Ruston

Whilst this is quite a low number, it means that this report does reflect views received from centres across the world.

In addition valuable input was received from University of Wisconsin (Chris Velden).

### 2. CPTEC

For GOES-16 CPTEC is part of the "early users" post launch validation program with Steve Goodman (GOES-R project manager), and is therefore in the process of acquiring a reception station. They have also had access to some of the images and were able to do some basic processing with no major problems. CPTEC is also signing an addition to an already existing MOU between NOAA-INPE about satellite data and geonetcast during the NESDIS director visit to INPE in this coming May.

CPTEC also noted that Luiz Augusto Machado will present Nowcasting user readiness status to IPETSUP, so there will be a more comprehensive report on CPTEC's experience and readiness in that report.

### 3. ECMWF

ECMWF note that initial work on lightning imager validation is easier for GOES-16 than FY4-A since several ground-based lightning detection networks are also available over the GOES-16 field of view (e.g. Vaisala GLD360, NLDN, ENTLN). Therefore their initial work will focus on GOES-16.

ECMWF know how and when we should get AMV data from GOES-16; initial test data with the new AMVs algorithm (not yet applied to GOES-16) has been provided some time ago, and the new algorithm has been documented and discussed in the community. What was less clear to ECMWF is the approval status for new BUFR template (however this appears now to be resolved - see input from Steve Goodman below). In any case it is an acceptable solution to use the old template initially.

To date information in plans for FY4-A AMVs and GIIRS radiances has been limited. To begin preparations more information on what will be provided, in what format and how and when is needed. ECMWF host a workshop on use of hyperspectral geostationary data in may 2017 where it is hoped we will learn more about FY4-A data status and dissemination plans.

### 4. Met Office

The Met Office made no specific comment on GOES-16, suggesting that they have no issues in terms of their readiness.

For FY4-A the Met Office are actively seeking to collaborate with CMA/NSMC in their evaluation of the GIIRS sounder data, but they need more information. They are also keen to work with the wider NWP community in this assessment to enable us to feed-back definitive and timely information to CMA/NSMC on the performance of the sounder. Specifically they need more information on:

- detailed spectral characteristics of the FY-4A GIIRS instrument (ILS, including OPD, self apodisation and numerical apodisation effects) - to train the fast RT model;
- some initial samples of real data - in the first instance this could be a single set of full disk spectra.

## **5. JMA**

JMA expressed very strong interest in GOES-16 and FY4-A imager and sounder data and plan to use them for NWP operationally, where possible. JMA feels it needs more information on the data distribution plan for FY4-A, the data format, and how to access NRT data. They commented that ECMWF and EUMETSAT have strong connections with CMA, but other centres do not have such a mature arrangement. It is not even clear to JMA if there is a plan for NRT data dissemination, given that FY4-A is a research satellite, not an operational satellite.

They noted that some information is available on the CMA/NSMC web page, including the first image observation and spectra, but at present this is the only channel of communication available. Early release of a sample of data would be very helpful to their preparations.

## **6. NRL**

NRL reported that they feel well positioned to use both GOES-16 AMVs and Geostationary Clear Sky Radiance products shortly after receipt. Successes with previous GOES, SEVIRI and now Himawari-8 products means they have a mature monitoring and evaluation strategy and expect a fairly rapid integration once they become "live".

They are also working to incorporate AOD products from GOES-16. The AOD products have been challenging, and the aerosol group here does pretty extensive work evaluating and doing extra levels of screening to make these products something of assimilation quality. They are seeking to know more about experience of other centres with assimilation of AOD products.

## **7. NOAA**

In February 2017 Steve Goodman briefed the EUMETSAT Science and Operations Working Group on latest GOES-16 status and plans, and kindly summarised the relevant points for the NWP user readiness question for IPETSUP. Questions were asked at the EUMETSAT Science and Operations Working Groups (by ECMWF in particular) about the BUFR AMVs and All Sky Radiances. These are being added to the original baseline user requirement for GOES-R, which contained netCDF format AMVs and clear sky radiances, because the Program and NESDIS recognize the importance to NWP. Dr Goodman also gave an update on availability of AMVs in BUFR (June 5 is currently the readiness review). NWS is developing the plan to post AMVs in GTS. NCEP expect the main NWP impact of GOES-16 to come from the AMVs. For the All Sky Radiances Jim Yoe and NCEP are working on a study to determine their requirements including at what spatial resolution for the next generation forecast system. After that study NESDIS will evaluate the cost to produce and archive CSRs and ASRs, and go from there. These clarifications fully address the small number of questions being raised by the NWP community for GOES-16.

NCEP have no plans to assimilate data from Chinese satellites. This is due to prioritisation in the US and has nothing to do with level of user readiness.

## **8. Discussion**

It is very clear that there is strong interest from the NWP community for GOES-16 and FY4-A data.

From these comments it appears that the NWP community is generally in good shape for GOES-16 and supported by the GOES-R program office. There has been some concern related to formats for GOES-16 AMVs and generation and provision of clear and all sky radiance products. However as noted there has already been considerable discussion of these issues between the GOES-R program office and NWP users, and these have been or are being resolved. Furthermore the University of Wisconsin reported (second hand) comments from the National Hurricane Center that they have never been so well prepared for a new satellite than they are for the GOES-R

series, which is very encouraging. Wisconsin also reported that the GOES-R proxy data group at CIMSS has provided countless examples to the NWP community pre-launch.

The situation for FY4-A is less clear and it appears the level of user readiness is low. More information is needed both on plans for AMV production and on the spectral characteristics and data dissemination plans for FY4-A data, especially GIIRS. As noted by JMA it's not clear, given this is not an operational satellite, if users should expect a NRT data stream to be provided. Lack of detailed spectral characteristics means widely used radiative transfer models such as RTTOV have not yet been able to provide coefficients for GIIRS.

The provision of detailed spectral characteristics, and initial sample data, and a clear statement on the plans for data dissemination, would be very helpful to the NWP user community in order to prepare capability to use FY4-A observations.

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