Agenda

• Post-Launch Activities: Validation Maturity
• Status of L2 Algorithms
• L2 Algorithm Updates to CSPP-GEO
POST-LAUNCH ACTIVITIES: VALIDATION MATURITY
What do the Product Maturity Levels mean? There is a PS-PVR at each stage as a method of informing the user community of the following readiness for use:

- **Beta**: Products are only made available to cal/val users via PDA to gain familiarity with data formats and parameters as well as provide assistance to the science teams. The Product has been minimally validated and may still contain significant errors and is not optimized for operational use.

- **Provisional**: Product ready for operational use but has documented known issues. Product analyses are sufficient to communicate product performance to users relative to expectations.

- **Full**: Product is operational. All known product anomalies are resolved and/or documented and shared with the user community.
What is a PS-PVR?

A Peer Stakeholder - Product Validation Review (PS-PVR) appraises the status of product quality with respect to Program definitions.

The PS-PVR Panel has the authority to declare products have achieved a product maturity level and provides guidance on work expected to achieve the next maturity level.

PS-PVRs continue into Extended Validation.

OSPO uses analogous SPSRB review gates to approve product readiness for operations.

- Chair: Steve Goodman, GOES-R Program Scientist
- Panel (consolidated recommendations to Chair): NOAA GOES Operational Requirements Working Group and GOES-R PSE
- Presenters: CWG and AWG
- Users: NOAA Line Offices (NWS, NOS, NMFS, OAR, OMAO)
Focus During PS-PVRs

What will be the focus of the PS-PVR at the different maturity levels?

Beta:
- Review present state of PLT activities and results
- Consider initial product quick looks
- Affirm release of data products to public

Provisional:
- Review present state of PLPT activities and results
- Compare initial assessment to predicted performance
- Discuss user feedback, known anomalies, and remediation strategies
- Recommend path to predicted performance

Full:
- Review present state of continuing cal/val activities and results
- Compare ongoing assessment to predicted performance
- Recommend further optimization activities, considering mission parameters and priorities
- Affirm dissemination of product quality assessment to public
### Beta Validation Tests

<table>
<thead>
<tr>
<th>L2 Algorithm</th>
<th>Number of Tests</th>
</tr>
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<tbody>
<tr>
<td>Clear Sky Mask</td>
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<tr>
<td>Aerosol Detection</td>
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<tr>
<td>Aerosol Optical Depth</td>
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<td>Cloud Optical Properties</td>
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<td>Cloud Top Parameters</td>
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<td>DMW</td>
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<td>Shortwave Radiation</td>
<td>8</td>
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<tr>
<td>Soundings (including TPW and DSI)</td>
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<tr>
<td>Fire</td>
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<tr>
<td>Hurricane Intensity</td>
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<tr>
<td>LST</td>
<td>8</td>
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<tr>
<td>Rainrate</td>
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<tr>
<td>SST</td>
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# Provisional Validation Tests

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<td>Hurricane Intensity</td>
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## Full Validation Tests

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STATUS OF L2 ALGORITHMS
Current GOES-16 L2 Status

- System is generating L2 Products
- Cal/Val teams are evaluating products
- Performing their validation tests for Beta: Hurricane Intensity
- All other L2 algorithms have begun their provisional tests.
### GOES-16 Science Product Availability & Validation Status

#### ABI L1b Product
- Radiances

#### ABI L2+ Products

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Cloud and Moisture Imagery (CMI) and Sectorized CMI (KPP)</td>
<td>Aerosol Detection (Smoke &amp; Dust)</td>
</tr>
<tr>
<td>Aerosol Optical Depth (AOD)</td>
<td>Clear Sky Mask</td>
</tr>
</tbody>
</table>

#### ABI L2+ Products (con’t)
- Downward S/W Radiation: Surface
- Fire/Hot Spot Characterization
- Hurricane Intensity Estimation
- Land Surface Temperature
- Legacy Vertical Moisture Profile
- Legacy Vertical Temperature Profile
- Rainfall Rate/QPE
- Reflected S/W Radiation: TOA
- Sea Surface Temperature
- Snow Cover
- Total Perceptible Water
- Volcanic Ash: Detection and Height

#### GLM L2 Product
- Lightning: Events, Groups, Flashes

#### SEISS L1b Products
- Energetic Heavy Ions
- Magnetospheric e⁻/p⁺: Low Energy
- Magnetospheric e⁻/p⁺: High Energy
- Solar & Galactic Protons

#### EXIS L1b Product
- Solar Flux: EUV
- Solar Flux: X-ray Irradiance

#### SUVI L1b Product
- Solar EUV Imagery

#### MAG L1b Product
- Geomagnetic Field

### Validation Maturity Levels

**Continuous Availability** (v/s intermittent tests e.g. HRIT/EMWIN, GNC-A):

- **Not Validated**
- **Beta Maturity**
  - Baseline Availability
    - CWG (STAR, NCEI-CO, NASA-MSFC) only via PDA, CLASS, LZSS
    - NWS I&T
  - Additional Availability
    - All Receivers via GRB, NWS’ SBN
    - EUMETSAT, CMC, INPE via PDA
    - DoD’s FNMOC, NAVO, 557th via PDA
- **Provisional Maturity**
  - Additional Availability
    - All remaining PDA accounts
    - All receivers via HRIT/EMWIN
    - All receivers via GNC-A
- **Full Maturity**
  - Additional Availability
    - No changes
GOES-16 Science Product Availability & Validation Status

- Radiance and Imagery held Provisional PS-PVR and awaiting final approvals in NOAA to be declared Provisional
- Hurricane Intensity Beta PS-PVR scheduled in September
- Snow Cover is TBD at this time
- Rain & Volcanic Ash are conditional Beta
- GLM is conditionally declared beta and is awaiting a LUT update to occur last week in June before official beta declaration
Current GOES-16 L2 Status

• Reminder of the definition of beta validation maturity:
  – Products are only made available to cal/val users via PDA to gain familiarity with data formats and parameters as well as provide assistance to the science teams. The Product has been minimally validated and may still contain significant errors and is not optimized for operational use.
• NOAA's GOES-16 satellite has not been declared operational and its data are preliminary and undergoing testing. Users receiving these data through any dissemination means (including, but not limited to, PDA and GRB) assume all risk related to their use of GOES-16 data and NOAA disclaims and any and all warranties, whether express or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose.
GOES-16 Post-Launch Science Product Validation Schedule

**Launch & Orbit Raising**
- 18 Days
- 30 Days

**Post-Launch Testing (PLT) - 180 Days**
- Outgas
- Instrument Calibration & Trending, INR System Testing & Validation
- PLTs (PLPTs for ABI L2+)

**Operations - ≤ 5 yrs Storage & ≥ 8.4 yrs Ops**
- PLPTs

Peer-Stakeholder Product Validation Reviews (PS-PVRs) begin, GRB populated with data (one day after an instrument reaches Beta validation).

Post-Launch Assessment Review (PLAR), Handover Readiness Review (HRR), Ops & Product Handover to OSPO

Transition to East Assignment

**Legend**
- PS-PVR:
- First public image release
- One-day data blackout due to COOP test
- OSPO outage during Nov 1-14
- Data flow begins
- Internal product flow begins
- Beta Validated Products
- External product flow begins
- Provisionally Validated Products
- Fully Validated Products

Note: All dates are coordinated with the Flight/MOST PLT SOE group and the T&H team and are subject to change.

Current as of June 12, 2017
elizabeth.kline@noaa.gov
ABI L2+ PS-PVRs

• Dates for remaining Beta PS-PVRs of ABI L2+ Products:
  – Week of 9/5/2017 – Hurricane Intensity

• Dates for Provisional PS-PVRs of ABI L2+ Products:
  – All L2+ Products will be Provisional by December 2017
L2 ALGORITHM UPDATES TO CSPP-GEO
Getting Updates to CSPP-GEO

- CSPP-GEO will have the following L2 Algorithms in the initial release (all declared beta):
  - Aerosol Detection
  - Aerosol Optical Depth
  - Cloud Mask
  - Cloud Height
  - Cloud Phase
  - Cloud Optical Depth and Particle Size
  - Imagery
  - Land Surface Temperature

See Poster: “The STAR Algorithm Processing Framework with Applications for CSPP GEO Direct Broadcast GOES-16 L2 Products” by Graeme Martin, Claire McCaskill, Shanna Sampson, Walter Wolf, Aiwu Li, William Straka, Alan De Smet, Ray Garcia
• Algorithms within CSPP-GEO will be the same as within NOAA/NESDIS Operations

• As algorithms are updated within operations, CSPP-GEO will get the updated algorithms.

• For more information on L2 Algorithms within CSPP-GEO, see the following poster:

  – “The STAR Algorithm Processing Framework with Applications for CSPP GEO Direct Broadcast GOES-16 L2 Products” by Graeme Martin, Claire McCaskill, Shanna Sampson, Walter Wolf, Aiwu Li, William Straka, Alan De Smet, Ray Garcia
Questions?

• For questions or general information, please contact me at:
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  – wayne.mackenzie@noaa.gov