National Polar-orbiting Operational Environmental Satellite System (NPOESS)
NPOESS Preparatory Project (NPP) Environmental Data Products Quality and Latency

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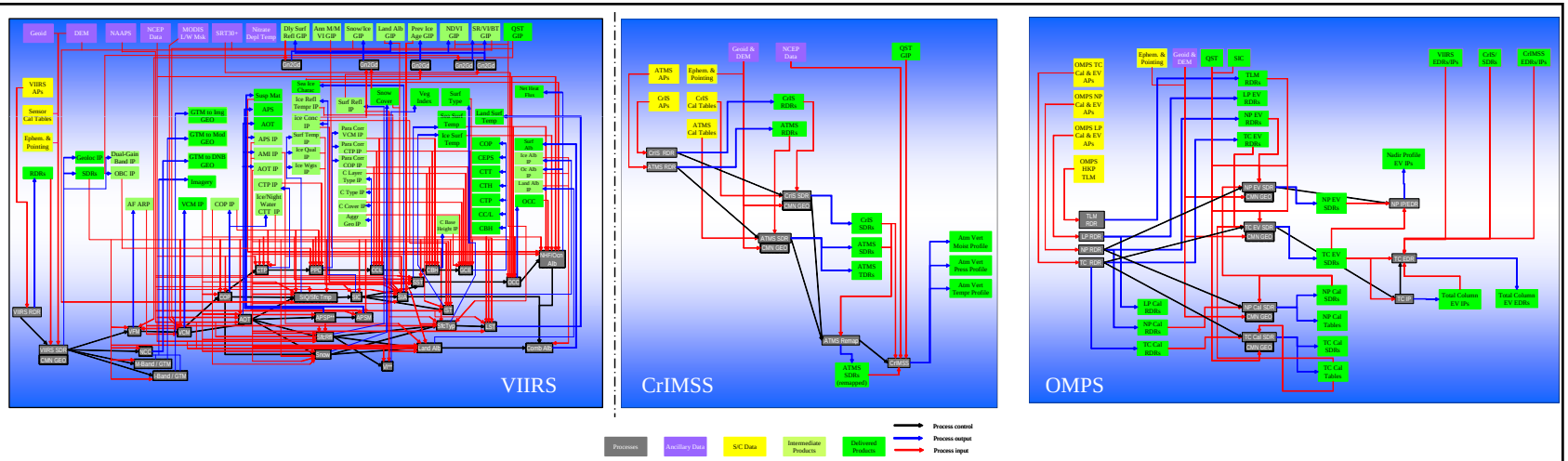


NPOESS products are created from a complex network of processing algorithms. A number of interdependencies between algorithms exist in order to provide the required data quality to the end User. The diagrams above illustrate the interdependencies between products and processes within the Interface Data Processing Segment (IDPS) needed to generate the NPP-era SDRs, EDRs, and Gridded Intermediate Products (GIP's). The algorithm interactions for the NPOESS era will be even more intricate.

Figure 1 – EDR Production

Attributes: The 25 NPP Environmental Data Records (EDRs) are specified by 449 individual performance attributes (in addition to latency), which detail all pertinent aspects of the EDRs' performance. Of the 449 attributes, 16 do not currently meet the Integrated Operational Requirements Document (IORD) requirements, and are being worked.

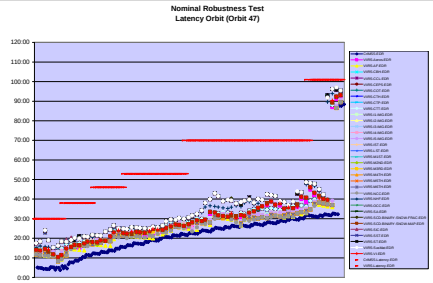
IORD Compliant EDRs

VIIRS				CrIMSS	OMPS
Imagery	Veg Index	Snow Cover	Cld Top Press	Vert Moist Prf	Ozone TC
Susp. Matter	Surf Type	Cld Top Temp	Cld Base Height	Vert Temp Prf	
Surf Albedo	Cld Cvr/ Layers	Cld Top Height		Vert Press Prf	
Sea Surf Temp	Ice Surf Temp	Aero Part Size			

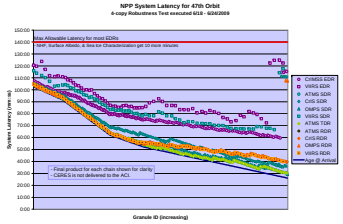
VIIRS EDRs In Work to Meet IORD Requirements

Aero Opt Thk	Performance expected to be similar to MODIS with improved spatial resolution. Additional enhancement for AOT over land possible, based on collection 5 MODIS algorithm	Cloud Eff Part Size	Current best estimates for accuracy over water and ice, along with precision, exceed IORD thresholds, but are comparable to MODIS
Sea Ice Charac	Performance depends on quality of climatology, which is expected to improve with MIS data. Sea Ice Age energy balance for classification of First Year and New Young ice require further evaluation. Daytime performance is better, approaching spec for Probability of Correct Type.	Ocean Color/Chl	Atmospheric Correction over Ocean inherent algorithm errors are being estimated, based on sensor test data. Performance for NPP slightly degraded, due to presence of optical crosstalk (some performance compensation via generation of look-up table based on measured relative spectral response). Performance for NPOESS will be better than NPP, due to use of remanufactured IFA for Visible and NIR spectral bands
Cld Opt Thick	Current best estimates for accuracy and precision exceed IORD thresholds, but are comparable to MODIS	Land Surf Temp	Emissivity knowledge limits precision of retrieval. Expected performance of 1.0K using split window during day. Science limitation is due to variation in surface emissivity within land surface types

Figure 2 – EDR Quality Assessment



The IDPS NPP Latency requirement is shown by the red lines. They specify the maximum time allowed to deliver a given percentage of the products on a per orbit basis. The data show the latency of individual products by granule within orbit 17 of a 44 orbit run, delivered four separate times. The four copy delivery portion of the test demonstrates the maximum required delivery volume at a given Central.



This graph compares IDPS latency to the System latency requirement (red line). The data show the latency of the last product generated in a given granule within orbit 17 of a 44 orbit run, delivered four separate times. The System latency requirement only applies to EDRs, but RDRs and SDRs are shown as well for completeness. Both graphs illustrate that IDPS outperforms its NPP latency requirements by a considerable margin.

Figure 3 – IDPS Latency Assessment