SUBMISSION AGREEMENT
BETWEEN
THE NGDC
AND
THE NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
FOR INTEGRATED POES/METOP-B SEM PROCESSED DATA

2014-02-27

Introduction

This document represents the agreement that the NGDC (NGDC>STP) (the "Provider") and the National Centers for Environmental Information (NCEI) (the "Archive") have reached for submitting the Provider's data, Integrated POES/MetOp-B SEM Processed Data, to the Archive for long-term preservation. It represents a joint effort between the Provider and the Archive to accurately document the agreement and the expectations between the two groups.

In order to ensure that the quality and integrity of the archived data is not compromised, the Provider and the Archive agree to maintain this agreement with accurate and up-to-date information through the life of the data submission.

The scope of this data archive arrangement covers L2 processed data that is derived from the Space Environment Monitor2 (SEM2) L1B sensor data retrieved from the NESDIS Environmental Satellite Processing Center (ESPC) after having been telemetered from the POES and EUMETSAT MeTOP satellites to the ground approximately once per 100 minute satellite orbit. The L1B raw data set and another minimally processed set of this raw data by NGDC are covered in another submission agreement for Integrated POES/METOP-B SEM RAW DATA.

Contacts

Persons included in all communications regarding the data submission.

Provider Contacts

Point of Contact, Principal Investigator

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Archive Contacts

Data Acquisition, Data Manager

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Data Overview

The processed data from the SEM-2 instrument suite on the NOAA POES and MetOp satellites provides measurements of electrons and protons over a range of energy levels. The processing transforms the data into environmental information needed for monitoring the space radiation impacts on such things as atmospheric chemistry and satellite systems. The processing changes the raw sensor bits to physical quantities with error bars and adds additional information such as the local magnetic field components that are needed for interpreting the spatial and temporal variation of the data. The processing works on the near real time level-1b data files retrieved from the NOAA Data Distribution System (DDS) and makes the level-2 data immediately available to outside users.

The processed data suite is close to 11 MB/satellite for a total of up to 70 MB/day for the current satellite configuration. It consists of a daily NetCDF4 product and accompanying Daily Quality Control Plots for the Medium Energy Proton and Electron Detector (MEPED) telescopes and Total Energy Detector (TED) instruments.

Applicable and Reference Documents

Documents applicable to or referenced from this agreement.

1. Integrated POES/MetOpB
   Project Wiki Page (NGDC Intranet Wiki):
   https://intranet.ngdc.noaa.gov/wiki/index.php?title=Integrated_POES/MetOpB
2. External_Users_Manual_POES_MetOp_SEM2_processing_V1.pdf,
   http://ngdc.noaa.gov/stp/satellite/poes/docs/NGDC/External_Users_Manual_POES_MetOp_SEM2_processing_V1.pdf
3. Team Sparrow Agile Project Review Folder (covers details/workflows of the L2 SEM-2 processing from),
   https://drive.google.com/a/noaa.gov/?tab=co#folders/0B5mrumV62jhOanRvdXNtd3hBY2s

Submission Scope

Active Submission Period

2013-01-01 - 2026-12-01

Data Types

Below is a summary of the data sizing and submission schedule by data type group. Enter information on at least one data type.

Data Type Name	Data Sizing	Submission Schedule
NetCDF-4, Daily 2-sec data	~7 MB/satelite = 42 MB/day	Daily ~ 4:00 UTC
PDF Format, Daily quality control plots (TED & MEPED)	~4 MB/satelite = 24 MB/day	Daily ~ 11:30 MT
ASCII	daily 16-s averages; 2.2 MB/sat= 13 MB/day	

Reviews and Testing

The project wiki page, https://intranet.ngdc.noaa.gov/wiki/index.php?title=ProcessingWrapper_Notes, describes the process steps and tests used for creating both the daily raw and processed NetCDF4 files, and workflow for staging data for archive and online access.
Team Sparrow Agile Reviews during Q4 of 2013 (Sprints 1 -4) cover the scope of the data processing framework and testing efforts related to the SEM-2 L2 processing effort.

Providing System

Identification of the system providing the data to NCEI.

System Name:	semprocess
System Owner:	NGDC
Physical Location:	NGDC, Boulder, CO
Additional Information:	The production software is deployed to the system semprocess (a virtual machine), running under the 'semproc' account. Disk space on /nfs/stp_sem_proc is for data processing, program deployment and archive staging.

Transfer Interface

Full descriptions of this internal data processing system are captured in the ProcessingWrapper Notes wiki page and Team Sparrow Review presentation noted above.

Submission File Inventory

Information on each submitted file type from the Provider. Information on multiple file types can be added below.

File Type Name: NetCDF-4, Daily 2-sec data

File Name Pattern:

<poes>_<id>_<YYYYMMDD>_<proc>.nc

File Name Field Definitions:

<poes> - data collection name

<id> - satellite id: m01,m02,m03,n15,n16,n17,n18,n19 (m - metop; n - noaa).

<YYYYMMDD> - Year Month Day

<proc> - indicates processed file.

<nc> - NetCDF4

Example File Name:

poes_m01_20140126_proc.nc

File Format: netCDF-4

File Compression: None

File Size Average: 7MB

File Count (Rate): 6/day

Data Volume (Rate): 42 MB/day

Submission Schedule: 4:00 UTC

Additional Information:

Descriptive Information Attributes:

Attribute	Source	Use
id	file name	For search, results display, and/or cross-referencing
YYYYMMDD	file name	For search, results display, and/or cross-referencing

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File Type Name: PDF Format, Daily quality control plots (TED & MEPED)

File Name Pattern:

<poes>_<id>_<YYYYMMDD>_<inst>_<proc>.pdf

File Name Field Definitions:

<poes> - data collection name

<id> - satellite id: m01,m02,m03,n15,n16,n17,n18,n19 (m - metop; n - noaa).

<YYYYMMDD> - Year Month Day

<inst> - instrument: ted or meped

<proc> - indicates processed file.

<nc> - NetCDF4

Example File Name:

poes_n19_20140220_ted_proc.pdf or poes_n19_20140220_meped_proc.pdf

File Format: PDF

File Compression: None

File Size Range: 1.0MB to 2.7MB

File Count (Rate): 2 files (ted and meped)/satellite/day - ~12 total/day

Data Volume (Rate): ~4MB/satellite/day - ~24 MB total/day

Submission Schedule: 11:30 AM MT

Additional Information:

Descriptive Information Attributes:

Attribute	Source	Use
id	file name	For search, results display, and/or cross-referencing
YYYYMMDD	file name	For search, results display, and/or cross-referencing
inst	file name	For search, results display, and/or cross-referencing

Submission Manifest

A submission manifest file with a 32-character MD5 checksum value is required for each submitted file in order to ensure the integrity of the submitted data.

File Content Specification:

Given the internal data processing and ingest arrangement for this data set, no submission manifest will be supplied. Instead, prior to archival of each data package, a test will be run to check the compressed file integrity.

File Transmission:

Not Applicable.

File Name Pattern:

Not Applicable.

File Name Definitions:

Not Applicable.

Example File Name:

Not Applicable.

Archive Ingest

Ingest processing steps at the Archive and communication with the Provider.

Receipt Verification:

Internal NGDC ingest logging and cataloging systems will supply information as to the assimilation of data into the archive system

Error Reconciliation:

NGDC supplies data managers with an Errors Tracking database that flags any errors with the data submissions.

Receipt Confirmation:

Successful data submission to the Archive will be reflected in catalogue entries to the Archive Catalog and file hierarchy systems for consumer access.

Quality Assurance:

No quality checks on the submitted data are planned. Data Quality information is described in the External_Users_Manual_POES_MetOp_SEM2_processing_V1.pdf, MEPED_OMNI_processing ATBD_V1.pdf and TED
processing ATBD_V1.pdf listed in the PDI section below.

Archive File Packaging:

All L2 SEM2 files will be compressed by gzip prior to transfer to the archive storage system.

Archive Storage

Archive attributes of each archived file type.

Archive File Type Name: NetCDF-4, Daily 2-sec data
Archive File Attributes/IDs:

Attribute/ID Type	Value
Storage System	archive/satellite/poes/data/processed/ngdc/uncorrected/full/year/satid/poes_id_ YYYYMMDD_proc.nc.gz

Archive File Type Name: PDF Format, Daily quality control plots (TED & MEPED)
Archive File Attributes/IDs:

Attribute/ID Type	Value
Storage System	archive/satellite/poes/data/processed/ngdc/uncorrected/full/year/satid/poes_id_ YYYYMMDD_inst_proc.pdf.gz

Archive Updates

Data submissions intended to update an existing archive record require adequate notification and justification. Updates can supersede previous data submissions as newer, corrected or improved versions are available. Further discussion will be required about the disposition of previously submitted data, whether or not to version or simply replace the

data. All actions with rationale will be captured in NGDC tracking systems.

Retention Schedule

The data will be retained in the Archive for long-term preservation in accordance with NOAA data management standards. Information on data usage and archive value may be used for making decisions on continuing the duration of the archive.

(Notional) Disposition: Unknown/TBD

Constraints

No constraints apply or will apply to the archived data.

User Community

There are many possible users of the POES/MetOp data including those interested in the near real time data for space weather operations as well as those interested in the retrospective data for detailed analysis. The raw POES/MetOp data are telemetered to the ground and processed by NSOF once per 90 minute orbit. Once the data are received at NGDC they are processed into physical units. These near real time data are of interest to SWPC, DoD, AFWA, NRO and commercial satellite operators. The data for each satellite are collected at a daily cadence and made available to users for retrospective studies. The primary users of the retrospective data are government and commercial satellite providers interested in associating satellite anomalies with space weather and researchers interested in understanding magnetospheric physics.

User Documentation and Metadata

The Provider will supply information to the Archive for writing and maintaining standard archive metadata, which includes data discovery information, references and data archive access links for users. The following published documents and archived items will be referenced from the metadata and made available to users.

Representation Information Items

For data to be useful to users, present and future, its format specification and characteristics must be documented and preserved with the data. Representation Information provides users with syntax (structure) and/or semantics (meaning) to decode the encoded data.

Item	Description
External_Users_Manual_POES_MetOp_SEM2_ processing_V1.pdf, http://ngdc.noaa.gov/stp/satellite/poes/docs/NGDC/External_Users_Manual_POES_MetOp_SEM2_processing_V1.pdf	Provides the content description for the Processed daily NetCDF4 file.
MEPED_OMNI_processing ATBD_V1.pdf, http://www.ngdc.noaa.gov/stp/NOAA/docs/NGDC/MEPED%20telescope%20processing%20ATBD_V1.pdf	This document provides a description of the algorithms and procedures used to transform the output from the Medium Energy Proton and Electron Detector (MEPED) telescopes on the POES/MetOp satellites into higher level data products. Error propagation and validation of the algorithm are discussed.

TED processing ATBD_V1.pdf, http://www.ngdc.noaa.gov/stp/NOAA/docs/NGDC/MEPED_OMNI_processing%20ATBD_V1.pdf	This document provides a description of the algorithms and procedures used to transform the output from the Total Energy Detector (TED) into higher level data products Error propagation, validation and examples of the algorithm are discussed.

Preservation Descriptive Information Items

Preservation Descriptive Information items contain context, provenance, and/or quality information for the data. All documents listed in the above section are also pertinent to PDI information.

Item	Description
POES Space Environment Monitor, Energetic Particles Metadata Record, http://www.ngdc.noaa.gov/docucomp/page?xml=NOAA/NESDIS/NGDC/STP/SEM/iso/xml/poes_sem_g00188.xml&view=xml2text/xml-to-text-ISO	Contains some PDI information but needs some updating to reflect the new data processing regime and references to support documentation as described in this submission agreement.

Access and Dissemination

NGDC's NOAA / POES Space Environment Monitor Web Page, http://www.ngdc.noaa.gov/stp/satellite/poes/, provides general information about the data set with access links.

Direct Access to POES SEM Data Web Page, http://www.ngdc.noaa.gov/stp/satellite/poes/dataaccess.html, provides directory access to the processed uncorrected NetCDF4 and flux files.

Additional Terms

This submission agreement does not cover the POES/MeTOP data as received from the Space Weather Prediction Center. It only covers processed data created from L1B incremental SEM2 data as received from the ESPC, covered in the Integrated POES/METOP-B SEM RAW Data Submission Agreement.