

The First Year of Operation of the North Slope of Alaska/Adjacent Arctic Ocean ARM Site: An Overview of Instrumentation, Data Streams, and Data Quality Assurance Procedures

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Introduction

The North Slope of Alaska/Adjacent Arctic Ocean (NSA/AAO) Atmospheric Radiation Measurement (ARM) Program site, established to study high-latitude cloud and radiation interactions and feedbacks, has been operational since spring 1998. The site is located in Barrow, Alaska (Figure 1). More than



Figure 1. The ARM NSA/AAO Site. Additional information about the site can be found on the ARM web site at <http://www.arm.gov>.

20 instruments are deployed at the site (Table 1). Data from these instruments are collected and processed daily by the site data system. To meet the data quality requirements established by the ARM

Table 1. ARM NSA Cloud and Radiation Testbed (CART) instruments with abbreviations through July 1999.	
SKYRAD	Downwelling Radiation Platform
PIRg	Precision Infrared Radiometer, global
PIRd	Precision Infrared Radiometer, diffuse
PSPg	Precision Solar Pyranometer, global
PSPd	Precision Solar Pyranometer, diffuse
NIP	Normal Incidence Pyranometer
UVB	Ultra Violet Biometer
IRT	InfraRed Thermometer
NIMFR	Normal Incidence Multi-Filter Radiometer
MFRSR	Multi-Filter Rotating Shadowband Radiometer
GNDRAD	Upwelling Radiation Platform
PIR	Precision Infrared Radiometer
PSP	Precision Solar Pyranometer
IRT	Infrared Thermometer
NET	Net Radiometer
MFR	Multi-Filter Radiometer
MET TOWER	
T*	Temperature Probe ^(a)
RH*	Relative Humidity Sensor ^(a)
WS*	Anemometer ^(a)
WD*	Wind Vane ^(a)
Barometric Pressure Sensor	
ORG	Optical Rain Gauge (ORG)
PWS	Present Weather Sensor (PWS)
AUXILIARY	All other ARM instrumentation
VCEIL	Ceilometer
MPL	Micropulse Lidar
MMCR	Millimeter Cloud Radar
ER-AERI	Extended Range Atmospheric Emitted Radiance Interferometer
MWR	MicroWave Radiometer
WSI	Whole Sky Imager
MMTP	Microwave Temperature Profiler
RWP-RASS	Radar Winder Profiler with Radio Acoustic Sounding System
SONDE	Radiosonde ^(b)
(a) Sensors located on tower at 2 m, 10 m, 20 m, and 40 m.	
(b) Sondes launched once daily Monday through Friday.	

Program, the data streams are subjected to a series of quality checks. First, the data streams are visually inspected in near-real time by the NSA/AAO site scientist team (SST), located at the University of Alaska, Fairbanks. From these visual inspections, metadata streams, which document the overall quality of the data streams, are generated. These inspections also facilitate early detection of instrument malfunctions. A web-based data base of the “quick look” images is maintained by the NSA SST at web address: <http://nanuna.gi.alaska.edu>. These images, produced for the visual inspections, are updated daily and made accessible to the general scientific community. In addition to the visual inspections, each data point must pass through quality control checks established by the individual instrument’s mentor. In the future, development of Quality Measurement Experiments (QMEs) and Value-Added Products (VAPs) are planned to enhance data quality assessment procedures.

Barrow Data Collection and Data Processing Status

Below we provide a brief status (current to 07/15/99) of the data collection and processing for each instrument currently deployed at the ARM NSA/AAO site in Barrow (see Table 1, Table 2). The development of data processing tools, such as ingest modules, are still in progress, and many of the instruments listed in the table below will have higher level data streams available in the near future. All data streams are expected to be online in near-real time within the next year for the Barrow site. Table 2 provides an instrument-by-instrument overview of 1) the date when data flow of “known and reasonable quality” was established, 2) operational status, 3) level of processing, and 4) data archiving status.

How to Access ARM NSA/AAO Data

The data collected by ARM at the NSA/AAO site can be ordered using a web browser, e-mail, or telephone. Data quality reports (DQRs) will accompany the data. Web address: <http://www.archive.arm.gov>, e-mail address: armarchive@ornl.gov, phone: (423) 241-4851

Table 2. ARM NSA CART instrument and data status through July 1999. This table contains information regarding operational status and archiving information through July 1999. This table does not include periods of missing, questionable, or bad data. This information can be obtained from the ARM PIF/CAR/DQR database.

Instrument	Date	Operational Status	Data Level	Available at the Archives
SKYRAD				
PIRg	05/15/98	Operational	00,a1	YES
PIRd	05/15/98	Operational	00,a1	YES
PSPg	05/15/98	Operational	00,a1	YES
PSPd	05/15/98	Operational	00,a1	YES
NIP	05/15/98	Operational	00,a1	YES
UVB	07/01/98	Operational	00,a1	YES
IRT	03/01/99	Operational	00,a1	YES
NIMFR	06/04/98	Operational	00,a0,a1,b1	
MFRSR	05/01/98	Operational	00,a0,a1,b1	
GNDRAD				
PIR	05/01/98	Operational	00,a1	YES
PSP	05/01/98	Operational	00,a1	YES
IRT	06/05/98	Operational	00,a1	YES
NET	05/01/98	Operational	00,a1	YES
MFR	05/01/98	Operational	00,a0,a1,b1	
MET TOWER				
T, RH, WS, WD		Operational	00	
Barometer		Operational		
ORG	04/03/99	Operational	00	
PWS	05/01/98	Operational	00	
SONDE	09/24/98	Operational.	00, a1	
AUXILIARY				
VCEIL	05/01/98	Operational	00,a1	
MPL	05/01/98	Operational	00,a1	
MMCR	05/09/98	Operational	00	
AERI	05/05/98	Operational.	00	
MWR	11/20/98	Operational	a1	
WSI	10/02/98	Raw data collected on Nanuq, Quality not inspected	00	
MMTP	--	Under testing.	--	
RWP-RASS	--	Operational in near future, currently in testing mode	--	