

Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

**Perl_Lib
Test Plan
Release 5
Version 1**

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
Document Revision Record	ii
1.0 Introduction.....	1
1.1 Document Overview	1
1.2 Perl_Lib Overview	1
1.2.1 Perl Library Modules	2
1.2.2 Architecture Dependent Code.....	2
1.2.3 Perl_Lib Version Definition	2
2.0 Software Installation Procedures	3
2.1 Installation.....	3
2.2 Compilation.....	3
3.0 Test and Evaluation Procedures.....	5
3.1 Executing the <i>AMI</i> PPC64 Perl_Lib Test Suite	5
3.2 Executing the <i>AMI</i> X86_64 Perl_Lib Test Suite.....	5
4.0 Perl_Lib File Promotion into Production.....	6
Appendix A - Acronyms and Abbreviations	A-1
Appendix B - Perl_Lib Library Directory Structure Diagram.....	B-1
Appendix C - File Description Table.....	C-1
C.1 Executable Scripts	C-1

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
Figure B-1. Perl_Lib Library Directory Structure	B-1

LIST OF TABLES

<u>Table</u>	<u>Page</u>
Table C-1. \$PERL5LIB directory	C-1

1.0 Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS) program. The CERES instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as ERBS, was successfully developed in ERBE to reduce time sampling errors. CERES continues that strategy by flying instruments on the polar orbiting EOS platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation and to improve the consistency between the cloud parameters and the radiation fields, CERES includes cloud imager data and other atmospheric parameters. The TRMM satellite carries one CERES instrument while the EOS satellites carry two CERES instruments, one operating in a fixed azimuth plane scanning mode (FAPS) for continuous Earth sampling and the other operating in a rotating azimuth plane scan mode (RAPS) for improved angular sampling.

1.1 Document Overview

This document, [Perl_Lib Release 5 Test Plan](#), is part of the Perl_Lib Library Release 5 delivery package provided to the Langley Distributed Active Archive Center (DAAC). It provides procedures for installing and testing the Perl_Lib Library software. A description of acronyms and abbreviations is provided in [Appendix A](#), a directory structure diagram is contained in [Appendix B](#) and a description of the software and data files is contained in [Appendix C](#).

This document is organized as follows:

- Section [1.0](#) - Introduction
- Section [2.0](#) - Software Installation Procedures
- Section [3.0](#) - Test and Evaluation Procedures
- Section [4.0](#) - Perl_Lib File Promotion into Production
- [Appendix A](#) - Acronyms and Abbreviations
- [Appendix B](#) - Directory Structure Diagram
- [Appendix C](#) - File Description Tables

1.2 Perl_Lib Overview

The Perl_Lib library contains no PGEs. Rather, it is a collection of routines and utilities used by multiple subsystems. Perl routines are contained within a collection of Perl modules. This collection consists of both in-house developed modules and some externally developed code. The externally developed code was obtained through CPAN.

1.2.1 Perl Library Modules

For implementation purposes, the Perl routines in Perl_Lib are divided amongst several Perl module files. The module files are themselves further divided into a hierarchical structure within the **\$PERL5LIB** directory. This structure helps to organize related modules while conforming to Perl industry standards.

1.2.2 Architecture Dependent Code

There are two different architectures that Perl_Lib can be installed: the *AMI X86_64* Linux and *AMI PPC64* Linux platforms. Though the majority of the code in Perl_Lib is strictly interpreted, there are several libraries within it that must be compiled to generate native code. These types of libraries must be compiled on both target install architectures. The source and compiled code for these all reside within a single **\$PERL5LIB** instance and are selected automatically by the makefiles at compile time and **\$CERESENV** at runtime.

1.2.3 Perl_Lib Version Definition

The Perl_Lib version is defined by both the release number and release date of the latest change to the source code within the library. The format of the release number is given as **XX.XX.XX** and the release date as **YYYYMMDD**. The Perl_Lib version can be obtained by running **local_version.pl** within the **\$PERL5LIB** directory. The current version of the Perl_Lib will be documented in the Delivery Memo.

2.0 Software Installation Procedures

This section describes how to install the Perl_Lib software in preparation for making the necessary test runs at the Langley DAAC. The installation procedures include instructions for uncompressing and untarring the delivered tar files, properly defining environmental variables, and compiling the code to create the Perl_Lib library files.

2.1 Installation

1. The scripts and makefiles in the Perl_Lib delivery package expect the CERES environment variable, `$CERESENV`, to point to a file which sets the following environment variables:

CERESHOME - Top directory for CERES software
CERESLIB - Top directory for CERESlib software (this location will be different for the different CERESlib versions)
PERL5LIB - Directory containing CERES Perl module

2. In the installation instructions below, use the following definition for the TAG variable, which is included in the file name of the delivery files.

TAG = R{R#}-{SCCR#}

where R# = CERES Software Release Number
 SCCR# = SCCR Number for the Perl_Lib Delivery

Ex: **TAG = R2-050**
 for CERES Software Release 2 and GGEO SCCR #050

3. Follow the steps below to install the Perl_Lib software.

```
source $CERESENV (any version)
mv Perl_Lib_src_{TAG}.tar.gz $CERESHOME
cd $CERESHOME
tar xf Perl_Lib_src{TAG}.tar.gz
```

2.2 Compilation

Complete the following steps to compile the Perl_Lib native source code.

On AMI with PPC64 arch:

1. Compile the PPC64 Perl_Lib version.


```
unsetenv GCC_EXEC_PREFIX
cd $PERL5LIB
make clean
make
```

On AMI with X86_64 arch:

2. Compile the X86_64 Perl_Lib version.

```
unsetenv GCC_EXEC_PREFIX  
cd $PERL5LIB  
make clean  
make
```

Notes:

- When moving from one version of Perl_Lib to the other, do not simply change directory locations, but be sure that the appropriate start-up script has been sourced. Failure to do so may cause errors to occur.

3.0 Test and Evaluation Procedures

This section provides instructions for compiling and executing the Perl_Lib test suite. (See Section 2.1 for an explanation of the CERESENV environment variable.)

The test suite will be executed once for each platform which Perl_Lib has been installed. In each case, the Test_Perl_Lib script will print a warning message to the screen and pause processing for each problem discovered during execution. If no problems are encountered, then the script will complete without interruption until the end. If problems are encountered, then contact one of the Perl_Lib analysts.

3.1 Executing the AMI PPC64 Perl_Lib Test Suite

1. Change directory to **\$PERL5LIB** and execute the test suite package.

```
source $CERESENV  
cd $PERL5LIB/test_suites  
./Test_Perl_Lib.pl
```

3.2 Executing the AMI X86_64 Perl_Lib Test Suite

1. Change directory to **\$PERL5LIB** and execute the test suite package.

```
source $CERESENV  
cd $PERL5_LIB/test_suites  
./Test_Perl_Lib.pl
```

4.0 Perl_Lib File Promotion into Production

After Perl_Lib testing is complete, the following subdirectories and all their contents should be promoted to the production directories:

1. **\$PERL5LIB**

Appendix A Acronyms and Abbreviations

CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
CPAN	Comprehensive Perl Archive Network
DAAC	Distributed Active Archive Center
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
NASA	National Aeronautics and Space Administration
Perl_Lib	CERES's Perl module library
TRMM	Tropical Rainfall Measuring Mission

Appendix B
Perl_Lib Library Directory Structure Diagram

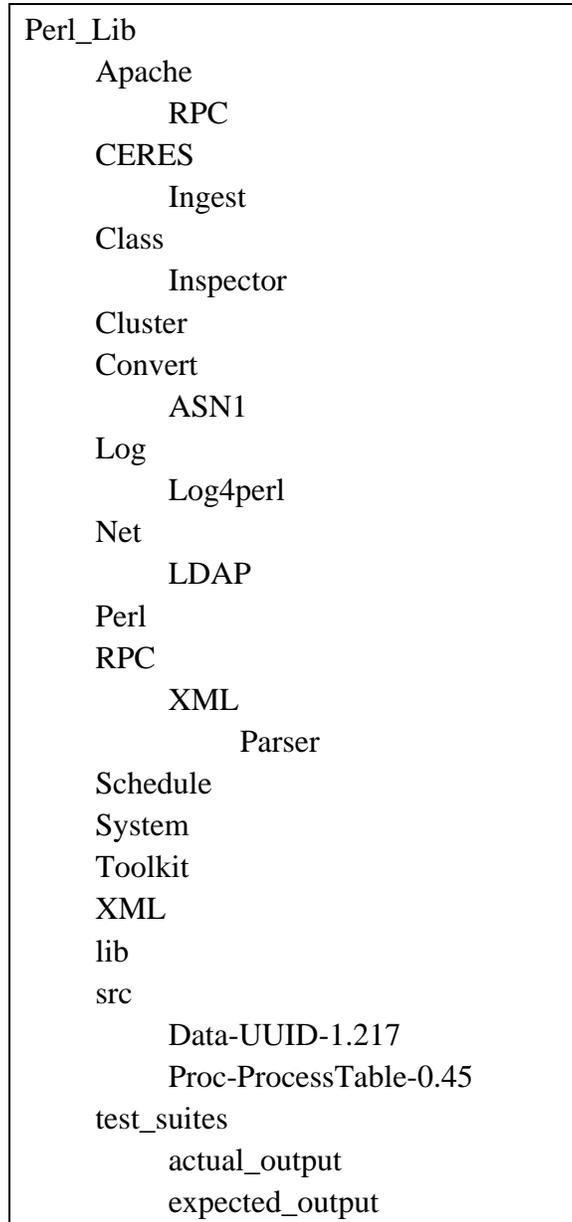


Figure B-1. Perl_Lib Library Directory Structure

Appendix C File Description Table

C.1 Executable Scripts

Table C-1. \$PERL5LIB directory

File Name	Format	Description
local_version.pl	ASCII	Prints the Perl_Lib release number and date to the console.
make_method.pl	ASCII	Combines .code, .help, and .base files used by Perl_Lib's RPC::XML library.