CERES Data Management Team Working Group Report

May 15, 2018

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CERES Data Management Team, NASA LaRC

Outline

Background

- CERES Production Workflow
- Staffing

Updates

- Recent DMT Activities
- Product Availability
- Systems and CM
- Technical Development

CERES DMT Overview

DMT Overall Tasks

Algorithms

- Implementation
- Verification
- Validation assistance

$$Z = \sum_{i=0}^{n} (\Delta C_i/\sigma C_i)^2 + \sum_{j=1}^{m} (\Delta v_j/\sigma v_j)^2 + \sum_{k=1}^{l} (\Delta F_k/\sigma F_k)^2 \qquad (3)$$

here on the r.h.s. the first term represents the cloud fraction adjustr
r model variable adjustments, and the third term the flux compon

quation (4) below restricts the solution such that the sum of the cl
his prevents unrealistic solutions (i.e.., sum of adjusted total fracti

$$X = \sum_{i=0}^{n} \Delta C_i = 0 \qquad (4)$$

Software

- Maintenance
- Configuration management

```
if ( dato(i,1) == -1 .and. dat(i,1) > 0.0 .and. dat(i,1)< 10000 ) then

 if (ifill == 1) then
  qc_validflag_sahclim_global (i) = 1
 endif

 if (ifill == 2) then
  qc_validflag_epoch_global (i) = 1
 endif

 qc_validflag_all_global(i) = 1

 dato(i,1:np) = dat(i,1:np)
endif

if ( dato(i,1) == -1  .and. ifill .eq. 2 ) then !LAST RESORT IGBP Based
 igbp1 = igbp(i)
 u0ohs = 1.0
 wv = 1.0 ! Pw(cm)
 call land_spec (igbp1, u0ohs, wv,  spec18_dum, bbalb)
 dato(i,1) = bbalb*10000
 dato(i,2) = u0ohs*1000
```

Data Management Team and ASDC Staffing

Science Team

- 7 working groups
- Derives, refines & validates algorithms
- Validates CERES datasets
- Writes documentation

Data Management Team (DMT)

- Implements algorithms
- Maintains software
- Verifies data
- Assists validation
- Provides CM and documentation support

Atmospheric Science Data Center (ASDC)

- Ingests data
- Promotes software to production env.
- Produces, distributes, archives datasets
- Provides user services

Data Management Team and ASDC Funding

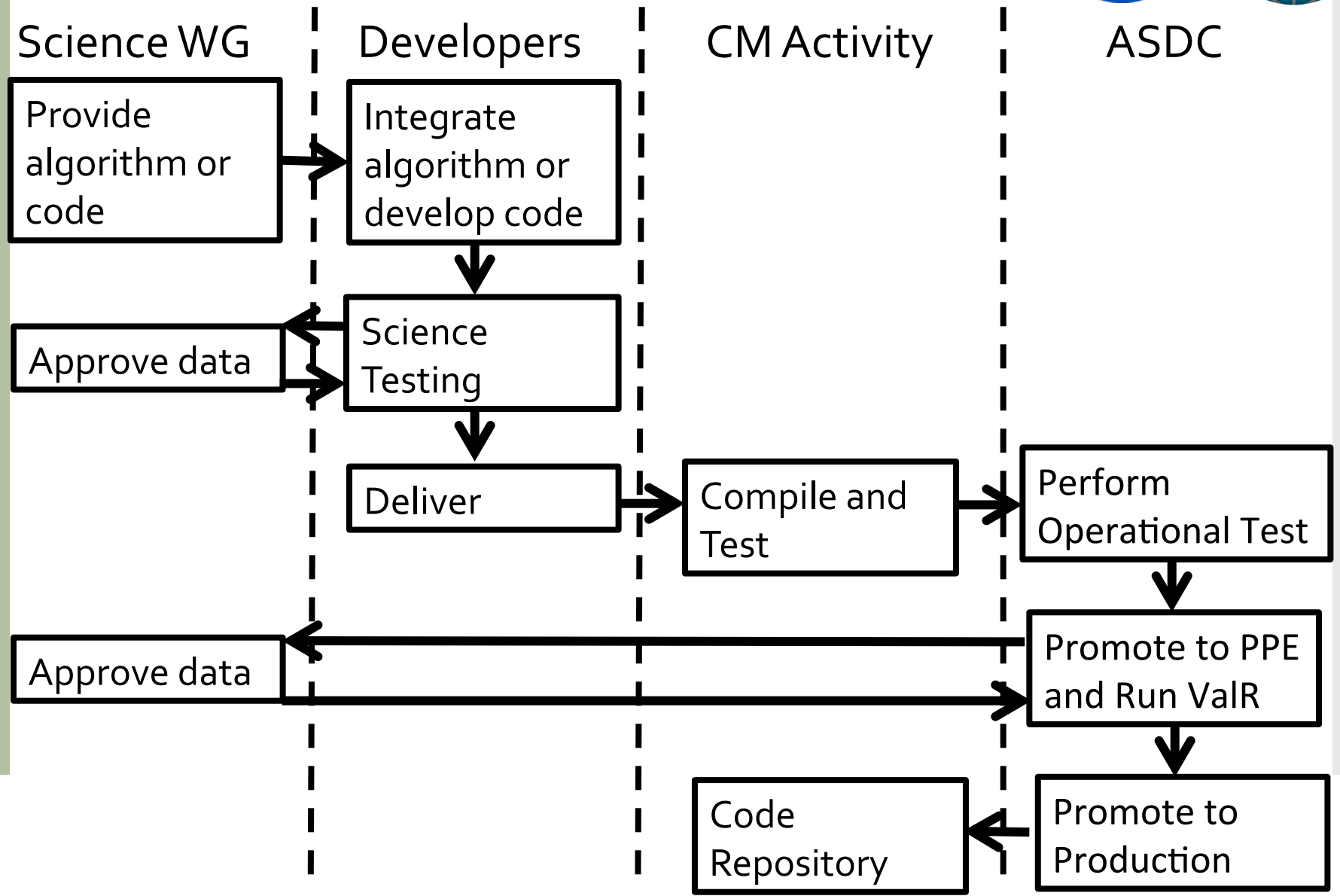
Science Team → Data Management Team (DMT)

Funded by Radiation Budget Measurements WBS

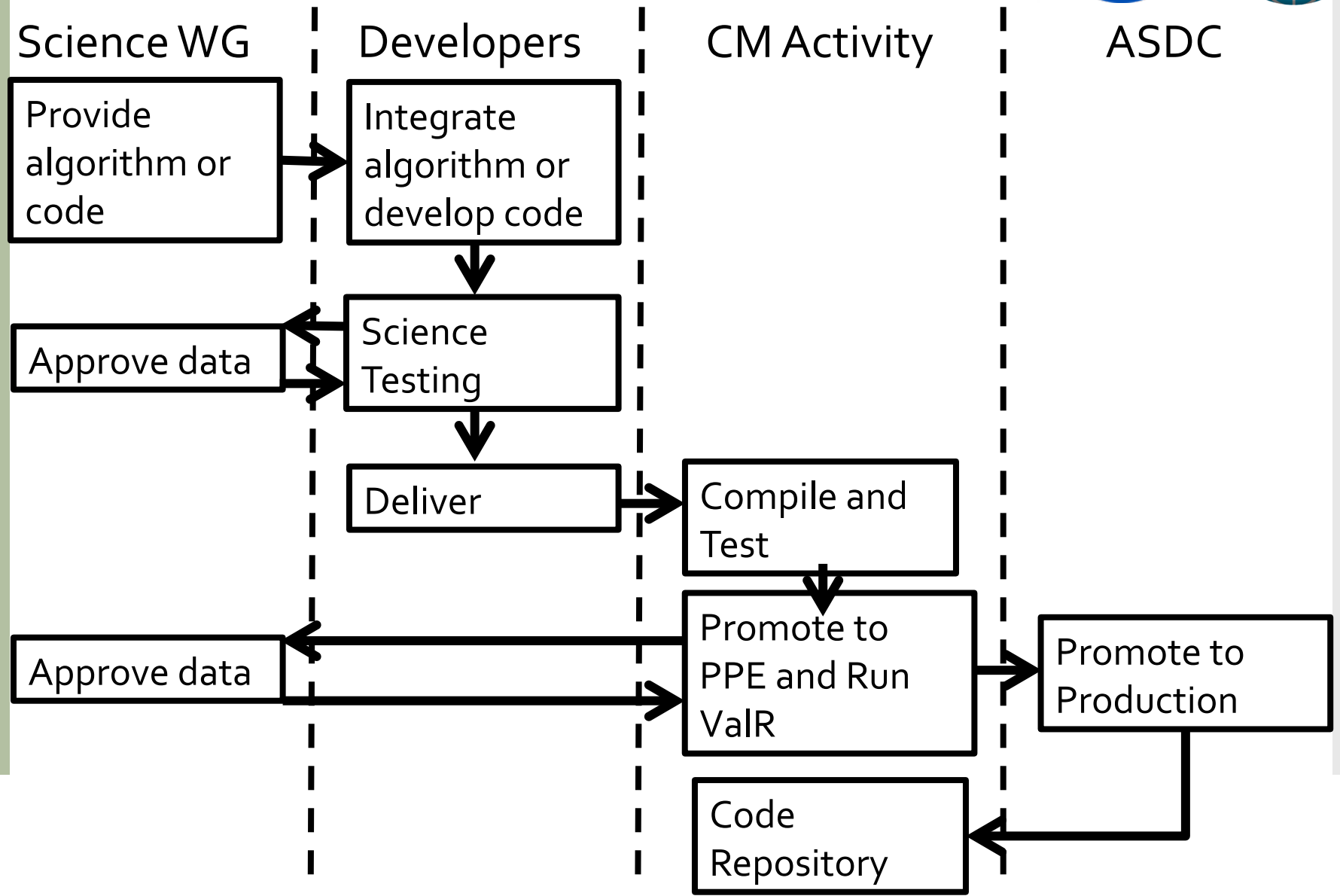
Atmospheric Science Data Center (ASDC)

Funded by ESDIS

Data Management Team and ASDC Staffing



Data Management Team and ASDC Staffing



Data Management Team and ASDC Staffing

DMT

- **Jonathan Gleason**
- **Katie Moore**
- Walter Miller
- Denise Cooper
- Mark Timcoe
- Tom Grepiotis
- Dianne Snyder
- Dale Walikainen
- Jeremie Lande
- Josh Wilkins
- Moguo Sun
- Cathy Nguyen
- Tom Caldwell
- Sunny Sun-Mack
- Yan Chen
- Rita Smith
- Ricky Brown
- Mike Linsinbigler

Data Management Team and ASDC Staffing

DMT

- Tammy Ayers
- Dennis Keyes
- Nelson Hillyer
- Joanne Saunders
- Victor Sothcott
- Igor Antropov
- Carla Grune
- Liz Heckert
- Churngwei Chu
- Cristian Mitrescu

ASDC

- Tonya Davenport
- Sharon Dukes-Allen
- Vertley Hopson

Recent DMT Activities

DELIVERIES SINCE 09/27/17:

16 DROPBOX/COEFFICIENT

55 CODE

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71 total

CODE DELIVERIES SINCE 09/27/17

INSTRUMENT (9)

Gains (all instruments), FM6 code updates

INVERSION (1)

make x86-only

TISA GRIDDING (2)

make x86-only, GEO monthly file update

CODE DELIVERIES SINCE 09/27/17

SARB (2)

make x86-only, PCF generation fix – updated directory

CLOUDS (4)

x86 compatibility, MODIS C6-to-C5 scaling coefficients file, PCF script update - filenames

ERBE-like (9)

SRFs, FM6 code update, make x86-only

CODE DELIVERIES SINCE 09/27/17

CATALYST (12)

Add production manager roles, FM6 code updates, secondary LDAP server, better BDSI file accounting, new archiver script compatibility

PR TOOL (13)

New workflow updates (CM/ASDC roles), add creation of PRs by product stream, FM6 updates, x86-only switches

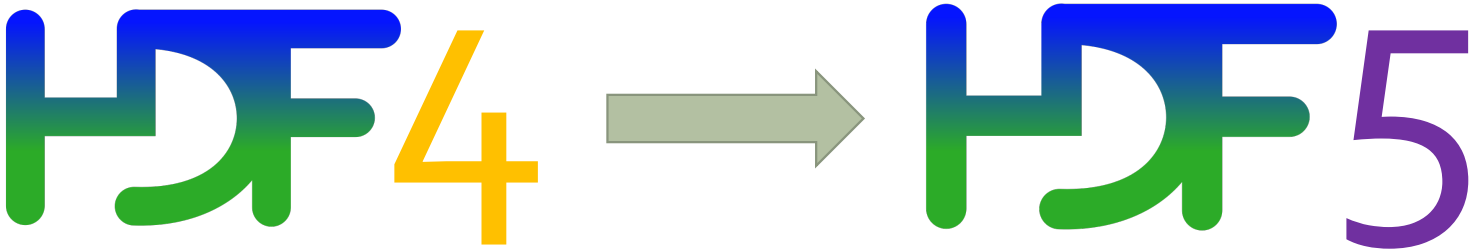
ARCHIVER (3)

Initial delivery and updates

Software Changes

- COMPLETED PGE migration into CATALYST in November 2017
- Release of new CERES archiver scripts, April 2018
  - More efficient
  - Addressed uncaught errors from ASDC (e.g. unarchived SGE logs)
- Release of new Production Request (PR) "chaining" feature for PR creation, April 2018

Software Changes: Ongoing

- Eliminating extraneous, intermediate files (PRES8, IES)
- Trailblazing ordering tool migration to OpenShift
- 

- Metadata implications

Software Changes: Ongoing

- MODIS Collection 6.1
  - Incorporating starting July
  - Reprocessing from March 2016 - current

Software Release

- Open source release
- Starting with:
  - **CERESlib**
  - **SARB**
- Compliance Matrix
  - Science Support Software – Class E
  - Science Software – Class D

Product Availability

EDITION 4 TERRA AND AQUA:

Product	Platform	Processed Thru	Publically Available?
BDS	Terra, Aqua	Jan. '18	Yes
SSF		Jan. '18	Yes
SSF1deg-Hour		Dec. '17	Yes
SSF1deg-Day/-Month		Dec. '17	Yes
SYN1deg-Hour/3Hour/ MHour	Terra+Aqua	Nov. '17	Yes
SYN1deg-Day/-Month		Nov. '17	Yes

EDITION 4 TERRA AND AQUA (CONT.):

Product	Platform	Processed Thru	Publically Available?
CldTypHist	Terra+Aqua	Feb. '17	Yes
FluxByCldTyp	Terra+Aqua		Will be
EBAF Surface	Terra+Aqua	Oct. '17	Yes
EBAF ToA	Terra+Aqua	Nov. '17	Yes

August 2018

EDITION 1 S-NPP:

Product	Platform	Processed Thru	Publically Available?
BDS	S-NPP	Dec. '17	Yes
SSF		Dec. '17	Yes
SSF1deg-Hour		Nov. '17	Yes
SSF1deg-Day/-Month		Nov. '17	Yes
SYN1deg	Terra+S-NPP	Nov. '17	Yes

EDITION 1-CV J01:

Product	Platform	Processed Thru	Publically Available?
BDS	JPSS-1	Apr. '18	No
ES8		Apr. '18	No
ES4			Will be
ES9			Will be

June 2018

Recent Public Releases

- Mid-December 2017
- Ed 1 S-NPP
  - ES4
  - ES9

Systems & CM

Hardware Changes

- CERES Level-0 data secondary drop moved to new computing facility (Katherine Johnson Computational Research Facility)
- Next few months:
  - Standing up new x86 blades
  - Updating to RHEL 7.3

Product Stewardship

- Algorithm Theoretical Basis Document:
  - http://ceres.larc.nasa.gov/atbd.php
  - Algorithm changes in publications: https://ceres.larc.nasa.gov/ceres_library_search.php
  - Creating a lookup table, directly relating all publications to algorithm improvments
- Ongoing dialogue on Phase F collections

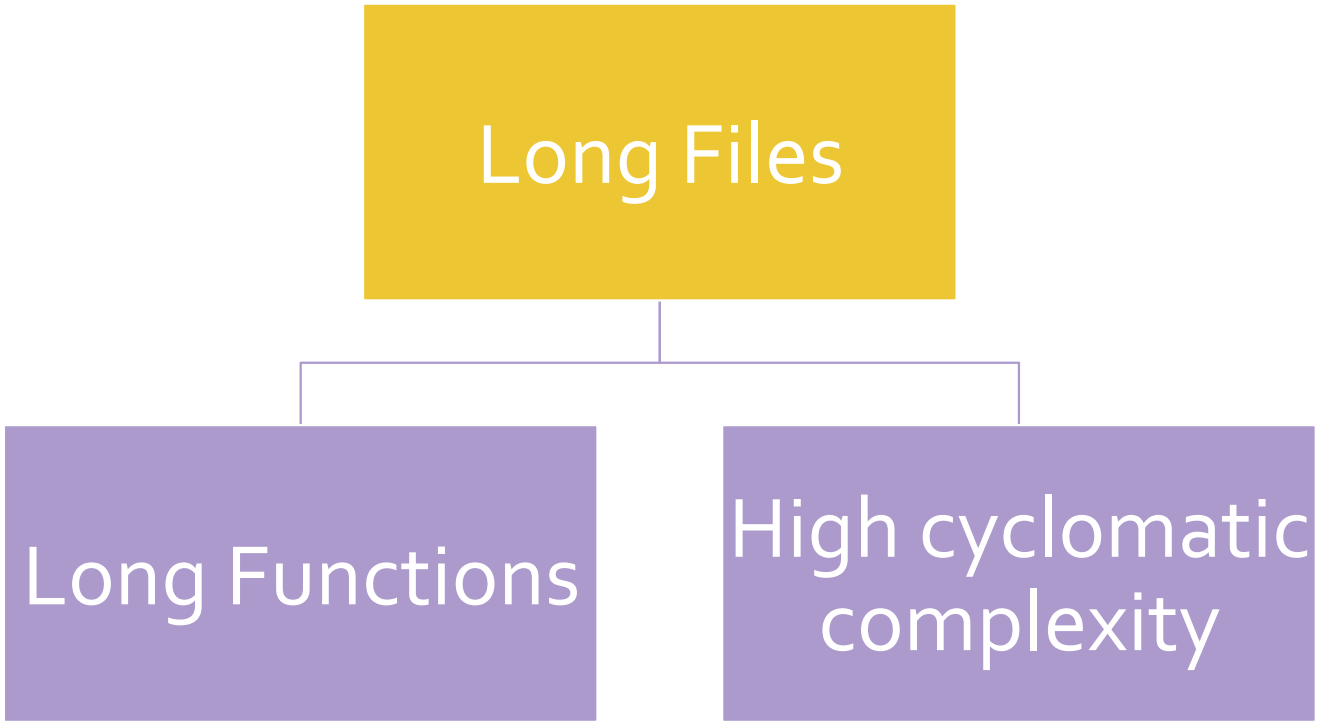
Technical Development

Code Re-Architecture

- Stakeholder interviews
- Git/Bitbucket training; code transitioned to Bitbucket
- Code analysis with SciTools' "Understand" software

Software Changes: Ongoing

- Initial analysis: TSI code (TISA)
- Top 3 static reasons for code improvement:



Code Re-Architecture

- Code analysis
- Code consultations
- Subsequent passes of code revision
- Finalize test case suite