

GSAS V5.6 Release Notes

GSAS Team
August 28 2009

Introduction

Release 5.6 includes several important changes to the GSAS code. The rec_ndx scale factor has been changed to avoid an October 2009 rollover. This means that the rec_ndx now increments by 5 rather than 10. An error fixed in the waveform Gaussian fit solution matrix resulted in minor changes to many fit parameters. The fit control parameters have been adjusted to recover more low signals for standard fit and less false signals for alternate fit. Several changes have been made to the elevation products including replacement of selected portions of the DEM and an update to the geoid. Products created by GSAS v5.6 will be identified as Release 31.

Important Note 1: Again, rec_ndx for Release 31 is scaled differently than rec_ndx for previous releases.

Important Note 2: The dry troposphere correction is elevation-sensitive. The geoid is subtracted from the elevation used in the tropospheric correction. The update from EGM96 (old geoid) to EGM2008 (new geoid) causes a shift of up to 2 cm in elevation due to the dry trop correction.

Important Note 3: The Icesat DEM on GLA06,12-14 has meters as units. There is more precision available on the DEM, but it was not put on the product. This may be fixed in a later release.

General Changes

The rec_ndx scale factor has been changed to avoid an October 2009 rollover. This means that the rec_ndx increments by approximately 5 instead of approximately 10. The rec_ndx is designed as a unique record identifier across products within a release and not a time counter, so caution should be used when using rec_ndx for things it was not necessarily intended.

L1A Changes (GLA01, 02, 03 and 04)

No changes (except for rec_ndx).

Altimetry Changes (GLA05, 06, 12, 13, 14, and 15)

Replaced the DEM over Greenland and Antarctica with the ICESat-derived DEM.

Added Pole Tide to GLA06, 12-15 over ocean.

Replaced the DEM with the GSFC Mean Sea Surface on GLA15.

Updated the Geoid to Earth Gravitational Model EGM2008.

Supplied the boresight calibration factor table for L2D and L2E.

Adjusted the signal fit width to improve performance with low transmit power.

Fixed an error in waveform fit solution matrix. This results in minor changes to many fit parameters.

Atmosphere Changes (GLA07, 08, 09, 10 and 11)

Full Resolution Ground Return Signal at 532 nm is now properly filled on GLA09.

Product Format/Definition Change Summary

Added pole tide (i_polTide) to GLA06, 12-15.

Changed i_DEM_elv to i_MSS_elv on GLA15.

Changed i_msRngCorr and i_msCorrFlg to spares on GLA06, 12-15.

Known Issues

When running under Linux, ANC47 inputs to the GLAS_LOP process are not supported. The C code used to read ANC47 (PDS construction records) crashes on Linux.

The dry troposphere correction is extremely elevation-sensitive. The geoid is the source of the elevation used in the tropospheric refraction correction. The update from EGM96 (old geoid) to EGM2008 (new geoid) causes a 1 to 2 cm shift in elevation due to the dry trop correction. **This means that Release 31 data cannot be used with prior releases. Use only Release 31 later data for comparisons.**

The Icesat DEM on GLA06,12-14 is has meters as units. There is more precision available on the DEM, but it was not put on the product. This may be fixed in a newer release.

Release Information

The ClearCase label for this release is RELEASE_5.6.

Products generated by this software will be labeled as Release 31 by SDMS.

The release date is August 28, 2009.

Version numbers have been updated to "V5.6 Aug 2009". This should be verified during operation by checking the version information in the appropriate ANC06 files.

SMDS Impact

The distribution tarfile is on glasdev.wff.nasa.gov at the following location:

`/glasdev1/v5/dist/gsas_v5.6.tar.Z.`

Bundle Changes

ANC5401-04 (Icesat-DEM) are new inputs to elev processing.

ANC55 (MSS) is a new input to elev processing.

ANC56 (Pole Tide) is a new input to elev processing.

ANC File Changes

New ANC07 files should be ingested.

New ANC45/ANC46 files should be ingested.

New ANC52 files should be ingested.

New ANC13 file should be ingested.

Linux Support Note: GSAS code and Makefiles have been modified to support running on 32 and 64-bit Linux systems using g95. The code compiles and test products have been generated and verified. However, full validation of GSAS on Linux is still underway.

Important Compilation Note: The first time GSAS is installed, an architecture-dependent definition file needs to be created. This can be done by executing the following script in the install directory (eg: not src, the directory above):

```
./configure
```

Detailed Change Notes

0002884: Apply pole tide corrections to the elevation

The pole tide correction computed in item 2751 have been applied to the elevation on GLA16,12-15. This is only computed/applied if the landmask is set to ocean.

0002883: Updated ANC45 and const_glob_mod for new release information

ANC45, ANC46 and GSAS internal versions numbers have been updated to reflect Release 31 and GSAS 5.6.

0002882: The Documentation For GLA06, GLA12, GLA13, GLA14, and GLA15 Should Be Changed.

Also includes the following items: 2737, 2750, 2872, 2880, 2881

Changed description on i_cntRngOff on GLA06, 12-15.

Updated the documentation to add a definition to gpCntRngOff

Updated the GLA01 rec_type, and Long and Short definition/documentation to include 0 means the data is invalid.

Updated documentation to reflect addition of i_poleTide (replacing i_spare2) on GLA06,12-15.

Updated documentation for i_DEM_hires_elv to reflect change to ICESat DEM on GLA06,12-14.

Updated documentation to reflect change of i_DEM_elv to i_MSS_elv on GLA15

0002879: GLA09 Ground Signal Problem

Added a computed value (previously unfilled) for i_FRg_grd_sig on GLA09.

0002877: The Time Dependent Values For d_nSig In anc07_0004 Need To Be Updated

Updated time-dependent NSIG table with values for L2C, L3A-L3G and L2E.

0002875: SRTM data shifted by 1/2 pixel (45m)

Investigated a reported 45m shift in SRTM data. Determined this was not an issue. The SRTM geolocation within GSAS is correct.

0002874: Replace the geoid model with EGM2008

The ANC13 geoid file has been replaced. The new geoid file contains the Earth Gravitational Model EGM2008 referenced to the Topex-Poseidon ellipsoid, with mean tides applied.

0002871: Overflow comment in datemethods.c

Removed unused routines from datemethods.c which had long integer overflow problems.

0002870: The Calculation Of GLA14%i_garea Needs To Be Corrected

Corrected the calculation of i_garea on GLA14.

0002869: Create utilities to difference products

Created utility software to compare versions of ANC29, ANC32, and all the GLAxx product files.

0002865: Waveform Software

Simplified waveform code. Removed area normalization. Removed special processing. Removed unused subroutine arguments. Removed unused subroutines.

0002864: Implement A Time Dependent d_nsig

Implemented time dependent values for the noise threshold. Note that this release uses the same values of nsig for all time periods. Item 2877 updates nsig with time-dependent values.

0002862: The BSS Calibration Factor Table Needs To Be Updated

Updated the BSS Calibration Factor Table with values for L2D and L2E periods.

0002859: The ANC50*01.DAT files for Laser 2E have a number of invalid values in the last record

Fixed an error in ANC50 computation where an uninitialized variable semi-randomly caused invalid output. Also incremented the output counter record on ANC50s so that the ANC06 file contained an accurate output record count for the ANC50 files.

0002858: Linux compatibility.

Also includes the following items: 2849, 2755, 2691, 2690, 2686, 2597, 2566, 2565, 2564, 2528, 2527, 2526, 2525, 2524, 2524, 2522, 2521, 2520, 2509, 2508, 2506, 2505, 2498, 2492, 0108. Modified the code to better conform with standard f90 guidelines and to ensure the code compiles with g95 on Linux. Code has been tested on both 32 and 64-bit Linux. The C code used to read ANC47 (PDS construction records) crashes on Linux.

The changes mostly involve

- 1) changing dfloat to dble
- 2) changing some C code to integrate with non-HP Fortran (anc29/anc32)
- 3) changing text data files to Unix-format rather than PC-format (anc38)
- 4) removing comments on pre-compiler directives
- 5) removing unused variable definitions
- 6) reworking the make system to support multiple architectures
- 7) rewriting utility makefiles to support new make system

0002844: Invalid Transmitted Energy Causes Waveforms To Crash

Fixed a problem in W_calibNrg where an invalid d_TxNrg caused a crash.

0002796: Saturation elevation correction table split and update

Added a time dependent lookup table and the capability of using multiple saturation elevation correction tables. Note that new values for the time-dependent tables have not been updated for this release.

0002764: The A-Priori Parameter Weight Matrix Should Not Be Changed Between Iterations

Fixed an error to stop changing V0 (the diagonal terms in the normal matrix) between iterations during the least-squares waveform-fitting process.

0002754: Replace high res DEM over Greenland and Antarctica with ICESat DEM

Replaced the GTOPO30 values over Greenland and Antarctica with the GLAS-derived 1k and 500m (respectively) DEMS on GLA06, 12-14.

0002753: Place GSFC MSS values (elevation) on GLA15 instead of a DEM

Placed the GSFC Mean Sea Surface values on GLA15 instead of a DEM. The reference frame for the MSS values is the TOPEX/Poseidon ellipsoid. Changed i_DEM_elv to i_MSS_elv.

0002751: Place the pole tide on GLA06, and GLA12-15

Added pole tide (i_poTide) to gla06, and 12-15.

0002746: The QA % missing data for one of the Laser 3I GLA06 granules has a negative value

Updated the method by which missing data is computed on the QA products.

0002743: Change i_msRngCorr and i_msCorrFlg to spares

Changed i_msRngCorr & i_msCorrFlg to spares on GLA06, 12-15.

0002720: Error from qapg_gla05_at.f90

Fixed a problem that caused QAP05 browse to crash.

0002701: Saturation Energy Correction Should Be Removed From Waveforms

The saturation energy correction code has been removed from W_Assess_mod

0002632: Check for possible rec_ndx rollover in 2009.

Changed the scale factor for rec_ndx from 10 to 5. This extends the range of rec_ndx for another 7 years.

Additional Information

Changed Files:

```
./bin/Makefile
./cc_util
./cc_util/cc_make_final.sh
./cc_util/config_specs/gsfvc_v0
./cc_util/make_defs.incl
./cc_util/make_depends.incl
./cc_util/testfile
./data/anc07_001_01_0000.dat
./data/anc07_001_01_0004.dat
./data/anc38_001_01_0001.dat
./data/anc38_001_01_0002.dat
./data/anc38_001_01_0003.dat
./data/anc38_001_01_0004.dat
./data/anc45_001_01_0001.dat
./data/anc45_001_01_0002.dat
./data/anc45_001_01_0003.dat
./data/anc45_001_01_0004.dat
./data/anc45_001_01_0005.dat
./data/anc45_001_01_0006.dat
./data/anc45_001_01_0007.dat
./data/anc45_001_01_0008.dat
./data/anc45_001_01_0009.dat
./data/anc45_001_01_0010.dat
./data/anc45_001_01_0011.dat
./data/anc45_001_01_0012.dat
./data/anc45_001_01_0013.dat
./data/anc45_001_01_0014.dat
./data/anc45_001_01_0015.dat
./data/anc52_001_01_0001.dat
./idl/qa_browse/compare
./idl/qa_browse/compare/headertimetoj2000s.pro
./idl/qa_browse/compare/qapc_metadata01.pro
./idl/qa_browse/compare/qapc_metadataelev.pro
./idl/qa_browse/compare/qapcompare.pro
./idl/qa_browse/read/qapr_readheader.pro
./idl/qa_browse/util/qap05V4_datastruct.pro
```

```
./lib/Makefile
./lost+found/Makefile.546ce61ba76e11dda0f9001083f8ab60
./lost+found/Makefile.61ccc4e4a76911dda019001083f8ab60
./lost+found/Makefile.c71cba20a76711ddbccc001083f8ab60
./lost+found/Makefile.f5f57559b70211ddb4b6001083f8ab60
./Makefile
./src/anc32_qa/ANC32_QA.f90
./src/anc32_qa/GetControl_mod.f90
./src/anc32_qa/Makefile
./src/atm_anc
./src/atm_anc/A_open_met_mod.f90
./src/atm_anc/A_open_ozone_mod.f90
./src/atm_anc/A_prod_reader_mod.f90
./src/atm_anc/A_read_control_mod.f90
./src/atm_anc/A_sum_lidar_mod.f90
./src/atm_anc/atm_anc.f90
./src/atm_anc/Makefile
./src/atm_lib/Makefile
./src/atmosphere/interp/A_interp_met_mod.f90
./src/atmosphere/layers/A_4s_1064_det_mod.f90
./src/atmosphere/layers/A_clD_det_mod.f90
./src/atmosphere/layers/A_clD_grd_det_mod.f90
./src/atmosphere/layers/A_clD_lays_mod.f90
./src/atmosphere/layers/A_pbl_det_mod.f90
./src/atmosphere/opt_props/A_aer_opt_prop_mod.f90
./src/atmosphere/opt_props/A_clD_opt_prop_mod.f90
./src/atmosphere/opt_props/A_opt_thin_mod.f90
./src/atmosphere/QA/QAP07_mod.f90
./src/atmosphere/QA/QAP08_mod.f90
./src/atmosphere/QA/QAP09_mod.f90
./src/atmosphere/QA/QAP10_mod.f90
./src/atmosphere/QA/QAP11_mod.f90
./src/common_libs/anc_lib
./src/common_libs/anc_lib/anc_hdr_mod.f90
./src/common_libs/anc_lib/anc01_met_mod.f90
./src/common_libs/anc_lib/anc07_atm_mod.f90
./src/common_libs/anc_lib/ANC07_mod.f90
./src/common_libs/anc_lib/anc07_wf_mod.f90
./src/common_libs/anc_lib/anc08_pod_mod.f90
./src/common_libs/anc_lib/anc12_dem_mod.f90
./src/common_libs/anc_lib/anc13_geoid_mod.f90
./src/common_libs/anc_lib/anc22_track_mod.f90
./src/common_libs/anc_lib/anc29_index_mod.f90
./src/common_libs/anc_lib/anc29_index.h
./src/common_libs/anc_lib/anc29_sort.c
./src/common_libs/anc_lib/anc30_aer_mod.f90
./src/common_libs/anc_lib/anc31_trop_mod.f90
./src/common_libs/anc_lib/anc32_gps_mod.f90
./src/common_libs/anc_lib/anc36_atm_mod.f90
./src/common_libs/anc_lib/anc38_msf_mod.f90
./src/common_libs/anc_lib/anc52_corr_mod.f90
./src/common_libs/anc_lib/anc54_dem_mod.f90
./src/common_libs/anc_lib/anc55_mss_mod.f90
./src/common_libs/anc_lib/anc56_pt_mod.f90
./src/common_libs/anc_lib/inst_state_mod.f90
./src/common_libs/anc_lib/Makefile
./src/common_libs/cntrl_lib/centertext_mod.f90
./src/common_libs/cntrl_lib/Makefile
./src/common_libs/cntrl_lib/multimenu_mod.f90
./src/common_libs/cntrl_lib/parse_keyval_mod.f90
./src/common_libs/cntrl_lib/strtrim.f90
./src/common_libs/err_lib/ANC06_mod.f90
./src/common_libs/err_lib/ErrorInit_mod.f90
./src/common_libs/err_lib/GLASError_mod.f90
./src/common_libs/err_lib/Makefile
./src/common_libs/err_lib/WriteError_mod.f90
./src/common_libs/exec_lib/C_CalcNrg_mod.f90
./src/common_libs/exec_lib/c_nose_mod.f90
./src/common_libs/exec_lib/check_recndx_mod.f90
./src/common_libs/exec_lib/CloseFiles_mod.f90
./src/common_libs/exec_lib/com_hdr_update_mod.f90
./src/common_libs/exec_lib/fCntl_mod.f90
```

```
./src/common_libs/exec_lib/get_fileindex_mod.f90
./src/common_libs/exec_lib/MainInit_mod.f90
./src/common_libs/exec_lib/MainWrap_mod.f90
./src/common_libs/exec_lib/Makefile
./src/common_libs/exec_lib/OpenFiles_mod.f90
./src/common_libs/exec_lib/passid_mod.f90
./src/common_libs/exec_lib/ReadAnc_mod.f90
./src/common_libs/exec_lib/ReadData_mod.f90
./src/common_libs/exec_lib/StdCntl_mod.f90
./src/common_libs/file_lib/Makefile
./src/common_libs/geo_lib/Makefile
./src/common_libs/gsashdf_lib/Makefile
./src/common_libs/Makefile
./src/common_libs/math_lib
./src/common_libs/math_lib/c_matrix_smooth_mod.f90
./src/common_libs/math_lib/c_minmaxmean_mod.f90
./src/common_libs/math_lib/conversions_mod.f90
./src/common_libs/math_lib/Makefile
./src/common_libs/math_lib/polar_stereographic_mod.f90
./src/common_libs/platform_lib
./src/common_libs/platform_lib/c_compare_mod.f90
./src/common_libs/platform_lib/const_glob_mod.f90
./src/common_libs/platform_lib/const_wf_mod.f90
./src/common_libs/platform_lib/Makefile
./src/common_libs/prod_lib
./src/common_libs/prod_lib/common_flags_mod.f90
./src/common_libs/prod_lib/common_hdr_mod.f90
./src/common_libs/prod_lib/GLA00_cols_mod.f90
./src/common_libs/prod_lib/GLA00_mod.f90
./src/common_libs/prod_lib/GLA00_print_mod.f90
./src/common_libs/prod_lib/GLA01_alg_mod.f90
./src/common_libs/prod_lib/GLA01_hdr_mod.f90
./src/common_libs/prod_lib/GLA01_wf_mod.f90
./src/common_libs/prod_lib/GLA02_alg_mod.f90
./src/common_libs/prod_lib/GLA02_hdr_mod.f90
./src/common_libs/prod_lib/GLA02_Pass_mod.f90
./src/common_libs/prod_lib/GLA03_alg_mod.f90
./src/common_libs/prod_lib/GLA03_hdr_mod.f90
./src/common_libs/prod_lib/GLA04_alg_mod.f90
./src/common_libs/prod_lib/GLA04_hdr_mod.f90
./src/common_libs/prod_lib/GLA05_alg_mod.f90
./src/common_libs/prod_lib/GLA05_hdr_mod.f90
./src/common_libs/prod_lib/GLA05_scal_mod.f90
./src/common_libs/prod_lib/GLA06_alg_mod.f90
./src/common_libs/prod_lib/GLA06_hdr_mod.f90
./src/common_libs/prod_lib/GLA06_Pass_mod.f90
./src/common_libs/prod_lib/GLA06_print_mod.f90
./src/common_libs/prod_lib/GLA06_prod_mod.f90
./src/common_libs/prod_lib/GLA06_scal_mod.f90
./src/common_libs/prod_lib/GLA07_alg_mod.f90
./src/common_libs/prod_lib/GLA07_hdr_mod.f90
./src/common_libs/prod_lib/GLA08_alg_mod.f90
./src/common_libs/prod_lib/GLA08_flags_mod.f90
./src/common_libs/prod_lib/GLA09_alg_mod.f90
./src/common_libs/prod_lib/GLA09_hdr_mod.f90
./src/common_libs/prod_lib/GLA10_alg_mod.f90
./src/common_libs/prod_lib/GLA10_hdr_mod.f90
./src/common_libs/prod_lib/GLA11_alg_mod.f90
./src/common_libs/prod_lib/GLA11_hdr_mod.f90
./src/common_libs/prod_lib/GLA12_alg_mod.f90
./src/common_libs/prod_lib/GLA12_hdr_mod.f90
./src/common_libs/prod_lib/GLA12_print_mod.f90
./src/common_libs/prod_lib/GLA12_prod_mod.f90
./src/common_libs/prod_lib/GLA12_scal_mod.f90
./src/common_libs/prod_lib/GLA13_alg_mod.f90
./src/common_libs/prod_lib/GLA13_hdr_mod.f90
./src/common_libs/prod_lib/GLA13_print_mod.f90
./src/common_libs/prod_lib/GLA13_prod_mod.f90
./src/common_libs/prod_lib/GLA13_scal_mod.f90
./src/common_libs/prod_lib/GLA14_alg_mod.f90
./src/common_libs/prod_lib/GLA14_hdr_mod.f90
./src/common_libs/prod_lib/GLA14_print_mod.f90
```



```
./src/common_libs/prod_lib/GLA14_prod_mod.f90
./src/common_libs/prod_lib/GLA14_scal_mod.f90
./src/common_libs/prod_lib/GLA15_alg_mod.f90
./src/common_libs/prod_lib/GLA15_hdr_mod.f90
./src/common_libs/prod_lib/GLA15_print_mod.f90
./src/common_libs/prod_lib/GLA15_prod_mod.f90
./src/common_libs/prod_lib/GLA15_scal_mod.f90
./src/common_libs/prod_lib/Makefile
./src/common_libs/prod_lib/qap_version_mod.f90
./src/common_libs/time_lib
./src/common_libs/time_lib/dateinterface.c
./src/common_libs/time_lib/datemethods.c
./src/common_libs/time_lib/j2000to19char_mod.f90
./src/common_libs/time_lib/Makefile
./src/create_gla16/Makefile
./src/createGran_util
./src/createGran_util/createGran_util.f90
./src/createGran_util/createGranule_mod.f90
./src/createGran_util/Makefile
./src/createGran_util/pop_granule_mod.f90
./src/createGran_util/rd_GranCntrl_mod.f90
./src/elev_lib/Makefile
./src/elevations
./src/elevations/anc09_pad_mod.f90
./src/elevations/c_Azimuth_FootPrint1s_mod.f90
./src/elevations/c_calcspl0c_mod.f90
./src/elevations/c_intrppod_mod.f90
./src/elevations/c_legacyintrppod.f90
./src/elevations/c_matmul_mod.f90
./src/elevations/e_calcearthtd_mod.f90
./src/elevations/e_calcequilttd_mod.f90
./src/elevations/e_calcloadtd_mod.f90
./src/elevations/e_calcoceantd_mod.f90
./src/elevations/e_calcpoletd_mod.f90
./src/elevations/e_calcslope_mod.f90
./src/elevations/e_calctrop_mod.f90
./src/elevations/e_getsunAngle_mod.f90
./src/elevations/e_LandParm_mod.f90
./src/elevations/e_LdTdArg_mod.f90
./src/elevations/e_legacyOcTd_mod.f90
./src/elevations/e_OceanParm_mod.f90
./src/elevations/e_tidpot.f90
./src/elevations/qap06_mod.f90
./src/elevations/qap12_mod.f90
./src/elevations/qap13_mod.f90
./src/elevations/qap14_mod.f90
./src/elevations/qap15_mod.f90
./src/glas_alt/eCntl_mod.f90
./src/glas_alt/Elev_QAP_mod.f90
./src/glas_alt/Elev_Support_mod.f90
./src/glas_alt/ElevMgr_mod.f90
./src/glas_alt/GetControl_mod.f90
./src/glas_alt/GLAS_Alt.f90
./src/glas_alt/Makefile
./src/glas_alt/WF_QAP_mod.f90
./src/glas_alt/WFMgr_mod.f90
./src/glas_alt/WriteElev_mod.f90
./src/glas_alt/WriteWF_mod.f90
./src/glas_apid/eCntl_mod.f90
./src/glas_apid/GetControl_mod.f90
./src/glas_apid/Makefile
./src/glas_apid/ProcessAPID_mod.f90
./src/glas_atm/AtmMgr_mod.f90
./src/glas_atm/eCntl_mod.f90
./src/glas_atm/GetControl_mod.f90
./src/glas_atm/GLAS_Atm.f90
./src/glas_atm/Makefile
./src/glas_atm/WriteAtm_mod.f90
./src/glas_gps/GetControl_mod.f90
./src/glas_gps/Makefile
./src/glas_l0p/eCntl_mod.f90
./src/glas_l0p/GetControl_mod.f90
```

```
./src/glas_l0p/GLAS_L0proc.f90
./src/glas_l0p/glop_mod.f90
./src/glas_l0p/gps_index.h
./src/glas_l0p/gps_sort.c
./src/glas_l0p/index_grouping_mod.f90
./src/glas_l0p/Makefile
./src/glas_l0p/time_conversion_mod.f90
./src/glas_l1a/eCntl_mod.f90
./src/glas_l1a/GetControl_mod.f90
./src/glas_l1a/GLAS_L1A.f90
./src/glas_l1a/L1A_QAP_mod.f90
./src/glas_l1a/L1AMgr_mod.f90
./src/glas_l1a/Makefile
./src/glas_l1a/WriteL1A_mod.f90
./src/glas_meta/eCntl_mod.f90
./src/glas_meta/GetControl_mod.f90
./src/glas_meta/GLAS_Meta.f90
./src/glas_meta/Makefile
./src/glas_meta/WriteMetaFile_mod.f90
./src/glas_reader/eCntl_mod.f90
./src/glas_reader/GetControl_mod.f90
./src/glas_reader/Makefile
./src/glas_reader/PrintAnc_mod.f90
./src/glas_reader/PrintQAP_mod.f90
./src/glas_tick/eCntl_mod.f90
./src/glas_tick/GetControl_mod.f90
./src/glas_tick/GLAS_Tick.f90
./src/glas_tick/Makefile
./src/glas_tick/ReadTickData_mod.f90
./src/glas_tick/TickStats_mod.f90
./src/l1a_lib/align_prap_mod.f90
./src/l1a_lib/bvtcw2utc_mod.f90
./src/l1a_lib/fsiz.c
./src/l1a_lib/L_Alt_mod.f90
./src/l1a_lib/L_Atm_mod.f90
./src/l1a_lib/L_Att_mod.f90
./src/l1a_lib/L_Eng_mod.f90
./src/l1a_lib/L_GeoLoc_mod.f90
./src/l1a_lib/Makefile
./src/l1a_lib/QAP01_mod.f90
./src/l1a_lib/QAP02_mod.f90
./src/l1a_lib/QAP03_mod.f90
./src/l1a_lib/qap04_mod.f90
./src/l1a_lib/set_apid_avflg_mod.f90
./src/l1a_lib/shot_time_mod.f90
./src/lib/Makefile
./src/Makefile
./src/met_util
./src/met_util/M_read_control_mod.f90
./src/met_util/Makefile
./src/met_util/SDMS_met_script
./src/modules/Makefile
./src/NOSE_util
./src/NOSE_util/Makefile
./src/NOSE_util/NOSEfile_util.f90
./src/NOSE_util/rd_NOSECntrl_mod.f90
./src/prod_util
./src/prod_util/char19_to_sec/Makefile
./src/prod_util/constr_rec/Makefile
./src/prod_util/gsas_prod_readers/gla01_reader
./src/prod_util/gsas_prod_readers/gla01_reader/Makefile
./src/prod_util/gsas_prod_readers/gla02_reader
./src/prod_util/gsas_prod_readers/gla02_reader/Makefile
./src/prod_util/gsas_prod_readers/gla05_reader
./src/prod_util/gsas_prod_readers/gla05_reader/Makefile
./src/prod_util/gsas_prod_readers/gla06_reader
./src/prod_util/gsas_prod_readers/gla06_reader/Makefile
./src/prod_util/gsas_prod_readers/gla07_reader
./src/prod_util/gsas_prod_readers/gla07_reader/Makefile
./src/prod_util/gsas_prod_readers/gla08_reader
./src/prod_util/gsas_prod_readers/gla08_reader/Makefile
./src/prod_util/gsas_prod_readers/gla09_reader
```

```
./src/prod_util/gsas_prod_readers/gla09_reader/Makefile
./src/prod_util/gsas_prod_readers/gla10_reader
./src/prod_util/gsas_prod_readers/gla10_reader/Makefile
./src/prod_util/gsas_prod_readers/gla11_reader
./src/prod_util/gsas_prod_readers/gla11_reader/Makefile
./src/prod_util/gsas_prod_readers/gla12_reader
./src/prod_util/gsas_prod_readers/gla12_reader/Makefile
./src/prod_util/gsas_prod_readers/gla13_reader
./src/prod_util/gsas_prod_readers/gla13_reader/Makefile
./src/prod_util/gsas_prod_readers/gla14_reader
./src/prod_util/gsas_prod_readers/gla14_reader/Makefile
./src/prod_util/gsas_prod_readers/gla15_reader
./src/prod_util/gsas_prod_readers/gla15_reader/Makefile
./src/prod_util/gsas_prod_readers/Makefile
./src/prod_util/gsas_prod_readers/wf_reader
./src/prod_util/gsas_prod_readers/wf_reader/Makefile
./src/prod_util/gsas_prod_readers/wf_reader/Makefile.parm_reader
./src/prod_util/gsas_prod_readers/wf_reader/Makefile.wf_reader
./src/prod_util/Makefile
./src/prod_util/prod_compare/anc29_compare.f90
./src/prod_util/prod_compare/anc32_compare.f90
./src/prod_util/prod_compare/gla01_compare.f90
./src/prod_util/prod_compare/gla02_compare.f90
./src/prod_util/prod_compare/gla03_compare.f90
./src/prod_util/prod_compare/gla0401_compare.f90
./src/prod_util/prod_compare/gla0402_compare.f90
./src/prod_util/prod_compare/gla0403_compare.f90
./src/prod_util/prod_compare/gla0404_compare.f90
./src/prod_util/prod_compare/gla0405_compare.f90
./src/prod_util/prod_compare/gla0406_compare.f90
./src/prod_util/prod_compare/gla05_compare.f90
./src/prod_util/prod_compare/gla06_compare.f90
./src/prod_util/prod_compare/gla07_compare.f90
./src/prod_util/prod_compare/gla08_compare.f90
./src/prod_util/prod_compare/gla09_compare.f90
./src/prod_util/prod_compare/gla10_compare.f90
./src/prod_util/prod_compare/gla11_compare.f90
./src/prod_util/prod_compare/gla12_compare.f90
./src/prod_util/prod_compare/gla13_compare.f90
./src/prod_util/prod_compare/gla14_compare.f90
./src/prod_util/prod_compare/gla15_compare.f90
./src/prod_util/prod_compare/Makefile
./src/prod_util/product_test/gla06_minmax_mod.f90
./src/prod_util/product_test/gla12_minmax_mod.f90
./src/prod_util/product_test/gla13_minmax_mod.f90
./src/prod_util/product_test/gla14_minmax_mod.f90
./src/prod_util/product_test/gla15_minmax_mod.f90
./src/prod_util/product_test/Makefile
./src/prod_util/scantime/eCntl mod.f90
./src/prod_util/scantime/Makefile
./src/prod_util/scantime/scantime.f90
./src/prod_util/scf_prod_readers
./src/prod_util/scf_prod_readers/Makefile
./src/prod_util/scf_prod_readers/Makefile_read_gla01
./src/prod_util/scf_prod_readers/Makefile_read_gla02
./src/prod_util/scf_prod_readers/Makefile_read_gla03
./src/prod_util/scf_prod_readers/Makefile_read_gla04
./src/prod_util/scf_prod_readers/Makefile_read_gla05
./src/prod_util/scf_prod_readers/Makefile_read_gla06
./src/prod_util/scf_prod_readers/Makefile_read_gla07
./src/prod_util/scf_prod_readers/Makefile_read_gla08
./src/prod_util/scf_prod_readers/Makefile_read_gla09
./src/prod_util/scf_prod_readers/Makefile_read_gla10
./src/prod_util/scf_prod_readers/Makefile_read_gla11
./src/prod_util/scf_prod_readers/Makefile_read_gla12
./src/prod_util/scf_prod_readers/Makefile_read_gla13
./src/prod_util/scf_prod_readers/Makefile_read_gla14
./src/prod_util/scf_prod_readers/Makefile_read_gla15
./src/prod_util/scf_prod_readers/Makefile_read_wf
./src/prod_util/scf_prod_readers/Makefile.gsas
./src/prod_util/splitter/eCntl mod.f90
./src/prod_util/splitter/Makefile
```

```
./src/prod_util/strip1984/Makefile
./src/qapg/Makefile
./src/qapg/qapg_gla05_at.f90
./src/qapg/qapg_gla05_mod.f90
./src/qapg/qapg_histogram_mod.f90
./src/qapg/qapg_qap03_interface_mod.f90
./src/qapg/qapg_readgla_mod.f90
./src/qapg/V_prod_reader_mod.f90
./src/qapg/V_read_control_mod.f90
./src/reforbit_util
./src/reforbit_util/c_procRefOrbit_mod.f90
./src/reforbit_util/Makefile
./src/reforbit_util/rd_reforbctrl_mod.f90
./src/reforbit_util/reforbit_util.f90
./src/saturation_util/mk_range_corr.f
./src/track_reader/track_reader_mod.f90
./src/wf_lib/Makefile
./src/wf_lib/QA_wf_mod.f90
./src/wf_lib/W_Assess_mod.f90
./src/wf_lib/W_CreQAStats_mod.f90
./src/wf_lib/W_FunctionalFt_mod.f90
./src/wf_lib/W_LsqFit_mod.f90
./src/wf_lib/W_MeanSDev_mod.f90
```