GSAS V6.0 Release Notes
GSAS Team

March 2011

Goddard Space Flight Center

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1.0   INTRODUCTION

Release 6.0 is planned to be the final major release of GSAS. This release incorporates many changes and enhancements. The following are important points to note.

1. The saturation correction for Laser 3 has been improved. Applying these should enable the ICESat data to be sufficiently improved.
2. The standard fit signal threshold was lowered starting with L3I. This provides significantly more elevations for the low signal areas. The qualities of the low signal elevations have not been fully evaluated.
3. Validation of ICESat data by a number of users has indicated that some campaigns have bias in the reported elevations relative to other campaign periods. A new bias parameter was added to the elevation products. The cause and dependencies of these have not been determined to allow correction values to be determined. For this release the bias parameter is set to invalid.
4. A new atmosphere characterization and confidence flag has been added to the products. This should be more consistent in identifying atmosphere effects on the elevation estimates.
5. Several changes were made that improve the calibration of the atmosphere product parameters.

2.0   GENERAL CHANGES

L1A Changes (GLA01, 02, 03 and 04)

Changed the data validation code within ANC32_QA and GLAS_L0p to improve the consistency of the internal quality assessment of the ANC32 GPS time alignment data. Fixed the GLA04 LRS Virtual Tracker Centroid Row and Column conversion factor.

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

Updated the Laser 3 saturation correction tables. Added distance from reference track. Added atmospheric characterization flag and removed blowing snow and erd. Added hi-resolution Canadian DEM. Provide greater precision and higher rate beam co-elevation and azimuth. Added a WGS84 elevation delta, track number, repeat cycle, and campaign. Added the local solar time at 1hz. Set reflectance and saturation energy correction to NAN when saturation energy correction is incalculable. Changed to SRTM 90m DEM to 9 values (3X3 box) surrounding the elevation. Updated the attitude flag to indicate spacecraft pointing activities. Added global mean pressure and ocean bathymetry to GLA15. Removed PAD and POD vectors to make room for additional parameters. Provided space on the elevation products for a (yet uncomputed) ocean bias.

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

Computed a new atmosphere characterization flag. This flag additionally placed on the elevation products. New parameters where added to GLA11. Improved the calibration of some parameters.

3.0   PRODUCT FORMAT/DEFINITION CHANGE SUMMARY

Although record sizes of the products did not change, this release incorporates several significant changes to the products. Due to the expansive nature of these changes, a general summary is presented in this section; a more detailed list of changes, including before/after code, is provided at the end of the document.

GLA01-GLA04

No changes

GLA05

(1) Changed i_PADPoint(6,40), i_PODFixedPos(6,40) to i_spare43(12,40)

(2) Renamed i_refRng to i_refRngNs

(3) Removed i_atmQF, replaced with spare

GLA06

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40). i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40), i_DEMhiresArElv (9,40), i_spare42(5,40)

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

(3) Moved (see above) i_SigBegOff(40); Replaced with i_spare47(40)

(4) Renamed i_reflctUncorr to i_reflctUC

(5) Changed i_erd, i_rdu to i_spare16(4)

(6) Removed i_atmQF; replaced with spare

(7) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

(8) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(9) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

GLA07-08

no changes

GLA09

 (1) Added i_atm_char_flag, i_atm_char_conf; resized i_spare4(418)

GLA10

no changes

GLA11

(1) Removed i_Aer_ir_ODFlg, i_cld_ir_ODFlg, i_FRir_ODFlg; replaced with i_spare6

(2) Added i_aer4_sval1, i_aer4_sval_ratio, i_aer4_aod_ratio, i_aer4_sval_uf, i_spare5, i_reflCor_atm; Resized i_spare4

2

GLA12

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40), i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40), i_DEMhiresArElv (9,40), i_spare42(5,40)

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

(3) Renamed i_reflctUncorr to i_reflctUC

(4) Changed i_erd, i_rdu to i_spare16(4)

(5) Removed i_atmQF; replaced with spare

(6) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

(7) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

 (8) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

GLA13

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40), i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40), i_DEMhiresArElv (9,40), i_spare42(5,40)

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

(3) Renamed i_reflctUncorr to i_reflctUC

(4) Added i_kurt2, deleted i_spare11

(5) Changed i_erd, i_rdu to i_spare16(4)

(6) Removed i_atmQF; replaced with spare

(7) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

(8) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(9) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

GLA14

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40), i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40), i_DEMhiresArElv (9,40), i_spare42(5,40)

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

(3) Removed i_SigBegOff; replaced with spare47

(4) Renamed i_reflctUncorr to i_reflctUC

(5) Changed i_erd, i_rdu to i_spare16(4)

(6) Removed i_atmQF; replaced with spare

(7) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

(8) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(9) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

GLA15

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following:
i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40)
i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_spare45, i_spare46,
i_spare42(5,40)

(2) Added i_bathyElv, replaced i_spare12

(3) Renamed i_reflctUncorr to i_reflctUC

(4) Changed i_erd, i_rdu to i_spare16(4)

(5) Removed i_atmQF; replaced with spare

(6) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

(7) Added i_kurt2; replaced i_spare13

(8) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

(9) Resized i_spare7; replaced with i_spare2, i_gASP

4.0   KNOWN ISSUES

i_ElevBiasCorr is currently not computed.

5.0   RELEASE INFORMATION

The ClearCase label for this release is RELEASE_6.0.

Products generated by this software will be labeled as Release 33 by SDMS.

The release date is March 10, 2011.

Version numbers have been updated to "V6.0 Mar 2011". This should be verified during
operation by checking the version information in the appropriate ANC06 files.

6.0   SMDS IMPACT

New ANC04, 08, and 09 files (POD/PAD) are being generated by UTexas.

ANC07 (constants) files have changed and need to be ingested.

ANC45 (metadata template) files have changed and need to be ingested.

ANC51 (SRTM DEM) files have changed and need to be ingested.

ANC54 (HiRes DEM) has two new subgraules (High Lat Canada HiRes DEM files) which are
additional inputs for GLAS_Alt elevation processing. ANC54 (HiRes DEM) files need to be
ingested.

ANC57 (Bathymetry) is an additional input for the GLAS_Alt elevation processing. ANC57 files need to be ingested.

ANC58 (Reference Track) is an additional input for the GLAS_Alt elevation processing. ANC58 files need to be ingested.

ANC59 (Pointing Mode Table) is an additional input for the GLAS_Alt waveform processing. ANC59 files need to be ingested.

7.0   DETAILED CHANGE NOTES

0003068: The documentation for anc54 needs to be updated to include files 5 and 6, and documentation for anc58 needs to be added.

The documentation was updated and added for ANC58, and ANC54-05, ANC54-06.

0003066: i_aer4_sval_uf on GLA11

Updated documentation for i_aer4_sval_uf on GLA10 & GLA11.

0003064: Error Found In Mantis 2566 Fix Of c_procRefOrbit_mod

Corrected a error caused in 2566 by converting the angles operated on by the functions that used to be DCOSD and DSIND, from degrees to radians, and converting the result of the function that used to be DACOSD from radians to degrees.

0003063: QAP05 files have bad data

Added protection for invalid values in the QAP05 code.

0003062: dTrop descriptions

Updated documentation for i_dTrop on GLA06, and GLA12, GLA13, GLA14, GLA15.

0003060: Please clarify deltaEllip

deltaEllip = surface_height(T/P) - surface_height(WGS84).

0003059: Problems with print mods

Updated the code to match V6.0. Also took the opportunity to update the ANC07 version numbers. The strategy I used was change the Version number to 6.0, but leave the version date as the date last changed.

0003057: Inconsistency between Dev PVDB and GLA14_prod_mod.f90

Updated the PVDB to match the code in GLA14_prod_mod.f90.

0003054, 0003055: Add an elevation bias correction to the elevation products

i_ElevBiasCorr was added to gla06,12-15 and initialized to invalid. The proper values may be added in a later (minor) release.

0003053: Improper pressure units

Updated units to hPa on all pressure parameter documentation.

0003051: Lower Standard fit threshold starting at L3I

Changed entry number 4 of D_NSIG_TABLE from time 280900000 to 244631000 so that the noise threshold determiners B_NSIG2 and E_NSIG2 (standard fit) will be 9.5 instead of 15.0 for campaigns L3I, L3J, and L3K.

0003049: Set value for OrbitQuality to 6 and fix code error which prevents its inclusion

Fixed a problem that caused the OrbitQuality AdditionalAttribute not to appear in the headers of GLA06,12-15.

0003041: rec_ndx scale changed caused atmosphere data loss on elevation products

Fixed an intra-record alignment problem with the atmosphere data on GLA06,12-15.

0003033, 0003036: Set i_AttFlg1 bits for TOO, Reference track steering, and Ocean Scans

Added anc59 containing the pointing mode data. Added code to WFMgr_mod to read anc59 and set i_AttFlg1 bits for TOO, Reference track steering, and Ocean Scans.

In previous releases, i_AttFlg1 bits 1, 2, and 3 (corresponding to alg variables i_AttFlg(2) (ocean sweep), i_AttFlg(3) (target of opportunity off-pointing), and i_AttFlg(4) (steering to ref track)) were not set. i_AttFlg1 bits 0, 4, and 5-11 were set, and have not been changed.

0003030: Define Spare Variables consistent between all products

Updated spare variables in all documentation to be consistent between all products.

0003028: LRS arcsecond scale factor change

Changed the LRS Virtual Tracker Centroid Row and Column (i_VTCentR and i_VTCentC) conversion factor from 0.02671875d0 to 0.02646875d0. The arc-seconds/pixel component was changed to 3.388. The full conversion is:

TLMRawValue(counts)* 1/128(pixels/count)*3.388(arc-seconds/pixel) = N arc-seconds

0003027, 0003031: Replace the i_reflCor_atm on the elevation products with the value from GLA11

i_reflCor_atm on the elevation products is being set with gla11%i_reflCor_atm instead of being calculated in the elevation code.

0003026: Remove Opt depth IR flags that were not implemented

i_frir_odflg was removed from GLA06,12-15.

i_atmQF was removed from GLA05,06,12-15; replaced with spare49

i_aer_ir_odflg, i_cld_ir_odflg, i_frir_odflg were removed from GLA11; replaced with spare6

0003015: Update Metadata for Release 6.0

Updated the anc45 01-15 with these changes, ReprocessingPlanned = Final version. No further reprocessing planned. VersionID = 33. anc45-06-15 changed OrbitQuality to 6.

0003012: Add the kurtosis (standard fit) to GLA13 and GLA15

Added _kurt2 to gla13 and gla15.

0003011: Signal Begin range offset added to GLA12, 13, 15

Added _SigBegOff to gla12, 13, and 15.

0003009: 0003046: 0003037: Report a 3x3 array of SRTM (high-res DEM) values for each elevation measurement

A 3 x 3 matrix of high resolution DEM values derived from the SRTM track files is now included in the GLAS output files, replacing the single central value previously in use.

Where available, elevations from anc54 (Greenland & Antarctica) are used to set d_DEMhiresArElv(2,2,:) on gla06,12-14. Changed i_DEMhiresArElv from (3,3,40) to (9,40)

Updated documentation for i_DEMhiresArElv on GLA06, GLA12, GLA13, GLA14.

0003008: Remove atmospheric range delay corrections and associated flags

Removed i_bs_erd, i_bs_conf, i_erd & i_rdu from the elevation products.

0003006: Corrected code error in the atmosphere transmission calculation

Corrected valid range for d_total_od in the atmospheric transmission calculation.

0003001: Remove NOSE information from the metadata files

Removed code from within GSAS that sets/writes NOSE metadata.

GLAS metadata files/product headers will no longer contain the following parameters:

SP_ICE_PATH_NO
SP_ICE_GLAS_StartBlock
SP_ICE_GLAS_EndBlock

0002998: 003039: 0003040: Atmosphere Characterization and Confidence Flags

The atmosphere characterization flag (i_atm_char_flag) is new to this release. It is on GLA09, 06 and GLA12 to 15. It is intended to characterize the atmosphere to help aid in the interpretation of altimetry data. The definition and meaning of the new flag is:

0 clear

1 high cloud (> 5 km) low optical depth
2 high cloud (> 5 km), high optical depth
3 mid cloud (>2, <=5 km) low optical depth
4 mid cloud (>2, <=5 km) high optical depth
5 low cloud (> 500 m, <=2 km), low optical depth
6 low cloud (> 500 m, <=2 km), high optical depth
7 blowing snow or fog (< 500 m), low optical depth
8 blowing snow or fog (< 500 m), high optical depth
9 not tested
10 data quality insufficient to assign flag

The flag is computed using the 1064 channel data since the 532 channel only operated sufficiently well for L2A and the first half of L2B. The 1064 channel, however, had sufficient laser energy to give reliable results for L1, L2A, L2B and L3A to L3I. With regard to the atmosphere's effect on range precision, the largest effect (range delay) is caused by fog or

blowing snow of high optical depth (flag value of 8) followed by low clouds of high optical depth (6).

Added i_atm_char_flag & i_atm_char_conf as pass-thru from GLA09 to GLA06, 12-15. These parameters (and a spare) replace i_frir_ODflg

Updated documentation for GLA06 GLA12-15, and GLA11.

0002997, 0003023: New GLA11 product parameters

Two new parameters are added to the GLA11 product and two others that currently exist on GLA10 are added to GLA11. All have to do with characterization of detected aerosol layers. The first parameter (i_aer4_sval_ratio) is the ratio of the 532 nm extinction to backscatter ratio (S532) to the 1064 nm extinction to backscatter ratio (S1064) for each detected aerosol layer. The second new parameter (i_aer4_aod_ratio) is the ratio of 532 nm aerosol optical depth to 1064 nm aerosol optical depth for each detected aerosol layer. This provides a way for the user to obtain the 1064 optical depth if the 532 optical depth is known. These parameters were computed from an aerosol transport model at the University of Arizona. Also added to GLA11 are the true 532 extinction to backscatter ratio (i_aer4_sval1) and Aerosol true S Values use flag (i_aer4_sval_uf), both also on GLA10.

0002996: Atmosphere attenuation correction factor

ID i_reflCor_atm is an atmospheric attenuation correction factor to be applied to the surface reflectance value to account for the loss of energy of the laser pulse from the satellite to and from the surface. In prior releases, this factor was too large as it did not properly account for multiple scattering. This version applies multiple scattering correction to the computed attenuation. The calculation of atmospheric attenuation is from the 532 channel. This means that when the 532 laser energy drops below 5.5 mJ and it is daytime, or when 532 energy drops below 1.5 mJ (day and night), the attenuation calculation cannot be done and i_reflCor_atm is set to invalid (gi_invalid_i2b). When the 532 laser energy is between 1.5 and 5.5 mJ, the attenuation calculation is only done for night data, and the daytime values of i_reflCor_atm will be invalid.

0002995: Cox-Munk Model coefficients

The Cox-Munk model relates surface wind speed to the reflectivity of water. Given surface wind speed, the reflectivity of water surfaces is obtained from the Cox-Munk model. Since surface wind speed is known at any location over the ocean from the NCEP model, total atmospheric transmission loss (at 1064 nm) can be obtained by comparing the measured ocean reflectance from the altimetry channel to the Cox-Munk calculated ocean reflectance. Careful analysis of the results of this retrieval has revealed that the calculated atmospheric transmission loss was too great, especially in low surface wind conditions. It was determined through an analysis of clear atmosphere only data that a small adjustment to the Cox-Munk model coefficients would alleviate this problem. This version incorporates that adjustment to the Cox-Munk model thereby producing less transmission loss and lower column optical depth at 1064 nm.

In addition, this version also computes the 1064 nm optical depth over ice sheets. The assumption is made that over ice sheets, the true surface reflectance is a constant 0.82. It should be noted, that while 0.82 is a measured mean value of the surface reflectance over ice sheets based on an analysis of many ICESat observation periods, the actual surface reflectance at 1064

nm over ice sheets varies considerably. Thus, the retrieved optical depth from this approach will have an error bar of roughly +/- 20% (over ice sheets).

0002994, 0003020: Change i_PADPoint and i_PODFixedPos to Other Variables

Removed i_PADPoint & i_PODFixedPos from GLA06, and GLA12 through GLA15.

Added c_campaign, i_cycle, i_track (2985); d_localSolarTime (2989); d_deltaEllip (2984); d_beamCoelv, d_beamAzimuth (2983); d_d2refTrk (2981) to the elevation products. Added d_DEMhiresArElv to gla06, 12-14 (3009). Added _kurt2 to gla13 and gla15 (3012). Added _SigBegOff to gla12, 13, and 15 (3011).

0002990, 0002991: Change Reference Range Variable Name On GLA05

Changed i_refRng to i_refRngNs on GLA05

Updated documentation for i_refRng on GLA05, GLA06, GLA12-15.

0002989: Place the Local Solar Time on the elevation products at 1Hz

Added the Local Solar Time (d_localSolarTime) to the elevation products at 1Hz.

0002987: 0003029: Replace the Low resolution DEM on GLA15 with the ocean bathymetry

The ocean bathymetry is being determined for the GLA15 products at a frequency of 1 per second. The first valid shot (with a valid lat/lon) in a record is used to determine the Bathymetry for that record.

Created anc57.

0002986: 0003019: Set reflectance to invalid when sat. energy correction is incalcuable

Changed i_reflctUncorr on GLA06, GLA12-GLA15 to i_reflctUC and updated description. Set to invalid when GLA06%d_satNrgCorr is invalid. Updated the documentation for GLA05 i_reflctUnCorr.

0002985: Place the campaign, repeat cycle, and track number on the elevation products at 1Hz

Added the campaign, repeat cycle, and track number to the elevation products at 1Hz (product = i_campaign, i_cycTrk; algorithm = c_campaign, i_cycle, i_track).

0002984: Add a 40Hz WGS-84 ellipsoidal surface height to all elevation products

The difference between the elevations wrt Topex/Poseidon and WGS-84 is now being reported for all GLA06, 12-15 elevation products. They are reported at 40Hz.

0002983: Increase the precision and frequency of the beam co-elevation and azimuth

Changed i_beam_coelev and i_beam_azimuth to 40Hz, and increased their precision on GLA06, and GLA12 through GLA15.

0002981: 0003038: 0003034: Add the "distance to the reference track" to the elevation products

Added distance to reference ground track to gla06, 12-15.

Added the control file option "ELEVATION_PROCESS=E_SupressRefGT" for running elevations without using anc58 (reference ground tracks).

0002980: Add Global Mean Pressure at 1Hz to GLA15

Added the global mean atmospheric pressure at 1Hz to gla15.

0002951: High Res DEM Over Antarctica is not on the Product for Latitudes Between -69 and -60

Fixed the problem that prevented the high resolution DEM data from anc54 being written to the elevation products.

0002936: Added EGM96 geoid to SRTM tracks

The SRTM high resolution DEM (i_DEM_hires_elv) values have been corrected. In prior releases the EGM96 geoid value was added to the SRTM values to change their reference to the TOPEX/Poseidon ellipsoid to match the GLAS elevations. This was done using the geoid values that were input to the GSAS software. When the GSAS input geoid on the GLAS standard data product was changes to EGM2008 in release 31, this introduced an error. The code that adds the geoid value to the SRTM values has been removed from the GSAS software and the SRTM trackfiles (input ancillary files) have been re-referenced outside of the GSAS system using the EGM96 geoid. Modifications were made such that all elevations with absolute value less than 30000 meters are included in output track files. This allows areas with elevations less than sea level to be included.

0002927: Eliminate Most g95 Warnings

Eliminated most warnings produced by compiling the GSAS code with g95.

0002912: ANC32_QA catches things GLOP misses.

Changed the ANC32 validation code to improve the consistency of the QA tests within ANC32_QA and GLOP.

0002905: ANC32_QA leaves a ftn114 file

Fixed a problem where writing to ANC06 before ANC06 was opened created an unwanted output file.

0002903: The BSS Calibration Factor Table was Updated

Changed the L2D, L2E and L2F BSS factor from 1.23 to 1.70.

0002900, 0003002, 0003003, 0003004, 0003005, 0003007, 0003013, 0003017, 0003022: Updates to documentation

Corrected the description of i_poleTide.

Updated GLA15 documentation to add i_spare2, i_gASP, and change i_Spare7.

Updated documentation for i_Raw_PkHt for GLA01_Long and GLA01_Short.

Updated documentation for i_N_val, i_r_val, i_compRatio on GLA01 and GLA05. Updated documentation for i_samp_pad on GLA01_SHORT, and GLA01_LONG.

Updated algorithm variable for i_reflctuncmxpk on GLA05 from d_reflctuncorrmxpk to d_reflctuncmxpk. Updated documentation for i_reflctuncmxpk on GLA05.

Updated documentation of i_SurfType for GLA06 and 12-15.

Updated documentation to change description of i_UTCTime on all products.

Updated GLA02 Documentation to add i_et_flags description.

Updated documentation for wfnoiseOb1 and wfnoiseOb2 on GLA05

0002876: 0003032: Updated the Saturation Elevation Correction Table (anc5201)

Updated the saturation correction table for laser three based on Uyuni data analysis and used new upper bound cutoffs. Made the table for laser two the same as for laser one. The table for laser one remains the same as implemented for release 28.

Modified the code to round to the nearest integer instead of truncating when writing the saturation elevation corrections to anc52_001_01_0001.dat, and when writing the saturation energy corrections to anc52_001_01_0002.dat. Updated print_anc52 to print all three laser tables for anc52_001_01_0001.dat.

0002861: 0003050: Replace high res DEM over Canada

Added elevations from the Canadian DEM to anc51 from 40N to 69.9997N, and to anc54 for areas not already covered by the ICESat Greenland DEM (west of 285E, from 70N through 84N). The elevations are converted from EGM96 before being placed on anc51. Elevations read from the new anc5406 are converted from EGM96 before being placed on the elevation products. The anc51 maker utility has been modified to work on both db1 (HP/Big_Endian) and icesat10 (linux/Little_Endian).

Updated documentation for i_DEM_hires_src on GLA06, GLA12, GLA13, GLA14.

8.0   DETAILED PRODUCT CHANGE NOTES

GLA01-GLA04

no changes

GLA05

(1) Changed i_PADPoint(6,40), i_PODFixedPos(6,40) to i_spare43(12,40)

5.7 code:

```
integer (kind=i4b) :: i_PADPoint (6,40)
integer (kind=i4b) :: i_PODFixedPos (6,40)
```

6.0 code:

```
integer (kind=i4b) :: i_spare43 (12,40)
```

(2) Renamed i_refRng to i_refRngNs

5.7 code:

```
integer (kind=i4b) :: i_refRng (40)
```

6.0 code:

```
integer (kind=i4b) :: i_refRngNs (40)
```

(3) Removed i_atmQF, replaced with spare

5.7 code:

```
integer (kind=i1b) :: i_atmQF (10)
```

 6.0 code:

```
integer (kind=i1b) :: i_spare49 (10)
```

GLA06

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following:
i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40).
i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40),
i_DEMhiresArElv (9,40), i_spare42(5,40)

5.7 code:

```
integer (kind=i4b) :: i_PADPoint (6,40)
integer (kind=i4b) :: i_PODFixedPos (6,40)
```

6.0 code:

```
integer (kind=i1b) :: i_campaign(2)
integer (kind=i2b) :: i_spare40
integer (kind=i4b) :: i_cycTrk
integer (kind=i4b) :: i_localSolarTime
integer (kind=i4b) :: i_spare41 (7)
integer (kind=i2b) :: i_deltaEllip (40)
integer (kind=i4b) :: i_beamCoelv (40)
integer (kind=i4b) :: i_beamAzimuth (40)
integer (kind=i4b) :: i_d2refTrk (40)
integer (kind=i4b) :: i_SigBegOff (40)
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEMhiresArElv (9,40)
integer (kind=i2b) :: i_spare42 (5,40)
```

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

5.7 code

```
integer (kind=i1b) :: i_bs_conf
integer (kind=i2b) :: i_bs_erd
```

 6.0 code

```
integer (kind=i1b) :: i_spare11 (3)
```

(3) Removed i_SigBegOff(40); Replaced with i_spare47(40)

5.7 code

```
integer (kind=i4b) :: i_SigBegOff (40)
```

(Note: i_ SigBegOff was actually moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i4b) :: i_spare47 (40)
```

(4) Renamed i_reflctUncorr to i_reflctUC

5.7 code

```
integer (kind=i4b) :: i_reflctUncorr (40)
```

6.0 code

```
integer (kind=i4b) :: i_reflctUC (40)
```

(5) Changed i_erd, i_rdu to i_spare16(4)

5.7 code

```
integer (kind=i2b) :: i_erd
integer (kind=i2b) :: i_rdu
```

6.0 code

```
integer (kind=i1b) :: i_spare16 (4)
```

(6) Removed i_atmQF; replaced with spare

5.7 code

```
integer (kind=i1b) :: i_atmQF (10)
```

6.0 code

```
integer (kind=i1b) :: i_spare49 (10)
```

(7) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

5.7 code

```
integer (kind=i4b) :: i_beam_coelev
integer (kind=i4b) :: i_beam_azimuth
```

(Note: i_beam_coelev and azimuth was changed to 40 per second and moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i1b) :: i_spare15 (8)
```

(8) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(Note: i_DEM_hires_src was actually moved to (1) the former PADPoint block above. i_DEM_hires_elv was changed to a 3 by 3 array and placed in the (1) the former PADPoint block above)

5.7 code

```
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEM_hires_elv (40)
```

6.0 code

```
integer (kind=i1b) :: i_spare44 (120)
```

(9) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

5.7 code

```
integer (kind=i1b) :: i_FRir_ODflg(40)
```

6.0 code

```
integer (kind=i2b) :: i_atm_char_flag
integer (kind=i2b) :: i_atm_char_conf
integer (kind=i1b) :: i_spare48(36)
```

GLA07-08

no changes

GLA09

 (1) Added i_atm_char_flag, i_atm_char_conf; resized i_spare4(418)

5.7 code

```
integer (kind=i1b) :: i_spare4 (418)
```

6.0 code

```
integer (kind=i2b) :: i_atm_char_flag (4) ! Sep 2010 SPP
integer (kind=i2b) :: i_atm_char_conf (4) ! Sep 2010 SPP
integer (kind=i1b) :: i_spare4 (402)
```

GLA10

no changes

GLA11

 (1) Removed i_Aer_ir_ODFlg, i_cld_ir_ODFlg, i_FRir_ODFlg; replaced with i_spare6

5.7 code

```
integer (kind=i1b) :: i_Aer_ir_ODFlg (2)
integer (kind=i1b) :: i_cld_ir_ODFlg (10,4)
integer (kind=i1b) :: i_FRir_ODFlg (160)
```

6.0 code

```
integer (kind=i1b) :: i_spare6(202)
```

(2) Added i_aer4_sval1, i_aer4_sval_ratio, i_aer4_aod_ratio, i_aer4_sval_uf, i_spare5, i_reflCor_atm; Resized i_spare4

5.7 code

```
integer (kind=i1b) :: i_spare4 (228)
```

6.0 code

```
integer (kind=i2b) :: i_aer4_sval1 (9)
integer (kind=i2b) :: i_aer4_sval_ratio (9)
integer (kind=i2b) :: i_aer4_aod_ratio (9)
integer (kind=i1b) :: i_aer4_sval_uf (5)
integer (kind=i1b) :: i_spare5
integer (kind=i2b) :: i_reflCor_atm (4)
integer (kind=i1b) :: i_spare4 (160)
```

GLA12

 (1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40), i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40), i_DEMhiresArElv (9,40), i_spare42(5,40)

5.7 code:

```
integer (kind=i4b) :: i_PADPoint (6,40)
integer (kind=i4b) :: i_PODFixedPos (6,40)
```

6.0 code:

```
integer (kind=i1b) :: i_campaign(2)
integer (kind=i2b) :: i_spare40
integer (kind=i4b) :: i_cycTrk
integer (kind=i4b) :: i_localSolarTime
integer (kind=i4b) :: i_spare41 (7)
integer (kind=i2b) :: i_deltaEllip (40)
integer (kind=i4b) :: i_beamCoelv (40)
integer (kind=i4b) :: i_beamAzimuth (40)
integer (kind=i4b) :: i_d2refTrk (40)
integer (kind=i4b) :: i_SigBegOff (40)
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEMhiresArElv (9,40)
integer (kind=i2b) :: i_spare42 (5,40)
```

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

5.7 code

```
integer (kind=i1b) :: i_bs_conf
integer (kind=i2b) :: i_bs_erd
```

6.0 code

```
integer (kind=i1b) :: i_spare11 (3)
```

(3) Renamed i_reflctUncorr to i_reflctUC

5.7 code

```
integer (kind=i4b) :: i_reflctUncorr (40)
```

6.0 code

```
integer (kind=i4b) :: i_reflctUC (40)
```

(4) Changed i_erd, i_rdu to i_spare16(4)

5.7 code

```
integer (kind=i2b) :: i_erd
integer (kind=i2b) :: i_rdu
```

6.0 code

```
integer (kind=i1b) :: i_spare16 (4)
```

(5) Removed i_atmQF; replaced with spare

5.7 code

```
integer (kind=i1b) :: i_atmQF (10)
```

6.0 code

```
integer (kind=i1b) :: i_spare49 (10)
```

(6) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

5.7 code

```
integer (kind=i4b) :: i_beam_coelev
integer (kind=i4b) :: i_beam_azimuth
```

(Note: i_ beam_coelev and azimuth was changed to 40 per second and moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i1b) :: i_spare15 (8)
```

(7) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(Note: i_DEM_hires_src was actually moved to (1) the former PADPoint block above. i_DEM_hires_elv was changed to a 3 by 3 array and placed in the (1) the former PADPoint block above)

5.7 code

```
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEM_hires_elv (40)
```

6.0 code

```
integer (kind=i1b) :: i_spare44 (120)
```

(8) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

5.7 code

```
integer (kind=i1b) :: i_FRir_ODflg(40)
```

6.0 code

```
integer (kind=i2b) :: i_atm_char_flag
integer (kind=i2b) :: i_atm_char_conf
integer (kind=i1b) :: i_spare48(36)
```

GLA13

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following:
i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40),
i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40),
i_DEMhiresArElv (9,40), i_spare42(5,40)

5.7 code:

```
integer (kind=i4b) :: i_PADPoint (6,40)
integer (kind=i4b) :: i_PODFixedPos (6,40)
```

6.0 code:

```
integer (kind=i1b) :: i_campaign(2)
integer (kind=i2b) :: i_spare40
integer (kind=i4b) :: i_cycTrk
integer (kind=i4b) :: i_localSolarTime
integer (kind=i4b) :: i_spare41 (7)
integer (kind=i2b) :: i_deltaEllip (40)
integer (kind=i4b) :: i_beamCoelv (40)
integer (kind=i4b) :: i_beamAzimuth (40)
integer (kind=i4b) :: i_d2refTrk (40)
integer (kind=i4b) :: i_SigBegOff (40)
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEMhiresArElv (9,40)
integer (kind=i2b) :: i_spare42 (5,40)
```

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

5.7 code

```
integer (kind=i1b) :: i_bs_conf
integer (kind=i2b) :: i_bs_erd
```

6.0 code

```
integer (kind=i1b) :: i_spare11 (3)
```

(3) Renamed i_reflctUncorr to i_reflctUC

5.7 code

```
integer (kind=i4b) :: i_reflctUncorr (40)
```

6.0 code

```
integer (kind=i4b) :: i_reflctUC (40)
```

(4) Added i_kurt2, deleted i_spare11

5.7 code

```
integer (kind=i1b) :: i_spare11 (80)
```

6.0 code

```
integer (kind=i2b) :: i_kurt2 (40)
```

(5) Changed i_erd, i_rdu to i_spare16(4)

5.7 code

```
integer (kind=i2b) :: i_erd
integer (kind=i2b) :: i_rdu
```

6.0 code

```
integer (kind=i1b) :: i_spare16 (4)
```

(6) Removed i_atmQF; replaced with spare

5.7 code

```
integer (kind=i1b) :: i_atmQF (10)
```

6.0 code

```
integer (kind=i1b) :: i_spare49 (10)
```

(7) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

5.7 code

```
integer (kind=i4b) :: i_beam_coelev
integer (kind=i4b) :: i_beam_azimuth
```

(Note: i_ beam_coelev and azimuth was changed to 40 per second and moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i1b) :: i_spare15 (8)
```

(8) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(Note: i_DEM_hires_src was actually moved to (1) the former PADPoint block above. i_DEM_hires_elv was changed to a 3 by 3 array and placed in the (1) the former PADPoint block above)

5.7 code

```
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEM_hires_elv (40)
```

6.0 code

```
integer (kind=i1b) :: i_spare44 (120)
```

(9) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

5.7 code

```
integer (kind=i1b) :: i_FRir_ODflg(40)
```

6.0 code

```
integer (kind=i2b) :: i_atm_char_flag
integer (kind=i2b) :: i_atm_char_conf
integer (kind=i1b) :: i_spare48(36)
```

GLA14

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40), i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_DEM_hires_src(40), i_DEMhiresArElv (9,40), i_spare42(5,40)

5.7 code:

```
integer (kind=i4b) :: i_PADPoint (6,40)
integer (kind=i4b) :: i_PODFixedPos (6,40)
```

6.0 code:

```
integer (kind=i1b) :: i_campaign(2)
integer (kind=i2b) :: i_spare40
integer (kind=i4b) :: i_cycTrk
integer (kind=i4b) :: i_localSolarTime
integer (kind=i4b) :: i_spare41 (7)
integer (kind=i2b) :: i_deltaEllip (40)
integer (kind=i4b) :: i_beamCoelv (40)
integer (kind=i4b) :: i_beamAzimuth (40)
integer (kind=i4b) :: i_d2refTrk (40)
integer (kind=i4b) :: i_SigBegOff (40)
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEMhiresArElv (9,40)
integer (kind=i2b) :: i_spare42 (5,40)
```

(2) Removed i_bs_conf, i_bs_erd; replaced with i_spare11(3)

5.7 code

```
integer (kind=i1b) :: i_bs_conf
integer (kind=i2b) :: i_bs_erd
```

6.0 code

```
integer (kind=i1b) :: i_spare11 (3)
```

(3) Removed i_SigBegOff; replaced with spare47

5.7 code

```
integer (kind=i4b) :: i_SigBegOff (40)
```

(Note: i_ SigBegOff was actually moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i4b) :: i_spare47 (40)
```

(4) Renamed i_reflctUncorr to i_reflctUC

```
5.7 code
integer (kind=i4b) :: i_reflctUncorr (40)
6.0 code
integer (kind=i4b) :: i_reflctUC (40)
```

(5) Changed i_erd, i_rdu to i_spare16(4)

5.7 code

```
integer (kind=i2b) :: i_erd
integer (kind=i2b) :: i_rdu
```

6.0 code

```
integer (kind=i1b) :: i_spare16 (4)
```

(6) Removed i_atmQF; replaced with spare

5.7 code

```
integer (kind=i1b) :: i_atmQF (10)
```

6.0 code

```
integer (kind=i1b) :: i_spare49 (10)
```

(7) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

5.7 code

```
integer (kind=i4b) :: i_beam_coelev
integer (kind=i4b) :: i_beam_azimuth
```

(Note: i_ beam_coelev and azimuth was changed to 40 per second and moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i1b) :: i_spare15 (8)
```

(8) Deleted i_DEM_hires_src , i_DEM_hires_elv; Replaced with i_spare44(120)

(Note: i_DEM_hires_src was actually moved to (1) the former PADPoint block above. i_DEM_hires_elv was changed to a 3 by 3 array and placed in the (1) the former PADPoint block above)

5.7 code

```
integer (kind=i1b) :: i_DEM_hires_src (40)
integer (kind=i2b) :: i_DEM_hires_elv (40)
```

6.0 code

```
integer (kind=i1b) :: i_spare44 (120)
```

(9) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

5.7 code

```
integer (kind=i1b) :: i_FRir_ODflg(40)
```

6.0 code

```
integer (kind=i2b) :: i_atm_char_flag
integer (kind=i2b) :: i_atm_char_conf
integer (kind=i1b) :: i_spare48(36)
```

GLA15

(1) Deleted i_PADPoint(6,40), i_PODFixedPos(6,40) and replaced with the following: i_campaign(2), i_spare40, i_cycTrk, i_localSolarTime, i_spare41(7), i_deltaEllip(40) i_beamCoelv(40), i_beamAzimuth(40), i_d2refTrk(40), i_SigBegOff(40), i_spare45, i_spare46, i_spare42(5,40)

5.7 code:

```
integer (kind=i4b) :: i_PADPoint (6,40)
integer (kind=i4b) :: i_PODFixedPos (6,40)
```

6.0 code:

```
integer (kind=i1b) :: i_campaign(2)
integer (kind=i2b) :: i_spare40
integer (kind=i4b) :: i_cycTrk
integer (kind=i4b) :: i_localSolarTime
integer (kind=i4b) :: i_spare41 (7)
integer (kind=i2b) :: i_deltaEllip (40)
integer (kind=i4b) :: i_beamCoelv (40)
integer (kind=i4b) :: i_beamAzimuth (40)
integer (kind=i4b) :: i_d2refTrk (40)
integer (kind=i4b) :: i_SigBegOff (40)
integer (kind=i1b) :: i_spare45 (40)
integer (kind=i2b) :: i_spare46 (9,40)
integer (kind=i2b) :: i_spare42 (5,40)
```

(2) Added i_bathyElv, replaced i_spare12

5.7 code

```
integer (kind=i2b) :: i_spare12 (2)
```

6.0 code

```
integer (kind=i4b) :: i_bathyElv
```

(3) Renamed i_reflctUncorr to i_reflctUC

5.7 code

```
integer (kind=i4b) :: i_reflctUncorr (40)
```

6.0 code

```
integer (kind=i4b) :: i_reflctUC (40)
```

(4) Changed i_erd, i_rdu to i_spare16(4)

5.7 code

```
integer (kind=i2b) :: i_erd
integer (kind=i2b) :: i_rdu
```

6.0 code

```
integer (kind=i1b) :: i_spare16 (4)
```

(5) Removed i_atmQF; replaced with spare

5.7 code

```
integer (kind=i1b) :: i_atmQF (10)
```

6.0 code

```
integer (kind=i1b) :: i_spare49 (10)
```

(6) Removed i_beam_coelev, i_beam_azimuth; Replaced with i_spare15(8)

5.7 code

```
integer (kind=i4b) :: i_beam_coelev
integer (kind=i4b) :: i_beam_azimuth
```

(Note: i_ beam_coelev and azimuth was changed to 40 per second and moved to (1) the former PADPoint block above)

6.0 code

```
integer (kind=i1b) :: i_spare15 (8)
```

(7) Added i_kurt2; replaced i_spare13

5.7 code

```
integer (kind=i2b) :: i_spare13(40)
```

6.0 code

```
integer (kind=i2b) :: i_kurt2 (40)
```

(8) Removed i_FRir_ODflg; replaced with i_atm_char_flag, i_atm_char_conf, spare48

5.7 code

```
integer (kind=i1b) :: i_FRir_ODflg(40)
```

6.0 code

```
integer (kind=i2b) :: i_atm_char_flag
integer (kind=i2b) :: i_atm_char_conf
integer (kind=i1b) :: i_spare48(36)
```

(9) Resized i_spare7; replaced with i_spare2, i_gASP

5.7 code

```
integer (kind=i1b) :: i_spare7 (150)
```

6.0 code

```
integer (kind=i1b) :: i_spare2(2)
integer (kind=i4b) :: i_gASP
integer (kind=i1b) :: i_spare7(144)
```

9.0   CHANGED FILES

```
./data/anc07_001_01_0004.dat
./data/anc52_001_01_0001.dat
./data/anc52_001_01_0002.dat
./src/NOSE_util/calc_track_segments_mod.f90
./src/NOSE_util/iwbincalc_mod.f90
./src/NOSE_util/rd_NOSECntrl_mod.f90
./src/anc_util
./src/atm_anc/A_seg_cal_cofs_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/atmosphere/backscat/A_bscs_mod.f90
./src/atmosphere/backscat/A_cal_cofs_mod.f90
./src/atmosphere/backscat/A_mbscs_mod.f90
./src/atmosphere/backscat/A_rebin_lid_mod.f90
./src/atmosphere/common/A_buff_data_mod.f90
./src/atmosphere/common/A_calc_ozone_mod.f90
./src/atmosphere/common/A_fetch_met_mod.f90
./src/atmosphere/common/A_median_mod.f90
./src/atmosphere/common/A_types_mod.f90
```

```
./src/atmosphere/common/anc18_stdatm_mod.f90
./src/atmosphere/interp/A_interp_met_mod.f90
./src/atmosphere/layers/A_1s_1064_det_mod.f90
./src/atmosphere/layers/A_20s_1064_det_mod.f90
./src/atmosphere/layers/A_20s_aer_det_mod.f90
./src/atmosphere/layers/A_4s_1064_det_mod.f90
./src/atmosphere/layers/A_4s_aer_det_mod.f90
./src/atmosphere/layers/A_aer_lays_mod.f90
./src/atmosphere/layers/A_blow_snow_mod.f90
./src/atmosphere/layers/A_cld_det_mod.f90
./src/atmosphere/layers/A_cld_grd_det_mod.f90
./src/atmosphere/layers/A_cld_lay_1064_40hz_mod.f90
./src/atmosphere/layers/A_cld_lays_mod.f90
./src/atmosphere/layers/A_lays_1064_mod.f90
./src/atmosphere/layers/A_pbl_det_mod.f90
./src/atmosphere/layers/A_pbl_lay_mod.f90
./src/atmosphere/opt_props/A_aer_cld_utils_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/common_libs/anc_lib/anc07_util_mod.f90
./src/common_libs/anc_lib/anc38_msf_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/c_calcSatCorr_mod.f90
./src/common_libs/exec_lib/C_CalcNrg_mod.f90
./src/common_libs/math_lib/polar_stereographic_mod.f90
./src/common_libs/platform_lib/const_atm_mod.f90
./src/common_libs/prod_lib/GLA02_flags_mod.f90
./src/common_libs/prod_lib/GLA02_scal_mod.f90
./src/common_libs/prod_lib/GLA05_Pass_mod.f90
./src/common_libs/prod_lib/GLA05_alg_mod.f90
./src/common_libs/prod_lib/GLA05_flags_mod.f90
./src/common_libs/prod_lib/GLA05_prod_mod.f90
./src/common_libs/prod_lib/GLA05_scal_mod.f90
./src/common_libs/prod_lib/GLA06_Pass_mod.f90
./src/common_libs/prod_lib/GLA06_alg_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_flags_mod.f90
./src/common_libs/prod_lib/GLA07_scal_mod.f90
./src/common_libs/prod_lib/GLA08_scal_mod.f90
./src/common_libs/prod_lib/GLA09_alg_mod.f90
./src/common_libs/prod_lib/GLA09_flags_mod.f90
./src/common_libs/prod_lib/GLA09_prod_mod.f90
./src/common_libs/prod_lib/GLA09_scal_mod.f90
./src/common_libs/prod_lib/GLA10_flags_mod.f90
./src/common_libs/prod_lib/GLA10_scal_mod.f90
./src/common_libs/prod_lib/GLA11_alg_mod.f90
./src/common_libs/prod_lib/GLA11_flags_mod.f90
./src/common_libs/prod_lib/GLA11_prod_mod.f90
./src/common_libs/prod_lib/GLA11_scal_mod.f90
./src/common_libs/prod_lib/GLA12_alg_mod.f90
./src/common_libs/prod_lib/GLA12_flags_mod.f90
./src/common_libs/prod_lib/GLA12_prod_mod.f90
./src/common_libs/prod_lib/GLA12_scal_mod.f90
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./src/common_libs/prod_lib/GLA13_alg_mod.f90
./src/common_libs/prod_lib/GLA13_flags_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_flags_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_flags_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/qap_version_mod.f90
./src/createGran_util/createGranule_mod.f90
./src/createGran_util/pop_granule_mod.f90
./src/createGran_util/rd_GranCntrl_mod.f90
./src/create_dem/maker_SRTM_trks/maker.f90
./src/elevations
./src/elevations/e_OceanParm_mod.f90
./src/elevations/e_calcloadtd_mod.f90
./src/elevations/e_calcpoletd_mod.f90
./src/elevations/e_calctrop_mod.f90
./src/elevations/e_getsunAngle_mod.f90
./src/elevations/e_tidpot.f90
./src/elevations/e_trop_fns_mod.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/ElevMgr_mod.f90
./src/glas_alt/WFMgr_mod.f90
./src/glas_atm/AtmMgr_mod.f90
./src/l1a_lib/L_Atm_mod.f90
./src/l1a_lib/QAP02_mod.f90
./src/l1a_lib/qap04_mod.f90
./src/qapg/V_read_control_mod.f90
./src/qapg/qapg.f90
./src/qapg/qapg_generate_mod.f90
./src/qapg/qapg_gla05_at.f90
./src/qapg/qapg_gla05_mod.f90
./src/qapg/qapg_gla05_sum.f90
./src/qapg/qapg_histogram_mod.f90
./src/qapg/qapg_qap03_interface_mod.f90
./src/qapg/qapg_readgla_mod.f90
./src/qapg/qapg_specialcases_mod.f90
./src/qapg/qapg_writeqap_mod.f90
./src/reforbit_util/c_procRefOrbit_mod.f90
./src/track_reader/track_reader_mod.f90
./src/wf_lib/W_Assess_mod.f90
./src/wf_lib/W_FunctionalFt_mod.f90
./src/wf_lib/W_LsqFit_mod.f90
./src/wf_lib/W_MeanSDev_mod.f90
./src/common_libs/anc_lib/anc58_gtrk_mod.f90
./cc_util/config_specs/gsfc_v0
./src/anc_util/mk_anc54_ca.f
./src/anc_util/mk_anc58.f
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./src/anc_util/mk_anc59.f
./src/anc_util/mk_nrg_corr.f
./src/anc_util/mk_range_corr.f
./src/anc_util/rfmt_geotiff.pro
./src/elevations/anc09_pad_mod.f90
./src/elevations/anc27_surfType_mod.f90
./src/elevations/c_Azimuth_FootPrnt1s_mod.f90
./src/elevations/c_Beam_Sun_Ang_mod.f90
./src/elevations/c_Reflect_Atm_Corr_mod.f90
./src/elevations/c_Retreive_HiRes_DEM_mod.f90
./src/elevations/c_calcsploc_mod.f90
./src/elevations/c_getgeoid_mod.f90
./src/elevations/c_legacyintrppod.f90
./data
./src/Makefile
./src/anc32_qa/ANC32_QA.f90
./src/common_libs/anc_lib
./src/common_libs/cntrl_lib/keyval_mod.f90
./src/common_libs/err_lib/ErrorBoot_mod.f90
./src/common_libs/exec_lib
./src/common_libs/geo_lib/Makefile
./src/common_libs/math_lib/c_quadratic_mod.f90
./src/common_libs/math_lib/conversions_mod.f90
./src/common_libs/platform_lib/c_compare_mod.f90
./src/common_libs/platform_lib/const_glob_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
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./src/common_libs/prod_lib/GLA08_hdr_mod.f90
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./src/common_libs/prod_lib/GLA12_hdr_mod.f90
./src/common_libs/prod_lib/GLA12_print_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/GLA14_hdr_mod.f90
./src/common_libs/prod_lib/GLA14_print_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/common_flags_mod.f90
./src/common_libs/prod_lib/common_hdr_mod.f90
./src/common_libs/time_lib/j2000to19char_mod.f90
./src/create_gla16/Create_GLA16.f90
./src/create_gla16/write_gla16_meta_mod.f90
./src/elev_lib
./src/glas_alt/Elev_Granule_mod.f90
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./src/glas_alt/Elev_QAP_mod.f90
./src/glas_alt/Elev_Support_mod.f90
./src/glas_alt/GLAS_Alt.f90
./src/glas_alt/GetControl_mod.f90
./src/glas_alt/WF_Granule_mod.f90
./src/glas_alt/WF_QAP_mod.f90
./src/glas_alt/WF_Support_mod.f90
./src/glas_alt/WriteElev_mod.f90
./src/glas_alt/eCntl_mod.f90
./src/glas_apid/GetControl_mod.f90
./src/glas_apid/ProcessAPID_mod.f90
./src/glas_atm/GetControl_mod.f90
./src/glas_l0p
./src/glas_l1a/L1AMgr_mod.f90
./src/glas_l1a/L1A_Granule_mod.f90
./src/glas_l1a/L1A_QAP_mod.f90
./src/glas_meta/GLAS_Meta.f90
./src/glas_meta/GetControl_mod.f90
./src/glas_meta/ReadMetaTemplate_mod.f90
./src/glas_meta/WriteMetaFile_mod.f90
./src/glas_reader/GetControl_mod.f90
./src/glas_reader/PrintAnc_mod.f90
./src/glas_reader/PrintData_mod.f90
./src/glas_reader/PrintQAP_mod.f90
./src/glas_tick/GetControl_mod.f90
./src/glas_tick/ReadTickData_mod.f90
./src/glas_tick/TickGranule_mod.f90
./src/glas_tick/eCntl_mod.f90
./src/l1a_lib/L_Alt_mod.f90
./src/l1a_lib/L_Att_mod.f90
./src/l1a_lib/L_Eng_Limits.f90
./src/l1a_lib/L_Eng_mod.f90
./src/l1a_lib/L_GeoLoc_mod.f90
./src/l1a_lib/QAP01_mod.f90
./src/l1a_lib/QAP03_mod.f90
./src/l1a_lib/align_prap_mod.f90
./src/l1a_lib/bvtcw2utc_mod.f90
./src/l1a_lib/shot_time_mod.f90
./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/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
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./src/prod_util/prod_compare/gla15_compare.f90
./src/prod_util/scantime/GetControl_mod.f90
./src/prod_util/scantime/eCntl_mod.f90
./src/prod_util/scantime/scantime.f90
./Makefile
./data/anc07_001_01_0000.dat
./data/anc07_001_01_0001.dat
./data/anc07_001_01_0005.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/anc59_001_01_0001.dat
./src/common_libs/anc_lib/Makefile
./src/common_libs/anc_lib/anc01_met_mod.f90
./src/common_libs/anc_lib/anc07_glob_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/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/anc35_ozone_mod.f90
./src/common_libs/anc_lib/anc36_atm_mod.f90
./src/common_libs/anc_lib/anc52_corr_mod.f90
./src/common_libs/anc_lib/anc53_aerosol_mod.f90
./src/common_libs/anc_lib/anc57_bathymetry_mod.f90
./src/common_libs/anc_lib/anc59_ptg_mod.f90
./src/common_libs/anc_lib/inst_state_mod.f90
./src/common_libs/exec_lib/Makefile
./src/common_libs/exec_lib/ReadAnc_mod.f90
./src/common_libs/exec_lib/check_out_time_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/passid_mod.f90
./src/common_libs/exec_lib/set_inst_state_mod.f90
./src/elev_lib/Makefile
./src/elev_lib/e_reRefEllipse_mod.f90
./src/glas_l0p/GLAS_L0proc.f90
./src/glas_l0p/GetControl_mod.f90
./src/glas_l0p/Makefile
./src/glas_l0p/eCntl_mod.f90
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