

**ICESAT/GLAS  
Science Computing Facility**

**Web Software Detailed Design Document**

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## Table of Contents

1.	Introduction .....	1
2.	Subscription Statistics .....	2
2.1	Run_subscription_display.ksh.....	2
2.1.1	Subscription.pl.....	2
2.1.1.1	get_subscription.pm .....	3
2.1.1.2	initialize_arrays.pm.....	3
2.1.1.3	get_area_dates.pm.....	3
2.1.1.4	get_product_seg.pm.....	3
2.1.1.5	get_tracks.pm.....	4
2.1.1.6	get_cycles.pm.....	4
2.1.1.7	write_html.pm .....	4
2.1.1.8	write_js_part1.pm .....	4
2.1.1.9	write_js.pm .....	5
2.1.1.10	copy_to_server.pm .....	5
2.1.1.11	write_menu.pm .....	5
2.1.1.12	write_main_frame.pm .....	6
2.1.1.13	write_title_frame.pm .....	6
2.1.1.14	write_date_product_frame.pm .....	6
2.1.1.15	write_area_frame.pm.....	6
2.1.1.16	write_8day_frame.pm .....	6
2.1.1.17	write_91day_frame.pm .....	7
2.1.1.18	write_tracks_cycles_frame.pm .....	7
2.1.1.19	send_mail_local.pm .....	7
2.2	Run_daily_stats_perl.ksh .....	8
2.2.1	Daily_stats_2006.pl .....	8
2.2.1.1	create_chart.pm.....	8
2.2.1.2	create_summary_chart.pm.....	8
2.2.1.3	create_summary_page.pm.....	9
2.2.1.4	create_calendar_2006.pm.....	9
3.	Instrument Status .....	10
3.1	Run_istats_display.ksh.....	10
3.1.1	Istats_display.pl.....	10
3.1.1.1	get_too_update.pm.....	11
3.1.1.2	write_too_table.pm .....	11
3.1.1.3	get_inst_update.pm .....	11
3.1.1.4	write_inst_table.pm .....	11
3.1.1.5	get_rtscm_update.pm .....	12
3.1.1.6	write_rtscm_table.pm .....	12
3.1.1.7	get_pointing_update.pm .....	12
3.1.1.8	write_pointing_table.pm .....	12
4.	TOO Updates .....	13
4.1	Run_too.ksh .....	13
4.1.1	Too.tcl.....	13
4.1.1.1	too_gla06_check.pro .....	13
4.1.1.1.1	read_too_file.pro.....	14
4.1.1.1.2	write_too_request.pro.....	14
4.1.1.1.2.1	send_mail_scf.pl.....	15
4.1.1.1.3	scp_rev_file.ksh .....	15

4.1.2	send_mail_mscf.pl.....	15
4.1.3	scp_file_web.ksh .....	16
5.	Product Trends Plots.....	17
5.1	Run_prod_trends.ksh .....	17
5.1.1	Prod_trends.tcl .....	17
5.1.1.1	Run_pt.ksh .....	17
5.1.1.1.1	prod_trends_05.pro .....	18
5.1.1.1.2	prod_trends_06.pro .....	18
5.1.1.1.3	prod_size_plots.pro .....	18

## **1. Introduction**

The GLAS SCF website ([glas-scfweb.gsfc.nasa.gov](http://glas-scfweb.gsfc.nasa.gov)) displays various statistical plots and reference tables that are automatically generated. The plots are generally created on the main SCF machine (icesat0) and then transferred to the SCF website ([glas-scfweb](http://glas-scfweb)). Sometimes, they are created on [glas-scfweb](http://glas-scfweb) itself, though. This document describes the programs that are used to create the plots, primarily codes written in Fortran 90, Perl, Tcl/Tk, and IDL. These codes are run from a main Korn shell script that defines the environmental variables used by the codes. The main script is set to run automatically from a cron job. When the script executes, the codes access data kept in a MySQL database, create plots and images, and transfer these to the SCF website.

This document does not describe the HTML software used to display the pages of the SCF website. That is given in some detail in the “SCF Programmer’s Guide”.

## 2. Subscription Statistics

The “Subscriptions” page displays parameters for each subscription as well as statistics on subscription and special request fulfillment for each remote site. These pages may be accessed by clicking the “Subscriptions” button on the SCF website main page.

### 2.1 Run\_subscription\_display.ksh

The script /SCF/src/web/ops/run\_subscription\_display.ksh is responsible for gathering subscription parameters from the MySQL database and transferring these data to the SCF website. A cron job executes this script once daily. This script defines the necessary environmental variables and runs the Perl script subscription.pl.

#### **Environmental Variables:**

```
export SRC_DIR=[location of the web source code]
export DB_NAME=[name of MySQL database]
export DB_USER=[username for MySQL database]
export INPUT_DIR=[location of the subscription html code on icesat0]
export REMOTE_IMAGE_DIR=[location of the plot images on glas-scfweb]
export MAIN_IMAGE_DIR=[location of the plot images on icesat0]
export OUTPUT_MAIN=[main location of the subscription code on glas-scfweb]
export OUTPUT_DIR=[location of the subscription html code on glas-scfweb]
export OUTPUT_JS=[ location of the subscription javascript code on glas-scfweb]
export USER_NAME=[username]
export REMOTE_HOST=[SCF website hostname]
export SSH_DIR=[location of ssh]
export DB_PASSWD=[ cat read-only file for MySQL database password]
```

#### 2.1.1 Subscription.pl

##### **Description:**

Retrieves subscription parameters from the MySQL database and writes them to an html file that is transferred to the SCF website. Error messages are sent in an email to SCF personnel.

##### **Arguments:**

None

##### **Subroutines Called:**

```
get_subscription.pm
initialize_arrays.pm
get_area_dates.pm
get_product_seg.pm
get_tracks.pm
get_cycles.pm
write_html.pm
write_js_part1.pm
write_js.pm
copy_to_server.pm
```

write\_menu.pm

#### **2.1.1.1 get\_subscription.pm**

**Description:**

Retrieves from the database a list of subscription numbers.

**Arguments:**

Database connection

**Subroutines Called:**

None

#### **2.1.1.2 initialize\_arrays.pm**

**Description:**

Initializes arrays for database information.

**Arguments:**

None

**Subroutines Called:**

None

#### **2.1.1.3 get\_area\_dates.pm**

**Description:**

Retrieves from the database dates and area for each subscription.

**Arguments:**

Database connection

**Subroutines Called:**

None

#### **2.1.1.4 get\_product\_seg.pm**

**Description:**

Retrieves from the database products and segments for each subscription.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **2.1.1.5    get\_tracks.pm**

**Description:**

Retrieves from the database a list of tracks for each subscription.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **2.1.1.6    get\_cycles.pm**

**Description:**

Retrieves from the database a list of cycles for each subscription.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **2.1.1.7    write\_html.pm**

**Description:**

Writes web pages to display subscription information.

**Arguments:**

None

**Subroutines Called:**

write\_main\_frame.pm  
copy\_to\_server.pm  
write\_title\_frame.pm  
write\_date\_product\_frame.pm  
write\_area\_frame.pm  
write\_8day\_frame.pm  
write\_91day\_frame.pm  
write\_tracks\_cycles\_frame.pm

### **2.1.1.8    write\_js\_part1.pm**

**Description:**

Writes the java script to display a GUI menu.

**Arguments:**

None

**Subroutines Called:**

send\_mail\_local.pm

### 2.1.1.9 write\_js.pm

**Description:**

Writes the java script to display a GUI menu.

**Arguments:**

Menu index  
Institute string  
List of users  
List of subscriptions  
Lowercase institute string  
List of userIDs

**Subroutines Called:**

None

### 2.1.1.10 copy\_to\_server.pm

**Description:**

Transfers file to output directory on remote host.

**Arguments:**

File name  
Output directory  
Remote host

**Subroutines Called:**

None

### 2.1.1.11 write\_menu.pm

**Description:**

Writes the menu page.

**Arguments:**

None

**Subroutines Called:**

send\_mail\_local.pm  
copy\_to\_server.pm

### **2.1.1.12 write\_main\_frame.pm**

**Description:**

Writes the main frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **2.1.1.13 write\_title\_frame.pm**

**Description:**

Writes the title frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **2.1.1.14 write\_date\_product\_frame.pm**

**Description:**

Writes the date and product frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **2.1.1.15 write\_area\_frame.pm**

**Description:**

Writes the geographic area frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **2.1.1.16 write\_8day\_frame.pm**

**Description:**

Writes the 8-day repeat track frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

**2.1.1.17 write\_91day\_frame.pm****Description:**

Writes the 91-day repeat track frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

**2.1.1.18 write\_tracks\_cycles\_frame.pm****Description:**

Writes the cycles and track frame of the subscription web pages.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

**2.1.1.19 send\_mail\_local.pm****Description:**

Sends message in an email to SCF personnel.

**Arguments:**

Message

Subject line

**Subroutines Called:**

None

## **2.2 Run\_daily\_stats\_perl.ksh**

On glas-scfweb, the script /var/www/html/subscriptions/src/run\_daily\_stats\_perl.ksh is responsible for gathering subscription and special request distribution information from the MySQL database and displaying it in a calendar format on the SCF website. A cron job executes this script once daily. This script defines the necessary environmental variables and runs the Perl script daily\_stats\_2006.pl.

### **Environmental Variables:**

```
export DB_USER=[username for MySQL database]  
export DB_PASSWD=[ cat read-only file for MySQL database password]
```

### **2.2.1 Daily\_stats\_2006.pl**

#### **Description:**

Writes daily statistics for each date in file (to current date) to html files.

#### **Arguments:**

File containing list of dates in year

#### **Subroutines Called:**

create\_chart.pm  
create\_summary\_chart.pm  
create\_summary\_page.pm  
create\_calendar\_2006.pm

#### **2.2.1.1 create\_chart.pm**

##### **Description:**

Creates subscription statistics chart.

##### **Arguments:**

None

##### **Subroutines Called:**

None

#### **2.2.1.2 create\_summary\_chart.pm**

##### **Description:**

Creates subscription statistics summary chart.

##### **Arguments:**

None

##### **Subroutines Called:**

None

#### **2.2.1.3    create\_summary\_page.pm**

**Description:**

Creates subscription statistics summary page.

**Arguments:**

None

**Subroutines Called:**

None

#### **2.2.1.4    create\_calendar\_2006.pm**

**Description:**

Creates subscription statistics calendar for 2006.

**Arguments:**

None

**Subroutines Called:**

None

### **3. Instrument Status**

The “Instrument Updates” page displays target of opportunity (TOO) information, instrument updates, real-time-saved commands (RTSCM), and pointing updates. These pages may be accessed by clicking the “Instrument Updates” button on the SCF website main page.

#### **3.1 Run\_istats\_display.ksh**

The script /SCF/src/web/ops/run\_istats\_display.ksh is responsible for gathering subscription parameter information from the MySQL database and transferring these data to the SCF website. A cron job executes this script once daily. This script defines the necessary environmental variables and runs the Perl script istats\_display.pl.

##### **Environmental Variables:**

```
export SRC_DIR=[location of the web source code]
export DB_NAME=[name of MySQL database]
export DB_USER=[username for MySQL database]
export INPUT_DIR1=[location of the too update html code on icesat0]
export OUTPUT_DIR1=[location of the too update html code on glas-scfweb]
export INPUT_DIR2=[location of the instrument update html code on icesat0]
export OUTPUT_DIR2=[location of the instrument update html code on glas-scfweb]
export INPUT_DIR3=[location of the rtscm update html code on icesat0]
export OUTPUT_DIR3=[location of the rtscm update html code on glas-scfweb]
export INPUT_DIR4=[location of the pointing update html code on icesat0]
export OUTPUT_DIR4=[location of the pointing update html code on glas-scfweb]
export USER_NAME=[username]
export REMOTE_HOST=[SCF website hostname]
export SSH_DIR=[location of ssh]
export DB_PASSWD=[ cat read-only file for MySQL database password]
```

##### **3.1.1 Istats\_display.pl**

###### **Description:**

Retrieves instrument updates information from the MySQL database and writes it to html files that are transferred to the SCF website. Error messages are sent in an email to SCF personnel.

###### **Arguments:**

None

###### **Subroutines Called:**

```
get_too_update.pm
write_too_table.pm
get_inst_update.pm
write_inst_table.pm
get_rtscm_update.pm
write_rtscm_table.pm
get_pointing_update.pm
write_pointing_table.pm
```

copy\_to\_server.pm – refer to section 2.1.1.10

### **3.1.1.1    get\_too\_update.pm**

**Description:**

Retrieves parameters from the TOO\_UPDATE database table.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **3.1.1.2    write\_too\_table.pm**

**Description:**

Creates web page to display the TOO updates.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **3.1.1.3    get\_inst\_update.pm**

**Description:**

Retrieves parameters from the INSTRUMENT\_UPDATE database table.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **3.1.1.4    write\_inst\_table.pm**

**Description:**

Creates web page to display the instrument updates.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **3.1.1.5     get\_rtscm\_update.pm**

**Description:**

Retrieves parameters from the RTSCM\_UPDATE database table.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **3.1.1.6     write\_rtscm\_table.pm**

**Description:**

Creates web page to display the RTSCM updates.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

### **3.1.1.7     get\_pointing\_update.pm**

**Description:**

Retrieves parameters from the RTSCM\_POINTING database table.

**Arguments:**

Database connection

**Subroutines Called:**

None

### **3.1.1.8     write\_pointing\_table.pm**

**Description:**

Creates web page to display the RTSCM pointing updates.

**Arguments:**

Returns html file

**Subroutines Called:**

send\_mail\_local.pm

## 4. TOO Updates

The “Instrument Updates” page displays target of opportunity (TOO) information. For each location of each TOO, there is a link that displays a plot of “Minimum distance from Groundtracks” vs. Latitude. These pages may be accessed by clicking the “Instrument Updates” button on the SCF website main page.

### 4.1 Run\_too.ksh

The script /SCF/bin/ops/run\_too.ksh is responsible for calling the codes that read the TOO station files and create the TOO plots and then transfers the resultant png files to the SCF website. A cron job executes this script once daily. This script defines the necessary environmental variables and runs the script too.tcl. Error messages are sent in an email to SCF personnel.

#### **Environmental Variables:**

ICESATVIS\_BIN=[location of source directory]  
ICESATVIS\_TMP=[location of temporary directory]  
TMP\_DIRECTORY=[location of temporary subdirectory]  
TOO\_ICESAT0\_IMAGE\_DIR=[location of png files]  
TOO\_IMAGE\_DIR=[location on glas-scfweb where png files are stored]  
STATION\_PATH =[location of TOO station files]  
IDL\_DIRECTORY =[location of IDL]

#### **Routines Called**

too.tcl  
send\_mail\_mscf.pl  
scp\_file\_web.ksh

##### 4.1.1 Too.tcl

#### **Description:**

Runs the IDL routine, too\_gla06\_check.pro, for all unprocessed station files in /SCF/ancillary\_data/data/stations\_data before yesterday's date.

#### **Arguments:**

Release  
Yesterday's date

#### **Subroutines Called:**

/SCF/IDL/IDLreadGLAS/too\_gla06\_check.pro

##### 4.1.1.1 too\_gla06\_check.pro

#### **Description:**

Reads the TOO station file, reads the rev file to get the pass ID for the TOO time, and then reads the GLA06 file that covers that time. The code calculates the shortest distance between

the file groundtracks and the TOO lat/lons and plots the results. It then copies the TOO station files to all rSCF's.

**Arguments:**

too\_file = TOO station file  
glas\_release = release number  
image\_dir=directory where png plot files are output

**Files Created:**

/SCF/ancillary\_data/data/stations\_data/png\_files/\*.png

**Subroutines Called:**

read\_too\_file.pro  
write\_too\_request.pro  
scp\_rev\_file.ksh

#### 4.1.1.1.1. **read\_too\_file.pro**

**Description:**

This routine reads the TOO station file and returns its values

**Arguments:**

too\_file  
station  
date  
time  
start\_lat  
stop\_lat  
start\_lon  
stop\_lon  
flag

**Subroutines Called:**

None

#### 4.1.1.1.2. **write\_too\_request.pro**

**Description:**

This routine writes and submits a special request file for Tim Urban at UTCSR

**Arguments:**

Station  
date1  
time1  
date2  
time2  
release  
refid

cycle  
track  
start\_lat  
stop\_lat  
start\_lon  
stop\_lon

**Subroutines Called:**  
send\_mail\_scf.pl

#### 4.1.1.2.1. send\_mail\_scf.pl

**Description:**  
Sends a data request in an email to the SCF account on icesat0.

**Arguments:**  
File containing request  
Subject line

**Subroutines Called:**  
None

#### 4.1.1.3. scp\_rev\_file.ksh

**Description:**  
Scp a file to all remote SCF's.

**Arguments:**  
Input/output directory  
File name to transfer

**Subroutines Called:**  
None

### 4.1.2 send\_mail\_msrf.pl

**Description:**  
Sends message in an email to SCF personnel.

**Arguments:**  
File containing message  
Subject line

**Subroutines Called:**  
None

#### **4.1.3 scp\_file\_web.ksh**

**Description:**

Scp a file to glas-scfweb web site.

**Arguments:**

Input directory on icesat0

Output directory on glas-scfweb

File name to transfer

**Subroutines Called:**

None

## **5. Product Trends Plots**

The “Product Trends” page displays plots of trend parameters from GLA05 and GLA06 as well as plots of product file size vs. time for each laser campaign laser campaign. These plots are meant to help detect instrument or processing changes by seeing changes in long-term plot patterns. These pages may be accessed by clicking the “Product Trends” button on the SCF website main page.

### **5.1 Run\_prod\_trends.ksh**

The script /SCF/bin/ops/run\_prod\_trends.ksh is responsible for calling the codes that create the product trends plots. A cron job executes this script four times daily. This script defines the necessary environmental variables and runs the script run\_prod\_trends.tcl. Error messages are sent in an email to SCF personnel.

#### **Environmental Variables:**

ICESATVIS\_BIN=[location of source directory]  
ICESATVIS\_TMP=[location of temporary directory]  
WEB\_PT\_DIR=[location on glas-scfweb where png files are stored]  
PT\_FLAG=[flag indicating if product trends plots for GLA05/6 should be made]  
PLOT\_FLAG=[flag indicating if product size plots should be made]  
PLOT\_FILE=[name of file containing product size information]  
IDL\_DIRECTOR =[location of IDL]  
PT\_DIR=[location of IDL routines]

#### **Routines Called**

prod\_trends.tcl  
send\_mail\_mscf.pl – refer to section 4.1.2

#### **5.1.1 Prod\_trends.tcl**

##### **Description:**

Runs the IDL programs that create the product trends plots and then transfers the resultant png files to the SCF website. Truncates the file /SCF/tmp/plot\_info.txt to data to within the past 45 days.

##### **Arguments:**

None

##### **Subroutines Called:**

Run\_pt.ksh  
scp\_file\_web.ksh – refer to section 4.1.3

#### **5.1.1.1 Run\_pt.ksh**

##### **Description:**

Runs the IDL routines that create the product trends plots.

**Arguments:**

None

**Subroutines Called:**

/SCF/IDL/prod\_trends/ops/prod\_trends\_05.pro  
/SCF/IDL/prod\_trends/ops/prod\_trends\_06.pro  
/SCF/IDL/prod\_trends/ops/prod\_size\_plots.pro

### 5.1.1.1.1. prod\_trends\_05.pro

**Description:**

This routine creates png files of plotted product trend parameters from GLA05.

**Arguments:**

Reads /SCF/tmp/prod\_trends\_05.dat

**Files Created:**

/SCF/tmp/prod\_trends\_05\*.png

**Subroutines Called:**

None

### 5.1.1.1.2. prod\_trends\_06.pro

**Description:**

This routine creates png files of plotted product trend parameters from GLA06.

**Arguments:**

Reads /SCF/tmp/prod\_trends\_06.dat

**Files Created:**

/SCF/tmp/prod\_trends\_06\*.png

**Subroutines Called:**

None

### 5.1.1.1.3. prod\_size\_plots.pro

**Description:**

This routine creates png files of plotted file size vs. time for all products.

**Arguments:**

Reads /SCF/tmp/plot\_info.txt

**Files Created:**

/SCF/tmp/prod\_size\_plots\*.png

**Subroutines Called:**

None