Space Frequency Coordination Group

The SFCG Remote Sensing Disaster Database User Guide

1. Introduction

This guide is intended to serve the users of the SFCG Remote Sensing Disaster Database and as a reference to the format of that Database. This database contains sources of satellite-based remote sensing data helpful in times of natural and manmade disasters. The database was constructed in response to a request from the Development Sector of the International Telecommunications Union (ITU-D).

2. Using the SFCG Remote Sensing Disaster Database Online.

This database is available on the Internet at:

https://www.SFCGonline.org/remote sensing/

Note the “https” rather than “http”, although either will work as the URL. A logon is not necessary to use this database or to download data from it. The following screen should appear (Figure 1).

Figure 1 – The SFCG Remote Sensing Disaster Database Screen Prior to a Search

Annex 1 of this document contains the format of the SFCG Remote Sensing Disaster Database. The items, or columns, are explained therein. The database itself is in the form of a simple, 2-dimensional spreadsheet with each row constituting a data record.

The default values in the boxes will show all available entries. The “Disaster”, “Phase”, “Type”, and “Additional Data to Display” boxes all have drop-down menus of choices to be made, if desired. ”Any” means list everything.

Other boxes require that you know the instrument name, mission name, source, or radio frequency of interest. Leaving “Any” in these boxes will return everything and include all possible search words. A single word in a name is usually sufficient to find all similar entries – an entire phrase need not be typed in.

In regard to the phases of a disaster, the “Latency” is critical for the Preparedness and Response/Relief phases, but not as critical for the Mitigation and Recovery phases. The usefulness of a sensor data product should be judged with consideration being given to how quickly the data can be processed and delivered. If it takes a week to process and deliver a data product, that product may be of limited usefulness in the Preparedness and Response/Relief phases and perhaps should not be included; on the other hand, it could be quite useful in the Mitigation and Recovery phases.

The ”Revisit” parameter is perhaps the most difficult to describe fairly and accurately. It refers to how often a particular spot on the ground is observed (not necessarily from the

same look angle), and not how often the spacecraft is visible to a tracking station on the ground. For example, Landsat may be seen by a ground station 5 times a day at mid-latitudes, but its instrument's field of view is only 180 km and a specific scene, or spot on the ground, is only observed once every 16 days. Furthermore, this parameter is latitude dependent. So as not to raise expectations unnecessarily, the worst case (usually equatorial locations for polar orbiting spacecraft) is given.

Finally, click on the “Search” box (left hand side) to search the database. The search results will be displayed on a new screen (see Figure 2).

The “Additional Data to Display” box normally limits the data displayed to: Instrument, Mission, Center Freq., Disaster(s)/Phase(s), Data Product, Product Usage, Availability, and Type. See Figure 2 for an example, noting the need to scroll down to see all the returned entries.

One additional data column may be displayed using the “Additional Data to Display” drop-down menu. These results may be reviewed on-screen, or exported in Microsoft Excel format (spreadsheet format), or the Comma-Separated-Variable database format, or as an Acrobat PDF document by clicking on the “Export Results to: (Excel) (PDF), (CSV)” output listed underneath the “Availability” choices. This “Export Results To” choice appears only after you have completed a search and is located at the top right-hand side of the listing of the returned data.

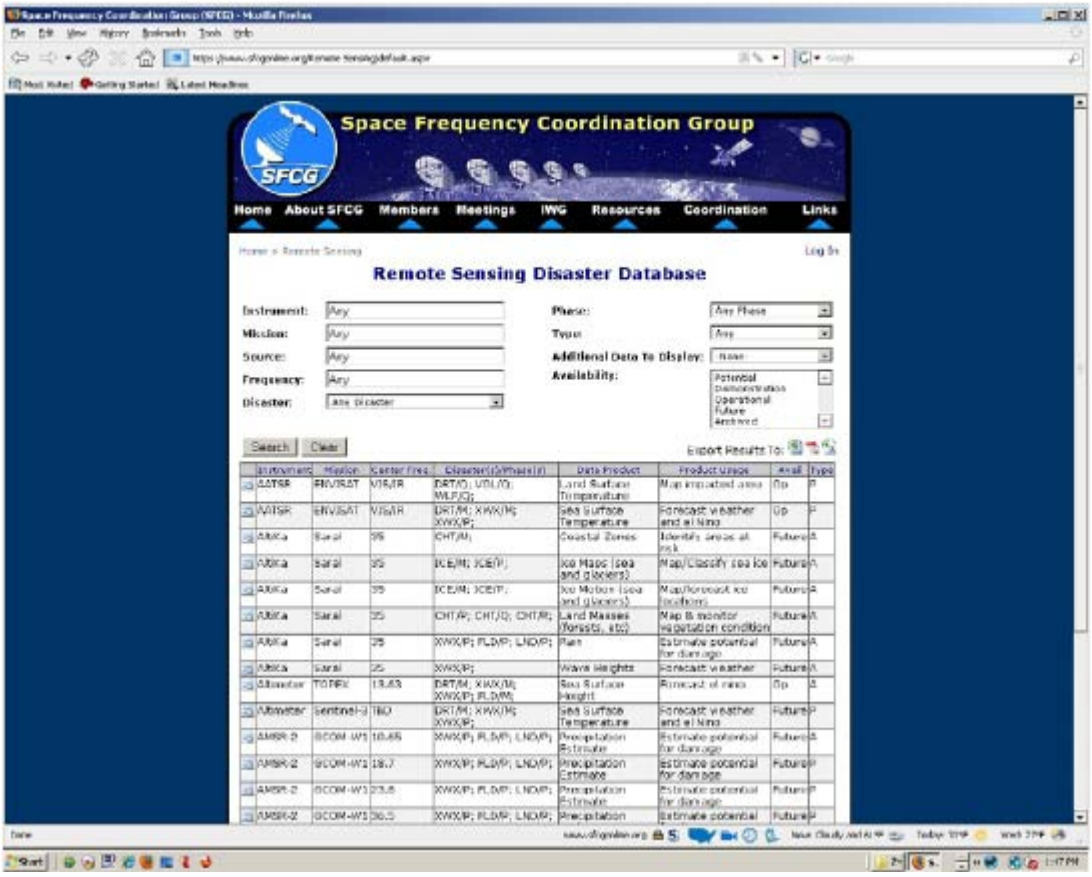

Figure 2 – SFCG Remote Sensing Disaster Database Screen with Search Results

3. Using the SFCG Remote Sensing Disaster Database Offline.

If you choose "- All -" in the "Additional Data to Display" drop-down menu, everything will be displayed (including an "Item Number" which identifies the database record), but the results may be too wide for most screens and left-right scrolling may be necessary. It may be more convenient to view the search results off-line.

You may export the results in either an Excel format or CSV format (PDF format is not available) to your computer. Then you may look at the database offline by using any software compatible with the Excel format (Microsoft Excel itself or the free Microsoft Excel Viewer from http://www.microsoft.com/downloads, or the free Microsoft-compatible OpenOffice software from http://www.openoffice.org/) or with the CSV format (for example, using the free CSVed viewer from http://csved.sjfrancke.nl/).

If you use an excel viewer, you may view or print the search results as shown on Table 1. Table 1 is a sample subset of this database and is presented below as several left-to-right segments. The first three columns and top row are repeated on each page.

4. Document with Examples

Examples showing how these data may prove useful are given in the International Telecommunications Union (ITU) Recommendation ITU-R RS.1859, "Use of remote sensing systems for data collection to be used in the event of natural disasters and similar emergencies." This document is available from the ITU at:

http://www.itu.int/rec/R-REC-RS/e

5. Other Data Sources

The following organizations provide data products to countries experiencing a natural disaster. They not only obtain the data from the satellite operators, but process it into a useful form – images, maps, etc. Advance planning would significantly shorten the time required to get help when it is needed. Therefore, it is advisable for parties to contact these agencies in advance of a disaster to establish the procedures for obtaining assistance.

Following the UNISPACE III conference held in Vienna, Austria in July 1999, an International Charter "Space and Major Disasters" was established. Authorized Users can now call a single telephone number, supported 24 hours a day, to request the mobilization of the space and associated ground resources of the agencies associated with that charter. These member agencies then provide data and information regarding the disaster. Examples of such data can be found at:

http://www.disasterscharter.org

Questions or comments for the Charter members or about the website should be directed to:

webmaster@disasterscharter.org

UNOSAT is a United Nations program created to provide the international community and

developing nations with enhanced access to satellite imagery and geographic information systems services. These services are used mainly for humanitarian relief, disaster prevention, and post crisis reconstruction, and they include satellite imagery selection and procurement assistance, image processing, map production, methodological guidance, technical assistance, and training. The UNOSAT Internet site is:

http://unosat.web.cern.ch/unosat

Another source of remote sensing support for Central America and East Africa is SERVIR, the regional visualization and monitoring system, which can be found at:

http://www.servir.net

The SERVIR initiative integrates satellite observations, ground-based data and forecast models to monitor and forecast environmental changes and to improve response to natural disasters. Contacts for SERVIR are:

SERVIR Director: Daniel.Irwin@nasa.gov
SERVIR Mesoamerica: Emilio.Sempris@cathalac.org
SERVIR Africa: Kate.Lance@nasa.gov

6. Corrections or Additions

Corrections or additions to this database should be sent through your representative to the SFCG (Space Frequency Coordination Group) or sent via email directly to:

Charles.Wende@cox.net

Enough information should be included to identify the record (if a correction) and as many associated web sites as known. Only future missions which have launch-agency approval and a tentative launch date should be forwarded; missions which are in a study phase should not be included in this database.

Table 1: SFCG Remote Sensing Disaster Database Subset – part 1 – Left Panel

Item ID	Instrument	Mission	Center Freq.	Disaster(s)/ Phase(s)	Data Product	Product Usage	Avail	Type	Application Goal	Revisit	Latency
90	ASAR	ENVISAT	5.3	VOL/M;	InSAR Image	Monitor surface deformation	Op	A	IRA		
91	ASAR	ENVISAT	5.3	LND/M;	InSAR Image	Monitor movement	Op	A	IRA		
125	ASAR	ENVISAT	5.3	CHT/M;	Near-shore bathymetry	Identify dangerous sea floor topography	Op	A	IRA		
201	ASAR	ENVISAT	5.3	POS/R;	SAR image	Map oil spill	Op	A	AI		
202	ASAR	ENVISAT	5.3	ICE/M; ICE/Q;	SAR image	Map and classify sea ice	Op	A	IRA		
203	ASAR	ENVISAT	5.3	FLD/Q; FLD/R; WLF/Q; WLF/R;	SAR image	Map impacted area	Op	A	AI		
204	ASAR	ENVISAT	5.3	POS/Q; POS/R;	SAR image	Identify, locate, and monitor spill	Op	A	MON		
289	ASAR	ENVISAT	5.3	DRT/M; FLD/M; FLD/P;	Snow Measurements	Map snow & ice, forecast water supply	Op	A	ICR		
312	ASAR	ENVISAT	5.3	DRT/M; FLD/M; WLF/M;	Soil Moisture Maps	Locate excessively wet/dry areas	Op	A	IRA		
63	ASCAT	MetOp	5.26	ICE/M; ICE/P;	Ice Monitoring	Map and classify ice	Op	A	IRA	29	RT
141	ASCAT	MetOp	5.26	FLD/M; WLF/M;	Plant-avail. Water	Locate excessively wet/dry areas	Op	A	IRA	29	RT
268	ASCAT	MetOp	5.26	DRT/M; XWX/M; XWX/P;	Sea Surface Winds	Forecast weather & el nino	Op	A	IWR	29	RT
170	ATMS	NPP	23.8	XWX/P; FLD/P; LND/P;	Precipitation Estimate	Estimate potential for damage	Op	P	ARF		RT
171	ATMS	NPOESS	23.8	XWX/P; FLD/P; LND/P;	Precipitation Estimate	Estimate potential for damage	Op	P	ARF		RT
17	AVHRR	NOAA-POES series	IR	XWX/P;	Cloud Structure and Movement	Forecast weather	Op	P	IWR	2+/day	RT
18	AVHRR	NOAA-POES series	VIS	XWX/P;	Cloud Structure and Movement	Forecast weather	Op	P	IWR	2+/day	RT
48	AVHRR	NOAA-POES series	IR	WLF/P; WLF/Q;	Fire Index	Identify fire-prone areas	Op	P	IRA	2+/day	RT

Table 1: SFCG Remote Sensing Disaster Database Subset – part 2 – Center Panel

Item ID	Instrument	Mission	Channels	Source	Mission Web Site	Instrument Web Site
90	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
91	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
125	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
201	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
202	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
203	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
204	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
289	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
312	ASAR	ENVISAT	1	ESA	http://envisat.esa.int/	http://envisat.esa.int/object/index.cfm?fobjectid=3772
63	ASCAT	MetOp	1	RT	http://www.esa.int/esaLP/LPmetop.html	http://www.esa.int/esaLP/SEMBWEG23IE_LPmetop_0.html
141	ASCAT	MetOp	1	RT	http://www.esa.int/esaLP/LPmetop.html	http://www.esa.int/esaLP/SEMBWEG23IE_LPmetop_0.html
268	ASCAT	MetOp	1	RT	http://www.esa.int/esaLP/LPmetop.html	http://www.esa.int/esaLP/SEMBWEG23IE_LPmetop_0.html
170	ATMS	NPP	1	NOAA ; RT	http://jointmission.gsfc.nasa.gov/ l	http://www.ipo.noaa.gov/Technology/atms_summary.htm
171	ATMS	NPOESS	1	NOAA ; RT	http://www.ipo.noaa.gov/ l	http://www.ipo.noaa.gov/Technology/atms_summary.htm
17	AVHRR	NOAA-POES series	3	NOAA ; RT	http://noaasis.noaa.gov/NOAASIS/ml/avhrr.html	http://www.ngdc.noaa.gov/seg/cdroms/AVHRR97_d1/avhrr3.htm
18	AVHRR	NOAA-POES series	2	NOAA ; RT	http://noaasis.noaa.gov/NOAASIS/ml/avhrr.html	http://www.ngdc.noaa.gov/seg/cdroms/AVHRR97_d1/avhrr3.htm
48	AVHRR	NOAA-POES series	3	NOAA ; RT	http://noaasis.noaa.gov/NOAASIS/ml/avhrr.html	http://www.ngdc.noaa.gov/seg/cdroms/AVHRR97_d1/avhrr3.htm

Table 1: SFCG Remote Sensing Disaster Database Subset – part 3 – Right Panel

Item ID	Instrument	Mission	Data Web Site
90	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
91	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
125	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
201	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
202	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
203	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
204	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
289	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
312	ASAR	ENVISAT	http://earth.esa.int/object/index.cfm?fobjectid=1451&i_id=63,53&p_id=142
63	ASCAT	MetOp	http://www.eumetsat.int/Home/Main/Access_to_Data/index.htm?l=en
141	ASCAT	MetOp	http://www.eumetsat.int/Home/Main/Access_to_Data/index.htm?l=en
268	ASCAT	MetOp	http://www.eumetsat.int/Home/Main/Access_to_Data/index.htm?l=en
170	ATMS	NPP	http://www.ipo.noaa.gov/index.html ; Http://directreadout.gsfc.nasa.gov/
171	ATMS	NPOESS	http://www.ipo.noaa.gov/index.html ; Http://directreadout.gsfc.nasa.gov/
17	AVHRR	NOAA-POES series	http://www2.ncdc.noaa.gov/docs/podug/ ; http://noaasis.noaa.gov/NOAASIS/
18	AVHRR	NOAA-POES series	http://www2.ncdc.noaa.gov/docs/podug/ ; http://noaasis.noaa.gov/NOAASIS/
48	AVHRR	NOAA-POES series	http://www2.ncdc.noaa.gov/docs/podug/ ; http://noaasis.noaa.gov/NOAASIS/

Annex 1 – Format of SFCG Remote Sensing Disaster Database

The following material describes the columns in this simple, spreadsheet database.

Item ID: Occurs only when displaying all the additional data. The Item ID identifies the record number in the database.

Instrument: The name of the instrument carrying the sensor used to produce the sensor data product. It frequently is an acronym or abbreviation.

Mission: The spacecraft or mission that carried the above instrument. It frequently is an acronym or abbreviation.

Center Frequencies: The frequency band(s), in GHz, used by the sensor. If the bands are above allocated microwave frequencies, the abbreviations VIS (Visible) and IR (Infrared), which includes NIR (Near Infrared), SWIR (Short-Wave Infrared), and TIR (Thermal Infrared), are used. The non-allocated band definitions used here reflect those used by the remote sensing community (see: "Remote Sensing of the Environment", J.R.Jensen, p. 34, 2000, Prentice-Hall, Inc., Upper Saddle Creek, NJ 07458, USA or "Remote Sensing and Image Interpretation", T.A.Lillesand & R.W.Kiefer, p.6, 2000, J.Wiley & Sons, New York).

VIS = visible, 0.4 – 0.7 micrometers, or 750 – 430 THz
IR = infrared, 0.7 – 14 micrometers, or 430 – 25 THz, further subdivided:
NIR = near infra-red, 0.7 – 1.3 micrometers, or 430 – 230 THz
SWIR = short-wave infra-red, 1.3 – 3 micrometers, or 230 – 100 THz (also called mid-IR)
TIR = thermal infra-red, 3 -14 micrometers, or 100 – 20 THz.

Disaster Types, with applicable phases given below:

CHT = Coastal Hazards/Tsunamis
DRT = Drought
EQK = Earthquake
XWX = Extreme Weather
FLD = Flood
LND = Landslides/subsidences/avalanches
POS = Pollution – typically ocean oil spills, but includes air pollution as well.
ICE = Sea and Lake Ice
VOL = Volcanoes
WLF = Wild Land Fires

Phase of Disaster (more than one may apply):

blank = Sensor Product is not useful for this disaster type.
M = Mitigation – measures undertaken far in advance of the disaster to identify and eliminate or reduce risk.
P = Preparedness – activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuing of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
Q = (Quick) Response/ Relief – measures taken immediately during and after an event, from detecting the occurrence of the event itself to filling humanitarian needs during and immediately after the event.
R = Recovery – measures taken, over the long term, to restore the affected people and area to some form of normalcy and/or to return to the pre-event conditions.

Data Product: The sensor product ultimately used by the customer.

Product Usage: A very brief description of how the sensor data product is used.

Avail. (Availability), or how routinely a location is or may be observed:

Pot = Potential, not planned but feasible
Fut = Future mission, planned or now under construction, launch date assigned
Demo = Demonstration or experimental, data spotty, special request needed
Op = Operational, data routinely collected
Arch = Archived, mission completed and data readily available

Type (of instrument):

P = Passive, or
A = Active

Application Goal:

AI = Assess Impact/damage
ARF = Assess Risk Factor
DLE = Detect and Locate Event
ED = Estimate (predict) Damage (prior to actual observation of the site)
ICR = Identify Climate Risk
IRA = Identify Risk Area
IWR = Identify Weather Risk
MON = MONitor situation

Revisit: The time between sequential observations of a given location (may be at different view angles).

Latency: The time delay between when an observation was made and when the sensor product is available to the user.

Channels: The number of frequency channels used within a given band (may be different bandwidths at the same frequency).

Source: The data center or agency distributing the sensor data products.

Mission Web Site: The URL for a web site describing the spacecraft or mission (sometimes comprising many spacecraft).

Instrument Web Site: The URL for a web site describing the instrument.

Data Web Site: The URL for a web site distributing or describing the sensor data product.