International Charter

Space & Major Disasters

Executive Secretariat

9th Annual Report

January-December 2009

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CONTENTS

1 Introduction

1.1 Purpose and scope

This document constitutes the annual report on the operations of the International Charter "Space & Major Disasters" prepared by the Executive Secretariat as laid down in [AD1]. It covers the 2009 calendar year. Over this period the Primus Inter Pares of the International Charter i.e. the agency leading the Board and Executive Secretariat on a on a six monthly rotational basis have been the following: the French space agency CNES (closing April 2009), the Argentinean Space Agency CONAE (April 2009 - October 2009) and the Indian Space Agency ISRO (starting October 2009).

The report was built upon the following input:

– Working documents, notes and actions of the Executive Secretariat,
– Input from the Communication Group,
– Project Managers' reports for each activation,
– Personnel communications.

The report follows the same structure as the work plan of the Executive Secretariat.

Chapter 1 is the present introduction.

Chapter 2 deals with external relationships, new members, Cooperating Bodies and Authorised Users.

Chapter 3 depicts internal business, mainly procedure updates and integration of new members, as well as the operations, anomalies and resource consumption.

Chapter 4 reports on communication activities, material and tools.

Chapter 5 provides an assessment of the system performance, products and services, user appraisal and communication assessment.

Conclusions are drawn in chapter 6.

1.2 Applicable documents

[AD1] Charter “Space and Major Disasters”

[AD2] Charter Implementation Plan, RSCSA-PL0098

[AD3] Project Manager Procedure, RSCSA-PR0419

[AD4] Emergency On-Call Officer Procedure, RSCSA-PR0418

1.3 Reference documents

[RD1] EM-DAT: The OFDA/CRED International Disaster Database - www.em-dat.net - Université Catholique de Louvain - Brussels – Belgium

List of acronyms

AOI	Area of Interest
AU	Authorised User (of the Charter)
BNSC	British National Space Centre
CAS	China Academy of Science
Charter	The International Charter Space & Major Disasters
CMA	China Meteorological Administration
CNES	Centre National d'Etudes Spatiales
CNSA	China National Space Agency
CONAE	Comision Nacional de Actividades Espaciales (Argentina)
CONIDA	Comision Nacional de Investigacion y Desarollo Aerospacial (Peru)
CRED	Centre for Research on the Epidemiology of Disasters
CRESDA	Center for Resources Satellite Data and Applications
CSA	Canadian Space Agency
DDSC	Direction de la Défense et de la Sécurité Civiles
DLR	Deutsche Luft- und Raumfahrtagentur
DMC	Disaster Management Constellation
ECO	Emergency On-Call Officer (of the Charter)
EM-DAT	Emergency Events Database
ESA	European Space Agency
EUR-OPA	European Open Partial Agreement
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
GMES	Global Monitoring for Environment and Security
ICD	Interface Control Document
IFRC	International Federation of Red Cross / Red Crescent societies
INGEOMINAS	Instituto Colombiano de Geología y Minería
INPE	National Institute for Space Research (Brazil)
JAXA	Japanese Aerospace Exploration Agency
NCDR	National Center for Disaster Reduction
NOAA	National Oceanic and Atmospheric Administration
NSMC	National Satellite Meteorological Center
NSPO	National Space Organisation (Taiwan)
ODO	On-Duty Operator
ONEMI	Officia Nacional de Emergencia del Ministerio del Interior (Chile)
PA	Partner Agency
PM	Project Manager (of the Charter)
ROSCOSMOS	Russian Federal Space Agency
ROWA	Regional Office for West Africa (OCHA)
SAFER	Services and Applications for Emergency Response
SARE	Semi Annual Refresher Exercises
SEGEMAR	Servicio Geológico Minero Argentino
SERTIT	Service Régional de Traitement d'Image et de Télédétection (France)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNITAR/UNOSAT	United Nations Institute for Training and Research/ United Nations Operational Satellite Applications Programme
UNHCR	United Nations High Commissary for Refugees
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNOPS	United Nations Office for Project Services
UN OOSA	United Nations Office for Outer Space Affairs
	United Nations High Commissary for Refugees
UNSPIDER	United Nations Platform for Space-based Information for Disaster Management and Emergency Response
URF	User Request Form
USAID/OFDA	United States Agency for International Development's Office of Foreign Disaster Assistance
USGS	United States Geological Survey
VAR	Value Added Reseller
WFP	World Food Programme

2 External relations

2.1 New members accession

In April of 2009 the Brazilian National Institute for Space Research (INPE) formally contacted the Board about becoming a member of the Charter. In September of 2009 the Russian Federal Space Agency (ROSCOSMOS) also contacted the Board about Charter membership. The Charter invited the agencies to the 23rd Charter Board meeting in April 2010 to formally present their requests and describe the space assets that they would make available to the Charter.

The German Space Agency Deutsche Luft- und Raumfahrtagentur (DLR), which has been cooperating with the Charter since 2002, was invited to join the Charter as a full member in January 2009. DLR welcomed the invitation but the formalities of their eventual membership request were not started in 2009.

In October 2009, The National Space Organisation (NSPO) of Taiwan submitted a formal request to become a full member, with the National Science and Technology Centre for Disaster Reduction (NCDR) to be the Authorized User in Taiwan. NSPO has been regularly supporting the Charter with FORMOSAT-2 data since 2006, channelled through CNES. Their request is under review and discussion by the Board.

The interest shown by these space agencies in becoming members demonstrates again the importance of the Charter as a mechanism of international collaboration in the beneficial use of space technologies. If accepted, these requests would result in further expansion of the Charter's satellite resources, improvement of the services provided and a reinforced network of Authorised Users.

2.2 Cooperating Bodies & Charter User Intermediaries

Concerning the collaboration with the United Nations two separate review meetings were organised in 2009. One concerning the United Nations Office of Outer Space Affairs (UN OOSA) and one concerning the United Nations Institute for Training and Research/ United Nations Operational Satellite Applications Programme (UNITAR/UNOSAT).

The meeting with UNITAR/UNOSAT took place in January 2009 at their premises in Geneva with a Charter delegation consisting of Centre National d'Etudes Spatiales (CNES) and European Space Agency (ESA). The meeting with UNOOSA was held in June 2009 at their premises in Vienna with a Charter delegation of Comision Nacional De Actividades Espaciales (CONAE), British National Space Center (BNSC now UK Space Agency), CNES and ESA. These meetings were intended to review the arrangements the Charter has concerning users from the United Nations. The roles and the responsibilities of the parties were clarified and the Charter policies and procedures were explained to maintain good working relationships.

At the 21st Board meeting led by CONAE in Buenos Aires in April 2009, the Board agreed to award UNITAR/UNOSAT the status of "Charter User Intermediary". This status formalizes the prerogative to submit activation requests on behalf of UN users that was granted to UNITAR/UNOSAT in 2008.

UNITAR/UNOSAT proposed that, in order to support the Charter with training activities, they would implement a specific module for the benefit of prospective users in the developing countries. The Charter and UNITAR/UNOSAT have begun to discuss means of collaboration on user training.

Detailed review reports of UN activations for the period January 2009-February 2010 have been provided by both UN OOSA and UNITAR/UNOSAT. The main findings of these reports will be discussed during the Board meeting to be held in April 2010, with follow-on meetings with UNOOSA and UNITAR/UNOSAT being planned for the third quarter of 2010.

The valuable support provided by both of these organisations was confirmed by Charter operations in 2009. UNOOSA and UNITAR/UNOSAT triggered the Charter 19 times out of a total of 47 calls received by the Charter in 2009. These 19 calls equalled 40 % of the Charter activations with UN OOSA responsible for 12 and UNITAR/UNOSAT for 7. The calls were submitted on behalf of UN agencies such as UNDP, WFP, UNOCHA and UNICEF. In addition, UNITAR/UNOSAT has had staff members nominated as Project Manager (PM) for 5 activations (Namibia, Angola and Benin floods, Vietnam Storm and Indonesia Earthquake) and has supported the Charter with value-added products for 4 activations (Afghanistan and Angola floods, Philippines and El Salvador storms).

2.3 Cooperation with other programmes and initiatives

During 2009, the Charter consolidated its cooperation with Sentinel Asia (SA) and the intergovernmental Group on Earth Observation (GEO).

Moreover, the Charter seeks to promote awareness of the results of its activations to the wider public and communities of interest. In response to a request from Google.org, the charitable arm of Google, the Charter is discussing collaboration to provide samples of Charter products generated during its activations. A preliminary agreement has been drafted and is under review of the members. A final version is foreseen for the April 2010 board meeting.

In addition, the European members of the Charter (CNES, ESA, UK Space agency) have made an arrangement with the Services and Applications for Emergency Response (SAFER) project of the Global Monitoring for Environment and Security (GMES) programme of the European Union.

2.3.1 Cooperation with Sentinel Asia.

In March 2009, JAXA formally requested a collaborative arrangement with Sentinel Asia, in the capacity of its Secretariat, and in this regard proposed the Asian Disaster Reduction Center (ADRC) to be accepted as a Co-operating Body of the Charter. The aim is to allow users from Sentinel Asia to access the Charter via the Sentinel Asia activation process. The

request was accepted at the Board meeting in April 2009 and ADRC was nominated Charter Cooperating Body with the privilege to submit requests to the Charter on behalf of national and regional users of Sentinel Asia. This is an escalation process allowing users to opt for a Charter request in the request forms (Emergency Observation Request, EOR) of Sentinel Asia. This was followed by the establishment of formal documentation including a Charter-SA Interface Control Document (ICD). The ICD has been drafted and is the subject of review and acceptance by the parties. Meanwhile, Sentinel Asia has updated its EOR form in order to implement the procedure for escalating the user request to a Charter request, if needed by the user. Escalation requests are filtered by the Cooperating Body ADRC.

2.3.2 Collaboration with GEO

Following a formal request from the GEO Secretariat in October 2007 to improve Charter access, the Charter Executive Secretariat evaluated the GEO proposal and presented these recommendations which were discussed and accepted at the April 2009 Board meeting:

- Consult users at the national level in the Asia Pacific and African Regions.
- Set up an arrangement with Sentinel-Asia (SA) to address Asia-Pacific users so SA countries have better access to the Charter by using an escalation process between SA and the Charter when needed (see § 2.3.1).
- Improve Charter access in Africa by reviewing activation methods with national authorities, evaluating the role of regional centres to address the potential increased user base and maintaining the mandate granted by the Charter to the UN.
- Ensure national users, their partners and the humanitarian community (UN) are aware and understand the Charter to minimize the risk of confusion concerning the National or Humanitarian (UN) nature of requests submitted to the Charter.
- Provide outreach organised by the Charter members fully exploiting collaboration with GEO and other initiatives (non-Charter, UN, etc) to increase awareness.

The GEO Secretariat was informed about the Charter decisions in May 2009. It indicated in a letter to the Board in September of 2009, that GEO supported the decisions and confirmed its willingness to work with the Charter to achieve broader access in Africa. A high-level meeting with GEO Secretariat is planned for 2010.

- **Improving access for Users of the Asia-Pacific region**

By allowing improved Charter access to the national users from member states of Sentinel Asia, significant progress was achieved concerning the Asia-Pacific region. This agreement involves 31 countries, 28 of which did not have direct access to the Charter before and 12 of which are GEO member states.

Just looking at the GEO requests, after one year of collaboration, from those 44 countries worldwide without direct Charter access, now 12 GEO member states from Asia–Pacific region can trigger the system.

- **Improving access for Users in Africa**

In close collaboration with the GEO Secretariat and with support from the network of local GEO principals, ESA has started a first phase of ‘formal user consultations’ in Africa. This

includes meetings with national users to gather their viewpoints concerning how the Charter can be accessed and used for disaster response. This two-year programme is primarily focused on the user segment with the aim to evaluate current mechanisms for a user to submit a request to the Charter and look at methods to improve access mechanisms and assess the potential role that national, regional and international organisations could play. The programme is also designed to raise awareness, to explain and promote the Charter with collaborative actions between the Charter members present in Africa and with GEO. Priority is being given to sixteen African countries that are most affected by natural disasters: Angola, Cote d'Ivoire, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Madagascar, Mali, Morocco, Mozambique, Namibia, Niger, Senegal, South Africa, Tanzania, Uganda and Zambia. 7 of these countries are GEO Member States. The list was discussed and approved at the 22nd Board meeting in Bangalore (India). Consultations with national authorities of Ethiopia and Uganda took place in September and October of 2009. Visits to Mali, Mozambique, Niger, and South Africa are planned for the beginning of 2010. Preliminary feedback from the national users is showing a strong interest in the Charter for rapid, objective and free information to monitor emergencies. National disaster management authorities of most of these countries are have previously been unaware of the Charter.

2.3.3 Collaboration between European members of the Charter and the GMES SAFER project

The European Union initiative Global Monitoring for Environment and Security (GMES) has a major component concerning emergency response. The SAFER project (January 2009 – December 2011) implements and validates the preoperational versions of the GMES Emergency Response Service. The project concentrates on rapid mapping concerning emergency response in risk management i.e. with a wider scope than the Charter that is focused on major disasters. SAFER is undertaken by a consortium led by industry and composed of 50+ partners (European industry and research institutes). The Charter and GMES both offer capacities essential in the domain of EO based disaster response, but there are major differences: the Charter is an international, neutral and best effort collaboration for humanitarian aid purposes while GMES is a programme of the Europe Union looking at emergency response in risk management. As far as short term links are concerned, a collaborative arrangement is currently in place between European members of the Charter (UK Space Agency, CNES and ESA) and the SAFER project focusing on Charter activations. Only pre-defined 'Authorized Users' can submit requests to the Charter and the SAFER project is not able to activate the Charter; the arrangement with SAFER specifically involves the interpretation and Value Adding of Earth Observation data provided by the Project Manager through the Charter. Accessing support from SAFER for Charter activations is particularly relevant concerning European Charter users and for requests relating to emergencies outside the European space that are within the priorities for GMES (for instance events for which Europe is involved in the humanitarian response). The agreement between European members of the Charter and GMES SAFER concerning Value Adding was activated for 6 Charter activations in 2009 (for instance the tropical cyclone Aila in Bangladesh in May, severe fires in Greece in August, etc).

2.4 Project Manager Training

Several training courses for new Charter project managers took place in 2009. They were organised by CONAE and USGS in Santiago, Chile in September, by JAXA in Bangkok, Thailand in October and by USGS in Denver, Colorado, USA in December.

The training held in Chile was in the context of the preparation for the Chilean satellite launch (next year). The Chilean Civil Protection Authority (CPA) strongly supported this training with its own funding and with additional resources provided by the Inter-American Development Bank. Thirty people from different government agencies were present, among them 10 from the Chilean CPA Oficina Nacional de Emergencia - Ministerio del Interior (ONEMI) and 2 from the Chilean Space Agency.

The Project Manager (PM) training held in Thailand at the Geo-Informatics Center / Asian Institute of Technology (GIC/AIT) premises, lasted three days including lecture and hands on operation in accordance with project manager procedure. The GIC/AIT is a Principal Data Analysis Node (P-DAN) in the framework of Sentinel Asia (SA) coordinating the analysis of satellite data and the PM function in the Charter. One extra day was arranged at the Earth Observation Center of JAXA for the PM candidates who will work in GIC/AIT from March 2010.

3 Operations

3.1 Charter activations

The Call-ID is the unique number assigned by the ODO to any User Request Form received. The number of the activation ('Activation number') differs from the Call-ID as some Calls are not processed (rejection mechanism) and others are merged. Forty regular activations took place during the reference period. They are summarised in Table 3.1.

In addition, five Activations are the result of more Calls as several requests were received and subsequently merged:

– Activation 204: Storms in France (two separate requests from the French Civil Security- COGIC)
– Activation 207: Fires in Australia (USGS as AU and, secondly, China National Committee for Disaster Reduction).
– Activation 226: Floods in Senegal and Mauritania (UNOOSA on behalf of OCHA ROWA and UNITAR/UNOSAT on behalf of UNICEF Mauritania).
– Activation 232: Wind storm in the Philippines (UNITAR /UNOSAT on behalf of UN OCHA and UNOOSA on behalf of WFP).
– Activation 238: Hurricane in El Salvador (USGS as AU and UNITAR/UNOSAT on behalf of UN OCHA).

As per the procedure for in such cases, results were sent to individual requestors in parallel.

One Call hasn't delivered any product/service:

- Although Call 280 was accepted (Act 239 – British Virgin Islands), no further action was taken as the storm moved away from the data acquisition point and no PM was nominated.

Three activations were processed by the Project Manager reported that the emergency was not a major disaster:

- These are three requests from UN users submitted by UN OOSA (Act 216 – Landslides in Tajikistan; Act. 227 – Flood in Burkina Faso and Act 241 – Cyclone in Fiji islands).

The two following requests were rejected:

– Call 239: Fiji floods. The request submitted by UN OOSA on behalf of UN OCHA concerned the anticipation of flooding in response to a hurricane. The emergency was not a major disaster and the Call was rejected by the Executive Secretariat.
– Call 283: Earthquake in Malawi. The request submitted by UN OOSA on behalf of the Geological Survey Department of Malawi has been cancelled (by OOSA). The event was not a major disaster and the prerogative to OOSA to submit request is only for UN users.

Activation ID	Hazard type	Country_name	Activation date
202	**Earthquake**	**Costa Rica**	08/01/2009
203	**Flood**	**Washington**	09/01/2009
204	**Wind Storm**	**France**	24/01/2009
205	**Flood**	**Morocco**	09/02/2009
206	**Flood**	**Argentina**	10/02/2009
207	**Wild Fires**	**Australia**	12/02/2009
208	**Volcano**	**Chile**	24/02/2009
209	**Flood**	**Namibia**	27/02/2009
210	**Flood**	**Indiana**	12/03/2009
211	**Flood**	**Namibia**	20/03/2009
212	**Flood**	**North Dakota**	25/03/2009
213	**Flood**	**Peru**	26/03/2009
214	**Volcano**	**Chile**	07/04/2009
215	**Flood**	**Angola**	11/05/2009
216	**Slides**	**Republic of Tajikistan**	14/05/2009
217	**Flood**	**Afghanistan**	19/05/2009
218	**Flood**	**Bangladesh**	27/05/2009
219	**Earthquake**	**Saudi Arabia**	08/06/2009
220	**Flood**	**Vietnam**	06/07/2009
221	**Flood**	**Benin**	10/07/2009
222	**Wild Fires**	**Canary Is**	05/08/2009
223	**Wind Storm**	**Taiwan**	10/08/2009
224	**Wild Fires**	**Greece**	23/08/2009
225	**Wild Fires**	**Argentina**	30/08/2009
226	**Flood**	**Senegal & Mauritania**	02/09/2009
227	**Flood**	**Burkina Faso**	03/09/2009
228	**Slides**	**Chile**	07/09/2009
229	**Flood**	**Turkey**	10/09/2009
230	**Earthquake**	**Indonesia**	16/09/2009
231	**Flood**	**Georgia**	22/09/2009
232	**Wind Storm**	**Philippines**	28/09/2009
233	**Wind Storm**	**Vietnam**	29/09/2009
234	**Wave / Surge**	**Samoa islands**	30/09/2009
235	**Earthquake**	**Indonesia**	30/09/2009
236	**Wind Storm**	**Lao People's Democratic Republic**	05/10/2009
237	**Volcano**	**Colombia**	23/10/2009
238	**Wind Storm/landslides**	**El Salvador**	10/11/2009
239	**Flood**	**British Virgin Islands**	16/11/2009
240	**Flood**	**Uruguay**	26/11/2009
241	**Wind Storm**	**Fiji**	14/12/2009

Table 3-1 List of 2009 Activations

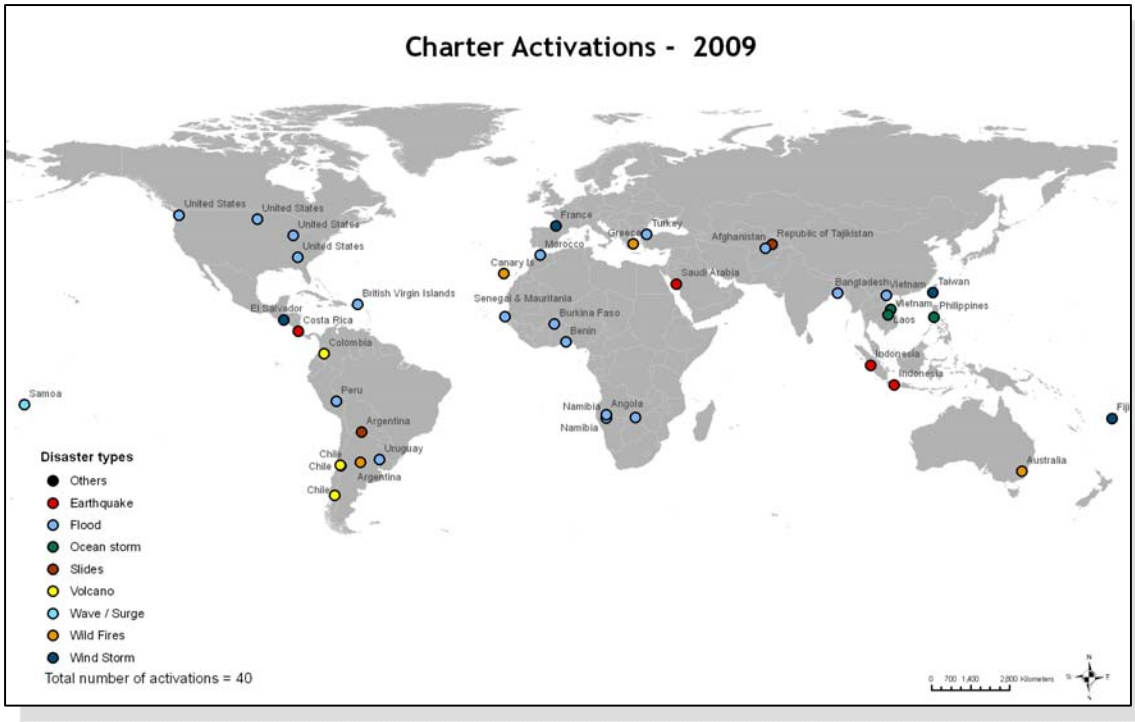


Figure 3-1 Geographic location of the 2009 activations.

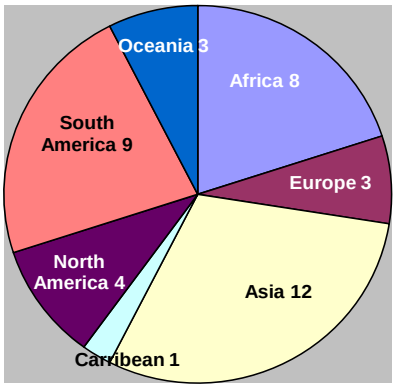


Figure 3-2 Number of activations by geographical areas

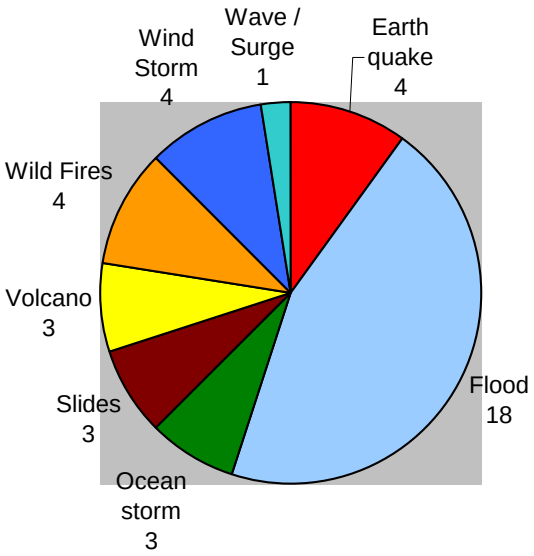


Figure 3-3 Number of activations by hazard type

The Charter was activated in 2009 for 40 major disasters including 12 in Asia, 9 in South America and 8 in Africa (Figure 3-2) with the most frequent hazard type being floods (Figure 3-3). In 2009, weather related hazards represent 72.5% of total calls while solid Earth-related hazards represent 17.5 % (Figure 3-3). Most of the solid-earth related hazards occurred in South America.

In Asia, 5 disaster events were also supported separately by Sentinel Asia. They included fires in Australia, flooding in Vietnam, an earthquake in Indonesia, and floods and an earthquake in the Philippines. It is expected that next year a more synergistic and efficient use of the Charter resources in these regions will be in place because of the agreement with Sentinel Asia and the Charter escalation mechanism that they have instituted.

Figure 3-4 shows the monthly distribution of activations in 2009. The month of September had 10 activations, the highest number which corresponded to 25 % of the total. The other months vary from 1 to 5 activations. The monthly average for 2009 is 3.9, the same as 2008.

Year	Average # of calls per month
2001	1
2002	1.6
2003	1.6
2004	2.1
2005	2.7
2006	2.3
2007	3.8
2008	3.9
2009	3.9

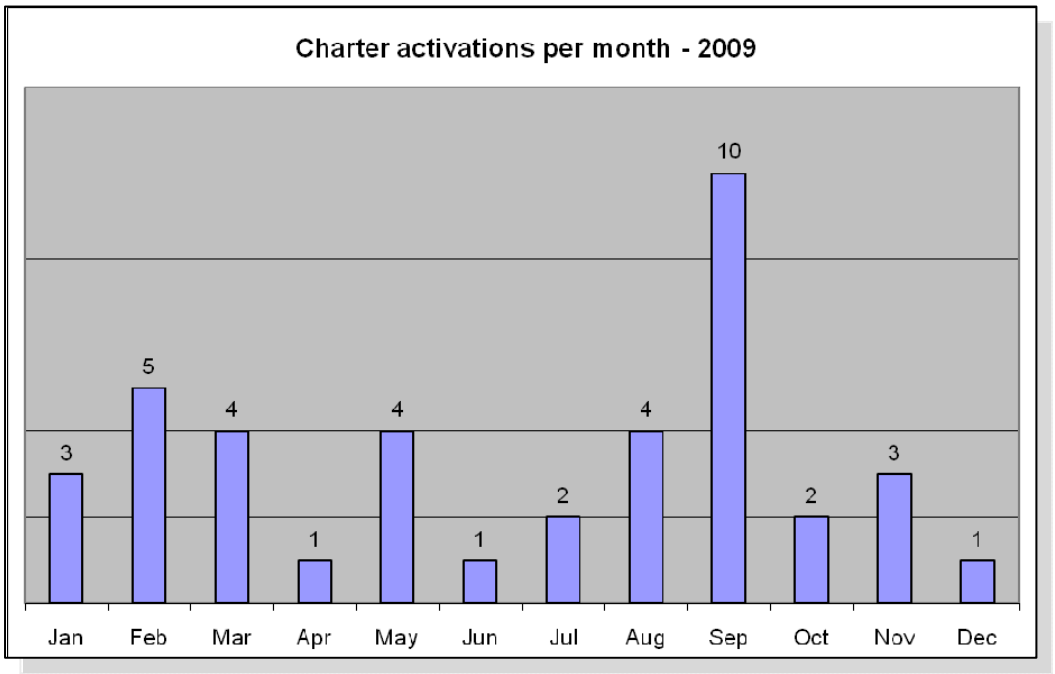


Figure 3-4. distribution of Charter activation in 2009.

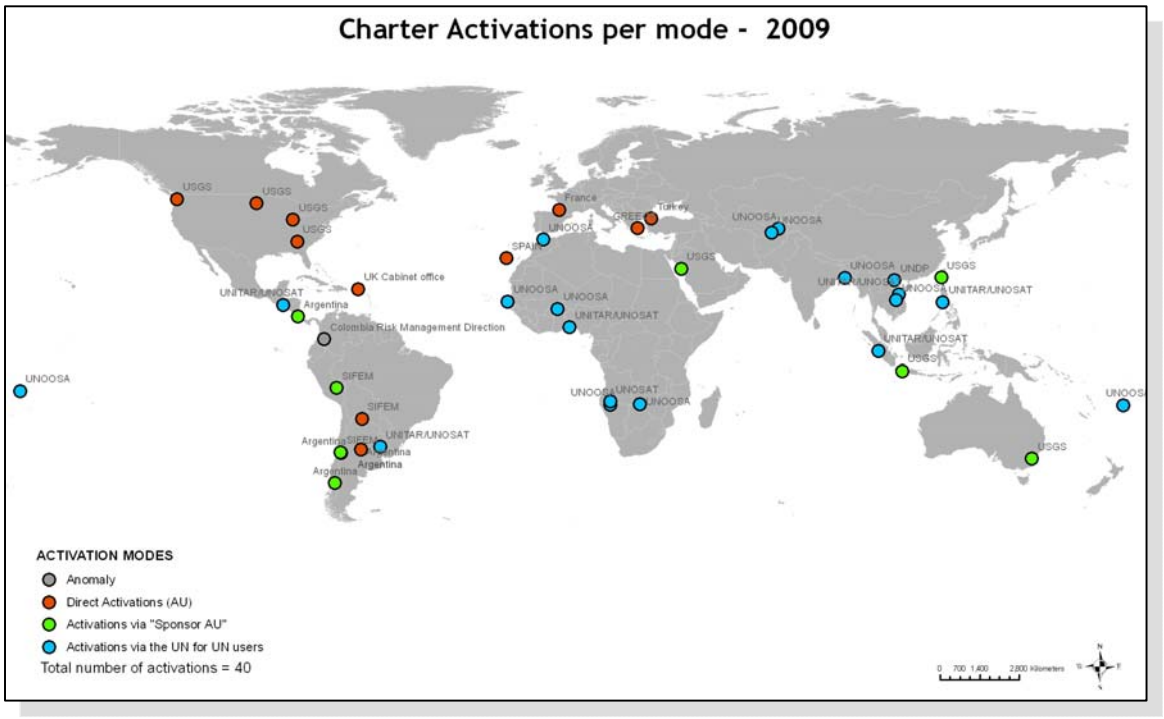


Figure 3-5. Charter activations per mode in 2009.

Figure 3-5 shows the geographic distribution of activations by access mode. There are 3 access modes that may be used. Mode 1 is a direct activation by an Authorized User for his own country. Mode 2 is an activation by an Authorized User on behalf of another country. Mode 3 is an activation made by the UN for UN users. Mode 1 was used for disasters in Europe, the United States and South America. Mode 2 was used for disasters in Central America, South America, and Oceania. Mode 3 was used mainly for disasters in Africa, Asia and Oceania.

Besides the 19 Mode 3 activations by UN bodies, the 20 Mode 1 and 2 activations were made by Authorized Users of China, Turkey, Greece, France, Spain, Argentina and USA. One additional call was made by the Colombia Risk Management Directorate, a non-Authorized User. The call was accepted but an anomaly report released (see § 3.2).

3.2 Anomaly reports

Two anomaly reports were opened during this period for landslides in the Republic of Tajikistan and volcano eruption in Colombia. One anomaly was due to a procedural error in violation of ECO Procedure for Non-Authorized User and the second anomaly was for usage of out-of-date forms. The Executive Secretariat analysed both of them and reported to the Board.

3.3 FTP site

The FTP site is a facility reserved for the Charter members, mainly used for daily archive of reports, procedures, minutes of meetings and occasionally utilized as a temporary repository to exchange raw data amongst space agencies and the Project Managers. CSA conducts regular monitoring of the ftp site to ensure that it is used and maintained effectively and appropriately.
Figure 3-6 shows the usage statistics and Figure 3-7 provides the monthly summaries.
The statistics only cover the period between January and October 2009 because the site was moved to another server in November. No statistics are available from the new site.

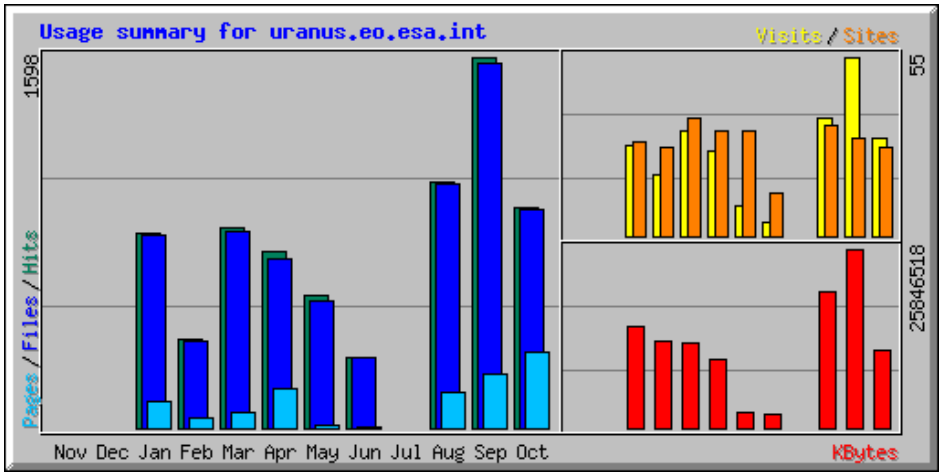


Figure 3- 6. FTP site usage statistics 2009

Summary by Month

Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Oct 2009	105	104	36	3	27	11254078	30	327	943	950
Sep 2009	61	60	9	2	30	25846518	55	236	1567	1598
Aug 2009	39	38	5	1	34	19571041	36	156	1048	1060
Jun 2009	30	30	0	0	13	1974687	4	4	300	300
May 2009	19	18	0	0	32	2366998	9	12	548	572
Apr 2009	25	24	5	0	32	9803619	26	170	730	757
Mar 2009	27	27	2	1	36	12323965	32	64	850	860
Feb 2009	14	13	1	0	27	12619978	19	42	375	381
Jan 2009	28	28	4	0	29	14642732	28	118	831	840
Totals						**110403616**	**239**	**1129**	**7192**	**7318**

Figure 3-7. FTP monthly usage 2009

3.4 Resource report

- **EO data consumption in 2009**

There were 1021 images used in 2009. This is slightly up of 1005 images used last year.

Figures 3-8 and 3-9 represent the data consumption of radar and optical sensors split by number of archive and new acquisition data. Tables 3-2 and 3-3 present general statistics concerning data consumption (total number of data products, data ex-archive and fresh acquisitions, average and maximum numbers of images per activation). Figure 3-10 shows the data consumption of metric resolution optical data and table 3-4 presents the relevant statistics.

Overall in 2009 the following total numbers of data products were delivered:

A) a total of 362 radar data products; ENVISAT, RADARSAT & ALOS data correspond to a total of 336 products (with 115 data ex-archive and 221 new acquisitions). There were also 26 VHR SAR products (TerraSAR-X) kindly supplied by DLR on a ad-hoc basis.
B) a total of 257 high resolution optical data products (HR Optical & VHR SPOT-5)
C) a total of 401 metric Optical (mainly US VHRO) data products

This is illustrated in figures 3.8 to 3.10 and tables 3-2 to 3-4.

– the case of metric resolution optical data: this year a high number of metric optical data were made available with a total of 401 products (Figure 3-10 and table 3-4). The bulk of this volume is associated to a limited number of events; in particular, most US VHRO data were supplied for a few activations, primarily the flooding in North Dakota, US (activations 212) with 153 WorldView data products, 51 OrbView products and 34 QuickBird products and, secondly, one earthquake in Indonesia (activation 230, with 27 WorldView data products & 24 OrbView products), and the tsunami in Samoa Island (activation 234, with 18 WorldView products, 12 OrbView products & 18 QuickBird products). IKONOS and KOMPSAT images were also used for several activations.

As for the previous years, the data resource analysis shows the capacity of the Charter and the power of joining forces to support adequately the national Authorities involved in disasters response. Overall the number of data products from sensors not coming from Charter Parties demonstrates the commitment and support to the Charter from other space agencies and from private sector companies.

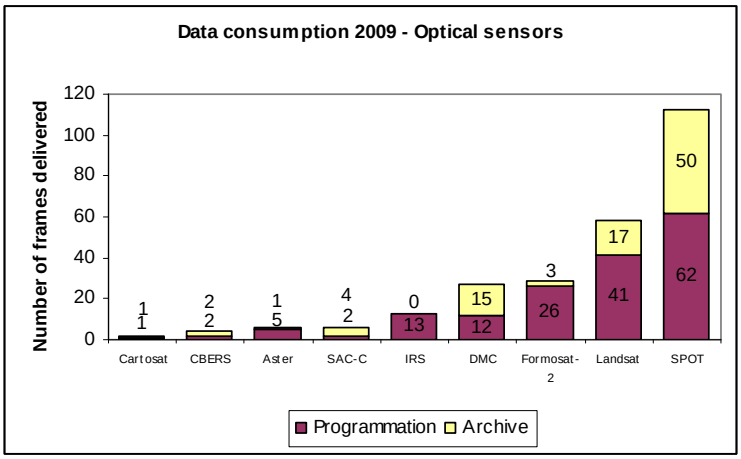


Figure 3-8. 2009 Data Consumption - Optical sensors.

Consumption of metric Optical data such as US VHRO are summarised in table 3-4. The most used optical data were SPOT products (total of 112 images with 50 archive images and 62 new acquisitions).

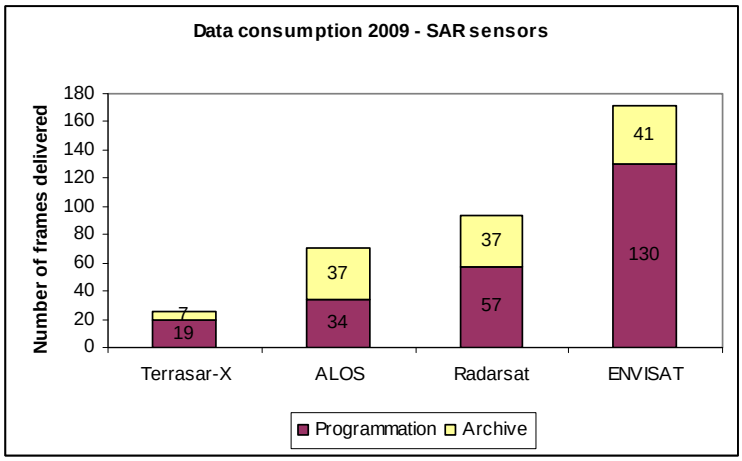


Figure 3-9. 2009 Data Consumption - Radar sensors.

Consumption of VHR SAR data from TerraSAR-X (ad-hoc) are included. The most used Radar data were ENVISAT ASAR products (total of 171 images with 41 products ex-archive and 130 new acquisitions).

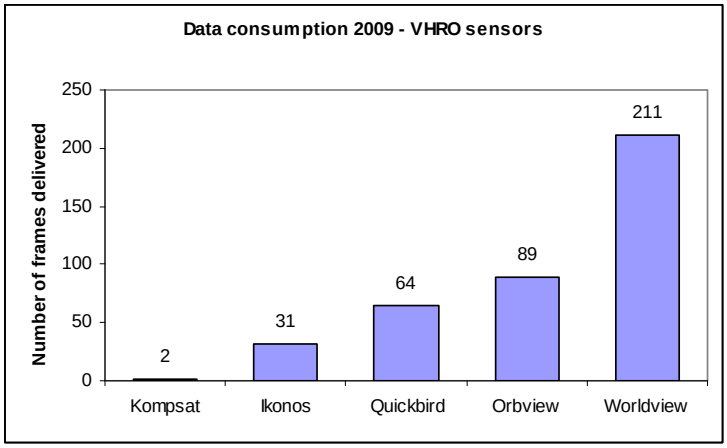


Figure 3-10. 2009 Data Consumption - metric resolution optical sensors.

Resource	SPOT	LANDSAT	FORMOSAT2	DMC	IRS	SAC-C	ASTER	CBERS	CARTOSAT
Total number of Data Products delivered	**112**	**58**	**29**	**27**	**13**	**6**	**6**	**4**	**2**
ex-archive	50	17	3	15	0	4	1	2	1
Programmed (new acquisition)	62	41	26	12	13	2	5	2	1
Max # images per Activation	*10*	*20*	*4*	*4*	*3*	*4*	*4*	*2*	*2*
Average # images. per activation	*2.8*	*1.4*	*0.7*	*0.6*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*

Table 3-2 statistics by high resolution Optical sensors.

Resource	ENVISAT/ ASAR	RADARSAT	ALOS/ PALSAR	TERRASARX
Total number of Data Products delivered	**171**	**94**	**71**	**26**
ex-archive	41	37	37	7
Programmed (new acquisition)	130	57	34	19
Max # per Activation	*27*	*5*	*6*	*6*
Average # images. per activation	*4.2*	*2.3*	*1.7*	*0.6*

Table 3-3 – statistics by Radar sensors.

Resource	WORLDVIEW	ORBVIEW	QUICKBIRD	IKONOS	KOMPSAT
Total number of Data Products delivered	**211**	**89**	**64**	**31**	**6**
Max images per Activation	*153*	*51*	*34*	*13*	*2*
Average images per activation	*5.2*	*2.2*	*1.6*	*0.7*	*<0.5*

Table 3-4 statistics concerning metric Optical data. The total volume is as of 401 products.

The figure 3.11 below shows the distribution of number of images by activation. The maximum of images were made available for the flood in North Dakota, US (activations 212). The hurricane in South West France (activation 202) and the fires in Australia (activation 207) required also a substantial contribution from the Charter. There was an average of 25 images used per activation in 2009 (the minimum being 2 products per activation).

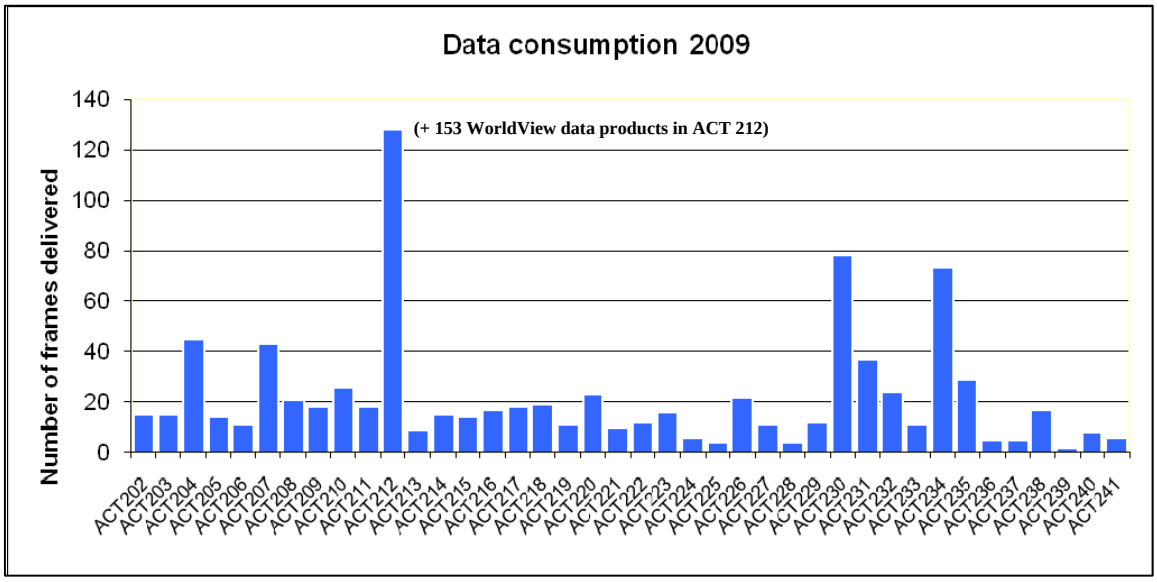


Figure 3-11. Number of data products by activation (for all EO sensors used). The 10 activations with the highest number of products delivered are (in chronological order with the three highest in *italic*): Activation 204, France, storm, 45 data products; Activation 207, Australia, fire, 43 data products; Activation 210, US, flood, 26 data products; *Activation 212, US, flood, 281 data products*; Activation 226, Senegal, flood, 22 data products; *Activation 230, Indonesia, Earthquake, 78 data products*; Activation 231, US, flood, 37 data products; *Activation 234, Samoa, tsunami, 73 data products*; Activation 235, Indonesia, earthquake, 29 data products.

- **Human resource contribution (ECO & PM) in 2009**

- resources concerning ECOs in 2009:

In terms of the human resource contribution of the members, the ECO services were provided on a weekly basis by ESA, CNES, CNSA/CRESDA, CONAE, CSA, ISRO/NRSA, USGS, DMC, and JAXA on an equal footing. The random nature of calls resulted in a rather skewed workload for the members, with CSA handling nearly one fifth of the calls. There were 9 calls processed by CSA, 7 calls each for ESA and USGS, 5 calls for CONAE, 3 calls apiece for DMCii and ISRO, and 2 calls for CNES. Some ECOs had to handle 2-3 calls during their week on duty.

- Distribution of Charter Parties responsible for the PM services delivered in 2009:

ESA, USGS, CONAE, and CNES nominated project managers for 46%, 26 %, 23% and 5% of activations (respectively).

- Distribution of organisations providing PM resources in 2009:

The PM may come from a Charter Party or a Third Party. Figure (3-12) shows the breakdown of the project managers' organisations involved in the processing and interpretation of the satellite imagery.

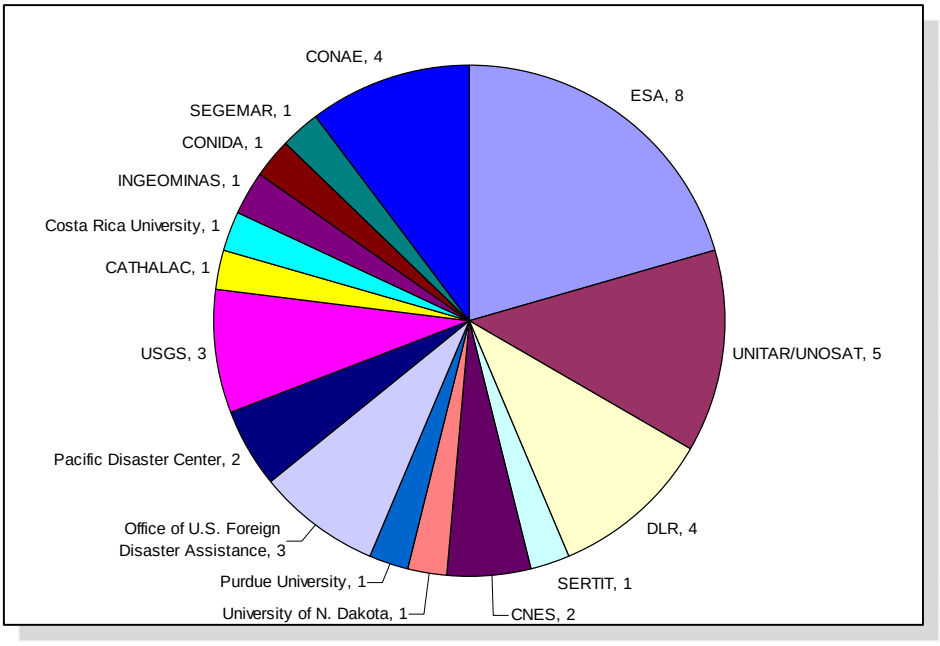


Figure 3-12. Distribution of organisations providing PM resources in 2009.

In details:

- USGS provided project managers from US separate organizations including the University of North Dakota, Purdue University, Pacific Disaster Center, Office of U.S Foreign Disaster Assistance for 25% of the total project managers while the South America project manager pool accounted for 23 % including support from CONAE, University of Costa Rica, Cathalac (Panama), INGEOMINAS (Columbia), CONIDA (Peru), and SEGEMAR (Argentina).
- UNITAR/UNOSAT (International) contributed to 13 % of the total.
- ESA provided the project managers to work on 21 % of activations, mainly in support of disasters located in Europe, Africa and Asia.
- CNES provided the project managers to work on 5 % of activations primarily for events in France.
- DLR (10%), CNES (5%) and SERTIT (3%) provided project managers for the rest of the activations which were located in Europe and Asia.

3.5 SARE – Semi Annual Refresher Exercises

Following the Charter procedures, two Semi Annual Refresher Exercises were performed in 2009:

- SARE-04 : simulated Floods in France (12- 26 May 2009). CNES conducted the exercise and JAXA reported to the Secretariat. 18 ECOs participated.

- SARE-05: simulated Landslide in ShanXi Province, China (17 November 2009 – 1 December 2009). CNSA prepared the exercise with the support of CONAE, and CNES reported to the Secretariat. CRESDA (China Center for Resources Satellite Data & Application) did the task on behalf of CNSA. 24 ECOs participated.

A set of recommendations were proposed at the end of each exercise that will be further examined next year to look for inclusion in the ECO Procedure or Scenario Guidelines. Whilst such exercises are recognised by all as useful procedures for training and testing the Charter tools and resources, participation of all agencies is difficult due to other commitments and priorities.

3.6 Metadata Catalogue

The tool to display metadata for all EO products supplied by the Charter, developed by CNES in 2008, has been tested successfully by ESA, DMC and JAXA. The tool was further improved by CNES in 2009, taking into account feedback from member agencies on search performance, creation of an open-source version and addition of user documentation. Additionally, software validation was performed by CNES and the home page was improved.

At the end of 2009, convertors were prepared by ESA, DMC data and CNES to allow ingest of the EO mission data products they supply. To date 600 SPOT metadata records

from 2004-2009 and 430 ENVISAT metadata records from 2007-2009 have been included in the catalogue. The convertors for Landsat and ALOS will be completed at the beginning of 2010.

Next year, the creation of a link with additional sensors including SAC-C, RADARSAT-2 and Formosat-2 and the performance of new tests by all agencies are foreseen before starting routine data inputs and providing users with access to the catalogue.

4 Communication

4.1 Web site

The web site is part of the standard communication activities and currently available in five languages (English, Chinese, French, Japanese and Spanish). Efforts were committed this year to improve design and functionalities of the website so as to:

- facilitate search of information on Charter activations using Google map ("maps of activation") ;
- offer a media gallery with a set of products to illustrate the Charter activities and a quick link to the relevant activation description ("media gallery") ;
- help the users with a Frequently Asked Questions.

The website was migrated to a new server. The new site is operational and was opened to users on 10 September 2009.

The following table shows statistics on the web site filtered from robots and internal traffic. Please note that the statistics are divided in two periods: January- August and September – December due to the server migration.
Table 4-1 and figure 4-1 represent the monthly summary from January to August 2009, with number of visits oscillating between 9000 during June to 34000 – 35000 visits in May and August. There was a total of 220,629 visits in eight months and a traffic of 950 Terabytes.

Summary by Month										
Month	Daily Avg				Monthly Totals					
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Oct 2009	15	11	12	4	1	11202	115	295	281	365
Sep 2009	10386	8690	1772	714	9907	25547830	11432	28357	139040	166185
Aug 2009	15854	14005	2362	1154	21406	229578827	35774	73222	434157	491486
Jul 2009	18867	16321	2968	884	7387	127111801	20343	68269	375395	433959
Jun 2009	15952	13804	2216	889	7758	24919754	8894	22165	138047	159522
May 2009	18333	16040	2451	1098	23574	86732089	34048	76001	497244	568348
Apr 2009	18265	15933	2346	925	22199	85654555	27778	70385	478009	547967
Mar 2009	20867	17551	2682	1004	25293	134741280	31145	83148	544100	646901
Feb 2009	19804	17248	2762	906	22425	125609565	25389	77360	482960	554522
Jan 2009	17396	15031	2175	829	22701	110364450	25711	67429	465963	539298
Totals						950271353	220629	566631	3555196	4108553

Table 4-1 Charter web monthly usage January – August 2009

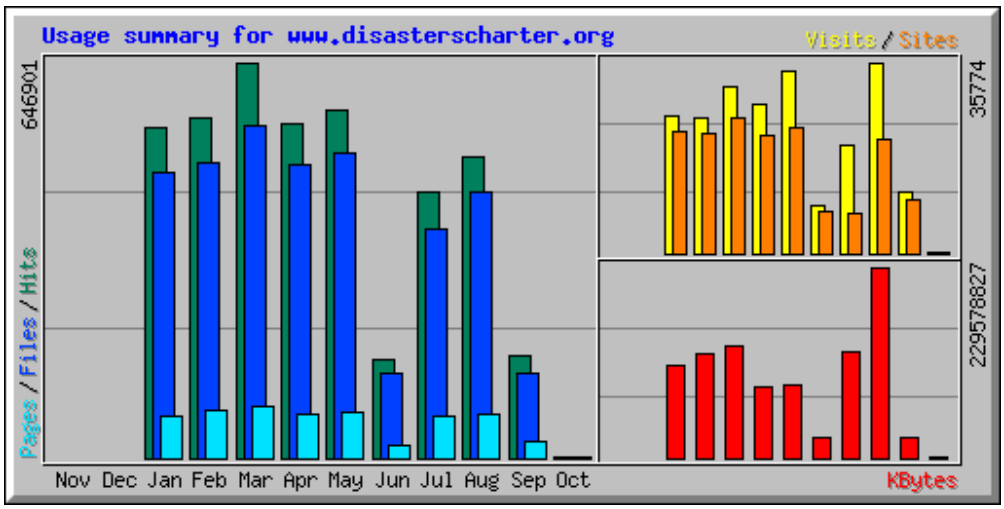
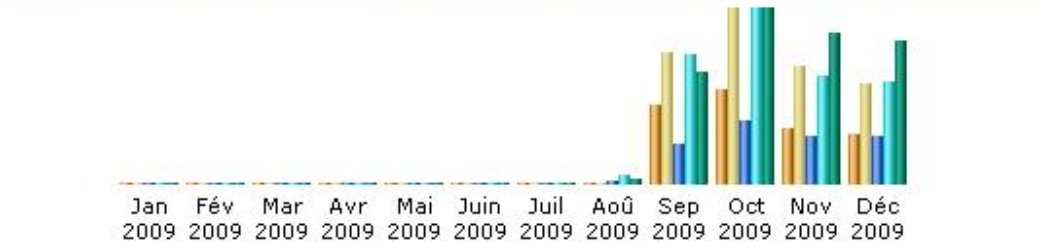


Figure 4-1 Charter web usage statistics 2009

From September 10 to December 31, 2009 (Table 4-2), total of the visits was 80,000 (eq. to 42,600 different visitors). The maximum amount of monthly activity was registered in October 2009 with around 27,000 visits (eq. to 14,500 different visitors) and 716,000 hits.



Mois	Visiteurs différents	Visites	Pages	Hits	Bande passante
Jan 2009	0	0	0	0	0
Fév 2009	0	0	0	0	0
Mar 2009	0	0	0	0	0
Avr 2009	0	0	0	0	0
Mai 2009	0	0	0	0	0
Juin 2009	0	0	0	0	0
Juil 2009	5	20	1186	2965	25.19 Mo
Aoû 2009	21	79	9566	31866	690.13 Mo
Sep 2009	11995	20017	160092	531250	13.06 Go
Oct 2009	14562	26783	257537	715989	20.37 Go
Nov 2009	8440	18115	193776	441145	17.44 Go
Déc 2009	7584	15204	191349	417646	16.69 Go
Total	42607	80218	813506	2140861	68.25 Go

Table 4-2 Charter web monthly usage September – December 2009

It is important to remember that in addition to the Charter website, where examples of Charter results are published for each activation, third party users of the Charter provide mapping products derived from Charter data on their own websites and portals.

4.2 Preparation of the 10th Anniversary of the Charter and Promotion material

In order to effectively celebrate the tenth anniversary of the Charter, ESA has been coordinating an update to the Charter brochure, the last version of which was published in 2005.
The design of the new brochure was set up with 3 key objectives:

- To provide dedicated information concerning each Charter member
- To have a long shelf life i.e. a main brochure with non-topical information
- To illustrate success stories in order to engage audiences

As shown in figure 4-2 below, the preparation of the brochure took a year and at the end of December 2009, all text and images were approved. The final English version of the brochure is planned to be available by the beginning of 2010. CSA will prepare a French version.

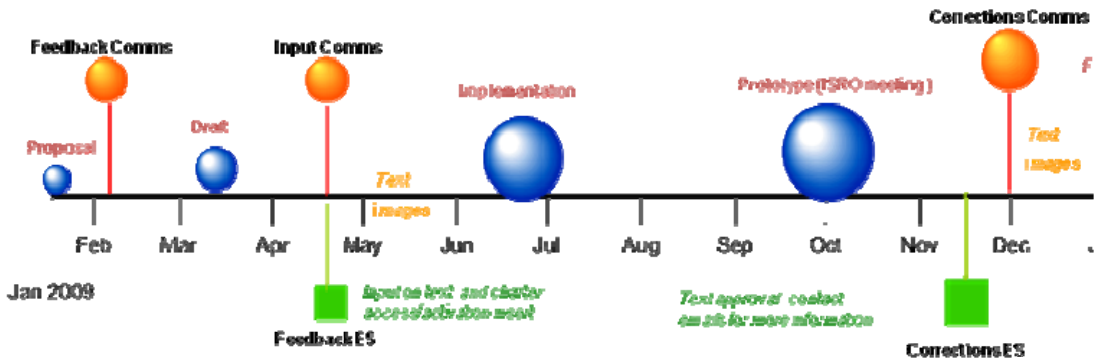


Figure 4-2 2009 Charter Brochure timeline

During the 22nd Board meeting in October 2009, the following strategies and actions, for celebrating the 10th Anniversary of the Charter were agreed upon:

- The Charter will be represented at events during 2010 such as. ILA, Farnborough, or others to raise awareness and enhance visibility of the Charter.
- a special video on 10 years of the International Charter will be produced.
- web stories and press releases during 2010 will be published

A list of events will be identified and proposed at the beginning of next year. ESA will facilitate the production of the Charter 10th Anniversary video.

4.3 Conferences & presentations

The following table provides a list of 2009 events or conferences where the Charter was presented.

Event	Venue	Date	Speakers
Meeting with the National Space Agency of Ukraine.	ESA-ESRIN (Italy)	January	ESA
Committee on the Peaceful Uses of Outer Space- COPUOS meeting	Vienna (Austria)	June	CONAE
ISDR meeting (Charter intervention during GEO presentation)	Geneva (Switzerland)	June	CONAE
International Conference on Space Technology (ICST)	Thessaloniki (Greece)	24-26 August	CSA
UN-SPIDER regional meeting: "Aplicaciones Espaciales en la Gestión para la Reducción del Riesgo y para la Respuesta en caso de Desastres"	Quito (Ecuador)	29 September - 2 October	CONAE
Meeting with Ethiopian Government Delegation	ESA-ESRIN (Italy)	22 September	ESA
GEOSS Workshop XXX: Disaster Management and Humanitarian Assistance for GEOSS	Kampala (Uganda)	23-25 October	ESA/ARGANS
Africa GIS	Kampala (Uganda)	26-30 October	USGS
International Disaster Management Congress-II	New Dehli (India)	4-6 November	ISRO
Commercial Imagery Forum	Reston,VA (USA)	November	USGS
AGU Conference	San Francisco,CA (USA)	December	USGS

Table 4-3 List of conferences with Charter presence

In addition, in November 2009 on the occasion of the GEO Plenary in Washington, DC USGS and ESA had booths where the Charter was promoted**.**

4.4 Press releases, articles

The following table summarises the main press releases, web and paper articles issued by the member agencies or other during this period.

Date	Issuing agency	Title
22 April	CONAE	CONAE takes on the presidency of the Space and Major Disasters International Charter: « *La CONAE asumió por segunda vez la coordinación de la CartaInternacional "El Espacio y Grandes Catástrofes" hasta octubre de 2009* »
24 August	ESA	Greek fires seen from space http://www.esa.int/esaEO/SEM0S8H7KYF_index_0.html
25 August	Greek Secretariat for Civil Protection	Article in Greek with relevant map published on the website: http://www.gscp.gr/ggpp/site/home/ws/units/secondary+menu/files/deltia/2009/August/260809-1.csp
August	CSA	Monitoring Disasters with a Constellation of Satellites – Type Examples by Ahmed Mahmood. Publ *Conference proceedings of '1st International Conference of Space Technology (ICST-2009)' Thessaloniki, Greece, 24-26 August 2009*
9 September	UNITAR/ UNOSAT	Mapping for disasters with UNOSAT. In Google Lat Long. http://google-latlong.blogspot.com/2009/09/mapping-for-disasters-with-unosat.html
26 October	ESA	22nd Meeting of the International Charter "Space And Major Disasters", 7-9 October 2009, Bangalore, India http://www.disasterscharter.org/
December	USGS	Disaster Response and the International Charter Program by Timothy Stryker and Brenda Jones, published on PE&RS *magazine. http://www.asprs.org/publications/pers/2009journal/december/

*PE&RS: Photogrammetric Engineering & Remote Sensing. Journal Of The American Society For Photogrammetry And Remote Sensing

Table 4-4 - Press release and publications

5 Assessment

This section provides a synthesis of the lessons learnt and recommendations to take into consideration for improving the Charter operations.

To assess the overall impact of the Charter as a service to support disaster response, statistics concerning activations in 2009 have been combined the EM-DAT Disaster Database kindly made available by CRED. EM-DAT is originated by the OFDA/CRED (Université Catholique de Louvain [RD1]).

Furthermore one of the main sources of information to assess the service provided by the Charter in 2009 has been the collection of Project Manager (PM) reports gathered throughout the activations. They have been used to assess the details of what products/services were supplied, how, the timeliness of the service and feedback from the users.

5.1 Overall impact

In 2009, CRED reported almost 300 natural disasters caused by earthquakes, volcanic eruptions, floods, landslides, tsunamis and storms. The Charter events represent a small fraction of the total number of disasters registered by EM-DAT, just 11% in 2009. For comparison generally accepted figures concerning the occurrence of natural hazards (not only major disasters) are around 800-1000 per year.

Figure 5.1 below illustrates how many Charter events are part of the 50 most severe disasters according to fatalities as recorded in ME-DAT each year since 2001. The total number of Charter activations for each year is shown in purple, while red indicates the number of Charter activations included in the 50 most severe disasters; table 5-1 lists the 10 disasters with the highest number of fatalities in 2009.

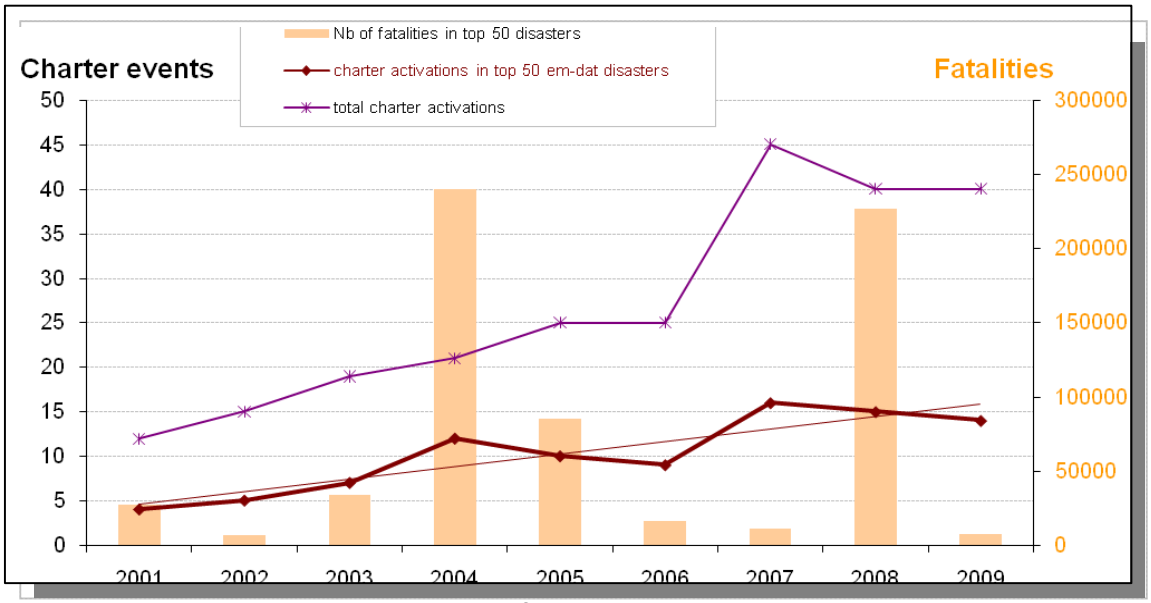


Figure 5-1. Number of Charter events over 2001-2009 .
In red the portion of Charter events part of the 50 most severe disasters recorded in EM-DAT each year. The total number of fatalities counted for the 50 main disasters was lower in 2009 (around 3000) compared to that of 2004: this is due to the impact of single very severe events: the Asian tsunami; the same occurs comparing to 2008 because of the impact of the Nargis cyclone Myanmar and the major earthquake in China in Q2.

It is to be noted that fatalities alone do not represent the only measure of the severity of an event; there are other criteria for the Charter: for instance, the service can be triggered for emergencies where there is a significant destruction of property or threat to human life. The following are a few such cases.

- No lives were lost in the January 2009 flood disaster in Western Oregon but 30,000 people were evacuated from their homes.
- The fires in Greece in August 2009 didn't claim lives but destroyed several homes and thousands of acres of forest. 10,000 people were displaced from their homes.

Top 10 Disasters – Number Killed – 2009 Red & *Italic Text Indicates Charter Response*				
Date	**Country**	**Type**	**# Killed**	**#Affected people**
30/09/2009	***Indonesia***	***Earthquake***	***1177***	***679,402***
07-09 /2009	**India**	**Flood**	**992**	**1,886,000**
7/08/2009	***Taiwan***	***Storm***	***630***	***2,307,523***
2/10/2009	***Philippines***	***Storm***	***539***	***4,478,491***
28/9/2009	***Philippines***	***Storm***	***501***	***4,901,763***
25/9/2009	**India**	**Flood**	**300**	**2,000,000**
6/4/2009	**Italy**	**Earthquake**	**295**	**56,000**
7/11/2009	***El Salvador***	***Storm***	***275***	***9,000***
25/5/2009	***Bangladesh***	***Storm***	***190***	***3,935,341***
28/9/2009	***Viet Nam***	***Storm***	***182***	***2,477,315***

Table 5-1 Ten most severe disasters by number of fatalities in 2009. Source: EM-DAT [RD1]. In italic Charter events.

Looking at Figure 5.1 there has been an increase of the number of Charter events per year between 2001 and 2007 and the number stabilised to a certain extent in 2008 and 2009 (with 40 events in average).

Among the 50 most severe disasters occurred in 2009 a large part correspond to hydro-meteorological events; there were 14 Charter activations – 7 of those are in the list of the ten most severe disasters of 2009 (Table 5-1). This highlights the fact that the Charter is well focused on mass disasters.

There has been an increase of the portion of Charter event part of the 50 most severe disasters according to EM-DAT: every year more and more Charter events are part of this segment. This is a general trend despite the fact that over the last three years the value is not increasing (16, 15, 14 in 2007, 2008, 2009).

Looking at 2009, there was no Charter activation for 36 of the 50 most severe disasters events.:

- half of these occurred in countries which have no direct access mechanisms to the Charter. In these regions, mostly in Africa and Asia, it is needed to increase awareness and promotion. The Charter is aware of this challenge and has strengthened in 2009 its efforts concerning international presence, formal consultation of end users without direct access for request submission, collaboration with the international humanitarian

community (United Nations) and other international initiative in the field of EO applications such as GEO and Sentinel Asia.

- the other half of these events occurred in countries either with Charter Authorized Users (AU) or in countries without an AU but where the disaster management authorities already have used the mode 2 ("sponsor-AU") to submit Charter requests. For some of these cases, like India and Italy, disaster management authorities have used their national asset for EO based disaster response and have not felt that the contribution of the Charter was needed. In particular, in Italy in the aftermath of the L'Aquila earthquake, satellite data and airborne imagery from Italian, European and US systems were gathered directly by organisations working with the Civil Protection authorities.

The different types of disasters that occurred between 2000 and 2009 is illustrated in figure 5.2 below. The data highlight that the Charter has been activated more often for weather-related hazards, such as floods, wind storms, wave surges, ocean storms (and landslides that occur after intense rainfalls) rather than other hazard types (e.g. solid Earth-related hazards such as earthquakes or volcanic eruptions).

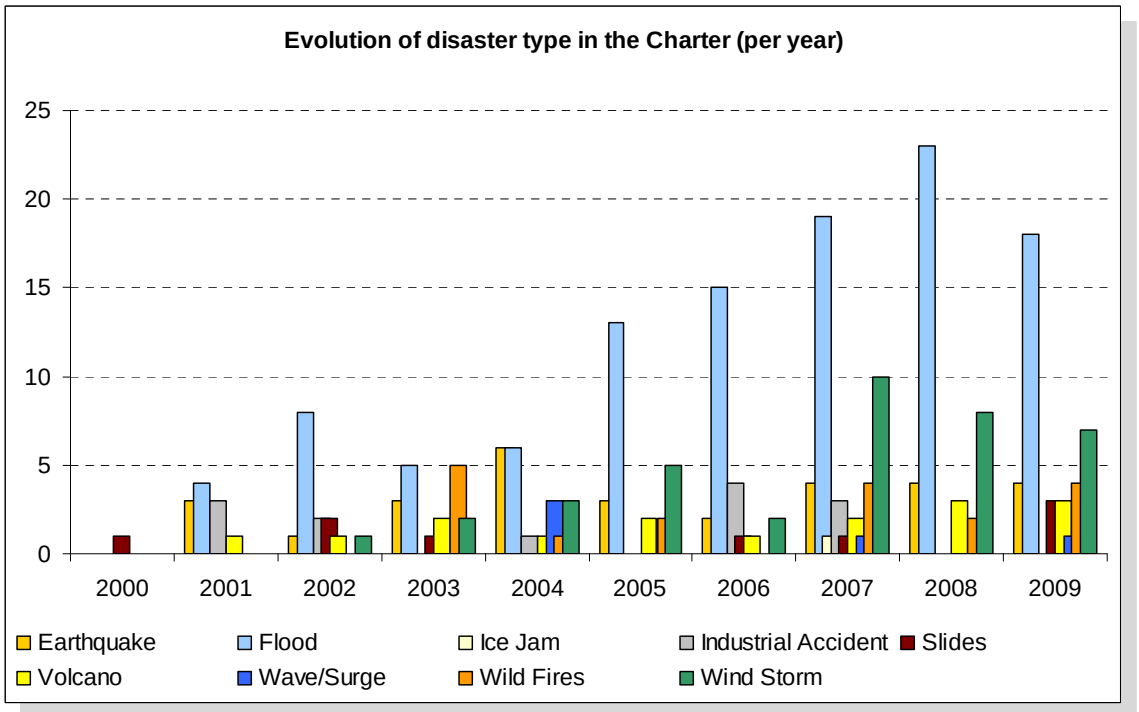


Figure 5-2 Disaster types per year over 2000-2009.

Over the period 2000-2009 there was a total of 242 activations in 90 different countries. Some regions were affected by recurrent hazards over a 10 year period. The worldwide distribution of Charter events, the hazard type, and the footprint of the Area of Interest (AOI) requested in the User Request Form (URF) are shown in figure 5-3 below.

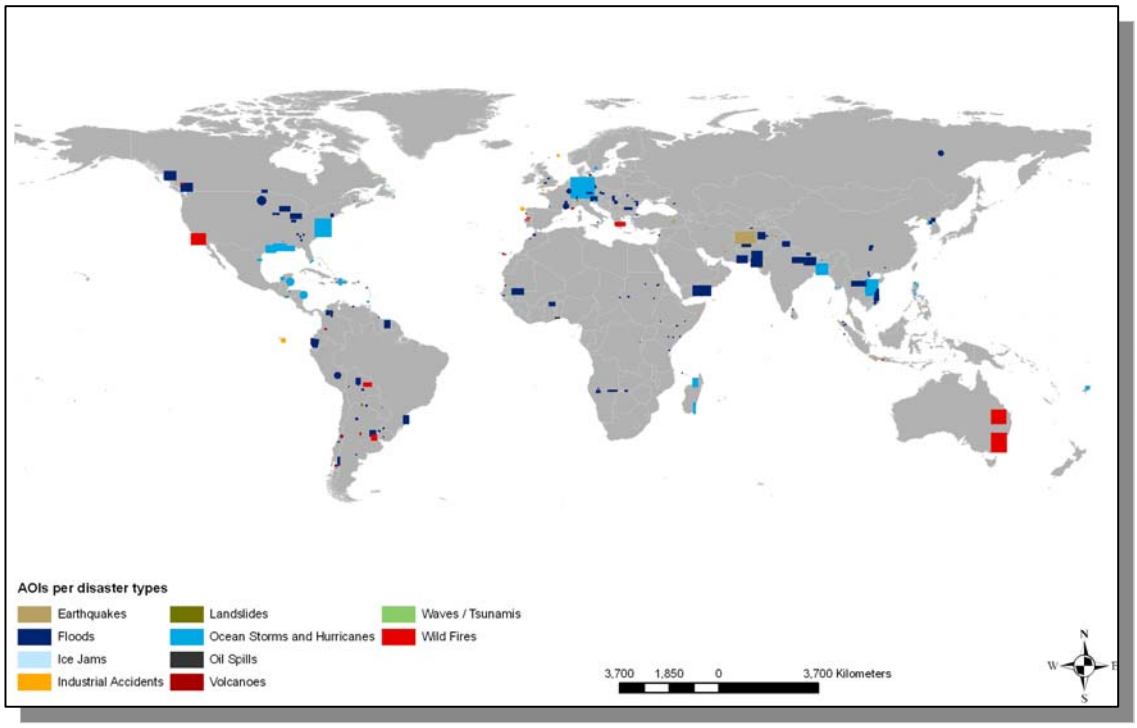


Figure 5-3 Area of Interest (AOI) over the period 2000-2009.

5.2 System performance assessment

- Assessment of timeliness for Charter services provided in 2009

The system performance review confirms that as for 2007 and 2008 the response time has been very good with a standard average turnaround time of two days. The following histogram indicates the acquisition time of the first satellite images received after the Charter was activated. In average this is better than two days. This is better than one day for 40% of activations. It is difficult to compare this to user requirements *in general* and EO systems will always be slower than needed for certain users. The driver being the timeliness of access to fresh observations in the aftermath of a hazard impact more satellites will always be needed to make this barrier go down. However many users indicate that providing crisis mapping (i.e. based on fresh acquisitions) on a daily basis and starting on Day 1 is an appropriate target.

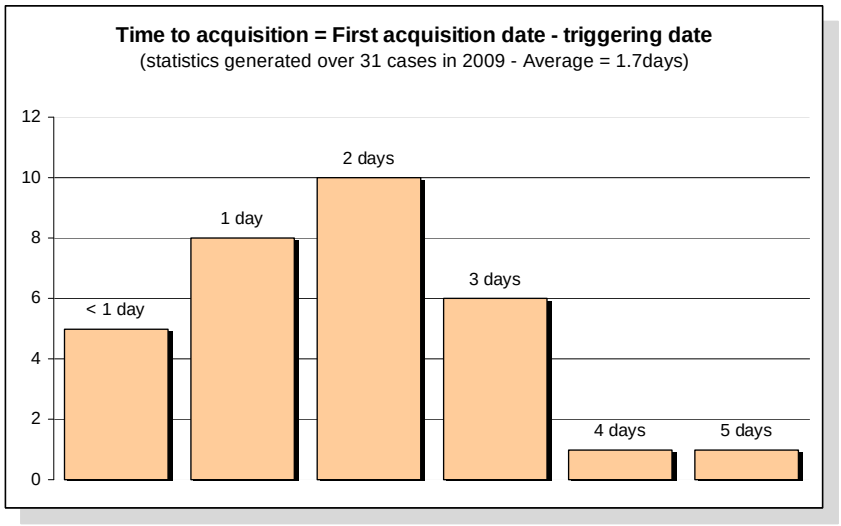


Figure 5-4. Time interval between the time of the Charter request and the time of the first acquisition (2009)

For disasters for which the hazard impact evolves rapidly (such as for flooding, hurricanes, etc) timeliness of data acquisition & supply is a key factor. For some Charter activations, none or very few results were delivered because the Charter was not rapid enough (Activation241, Cyclone in Fiji islands Activation 239, Flood in British Virgin Islands and Activation 227, Floods in Burkina Faso). Given the range of hazard types that needs to be addressed EO systems will always have limitations concerning timeliness. Several PMs suggested that a better and faster service could be obtained by improving the satellite tasking time and by using anticipation when possible (hydro-meteorological events).

- Assessment of EO data supply chain for Charter services provided in 2009

To improve how data products are accessed during the emergency response time several PMs have suggested that a single point of access to all EO data delivered by the Charter shall be provided. The PM typically handles many data sources accessible via diverse dissemination protocols. This would help reduce delays and risks of confusion and sometimes process failure.

Moreover, the Charter is often facing complex situations when the impact of a given disaster may require the combination of different Charter scenarios to respond adequately to the emergency. For instance, the impact of a hurricane/windstorm may take the form of flooding, landslide or wind damage. In these cases, even though the Charter scenarios are well designed, managing of such complex situations is a challenge for Charter project managers and EO data providers. Several PMs indicated that Charter scenario guidelines are useful and should be improved by taking these more complex situations.

5.3 Assessment of products & services

As in the previous years, some Charter members have provided value-adding services to deliver crisis maps, damage maps, or reference maps beyond their obligations to the Charter. Some services were carried out through dedicated contracts, in close cooperation with the GMES programme, RESPOND and SAFER projects, and by using in-house or external resources. The UN has been contributing noticeably through UNITAR/UNOSAT.

5.4 Users appraisal

In 2009, feedback received from the users once again highlighted their appreciation of the information obtained through the Charter data that were used to generate maps. However, it has been reported by several project managers that some end users are not fully equipped to exploit the products and in some cases have problems with the format of EO data products, when the data format is not standard. This is particularly true concerning data from radar sensors. Technical trainings were recommended to improve end users awareness. Other users suggested the involvement of local expert partners in further processing and interpretation of data. In addition, there is a growing demand to receive information products as vector data to be directly exploited in GIS (for instance vector of inundated areas) rather than raster, as provided generally by Value Adders.

Rapidly access to the Charter data/products and the usefulness of high spatial resolution data, especially for disasters such as floods in urban areas or volcanic eruptions were highlighted by the users as key results. Some users noted the importance of getting rapid access to low-resolution data in order to evaluate the overall extent of the disaster, and subsequent access to the higher-resolution data for a closer view. Several users raised the need for data to obtain information in anticipation of flood events, such as flash floods, and volcanic eruptions. In some cases, the Charter was asked to provide additional information in support of recovery efforts.

The Charter products were used to coordinate and focus the relief efforts, in order to maximize the response of the humanitarian community to the disaster, and to help decision makers formulate response strategies.

Users valued the cooperation of the Charter with other programmes like GMES, thereby allowing them to obtain a higher volume of information and value-added products. Moreover, the cooperation between the Charter and the UN organisations in situations and areas where local knowledge of the Charter activities was poor was also acknowledged.

A number of other types of users not directly involved in emergency and rescue operations have also expressed interest in the Charter products. Such user organisations comprise flood or forest management authorities, and local government and civil protection services.

5.5 Communication assessment

In order to raise Charter awareness worldwide, significant efforts have been focused on improving communication through tools such as the website and the design of the new brochure. The impact of such actions will be evaluated over the next 12 months.

Once again, as in 2008, the list of international conferences attended by the Charter representatives served to highlight the commitment of its members to the promoting of this initiative as the major capacity for EO based disaster response and a model of international cooperation. In fact, the Charter members have worked hard to strengthen cooperation with international and regional initiatives (GEO, Sentinel Asia); this cooperation will serve to broaden the network of Charter users, and will help facilitate dialogue and communication worldwide in the disaster management process.

The discussion started with Google Earth and the implementation of the Charter metadata catalogue are additional means to improve visibility on products delivered and on the achievements of the Charter.

6 Conclusions

The year in review has been a year of expansion marked by membership requests from new space agencies from Germany, Brazil and Russia. Achievements have been made concerning the Asia Pacific region with the development of operational links between Sentinel Asia and the Charter and the nomination of the Asian Disaster Reduction Centre (ADRC) as Charter Cooperating Body to help Sentinel Asia access the Charter. Concerning users from the United Nations UNITAR/UNOSAT was granted the status of “Charter User Intermediary” providing a new gateway for UN aid users while UN OOSA, another channel for requests from UN users, continue to play a role to promote the Charter in their capacity of Cooperating Body. The collaboration with international programmes such as the Group on Earth Observation (GEO) was pursued and reinforced to address the challenge of improving Charter worldwide.

The operational activity of the Charter was similar to that of 2008 concerning levels of resources (EO data products, ECO and PM resources) and the Charter was activated for forty major disasters. The services provided by the Charter were appreciated by the users, whose expectations are always high, in particular concerning service timeliness, a major challenge. The cooperation between the Charter and other initiatives and programmes enhanced the capacity of the Charter and this is considered very positive by the users.

The participation in the international events and training activities have been highlighted as key to improving the use of space technologies by civil protection authorities and the international humanitarian community. A significant amount of efforts has been directed towards the improvement of the Charter communication strategy, especially the preparation of the materials for the tenth anniversary of the Charter in 2010.