

INSURANCE INDUSTRY WORKSHOP ON EARTH OBSERVATION

(NATURAL CATASTROPHES)

WORKSHOP SUMMARY REPORT

**(HELD AT ESA/ESRIN, 23-24 FEBRUARY
2012)**



prepared by/ <i>préparé par</i>	Gary Timms, Logica & Ola Gråbak, ESA
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**European Space Agency
Agence spatiale européenne**

ESRIN

Via Galileo Galilei - Casella Postale 64 - 00044 Frascati - Italy
Tel. (39) 06 941801 - Fax (39) 06 94180 280

TABLE OF CONTENTS

1	INTRODUCTION	1
2	WORKSHOP OVERVIEW	2
3	WORKSHOP FINDINGS	2
4	WAY FORWARD.....	8
APPENDIX A	: WORKSHOP PROGRAM	10
APPENDIX B	: WORKSHOP PARTICIPANTS.....	12
APPENDIX C	: WORKSHOP FEEDBACK	14

1 INTRODUCTION

On 23-24 February 2012, the European Space Agency (ESA) Directorate of Earth Observation Programmes (EOP) hosted a workshop aimed at assessing new opportunities for the application of earth observation (EO) within the Insurance sector.

This was driven in part by the fact that we are now entering a new era of satellite EO. The next decade will see advances in the range and capabilities of instruments currently in orbit, and the transition of EO from an R&D tool to technology that provides, on a long-term sustainable basis, a wide range of operational information services about the Earth's environment. The joint EU-ESA initiative of Global Monitoring for Environment and Security (GMES) will be a major factor in this process. A key element in encouraging uptake of EO-based services by user communities is ease of access to data. Within GMES, a change in data policy is being proposed to provide free, transparent and open access to systematic pre-planned data for the ESA Sentinel fleet of satellites.

EO is not as widely used in the Insurance sector as in other sectors like Oil and Gas, but several factors indicate this might change in the coming years. More frequent extreme weather events is putting new requirements on the insurance industry in terms of pre- and post-event preparedness, and this is where the steadily increasing spatial and temporal coverage of satellite data could play an important role. With this prospect, ESA brought together specialist companies providing EO-based services and leading players from the Insurance industry to better understand current and evolving information requirements.

For EO service industry, the growing potential of EO within the Insurance sector represents an opportunity to expand commercial business. Capitalizing on the benefits of this opportunity will depend on the EO service providers better understanding the requirements of the Insurance users and in doing so better communicating the range of products and services available to key decision makers within the industry.

The workshop represented an initial step towards more sustained dialogue between the insurance industry and EO community, with the overarching goal of advancing the use of earth observation within the insurance sector. The objective of the workshop was to ensure that key players in the insurance sector are aware of current and future earth observation satellite monitoring capabilities and how this technology could bring significant benefits and cost savings to their businesses. Attendees from the insurance and Earth Observation communities worked together to identify challenges in utilizing Earth Observation information and discussed potential solutions that will ensure that the insurance industry is able to fully benefit from the possibilities afforded by Earth Observation.

The expectation was that the workshop would help to develop the following:

- A move towards identification of best practices/guidelines for use of earth observation in the industry.
- Identified requirements for demonstrations in order to consolidate newly developed application capabilities.
- Identified R&D with respect to new sensors/products to develop/enhance applications.
- Future studies related to requirements for new sensors, constellations etc.

2 WORKSHOP OVERVIEW

The workshop, held at ESA's Earth observation center (ESRIN) in Frascati, Italy, on 23 and 24 February, was co-organized by ESA, EARSC, Swiss Re, Willis and Lloyds and was attended by 60 participants, with at least 30 from the insurance and reinsurance industry, including insurers, reinsurers, brokers, modellers and data providers.

In order to encourage free and open expression, it was agreed at the start of the workshop that no sourcing of individual comments or statements would take place in the reporting from the workshop.

Following introductions and keynotes, the group split into two parallel core sessions in the areas of "Pre-Event", and "Post-Event" with both sessions incorporating an element of "Risk Modelling". The keynotes and introductions set the scene for the working group sessions, and focused on the 2011 Japanese Tsunami and the common experiences of the insurance industry. This event was used as a common discussion and focal point to allow attendees to relate to a shared peril.

The discussions and recommendations made during the parallel sessions were reported back to the group during the morning of the second day. Participants were invited to discuss the recommendations and endorse actions to deal with the recommendations

The workshop program is given in Annex A. The program and individual presentations in the separate sessions can be found at:

<http://earth.eo.esa.int/workshops/Insurance/>

3 WORKSHOP FINDINGS

This workshop report contains a summary of the main observations made during the parallel sessions during the two days. The findings have been grouped according to the core session from which it originated (pre- or post-event).

For clarity, and to avoid duplication, general observations not specific to pre- or post-event are given in the Final Plenary observations.

This report does not contain details of technical discussions in relation to individual presentations.

Pre-event: Main Observations

The key observations of this core working group have been broken out into 3 categories; exposure, hazards and barriers to use.

Exposure: (i.e. insured assets at risk from a specific hazard)

- Data about insured assets comes from a wide variety of sources and commonly not as detailed or as complete as insurers would like. Therefore
 - more accurate location (lat/lon), and
 - detailed information about building characteristics (type, age (or year built), construction i.e., timber, brick, reinforced concrete, occupancy and height is needed
- EO data can be used to enhance the incomplete or poor quality exposure information which already exists
- Overall the opportunity for using EO is primarily to supplement conventional sources.
- Some users are already exploring the possibility of extracting these characteristics from remotely sensed images
- A broad range of needs exist at different scale, varying by hazard type (high res for flood) and purpose / end use
- The availability of existing data sets which may be used to enhance exposure data also varies by country, data type or subject matter
- Some users are aware of and using current services such as CORINE and the new URBAN ATLAS services in Europe.
- It is common to have exposure data in an aggregated form and a need to disaggregate in an appropriate way. Need for complementary datasets to facilitate this disaggregation
- Sometimes there is a need to aggregate exposure data to simplify the complexity for practical reasons e.g. manageable volume or computational efficiency
- It is important that the EO based solution for exposure mapping is able to address the extent of coverage required. Insurers operating in a single territory may need national coverage. Multinational insurers likely to need regional or more likely consistent global cover. Occasionally single city coverage might be sufficient.
- Better characterised exposure information is necessary in all segments. The main information about exposure is coming from the insurance companies (and the insurance policies gathered networks of agents) and the granularity and the

consistency of this information generally are not at the right levels. This information is much more complete and precise in the USA.

- There is a common need to enhance the information we already have about exposed assets, both in terms of accuracy of location and detailed characteristics of assets.
- Insurance users need to be made aware of what is available (data and primarily services) and what are the costs and benefits.
- It should be clarified what is the level of commonality between various users of the insurance sector concerning the need for exposure information. And what is the potential for a mutualised service to better fit the expected cost/benefit. Are all users able to define what information is really required and do they agree on a standard level that could be shared? Or is this a question for the national regulator to decide?

Hazards:

- A variety of needs e.g. liquefaction for earthquakes, flood extent/height and dynamic analysis for plain flooding, history/likely and max height for storm surge, agriculture with yield information, geo-referenced fault lines, oil rig location – clear images of pre and post event so that it is possible to establish which have moved, historical storm surge data for different cities
- Users need the footprint of the hazard impact
- Parametric index based services a more mature domain where Satellite EO is contributing. Met data are used in this domain (rainfall, soil moisture) and are based on long time series (decades) at coarse resolution.
- For risk assessment in the pre event phase it would make sense to make sure systematic observations are available. E.g. building databases of flood observations would have a lot of value. It would be expensive and time consuming to provide monitoring of risk prone areas – i.e. data acquisitions and image analysis to extract flood extent - in a systematic fashion globally. It would however be pertinent to concentrate on key areas where exposure is important and hazard occurrence is high. Are insurance users able to identify and agree such areas?
- For EQ, Hurricane/Typhoon etc. there are key geographical areas and a top10 can be defined commonly – they are in different places of the world (Tokyo, San Francisco, etc.). Flood is more complex (wide extent of areas exposed globally) but users mentioned it could start with Europe.

Barriers to use:

- Cost, especially cumulative costs given the coverage extents needed. New business models should be investigated looking at shared purchasing and transactional pricing?
- Ability to prove the value to senior decision makers is important to increase the credibility of EO based solutions among senior managers.
- Licence terms and conditions an issue that could be overcome rather than a barrier
- Main barrier is not knowing what data is available or where to access it.

- Potentially overwhelming choice of suppliers and difficult to know who to approach and what is being offered.
- Is it for the national regulator or insurance association to make things happen? e.g. ANIA, ABI
- What is the potential for a mutualized service to better fit the expected cost/benefit?

Post-event: Main Observations

- The Insurance Industry has geo-information requirements covering floods (extent, water depth, time evolution and modelling), earth quakes, wind storms, hail events and drought
- Industry-endorsed EO product specifications exist
- There is an Industry-led initiative for a common information platform (PERILS). It is currently handling loss/claims meteorological data for Europe, but with plans to expand to other data relevant to floods and quakes and geographic coverage. Information distribution channels like PERILS shall be considered for EO based information in order to maximize widespread distribution at a shared reduced cost
- Some industry-led initiatives exist like ClimateWise and GEM. A better understanding is required to know how these initiatives could benefit from EO.
- The Insurance industry will often be interested in the events addressed by the International Charter. A better understanding needs to be developed about how the Insurance industry can benefit from the charter activities and data collected.
- Industry budgets are limited for EO-based information
- Better understanding is needed within the Insurance industry concerning the licensing of EO data and information products. It is possible that an alternative licensing model may be appropriate to some insurance end-users.
- There is no single, consolidated source of information of what EO can do for the general event-types of interest to Insurance
- For flood events more documentation is required with respect to what EO can do in terms of accuracy, performances, limitations and costs For monitoring a flood event, no single satellite operator is able to meet the requirements for update frequency (daily) and redundancy and there is currently no single point of contact for obtaining the EO derived products
- Need to better inform the Insurance Industry on the capabilities of EO for the Insurance sector issues
- For Floods, there is a need to demonstrate jointly with Industry that EO specifications can be delivered (few lives trials this year). EO for flood extent is a mature technology, but a proof of concept meeting the requirements of the insurance industry is required to establish a blue print for the industry
- Early alerting of a major flood event is essential in order to start EO acquisitions. In the developed part of the world this will play an important role, but a coarse resolution EO based change detection system could be important where flood forecasting is currently less accurate

- Insurance Industry requirements should be further consolidated
- Relevance of EO to on-going Insurance industry initiatives should be investigated

Final Plenary: Observations

Day 2 of the workshop focused on the presentation of the key discussion points from the working groups on Day 1, followed by a final plenary session summarising the key actions and next steps to be taken forward from the workshop. We present here, some of the additional key observation points during this session. To avoid duplication, any items that were repeated again during this final session have been kept in the previous findings sections.

- The EO service industry should focus on the provision of information and not just data.
- Cooperation between Insurance industry and donor organizations like UNIFAD is required, especially on parametric products and micro-insurance. As a starting point, one could focus on countries where there is a shared/common hazard, e.g. sub-Saharan.
- Cooperation between Insurance industry and national civil protection agencies would be beneficial due to the shared requirements for geo-information on natural disasters
- A common language between the two industries is important. For example, what is the definition of ‘data’, ‘derived data’, ‘information’, and ‘raw data’ – these are all commonly used by both communities, but interpreted in quite different ways. The concept of resolution can be quite significantly different, with, for example, the understanding of high resolution having a very different meaning depending on the context.
- The use of standards is welcomed, but should be kept to a minimum and focus on standardised products to be made available to the market.
- Use of the International Charter would be welcomed, but as not all events of interest to the Insurance industry are triggered, would an automated “global monitoring system” be a suitable triggering process?
- A distribution channel providing a single access point to information (e.g. flood event snapshots at a known standard.) is the preferred solution of the Insurance industry
- Geographical focus should consider other ‘developing countries’ rather than just the typical insured regions.
- Consideration for the systematic monitoring of a small number of areas – mixed opinion about the global approach of satellite monitoring versus this ‘focused site’ approach. Cost benefits likely but due to the reactive mode of insurance, would this actually work in practice? A defined process for the supply & monitoring may be more appropriate. In practice, bringing together the civil defence, insurance and EO

may be possible through the use of catastrophe insurance pools. These already exist in France, Spain, Turkey, Norway, and others. These pools could act as an intermediary for the purchase and dissemination on behalf of the insurance community. An illustrative area could be New Zealand where flood insurance is problematic – in this example, a parametric approach may be considered. The insurance

- New products such as parametric products should be considered – maybe this could be the focus for a working group.
- A PPI initiative with the civil protection agencies should be considered. These organisations already have clear inputs/outputs, and act as a national platform for disasters, already receiving support from major stakeholders (e.g. UN). Relevant activities in this context areas the ‘open geospatial testbed’, and the ‘national disaster risk reduction’ initiative.
- In order to promote the use of EO, major insurance industry conferences should be identified, e.g. RIMS, country specific insurance body annual meetings, Monte Carlo Rendezvous (in preparation for next years’ renewals). It is recommended that the EO community make a representation at the next ABI conference in the UK. Micro-insurance also has an active platform with which to engage.

4 WAY FORWARD

The following recommendations for actions to be taken were proposed by the workshop following discussion in the final plenary session:

Action on ESA and the European Association of European Remote Sensing Companies (EARSC):

There is a need for improved information exchange between the two industry sectors. ESA and EARSC should therefore

- Identify and document EO based services that are mature and relevant to the Insurance sector, supported by documented service specifications (information content, accuracies and availabilities).
- Establish fully documented case studies (white papers) with the aim of establishing industrial best practice guidelines for the use of EO. The case studies should contain:
 - EO product specifications
 - Description of how the information is being used within the Insurance companies and the benefits generated Information on limitations and constraints.
- Ensure representation at key insurance events (e.g. ABI conference) to present the capabilities of the EO community to Insurance members.
- Develop new innovative EO derived products addressing the requirements of the insurance industry, e.g. better characterized exposure information, better risk assessment by improved monitoring of natural hazards globally etc.
- Develop new business models and delivery mechanism dealing with barriers related to pricing and licensing of EO derived data

A phased action implementation approach with agreed priorities, timelines and procurement methods shall be in place before end 2012. First actions shall be initiated early 2012 as part of the ESA VAE program focusing on flood plains in Europe.

Actions on the Insurance sector:

Identify and setup ad-hoc topical working groups to further develop the use of EO within Insurance industry priority areas. These working groups should have very specific objectives and have a limited lifetime.

More specifically these working groups should:

- Act as the interface to ESA and EARSC for ensuring proper communication and coordination of EO related activities.

- Provide advice on current, priority insurance topics where geo-spatial information can play a part
- Coordinate industry wide issues relating to EO and Insurance, including consolidating the industry requirements and user needs for geo-information
- Investigate and coordinate the setup of Industry pilot projects to address EO development activities.

APPENDIX A : WORKSHOP PROGRAM

Satellite Earth Observation for the Insurance Sector: New Technologies and Opportunities	
Wednesday 22nd Feb 2012	
18.00 - 19.30 Ice breaker reception (ESA ESRIN)	
INSURANCE Workshop - DAY 1 Thursday 23rd February 2012	
08.00 - 09.00 REGISTRATION	
09.00 - 11.20 Plenary Session I Earth Observation for Insurance - Setting the Scene	
09.00 - 09.10: Opening of the workshop - Stephen Coulson, ESA	
09.10 - 10.00: Keynote - Fiona Shaw, Willis Research Network	
10.00 - 10.20: The European EO Service Industry - Geoff Sawyer, EARSC	
10.20 - 10.50: Japan Earthquake 2011 - an Insurance Perspective - Matthew Foote, Industry Expert	
10.50 - 11.20: The International Charter - Space and Major Disasters - Philippe Bally, ESA	
11:20 - 12:00: Coffee Break	
GROUP 1 : Pre Event 12.00-13:45	GROUP 2: Post Event 12:00-13:45
Chair: F. Shaw (WillisRe) Rapporteur: ESA, SwissRe	Chair: J. Mehlhorn (Swiss Re) Rapporteur: ESA
13:45 - 15:00: Lunch	
Group 1: Rotation of EO Doctors 15.00-16.30	Group 2: Rotation of EO Doctors 15.00-16.30
16:30 - 17:00: Coffee Break	
Group 1 - Summary for Day 2 17.00-18.15	Group 2 - Summary for Day 2 17.00-18.15
18:15 End of Day 1	
19.30 Dinner at Villa Grazioli (sponsored by SwissRe)	

INSURANCE Workshop - DAY 2 Friday 24th February 2012
09:00 - 12:00: Plenary Session II Reporting from parallel sessions and discussions
09:00-09:10 Introduction & Expectations for Day 2 (Geoff Sawyer)
09:10 - 09:50 Group 1 report incl. Q&A (40 mins), Chair: F. Shaw (WillisRe) <ul style="list-style-type: none"> • Feedback from Workshop Group 1
09:50 - 10:30 Group 2 report incl. Q&A (40 mins), Chair: J. Mehlhorn (SwissRe) <ul style="list-style-type: none"> • Breakout Post-Event Summary • Post-Event Findings
10:30 - 11:00: Coffee Break
11:00 - 12:00: Plenary Session III Recommendations & Close
13:45: Lunch and departure

Figure 1. The ESA Insurance Workshop Programme.

APPENDIX B : WORKSHOP PARTICIPANTS

1	Alain, Arnaud	ALTAMIRA INFORMATION	SPAIN
2	Almond, Sam	Logica	
3	Andenmatten Berthoud, Nathalie	New/Re	SWITZERLAND
4	Aniello, Salvatore	Reale Mutua Spa	ITALY
5	Bach, Heike	Vista GmbH	GERMANY
6	Battiston, Stéphanie	Sertit, Université de Strasbourg	FRANCE
7	Bevington, John	ImageCat / ecityrisk	UNITED KINGDOM
8	Bianchi, Marco	Telerilevamento Europa	ITALY
9	Boni, Giorgio	CIMA Research Foundation	ITALY
10	Braccia, Sabrina	Willis Re Southern Europe	ITALY
11	Busswell, Geoff	ISIC	United Kingdom
12	Casey, Simon	European Space Imaging	GERMANY
13	Cespa, Stefano	Telerilevamento Europa	ITALY
14	Coleman, Emily	IFAD	ITALY
15	Corradini, Fabio	Carige	ITALY
16	Davis, Nigel	Willis	
17	Dickson, Gill	Astrium	UNITED KINGDOM
18	Fellah, Kader	SERTIT	FRANCE
19	Feyen, Hans	Swiss Reinsurance Company Ltd	SWITZERLAND
20	Foote, Matthew		
21	Frei, Peter	PERILS AG	SWITZERLAND
22	Goodwin, Simon	Esri UK	United Kingdom
23	Gråbak, Ola	ESRIN	ITALY
24	Grabbert, Jan-Henrik	Aon Benfield Impact Forecasting	GERMANY
25	Hall, Richard	Kongsberg Satellite Services	NORWAY
26	Hilberts, Arno	Risk Management Solutions Ltd.	UNITED KINGDOM
27	Kadlec, Martin	Aon Benfield	CZECH REPUBLIC
28	Kuettel, Marcel	Swiss Re	SWITZERLAND
29	Lamb, Alistair	Astrium Service	UNITED KINGDOM
30	Lang, Patrick	PartnerRe	SWITZERLAND
31	Lewycky, jNicolas	VITO	BE
32	Lozano, Francisco	DEIMOS Imaging	SPAIN
33	Mantovani, Roberta	Risk Management Solutions	UNITED KINGDOM
34	Marchionne, Marco	Catlin	ITALY
35	Mascioli, Mario	Willis Re Southern Europe	ITALY
36	McCormack, Harry	Fugro NPA	UNITED KINGDOM
37	Mehlhorn, Jens	Swiss Reinsurance Company	SWITZERLAND
38	Morucci, Carlo	e-GEOS	ITALY
39	Nix, Barbara	Guy Carpenter	SWITZERLAND
40	Palma, Aurelio	SwissRe	SWITZERLAND
41	Pierre, Tinard	Caisse Centrale de Reassurance	FRANCE
42	Relin, Axel	GAF AG	GERMANY

43	Rentzos, Panagiotis	RMS	UNITED KINGDOM
44	Rudari, Roberto	CIMA Research Foundation	ITALY
45	Rupp, Thomas	Allianz Elementar Versicherung	AUSTRIA
46	Sabatini, Alessandra	SATEC	ITALY
47	Saccottelli, Maria Elena	Catlin	ITALY
48	Sandmark, Therese	GCAMF	LUXEMBOURG
49	Sawyer, Geoff	European Association of Remote Sensing Companies	BELGIUM
50	Shaw, Andrew	National Centre for Earth Observation	UNITED KINGDOM
51	Shaw, Fiona	Willis	UNITED KINGDOM
52	Sørensen, Michael Kamp	GRAS	DK
53	Tabasco Cabezas, Antonio	GMV	SPAIN
54	Tartarin, Cécile	GEOSYS SA	FRANCE
55	Thomas, Bart	GIM	BELGIUM
56	Thompson, Tina	Risk Management Solutions	UNITED KINGDOM
57	Timms, Gary	EARSC-Logica	UNITED KINGDOM
58	Vetrone, Valentina	Willis Re Southern Europe	ITALY
59	Vigliotti, Rosario	Thales Alenia Space	ITALY
60	Wagner, Hanne	Endurance Worldwide Insurance	UNITED KINGDOM
61	Wang, Jing Jing	Willis Italia Spa	ITALY
62	Wheeldon, Ivor	Esri UK Ltd	United Kingdom
63	Williams, Guy	Agencyport Software	United Kingdom

Figure 2. The ESA Insurance Workshop list of participants.

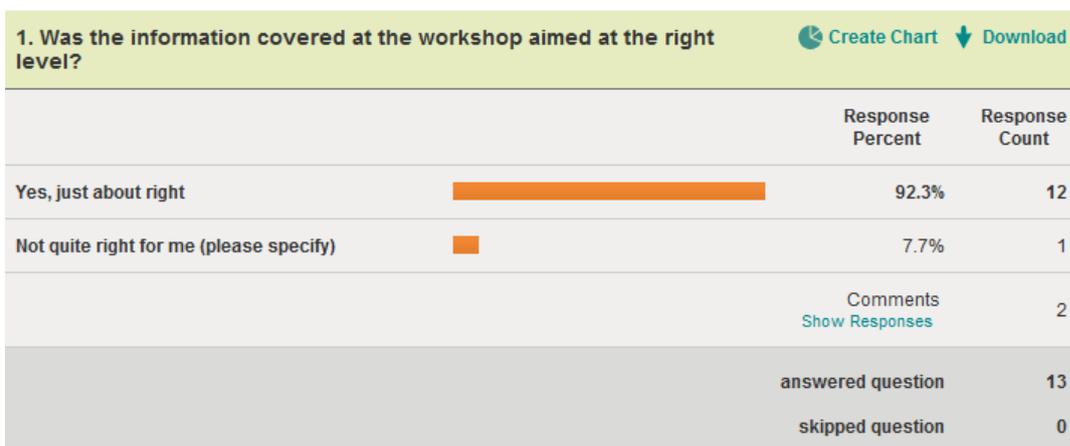
APPENDIX C : WORKSHOP FEEDBACK

A web based survey was implemented following the workshop, with a total of 13 attendees completing the survey.

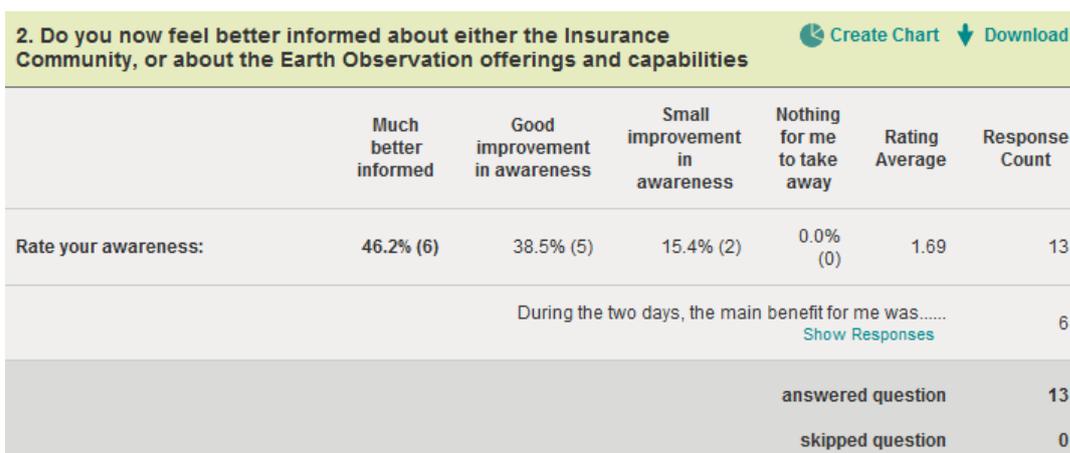
A total of 5 questions were asked and a summary of the responses is shown here:

http://www.surveymonkey.com/MySurvey_Responses.aspx?sm=gCdvU/xx4kns40h6Ex8ee38Ov7IkO66vRJh59Lzfe4_3D_0A

1. Was the information covered at the workshop aimed at the right level?



2. Do you now feel better informed about either the Insurance Community, or about the Earth Observation offerings and capabilities



3. *Was the format of the breakout sessions useful for you?*

3. Was the format of the breakout sessions useful for you?		Create Chart	Download
		Response Percent	Response Count
Yes, the format was good		84.6%	11
No, would have liked a different arrangement (please specify)		15.4%	2
	Comments		6
	Show Responses		
	answered question		13
	skipped question		0

4. *Were there any topics not covered that you would like to cover in the future (possibly through the idea of specific themed 'task groups')?*

4. Were there any topics not covered that you would like to cover in the future (possibly through the idea of specific themed 'task groups')?		Download
		Response Count
	Show Responses	8
	answered question	8
	skipped question	5

5. *How likely is it that you would recommend this and future workshops to colleagues?*

5. How likely is it that you would recommend this and future workshops to colleagues?		Create Chart	Download
		Response Percent	Response Count
Definitely		53.8%	7
Quite likely		46.2%	6
Not at all		0.0%	0
	answered question		13
	skipped question		0

Specific Comments

Q1. Was the information covered at the workshop aimed at the right level?

- *not quite right for me (please specify)*

- A good first step aimed at the right level.
- The two industries do use different terminologies and it took a little for everyone to tune in.

Q2. Do you now feel better informed about either the Insurance Community, or about the Earth Observation offerings and capabilities?

- *During the two days, the main benefit for me was...*

- Finding where to get the information from.
- To understand better the players within the insurance community and to see their roles in relationship with possible alliances.
- Hearing the Insurance industries views and attitudes to EO data and services.
- Learn about the insurance industry's requirements for Earth Observation data.
- Trying to understand a bit more the other side of the problem. The specific language of insurance company was part of it.
- To understand the way insurance companies are working and having a clear overview on common issues they all face at the moment.

Q3. Was the format of the breakout sessions useful for you?

- *No, would have liked a different arrangement (please specify)*

- A little too much time spent on address level lat/longs.
- Too much time devoted to introduce us as EO providers, as least in one of the sessions, this left no real time for discussions.
- Worked better when the two groups were in separate rooms.
- No because it was not focused enough. Hazard, vulnerability, exposure, preparedness, post crisis, etc were mixed due the high intensity of brainstorming. Quite normal for a first event. Now we need to structure it.
- The organisation of parallel workshop sessions was a nice initiative, but also had some negative implications. For example, I have been told that in the first session of "pre-event" 90% of the time was spent on discussion of baseline situation mapping with focus on built-up environment mapping. This is one of the main capabilities of my company and I would have been able to provide a lot of feedback on that topic.

Unfortunately, I had to participate to the second session of "pre-event" and because already a lot of time had been spent on the baseline mapping topic, the focus had been shifted to data licensing issues which was personally of less relevance to me...

- Very useful. A few presentations, a lot of talking and then networking

Q4. Were there any topics not covered that you would like to cover in the future (possibly through the idea of specific themed 'task groups')?

- Pre - event historical information - what is available that was not discussed.
- Agricultural insurances were not well covered.
- Subsidence
- The focus was on land applications - would like to see a similar event focusing on marine applications. In general: need to pick specific themes and look at case examples.
- Satellite digital elevation models
- Workgroup need to be structure between hazard and exposure.
- How, and whether to offer EO to local insurances