EO4OG PROJECT





Earth observation for O&G (EO4OG) Workshop Report

November 18, 2014
London

www.ogeo-portal.eu

Executive Summary

The Earth Observation for Oil and Gas (EO4OG) project and workshop was implemented by a collective of four independent consortia that consist of established service providers and consultants to the O&G sector, including earth observation (EO) services. Hatfield Consultants and OTM Consulting focused on the onshore oil and gas sector, while CLS and C-CORE led the offshore study.

The EO4OG Workshop enabled EO experts and users from the O&G industry to review the key findings of the EO4OG Project, and to discuss the potential opportunities to support the O&G sector to adopt appropriate EO technologies.

The morning session involved the presentation of O&G sector challenge and geo-information requirements across the project lifecycle, for both offshore and onshore areas. This information was compiled based on an industry consultation and expert review conducted throughout the EO4OG project. Subsequently, the capabilities of EO to address these challenges and needs were presented. The onshore and offshore project teams also presented the results of a gap analysis conducted to evaluate the industry requirements in relation to earth observation capabilities.

Following the presentation of EO4OG project outputs, the afternoon session included onshore and offshore breakout sessions to discuss the priority EO products for the O&G sector. These sessions identified the EO products that could benefit from improved specification or industry guidelines, as well as areas for further research and development where current EO capabilities do not meet fully requirements.

Considerable information was presented during the workshop, and attendees indicated that they need time to review the materials. All the project findings are being added to the OGEO Portal (link to https://wiki.ogeo-portal.eu), a gateway to information and a community of users dealing with earth observation products and services in the oil and gas industry.

A lot of information was presented to attendees on the day and internal review by O&G companies is needed before the next steps can be defined. A follow-up meeting to discuss the ways forward should be considered to tie in with the Q1 2015 IOGP Geomatics Committee meeting.

A series of preliminary recommendations have been generated following the workshop.

Recommendations

- **Integration**
  EO-based products and services need to be integrated into existing O&G sector processes, which requires standardization in how geo-information products are described and delivered. The Oil Spill Response Joint Industry Project (JIP) Common Operating Picture (COP) recommended practice is an important initiative that will develop open standards for distributed information integration. The reports and outputs of the Oil Spill Response JIP must be reviewed by the EO services industry.

- **Communication**
  EO-based product capabilities should be communicated clearly and more frequently to the O&G sector. Even within the small group sampled during this workshop, it was apparent that the use and perceived impact of EO products or technology varies greatly. Improved communication of EO product capability would enable the O&G sector to build a common understanding of how, when and where particular products should be used. Actions to facilitate this may include:
    - Streamline access to the outputs of the EO4OG project.
    - Continue to develop case studies of successful use of EO in the O&G sector.
    - Continue to explore the benefit and scope of O&G sector specific EO guidelines.

- **Collaboration**
  The successful collaboration should be continued between the International Association of Oil and Gas Producers (IOGP) and European Space Agency (ESA). IOGP members are invited to provide inputs to ESA's Sentinel-1 data acquisition planners regarding priority surveillance areas.

- **Research and development**
  IOGP, ESA and the EO services industry should work together through various fora to set priorities for future EO product and tool development.

- **EO Guidelines**
  The concept for guideline development should continue to be pursued. Short-term actions associated to this include the collection of feedback from the industry (on content, purpose and requirements), and the development of an agreed outline for guideline content.

Table of Contents

1 Workshop attendees 1
2 Workshop summary 2
2.1 Morning 2
2.2 Afternoon 3
3 Working session 1: Prioritisation of gaps 4
3.1 Onshore session 1-a 4
3.1.1 Methodology 4
3.1.2 Analysis of prioritisation exercise 5
3.1.3 Observations 5
3.1.4 Limitations of the exercise 6
3.1.5 Outcome 6
3.1.6 Commentary on results 8
3.1.7 Conclusion 8
3.2 Offshore session 1-b 9
3.2.1 Methodology 9
3.2.2 Results 12
3.2.3 Discussion following the group exercise 15
4 Working session 2 - Open discussion 18
4.1 Introduction 18
4.2 Discussion 18

Figures

Figure 1: Product scoring matrix 5
Figure 2: Example of panel obtained for meteorology 13

Tables

Table 1: O&G industry and EO4OG project workshop attendees 1
Table 2: Workshop 1 scoring methodology 4
Table 3: Output of prioritisation exercise 7
Table 4: Onshore top 5 priority products as voted by participants 7
Table 5: Offshore EO-Based Products 9
Table 6: Offshore EO-based product classification 13

1 Workshop attendees

The workshop attendees are shown in Table 1.

Table 1: O&G industry and EO4OG project workshop attendees

Oil and Gas Company
Chevron
Statoil
Woodside
ENI
Irish Petroleum Infrastructure Programme
Tullow Oil
PETRONAS Carigali Sdn Bhd
BP
ExxonMobil Exploration Company
Eni - Exploration and Production Division
PETROBRAS
CG Metocean Consulting Limited
TOTAL Exploration Production
Saipem
Tullow Oil
Oceanalysis
SPIE Oil & Gas Services
IOGP
IOGP
TOTAL
BP International Limited
Woodside Energy Ltd
Shell
GDF Suez E&P UK Ltd
British Antarctic Survey, rep. Premier Oil

EO4OG Project	
Desmond Power	C-CORE
Thomas Puestow	C-CORE
Francis Wiese	Stantec
Dana Feltham	Stantec
Andy Dean	Hatfield Consultants
Grant Bruce	Hatfield Consultants
Jason Manning	Arup
Sebastian Aleksandrowicz	SRC
Paul Nolan	RPS Group
Matthew Willis	Arup
Maureen Coat	CLS
Marc Lucas	CLS
Laurent Guerlou	MeteoGroup
Rick Danielson	NERSC
JF Bonnin	CLS
Mark Butcher	OTM
Andrew Cutts	WesternGeco
Maria Lemper	Geoville
Mike Simioni	OTM
Alastair Belson	TRE
Christian Hoffmann	Geoville
Kim Partington	Geocento
Geoff Sawyer	EARSC
Mónica Miguel-Lago	EARSC
Ola Grabak	ESA
Stephen Coulson	ESA

2 Workshop summary

2.1 Morning

The morning of the workshop provided the opportunity for the EO4OG projects to be presented to the attendees. The project methodology and summary of findings were shared by each of the four lead consortia (onshore and offshore) with 25 attendees from the O&G sector and 26 from the EO4OG consortia, European Space Agency (ESA), and European Association of Remote Sensing Companies (EASRC).

Key note

Presentations were provided by ESA (Stephen Coulson) and the Chair of the IOGP EO sub-committee (Richard Hall). These presentations set the stage for the workshop, and elicited questions and discussion:

- Status of Cryosat and operational delivery of valuable ice products – ESA confirmed that Cryosat was never intended to be for operations, only for scientific studies. Copernicus missions are intended for true operations.
- Free and open data policy – ESA confirmed the data are available to everyone, any country, regardless of status. ESA suggested that Sentinel-1 acquisition plan could be influenced by O&G sector and therefore suggestions are welcome on where data should be captured, and what modes should be collected.

Identifying onshore requirements – OTM (Mark Butcher)

Identifying onshore requirements – CLS (Marc Lucas)

EO Capabilities and Gap Analysis Onshore – Hatfield Consultants (Andy Dean)

EO Capabilities and Gap Analysis Offshore – C-CORE (Thomas Puestow)

The EO4OG projects were well received and attendees were impressed with the collaboration apparent between the consortia and the volume and quality of documentation generated. These presentations elicited questions and discussion:

- Updating O&G sector challenges – will the list of challenges be maintained and updated? The consortia suggested that the challenges are a snapshot. The important action is to cross reference from challenges to EO capabilities.
- Information dissemination – all info from this project will be available on OGEO portal.
- Analysis of costs of EO services – the logic was to look at technology first, and look at costs later. However, complementary or competing technologies and the

relative cost were considered as factors. The most important issue is whether data are fit for purpose. There was some rationalization of whether EO data are fit for purpose and whether cost or value should be the key consideration.

- Awareness – it was noted that the solution that O&G companies use may be the technology that has been traditionally applied, and not necessarily the 'best solution.' Companies tend to be somewhat conservative, so it is important to know what EO can to and provide better information to companies on what can be 'better'.
- Offshore and onshore overlap and collaboration – coastal areas are an overlap, but there was a lot of interaction between the consortia and synergies were developed.
- R&D aspects of EO products – who will address development challenges? A collaborative effort is needed, which may include ESA, the O&G industry, and EO service providers.
- Impact on environmental regulations – there may be an uptake in new EO technologies to enforce regulations. This is very jurisdictional specific. There are cases where companies are obliged to acquire EO data to support regulatory approvals and the like. There appears to be an opportunity for this community to suggest to various regulators that EO data are available for strategic environmental assessments to improve the quality of these assessments.
- Commonality of input EO data between products – the challenge analysis revealed the commonality of information requirements. The EO product sheets also show commonality of EO data.

2.2 Afternoon

The afternoon of the workshop was split into two sessions.

Session 1 consisted of an exercise to prioritise the gaps (between EO capability and O&G demand) identified as part of both the onshore and offshore EO4OG projects.

Session 2 gave the attendees the opportunity to reconvene and have an open discussion about the findings of the project and possible next steps.

3 Working session 1: Prioritisation of gaps

The workshop session 1 was split into two groups: one onshore and one offshore. Each group used its own methodology and products in order to validate and prioritise the gaps.

3.1 Onshore session 1-a

3.1.1 Methodology

Operators were asked to rank EO products based on the impact they may have on O&G operations and the current level of utilisation within their organisation. The scoring system used the methodology set out in Table 2. Impact was ranked assuming a baseline of no use of the product at all.

Table 2: Workshop 1 scoring methodology

Score	Impact	Utilisation
0	**None/ negligible** i.e., we would not use this product	**None** i.e., we are unaware of this product or do not currently use it
1	**Marginal** i.e., we would not consider it worth trialling although we may follow if others prove its applicability	**Emerging** i.e., we have considered using this product (e.g. feasibility assessment) or it has been piloted
2	**Noticeable** i.e., it is an appealing product but alternative methods offer stiff competition	**Ad-hoc** i.e., we have utilised these products from time-to-time but it does not occur (or is not considered) on all occasions and/ or we are not utilising the products to their full potential
3	**Enhancing/ complementary** i.e., We would strongly consider this product	**Established** i.e., we have frequently utilised this product but not to its full potential, as described today
4	**Revolutionary** i.e., we would undoubtedly seek to utilise this product	**Frequent** i.e., we commonly utilise this product to its full potential or have established practices to ensure it is considered on all projects

A brief introduction to the product, its purpose and capability/ limitations was given by one of the onshore consortia prior to its ranking. Following this, participants were asked to place a sticker in the area on the product scoring matrix (Figure 1) that best represented their understanding of the EO product. Participants who did not have an

opinion on a particular product were asked not to participate. Finally, participants were asked to prioritise their top 3 products. Each operator was given 3 votes to share between the 22 products discussed.

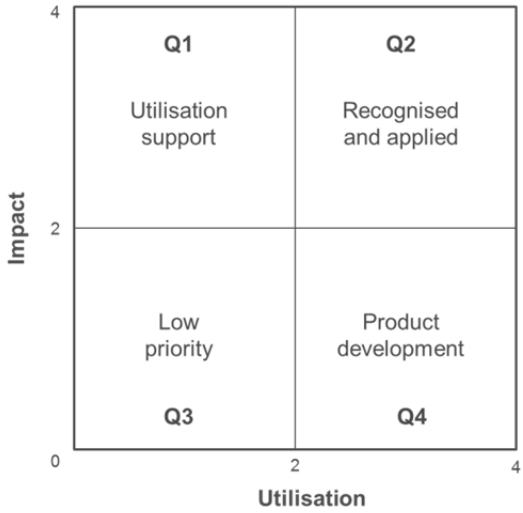

Figure 1: Product scoring matrix

3.1.2 Analysis of prioritisation exercise

For each product, the number of stickers (dots) placed within each of the quartiles was summed, giving a total score of each of Q1, Q2, Q3, Q4. These scores were then normalised by dividing by the total number of participants who ranked the product.

Where a margin of >50% existed between the most selected and second most selected quartile, the product was defined as per the most selected quartile. For example, 70% Q1, 10% Q2, 10% Q3, 10% Q4 would be defined as Q1, Utilisation Support.

Where opinion was not so well defined, a closer analysis was undertaken to assess the possible next steps.

3.1.3 Observations

The perception of the products' impact by the workshop participants was generally in agreement, although greatest deviation in impact was evident in the CO2 monitoring product. This is understandable given the R&D nature of this product.

Utilisation often varied between operators, although this was commonly within a deviation of 2. The most marked difference in utilisation was noted with respect to surface deformation, lithology and seismic logistics products.

Products with the most variation in opinion, across both impact and utilisation, included coastline monitoring and hydrocarbon seep detection. It was clear that both the understanding of impact and utilisation of these products differs greatly throughout industry.

3.1.4 Limitations of the exercise

- The exercise included EO specialists from a mix of operators, who were selected from the workshop attendees based on their own preference for onshore or offshore information. Consequently, the group sample may be subject to bias i.e., it was not an equal mix of participants from varying disciplines or operators.
- Due to time constraints, only a short summary (1-2 min) of product capability was defined by the EO4OG project teams. Consequently, the understanding or perception of each product within the group may vary between participants. However, this information in itself (a lack of consistent understanding) is of interest.

3.1.5 Outcome

This section provides the results of the onshore prioritisation exercise. This is summarized in Table 3 and Table 4.

Table 3: Output of prioritisation exercise

	Recognised and applied	Utilisation support	Product development	Low priority
Available products	o Critical habitat mapping o Land use o Oil spill sensitivity mapping	o Flood extent o Flood mapping and risk o Land cover o Seismic coupling risk mapping o Seismic logistics o Surface deformation		o Coastline o Encroachment o Hydrocarbon seep detection o Linear disturbance features o Water body nutrients
R&D	o Assets*	o Biomass o CO2 o Elevation		o CH4 o Infrastructure o Lithology o Transport network

*Only 3/11 participants ranked the asset monitoring product

Table 4: Onshore top 5 priority products as voted by participants

Product	Votes
Critical habitat mapping	6
Land cover	4
Oil spill sensitivity mapping	4
Surface deformation	4
Transport network	3

No ratings were given to the following products:

- Biomass
- CO2
- Coastline
- Elevation
- Encroachment
- Linear disturbance features
- Water body nutrients

3.1.6 Commentary on results

Critical habitat mapping and oil spill sensitivity mapping were identified as high priority products that are generally well recognised and applied within the O&G sector. Participants unanimously ranked these as high priority products.

Land cover and land use were also highlighted as high priority products, although opinion and use of these was less consistent across industry than for critical habitat and oil spill sensitivity mapping. It is possible that opinion between the two was diluted as the differences between the two products were not clearly defined or understood.

Surface deformation monitoring was prioritised by participants and highlighted as an area where utilisation support would be beneficial. 85% of participants perceived this product as high impact but only 50% felt that it was utilised within their organisation to its full capability.

As the only R&D product listed in the top 5 priority list, the transport network was surprisingly listed as a low priority (55%) during the exercise. However, 45% (Q1+Q2) perceived this to be a high impact product, demonstrating the conflicting perception of this product between operators.

No products were identified in Q4 i.e., requiring product development. Rather than recognition of products not requiring improvement, this is more representative of the fact that operators are not utilising products that their employees believe to be of low impact.

3.1.7 Conclusion

The top three priority products as ranked by the workshop participants (critical habitat mapping, land cover/ land use, oil spill sensitivity mapping) also correlate with the products that are most widely recognised and applied. Combined with the evidence that utilisation and the perception of the impact of different EO products is inconsistent within the O&G sector, this suggests that the capability and impact of EO needs to be better defined and communicated within O&G.

Nine EO products have been defined as requiring utilisation support and nine have been defined as low priority. The results of this workshop should be considered with some caution due to the time constraints under which it occurred and the bias present in the group sampled.

3.2 Offshore session 1-b

Workshop 1-b presented attendees with a list of EO-Based products relevant to offshore operations. The suite of EO-derived products was generated as a result of the analyses of information requirements and EO capabilities during Tasks 1 and 2. It was the purpose of this workshop to validate both the suite of EO products identified and the gaps found between EO capabilities and usage within the industry. The feedback from O&G operators attending the workshop was critical in identifying relevant EO products and capabilities not yet captured. It also provided a basis for exploring the reasons for the underutilization of EO within the industry.

3.2.1 Methodology

The list of EO-Based products and product categories presented to workshop participants is presented in Table 5.

Table 5: Offshore EO-Based Products

Product Category	EO-Based Products
Coastal	Upland/intertidal land cover/habitat
	Upland/intertidal land cover/habitat change
	Shoreline
	Shoreline change
Subtidal	Subtidal habitat/bottom type
	Shallow water bathymetry
Water quality	Turbidity
	Plumes
	Suspended concentration
	Chlorophyll-a concentration
	Dissolved organic matter
	Salinity
	Other water constituents
Slicks	Potential oil slick location and distribution
Targets	Vessel location, size and type
	Iceberg location and size

Product Category	EO-Based Products
Ocean Surface	Sea surface height (SSH)
	Sea surface temperature (SST)
	Surface wind statistics
	Surface wind (coastal areas)
	Surface wind (open ocean)
	Wave statistics
	Waves (coastal areas)
	Waves (open ocean)
	Swell forecast
	Surface current
	Upwelling
	Oceanographic front
	Interaction between current and bathymetry
	Sea ice
Meteorology	Rain cells
	Atmospheric fronts
	Local weather phenomena
	Hurricane tracks
Wildlife	Gas flares
	Seabird colonies
	Marine mammals
	EO-Based Products

The methodology for prioritizing the products was slightly different than for the onshore workshop. In this case, for each of the eight product categories, the workshop participants were asked to select two or more products most relevant to their operations. These products were subsequently scored them in terms of usage and impact from 0 (no usage, no impact) to 4 (high usage, critical impact). The same four quadrant matrix used for the onshore scoring (c.f. Figure 1) was used here. For the offshore users, the quadrants were given slightly different definitions compared to the

onshore users (c.f., Table 2). The quadrant definitions used in the offshore workshop were given as:

- Q1: high impact of the EO-based product, but low-to-moderate usage; points to opportunities for bridging the gap between capability and utilization of EO
- Q2: high impact and high usage of the EO-based product; points to an equilibrium between capabilities and utilization
- Q3: low-to-moderate impact of the EO-based product and low-to-moderate usage within O/G operations; points to low priority for further development
- Q4: low-to-moderate impact of the EO-based product but high usage; points to EO-based products under research and development

In spite of the differences, the quadrant definitions were quite similar between onshore and offshore products.

The participants used post-it notes to place the products in the appropriate quadrant for each product category matrix. The scoring of EO products in terms of impact and usage was completed for all product categories presented in Table 1. The responses of participants were quantified as follows:

- n = total number of valid responses in a product category
- n_{Q1} = number of times a product was placed in Q1
- n_{Q2} = number of times a product was placed in Q2
- n_{Q3} = number of times a product was placed in Q3
- n_{Q4} = number of times a product was placed in Q4

Any response placed on the boundary between two quadrants was assigned a value of 0.5 to each quadrant. The number of responses per quadrant formed the basis for the subsequent classification of EO products according to the following scheme:

- Case 1 ($n_{Q1} > n_{Q2} + n_{Q3} + n_{Q3}$): EO-based products falling into this category are important to O&G operators but are under-used by the industry; there is considerable potential for increasing usage of these products within the industry.
- Case 2 ($n_{Q2} > n_{Q1} + n_{Q3} + n_{Q3}$): EO products in this category are recognized to have a high impact by O&G users and are widely used within the industry.
- Case 3 ($n_{Q3} >= n_{Q1} + n_{Q2} + n_{Q4}$): EO products in this category reflect the range in opinion across different O&G organizations, especially if the same product has also been placed in Q1 or Q2; if the product is only appearing in Q3 it may indicate limited potential for future usage across the industry.

- Case 4 ($n_{Q4} >= n_{Q1} + n_{Q2} + n_{Q3}$): EO-derived products falling into this category are considered under development and having not yet reached their full potential in terms of impact on user operations.

Following this exercise, a discussion was held on different subjects presenting a subject of concern for the operators. The purpose of this discussion was to understand the issues and concerns of the O&G operators in order to prioritize the gaps or to propose solutions.

3.2.2 Results

Figure 2 shows an example of the scoring matrix resulting for the product category meteorology, the remaining matrices are presented in Appendix 1.

Table 6 shows the number of responses received for each EO-derived product in each quadrant and the resulting classification of the product as Case 1 (red), Case 2 (green), Case 3 (yellow) or Case 4 (white). Products not selected by any participant area are shown in white.

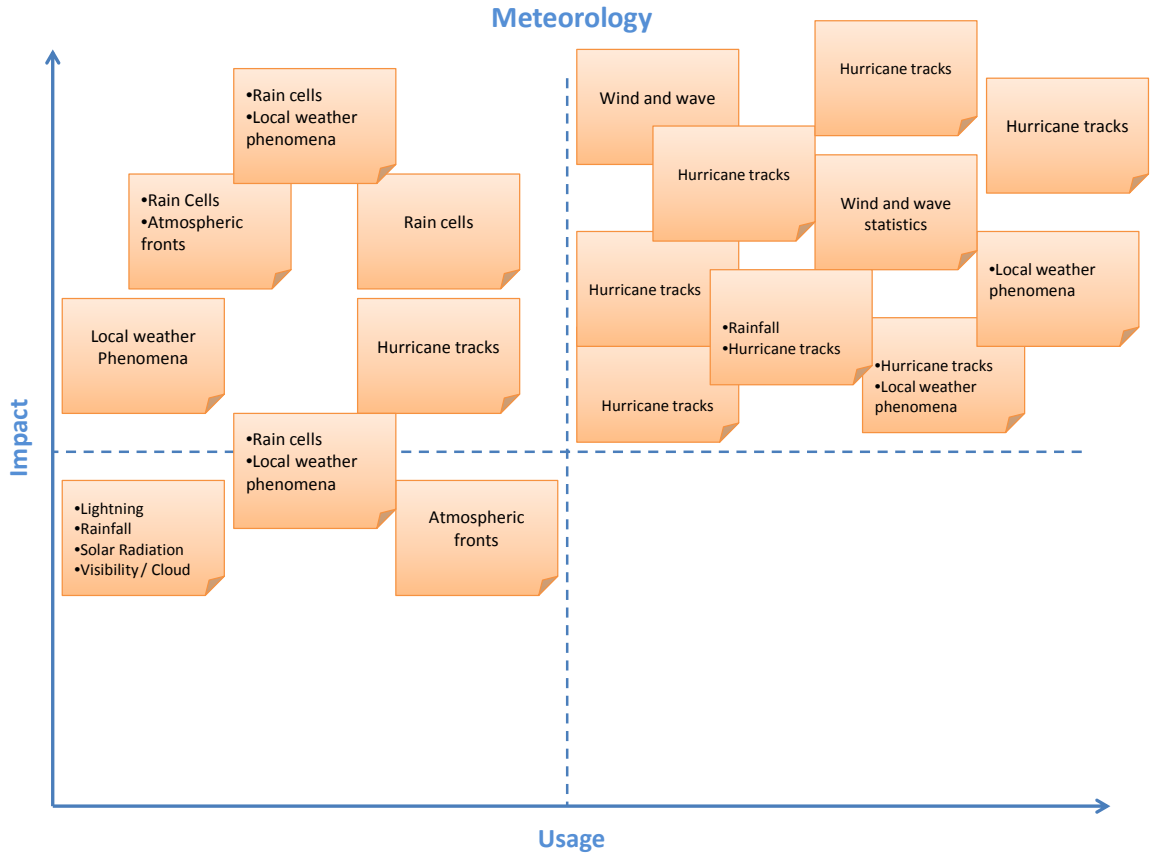

Figure 2: Example of panel obtained for meteorology

Table 6: Offshore EO-based product classification

Category	EO-Based Products	Q1	Q2	Q3	Q4
Coastal (n=8)	Upland/intertidal land cover/habitat	**0**	**1**	**1**	**0**
	Upland/intertidal land cover/habitat change	**0**	**0**	**0**	**0**
	Shoreline	**0**	**2**	**1**	**0**
	Shoreline change	**0**	**3**	**0**	**0**
Subtidal (n=10)	Subtidal habitat/bottom type	**1**	**2**	**0**	**0**
	Change detection	**0**	**2**	**0**	**0**
	Shallow water bathymetry	**2**	**3**	**0**	**0**

Category	EO-Based Products	Q1	Q2	Q3	Q4
Water Quality (n=13)	Turbidity	**0.5**	**0.5**	**0**	**0**
	Plumes	**0**	**0**	**0**	**0**
	Suspended concentration	**0**	**1**	**0**	**0**
	Chlorophyll-a concentration	**2**	**2**	**0**	**0**
	Dissolved organic matter	**0**	**0**	**2**	**0**
	Salinity	**2**	**1**	**1**	**0**
	Other water constituents	**0**	**1**	**0**	**0**
Slicks (n=7)	Potential oil slick location and distribution	**0**	**6**	**0**	**0**
	Internal waves	**0**	**1**	**0**	**0**
Targets (n=9)	Vessel location, size and type	**3**	**2**	**0**	**0**
	Iceberg location and size	**0.5**	**3.5**	**0**	**0**
Ocean surface (n=34)	Sea surface height (SSH)	0	**2**	**0**	**0**
	Sea surface temperature (SST)	**1**	**4**	**0**	**0**
	Surface wind statistics	**0**	**0**	**0**	**0**
	Surface wind (coastal areas)	**1**	**0**	**0**	**0**
	Surface wind (open ocean)	**0**	**2**	**0**	**0**
	Surface wind/wind	**0**	**3**	**0**	**0**
	Wave statistics	**0**	**1**	**0**	**0**
	Waves (coastal areas)	**1**	**0**	**0**	**0**
	Waves (open ocean)	**0**	**4**	**0**	**0**
	Waves	**0**	**2**	**0**	**0**
	Swell forecast	**0**	**1**	**0**	**0**
	Surface current	**3.5**	**2.5**	**0**	**0**
	Upwelling	**1**	**0**	**0**	**0**
	Oceanographic front	**0**	**1**	**0**	**0**
	Interaction between current and bathymetry	**1**	**0**	**0**	**1**
	Sea ice	**0**	**1**	**0**	**0**
Meteorology (n=22)	Rain cells	**3.5**	**0**	**0.5**	**0**
	Atmospheric fronts	**1**	**0**	**1**	**0**
	Local weather phenomena	**2.5**	**2**	**0.5**	**0**
	Hurricane tracks	**1**	**7**	**0**	**0**

Category	EO-Based Products	Q1	Q2	Q3	Q4
	Rainfall		**1**	**1**	
	Lightning			**1**	
	Solar radiation			**1**	
	Visibility/clouds			**1**	
Wildlife (n=13)	Gas flares	**0**	**0**	**2**	**0**
	Seabird colonies	**3**	**0**	**0**	**0**
	Marine mammals	**3.5**	**2.5**	**0**	**0**

For the products in the red category, the main issue is they are of a great impact for the producers but the producers are not or seldom using it. Different reasons can be given to these gaps. Concerning the seabird colonies and the marine mammals, the fact is these products are at a R&D stage. This leads to a poor utilization of these although they could be of great help.

On the other hand, salinity and vessel location size and type are completely operational and field qualified. This typically represents a lack of communication on these products toward the O&G companies.

Some products were also reported as missing although important:

- Rainfall (Q3)
- Solar radiation (Q3)
- Visibility/cloud (Q3)
- Lightning (Q3)
- Charismatic mega fauna (Q2)
- Deep water corals (Q1)
- Marine Archaeology (Q1)

These products will be added to the list available on the OGEO portal.

Further analysis of these results and a validation and prioritization of the gaps will be presented in the offshore document summarizing the results found within the task 2 of the EO4OG project. It will be available on the OGEO portal.

3.2.3 Discussion following the group exercise

A discussion followed the exercise in order to collect the feedback from all the operators on different subjects of concern:

Models

These are useful as EO data feeds into them and furthermore, they can compensate the shortcomings of EO products in the area of forecast and temporal/spatial resolution.

Validation of EO data

The industry still feels the necessity of groundtruthing EO data even though this has already been done intensively by the academic community. This suggests a lack of communication. For the operators, it is important to understand the limitations of the data while not discounting its value. A good challenge could be to build a product with a traceable error history.

Interaction between OG companies and institution

Interaction between institutions, OG companies, growth of compliance issues, changes in regulation are likely.

Data access

The data formats and sharing is an outstanding issue. There is a need to determine the role of regulators in the process, who drives it and why/how the data is collected.

The 3rd tier companies, those who provide services to oil and gas companies, could be a driver. These companies provide important guidance on how this data will be collected and used by offshore oil and gas companies

There is also a lack of standardized formats for GIS and this is a barrier to data accessibility and sharing of information.

The OGP JIP on oil spill will provide a first set of guidelines as well as a Common Operating Picture that will define acceptable formats and the likes. Common Operating Picture is a model on how to provide best practice guidance for emergency response data in a form that is OGC compliant. This could be extended to EO data as a whole.

Through this work, there is the potential for a whole new audience to be made aware of earth observation, its capabilities, and its value.

Earth observation importance

Earth observation has been identified as a means to improve Strategic Environmental Assessment in advance of national licensing rounds. Data accessibility improves the value of the information.

Data delivery time

Data delivery time is still an issue.

Offshore data are changing more rapidly than the onshore data. This implies the necessity of having a shorter delivery time for offshore products and an access to NRT data.

The NRT delivery is not possible all the time because of the process of satellite data: it is not a camera snapshot, the gridded products are composites. And it often requires a couple of days to create the composite image that is required.

Moreover, delivery in real time does not mean immediate. It takes a few minutes to provide the data (15min).

Training

Training is necessary but it's also worth keeping in mind that what OG companies want is a product that is easy to use and that requires a little training as possible. They prefer have high end products rather than just data. Enhancing the profile of EO and its use in other common applications could make it become part of the common vocabulary of the industry.

4 Working session 2 - Open discussion

4.1 Introduction

Three key questions were posed to stimulate discussion and to guide the conversation toward the identification of next steps. These were:

- How can OGP best take advantage of the available compilation of documented EO based products?
- If guidelines/good practices are to be considered, what is the best approach?
    - Self-standing remote sensing guidelines?
    - Integrate remote sensing capabilities in more general new and existing guidelines (information focus rather than remote sensing focus)?
- Which lessons can be learned from the oil spill and sea-ice guidelines initiatives?
- How is the EO Sub-committee going to maintain the momentum from the ESA projects in the short term?

Colin Grant (CG Metocean Consulting Limited) provided his view on the development of guidelines and the degree of effort required to generate them. Based on experience, an outline document should be drawn-up in order to facilitate the collection of feedback. A champion within an O&G organisation is important.

Desmond Power (C-CORE) presented the guideline development process undertaken for Ice Charting.

These presentations demonstrated the level of commitment required to develop a guideline and the complexity of the proposal generation and approval process required for initiating a 'guideline type' project.

4.2 Discussion

A lot of information was presented during the day and the discussion explored the way forward, with a general agreement that time was needed for the O&G sector to review the outputs from the EO4OG project and to hold internal discussions before reporting future actions.

Suggested ways forward include:

Identify champions

A champion would be needed to pursue future projects and move them through internal review procedures and to ensure alignment with the needs of the IOGP sub-committee.

Case studies

It was felt that case studies would enable the business case and value proposition of EO products to be better communicated within O&G organisations which ultimately, would encourage the uptake of the technology. Attributing a cost saving to the use of EO was flagged as being a potential issue (gaining internal approval etc.).

Educational resource

The documents generated as part of the EO4OG projects were recognised as being valuable educational resource, especially for non-specialists or people new to the technology area as way to appreciate how EO can benefit multiple parts of an O&G organisation. It was suggested that the lack of demand may be a reflection of the lack of understanding of EO capability.

The portal was also mentioned in this context and it was identified that it needs to evolve into a more user-friendly platform that hosts a consolidated version of the EO4OG project outputs i.e., moves away from the separate consortia areas.

EARSC confirmed that, with ESA, they will continue to use the OGEO Portal to provide access to all the results but will seek to transform the project presentations into a simpler, harmonised, information-structured approach. This would be reviewed and discussed with the project teams and implemented over the next few months.

The outputs from the project can be used by O&G companies for internal awareness raising and training regarding the possibilities for EO to support business operations.

O&G section guidelines

There was mixed opinion on whether guidelines were appropriate and whether they should consider an event e.g., oil spill, technical area e.g., environmental monitoring, or product e.g., land use mapping. Furthermore, it was also put forward that guidelines may need to encompass the wider topic of mapping i.e., including aerial and ground surveys as well (although this would be a much greater task).

The general consensus was that producing multiple guidelines should be avoided and therefore the option to include a guideline for each product would be unlikely to be pursued.

The content of a 'guideline' needs to be defined and agreed between the O&G and EO industry.

Common operating picture (standardisation/ integration)

It was suggested that any EO guidelines should align with the Oil Spill COP to avoid duplication of effort. This should define the format of EO products and how they can be integrated into operational decision support systems.

Collaboration

Collaborating with organisations or committees that have a mutual interest in encouraging the use of EO in the O&G sector is key component of a strategy to further develop the use of EO technologies.

It was suggested that service providers could lead EO product development, as per standardisation across other technical areas, e.g., subsea. However, it was also recognised that the service providers in the EO sector do not have access to the same level of funding as many O&G service providers. A JIP may have potential here.

Other organisations such as the Petroleum Environmental Research Forum (PERF) may provide an avenue to pursue potential projects and access funding. ESA will also continue to be active in engaging with the O&G sector to enhance industry understanding of the benefits of EO technology on an operational basis. An immediate opportunity for the O&G sector is to engage with ESA to influence the Sentinel-1 programme, in particular, the acquisition schedule for Sentinel-1A. There is a need for the O&G sector to be proactive and aware of the proliferation of freely available, open data, which may be used by third parties for independent monitoring.

To build upon the information produced as part of the EO4OG projects, a follow-up meeting to discuss the ways forward should be considered to tie in with the Q1 2015 IOGP Geomatics Committee meeting.