**V1.0**

# MINUTES OF THE 13th MEETING OF THE CEOS SPACE DATA COORDINATION GROUP FOR GFOI (SDCG-13)

**13-16 March 2018**
**Bogotá, Colombia**
*Meeting Website, Agenda and Actions Table*

## Tuesday, March 13

**Participants:** Ake Rosenqvist, Helmut Staudenrausch, Stephen Ward, Joanne Nightingale, Brian Killough, Alex Held, Martin Herold, Frank Martin Seifert, George Dyke

### 1. Space Data Support to the GFOI R&D Component (Element 3)

Ake (for JAXA) reviewed the status of the Element 3 SDCG Work Plan outcomes.

Ake suggested that because 15% of the NovaSAR data will be available free and open, we could discuss adding it as a Core Data stream. Including NovaSAR in this way could also be a good opportunity to engage the UK in GFOI. Helmut noted that DLR also has a share of TSX and TDX data available for (open) research, and that NovaSAR therefore also should be considered a contributing data stream for consistency. It was agreed that due to uncertainty around data policy and systems, that we should wait until the mission is launched before confirming plans.

Stephen proposed a new objective for Element 3 for the next work plan around pursuing a dedicated GFOI R&D fund, in part in response to a low or unclear ROI for CEOS Agencies who have contributed to SDCG in support of R&D. He also suggested that SDCG should consider suspending the GFOI R&D data supply in order to force the discussion around a well supported GFOI R&D programme. Ake noted that while pursuing for dedicated funding for the GFOI R&D programme would be in the interest of the SDCG, the responsibility of such a work task should probably be the responsibility of the R&D Coordination component.

It was noted that CSIRO and UKSA should add the details on NovaSAR data access to the SDCG R&D data access procedures once this information is available.

The R&D groups are being asked to provide inputs into a technical progress report, but the reporting will be 'light' this year, due to disrupted funding from ESA to the GFOI R&D Coordination component. The report will be compiled by the GOFC-GOLD office and it was agreed that it should be completed in time before SIT-33.

Ake summarised a survey of responses received from SDCG 'Element 3' agencies on the question of the 'way forward'. (See slides.)

It was agreed that any 'reboot' of the GFOI R&D component needs to include communication and consultation with the other GFOI Components, as well as GFOI countries. From the beginning the 'reboot' should be framed as a funded activity, as opposed to preparing a programme, and then appealing for funding. This will require working with donors to define themes and elements of the programme they are willing to fund from the outset, and this will in turn require working with end users and countries. Any programme will need to lead to added benefits, i.e. should be more than the sum of its parts.

Helmut noted that DLR did not receive enough feedback from the data they provided via SDCG Element 3 for GFOI R&D. DLR remains ready to support GFOI R&D in Phase 2, in particular with well focused data requests. Helmut would like to see an updated GFOI R&D Phase 2 plan with clearer (and perhaps fewer) priorities. It was noted that in the case of Germany and Norway, national development donor agencies cannot respond to requests for R&D funding support, but R&D funding agencies can.

An annual/bi-annual science meeting or workshop, including clear feedback mechanism for the MGD, could be considered as a part of any GFOI R&D component 'reboot'. Past science meeting formats haven't been directly useful for GFOI objectives, but Martin Herold suggested that providing a forum for GFOI science teams supporting R&D efforts should be considered.

A discussion followed:

- Frank Martin noted that the research interest is moving towards new types of data sets from more recent missions, including with dense time series.
- Stephen suggested that a GFOI R&D 'reboot' could have the objectives of securing securing donor support, GFOI support, and data provider support in the process of its development. This could mean a smaller more focused GFOI R&D programme, clearly communicated, and with clear links to the MGD. If this approach is agreed, then how to sell this to the GFOI Leads would need to be considered.
- Alex suggested that the supporters of this effort should be the MGD, and so getting that connection and feedback in place needs to be addressed.
- Martin noted that improving accuracy and reducing uncertainties are the two key issues that countries and donors are trying to address. Early warning could become a priority, but it is not currently true. These are generally shorter term goals, rather than long term objectives.
- The SBSTA approach to R&D is to hold dedicated sessions on focused topics to first consider options, and then a way forward is agreed and arranged.
- Martin outlined the four key science topics would be useful to advance based on discussions yesterday in the GFOI R&D component: integration of various data streams into analyses (e.g. Data Cubes); the use of high resolution to improve accuracy and verification; responding to the outcomes of the Early Warning task force; and, the inclusion of future missions which will be capable of measuring biomass from space. Coordination across these

biomass missions to ensure consistency in results will be important to make the usable for the GFOI and policy community.
- The concept of a GFOI R&D Super Site may be able to address some of these key topics. This could be linked to the LPV process, as well as the BIOMASS mission cal/val. Ake noted that for Super Sites to be effective, dedicated funding for research there would be required.
- Helmut stressed the importance of clear GFOI priorities to avoid a sense of frustration amongst the space data providers as well as donors.

Martin Herold shared his notes from the session following the discussion:

> *R&D component issues:*
> *How to regularly update and present R&D needs generically and by (GFOI) country? GFOI role for matchmaking with R&D teams and donors, updated, new R&D plan ...*
> *Interaction with donors (REDD+) is to provide justification based on country R&D needs and not so much the availability of new satellite data*
> *Have a system to register R&D efforts by priorities, regions/countries and CALM levels – online system with map?*
> *Structure R&D coordination by CALM levels:*
> • *Research: local, new satellite missions, commercial data etc. (current R&D teams)*
> • *Pre-operational: Upscaling to country scale, involving country partners, testing integration in GHG inventories (much broader set) – much more funding from REDD+ donors*
> • *Operational: guidance, training materials and capacity development*
> *Important evolving links between R&D and Data component (not local cases):*
> • *Integration of Sentinel data in E&R*
> • *Use of HR data for targeted sampling in stratified area change estimation (for long-term monitoring)*
> • *Early warning: responding to user needs, demonstration and upscaling*
> • *Biomass mapping from space taking advantage of 6-7 upcoming missions*
> *Idea of supersites (CEOS LPV)*
> *Requires different scale of commitment from space agencies to provide data*
> *How to phase out the 18 research team ideas – explain and evolve*
> *Expert workshop planning*
> *Science meeting next meeting*

It was agreed that the results of this discussion should be communicated to all SDCG agencies, and also that the outcomes of this discussion should be reflected in the record of the GFOI R&D component discussions from this week.

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| **SDCG-13-01** | Ake to follow-up with Joanne and Alex Held on including details of NovaSAR data access in the SDCG R&D data access procedures. | **SDCG-14** |

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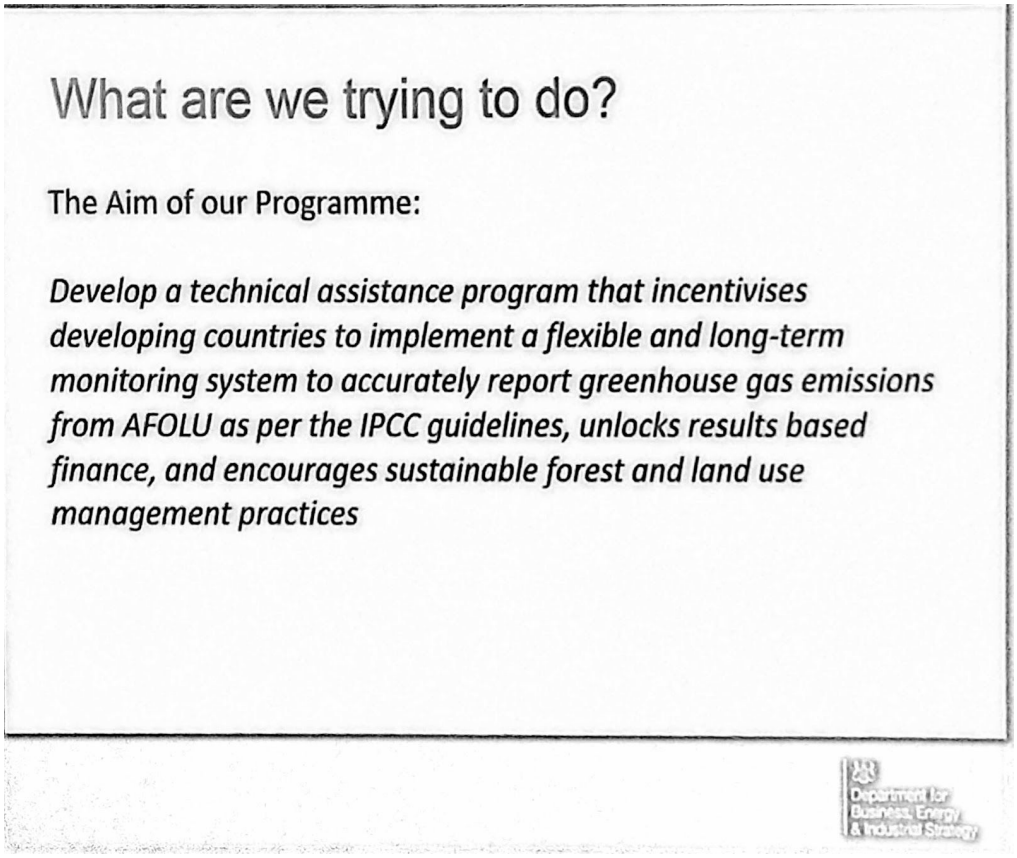
| **SDCG-13-02** | Frank Martin, Ake & Martin Herold to work with agencies who have contributed to Element 3 during GFOI Phase 1 to develop a brief strategy paper (2-3 pages) describing the space agency approach to GFOI R&D Coordination Component in GFOI Phase 2. | **April 2018** |

The UK's motivation in funding via GFOI is that they have results-based funding that is not moving due to gaps in MRV. The scope of this funding could include education, R&D or other activities that support this objective. This makes them a potential donor for the R&D component. They have other programs looking at implementation support, e.g. in the area of emissions reductions.




## Thursday, March 15

## Data Component Scoping Meeting

**Opening**

Osamu opened the meeting and explained the objectives. He noted the expanded data support proposed for Phase 2 of GFOI with more emphasis on the tools and data uptake. Questions to be addressed include:

- what data and tools countries are currently using for each of the steps?
- what you plan to use for their next phase of development?
- what you have not yet decided on, secured access to, or received training in?
- what steps you think need to be added/deleted/amended to this flow chart for future use by the Data Component?

As Data Component Lead, CEOS hopes to see how the the dynamic goes – hopefully providing a model for engagement of countries on Data issues at GFOI Plenaries. We hope to get initial insights into the nature of the gaps raised by GFOI countries. Beyond today CEOS will refine the role of the Data Component meetings at GFOI Plenary to be consistent with the Country Needs Assessments process of GFOI, with the necessary links to CB Component and to the R&D Component and MGD.

**Vietnam**

Vu Anh Tuan reported on the Vietnam status:

- No real NFMS/MRV procedures for REDD+ in Vietnam;
- FIPI is the key agency and mostly uses statistical data;
- FIPI used satellite data since 1995 for generation of national forest maps;
- VNSC hopes to work with FIPI to establish Vietnam DataCube as the basis for NFMS in Vietnam; significant help thus far from international community to get DataCube started;
- main issues are to sustain technical activity on VDC and to develop capacity of FIPI to use the system for forest applications;
- VNSC/FIPI plan: Forest change (forest loss and deforestation) yearly based on sentinel (1 and 2) data; Forest change analysis: for 30 years based on Landsat data; in future, forest monitoring application of VDC can be used for biomass estimation based on ALOS-2 data and LOTUSat data;
- main gaps are: linking VDC to FIPI processes; need for forest algorithms; VNSC will train FIPI on VDC; no plans at moment to use REDDCompass; and,
- stressed the importance of learning from countries with more mature processes and systems.

**Kenya**

- Min Envt & Forestry is the UNFCCC focal point; first reported in 2002, then 2015;
- NFMS roadmap was developed in 2016;
- developing SLEEK emissions estimation system;
- wall-to-wall pixel-based land cover maps from 2000-2014 based on SLEEK;

- includes land cover change products and biomass values and emissions factors;
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- FIPI is the key agency and mostly uses statistical data;
- FIPI used

**PNG**

- FRL being submitted 2018
- inventory structure shown
- gaps include systems for EO data acquisition and application

**Mexico**

- technical unit for MRV was established out of the Norwegian-Mexico project;
- using Landsat and S-2 data;
- two key tools: forest satellite monitoring system (IDB/UKSA); FLINT;
- key gap is the need to develop land change maps rapidly;
- using RapidEye for land cover mapping;

Nikki gave guidance to the breakout groups and noted that the flow chart template has been populated with items already referenced in the MGD and we are looking to find needs that countries have and that can be prioritised. The groups that reviewed the flow chart reported back to the group.

**Table:** *Fiji, PNG, Indonesia, Colombia*

**Acquisition:** Digital Globe, Collect Earth, space agency data systems, Data Cube
**Data:** Landsat -5 and -6, some -7. Colombia taking up S-1 and S-2. Fiji looking at S-2. Colombia national agreement on Sentinel data hub. Broadening of data sources are an overall trend, and there is a role for Analysis Ready Data there.
**Systems:** Tools used included Collect Earth, Data Cube, ERDAS
**Next targets:** Fiji forest change map 2025; PNG improved archive and analysis; Indo improved accuracy and early warning; closer connection of EO and FRA; Colombia large data increase and analytics increase with more radar data; ColombiaCube will grow.
**Issues and obstacles:** Fiji, PNG, and Colombia both raised training on integration tools and methods. Indonesia welcome help on accuracy improvements. Several want help on data harmonisation and use of ARD.

**Table:** *Vietnam, Cambodia, Australia*

**Acquisition:** Data Cube; Sentinel Hub
**Data:** Landsat, Sentinel, Drone, ARD through DC or USGS; hi-res for validation
**Systems:** SEPAL, DataCube, ARG-GIS

**LC/LUC:** Vietnam pixel-based;
**Issues and obstacles:** More support needed in estimation of emissions factors.

**Table:** *Kenya, Guyana, Togo*

**Acquisition:** Mostly direct download
**Data:** Landsat
**Systems:** GIS software (e.g. UMD)
**LU/LUC:** Suggested adding a box on land use (e.g. commercial forestry)
**Issues and obstacles:** Capacity building needed to enable reporting.

**Table:** *Argentina, Ecuador, Colombia*

**Acquisition:** Flow chart first row may be more integrated depending on systems. Emphasis on open source where possible. Google Earth Engine popular.

**Data:** Discussion around crowd sourced information, but quality assurance would need to be addressed.

**Systems:** -

**LU/LUC:** Could be added level of detail in these boxes on the flow diagram.

**Issues and obstacles:** -

**Table:** *Ghana, Nepal*

**Acquisition:** Direct from USGS and ESA or UMD - works well
**Data:** Landsat, Sentinel-2. Pre-processed and ARD from USGS is very welcome.
**Systems:** Envi, ARC-GIS in Ghana. Nepal using UMD GLAD.
**LC/LUC:** No area estimation in Nepal.
**Issues and obstacles:** Ghana would like active remote sensing data (e.g. vegetation structure) and plan to use upcoming missions (e.g. GEDI, BIOMASS). Nepal uncertainty around future of SilvaCarbon and UMD involvement, and if this ends, then they would have problems replicating the current methodology.

**Table:** *FAO, CEOS, MGD*

**Acquisition:**
**Data:**
**Systems:** Categorisation of tools: currently available, current but needs modification, and custom built; commercial or open source. Ensuring systems are built to both address short term

needs and also longevity. Linkages and integration of tools key to building work flows and ensuring program management. Flow diagram too compartmentalised and overlaps need to be identified.
**LC/LUC:**
**Issues and obstacles:**

**Table:** *GIZ, CEOS*

**Acquisition:** Very satellite oriented; should also include ground data from the outset.
**Data:** GIZ highlighted the need for cloud free mosaics as a part of ARD products.
**Systems:** SDMS no longer exists. Flow diagram focused on reporting and verification, but systems can be multi-use. Wondering where MGD and REDDCompass should appear in the diagram.
**LC/LUC:** Titles of boxes need to be clarified; either LC/LCC or LU/LUC. Moved ground data box up to acquisitions box.
**Issues and obstacles:**

**Table:** *South Africa*

**Acquisition:** Work flows all outsourced to local company; hope to build capacity in house and source data directly.
**Data:** LS-5, SPOT-5
**Systems:** ERDAS Imagine (commercial)
**LC/LUC:** -
**Issues and obstacles:** -

## 2. SDCG-13 Opening

**Participants:** Frank Martin Seifert, Joanne Nightingale, Tara O'Shea (Planet), Hiroaki Okonogi (JICA), Takahiro Endo (RESTEC), Ake Rosenqvist, Alex Held, Osamu Ochiai, Sanjay Gowda, Helmut Staudenrausch, Brian Killough, Shaun Deacon, Dalton Valeriano, Leila Fonseca, Mikaela Weisse, Stephen Ward, George Dyke

Frank Martin and Joanne welcomed participants, noting the progress that countries have made reflected in the GFOI Plenary discussions, and Frank Martin noted the agreed objectives of the meeting.

Frank Martin noted that the feedback from the countries during the Data Component meeting was useful, and a brief discussion followed.

- Brian noted that many of the country issues raised during the Data Component meeting were familiar, including issues around data process efficiencies. Data Cubes were mentioned by a number of countries.
- Helmut noted a lot of country interest in the Data Component, which may be a sign of the gaps that still exist and a driver for future country meetings to address gaps and provide

solutions. However, clarity around the management of the Data Component is required, e.g. who is responsible for the follow-up from today's session.

- Helmut noted that the SDCG strategy has three elements, and the country dialogue only really addresses Element 2. The baseline and R&D are less dependant on country interaction, but its not clear who should lead the country interaction. CEOS is not well placed to do this, but should not withdraw from the process.
- It was agreed that after reflection, SDCG should come back with a discussion paper on how we see the Data Component is run, and what the role of SDCG could be.
- Stephen noted the positive feedback received from country interaction at IDEAM on Monday ('Data Cube club'), and how fostering this kind of community collaboration may be important to scaling.
- Sanjay noted the need for '*tools to help identify tools and data*' and this could be an opportunity for the Data Component to support countries.
- Osamu noted that we need to be more proactive in Phase 2 with CEOS activities more closely connected to other components. He noted the interest in hi-res data such as Planet.
- Alex suggested stressing to CEOS the importance of ARD and its role in GFOI.
- Ake suggested that a role of the Data Component could be to coordinate country inputs at each GFOI Plenary, and that this could be shaped by the SDCG.
- Joanne noted the demand for ARD and FDA solutions, and the importance of addressing issues such as accuracy assessment and ARD quality assurance. Stephen noted that there is an LSI-VC action for GFOI to feedback on the suitability of ARD for their purposes, and we should include Joanne's point in this feedback.
- Stephen suggested we need to identify strategies that will help GFOI: like data standards to support broader choice of data sources; and FDA solutions with cloud processing to mitigate increasing network transfer of data.
- Tara (Planet) noted we need to introduce efficiency gains as data providers - like SR products and ARD.
- Dalton said that GFOI should use CALM to assess which countries are worth supporting.

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| **SDCG-13-03** | SDCG EXEC to draft a discussion paper on how SDCG and the GFOI Data Component will interact for GFOI Phase 2. For consideration by the community, including CEOS (SIT-33), and also the GFOI Leads. | **April 2018**<br>**(Draft for SIT-33 22-24 April)** |

## 3. Space Data Requirements for Early Warning

*Session Introduction*

Ake recalled the main points from the Monday Early Warning Task Force meeting.

Mikaela Weisse (WRI) explained about the user needs assessment on EW and the multi stakeholder forum planned for July. Brice Mora is executing the study through FAO contract. The Forum will build on the lessons learned from the study.

Stephen noted that the EW activity may be one way to exercise the linkages between GFOI Components. Tom Harvey is managing the work being done by Brice, and it may be important to present the results of the study address implications of the outcomes on the GFOI components.

Dalton noted that some EW needs to be very fast (for law enforcement) whilst others may be slower (for policy makers), and there is a tradeoff between these performance factors and requirements. These tradeoffs will have implications for space data requirements.

Ake suggested that we need to include something like MGD or REDDcompass to steer countries looking to implement EW capabilities. Question whether EW support is Element 2 (Space Data Services) or a new Element 4 would need to be considered.

*Updates on Early-Warning Related Space Agency Activities*

- **JJ-FAST (Hiroaki Okonogi/JICA):** JJ-FAST is based on ALOS-2 data at 50m resolution, and from November 2016 has been able to detect deforestation for 77 countries every 1.5 months. Deforestation data is available via the website with a lag of approximately two weeks. The product is being improved to use time series of data, which should have the impact of reducing errors.
- **DLR (Helmut Staudenrausch):** DLR's Global Forest Map activity is a science and technology only, without a current implementation program. The product is a global product, but is not validated globally. DLR is interested in working with others to cross-validate global forest products. The data has been tested in the Amazon, and some change detection products have been delivered. Based on this, a concept for an EW system has been developed, featuring regular Sentinel-1 coverages, and with TanDEM-X and/or TerraSAR-X follow-up for active areas in order to increase accuracy and understanding about drivers. Sentinel-1 coverage is available within 6-12 days, and full bi-static TanDEM-X data can then be acquired within 11 days; the introduction of the Spanish PAZ satellite to the TerraSAR-X/TanDEM-X ("WorldSAR") constellation may even reduce this time.
- **Brazilian Experience (Dalton Valeriano):** The DETER system does not differentiate between deforestation and degradation directly, but this is generally determined later with 60% being attributed to deforestation. 6Ha is the minimum mapping area for the system, though they are detecting smaller areas than this. Accuracy is being improved by the introduction of Sentinel-1 and Sentinel-2.

*Stephen summarised the discussion*

- There was a CEOS discussion paper around GFOI Early Warning put together about a year ago, which appears to have achieved its goal of catalysing the discussion.
- There may be scope for demonstrations (e.g. via Data Cube) to demonstrate the potential, and Brian noted that he is working on one such demonstration for Colombia.
- At present, for SDCG this appears to be a watching brief, and there is likely to be more detail in the SDCG-14 timeframe. Mikaela confirmed they expect to have their study completed by July.

## 4. Baseline Strategy Update (Element 1)

*Sentinels Update*

Frank Martin provided an update.

- **Sentinel-1:** Operations are nominal for both 1A and 1B, and generates 12TB of products daily, 4x more than foreseen. Increased dual pol acquisitions to support GFOI.
- **Sentinel-2:** A & B fully operational with systematic global coverage every 5 days. SR product over Europe since May (A) and December (B) 2017. In February the mission acquisitions reached 100% capacity as the ramp up phase concluded, providing global coverage every 5 days.
- **Sentinel-3:** Sentinel-3B will be launched on April 25.
- Future Sentinel sensor options are being considered, including Sentinel-7 (CO2), Sentinel-8 (Thermal), Sentinel-9 (Ice), Sentinel-10 (HSI), and Sentinel-11 (L-band SAR).

*Landsat Update*

Brad Reed presented an update.

- Landsat operations are nominal, with Landsat-7 having fuel to 2020-21 (refueling remains possible via Restore-L mission concept), and Landsat-8 collecting up to 725 scenes per day. Landsat-9 (a re-fly of 8) is planned for a late 2020 launch, and Landsat-10 in 2027-28. All options are on the table for 10.
- Level 2 product demand is increasing, with more than 50% of data provided being SR, and in the future these products will be the standard Landsat products. ARD will be the standard product for Landsat-9.

*ALOST-2 Core Data Products*

Ake Rosenqvist

- The ALOS-2 BOS was updated from January 2018 to increase acquisitions, with focus on dual-pol and ScanSAR observations.
- JAXA is providing data and support to Global Mangrove Watch, using mosaic data dating back to 1996 comprising JERS-1, ALOS and ALOS-2. The Global 2010 baseline is currently available online at www.globalforestwatch.org, and data from seven epochs will be available for download once a quality assessment is completed.
- Osamu noted the changes planned to JAXA's data policy with more ALOS data available as open and free. ALOS-2 ScanSAR (100m), ALOS-1 (10m), and AVNIR-2 will now be open.
- Helmut suggested acknowledgement from CEOS or GFOI about the opening of the ALOS data.
- JAXA forest observations strategy may add MOLI Lidar and ALOS-4 L-band SAR in future to measure carbon biomass and support country reporting.

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| **SDCG-13-04** | SDCG Co-Chairs to draft a communication congratulating | **April 2018** |

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| | JAXA on the recent changes to their data policy towards free and open access for some products. (CEOS Plenary Presentation) | |

*CBERS-4 Update*

Leila Fonseca provided a brief status update on Brazilian EO activities, including CBERS-4.

- Currently CBERS-4 is on orbit, with CBERS-5 and -6 under consideration, but this is subject to discussions between Brazil and China.
- Brazil Data Cube has received some funding from Amazon fund and they hope CEOS will help.
- CBERS-4 data has been acquired extensively over east and south Africa.
- The use of CBERS-4 data in Peru, Ecuador, and Colombia should be considered, and Dalton noted that they have already received these requests from these countries.

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| **SDCG-13-05** | Ake to follow-up with INPE (Joao Soares) on extended CBERS-4 coverage of South America. | **SDCG-14** |

*Future Core Data Streams*

Ake presented a summary of some future data streams. (*ALOS and MOLI*, *GEDI*, *SAOCOM*, *NovaSAR*, *NISAR*)

- **ALOS-3:** This will be an optical satellite (0.8m PAN), launching in 2020
- **ALOS-4:** This will be an L-band satellite, projected for launch in mid-2020.
- **MOLI:** ISS-based Lidar planned for launch in 2020/2021. (To follow GEDI, with nearly four years continuity anticipated between them.) MOLI includes a 5m optical imager which is capturing the swath of the Lidar.
- **GEDI:** NASA Lidar to be launched in May 2019 with 2 year mission focused on studies of carbon cycle and biodiversity. DLR is collaborating with NASA on the integration of TanDEM-X.
- **SAOCOM**: Launch in September 2018 for 1A with 1B a year later; SDCG should press CONAE on ARD compliance.
- **NovaSAR:** launching late Q2 2018; data available 6 months after launch; 15% capacity free and open from UK; CSIRO has 10% capacity; 7 year mission; multiple polarisations possible.
- **NISAR**: L-Band SAR with free and open data; 12-day repeat global coverage; launch in late 2021.

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| **SDCG-13-06** | SDCG EXEC to follow-up with CONAE (Laura F) at SIT-33 about the prospects for SAOCOM ARD compliance for general use, and also with a view to SDCG/GFOI uptake. | **SIT-33** |

*Discussion*

- A new global acquisition strategy for biomass measurements should be looked at by SDCG, and could follow the JAXA strategy. It needs to be made clear that these efforts are in the R&D phase, but for SDCG to take stock of this sector may be of interest.
- CONAE would like SAOCOM data to be useful for global biomass observations. Internally however, CONAE are completely focused on Argentina.

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| **SDCG-13-07** | Osamu to lead the drafting of a proposal for SDCG EXEC to engage CEOS agencies in a Global Baseline strategy for biomass estimation missions.. | **April 2018** |

### 5. Space Agency Approach to GFOI Phase 2

*GFOI Phase 2*

Frank Martin presented quick status and overview of updates to GFOI leadership and activities.

- Joanne suggested that SDCG could use a Terms of Reference, and we should include this as a discussion topic for tomorrow. This could also be reflected in refreshed three year objectives.

## Friday March 16

**Participants:** Joanne Nightingale, Frank Martin Seifert, Ake Rosenqvist, Peter Caccetta, Brian Killough, Shaun Deacon, Osamu Ochiai, Stephen Ward, George Dyke

### 6. Space Data Services (Element 2)

Brian Killough presented, noting:

- Country space data coverage reports are available on the SDCG website, and are updated annually;
- COVE now has a coverage analyzer as well as a data browser tool to support ordering; at present it has thousands of users annually;
- Several different data access routes were raised by users yesterday: FAO tools (e.g. Collect Earth), CEOS tools (e.g. Data Cube), direct access and 'traditional methods', and Google Earth Engine;
- Should we present a summary of the options for data access, the pros and cons, and help countries to decide;
- Google Earth Engine has become a source for ARD for several data streams, and at the moment is one of the only places where Sentinel-1 ARD is being produced systematically; and,
- Africa Data Cube is under discussion, and will launch in the UK next week.

Brian asked for feedback on the efforts of the CEOS SEO, and Ake agreed that the interaction with countries (e.g. Colombia, Vietnam) is quite valuable. In the ODC community, Brian has

focused on country user interaction, where other Partners (e.g. GA) have focused on the core technology development. These kind of pilot efforts are necessary, in particular during this startup phase, to provide examples for prospective users. GFOI Phase 2 is supposed to be about services for countries, and so this also fits well with that driver. There is also a need to connect the efforts of SDCG are linked to the activities of the other GFOI Components, though there is a need for resources to support this interaction.

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| **SDCG-13-08** | Brian to compile a list of datasets (including ARD), algorithms, and tools relevant for GFOI and MGD workflows as examples to inform the SDCG approach to GFOI Phase 2. (Check old space data services guide PDF.) | **June 2018** |

The Data Cube should be developed as a general solution, where forests are one example. It would be beneficial if Data Cube algorithms and work flows related to forests (and other thematic areas) could be collected in one place, and eventually deemed 'MGD compliant' and promoted as such.

*GFOI/SDCG Input to LSI-VC on ARD*

Stephen presented, noting that ARD is likely to be one of the main legacies of this current period of coordination, and there's a need (and an action from LSI-VC) to develop a strategy around how this may unfold. There will also be a stocktake paper summarising the current availability and access to ARD.

There is also an action to get LSI-VC feedback from GFOI on CEOS ARD standards, and part of that process was the the 'lightning round' presentation and survey forms during GFOI Plenary on Tuesday.

A brief discussion followed.

- In order to get feedback from the community, there is an urgent need to provide sample data and some tools to enable working with the data.
- It was suggested that the SEO could provide a mini ARD sample data service.
- Brian noted that Tara from Planet would provide sample data from their new SR product for evaluation, and can also provide support for this collaboration.

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| **SDCG-13-09** | Brian and Joanne to follow-up with Planet on an ARD assessment of their new Surface Reflectance product (here and here), including sharing the PFS documents with Planet. | **June 2018** |
| **SDCG-13-10** | SDCG EXEC to follow-up on the CEOS ARD feedback forms received at GFOI Plenary. EXEC to suggest any other GFOI Plenary contacts who may be able to provide feedback (e.g. Colombia). | **April 2018** |

## 7. Discussion Topics

Joanne noted that the UK is just starting up, and expects an iterative process to define UK interests. A few potential topics could be considered.

- UKSA and NCEO interested in data flows;
- UK ARD capability may be useful;
- Joanne interested in quality of SR products and help support the CARD4L compliance regime - especially for third party providers beyond CEOS;

| | | |
|---|---|---|
| **SDCG-13-11** | Joanne and Brian to explore CARD4L compliance and the development of a compliance matrix. (Reference LSI information on CARD4L and CEOS ARD provided by Stephen). | **June 2018** |

Joanne introduced a discussion of the possibility for establishing or updating via the current Work Plan Terms of Reference for the SDCG.

- At the highest level, SDCG coordinates the space data for GFOI. It does this by maintaining a global baseline, investigating and building efficient flows of space data and services, and supports country engagement and R&D. It was agreed to take these points and consolidate them into a statement of Terms of Reference.

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|---|---|---|
| **SDCG-13-12** | Joanne to circulate the draft Terms of Reference document captured at SDCG-13 for EXEC feedback and comment. EXEC to comment, for discussion on first post-SDCG-13 telecon. | **April 2018** |

## 8. Work Planning and Closing Session

*SDCG Work Plan Update*

Stephen presented a summary of the way forward on the SDCG 3-Year Work Plan.

- If there was a structured way of collecting feedback from the various country interactions, that may be valuable.
- At present, activities of other CEOS agencies on forests (e.g. DLR, ESA, UKSA, JAXA) is not reflected in the work of SDCG. This could take the form of reporting on these activities (e.g. Forest TEP) for SDCG discussion, or participation of agency staff if possible.
- The home for GFOI Early Warning within the strategy will need to be determined, but Services (Element 2) makes most sense. This can't be confirmed until we see the results of the GFOI EWTF studies.

Stephen reviewed the new draft outcomes in the draft v0.1 2018-2020 Work Plan.

- **Baseline:** It was agreed to add the global biomass product discussed during the meeting this week under the global baseline. This approach is captured in the MGD, which is a key prerequisite to supporting it. This would address the data required to enable the derivation of biomass products, rather than delivering biomass products. Supersites could be one approach, and links to the CEOS LPV biomass group should be pursued.
- Ake shared a link to a recent ISSI Biomass Workshop. http://www.issibern.ch/workshops/biomass/
- It was agreed to remove the baseline outcome on 'Efficient and effective global flows of data '.
- **Space Data Services:** It was agreed to remove the term 'priority countries' from the 'Ensured on-going coverage ' outcome.
- It was agreed that (2) and (3) can be merged, but retaining the reference to 'community' in (3).
- Under (1), these data transfers are happening on a routine basis to help support pilots and startup activities (e.g. Landsat and ALOS data to Vietnam Cube).
- It was agreed to remove outcome (5) on the IFI interaction.
- It was agreed to update the wording of (6) in order to ensure the task is clear (e.g. creating 'MGD-compliant' Data Cube scripting).
- **GFOI R&D Support:** It was agreed to delete (1).
- (3) could be moved to the next section on Component Coordination.
- (4) should be revised or possibly shifted to the R&D Coordination component.
- **Component Coordination and Country Engagement:** Item (3) from R&D to be moved here.
- (1) should be revised.
- It was agreed that (2) can be removed.

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| **SDCG-13-13** | EXEC to comment on the draft SDCG 3-Year Work Plan overview document, for discussion on first post-SDCG-13 telecon. | **April 2018** |
| **SDCG-13-14** | SDCG EXEC and Osamu to provide feedback, comments, and suggested changes to the revised SDCG 2018-2020 Work Plan Outcomes. (Here.) | **April 2018** |
| **SDCG-13-15** | SDCG EXEC to circulate the revised SDCG 2018-2020 Work Plan Outcomes to SDCG-All for comment and feedback. | **May 2018** |
| **SDCG-13-16** | SDCG Sec with support of EXEC and Osamu to draft an updated SDCG 2018-2020 Work Plan with a schedule of milestones and reviews for concurrence at SDCG-14. | **SDCG-14** |
| **SDCG-13-17** | Joanne and Frank Martin to send Osamu the summary (1-2 slides) of the SDCG resourcing study status for SIT-33 (22-24 April) | **No later than 6 April** |
| **SDCG-13-18** | SDCG Sec to create a preliminary set of mission timelines for coming biomass missions as input to a potential biomass outcome in the new 2018-2020 Work Plan. | **April 2018** |
| **SDCG-13-19** | Joanne to seek feedback from the CEOS LPV sub-group on biomass estimation on the potential for GFOI/SDCG to help on dataset coordination. | **April 2018** |

*Discussion on Way Forward*

Stephen reviewed the CEOS Provisional Objectives for GFOI Phase 2. Osamu reviewed his slides on the CEOS strategy for GFOI Phase 2.

- As a baseline way forward, there will be Data component 'workshops' which will include country inputs, though this plan needs to be confirmed.
- Joanne and Frank Martin are planning to follow-up with their agencies on the potential for resourcing of the SDCG Sec.
- The SDCG side event at SIT-33 should include a brief introduction (10 minutes), and then facilitate a discussion to hear the views of CEOS agencies ('listening mode').

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| **SDCG-13-20** | SDCG Sec to follow-up with all SDCG agencies (including those who were at SDCG-13) on their views for the role and activities of CEOS during GFOI Phase 2. | **For SIT-33** |
| **SDCG-13-21** | Frank Martin to provide link to the R&D Team progress report for inclusion with the SDCG materials for SIT-33. | **For SIT-33** |

There was a discussion on the linkage between SDCG and the Data Component.

- Ake noted that the inclusion of 'Space' in the Data Component name may have given the impression of technology-push, and this may have been one of the reasons that it was removed from the Component name. It also acknowledges the idea that there is more to the required data for GFOI than space data.
- SDCG and space agencies don't have competencies in the collection of ground data, and this needs to be acknowledged.
- However, this change doesn't appear to impact the way forward.
- There needs to be discussion across Components, and as well between the SDCG and Data Component, but the format of this discussion (e.g. workshop, meeting, Plenary/mini-Plenary) needs to be revisited. It may be that the proposed 3-day workshop which the GFOI Leads were considering may be revitalised.
- The way forward needs to be one of the main topics for the next EXEC telecon.

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| **SDCG-13-22** | Stephen to follow-up with the GFOI Office on the written summary of the trial Data Component meeting at GFOI Plenary. | **April 2018** |

*SDCG-14 and Joint Meetings*

Stephen reviewed the plans for week of 3 September at JRC. There will be both SDCG and joint sessions, including around feedback and input for CEOS ARD. There may be a Data Cube session, but this remains to be coordinated.

For 2019, there is some consideration around coordinating with a possible ODC meeting in Canberra in March 2019, and the SIT TWS in September 2019. GFOI Plenary 2019 is still being considered with no firm options, but Africa (Nairobi) has been raised.

*Review of Actions*

George and Stephen reviewed the draft actions table.

*Closing Remarks*

Frank Martin and Joanne closed the meeting, reflecting on the progress made by countries and the opportunities presented by the country focus in GFOI Phase 2.

## APPENDIX A - Attendees

*(Days in attendance as noted above.)*

| Organisation | Name |
|---|---|
| CEOS SEO | Brian Killough |
| CEOS SEO/AMA | Sanjay Gowda |
| CEOS SEO/AMA | Shaun Deacon |
| CSIRO | Alex Held |
| CSIRO | Peter Caccetta |
| DLR | Helmut Staudenrausch |
| ESA | Frank Martin Seifert |
| FAO | Erik Lindquist |
| GFOI R&D | Martin Herold |
| INPE | Leila Fonseca |
| INPE | Dalton Valeriano |
| JAXA | Osamu Ochiai |
| JAXA | Ake Rosenqvist |
| JICA | Hiroaki Okonogi |
| Planet | Tara O'Shea |
| RESTEC | Takahiro Endo |
| SDCG Sec | Stephen Ward |
| SDCG Sec | George Dyke |
| UKSA | Joanne Nightingale |
| USGS | Brad Reed |
| WRI | Mikaela Weisse |

## APPENDIX B - SDCG-13 Actions Record

*Action Table*

V1.0

| No. | Action | Due date |
|---|---|---|
| **SDCG-13-01** | Ake to follow-up with Joanne and Alex Held on including details of NovaSAR data access in the SDCG R&D data access procedures. | **SDCG-14** |
| **SDCG-13-02** | Frank Martin, Ake & Martin Herold to work with agencies who have contributed to Element 3 during GFOI Phase 1 to develop a brief strategy paper (2-3 pages) describing the space agency approach to GFOI R&D Coordination Component in GFOI Phase 2. | **April 2018** |
| **SDCG-13-03** | SDCG EXEC to draft a discussion paper on how SDCG and the GFOI Data Component will interact for GFOI Phase 2. For consideration by the community, including CEOS (SIT-33), and also the GFOI Leads. | **April 2018 (Draft for SIT-33 22-24 April)** |
| **SDCG-13-04** | SDCG Co-Chairs to draft a communication congratulating JAXA on the recent changes to their data policy towards free and open access for some products. (CEOS Plenary Presentation) | **April 2018** |
| **SDCG-13-05** | Ake to follow-up with INPE (Joao Soares) on extended CBERS-4 coverage of South America. | **SDCG-14** |
| **SDCG-13-06** | SDCG EXEC to follow-up with CONAE (Laura F) at SIT-33 about the prospects for SAOCOM ARD compliance for general use, and also with a view to SDCG/GFOI uptake. | **SIT-33** |
| **SDCG-13-07** | Osamu to lead the drafting of a proposal for SDCG EXEC to engage CEOS agencies in a Global Baseline strategy for biomass estimation missions. | **April 2018** |
| **SDCG-13-08** | Brian to compile a list of datasets (including ARD), algorithms, and tools relevant for GFOI and MGD workflows as examples to inform the SDCG approach to GFOI Phase 2. (Check old space data services guide PDF.) | **June 2018** |
| **SDCG-13-09** | Brian and Joanne to follow-up with Planet on an ARD assessment of their new Surface Reflectance product (here and here), including sharing the PFS documents with Planet. | **June 2018** |
| **SDCG-13-10** | SDCG EXEC to follow-up on the CEOS ARD feedback forms received at GFOI Plenary. EXEC to suggest any other GFOI Plenary contacts who may be able to provide feedback (e.g. Colombia). | **April 2018** |

| | | |
|---|---|---|
| **SDCG-13-11** | Joanne and Brian to explore CARD4L compliance and the development of a compliance matrix. (Reference LSI information on CARD4L and CEOS ARD provided by Stephen). | **June 2018** |
| **SDCG-13-12** | Joanne to circulate the draft Terms of Reference document captured at SDCG-13 for EXEC feedback and comment. EXEC to comment, for discussion on first post-SDCG-13 telecon. | **April 2018** |
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| **SDCG-13-14** | SDCG EXEC and Osamu to provide feedback, comments, and suggested changes to the revised SDCG 2018-2020 Work Plan Outcomes. (Here.) | **April 2018** |
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| **SDCG-13-16** | SDCG Sec with support of EXEC and Osamu to draft an updated SDCG 2018-2020 Work Plan with a schedule of milestones and reviews for concurrence at SDCG-14. | **SDCG-14** |
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| **SDCG-13-22** | Stephen to follow-up with the GFOI Office on the written summary of the trial Data Component meeting at GFOI Plenary. | **April 2018** |