



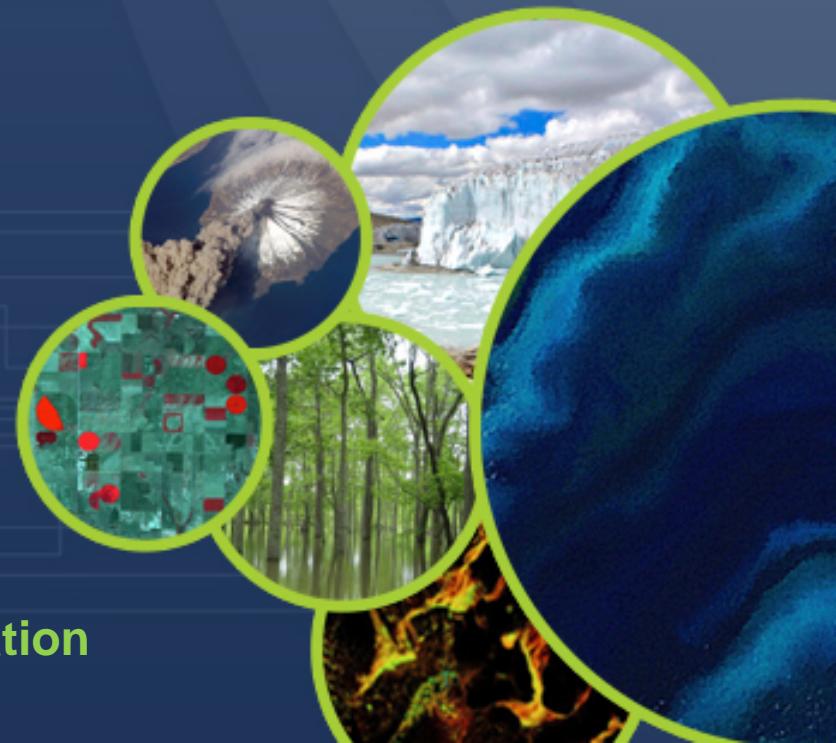
Working Group on Calibration and Validation (WGCV)

Infrared Visible and Optical Sensors (IVOS) subgroup: #27

Nigel Fox

NPL (with UKSA support)

Toulouse, 2015



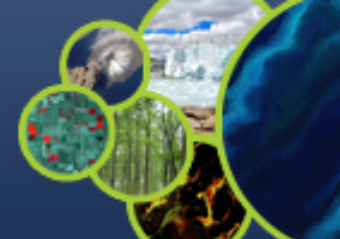
Working Group on Calibration and Validation

20 seconds:

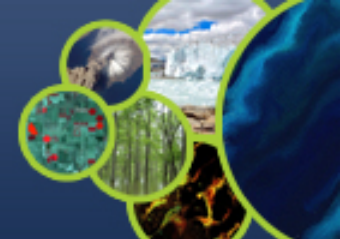
Name

Organisation

Particular specialism / interest



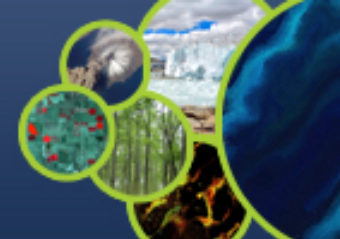
~12:45				Lunch			
14:00	IVOS-27 Main Meeting						
14:00	IVOS chair Intro	Fox	Meeting intro				
	*		<ul style="list-style-type: none"> •→ Brief Introductions •→ Objectives •→ Agenda •→ Actions •→ Terms of reference •→ IVOS report to CEOS WGCV-39 •→ * 				
14:25	CEOS WGCV chair welcomes	Thome on behalf of Von Bartsch	Welcome from CEOS WGCV chairs				
14:30	Vicarious Radiometric Cal/Val of land imagers						
14:30	*	Henry	PICS workshop conclusion (formerly adopt Workshop outputs)				
14:35	*	Bourvet	RadCALnet status *				
15:15	Candidates sites for future Radcalnet expansion *						
15:15	*	Bruegge (JPL)	JPL automated site at RRV *				
15:30	*	Griffith (CSIR)	South African artificial target plans *				
15:45	Break						
16:15	□	Ma (AOE)	Baotou instrumented desert site *				
16:30	Other vicarious cal methods *						
16:30	□	Wagner (Eumetsat)	Status of Lunar calibration projects *				
16:45	□	Wagner (Eumetsat)	Optical sensor monitoring at Eumetsat *				
17:00	Sensor to sensor interoperability/Cross comparison *						
17:00	DISCUSSION	Woolliam (NPL)	Establishing & reporting sensor to sensor harmonization (bias correction) coefficients *				
18:00	END of DAY 1						



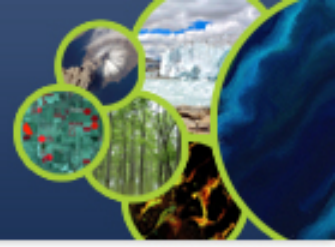
¶ Thursday 19 November			
09:00	09:00	Czaplar-Myers (u of Arizona)	Use of test site for calibration of Landsat 8 OLI and Sentinel 2 MSI
09:20	09:20	Bruegge (JPL)	Use of test site for calibration of OCO2 and GOSAT
09:40	09:40	Gomono (NPL)	Sensor to sensor cross-comparison uncertainty limits
10:00	Sensor in-flight calibration and uncertainty assessment		
10:00	10:00	Lee (Kari)	Kompsat 3A Radiometric Cal/Val
10:20	Break		
10:45	10:45	Xiong (NASA)	Status of S-NPP VIIRS Solar and Lunar Calibration
11:00	11:00	Gomono (NPL)	Radiometric Uncertainty Tool to allow user derived per pixel uncertainty values for Sentinel 2
11:20	11:20	Morfitt (USGS)	Status of Radiometric Cal of Landsat 8 and comparison of OLI with Sentinel 2 MSI
11:40	11:40	CNES	Radiometric image quality of Sentinel 2
12:00	12:00	Poutier (ONERA)	Infrared in-flight Radiometric Calibration
~12:20	Lunch		

13:20		Sensors (new /current status)	
13:20	**	Murakami (JAXA)	JAXA Optical sensors
13:40	**	Goryl (ESA)	Status on Sentinel-3
13:50		Satellite-Surface-temperature-Validation	
13:50	**	Fox (NPL)	Progress on FRM4STS (Miami IV) comparisons for Land, Ocean and Ice temp validation
14:10		GEO-SPATIAL image quality	
14:10	**	Helder (SDSU) / Viallefont (ONERA)	Progress on MTF best practices, test site catalogue etc (summary and conclusion of workshop)
14:50	**	CNES	Sentinel-2 Geometric image quality
15:10		Break	
15:30		Ocean Colour	
15:30	**	Zibordi (JRC)	Uncertainty requirements for in-situ radiometric measurements supporting ocean color system vicarious calibration
15:50	Including Discussion	Zibordi (JRC) / Murakami (JAXA)	IOCCG and OCR-VC updates and status IVOS review of white paper and plans (initiate)

16:30	**	Goryl (ESA)	FRM4SOC (ESA plans to support OC validation)
16:35		Atmosphere effects on Radiometric Cal	
16:35	**	Thome (NASA)	Update on radiometric correction and CEOS WGCV project
16:50	**	Helder (SDSU)	SDSU Modtran atmospheric correction anytime anywhere (SMACAA)
17:10	**	CNES	MACCS: an Operational Atmospheric Correction Tool for SENTINEL-2 and LANDSAT time series
17:30		End of Day 2	



Friday 20 November			
	Formal Welcome and Host Presentation		
09:00		ONERA	Welcome and overview of institute and activities
09:30	WGCV and cross-cutting activities		
09:30	Including Discussion	Thome (NASA) (WGCV vice-chair)	Update on WGCV activities/plans/structure and IVOS inputs/interactions -> Cloud -> DEM -> Carbon strategy -> Climate -> Constellations -> GSICS -> Work plan
	Discussion	Fox	New IVOS and/or collaborative projects WGCV/GSICS And/or Recommendations
10:45	Break		
11:15	Discussion	Goryl (ESA)	Cal Val Portal & communication of groups activities
11:40		CNES/ESA/USGS/NASA/?	Update on status of cross calibration databases and tools
11:45		Fox (NPL)	Review of actions / meeting
12:00		All	Proposal/offers for Next meeting Topics for discussion
12:10		All	AOB
12:30	End of Meeting - Lunch		



- IVOS 26 @ Pasadena hosted by NASA JPL June 4-6 2014
- 22 agency/orgs represented
- All themes and topics (work-plan discussed or summarised)
- **GSICS/IVOS Lunar workshop (Dec 2014)**
- **WGCV special workshop on Cross-cutting projects (Feb 2015)**
- **WGCV 39 (Berlin, May 2015)**
- **MTF workshop (!6 Nov)**
- **PICS workshop (17-18 Nov)**

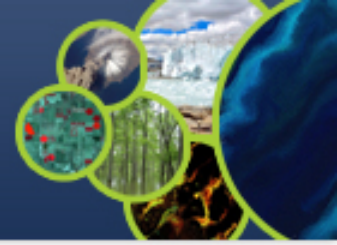


Special Projects:

- **RadCALNet team met Feb 2015 @NPL**
- **Nov 2015 @ CNES**
- **SST/LST comparison (under sponsorship from ESA) now started call for participants**

CEOS WGCV elected a new Vice Chair

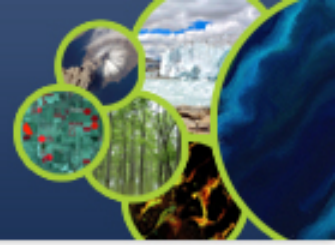
Working Group on Calibration and Validation



Mission

“To ensure high quality calibration and validation of infrared and visible optical data from Earth observation satellites and validation of higher level products”





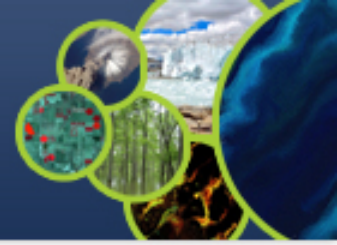
- Promote international and national collaboration in the calibration and validation of all IVOS member sensors.**
- Address all sensors (ground based, airborne, and satellite) for which there is a direct link to the calibration and validation of satellite sensors;**
- Identify and agree on calibration and validation requirements and standard specifications for IVOS members;**
- Identify test sites and encourage continuing observations and inter-comparison of data from these sites;**
- Encourage the preservation, unencumbered and timely release of data relating to calibration and validation activities including details of pre-launch and in flight parameters.**
- In the context of calibration and validation encourage the full consideration of “traceability” in all activities involved in the end-to-end development of an EO product including appropriate models and algorithms.**

To facilitate the provision of 'fit for purpose' information through enabling data interoperability and performance assessment through an 'operational' CEOS coordinated & internationally harmonised Cal/Val infrastructure consistent with QA4EO principles.

- *Pre-flight characterisation & calibration*
- *Test – sites*
- *Comparisons*
- *Agreed methodologies*
- *Community Best Practices*
- *Interchangeable/readable formats*
- *Results/metadata - databases*

Key Infrastructure to be established and maintained independent of sensor specific projects and/or agencies

Work scope: for optical sensors: (land/ocean)



AGENCIES

Pre-flight

Post-launch

On-Board

Vicarious

- Sharing best-practise
- Informal peer review
- Ref stds

Vis Sources
Black bodies
MTF
Spectral
.....

- Sharing best-practise
- Informal peer review
- Ref stds

Diffusers
Black bodies
...

Mission specific

Harmonisation /bias removal

- Sharing best-practise
- Informal peer review
- Tools/infrastructure

- Consistency
- Cost
- Suitability
- Usability

'SHARED'

"Products"

Radiometric

Geometric

"Image quality"

Test-sites / Methodologies

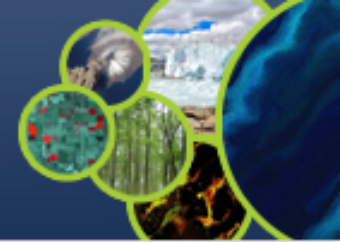
Algorithms/code

- Comparisons
- Traceability

Work plan



CEOS



Structured into themes and led by 'champions' (Plus specific projects)

- Look to develop best practises
- Organise comparisons
- Shared learning (research activities)
- Shared infrastructure / tools / Methods
- Recommendations as needed

Land surface reflectance

- Czapler Myers (U of Arizona USA)

Ocean colour (link to IOCCG, VC-OCR etc)

- Zibordi (JRC, EU) & Murakami (JAXA JPN)

Surface Temperature (link to VC-SST, GHRSSST) - Corlett (U of Leicester, UK)

Geo spatial image quality

- Helder (SDSU, USA) & Viallefont (ONERA F)

Atmospheric Correction (Link to AC subgroup)

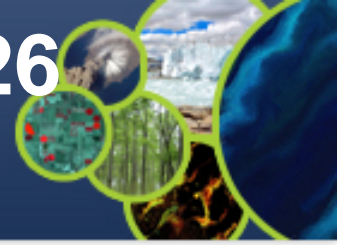
- Thome (NASA, USA)

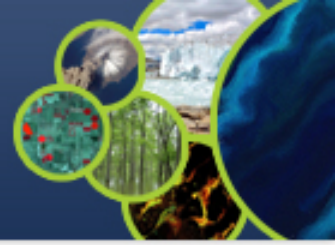
RT codes (context of IVOS use in calibration)

- Widlowski (JRC EU)

Working Group on Calibration and Validation

- **RadCALNet** - Bouvet (ESA)
- **Libya 4 (PICS) (with GSICS?)** - Henry (CNES, F)
- **SST/LST cross-comparison (+ VC-SST & LPV (instrument Cal for LST))** - Fox (NPL, UK)
- **Others in progress/development**
 - **Analysis of comparisons/Uncertainties/establishing and presenting harmonised biases for sensor to sensor comparisons (with GSICS) (including tools/databases)**
 - **Best practise for convolving spectral data sets (solar/surface/sensor bandwidth) (CEOS WGCV (sub-groups) & GSICS)**
 - **Comparison of Rayleigh and Sun-Glint methods**





- **Information exchange between agencies**
 - **Up and down through CEOS**
- **Reporting on progress on projects**
- **Interactions/activities in other related groups**
- **Updates on work-plan / new project ideas/collaborations**
- **Communications**