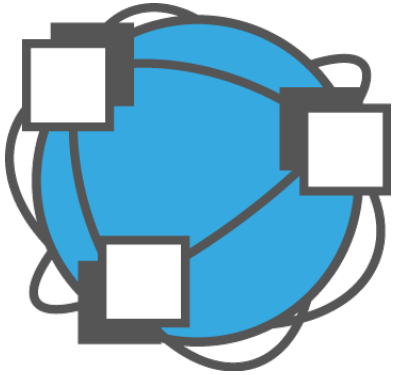
RadCalNet

Status

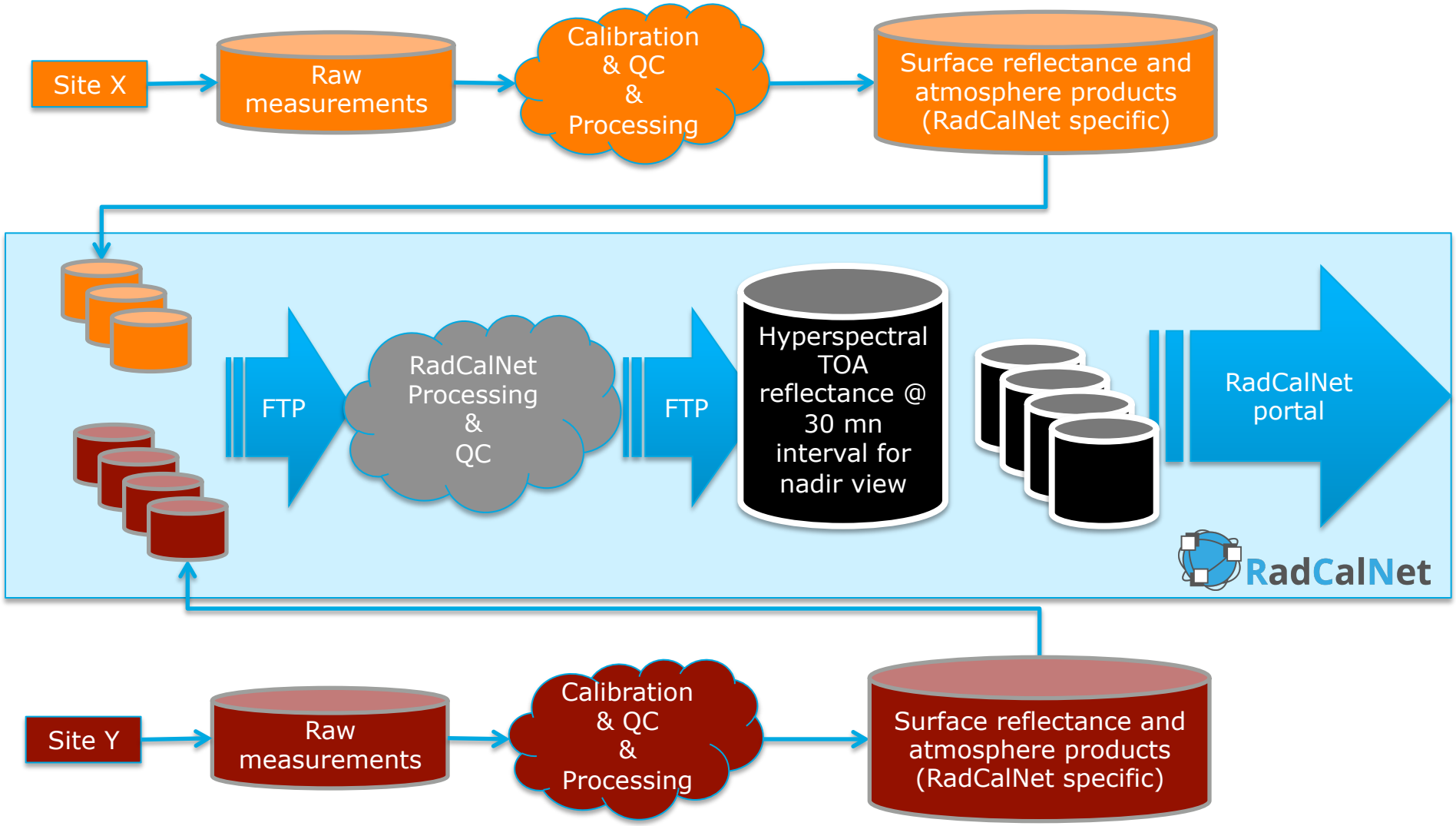


M. Bouvet on behalf of the RadCalNet WG

What is RadCalNet?

RadCalNet is a CEOS WGCV initiative to provide satellite operators with SI-traceable Top-of-Atmosphere (TOA) spectrally-resolved reflectances to aid in the post-launch radiometric calibration and validation of optical imaging sensors from a coordinated network of instrumented land-based test sites.

What is RadCalNet?



Timeline since last WGCV/IVOS meeting at Tucson

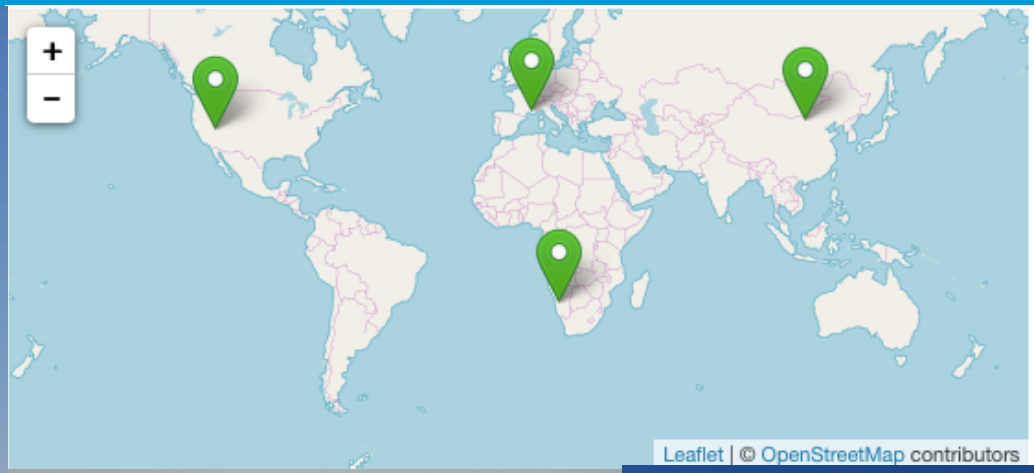
- March 2017: 1st RadCalNet beta user workshop and RadCalNet WG meeting #6 in Tucson
- July 2017: start of operation of new site Gobabeb
- Summer 2017: reprocessing of surface reflectance data from site owners to include additional quality indicators
- September 2017: full reprocessing of RadCalNet TOA reflectance data to propagate uncertainties
- November 2017: 2nd beta user workshop via webex
- March 2018: RadCalNet WG meeting #7 at ESTEC

The sites

- Since last year, efforts dedicated to:
  - ✓ Operationally running the existing sites and instrumentation updates / maintenance
  - ✓ Feeding surface and atmosphere measurements into the RadCalNet processing ‘system’
  - ✓ Defining surface reflectance measurement uncertainties
  - ✓ Start operation at Gobabeb




The sites: Gobabeb



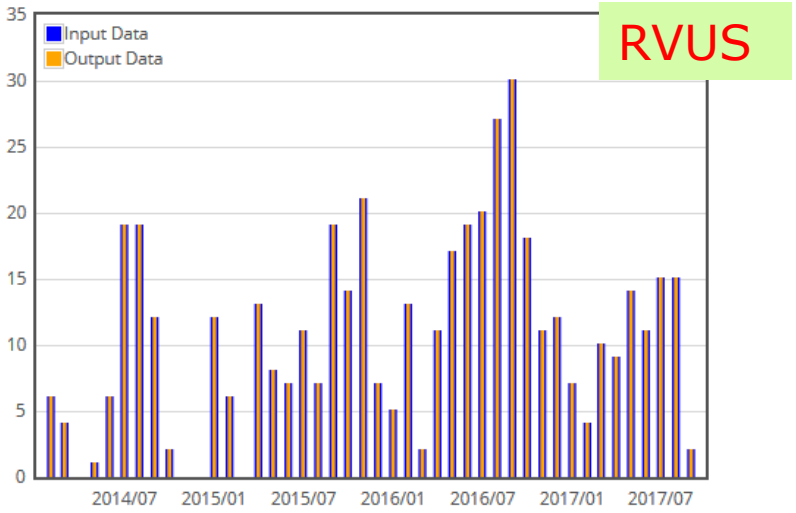
The data availability

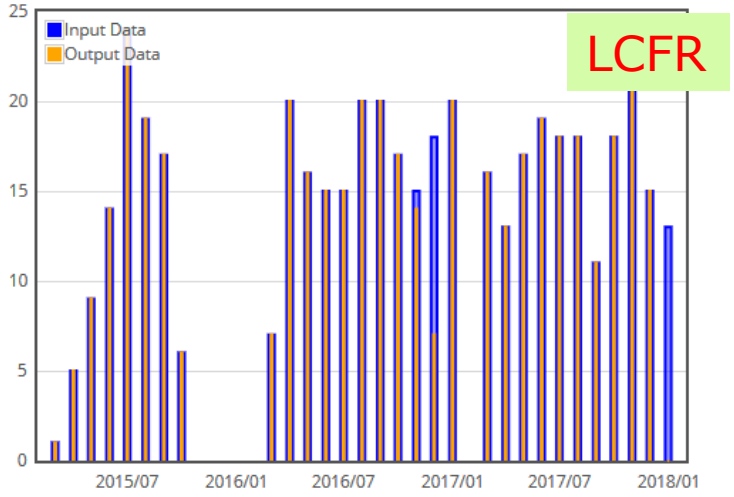
1148 days with BOA reflectances
1104 days with TOA reflectances

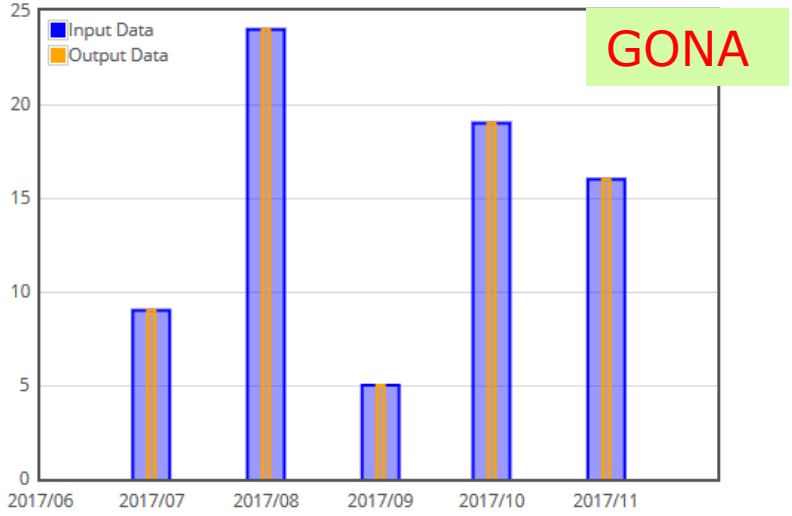
BOA	2014	2015	2016	2017	2018	Total
BTCN	0	5	66	76	5	152
GONA	0	0	0	73	0	73
LCFR	0	95	163	186	13	457
RVUS	69	125	185	87	0	466

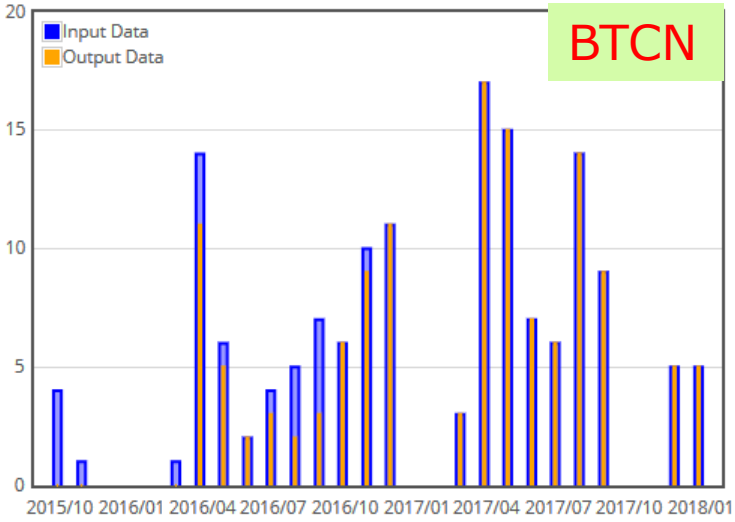
TOA	2014	2015	2016	2017	2018	Total
BTCN	0	0	52	76	5	133
GONA	0	0	0	73	0	73
LCFR	0	95	151	186	0	432
RVUS	69	125	185	87	0	466

The data availability





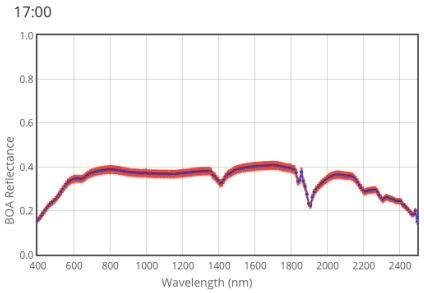




The RadCalNet processing

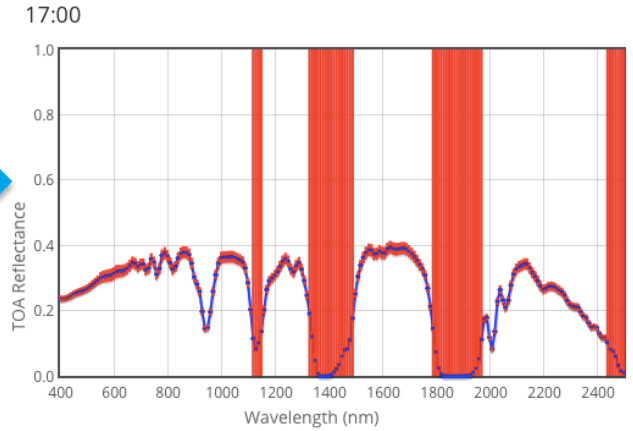
- MODTRAN 5
- TOA reflectance reprocessed last summer to include propagation of the surface / atmosphere uncertainties to TOA uncertainties via pre-computed LUT from Montecarlo MODTRAN runs

Surface reflectance

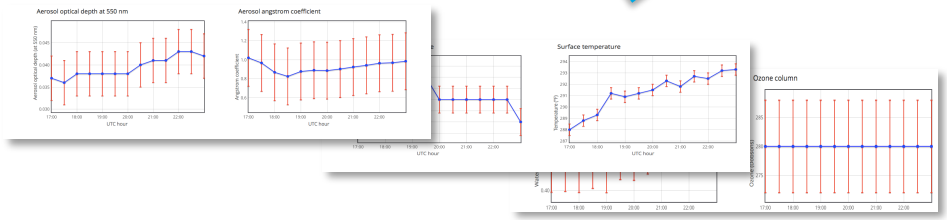


RadCalNet Processing

TOA reflectance

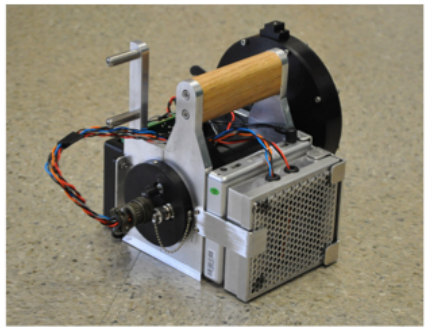


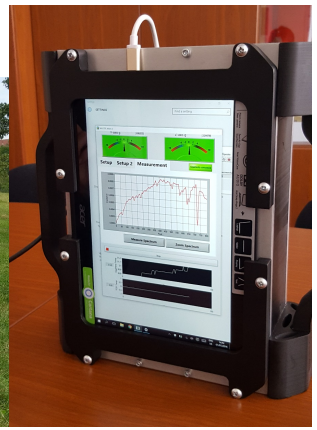
Atmospheric measurements



The BOA intercomparison of RadCalNet surface reflectance using portable transfer radiometers

- Objective: identify site-to-site radiometric differences at surface radiance (reflectance) level
- Status: site visits are in preparation by Univ. of Arizona and NPL





Documentation for users: site questionnaires

Document title	Status
RadCalNet quick start guide	Available on RadCalNet portal
RadCalNet data format and processing	V7 available on RadCalNet portal
RadCalNet data policy	Done – Available on RadCalNet portal
CEOS site questionnaire – Template	V1 available on RadCalNet portal
CEOS site questionnaire - Baotou	Available on RadCalNet portal
CEOS site questionnaire - La Crau	Available on RadCalNet portal
CEOS site questionnaire – Railroad Valley Playa	Available on RadCalNet portal
CEOS site questionnaire – Gobabeb	Available on RadCalNet portal (version 28 Jun 2016) but being updated to reflect start of operations
Paper on measurement uncertainties - Baotou	Submitted version under review by RadCalNet WG
Paper on measurement uncertainties - La Crau	Submitted version under review by RadCalNet WG
Paper on measurement uncertainties – Railroad Valley Playa	Submitted version under review by RadCalNet WG
Paper on measurement uncertainties – Gobabeb	Submitted version under review by RadCalNet WG

Documentation for candidate site owners: general documentation

Document title	Status
Requirement Document: membership criteria	Done – Available on RadCalNet site
Requirement Document : site data provision	In preparation
Good Practice Guide 1: site selection	In preparation
Good Practice Guide 2: site characterisation	In preparation
Good Practice Guide 3: site instrumentation and data processing	In preparation
Good Practice Guide 4: site quality assurance	In preparation

The portal

RadCalNet | CEOS Committee on Earth Observation Satellites | esa

Welcome to the Radiometric Calibration Network portal

The portal provides access to all RadCalNet datasets, allowing users to visualize and download data acquired by the four instrumented reference test sites.

- University of Arizona's site at Railroad Playa, Nevada, USA,
- AoE's site at Baotou, China,
- the CNES site at La Crau, France,
- the new ESA/CNES site in Gobabeb, Namibia.

These test sites provide nadir-view top-of-atmosphere reflectance at 30 minute intervals from 9am to 3pm local standard time at 10 nm intervals from 400 nm to 2500 nm. This is calculated from ground nadir-view reflectance measurements, and atmospheric measurements such as surface pressure, columnar water vapour, columnar ozone, aerosol optical depth and the Angstrom coefficient. Correction to top-of-atmosphere will be performed for all sites in the same way using Modtran.
The data are provided in a text format, defined in RadCalNet_File_Specs_v7.pdf.
To download data from a site, please select a site.
To download complete data sets, please press the hyperlink download all data. Users are also asked to consider RadCalNet data policies especially providing appropriate citations when displaying data downloaded from this site.
A quickstart guide for new users is available here : RadCalNetQuickstartGuide_20180312.pdf.

20-Nov-2017 *The RadCalNet project status was presented at Workshop #2. Presentations available on RadCalNet Documents/ Intercomparison Reports folder.*
02-Fev-2017 *RadCalNet file specification has been updated to describe the MODTRAN data processing.*

Please select a site :

- Railroad Valley Playa
- La Crau
- Gobabeb
- Baotou

RadCalNet Documents

Contact Admin

The portal

RadCalNet

CEOS

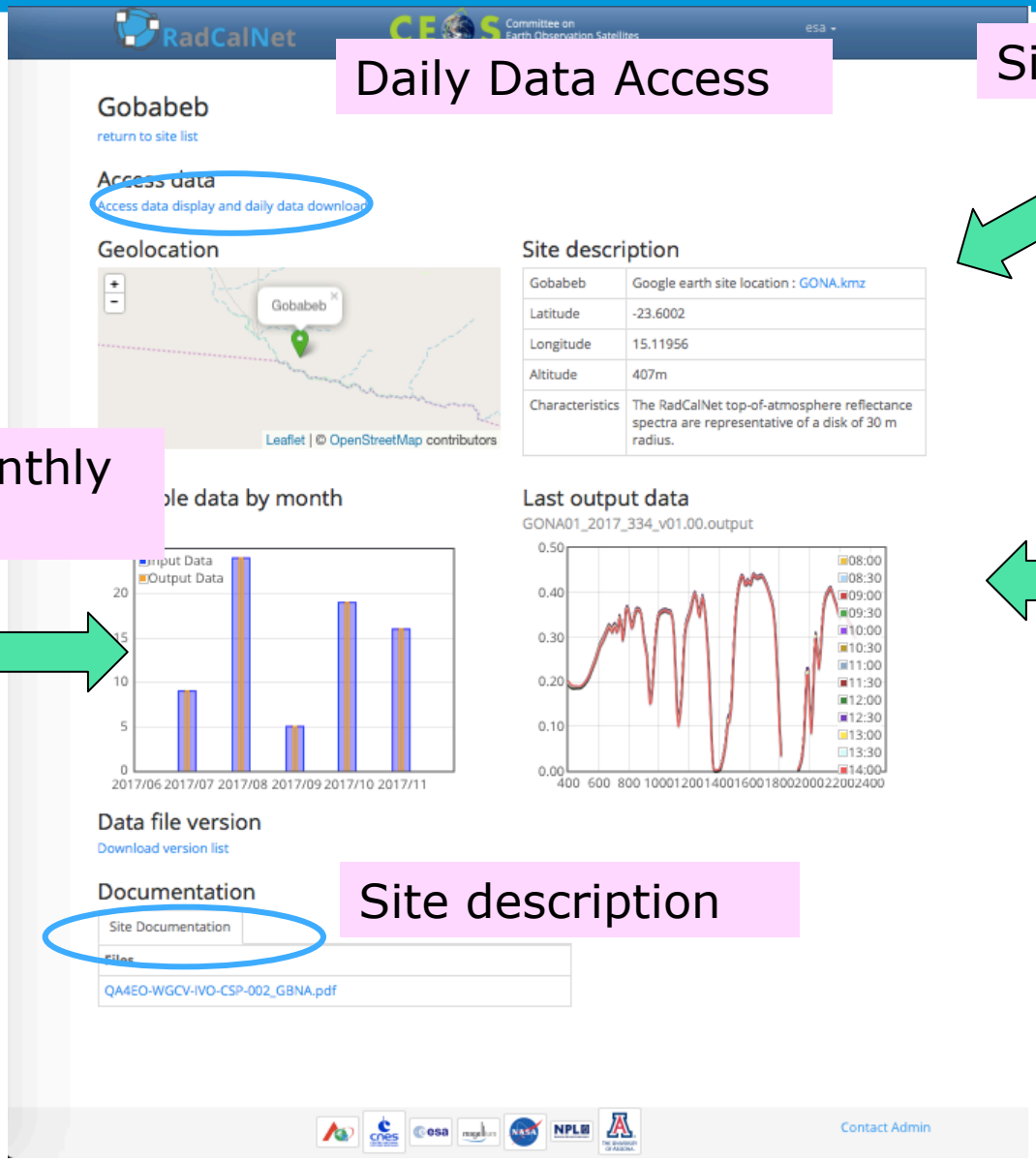
Daily Data Access

Site Characteristics

Dataset monthly availability

Last Spectrum

Site description



The portal

RadCalNet

CEOS Committee on Earth Observation Satellites

esa

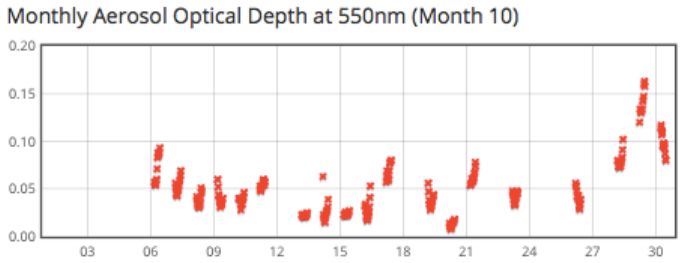
Gobabeb

return to site description

Data

October 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
01	02	03	04	05	06	07
08	09	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	01	02	03	04
05	06	07	08	09	10	11



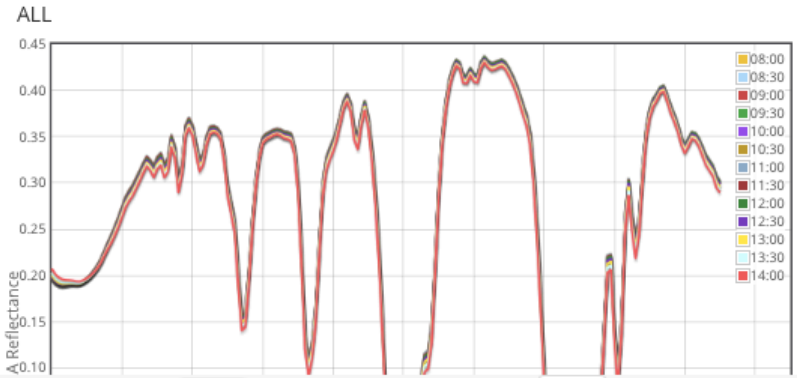
All TOA simulations available for this day (every 30 mins between 9:00 and 15:00 Local Standard Time)

TOA simulations only partially available for this day

Download daily data for all instruments

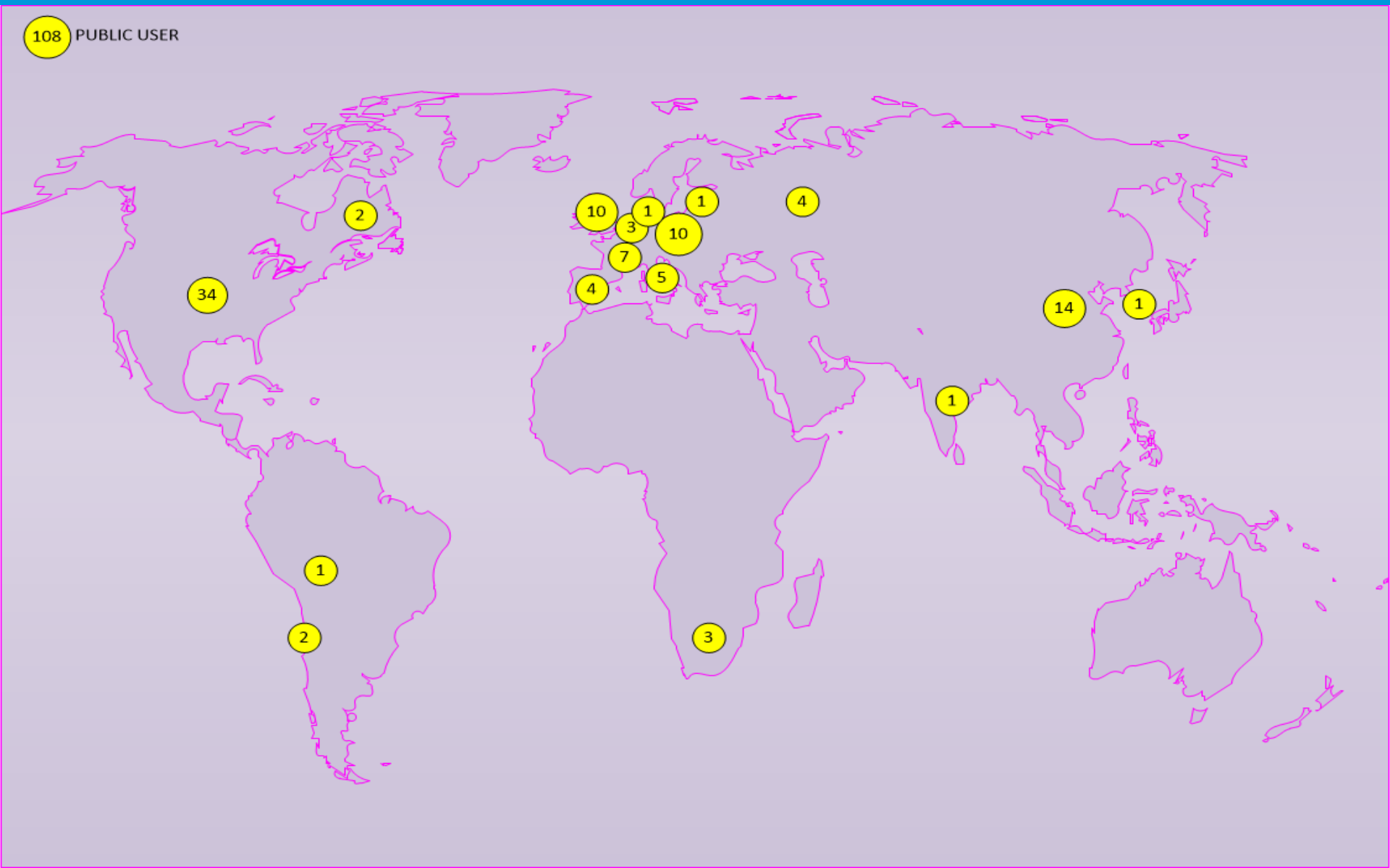
Sensor : 01 Input version : 00 Output version : 01

Atmospheric parameters | BOA Reflectance | TOA Reflectance



Contact Admin

Candidate public user



Current beta users

- *Dove Constellation (N. Wilson)*
- *Proba-V (S. Adriaensen) (and S. Sterckx remotely)*
- *Sentinel-2 (B. Alhammoud)*
- *Rapideye Constellation (A. Brunn)*
- *GOES-13/15 (X. Wu)*
- *Landsat 7/Landsat 8/Sentinel-2 (D. Helder and X. Jing)*
- *CBERS04, ZY02C, ZY3, GF1 and GF2 satellites (Q. Han)*
- *Digital Globe sensors (T. Ochoa)*
- *MISR (C. Bruegge)*
- *…*

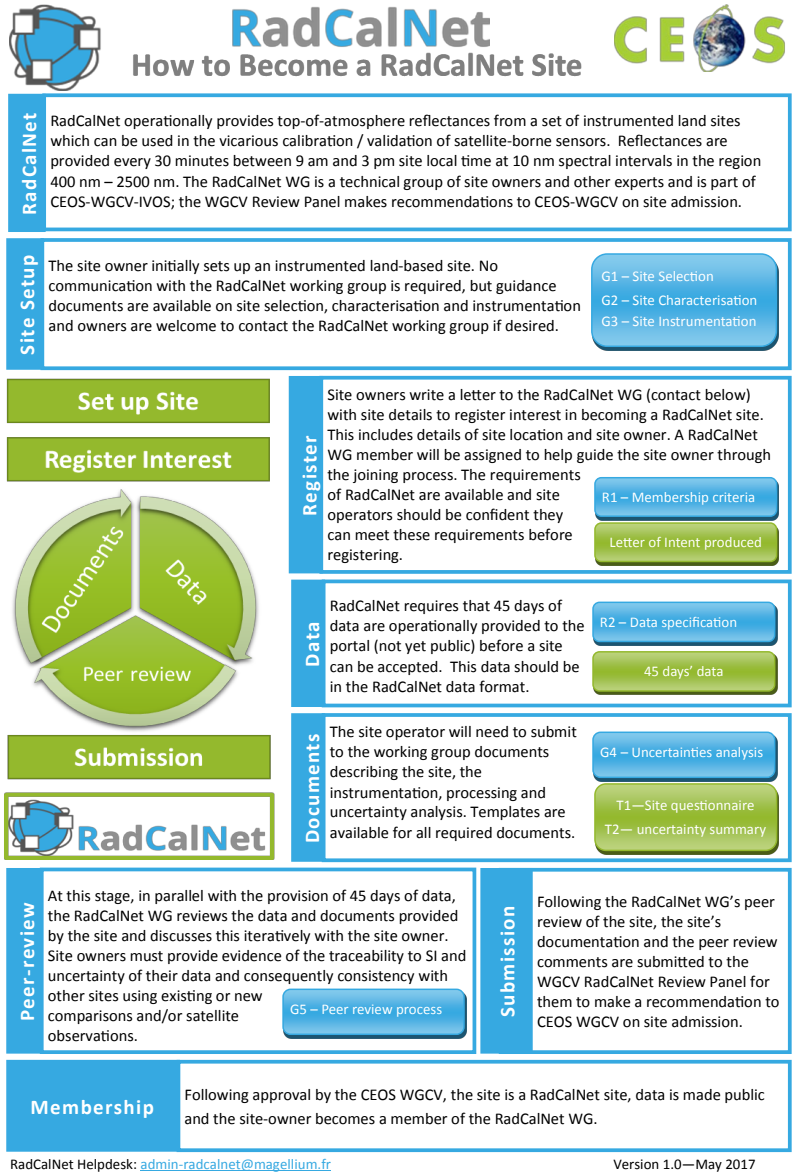
Beta Users Workshops Summary

- Beta users have expressed their interest in using RadCalNet data to support their operational sensor in-flight radiometric performance assessment (e.g.: Planet Labs)
- Beta users are being very instrumental in suggesting and pushing for improvements of what RadCalNet delivers
- Overall satisfied by the portal functionalities and documentation
- Beta users have carried out comparisons of RadCalNet TOA reflectance to space sensor measurements that give us some degree of confidence on RadCalNet data

Comparison of RadCalNet TOA reflectances to space sensor measurements

- Differences observed by beta users in indirect comparisons between RadCalNet TOA reflectance and sensor measurements are <10%
- Indirect comparisons suffer limitations due to BRDF effects and spectral sampling / resolution of the RadCalNet TOA reflectance in spectral regions with strong gaseous absorption
- Users are encouraged to look at TOA reflectance uncertainties and/ or contact site owners when needing fitter for purpose data
- Ongoing discussions in RadCalNet WG on trade-off between making data directly useful for comparisons of RadCalNet data to all sensors vs. some sensors => Trade-off on: data volume, complexity of data processing and distribution, 'getting something out there or wait until it's perfect', providing working opportunities to site owners

Acceptance process for new sites



- Process overseen by WGCV
- Through an acceptance pannel reporting to WGCV

Next steps

- Continue operation at the sites and on the portal for beta users
- Improve data latency
- Improve documentation: site data uncertainty statements, guideline documents for candidate sites.
- The 4 prototype sites are about to go through the formal RadCalNet acceptance process of WGCV
- RadCalNet open to the public

Questions?