Catalog of Worldwide Test Sites for Sensor Characterization

http://calval.cr.usgs.gov/sites_catalog_map.php

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Scope of Test Sites

- Test sites are central to any future Quality Assurance/Quality Control (QA/QC) strategy
- Test sites provide a convenient means of obtaining information to verify sensor performance
- Test sites are the only practical means of deriving knowledge of biases between sensors
- Test sites allow, at some level, a means of bridging anticipated data gaps caused by lack of measurement continuity, due to lack of co-existent in-flight sensors

Characteristics of Sensors which can Benefit from Test Sites

- Gain
- Stability
- Modulation Transfer Function (MTF)
- Uniformity
- Stray light
- Polarization
- Spectral
- Signal-to-Noise Ratio (SNR)
- Geolocation
- Camera model
- Band-to-band
- Internal Geometry

Well-Established Site Selection Criteria for Radiometry Test Sites

- High spatial uniformity over a large area (within 3%)
- Surface reflectance [0, 1] greater than 0.3
- Flat spectral reflectance
- Temporally invariant surface properties (within 2%)
- Horizontal surface with nearly lambertian reflectance
- At high altitude, far from ocean, urban, and industrial areas
- In arid regions with low probability of cloud cover

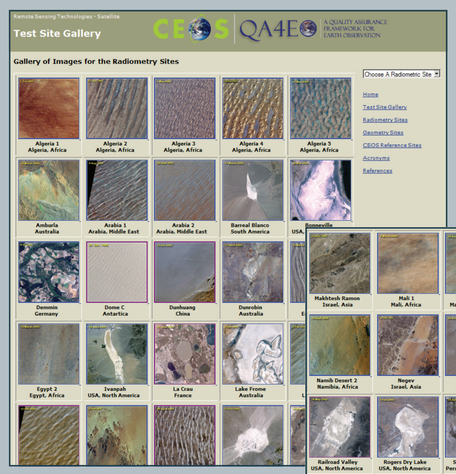
CEOS Reference Standard Test Sites

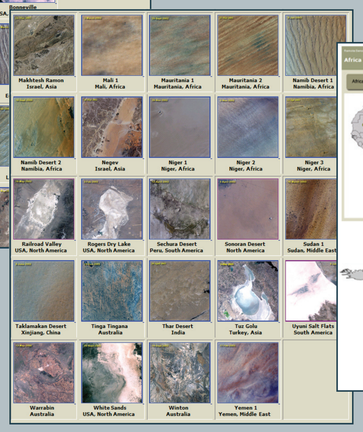
- The instrumented sites are primarily used for field campaigns to obtain radiometric gain. These sites can serve as a focus for international efforts, facilitating traceability and cross-comparison to evaluate biases of in-flight sensors in a harmonized manner
- The pseudo-invariant desert sites have high reflectance with low aerosol loading and practically no vegetation. Consequently, these sites can be used to evaluate the long-term stability of a sensor and facilitate cross-comparison of multiple sensors

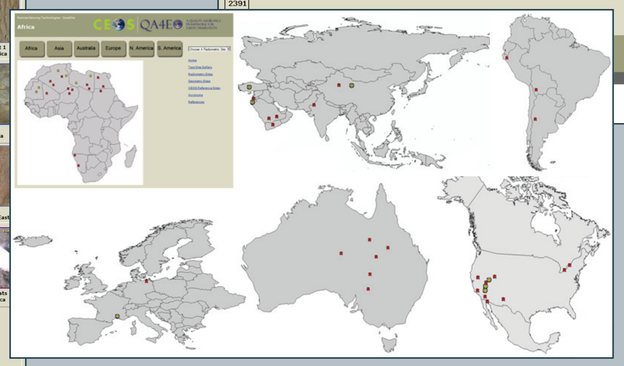
CEOS Reference Standard Test Sites

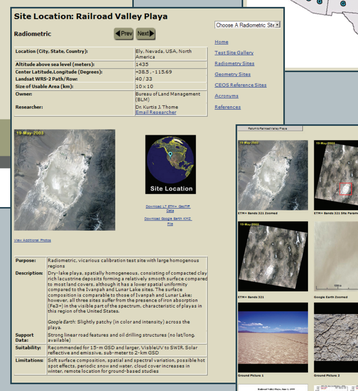
#	Site	Center Latitude	Center Longitude	WRS-2 Path/Row	Point of Contact (POC)	Affiliation	Email
				Instrumented Sites			
1	Dome C, Antarctica	-74.50	123.00	88 / 113	Stephen Wanner	University of Washington	wanner@atmos.washington.edu
2	Dunhuang, China	40.13	94.34	137 / 32	Xiuqing Hu	NSMC/CMA	huxq@cma.gov.cn
3	Frenchman Flat, USA	36.81	-115.91	40 / 34	Kurtis J. Thome	NASA/GSFC	kurtis.thome@nasa.gov
4	Railroad Valley, USA	38.50	-115.69	40 / 33	Kurtis J. Thome	NASA/GSFC	kurtis.thome@nasa.gov
5	La Crau, France	43.56	4.86	196 / 30	Patrice Henry	CNES	patrice.henry@cnes.fr
6	Negev, Southern Israel	30.11	35.01	174 / 39	Arnon Karnieli	Ben Gurion University	karnieli@bgu.ac.il
7	Railroad Valley Playa, USA	38.50	-115.69	40 / 33	Kurtis J. Thome	NASA/GSFC	kurtis.thome@nasa.gov
8	Tuz Golu, Turkey	38.83	33.33	177 / 33	Selime Gürol	TUBITAK UZAY	selime.gurol@uzay.tubitak.gov.tr
				Pseudo-Invariant Test Sites			
1	Libya 4	28.55	23.39	181 / 40	Patrice Henry	CNES	patrice.henry@cnes.fr
2	Mauritania 1	19.40	-8.30	201 / 47	Patrice Henry	CNES	patrice.henry@cnes.fr
3	Mauritania 2	20.55	-10.16	202 / 46	Patrice Henry	CNES	patrice.henry@cnes.fr
4	Algeria 3	30.92	7.09	192 / 39	Patrice Henry	CNES	patrice.henry@cnes.fr
5	Libya 1	24.42	13.35	187 / 43	Patrice Henry	CNES	patrice.henry@cnes.fr
6	Algeria 5	31.02	2.23	199 / 39	Patrice Henry	CNES	patrice.henry@cnes.fr

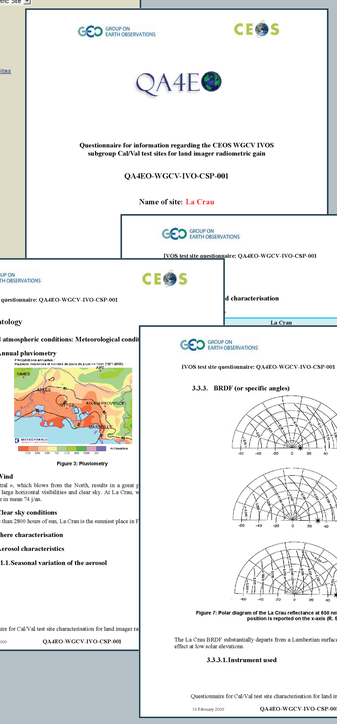
Online Test Site Catalog











Summary

- The test site catalog provides a comprehensive list of prime candidate terrestrial targets for consideration as benchmark sites for the postlaunch calibration of space-based optical sensors
- The online test site catalog provides easy public Web site access to this vital information for the global community
- The incompleteness of available information on even these prime test sites is an indication that much more coordination and documentation are still needed to facilitate the wider use of calibration test sites in remote sensing

Proposed Future Plans

- Gather complete site characterization data & define core measurements (eg. Instruments)
- Create an operational network of land sites ("Landnet") & develop online data access infrastructure
- Encourage agencies to acquire, archive, and provide data over the CEOS sites
- Integrate the catalog into the CEOS Cal/Val portal
- Establish traceability chain for primary site data
- Develop "best practice" guidance on site characterization and its use