



OSCAR

Observing Systems Capability Analysis
and Review Tool

- User Manual -

Updated in August 2013

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INTRODUCTION

This document describes and explains the functionality of the web-based interface of the **Observing Systems Capability Analysis and Review Tool (OSCAR)** for the general public. This manual is complemented by the special **OSCAR/Requirements Manual for Focal Points**, which specifically targets users with a dedicated account who are responsible for maintaining observation requirements in their respective area.

OSCAR is a resource provided by WMO in support of Earth Observation studies and global satellite mission coordination. The information contained in OSCAR is updated by the WMO Secretariat to the best of its knowledge, in close cooperation with space agencies. However, satellite systems and plans are continuously evolving. Neither WMO, nor the space agencies, nor any of their employees or contractors, makes any warranty on the data contents, or any assumed legal liability for the accuracy, completeness, or usefulness of this information.

It is underlined that the assessments contained in OSCAR are performed according to objective criteria, based on instrument design characteristics, and submitted to validation by international expert teams (primarily the WMO/CBS Expert Team on Satellite Systems). These assessments only reflect a relative, and generally qualitative, evaluation. This first level analysis does not replace a detailed analysis of instrument performances or a detailed evaluation of the quality of derived environmental data records for a specific user application.

Information contained in OSCAR may be used freely. Publications using information from OSCAR should acknowledge WMO.

System Requirements

The web-application is platform-independent, and can be accessed with any recent web-browser. JavaScript and Cookies need to be enabled for proper functionality. The application has been tested and is known to work with Internet Explorer 7 or higher, Firefox 4 or higher, Chrome and Safari. The application is simply started by accessing the URL, accessible under <http://www.wmo.int/oscar/>.

Basic Structure

OSCAR as shown in Figure 1 consists of three modules, Observation Requirements, Satellite Capabilities, and Surface-based capabilities. These modules can be accessed by the general public via one single web-interface. Users with special rights, such as WMO Focal Points or Administrators are able to maintain data in their respective field. Currently only Observation Requirements and Space-based capabilities have been implemented; the third component, Surface capabilities is still being designed and is planned to become operational in 2015.

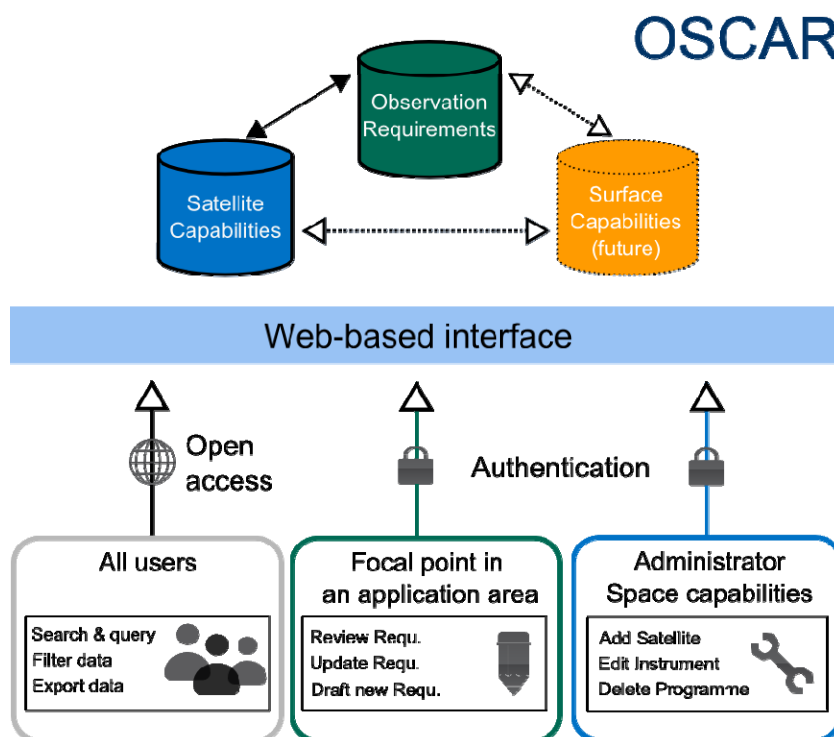


Figure 1 Basic Structure of OSCAR and examples of access

USING OSCAR

Home Page and Navigation

The first page users see consists of the head section (indicated as the green box in Figure 2), which includes a simple navigation bar and the login for registered users. This head section stays the same throughout OSCAR and allows direct access to all core content. The three main modules can be accessed from the navigation bar.

The content section (shown in red box) provides basic information about OSCAR

O.S.C.A.R.
Observing Systems Capability Analysis and Review Tool

Home | Observation Requirements | Satellite Capabilities | Surface-based Capabilities

Welcome to OSCAR

OSCAR is a resource developed by WMO in support of Earth Observation applications, studies and global coordination.

It contains quantitative user-defined requirements for observation of physical variables in application areas of WMO (i.e. related to weather, water and climate). OSCAR also provides detailed information on all earth observation satellites and instruments, and expert analyses of space-based capabilities.

The tool constitutes a building block of WMOOS and more specifically, the so-called [Rolling Requirements Review process](#). OSCAR targets all users interested in the status and the planning of global observing systems as well as data users looking for instrument specifications at platform level. To continue, please select one of the following modules:

- ⇒ [Observation Requirements](#)
- ⇒ [Satellite Capabilities](#)
- ⇒ [Surface based Capabilities](#) (future module, not yet available)

Each of the modules can be consulted individually, however, the tool is also designed with the goal to integrate user requirements with actual capabilities. This facilitates the Rolling Requirements Review process, comparing "what is required" with "what is, or will be available", in order to identify gaps and support the planning of integrated global observing systems.

The tool is being further developed, and additional functionality and information will be added as appropriate. One future objective is to automatically generate first-level analyses of compliance between the quantitative requirements and the actual capabilities (space- or surface-based).

Please provide feedback to the WMO Space Programme Office nhetlich@wmo.int

Getting started

- ⇒ Watch the [10 minute OSCAR screen-cast](#) to get an overview of the application and learn how to use its functionalities (no audio)
- ⇒ Download the [OSCAR user manual](#) (400 kbyte)
- ⇒ More detailed explanations can also be found in the [Help Section](#)

OSCAR Screencast
Running Time: about 10min

Figure 2: Home Page of OSCAR

Accessing factual data

There are 2 general ways of accessing data in OSCAR, either through a the “**quick search**” – helpful if searching for any particular Variable, Instrument, Satellite etc, or via the **full data tables**, if the objective is to get an overview over multiple data items.

“Quick Search”

The quick search box is located in the right top header, and is available in both modules, but not on the homepage. This free-text search field (Figure 3) expects the name or partial name of either

- **Variable or Application Area** (when in the *Observing Requirements* module)
- **Satellite, Programme, Instrument, Instrument type, Capability, Space Agency or Variable** (when in the *Satellite capabilities* module)

The search will presents possible matches in a structured list while typing. The search is started as soon as at least 2 characters are entered in the field.

The “quick search” not only takes the acronym and name fields into account, but also the description field (if such information is available). Therefore it is also possible to use keywords, if the exact name of an item is not known. For example, the term “lightning” will return the instrument “LMI”.

As Figure 3 shows, the Search instantaneously returns some suggested results, trying to “guess” the users intention (in this case, searching for “Aerosol Effective Radius”). As soon as these results pop up, it is possible to directly click on any item, which takes the user to the required page.

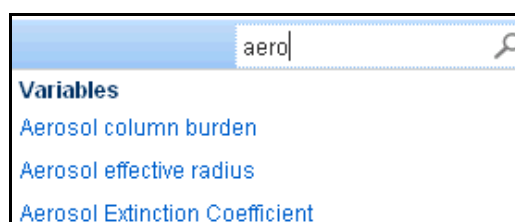


Figure 3: Free Text Search, searching for Term "aero"

Note

The “quick search” is **context-sensitive**, which means it only searches through the data items that are part of the currently selected module (e.g. variables, application areas for OSCAR/Requirements; Satellites, Instruments, Space agencies, Variables etc. for OSCAR/Space)

The quick search is not **case-sensitive**, i.e. **Aerosol** and **aerosol** will return the same results.

Working with the full data tables

Another way of accessing the content of OSCAR is by navigating through the submenu of each module of the tool (Figure 4). This option offers tabular access to all available data, i.e. all Variables, Satellites, Instruments, and Application Areas etc. with respective links to more detailed pages.



Figure 4: Observation Requirements Sub-menu

Filtering

Instead of browsing through the entire table, there is the possibility to use the “**Filter**” option(s) provided for most tables to pre-select items which are of most interest. Figure 5 shows the use of the filter option on the Satellite page.

Figure 5: Filter options of the Satellite page

In this example, three types of different filters are provided: By year of operation, orbit in which the satellite is flying and by agencies which are involved in the mission. All available filter options can be combined to create complex conditions such as

Show all currently active Satellites in GEO or Drift Orbit, operated by NOAA or CMA

Note:

Generally, if no item is selected, all are returned.

The **export functionality** takes the current filter into account


Sorting

In tables data can be sorted in ascending and descending order where indicated by small arrows, (red circle in Figure 6). Sort direction is changed by clicking on the respective column head.

Variable name	Theme
Accumulated precipitation (over 24 h)	Clouds and precipitations
Aerosol Absorption Optical Depth	Aerosols and radiation
Aerosol Extinction Coefficient	Aerosols and radiation

Figure 6: Detailed view of Table, with sort options in columns

Export

All Tables indicated with  **Export** (such as Requirements, Variables, Themes, Satellites, Instruments etc.) can be downloaded and saved in .xlsx Format, a native Office 2007 format, which can be read by most other spreadsheet software. These files are automatically generated and thus reflect the current status of the Database. The export function also takes the current filter status into account. Please note that the generation of a large table might take a few seconds.

Detail pages

All data items, such as Variables, Requirements, Instruments or Satellites have their own dedicated detail pages which are accessible through a unique URL (and can thus be bookmarked). These pages can be accessed directly through the quick search, but also from the tables. Detail pages contain all information that is available, e.g. in the case of a satellite, there can be many additional details that are not shown in the overview tables, such as comments on status, frequencies used for downlink, the field of view etc.

Variable: Aerosol Extinction Coefficient ◀ ▶

Definition

Full name	Aerosol Extinction Coefficient		
Definition	3D field of spectral volumetric extinction cross-section of aerosol particles.		
Measuring Units	m ⁻¹	Uncertainty Units ⓘ	m ⁻¹
Horizontal Res Units	km	Vertical Res Units	km

Comment: The scattering and absorption components of aerosol extinction coefficient are called "aerosol scattering coefficient" and "aerosol absorption coefficient" May be specified as a size-dependent quantity.

Last modified:

Classification

- Domain: [Atmosphere](#)
- Theme: [Aerosols and radiation](#)
- Variable: Aerosol Extinction Coefficient
- Measured in Layers:
 - HS&M
 - LS
 - HT
 - LT
- Used in Application Areas:
 - [Climate-AOPC](#)

Requirements defined for *Aerosol Extinction Coefficient* (4)

This table shows all known Requirements defined for this variable area. For more operations/export, please go to the main [Requirements page](#)

Note: In reading the values, goal is marked **blue**, breakthrough **green** and threshold **orange**

Id	Layer	Application Area	Uncertainty	Horizontal Resolution	Vertical Resolution	Observing Cycle	Availability	Conf Level	Val Date	Source	Comment
55	HS&M	Climate-AOPC	1e-05 m ⁻¹ 1.5e-05 m ⁻¹ 2e-05 m ⁻¹	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	
56	HT	Climate-AOPC	1e-05 m ⁻¹ 1.5e-05 m ⁻¹ 2e-05 m ⁻¹	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	
57	LS	Climate-AOPC	1e-05 m ⁻¹ 1.5e-05 m ⁻¹ 2e-05 m ⁻¹	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	
58	LT	Climate-AOPC	1e-05 m ⁻¹ 1.5e-05 m ⁻¹ 2e-05 m ⁻¹	10 km 20 km 100 km	0.5 km 0.65 km 1 km	24 h 2 d 7 d	7 d 14 d 60 d	reasonable	2007-07-19	AOPC	

Figure 7: Detail page: All information on a specific variable

Expert analysis tools

Oscar also serves as a first level analysis tool providing expert assessments on the relevance of the various instruments to fulfil particular missions, or for measuring particular variables. However, this should only be seen as a starting point for more detailed, specific studies. The following has to be kept in mind:

- OSCAR assessments are based on instrument categories rather than individual instruments
- OSCAR assessments are primarily based on instrument design features, and do not take into account other important criteria such as: instrument operational status, calibration, actual data availability, etc

This choice was made deliberately, in order to limit the scope of OSCAR to what is thought to be maintainable by the WMO Secretariat and its Expert Groups. Reference should be systematically made to satellite operators' websites for updated status information.

Two kinds of expert assessments are currently provided:

Capability review

This is an internal tool for WMO Members. It refers to the list of capabilities identified either in the WMO Vision of Global Observing Systems for 2025, or to the Implementation Plan for Evolution of Global Observing Systems. The “rating” of instruments is a simplified index, limited to five levels, that is used to identify which classes of instruments are most suitable to provide the capability identified in WMO plans, and to evaluate the status of implementation of these plans.

To see instruments contributing to a particular capability and their evaluation against the reference observation strategy, as established by the CBS Expert Team on Satellite Systems (ET-SAT), one can select that capability (red circle Figure 8).

Capability	Definition
Multi-purpose VIS/IR imagery from LEO	This capability consists of medium-resolution multi-channel radiometers operating in the VIS and IR parts of the spectrum in Low Earth Orbit.
Multi-purpose VIS/IR imagery from GEO	This capability consists of medium-resolution multi-channel radiometers operating in the VIS and IR parts of the spectrum, in geostationary orbit.
IR temperature/humidity sounding from LEO	This capability consists of medium spectral resolution spectrometers or radiometers operating in the IR part of the spectrum, in Low Earth Orbit.
IR temperature/humidity sounding from GEO	This capability consists of medium spectral resolution spectrometers or radiometers operating in the IR part of the spectrum, in geostationary orbit.
MW temperature/humidity sounding from LEO	This capability consists of MW radiometers supporting the IR sounder for nearly-all-weather conditions, in Low Earth Orbit.

Figure 8: Capability Review

Gap Analyses by Variables

The Gap Analysis by Variable is based on an expert assessment of the relevance of each instrument for the measurement of particular geophysical variables. This tool can be used to draw measurement timelines by specific Variables, by selecting a theme (E.g. Atmosphere, Land, Ocean) and the particular variable. The resulting data (Figure 10) can be sorted by clicking on the header columns (e.g. satellite, instrument, year, etc). Filtering by satellite or instrument is also possible.

Variable selection

Basic atmospheric

Atmospheric temperature
Height of the top of PBL
Height of the tropopause
Specific humidity
Temperature of the tropopause
Wind (horizontal)
Wind vector over the surface (horizontal)

Figure 9: Selecting a Variable and Theme for Gap Analysis

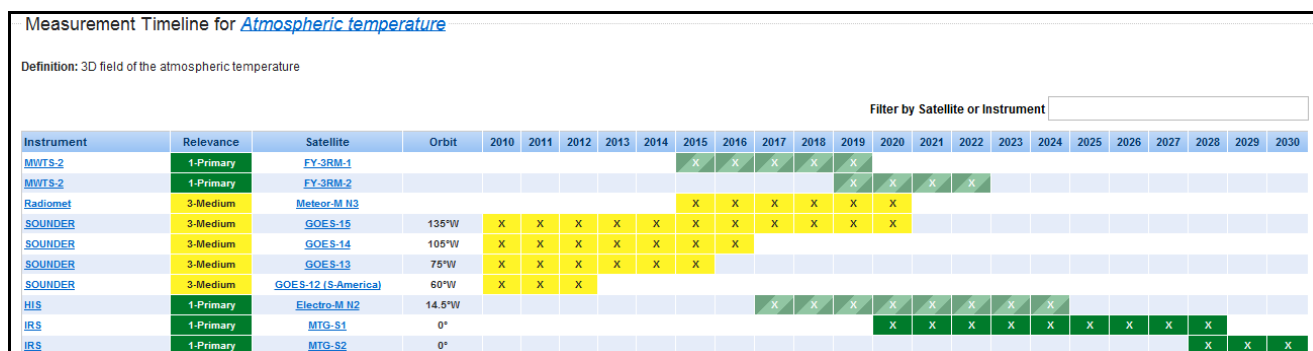


Figure 10: Result of a Gap Analysis

Note: Instruments to fly on satellites which are not firmly planned are shaded with stripes in the table. A warning icon (⚠) indicates a degraded satellite. Hover over the icon or select the satellite to see details on the type of degradation