ANNEX III. OSCAR/REQUIREMENTS

The OSCAR tool provides three separate databases: OSCAR/Requirements, OSCAR/Space and OSCAR/Surface. This Annex provides further information about OSCAR/Requirements.

As was illustrated in **Figure 3**, three basic elements are needed to express a requirement in the OSCAR/Requirements database: who wants the observation, what is the observation (the combination of a geophysical variable and the place/s where it is to be observed), and the performance level required for this observation for this user. Further details of the main parameters used are provided in **Figure III.1**. Some elaboration on some parameters is provided here – further details may be found on the OSCAR website at: https://space.oscar.wmo.int/

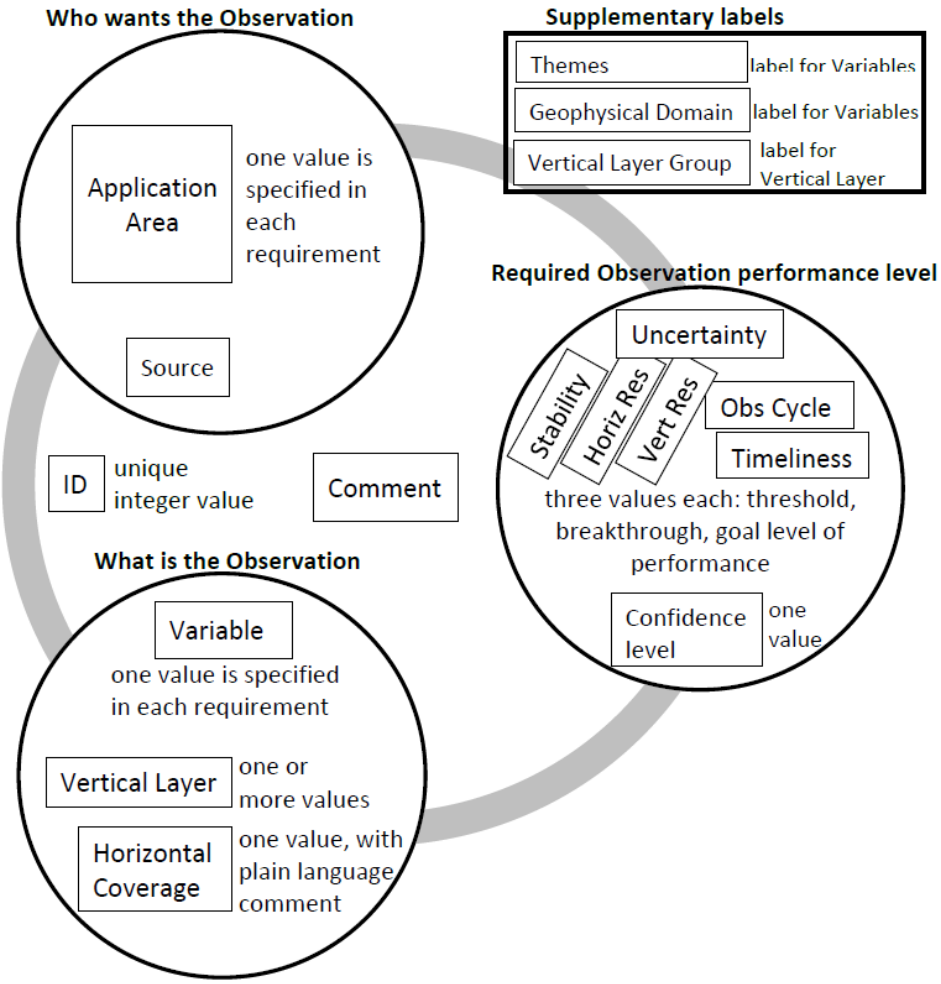

Figure III.1: Schematic diagram of the basic structure and main parameters used to express a requirement for an observation in the OSCAR/Requirements database.

Who wants the observation

This is one of the Application Areas and may be elaborated further with a comment, for example to identify a specific activity within the overall Application.

What is the observation

This combines a geophysical variable, selected from OSCAR's defined list containing 318 variables (subject to review), with the place/s where it is to be observed within a defined list of 31 vertical layers and 8 types of horizontal coverage. One or more "vertical layers" may be included in a single requirement. The "horizontal coverage" parameter locates where the variable is to be observed in the horizontal dimension. From a list of 8 options, exactly one entry must be specified. The options are: Global; Global Land; Global Ocean; Coastal areas; Regional (the applicable WMO Region/s to be specified in Comments); Sub-regional (area of magnitude 1000x1000 km to be specified in Comments); Local (area of magnitude 100x100 km to be specified in Comments); and Point (specific locations to be specified in Comments).

Required observation performance level

The required performance level is stated quantitatively in terms of six, in the future there will be eight, criteria: Horizontal resolution, Vertical resolution, Frequency (observation cycle), Timeliness (delay in availability), Uncertainty (acceptable RMS error and any limitations on bias), Stability (the maximum permissible cumulative effect of systematic changes of the measurement system to allow long-term climate records compiled from assorted measurement systems – percentage change per decade), Layer/s quality (how well the specified vertical layer/s is/are delivered), Coverage quality (how well the specified horizontal coverage is delivered).

Figure III.2 shows additional parameters proposed for inclusion in OSCAR/Requirements in the future. It shows the comment field split into several separate Comments, making it easier to locate and interpret the various Comments in each Requirement. It also shows several "priority" parameters, giving the user the opportunity to ascribe different levels of priority for the requirement overall, and for each of the six performance criteria within a given requirement.

The structure of a requirement may be further illustrated by exploring the content of Requirement #335 from the OSCAR/Requirements database (as of January 2022, please visit the database for up-to-date requirements):

Application Area: High Res NWP;
Physical variable: Air pressure (near-surface);
Place/s: vertical layer = Near-Surface; Horizontal Coverage = Global;
Observations performance level:

	Goal	**Breakthrough**	**Threshold**
Uncertainty	0.5 hPa	0.6 hPa	1 hPa
Stability/decade	--	--	--
Horizontal Resolution	2 km	10 km	40 km
Vertical Resolution	--	--	--
Observing cycle	30 min	60 min	3 h
Timeliness	15 min	30 min	2 h

While High Res NWP is not the only application area which requires observations of "Air pressure (near-surface)" over a global domain, it is the only one with a requirement for these performance levels. In general, where multiple application areas require observations of the same physical variable in the same place/s, they usually have different performance requirements.

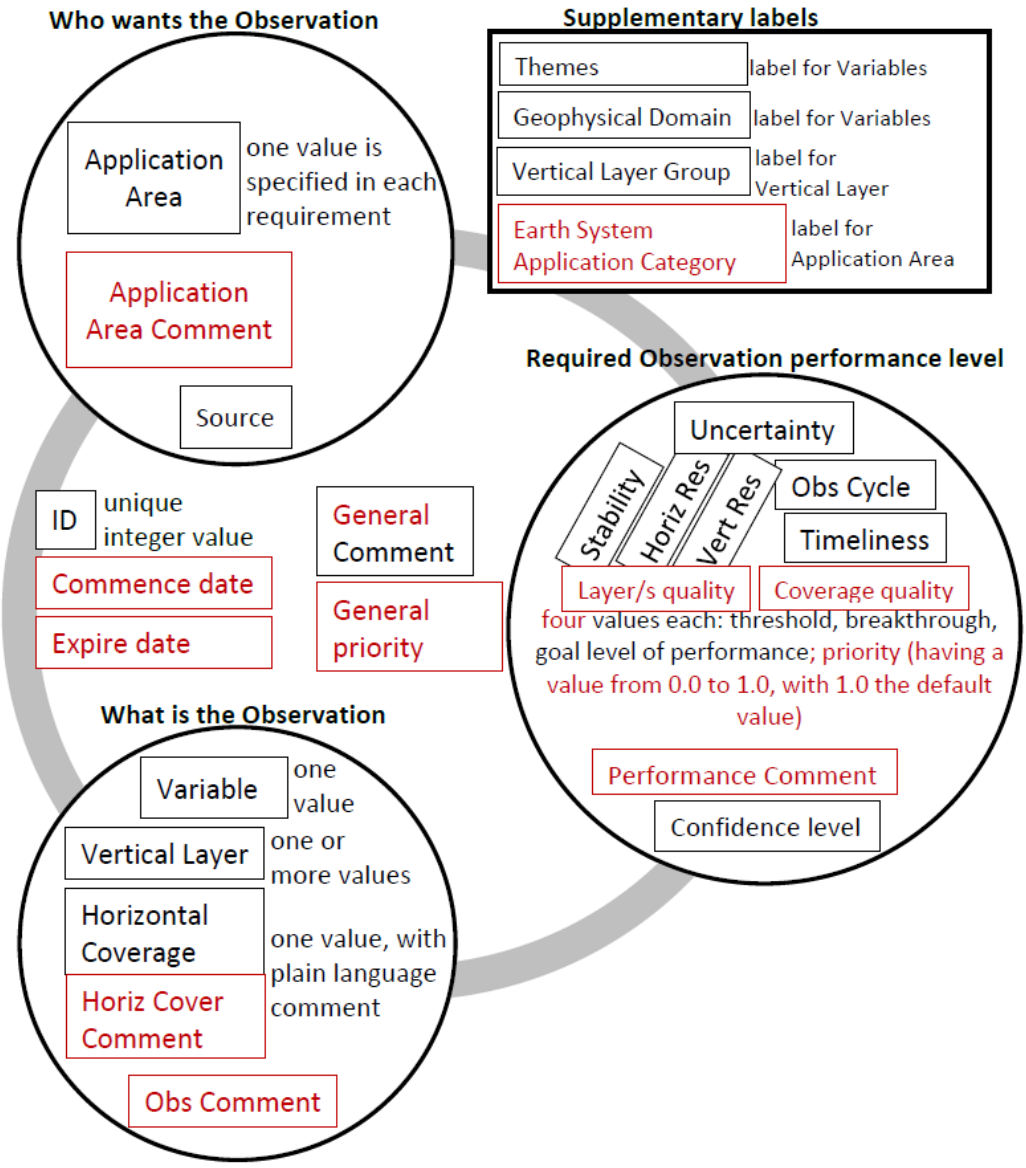

Figure III.2: Schematic diagram of the basic structure and main parameters used to express a requirement for an observation in the OSCAR/Requirements database, with proposed changes shown in red.

All of the requirements registered in the OSCAR/Requirements database may be freely and easily viewed through read-only access online at: https://space.oscar.wmo.int/observingrequirements. The website provides several tables with filtering, sorting and export options to enhance the useability of the data. For example, **Figure III.3** shows a table of requirements that was filtered to show only the requirements of the Global NWP Application Area, and sorted in alphabetical order of the variable name.

Access to OSCAR/Requirements for proposing new requirements or updating existing requirements is restricted. It is the role of the PoC for each Application Area to undertake this activity (see Attachment 3). Similarly, access to OSCAR/Requirements for proposing new variables or updating the definitions of existing variables is restricted.

This tables shows all related requirements. For more operations/filtering, please consult the full list of Requirements
Note: In reading the values, goal is marked blue, breakthrough green and threshold orange

Id	Variable	Layer	App Area	Uncertainty	Stability / decade	Hor Res	Ver Res	Obs Cyc	Timeliness	Coverage	Conf Level	Val Date	Source
244	Accumulated precipitation (over 24 h)	Near Surface	Global NWP	0.5 mm 2 mm 5 mm		10 km 30 km 100 km		60 min 3 h 12 h	24 h 5 d 30 d	Global	firm	2009-02-10	John Eyre
245	Aerosol column burden	TC	Global NWP	10 % 20 % 50 %		15 km 50 km 250 km		60 min 6 h 24 h	6 min 30 min 6 h	Global	tentative	2009-02-10	John Eyre
246	Aerosol mass mixing ratio	MUSM	Global NWP	10 % 20 % 50 %		15 km 50 km 250 km	0.2 km 3 km 3 km	60 min 6 h 24 h	6 min 30 min 6 h	Global	tentative	2009-02-10	John Eyre
247	Aerosol mass mixing ratio	FT	Global NWP	10 % 20 % 50 %		15 km 50 km 250 km	0.2 km 3 km 3 km	60 min 6 h 24 h	6 min 30 min 6 h	Global	tentative	2009-02-10	John Eyre
248	Aerosol mass mixing ratio	UTLS	Global NWP	10 % 20 % 50 %		15 km 50 km 250 km	0.2 km 3 km 3 km	60 min 6 h 24 h	6 min 30 min 6 h	Global	tentative	2009-02-10	John Eyre
249	Aerosol mass mixing ratio	PBL	Global NWP	10 % 20 % 50 %		15 km 50 km 250 km	0.2 km 3 km 3 km	60 min 6 h 24 h	6 min 30 min 6 h	Global	tentative	2009-02-10	John Eyre
250	Air pressure (near surface)	Near Surface	Global NWP	0.5 hPa 1 hPa 1 hPa		15 km 100 km 500 km		60 min 6 h 12 h	6 min 30 min 6 h	Global land	firm	2009-02-10	John Eyre

Figure III.3 shows part of the screen display of the observational user requirements of the Global NWP Application Area, sorted alphabetically on the variable name (as of May 2022).