

## Requirements for water vapour to include in OSCAR

The current AOPC requirements for water vapour relative to OSCAR for NWP are outlined below in the table. This needs reviewing and updating to be more consistent with the OSCAR variables for other requirements. The variable is “Specific Humidity” and the unit is g/kg. The uncertainties are expressed in percent. I am not reviewing the numbers here only the variable names and units.

For the surface humidity the dew point temperature has long historical records and is what is actually measured and is archived in the datasets but it relies on a Saturated Vapour Pressure to be computed to provide an absolute specific humidity. Other applications, including the old AOPC list below, all use specific humidity in g/kg. We have to think what these requirements are for which I think is to help instrument manufacturers to design sensors to measure the variables to the required accuracy for climate monitoring. Given that the latest sensors don't necessarily measure dew point I am minded to keep the requirement specified in terms of specific humidity. The instrument manufacturer can then do the conversion to the actual quantity being measured. However there is an argument to also have dew point temperature so I think a discussion on this at AOPC would be worthwhile. OSCAR may be able to have 2 variables for the same thing. The unit for uncertainty should be % as already in the table.

For the upper air requirements similar considerations apply to the variable and units although perhaps the case for dew point here is slightly less. The necessity of having 4 layers should be reviewed and I note Global NWP has reduced to just two being Upper and Lower Troposphere. I do think stratospheric water vapour deserves an entry though as there is a good record of this from both satellites, rockets? and in-situ. It is not clear there is any merit in the High Stratosphere/Mesosphere entry though so I would recommend entries for 3 levels.

69	Air specific humidity (at surface)	Near Surface	Climate-AOPC (deprecated)	1 % 1.3 % 2 %	25 km 50 km 100 km		3 h 4 h 6 h	24 h 2 d 3 d	Global	speculative	2007-07-19	AOPC
110	Specific humidity	HS&M	Climate-AOPC (deprecated)	2 % 5 % 20 %	50 km 100 km 200 km	2 km 3 km 5 km	3 h 4 h 6 h	7 d 14 d 60 d	Global	firm	2007-07-19	AOPC
111	Specific humidity	HT	Climate-AOPC (deprecated)	2 % 5 % 20 %	20 km 50 km 100 km	0.1 km 0.5 km 2 km	3 h 4 h 6 h	7 d 14 d 60 d	Global	firm	2007-07-19	AOPC
112	Specific humidity	LS	Climate-AOPC (deprecated)	2 % 5 % 20 %	50 km 100 km 200 km	2 km 2.5 km 3 km	3 h 4 h 6 h	7 d 14 d 60 d	Global	firm	2007-07-19	AOPC
113	Specific humidity	LT	Climate-AOPC (deprecated)	2 % 4 % 15 %	10 km 15 km 25 km		3 h 4 h 6 h	7 d 14 d 60 d	Global	firm	2007-07-19	AOPC

*Extract from current OSCAR web site (dated 30/11/17)*