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| **World Meteorological Organization****Commission for Instruments and Methods of Observation** **Joint Session of the Expert Team on Operational In Situ Technologies (ET-OIST) and the Expert Team on Developments in In Situ Technologies (ET-DIST)**Geneva, Switzerland, 21-23 June 2017 | **CIMO/ET-A1-A2/Doc. 7(8)**  |
| Submitted by:Jane Warne20.06.2017**DRAFT 1** |

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# Soil moisture measurement technologies

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| **Summary and purpose of document**This document provides a brief summary of the outcomes of the meeting at CIMO16 which was held in conjunction with Metrology for Meteorology which involved an extensive workshop on soil moisture |

**Action proposed**

The Meeting is invited to take notice of the findings reported in this document and to provide feedback and guidance on the content and direction.

# Overview

**background**

Last year at CIMO 16 in Madrid, there was a meeting of metrology for meteorology which held a workshop on soil moisture. I was requested to attend and present some information on how soil moisture information was gathered and used in Australia particularly by the Bureau of Meteorology.

The meeting had representatives from sensor manufacturing and calibration industry, data users, national measurement infrastructure and metrological organisations. The meeting was chaired by Stephanie Bell of NPL.

We discussed the range of sensors available on the market which include

* Water Potential probes e.g.
* Tensiometers, which measure the suction pressure required to remove the water from the soil.
* Granular matrix probes, which pass a current across media and the resistance is measured
* Water Content Probes (Soil Dialectric), which use the time of flight between two electrodes
* Capacitance Probes, which measure the change in capacitance of a media in the presence of water
* Time and Frequency Domain Probes,
* Neutron Capture Probes.
* Satellite
* Modell

There was a long discussion about how to calibrated the sensors and the dependence on "standard soils". This was led by one of the sensor manufacturers who pointed out that this was verging on a fine art and highly dependent on both the sensor and soil used. It is the most common method of calibration. Currently most methods of calibration are sensor specific and difficult if not impossible to compare.

The critical issue discussed by the meeting was what were we measuring:-

* The total water in the soil ie gravimetric measurements?
* The total water available to the plants?

A long list of requirements and desires was gathered for NPL to commence working up into document that could be use to start to define the answer to this issue.