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Air quality — Meteorology — Siting classifications for surface observing stations on land

Qualité de l'air — Météorologie — Classifications des sites pour les stations terrestres d'observation

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

ISO 19289 was prepared by ISO/TC 146, *Air quality*, Subcommittee SC 5, *Meteorology,* and the World Meteorological Organization (WMO) as a common ISO/WMO Standard under the Agreement on Working Arrangements signed between the WMO and ISO in 2008. This International Standard is identical to the "Siting Classifications for Surface Observing Stations on Land", published in the WMO Guide to Meteorological Instruments and Methods of Observations (WMO-No. 8), 2014 Edition, Part I, Chapter 1, Annex 1B.

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Introduction

Environmental conditions of a site[1)] might influence the measurement results. A careful analysis of the site environmental conditions is to be associated to the knowledge of the instrument characteristics to avoid quantities of influence to distort measurement results affecting their representativeness, particularly when a site is supposed to be representative of a large area (i.e. 100 km^2 to 1 000 km^2).

1) A “site” is defined as the place where the instrument is installed.

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Air quality — Meteorology — Siting classifications for surface observing stations on land

1 Scope

This International Standard indicates exposure rules for various sensors, but what should be done when these conditions are not fulfilled? There are sites that do not respect the recommended exposure rules. Consequently, a classification has been established to help determine the given site's representativeness on a small scale (impact of the surrounding environment). Hence, a class 1 site can be considered as a reference site. A class 5 site is a site where nearby obstacles create an inappropriate environment for a meteorological measurement that is intended to be representative of a wide area (at least tens of km^2). The smaller the siting class, the higher the representativeness of the measurement for a wide area. In a perfect world, all sites would be in class 1 but the real world is not perfect and some compromises are necessary. A site with a poor class number (large number) can still be valuable for a specific application needing a measurement in this particular site, including its local obstacles.

The classification process helps the actors and managers of a network to better take into consideration the exposure rules and thus it often improves the siting. At least, the siting environment is known and documented in the metadata. It is obviously possible and recommended to fully document the site but the risk is that a fully documented site might increase the complexity of the metadata, which would often restrict their operational use. That is why this siting classification is defined to condense the information and facilitate the operational use of this metadata information.

A site as a whole has no single classification number. Each parameter being measured at a site has its own class and is sometimes different from the others. If a global classification of a site is required, the maximum value of the parameters' classes can be used. The rating of each site should be reviewed periodically as environmental circumstances can change over a period of time. A systematic yearly visual check is recommended: if some aspects of the environment have changed, a new classification process is necessary. A complete update of the site classes should be done at least every five years.

In this International Standard, the classification is (occasionally) completed with an estimated uncertainty due to siting, which has to be added in the uncertainty budget of the measurement. This estimation is coming from bibliographic studies and/or some comparative tests.

The primary objective of this classification is to document the presence of obstacles close to the measurement site. Therefore, natural relief of the landscape may not be taken into account, if far away (i.e. >1 km). A method to judge if the relief is representative of the surrounding area is the following: Does a move of the station by 500 m change the class obtained? If the answer is no, the relief is a natural characteristic of the area and is not taken into account.

Complex terrain or urban areas generally lead to high class numbers. In such cases, an additional flag "S" can be added to class numbers 4 or 5 to indicate specific environment or application (i.e. 4S).

2 Air temperature and humidity

2.1 General

Sensors situated inside a screen should be mounted at a height determined by the meteorological service (within 1,25 m to 2,0 m as indicated in Reference [1]). The height should never be less than 1,25 m. The respect of the higher limit is less stringent, as the temperature gradient versus height is decreasing with height. For example, the difference in temperature for sensors located between 1,5 m and 2,0 m is less than 0,2 °C.

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