



Recommendation ITU-R P.841-7
(08/2022)

**Conversion of annual statistics to
worst-month statistics**

P Series
Radiowave propagation



Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

Electronic Publication
Geneva, 2022

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RECOMMENDATION ITU-R P.841-7

Conversion of annual statistics to worst-month statistics

(Question ITU-R 201/3)

(1992-1999-2001-2003-2005-2016-2019-2022)

Scope

This Recommendation provides methods for the conversion of annual percentage into worst-month percentage for propagation related parameters.

Keywords

Worst-month statistics, annual statistics, conversion method

The ITU Radiocommunication Assembly,

considering

- a) that for design of radiocommunication systems the required statistics of propagation effects pertain to the worst-month period of reference;
- b) that the concept of worst-month is defined in Recommendation ITU-R P.581;
- c) that the reference statistics for many radiometeorological data and propagation prediction methods is “the long-term average annual” distribution;
- d) that consequently there is a need for a method that provides for the conversion of the “annual” to the “worst-month” statistics;
- e) that the worst-month cumulative probability and the worst-month exceedance probability are needed,

recommends

that, when monthly statistics are not available, the method given in Annex 1 be used to convert exceedance probability to worst-month exceedance probability and convert cumulative probability to worst-month cumulative probability.

Annex 1

1 The average annual worst-month exceedance probability¹, p_w , is calculated from the average annual exceedance probability, p , using the conversion factor Q :

$$p_w = Q p \quad (1)$$

where $1 \leq Q \leq 12$, and both p and p_w refer to the same threshold levels.

¹ The terms exceedance probability, time fraction of excess and complementary cumulative distribution function (CCDF) are synonymous.