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一种新的生态监测数据质量评估方法——以CERN乔木生长数据为例

颜绍馗1,吴冬秀2,Singh AN3,李媛良1,韦文珊2,崔杨1,汪思龙1**,徐广标1

1中国科学院沈阳应用生态研究所会同森林生态实验站, 沈阳 110016|2中国科学院植物研究所植被与环境变化国家重点实验室/CERN生物分中心, 北京 100093|3Department of Botany, Panjab University, Chandigarh 160014, India

A new assessment method for the quality of ecological monitoring data: Taking CERN’s tree growth dataset as a case.

YAN Shao-kui1, WU Dong-xiu2, SINGH AN3, LI Yuan-liang1, WEI Wen-shan2, CUI Yang1, WANG Si-long1, XU Guang-biao1

1Huitong Experimental Station of Forest Ecology, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110016, China|2State Key Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences/Sub-Center of Biology of CERN, Beijing 100093, China|3Department of Botany, Panjab University, Chandigarh 160014, India

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摘要

将数据可靠性作为有序变量进行分级，在理论上使数据可靠性与主要生态过程、次级生态过程、外部过程等数据源建立关联，构建了一种生态监测数据质量评估方法，提供了一个新的数据质量指数.它通过观察记录的合格率来估计数据集的质量，其检测结果包括了每一条数据的可靠性级别、标记为离群或错误数据的原因，以及完整数据集的质量指数值.将该方法应用于CERN的两个乔木生长数据集，发现该数据质量指数可以定量评估乔木生长数据集的质量.该方法为相关软件的开发提供了基础.

关键词： 数据检测 信息系统 数据质量控制 离群数据

Abstract:

This paper presented a new and simple assessment method for the quality of ecological monitoring data. This method theorized the associations between the data reliability as an ordinal variable with different number of classes and the data sources such as natural main ecological processes, secondary ecological processes, and extraneous and exotic processes, and offered a new data quality index to estimate the quality of the whole dataset by using the reasonableness ratio of observations. The assessment results provided the reliability class of each dataset, good explanations for outlier (or error data) flagging decisions, and quality value of the whole dataset. The method was applied to assess two tree growth datasets from Chinese Ecosystem Research Network (CERN), and the results demonstrated that the new data quality index could quantitatively evaluate the quality of the tree growth datasets. The new method would facilitate the development of corresponding software.

Key words: data check information system data quality control outlier data

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