



A critique of some aspects of statistical usage in hydroclimate research.

Robin Thomas Clarke

Instituto de Pesquisas Hidráulicas, Hidromecânica e Hidrologia, Porto Alegre, Brazil (clarke@iph.ufrgs.br)

Areas are discussed where, in the author's view, statistical methods are misused in reporting results of hydroclimate research: areas where, to quote Sir Winston Churchill, statistics are like a drunk with a lamp-post: used more for support than illumination. Examples include the use of the same data-set both to suggest a hypothesis (such as the existence of a time-trend) and to test it, and failure to account for spatial correlation, so that in practice measures of uncertainty (standard errors) are underestimated. As a consequence of the latter, "statistical significance" is often over-estimated. Much of the corpus of statistical methodology now widely used throughout science was developed originally for agricultural research, and was based on principles of randomization and replication which are seldom applicable in hydroclimate research. On the other hand, procedures for the design of experiments, also developed for agricultural research, should be capable of much wider use where the performance of competing models is to be evaluated. Examples are given to illustrate why particular care is needed when interpreting results of analyses of hydroclimate data, taken from a major project to update hydrometric networks in the Amazon basin.