A standard protocol for describing individual-based and agent-based models.

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Ecological Modelling

A standard protocol for describing individual-based and agent-based models

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Abstract

Simulation models that describe autonomous individual organisms (individual based models, IBM) or agents (agent-based models, ABM) have become a widely used tool, not only in ecology, but also in many other disciplines dealing with complex systems made up of autonomous entities. However, there is no standard protocol for describing such simulation models, which can make them difficult to understand and to duplicate. This paper presents a proposed standard protocol, ODD, for describing IBMs and ABMs, developed and tested by 28 modellers who cover a wide range of fields within ecology. This protocol consists of three blocks (Overview, Design concepts, and Details), which are subdivided into seven elements: Purpose, State variables and scales, Process overview and scheduling, Design concepts, Initialization, Input, and Submodels. We explain which aspects of a model should be described in each element, and we present an example to illustrate the protocol in use. In addition, 19 examples are available

in an Online Appendix. We consider ODD as a first step for establishing a more detailed common format of the description of IBMs and ABMs. Once initiated, the protocol will hopefully evolve as it becomes used by a sufficiently large proportion of modellers.

Keywords

Individual-based model; Agent-based model; Model description; Scientific communication; Standardization

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