

Testing NetLogo Model Code

Steven F. Railsback, Jocelyn Bliven, Volker Grimm, Jacob Kelter

Appendix A: Literature Search for Code Testing

We searched for journal articles that mention testing of model code by using both the Undermind artificial intelligence tool for scientific literature searches (www.undermind.ai) and manual verification. We searched two journals: *JASSS* (www.jasss.org) and *Ecological Modelling* (www.sciencedirect.com/journal/ecological-modelling), which is a leading (but not free) modeling journal in ecology and environmental science.

We asked Undermind to identify papers published in 2025 in *Ecological Modelling* that explicitly report software testing or verification of process-based or simulation models. Undermind screened titles, abstracts, and, where accessible, full texts of papers that (i) presented a process-based, mechanistic, or simulation model (e.g. equation-based models, ABMs and individual-based models, and process-based network or ecosystem models), and (ii) contained at least one explicit statement in the main text that the implementation or code had been tested or verified (e.g., via unit or integration tests, regression tests, verification against analytical solutions or benchmarks, formal test plans, or clearly described numerical/implementation checks). We excluded purely statistical or machine learning models without explicit ecological processes, conceptual/theoretical papers, non-primary research (e.g. pedagogical or review articles such as Swannack et al. 2025), and any evidence of “validation” or sensitivity analysis that was not clearly framed as checking software implementation correctness. We did not exclude models programmed in platforms other than NetLogo.

To check the Undermind results for *Ecological Modelling*, we independently searched the text of ~160 papers published in 2025 for the terms “code,” “verification,” and “software,” and then reviewed the ones that included any of those terms.

For *JASSS*, we asked Undermind to survey all articles published in 2024–2025 (volumes 27–28), using methods similar to those for *Ecological Modelling*; however, for *JASSS* Undermind was able to search the full text of all articles. This survey included 69 research and methods papers. To confirm the Undermind survey, we manually examined 20 of the most recent (Volume 28) *JASSS* papers.

The results indicate that code testing is rarely addressed in model-based publications. The Undermind search found no 2025 *Ecological Modelling* research articles that clearly reported software testing or verification of the model implementation in the main text. Our manual search found two papers that explicitly discuss how code was tested; in neither of those two examples were formal tests documented and archived. Undermind found no 2024–2025 *JASSS* articles that explicitly mentioned code testing, but our manual search found one paper that explicitly discussed testing. That example also did not document formal tests.