Designing multi-scale models to support environmental decision: Application to the control of Brown Plant Hopper invasions in the Mekong Delta (Vietnam)

Mots clés :
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Résumé du projet de recherche (Langue 1)

This research tries to build Dynamically scaling models (DSMs) to couples hierarchically and interconnects models that have different scaling levels. DSMs can be viewed as organized collections of models where each model knows about its most appropriate scale, which type of data it needs, the outputs it may be producing, and the interactions it may have with other models. The purpose of DSMs is to dynamically adapt their functioning to two constraints of decision-support systems: 1. Interactions with a user, who can decide to “zoom in” a simulation by exploring micro-scale models in specific spatial contexts; or “zoom out” to address long-term evolutions, therefore possibly deactivating the simulation of local models (or changing their regime). 2. Availability or unavailability of data, which can render some models totally useless or, on the contrary, trigger the execution/numerical solving/simulation of some models. More specific outcomes in this research relate to developing decision-support systems in scenario of modelling spatial and temporal multi-scale of the spread of brown plant hoppers in the mekong region. Decision-support systems will cover four scales (village, commune, province and the whole region of the Delta) and try to capture dynamics and relationships of scales so that these systems will provide advices to farmers, local authorities, protection centers or policy makers on possible pests outbreaks and the best options available for fighting them.