Jul 11th, 2:50 PM - 3:10 PM

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International Environmental Modelling and Software Society (iEMSs)
8th International Congress on Environmental Modelling and Software
Toulouse, France, Sabine Sauvage, José-Miguel Sánchez-Pérez, Andrea Rizzoli (Eds.)
http://www.iemss.org/society/index.php/iemss-2016-proceedings

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Abstract: In many parts of the U.S., population growth combined with continued demand for low-density housing is transforming the structure of peri-urban landscapes. Despite the substantial amount of privately owned land, the important decision-making roles that individual landowners play in shaping patterns of urbanization and landscape change is understudied. We introduce a data-informed simulation model developed to analyse the decision-making processes that determine spatial characteristics of fragmentation in peri-urban areas by combining the utility of a cellular automata urban growth algorithm (CA module), based on the FUTURES model, with an agent-based model (ABM module). The CA module is conceptualized as a 'developer' in the urbanization process and responds to demand for development by selecting candidate development locations based on site suitability factors. The ABM module is composed of landowner agents categorized by typologies of willingness to sell (WTS). Their WTS allows the CA module to convert a location to a new development. We consider landowner typologies that differ in preferences, values and socio-economic characteristics, leading to variation in WTS and subsequently different urban growth patterns. We also include peer influence as an integral component of the landowners' decision-making processes. To test the spatio-temporal behaviour of the simulations, we applied the model for Cabarrus County in North Carolina. The simulation results show specific landscape characteristics that are the result of landowner decisions as prescribed by our model, and others that do not align with our hypotheses. These simulations contribute to further description of processes underlying emergent urban growth patterns in heterogeneous landscapes and mixed ownership characteristics.

***Keywords**:* Urbanization; Cellular Automata; Agent-based Modelling; Land Systems; FUTURES