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AMAZON SCENARIOS

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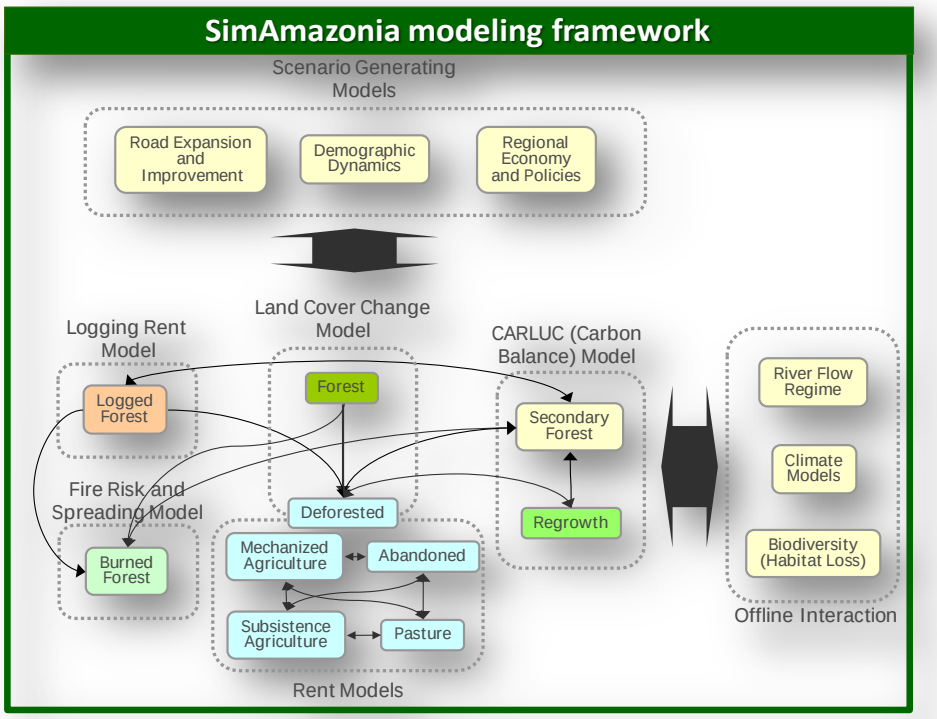
Dinamica EGO

Providing powerful modeling and analytical tools to turn oceans of data into knowledge and intelligence in support of REDD projects (Reduced Emissions from Deforestation and Forest Degradation)

Dinamica EGO has been applied to numerous environmental studies, including the modeling of deforestation in the Amazon from local (1) to basin-wide scales (2,3), land-use and cover change in the Atlantic Forest (4) and in the dry tropical forest of Mexico (5), urban dynamics (6,7), logging in the Amazon (8), and forest fire risk (9). In addition, the application of Dinamica EGO was central to helping develop the very pioneer studies of REDD, such as the costs and benefits of reducing carbon emissions from deforestation and forest degradation in the Brazilian Amazon (10), the Juma sustainable development reserve project (11), the role of protected areas in reducing carbon emissions in the Brazilian Amazon (12), the co-benefits of REDD in Xingu headwaters (13), and a proposal to end deforestation in the Brazilian Amazon (14).

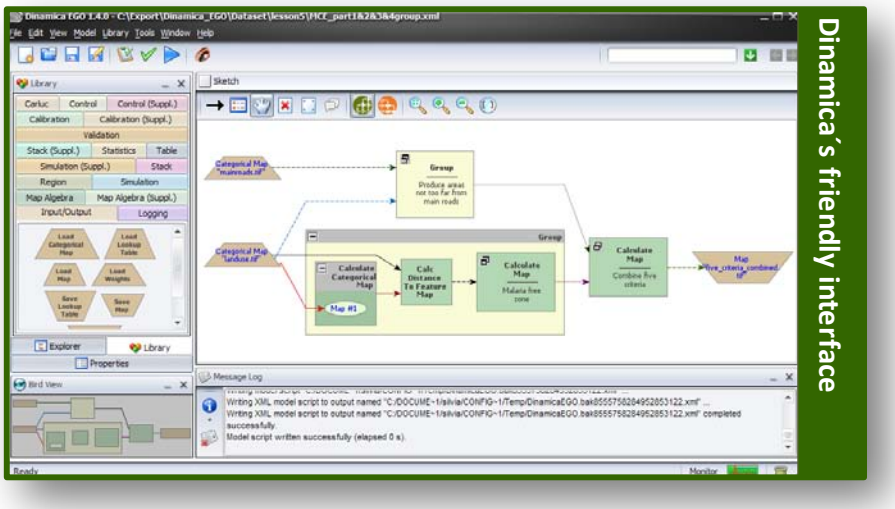
DINAMICA EGO — Modeling in Support of Sound Policy Development

Dinamica EGO (EGO stands for Environment for Geoprocessing Objects) was developed to enable the implementation and integration into a common platform (SimAmazonia) of the various models designed under the Amazon Scenarios project. Applications of SimAmazonia involve spatially-explicit projections of land use and cover changes across the Amazon basin under a set of infrastructure investments, public policies and socioeconomic scenarios (3) and the assessments of their impacts on biodiversity, river regimes, climate, and forest dieback (15,16,17,18). Other applications include the calculation of opportunity and marginal costs, taking into consideration an emergent carbon credit market for reduced deforestation (10,14).



To disseminate the use of SimAmazonia models, we made available its modeling platform as a freeware. Dinamica EGO presents outstanding possibilities for the design of spatial models, from analytical to the very complex dynamic ones, which can ultimately involve nested iterations, dynamic feedbacks, multi-region and multi-scale approaches, manipulation and algebraic combination of data in several formats, decision processes for bifurcating and joining execution pipelines, and a series of complex spatial algorithms for the analysis and simulation of space-time phenomena. Dinamica EGO operators (called functors) are sequenced in graph form to establish a visual data flow, making it a very user friendly environment.

Dinamica EGO is the only software that simulates landscape structure thanks to its set of cellular automata transition functions, which allow the definition of form and size of patches of changes. Worthy of mention, these functions also replicate the expanding and contracting landscape elements. In terms of performance, Dinamica EGO is unbeatable; its dataflow framework optimizes the way computer memory is used, keeping data in virtual memory only



while needed. As a result, Dinamica EGO is able to handle large and multiple set of maps. In addition, its algorithms are designed to process data in a very fast way, taking advantage of multiple processor architecture. Dinamica EGO holds multiple transitions and allows dynamic feedback from any model element. In particular, it is the only platform that features simultaneous multiple resolution simulation, implemented through its subregion approach, a functionality that also enables to customize model parameters or to perform a particular calculation for a map zone, i.e. a region in a map, such as a country or state. In sum, Dinamica EGO innovative modeling techniques provide a complete solution for calibrating, running and validating space-time models, no matter the complexity.

For the implementation of REDD modeling projects, Dinamica EGO, version 1.4, brings a comprehensive guidebook, help, model examples and datasets. It includes a REDD case study, describing how to build a model that projects deforestation rates under socioeconomic and political scenarios, simulates spatial patterns of deforestation and calculates associated carbon emissions (also providing an example of a carbon bookkeeping model). In the forefront of environmental modeling, Dinamica EGO is a non-commercial program freely available on the Web (www.csr.ufmg.br/dinamica).

Join our worldwide community applying Dinamica EGO to your environmental studies. You will experience its vast possibilities for the creative design of models that can truly represent the complexity of geographic phenomena.