

## **Model integration – from simple to complex, from brain to cloud**

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There is much interest in model reuse and integration, which supposedly should help to take into account more factors and therefore better explain how systems work. When models are treated as software components only, there is an increased risk of generating run-away complexity of integrated models, and producing ‘integronsters’ - constructs that are perfectly valid as software products but ugly or even useless as models. One possible remedy is to learn to use the data that are available for module calibration as an intermediate linkage tool against which we check the information flow between modules. Engaging stakeholders in the modeling process can be another efficient way to keep model complexity under control and to produce better and more useful models. Participatory modeling is a good way to synchronize and integrate stakeholder knowledge, and to build more consensus, more ‘buy-in’ into the modeling results. Models provide the necessary formalism to describe and integrate stakeholders perceptions and system conceptualizations. The challenge is to develop tools and methods to integrate qualitative stakeholder models with quantitative computer simulations.