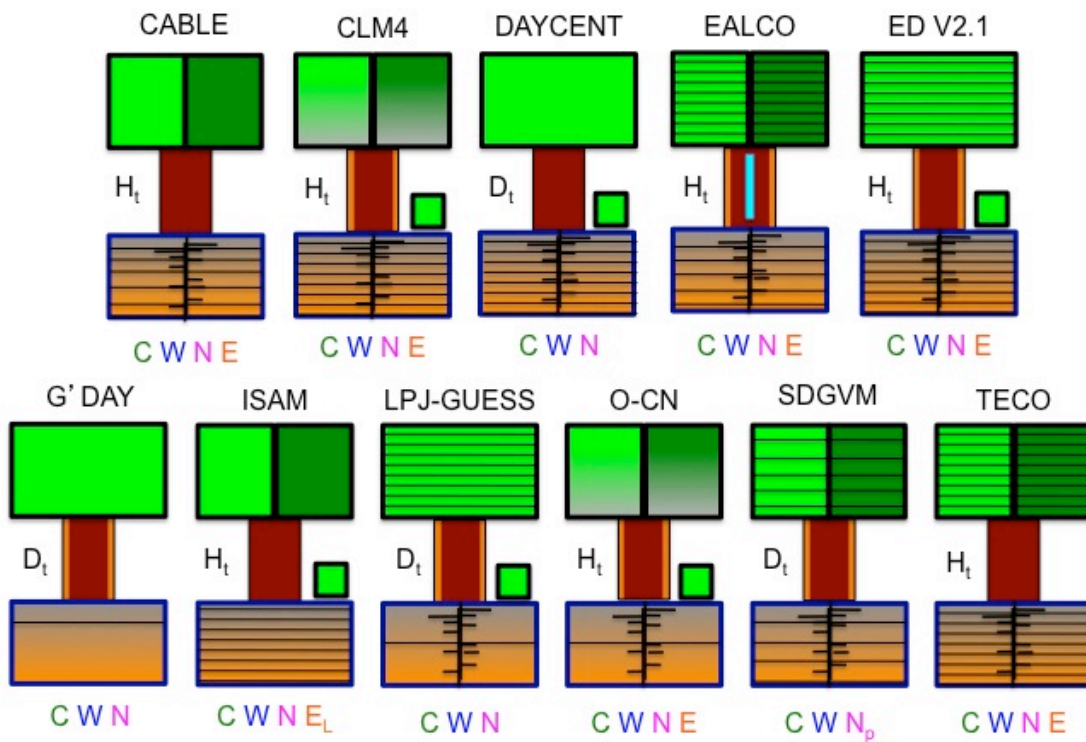


Index to identify important system processes in ecosystems

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This diagram represents 11 ecosystem models used to predict how environmental changes might affect processes such as canopy layering, vegetation, soil layering, roots; carbon (C), water (W) and nitrogen (N) cycles and energy balance (E). Scientists developed a new process sensitivity index method aimed to address model uncertainty and make more precise predictions. Credit: Oak Ridge National Laboratory

Predicting how ecosystems might respond to environmental change could become more precise thanks to a new method known as a process sensitivity index developed by Oak Ridge National Laboratory, Florida State University and Pacific Northwest National Laboratory.

Scientists use simulations to predict how a range of [environmental changes](#) might affect forests, grasslands, hydrology and other [ecosystems](#). But because these complex models represent many sub-processes, they can produce a wide range of predictions.

The process sensitivity index can scan existing computational models and identify the processes that cause the most uncertainty, suggesting where further research will provide the largest benefit.

The researchers demonstrated their approach on groundwater models but note that the index can be applied to any modeled system. Results of the study were published in *Water Resources Research*.

More information: Heng Dai et al. A new process sensitivity index to identify important system processes under process model and parametric uncertainty, *Water Resources Research* (2017). [DOI: 10.1002/2016WR019715](#)

Provided by Oak Ridge National Laboratory

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