iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 a.m. CST; 9 a.m. EST; 2 p.m. GMT; 10 p.m. Beijing

Wednesday, Nov. 10, 2021

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A. R. Ives works at the interface of theoretical and empirical ecology, using mathematical models to understand patterns of variation in ecosystems. Ives' research projects involve different questions and different experimental systems, although they all involve temporal dynamics, spatial dynamics, or spatial-temporal dynamics – how things vary through time and space. One of his current projects investigates the midge population in Myvatn, a lake in Iceland, which shows large and unpredictable fluctuations. Another long-term project addresses the ecological and evolutionary dynamics of aphids and their natural enemies in agricultural ecosystems. Joining theory with long-term field projects will hopefully help us understand the seeming unpredictability of natural systems.

Data, models, and prediction in the environmental sciences

Making ecological predictions from existing data requires statistical models to tell us what can be known from data and what is unknowable. Three types of challenges often arise when making predictions, which I will illustrate with three examples. First, even very large datasets may not contain a lot of information to make predictions. Second, even if data can be well-explained by a statistical model, predictions may be impossible if the model shows complex stochastic dynamics. Third, sometimes it is impossible to fit data with a statistical model, which shows that more information or new explanations are needed. I will illustrate these challenges of prediction using three studies. While data are essential for making ecological predictions, data by themselves are not enough: we need strong analytical tools to translate data into predictions or tell us that predictions are impossible.

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Zoom webinar ID: 934 8142 2012 (https://zoom.us/j/93481422012)

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