EENS sections

RMD

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## As biologists, we are tasked with understanding and predicting how ecological/evolutionary systems change over time, especially in an era of dramatic changes to biodiversity.

## Enormity-of-the-system/statistical equilibrium argument for focusing on deviations from statistical null models

## Efforts to apply this approach in ecology have been intriguing, but constrained by 1) too few comparison/evaluation points 2) the scarcity of historical data

## Incorporating population genetics with ecological patterns would 1) provide an additional point for inference and 2) specifically a point of inference that encodes information about past dynamics.

## This approach shows promise but has been constrained by 1) a lack of quantitative theoretical work integrating null models of popgen and ecology, 2) a lack of widely-available joint community genetics-and-abundance data to ground theoretical work.

## Both of these are addressed by recent advances: 1) the double-neutral line of MESS thinking and 2) wetlab and bioinformatic technologies for NGS.

## Here we illustrate how joint neutral modeling of popgen and ecological dynamics can illuminate the past and future trajectories of eco-evolutionary systems as they move away from and towards macroscopic equilibrium.

### Present a theoretical framework for interpreting deviations from macroscopic equilibrium

### Simulations demonstrating how specific scenarios map on to the expectations of this framework

### Demonstration of bioinformatic advances for plugging real-world data into this framework

## Call for continued work/signaling of next steps using community genetics data and double-neutral modeling to understand and predict trajectories of eco-evolutionary change.