PREFACE

The main theme is stated in the beginning: *"If deep general principles are to be found (in ecology) they are likely to be associated with general widely observed empirical regularities.... and that the theory should be as directly and simply connected to measurements as possible."* This opinion still sounds true to me, and the question of how to use available data to render one of the cornerstone ideas in ecology— Hutchinson's n-dimensional niche—has remained a central vision.

What is presented here is a heuristic data-driven theory at a high level of abstraction that resonates more with the intellectual traditions of physics than those commonly exercised in ecology. The style of thought is physics-like and agnostic in that it tries to put data parsimonious theory before current preconceptions. It is minimalist and takes as a starting point an attempt to unify two disparate areas in ecology for which data were most available: the classic study of species abundances and the study of food webs. It uses these data with minimal assumptions to reveal patterns about the structure of niche space that suggest unifying high-level mechanisms.

Of note is that fact that the work makes several predictions that were unknown at the time but have subsequently been validated, such as a negative skew in a fully unveiled lognormal species abundance distribution (Nee et al., 1993), and a connection between diagrams of niche similarity and species relative abundance (Sugihara et al., 2003). Both predictions are a product of hierarchically structured niche space. Also, the attempt in Chapters 4 and 6 to connect static topological niche patterns to the process of community assembly and to system dynamics and stability, resonates with continuing works on these relationships and helps to set the stage for an entirely different approach to understanding the communal niche—work based on rendering time series data as an attractor in an n-dimensional state space—a dynamic version of Hutchinson's n-dimensional niche.

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