**-ABSTRACT-**

**ENVIRONMENT, DEVELOPMENT, AND PHYSIOLOGY: A SYSTHESIS**

To evaluate and predict the effects of a changing environment on populations, it is appropriate to consider the sum of multiple biological levels of integration, the cooperation between biological systems, and the complex physiochemical dynamics of the environment. The results of these interactions are more than the sum of the parts, especially when considering the multiplex of processes occurring during early development and the potential effects of physiological alterations imposed by environmental perturbations. In Environment, Development, and Physiology: A Synthesis, we explore the current trends and perspectives in developmental physiology within this context where stochastic interactions necessitate a holistic approach to understanding environmental influences on development, and the effects on the population at large.

This book offers a unique approach to explain the physiological constraints developing animals face from both natural and anthropogenic stressors by exploring time-honored and current methodologies used to answer complex biological questions. Intended for advanced students in the sciences and industry professionals, the constraints and power of developmental physiology research are outlined in each chapter. The themes discussed in detail in each section are then put into a “real world” perspective in case studies that highlight the complexities of development in a changing environment, and the utility of developmental biology within the field of environmental sciences.

in predicting the effects on the ecosystem and human health.

including aquatic and terrestrial organisms. in this way, and by This approach will create appeal allow this As such, this book will

both within the chapters and then that outline the compendium of knowledge in action by reviewing case studies.

trends occurring in both laboratory and field-based methodologies. The

, and the benefit of expansion of the traditional framework of research by including multiple fields of scientific expertise. outcome integration of .

y, this book will explore developmental biology and its role within the environmental sciences to appeal to advanced students, academics and industry professionals.

from the and the developmental approach to environmental biology where the dynamic interactions between environmental stressors and successful development to reproductive age are likely to affect the population at large.

The impact of environmental stressors on the complex orchestration of developmental processes occurring throughout growth and differentiation are impacted variably, and compounded by our virtual inability to predict how future generations will be impacted by the effects of the environment without consideration of . Therein, this book g of “what that guy in the other building actually does, and how it can help me do better science.”

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However, one might suggest that such an approach is essential to accurately portray experimental results that have tightly controlled variables in the laboratory, and predetermined constraints in field-based studies.

on the population when effects are transmitted to early life-stage organisms.

However, we are often confronted with the effects that incur our experimental reality that is pragmatic, in the face of the complexity of the biological reality that exists in the environment.

The pragmatic execution of biological experimentation is

in the interpretation of . and multidisciplinary perspectives into studies of developmental biology are becoming increasingly popular. Combination of

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demonstrate that, when taken into emvironmental , in addition to providing a holistic perspective by demonstrating that the results is often more than the sum of its parts.

in a holistic work that on but synthesizes the sum of these parts into a and Linking proximate and ultimate causation through multiple levels of biological integration and …

Laboratory and field study to creat a holistic view of interacting systems. Isn't this the goal of modelers who always have a missing variable? (This is a dream) but higher order thinking than manipulating a single variable can help.

This is not possible without coordinated collaborative efforts that incorporate multidisciplinary participation to answer overreaching questions that might reinforce that the "product of even a decades worth of collaboration is greater than the sum of a lifetime of studies conducted in a single lab".

This book will be targeted to advanced undergraduate, graduate-level and professionals in academia and industry.

Help fill in the disconnect…

WHY IS THIS BOOK NEEDED

This book will be distinguished from others in its integrative nature. Not just in the multiple biological systems themes, but in the blending of multiple fields of expertise. In this, the book will help define the scientific collective within the highlighted fields of so-called environmental science to both those readers that are outside of a particular field (students and professionals alike) and those that work within a field, where multiple iterations of the same job description exist. Both the chapter descriptions and the author choice delineate this goal. Highlight this goal by using the… in terms of the goals and trends of execution, but also in the …

This volume will incorporate a representation of virtually every field that surrounds the use of developing animals in environmental science, such that it is a synthesis of the current and emerging trends in this broad field.