

Physiological and Behavioral Approaches to Studying the Biological State of California Native Fishes

Nann A. Fangue

Wildlife, Fish, and Conservation Biology Department

UC Davis



Jamilynn Poletto



**Ken
Jeffries**



**Nate
Miller**



Lisa Komoroske



**Britt
Bjelde**



**Theresa
DaBruzzi**



Dennis Cocherell

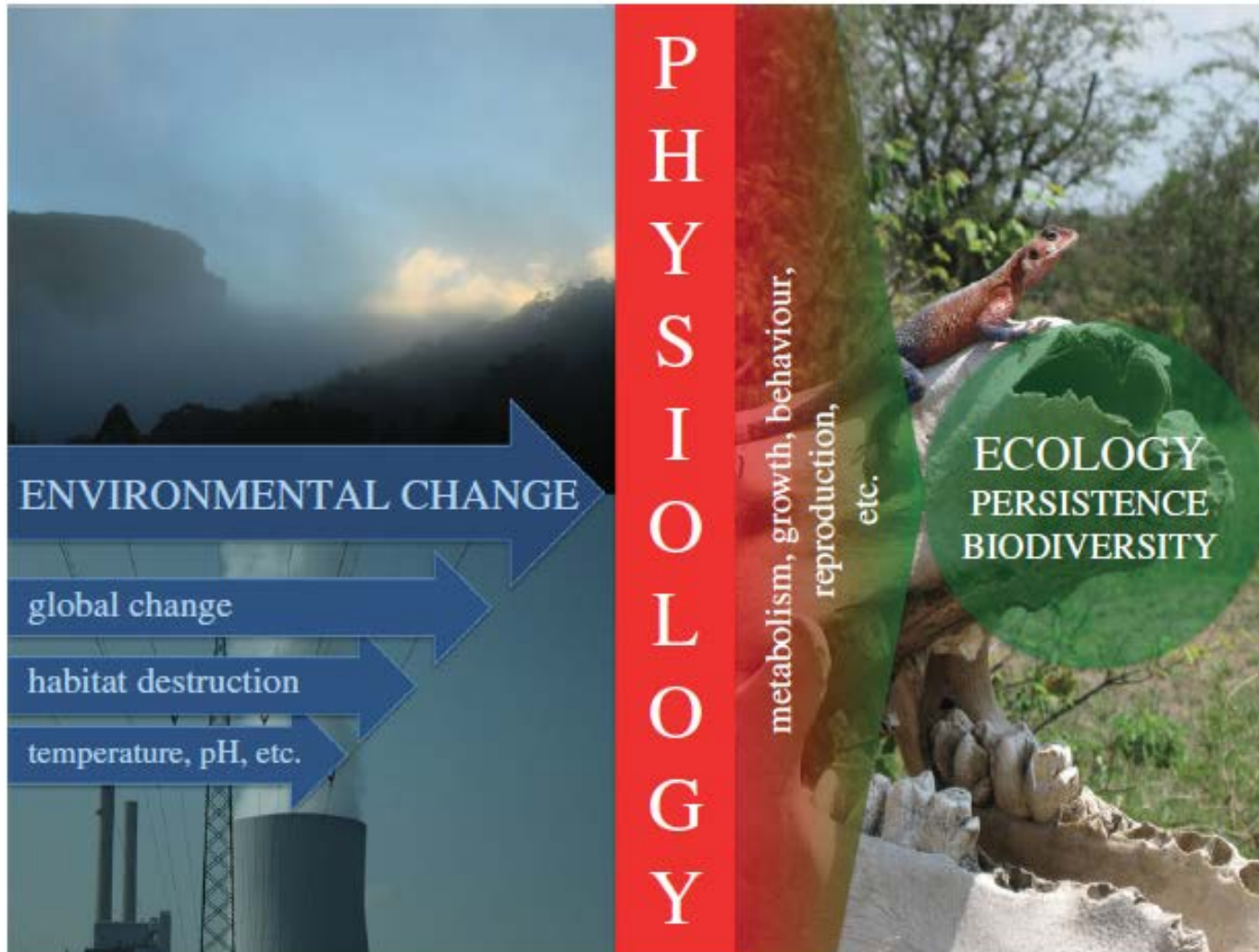
Comparative Environmental Physiology

How animals do the unusual things that they do, in the unusual environments in which they live

Emphasis is on mechanism



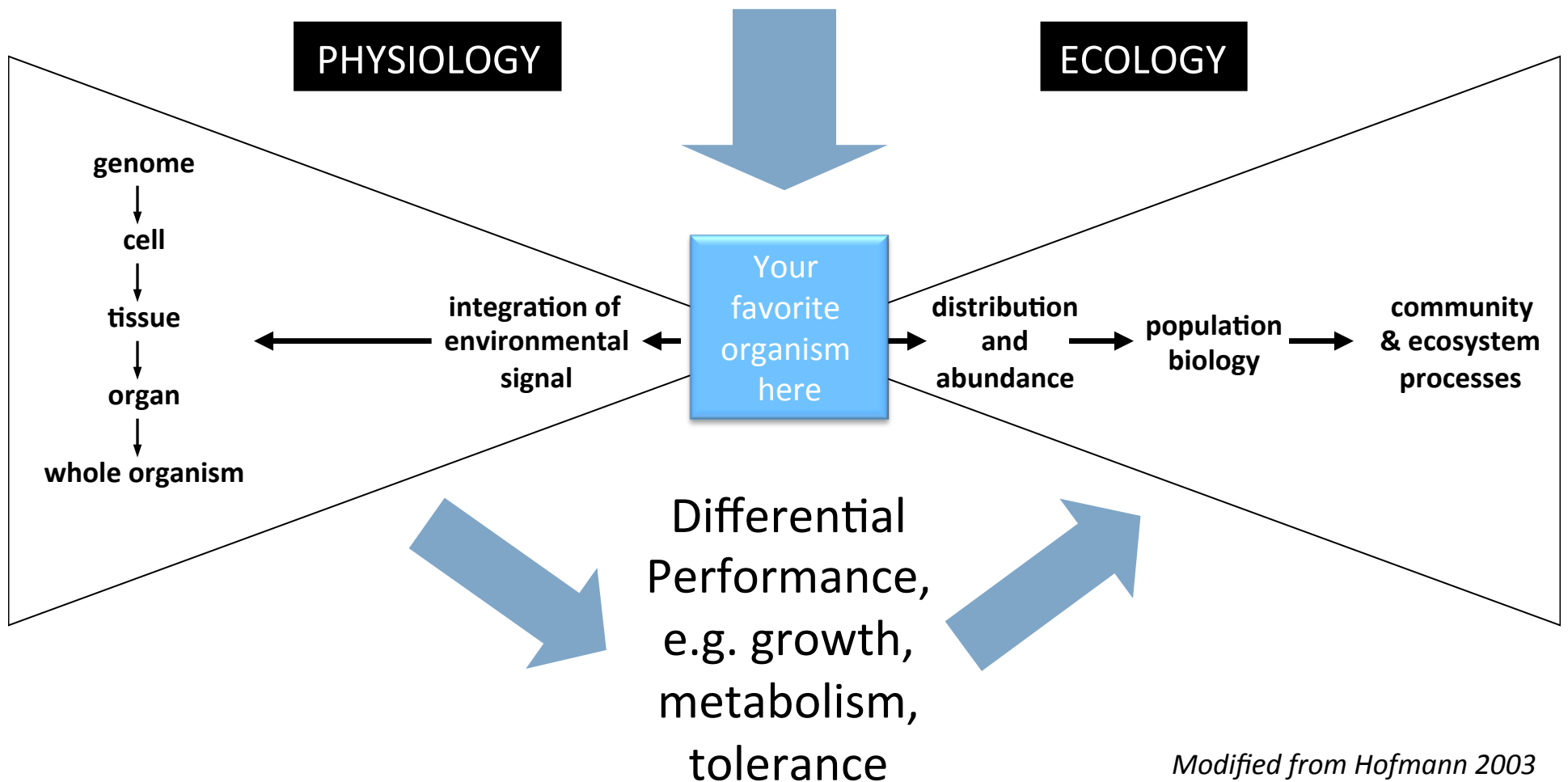
Physiology: The filter between environmental change and ecology and biodiversity



- “How” & “Why”
- Links patterns to mechanisms
- Causative
- Informs management and policy

Conservation Physiology: linking mechanisms to outcomes

Temperature, Salinity, Oxygen, pH



Modified from Hofmann 2003

Temperature

Batoids

Temperature

Salmon

Temperature

Killifish

Temperature x Salinity x Turbidity

Delta Smelt

Environmental Stress

Temperature x CO₂

Urchins

Rockfish

Flow x Turbidity

Chinook Salmon

Green Sturgeon

Temperature

Hardhead

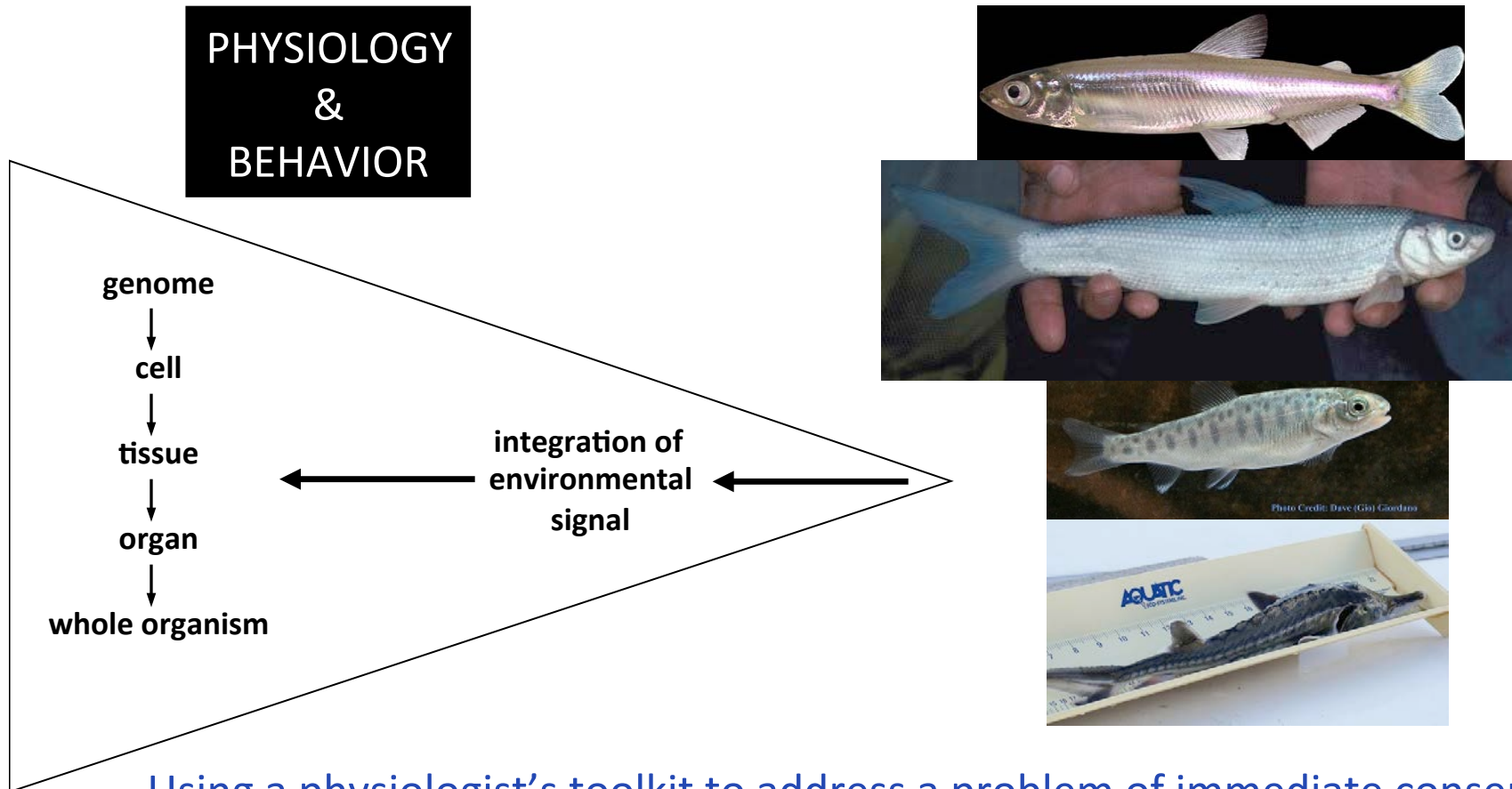
Temperature & Salinity

Spittail

Recurring Research Themes

- Role of acclimatization and adaptation in responding to environmental change
 - Mechanisms of physiological plasticity
- Interactive effects of multiple stressors
- Integrating physiological and behavioral studies with conservation and management
- Conservation Physiology: linking mechanisms to outcomes

Native Fish Conservation: linking mechanisms to outcomes



Using a physiologist's toolkit to address a problem of immediate conservation concern.

Multiple stressors, timescales, levels of biological organization, ecological context