



# Environmental Physiology in a Changing Climate: The Team

Anne



Erin Flynn



Nate  
Miller



Britt  
Bjelde



Madeline Kinsey



Joel  
Van Eenennaam





# Physiological Plasticity in Current & Future Aquatic Environments

Environment

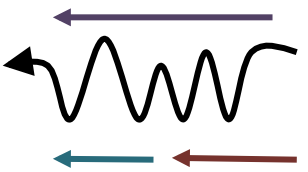


**PHYSIOLOGY**

**ECOLOGY**

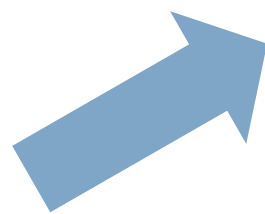
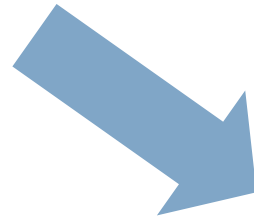


genome  
↓  
cell  
↓  
tissue  
↓  
organ  
↓  
whole organism



integration of environmental signal

distribution and abundance → population biology → community & ecosystem processes



Differential Performance

e.g. Metabolism, Growth, Reproduction, Stress Tolerance

# Physiological Plasticity in Current & Future Aquatic Environments

## *Integrative Approach*

Molecular → whole organism performance

- Transcriptomics (e.g. RNASeq, qPCR)
- Biochemical analysis (e.g. enzyme activity, protein quantification, oxidative stress)
- Metabolism
- Cardiac performance
- Growth, Behaviour & Survival

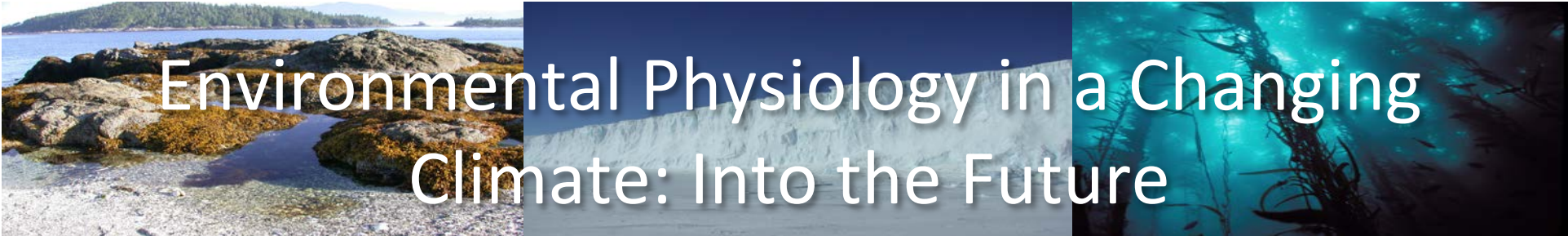
## *Multiple Environments/Multiple stressors*

- Temperate & Polar, Coastal & Estuarine
- Temperature, Ocean Acidification, Osmotic Stress & Hypoxia
- Concurrent vs. Sequential Stressors

## *Comparative Species Approach*

- Adults vs. Early Life History Stages
- Fishes, Limpets, Crabs, Oysters, Urchins
- Wild and Cultured species





# Environmental Physiology in a Changing Climate: Into the Future

- Transgenerational plasticity and adaptive capacity of organisms to tolerate multiple stressors
- Managing the stress of intensification of aquaculture under GCC scenarios
- Scaling up beyond physiology
- Integration of complex environmental signals
- **Education:** Developing case studies on critical issues in marine science for undergraduates