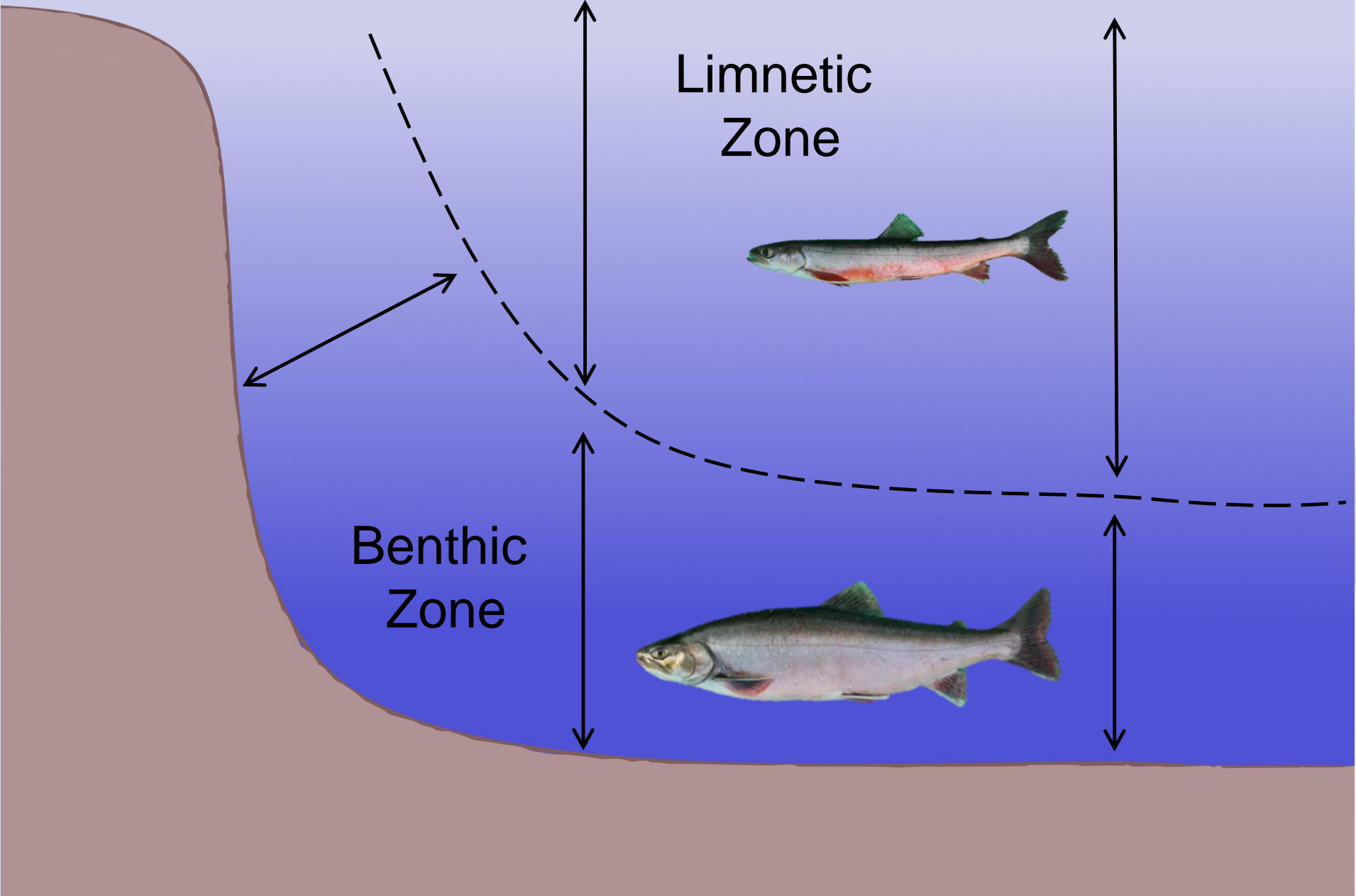


# Comparative Plasticity in Four Scottish Salmonid Species

Madeleine Carruthers



# Taking an Integrative Approach

- Four species comparison.



Arctic charr



European whitefish

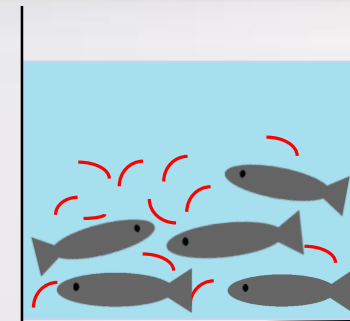


Brown trout

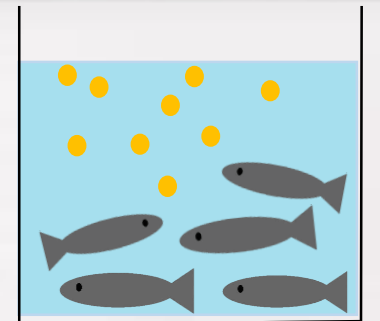


Atlantic salmon

- Full-sib families were produced for all four groups.
- Species were divided into two treatment groups:
  - Benthic vs. Limnetic



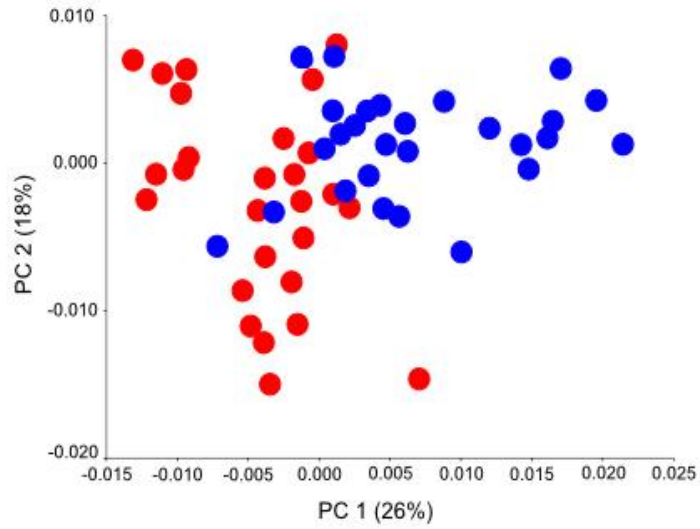
Bloodworm Diet



Daphnia Diet

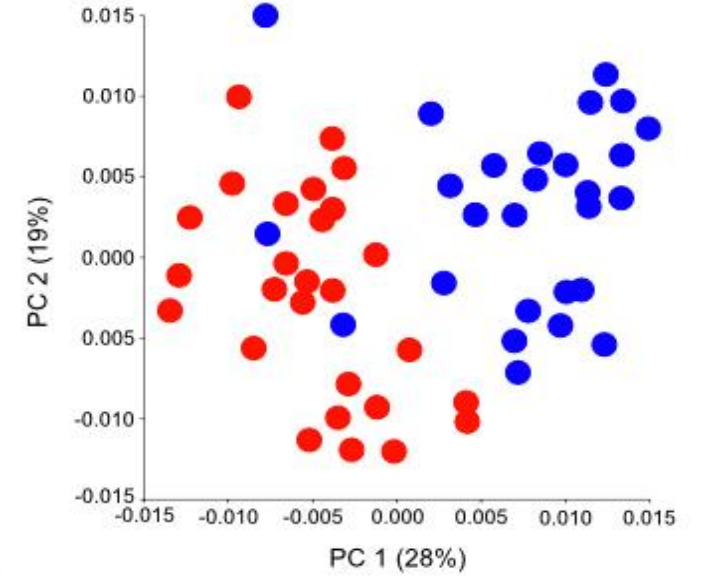
# 1. Morphology

Arctic charr

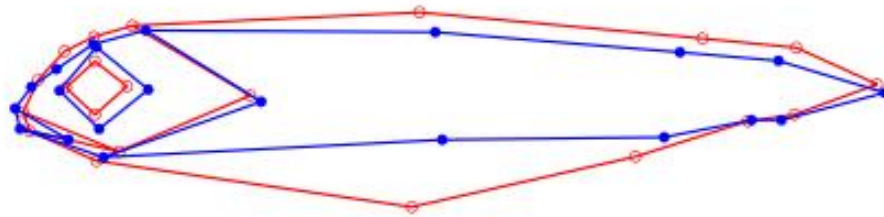
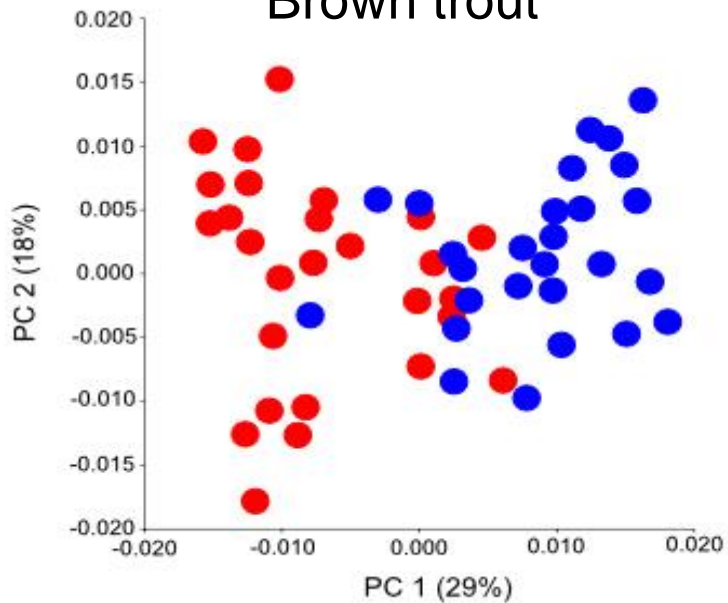


● Benthic ● Limnetic

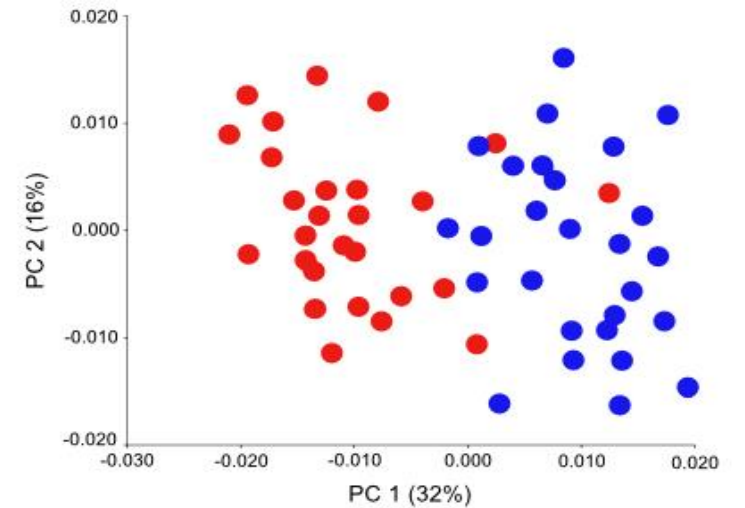
Whitefish



Brown trout

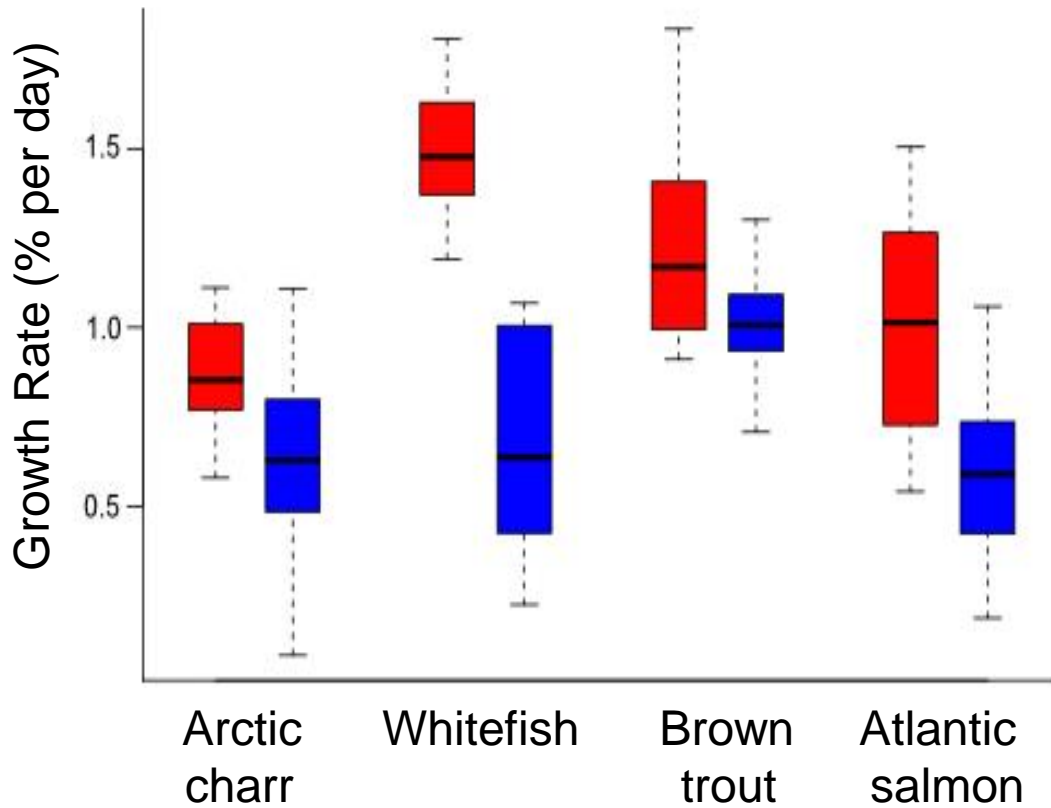


Atlantic salmon

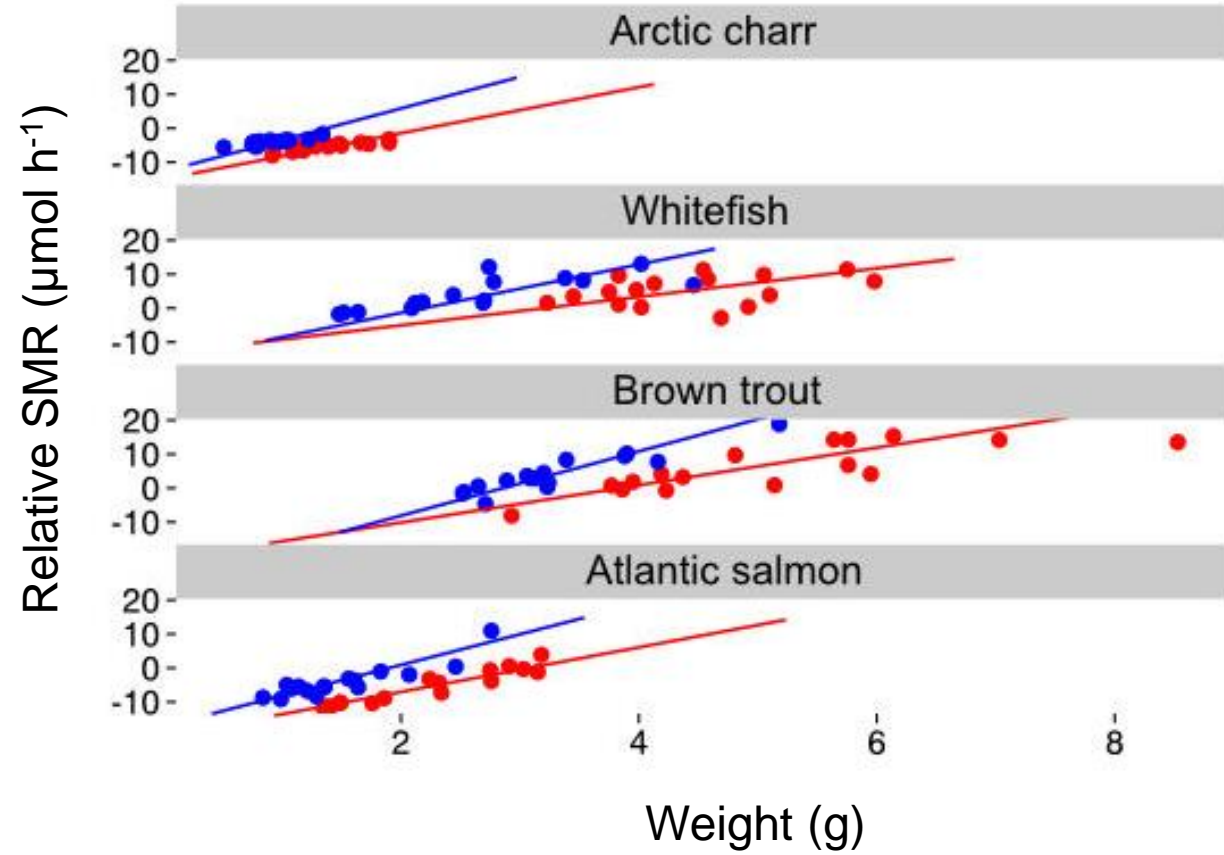


# 2. Physiology

## Growth Rate



## Standard Metabolic Rate

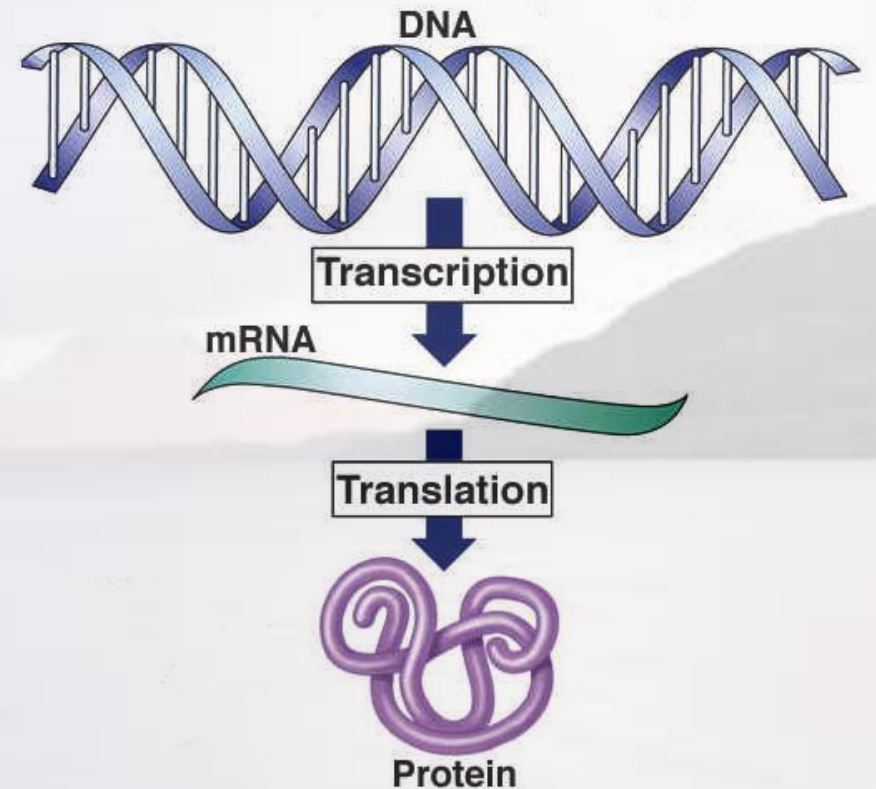


● Benthic    ● Limnetic

# 3. Gene Expression

- Primary building block of all biological variation.
- mRNA responds dynamically to the environment.
- Gene expression:

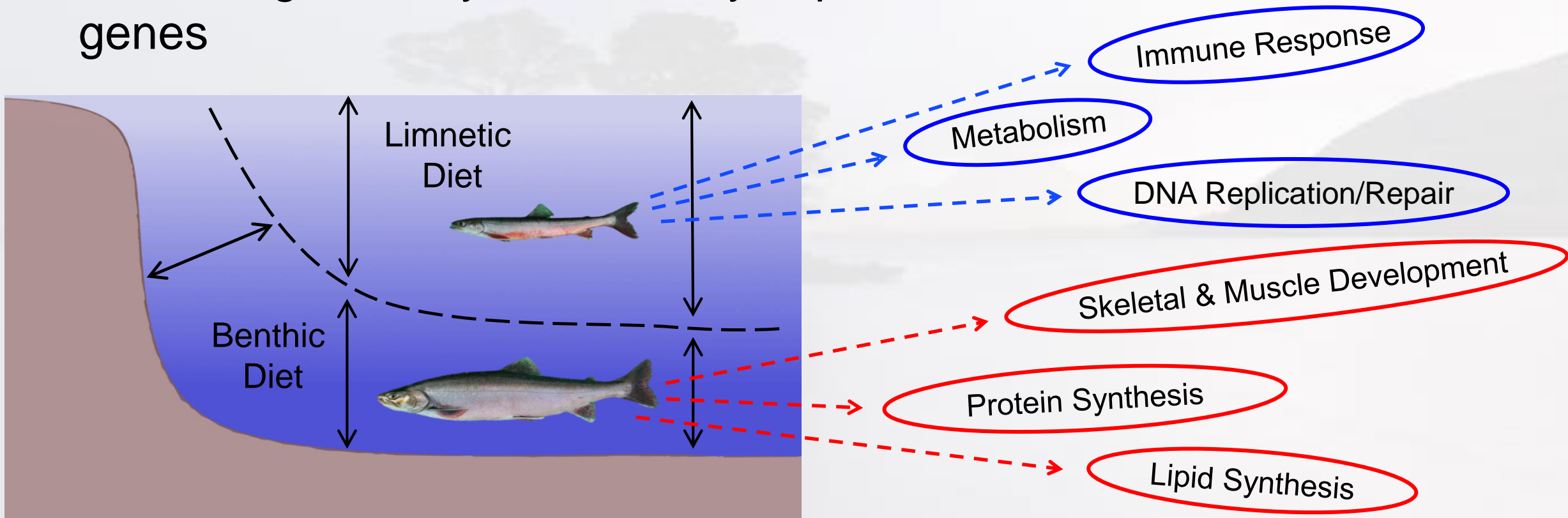
‘The Molecular Phenotype’



# 3. Gene Expression

- 1,804,201,652 sequences
- 12,750 significantly differentially expressed genes

● Benthic  
● Limnetic



# Conclusions

- Morphological, physiological and gene expression results were highly correlated.
- Significant and parallel patterns of phenotypic plasticity were observed across all species.
- Comparable plasticity of radiating and non-radiating species suggests that ecological opportunity and genetics interact with plasticity in driving speciation.