



Effects of climate change on fist-feeding brown trout growth and metabolism : a mesocosm experiment

Elorri Arevalo, Stéphane Panserat, Iban Seiliez, Aitor Larrañaga, Agnes Bardonnnet

► To cite this version:

Elorri Arevalo, Stéphane Panserat, Iban Seiliez, Aitor Larrañaga, Agnes Bardonnnet. Effects of climate change on fist-feeding brown trout growth and metabolism : a mesocosm experiment. Fisheries Society of the British Isles Annual Symposium, Jul 2017, Exeter, United Kingdom. , 162 p., 2017, Understanding fish populations. Symposium handbook. hal-01606524

HAL Id: hal-01606524

<https://hal.science/hal-01606524>

Submitted on 2 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - ShareAlike 4.0 International License

Effects of climate change on first-feeding brown trout growth and metabolism: a mesocosm experiment

Contact : elorri.arevalo@gmail.com

AREVALO Elorri¹, PANSERAT Stéphane², SEILIEZ Iban², LARRAÑAGA Aitor³, BARDONNET Agnès¹

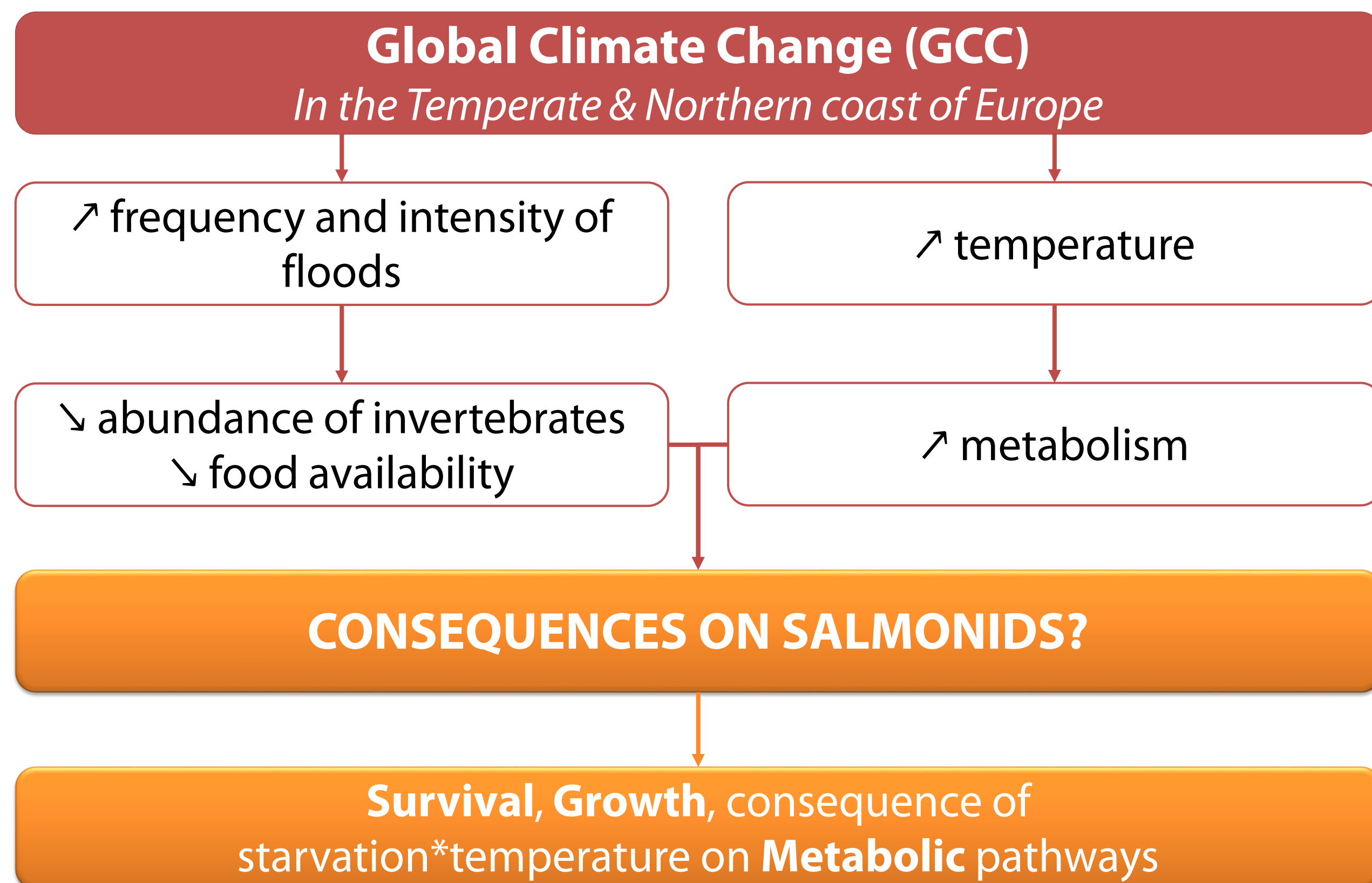
1 - ECOBIOP, UMR 1224, INRA, Univ Pau & Pays Adour, 64310, Saint-Pée-sur-Nivelle, France

2 - NUMEA, UMR 1419, INRA, Univ Pau & Pays Adour, 64310, Saint-Pée-sur-Nivelle, France

3 - Laboratory of Stream Ecology, University of the Basque Country, Bilbao, Spain



Context



For Salmonids, **emergence** is a critical period during which high mortality rates occur. Indeed, young trout have a **limited amount of reserves** and they need to start food intake quite quickly to avoid mortality.

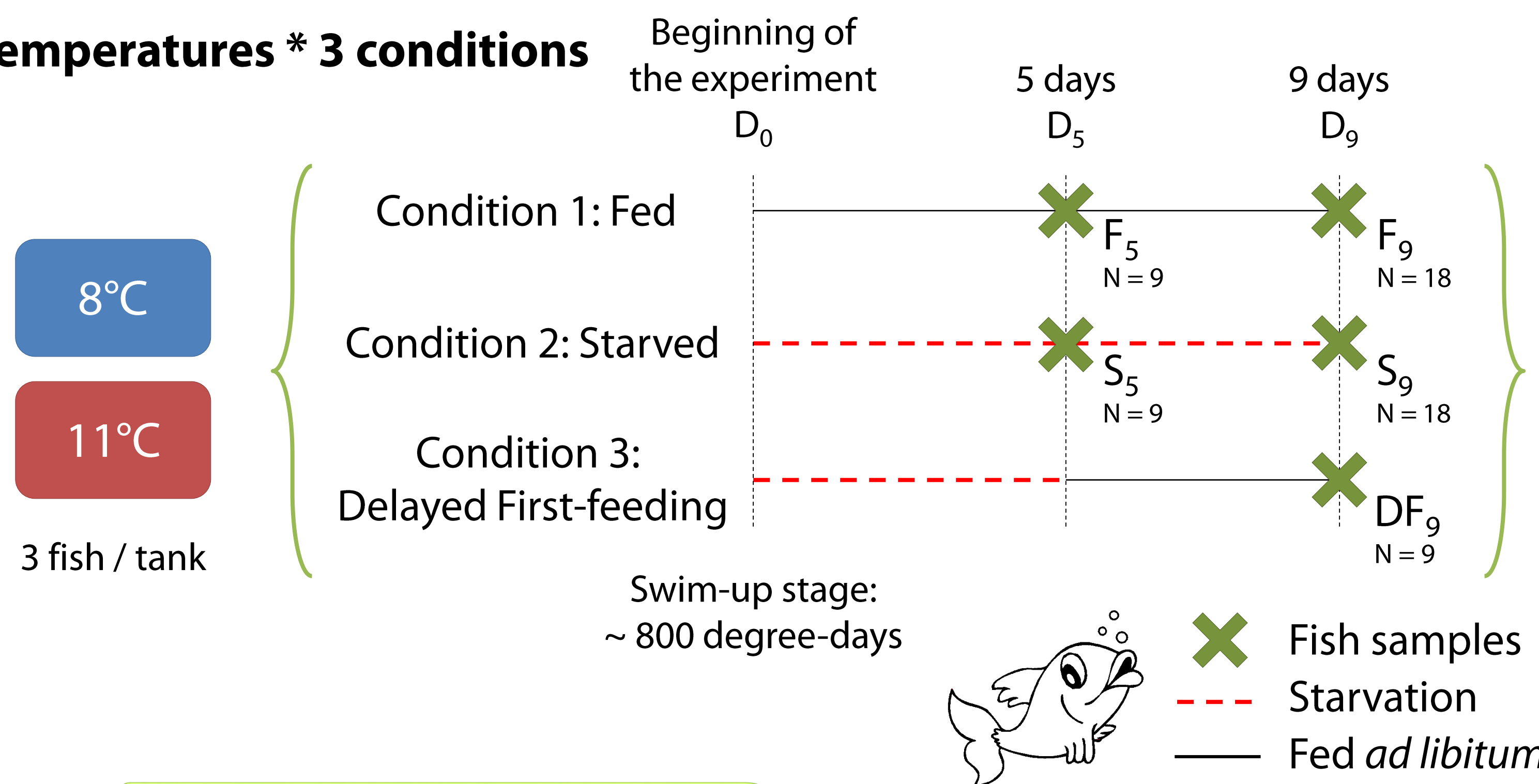
The aims of the present study were to better understand emerged brown trout response to Global Climate Change by:

- (1) Describing the consequences of **starvation** on their nutritional status,
- (2) Testing their ability to **recover** from a delayed first feeding,
- (3) Analysing the effect of **temperature** on both

Material and Methods



2 temperatures * 3 conditions



Biometric data

- Weight and Size

Wilcoxon-Man-Whitney rank sum test

Molecular data

- Whole body
- RT-qPCR: mRNA levels of 19 genes
- Fatty acid (3) & Amino-acid (6) catabolism**
- Proteasome (5), Autophagy (5)**
- Pfaffl method

Bayesian modelling

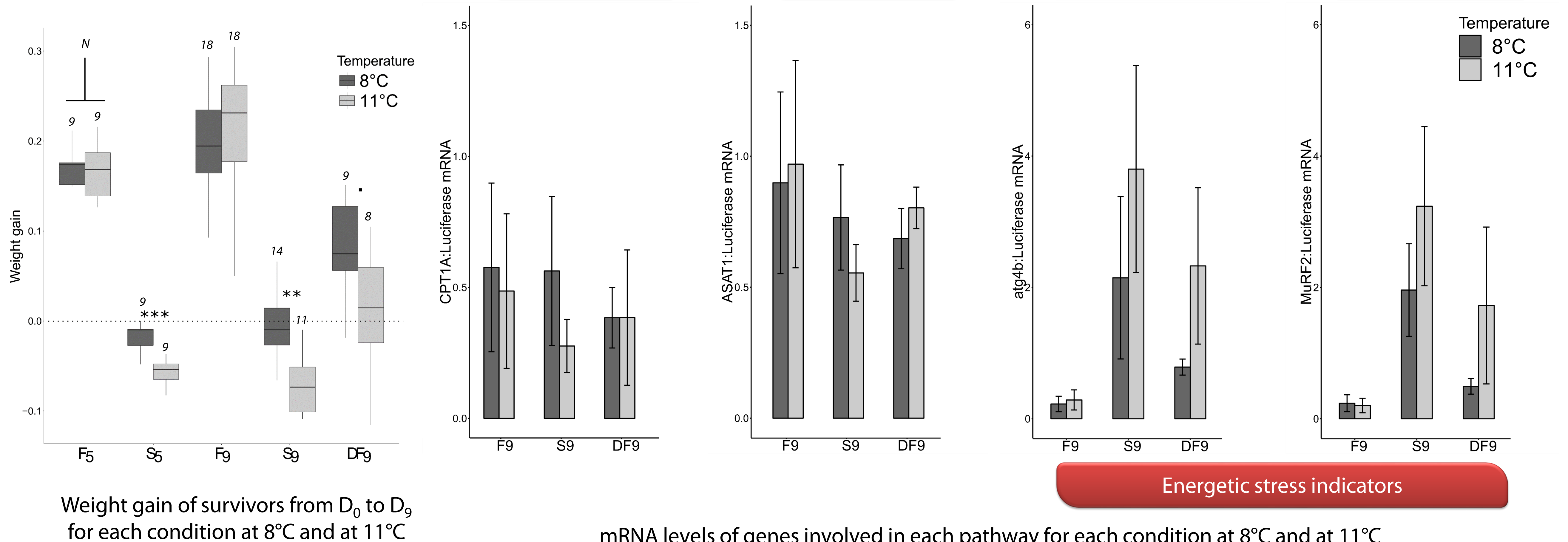
Results



Mortality: On D₉, **12** fish died

At 8°C : **4** S₉

At 11°C : **7** S₉ + **1** DF₉



Conclusions

- Growth and catabolism are **similar** between 8 and 11°C for Fed fish
- A **higher** temperature exacerbates the metabolic **distress** induced by **starvation**
- Despite 5 days of starvation, alevins are **able** to feed but **recovery**:
 - Is **not complete** after 4 feeding days
 - Is more **contrasted** at 11°C than at 8°C

GCC increases the risk that temperature reaches values above 10°C and that prey are washed out by large floods

The strength of 0⁺ cohorts could decrease in relation to starvation in years of large spring floods and the increase in temperature should worsen this effect