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# Assessing the environmental impacts of conventional and organic scenarios of rainbow trout farming in France

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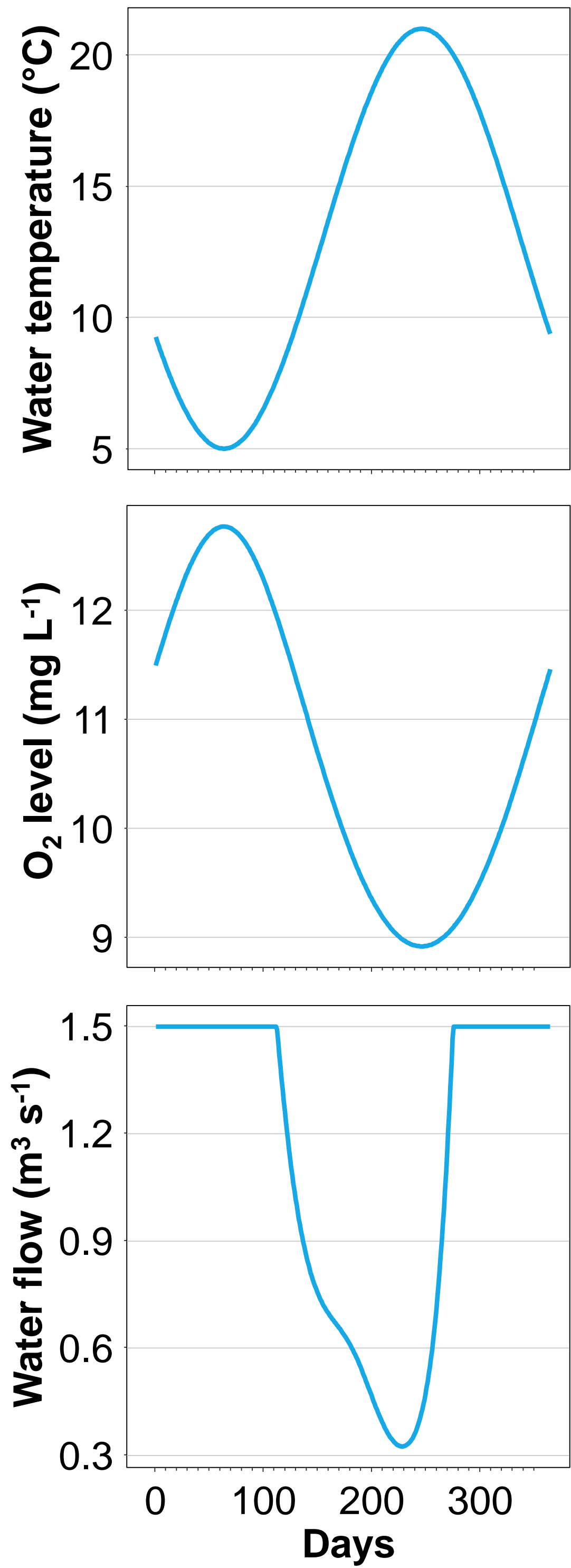


## Research question

This study models and compares the environmental impacts of conventional and organic rainbow trout farming in France



## Environmental conditions



### HYPOTHETICAL FARM

- Infrastructures
- Equipments
- Production (quota, market size...)
- Batches of fry (number, stocking dates)

### MODEL INPUTS

#### Feeds

- Proximate composition
- Ingredients

#### Fish physiology

- Temperature range
- Digestibility coefficients
- Oxy-caloric coefficients
- Body composition

#### Fish traits

- TGC
- Mortality rate
- FCR

### Constraints specific to the production system

- Rearing density
- Oxygenation
- Feed type

### MODELLING

#### Environmental conditions

- Temperature
- Dissolved oxygen
- Water flow

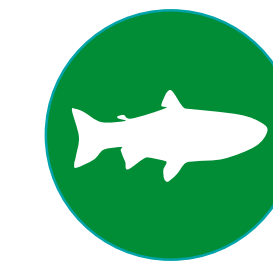
#### Zootechnical parameters

- Growth
- Biomass
- Oxygen requirements
- Raceways occupancy
- Feed intake
- Nutrient use efficiency

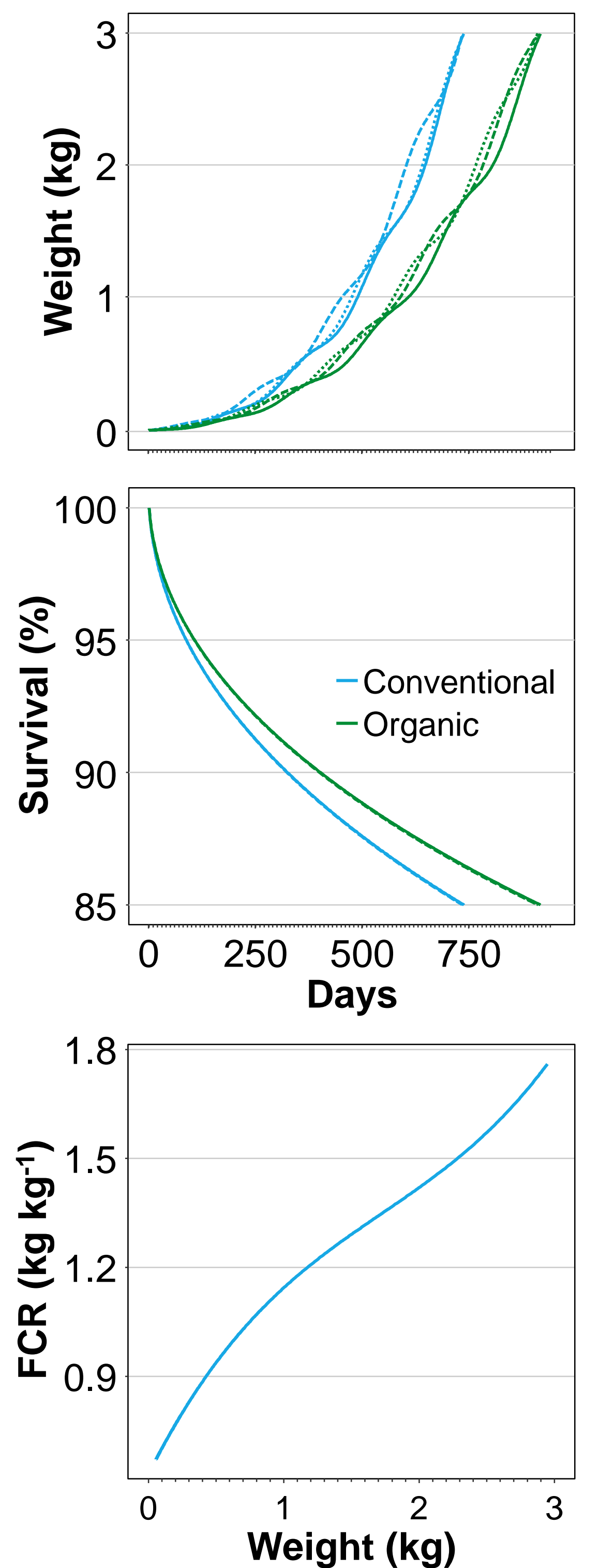
### MODEL OUTPUTS

#### LCA Inventory

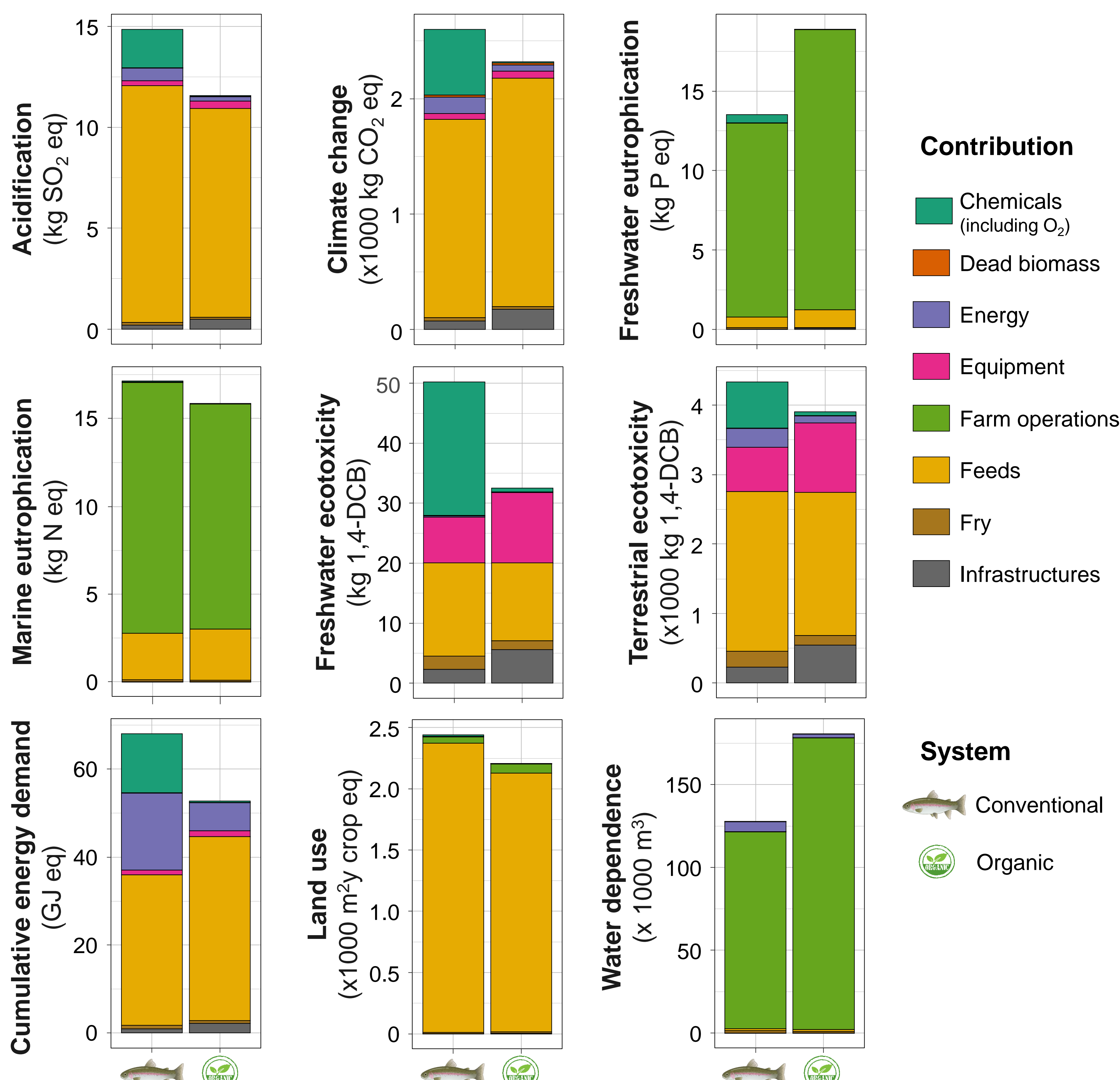
- **Inputs:** Water, fry, feeds, chemicals, electricity, infrastructures, and equipments
- **Outputs:** Trout at market size, dead biomass, N and P release, COD



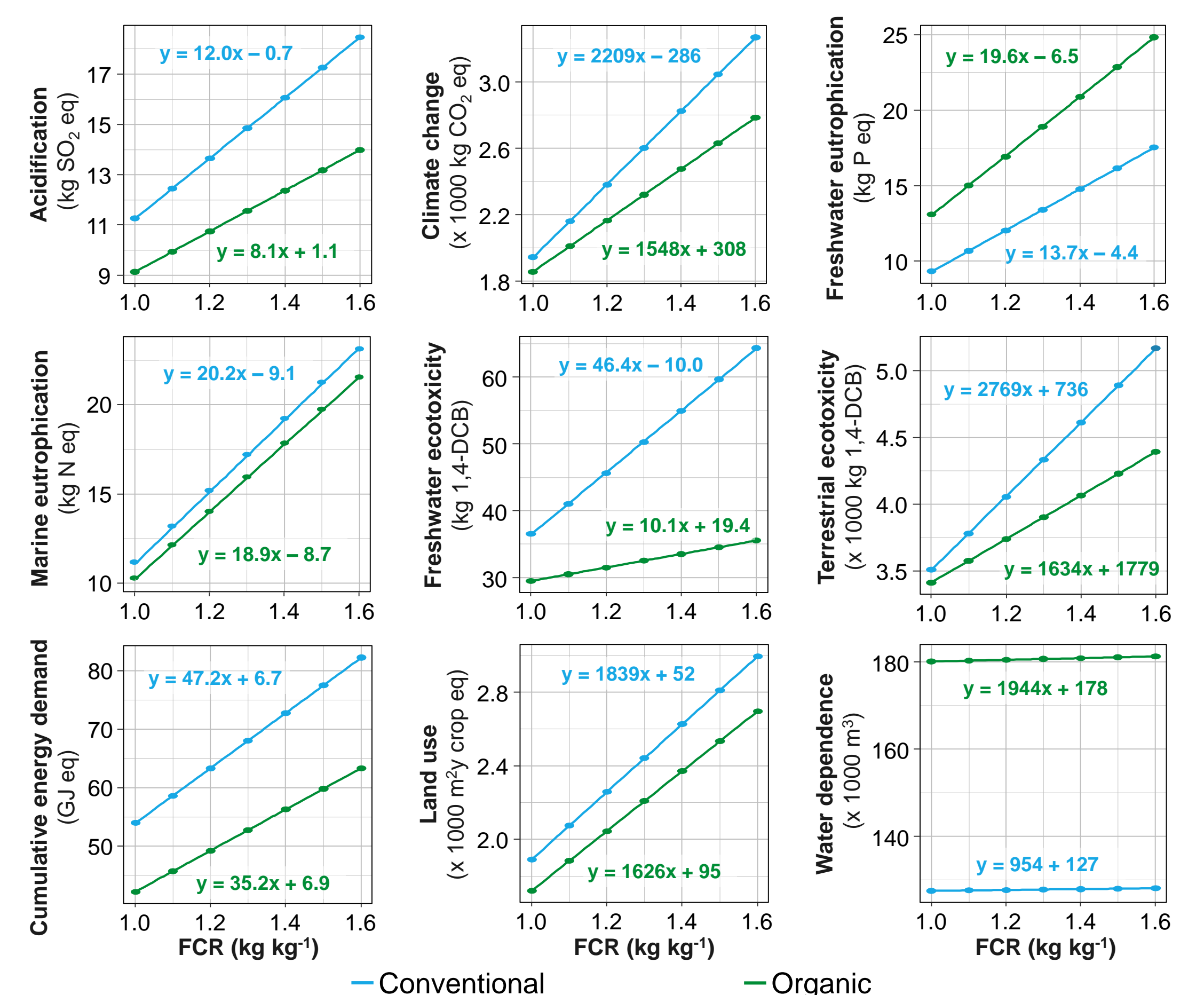
## Zootechnical parameters



## Environmental impacts per tonne



## Sensitivity analysis



## Take home messages

- Organic farming reduces environmental impacts in most of the categories
- Freshwater ecotoxicity and energy demand drop by ~30-35% in trout organic farming
- Benefits of organic farming are even more marked using a surface-based functional unit