

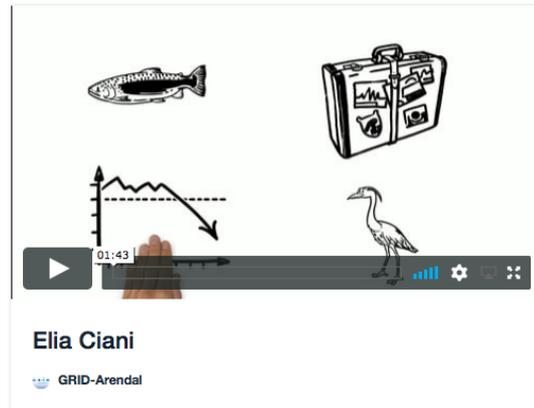
Salmon reproduction – all in the mind

by Elia Ciani

When we think about salmon, we have two different imagines in our mind. On one hand, they are one of the most important farmed fish which we can easily find in all supermarkets. On the other hand, we envision wild salmon running upstream in our rivers looking for their birth place to reproduce and perpetuate the species. Since farmed salmon are produced in large numbers, it can be difficult to imagine that wild populations are struggling and that the IUCN has put them on its Red List of Threatened Species.

The role of the environment is crucial in the regulation of salmon reproduction. For example, these fish use the length of the day and the temperature of water as a clock for timing the right season for sexual maturation and reproduction. In a world where environmental conditions are rapidly changing due to human activity, salmon physiology may respond in ways that the scientific community is still not able to predict effectively.

For this reason, we need more detailed knowledge about how the nervous and hormonal systems interact with the physiological condition of the animal and how it processes information from the environment. This is necessary if we want to produce efficient conservation strategies and make reliable predictions about the effects of global warming on salmon reproduction.



[Simpleshow video -
https://vimeo.com/271433812](https://vimeo.com/271433812)

One of the reasons why I decided to undertake this PhD program is because I wanted to invest the knowledge and skills I learned in university to become a marine biologist to do something that could help the marine environment in general – and salmon in particular – to be healthy and rich. I am fascinated by the way the nervous and hormonal systems process information from the external environment via the brain and pituitary gland. And how they interact and regulate internal body conditions to decide the exact moment when the animal is ready to invest energy in reproduction.

The aim of my PhD is to have a deeper insight on the communication between brain and pituitary gland. To do so, I am working with microscopy techniques that allow the visualization of specific cell types in the pituitary gland responsible for the production of hormones involved in sexual maturation. The ultimate goal is to identify which molecules, produced by the brain, are responsible for the release of those hormones during the development of puberty.

One of the candidates of my research is melatonin. This molecule, produced in the brain, has a central role in the perception of day length and temperature. It can be considered a good link between environmental conditions and reproduction.

During my research, I have also realized that the relationship between Norwegians and salmon is not something recent but it is a tradition that goes back centuries. In the museum of natural history in Stavanger, there is a stone with rune inscriptions dated 1100 CE. It regulates fishing rights in the Figgjo River, the river that is home to the salmon in my research.