



INTERREG IVA CRESH

Comparison of pre-recruit stages from different coastal areas
Comparaison des pré-recrues de différentes zones côtières

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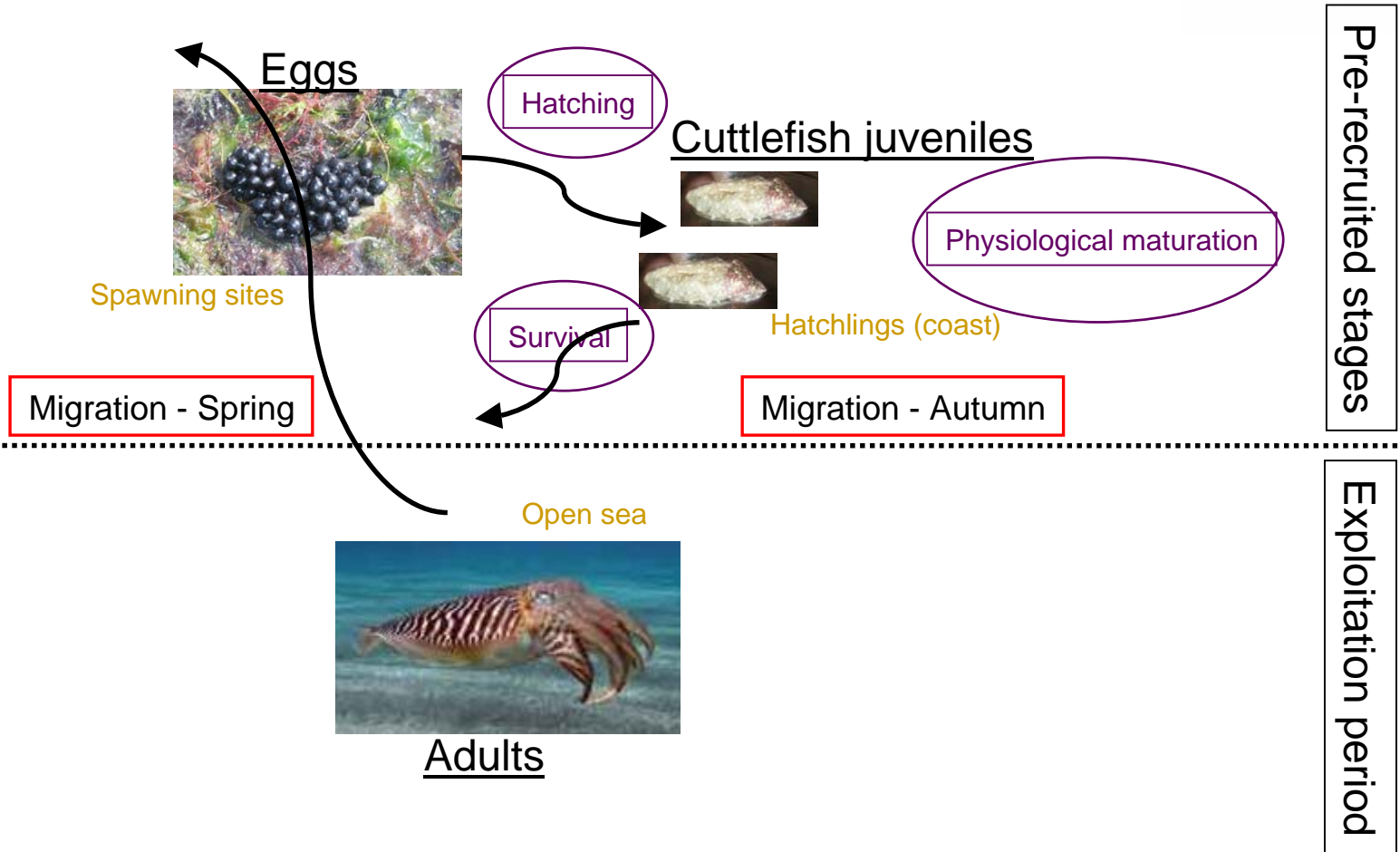
Université de Caen Basse-Normandie
UMR-IFREMER-100-Physiologie et Ecophysiologie des Mollusques Marins
IBFA Esplanade de la paix, Caen, France



Context and objectives



Sepia officinalis life cycle



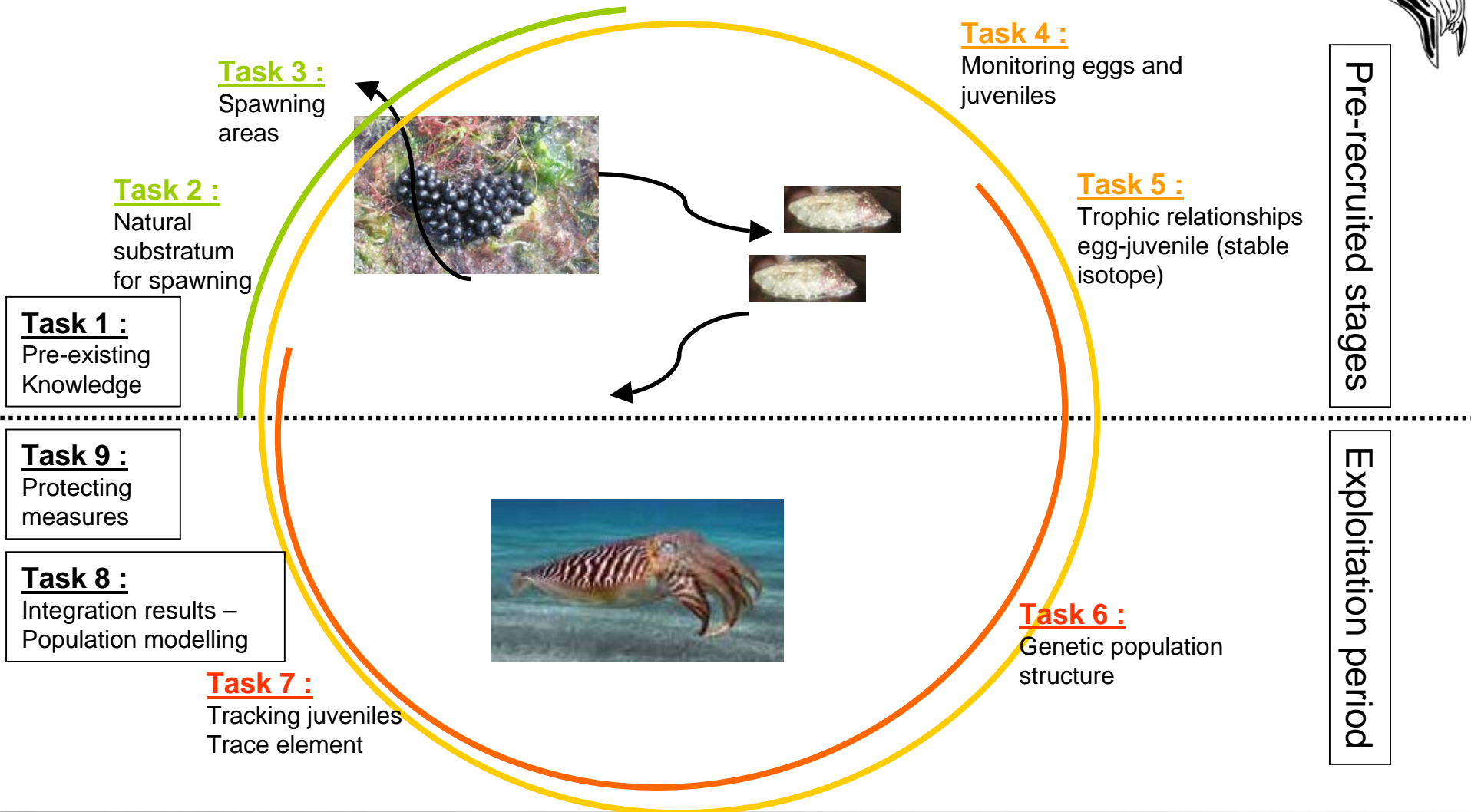


Context and objectives

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Comparative studies within the project





Context and objectives

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Objectives (eggs and juveniles studies)

- Improve knowledge of the English Channel habitats favourable to the reproduction of cuttlefish
- Study the effect of spawning sites on eggs quality then on growth and survival of cuttlefish at the first stages of their life
- Assess the contribution of different spawning sites on the global stock recruited (by using biochemical tools)



Context and objectives

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Objectives (eggs and juveniles studies)

- First approach : Eggs quality

The sites abiotic factors → The eggs quality

- Second approach : Juvenile physiological performance

The eggs quality → The state of hatchlings → The juveniles physiological performances
(Digestive capacities, immunity, biochemical composition)

- Third approach : Juveniles and preys of the sites

Trophic relationship between juveniles / preys of their site (stable isotope ratios)

- Fourth approach : Juveniles from trawl surveys (Trace elements)

Juveniles differences before migration?

Better physiological performance

Better contribution to the central stock

Pre-recruited stages: Spawning period → Autumn migration



Sampling and comparative experiments



Sampling protocol for eggs



- Field operations (April → August)

- Eggs batches

→ Localised (GPS Data)

→ Natural substratum listed

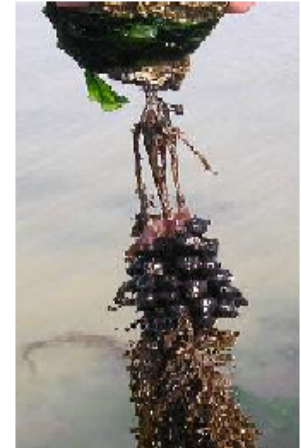
Related to habitats description

- A first part of the eggs batches

→ Incubated (hatching rates and juveniles rearing)

- A second part of the eggs batches

→ Frozen (biochemical indices)





Sampling and comparative experiments



Collection of juvenile specimens

- Experimental fishing operations

→ Trawl surveys (IFREMER – CEFAS)

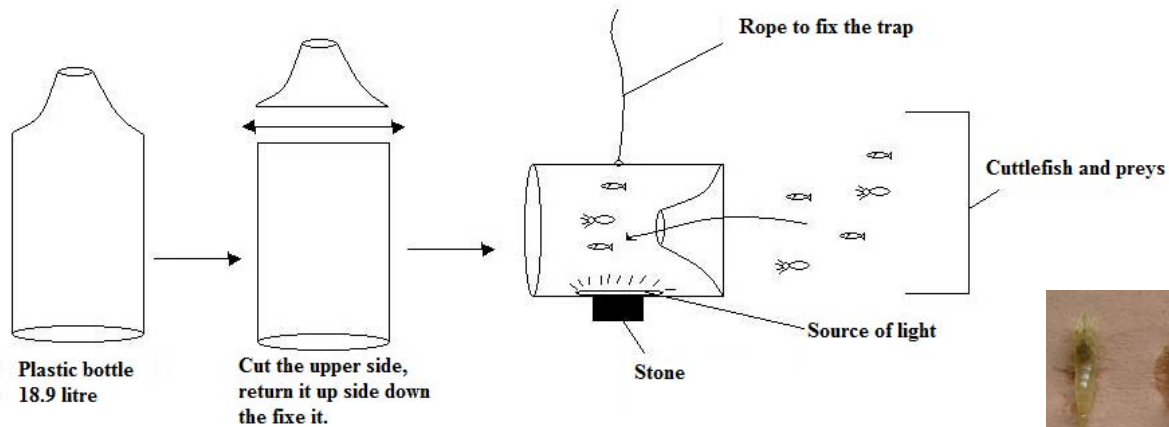
- Collect cuttlefish juveniles

- Collect potential preys

Exemple of trap

Biochemical analysis

Trophic ecology





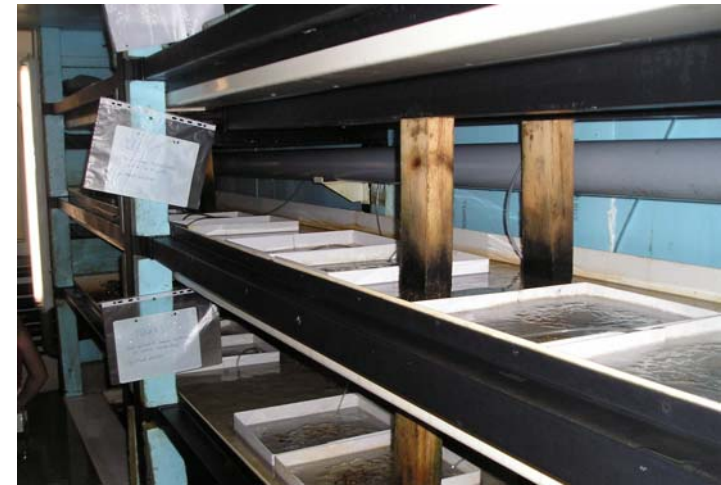
Sampling and comparative experiments

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Experimental rearing (eggs from different pilot sites)

- After hatching, cuttlefish of the different sites are placed in the same rearing structures
 - Same biotic and abiotic factors
 - Comparison of the different cuttlefish batches according to their site of origin
- Survival rates
- Samples performed every week (growth parameters)



CREC – Station Marine de Luc-sur-mer, Université de Caen.



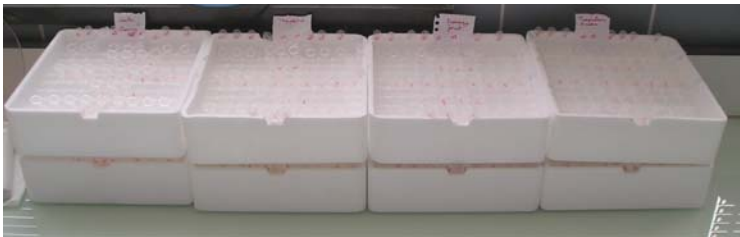
Sampling and comparative experiments

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Analysis (physiological condition, trophic signatures)

- Extraction and enzymatic assays (digestive capacities $\xrightarrow{\text{Growth}}$ recruitment)
- Indications of immune conditions (resistance and survival)
- The biochemical composition (nutritional values)
- Stable isotope ratios (determine the food sources / sites)
- Trace element analysis (track juveniles / origins)



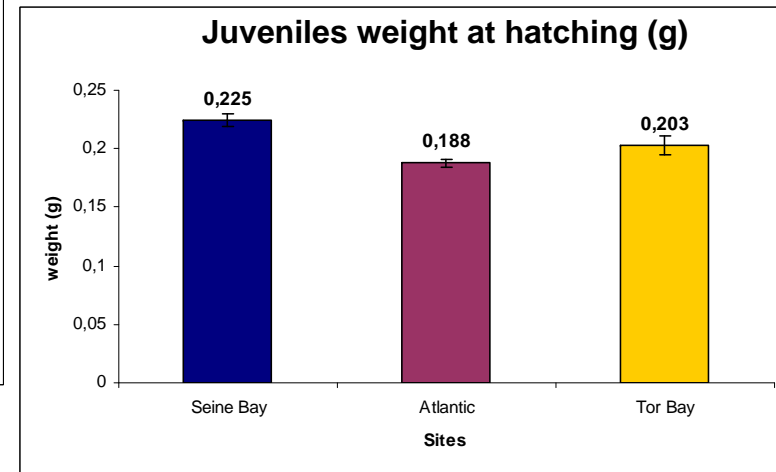
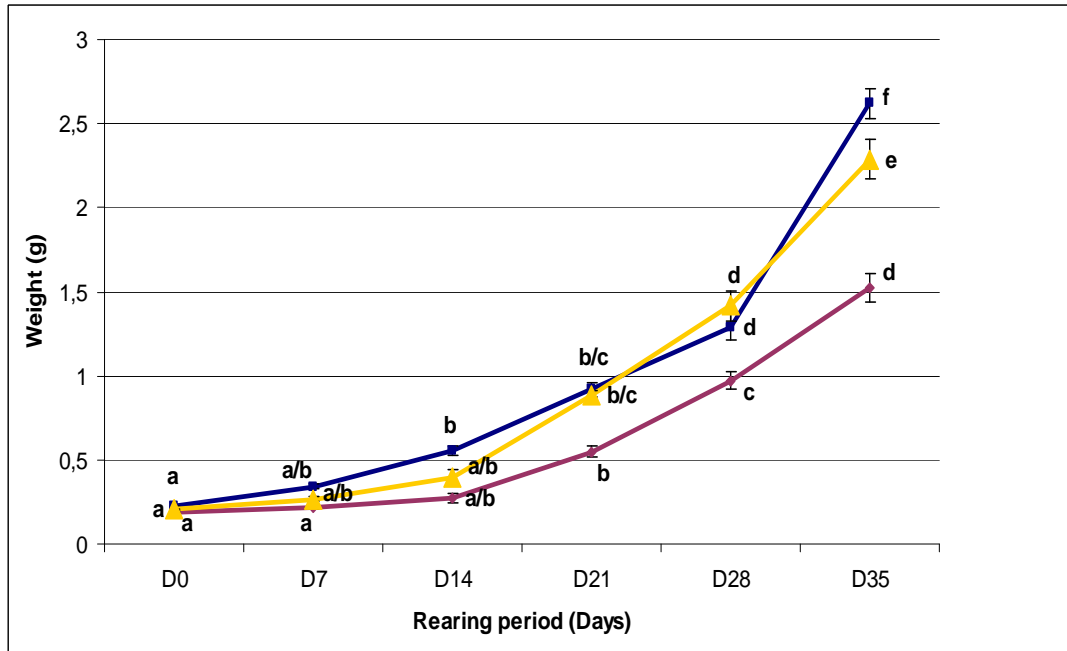


First results obtained in 2009

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The rearing



Cuttlefish from Tor Bay and Seine Bay grew significantly more than those of Agon

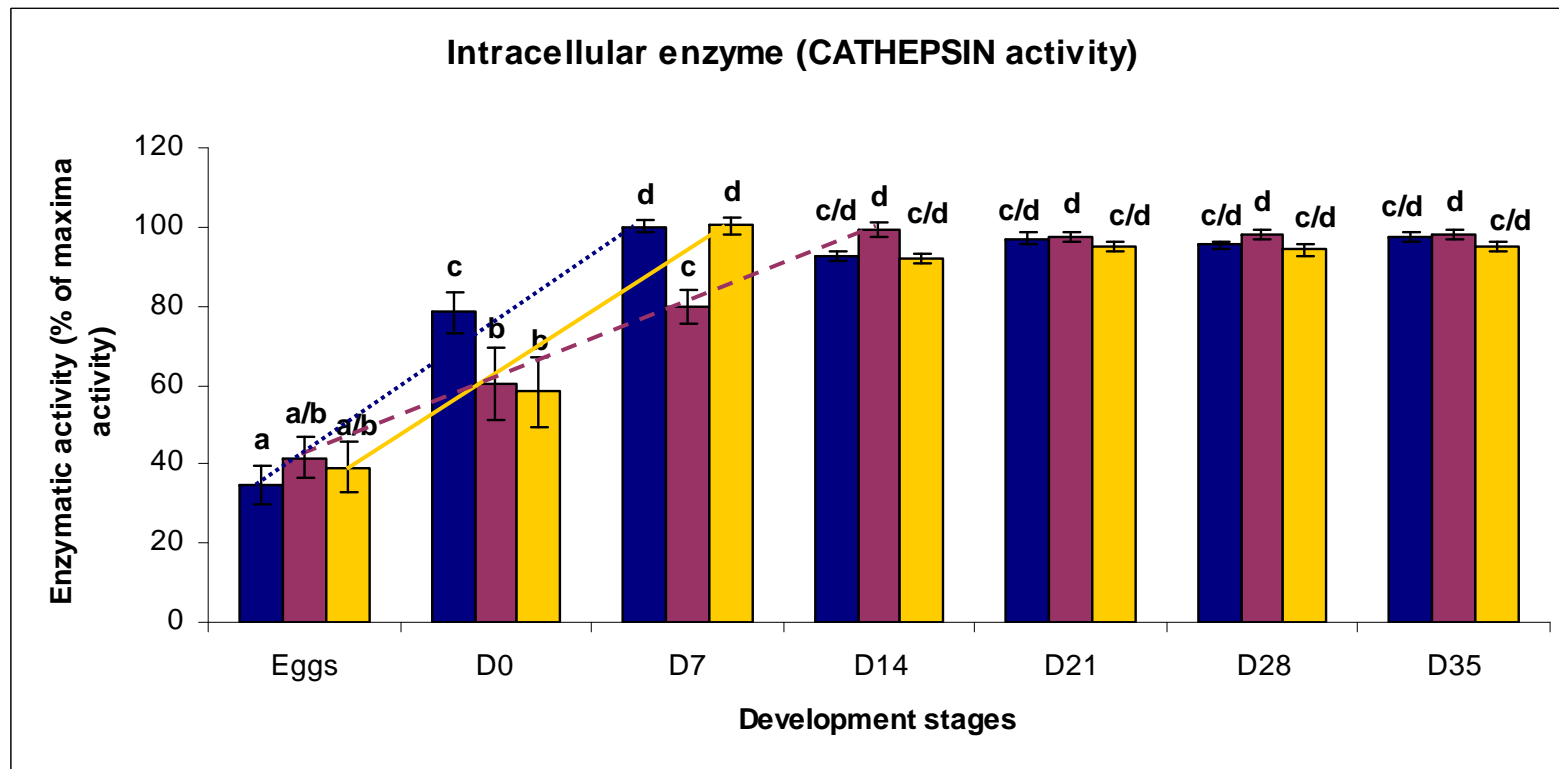


First results obtained in 2009

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The biochemical analyses

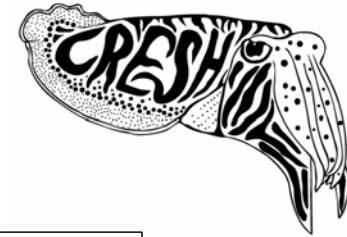


The maturation of digestive cells (intracellular enzyme) is faster for Seine Bay and Tor Bay specimens than for those of Agon

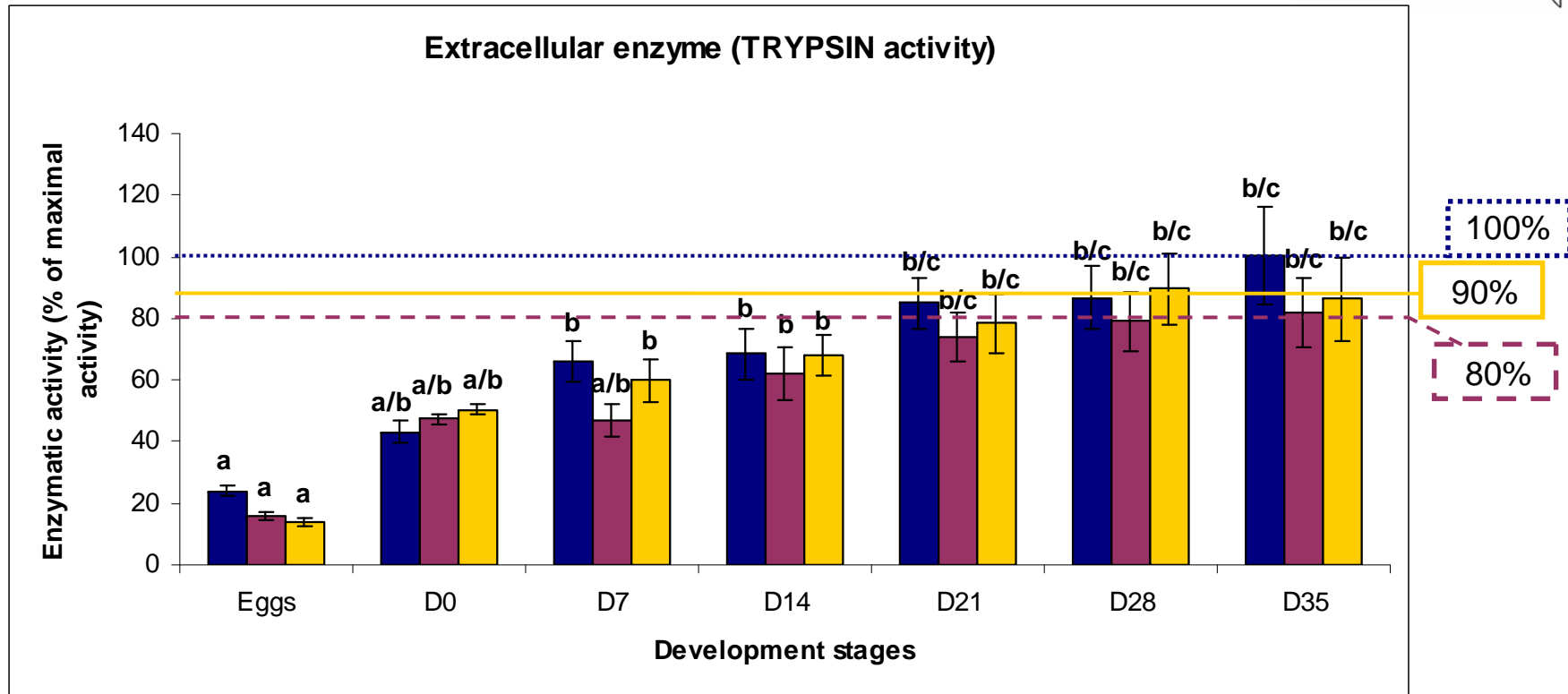


First results obtained in 2009

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The biochemical analyses



The mean alkaline activity (Trypsin) occurred earlier for Seine Bay and Tor Bay than for Agon



First results obtained in 2009

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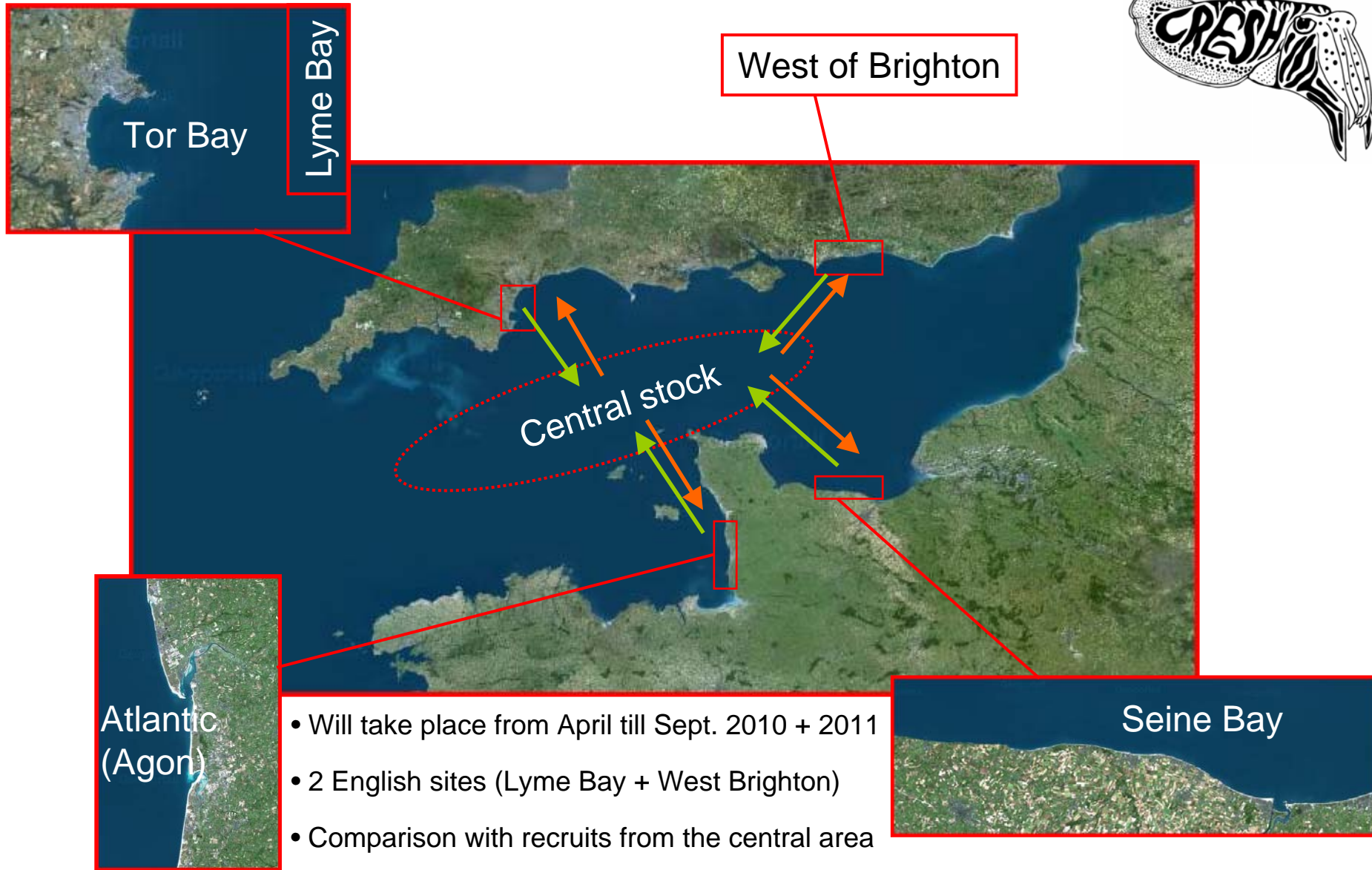


Conclusion and perspectives

- Bays seems to be more favorable for juvenile performance
 - Comparison 2008/2009
 - Seine Bay and Tor Bay compared to Agon
 - Significant differences observed
- Digestive capacities as a tool for understanding
 - Maturation of digestive cells
 - Implementation of digestive enzymes
 - Histological observations to complete the digestive approach
- Sites monitoring and experiments
 - Confirmation of trends over several years

Plans for continuation (2010 – 2011)

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Thank you for your attention...