Study of wave trends along the Galician coast and evaluation of their potential impact on the quality of the stalked barnacle, *Pollicipes pollicipes*

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INTRODUCTION

- Due to **climate change**, several studies show **upward trends in maximum wave height** in the North Atlantic.
- Changes in wave height, wave period and orbital currents can be translated to marked shifts in the shape of intertidal organisms such as the stalked barnacle ***Pollicipes pollicipes***, whose quality and market price is known to decrease with the relative length of its peduncle.

Evaluation of **wave trends** along the Galician coast and monitoring the possible **impact on barnacle populations.**

Denny & Gaylord, 2010

OBJECTIVES

1. Analyze the dominant **trends** in the **wave regime** in Galicia.
2. Study the **trends** in barnacle **morphology/quality**.
3. Evaluate the **coupling** between wave and **morphology/quality trends**.

CONCLUSIONS

Increases in **maximum wave hight** and **wave period**. Heterogeneous distribution in orbital currents.

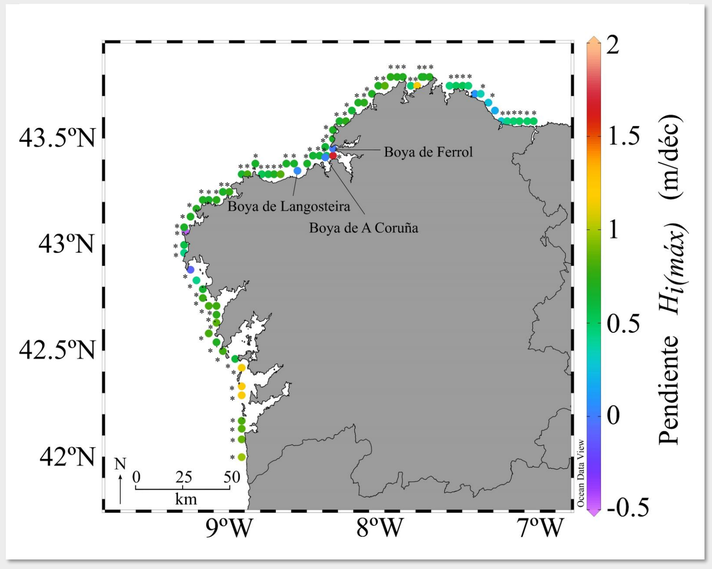
Morphological index can be used as a method to classify the quality. Quality depends on **site** and **intertidal level**. Elongation trends predominate, **worse quality**.

Variable coupling. Reached **90%** in high quality sites in Baiona.

RESULTS

Wave trends

VARIABLE	MEAN RATE OF CHANGE	
Maximum wave height	0.65 m/dec	↗
Wave period	0.57 s/dec	↗
Total orbital current	0.114 m/s·dec	↗
Orbital current X	0.091 m/s·dec	↗
Orbital current Y	0.060 m/s·dec	↗

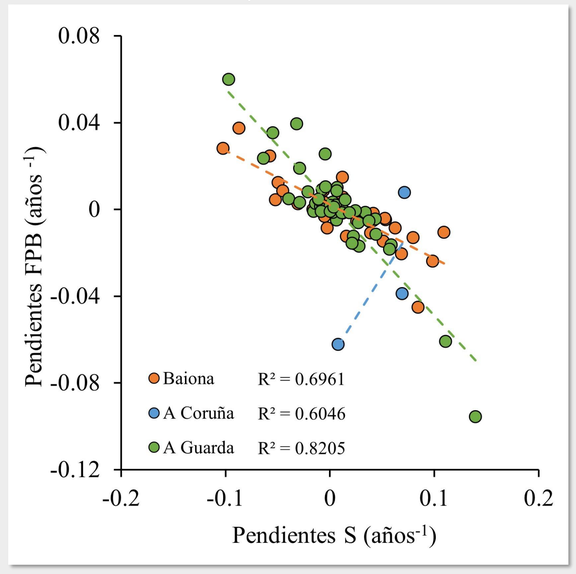


Trends in *P. pollicipes* morphology and quality

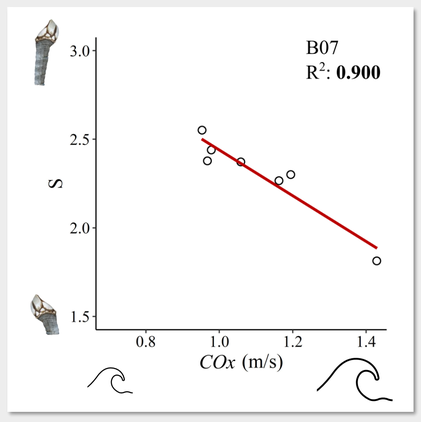
81 time series
- 28: ↑ S
- 12: ↓ S
- 41: no significance

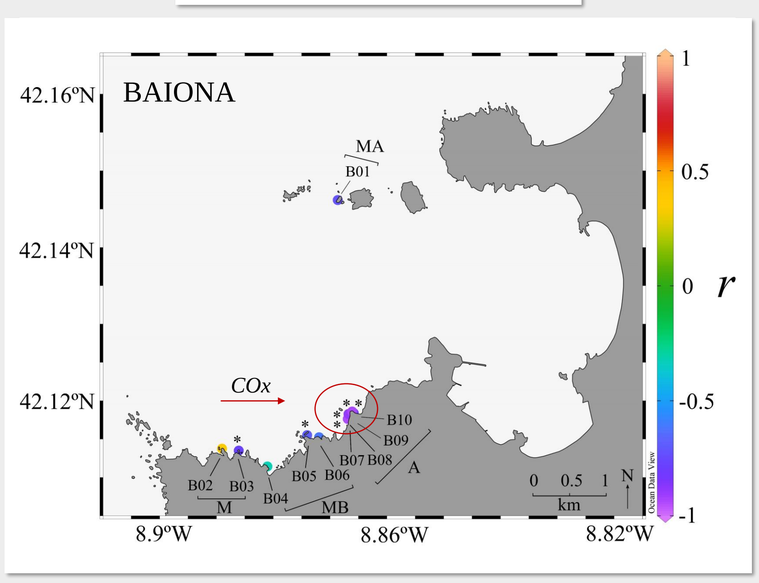
GLMM → spatial and temporal variability

S vs FPB



Coupling between wave trends and morphology/quality





MATERIAL AND METHODS

Wave trends

- 77 SIMAR modelled data points in Galicia (Spain) between 2006 and 2020
- 3 REDCOS buoys were used to calibrate the data from 2012 to 2020

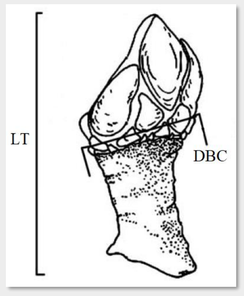
For each SIMAR point, a GAMM was applied to obtain a rate of change over time for each wave variable: maximum wave height; wave period; orbital currents (in component X and Y).

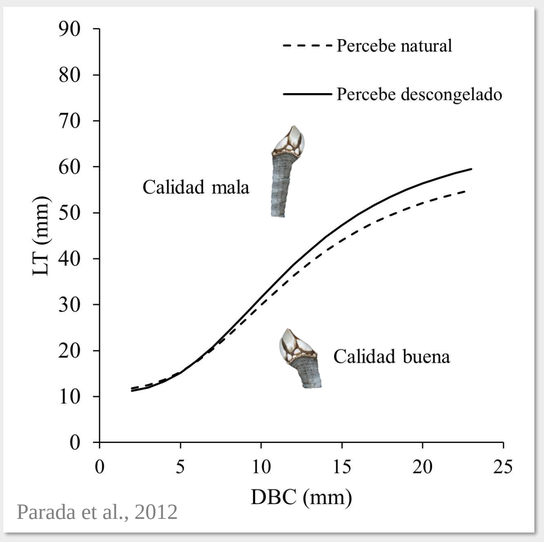
Trends in *P. pollicipes* morphology and quality

"Cofradias" of A Coruña, Baiona and A Guarda provided *P. pollicipes* morphology data (LT and DBC) between 2011 and 2020 from different locations and intertidal levels.

- Morphology:
  - 81 time series
  - GLMM to test de variation of the morphology index (S)
- Quality: variation of FPB index and comparison between S and FPB

$$S = \frac{LT}{DBC}$$





Parada et al., 2012

Coupling between wave trends and morphology/quality

Trends between 2011 and 2020 in S and winter orbital currents were correlated in Baiona to evaluate a possible coupling.

REFERENCES

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