

Can *CoastAppli* (a citizen science smartphone app) improve monitoring and understanding of coastal hazards to support coastal management?

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OSIRISC OBSERVATOIRE DES RISQUES CÔTIERS EN BRETAGNE



Introduction

- Coastal hazards and coastal dynamics remain unknown for the general public.



- OSIRISC research project (towards an observatory of coastal risks): standardized and simple field protocols for measuring hazards have been co-designed with coastal managers and scientists.
- Coastal managers are motivated to do hazard measurements according to OSIRISC protocols but often lack of time to frequently do them. Conversely, some citizens want to participate in the acquisition of scientific measurements while learning.

Can *CoastAppli* (a citizen science smartphone app) improve monitoring and understanding of coastal hazards to support coastal management?

Introduction

Elected officials and coastal managers involved in collecting data and raising awareness



Citizen motivated to monitor coastal hazards



Secondary school students and teachers motivated to monitor coastal hazards



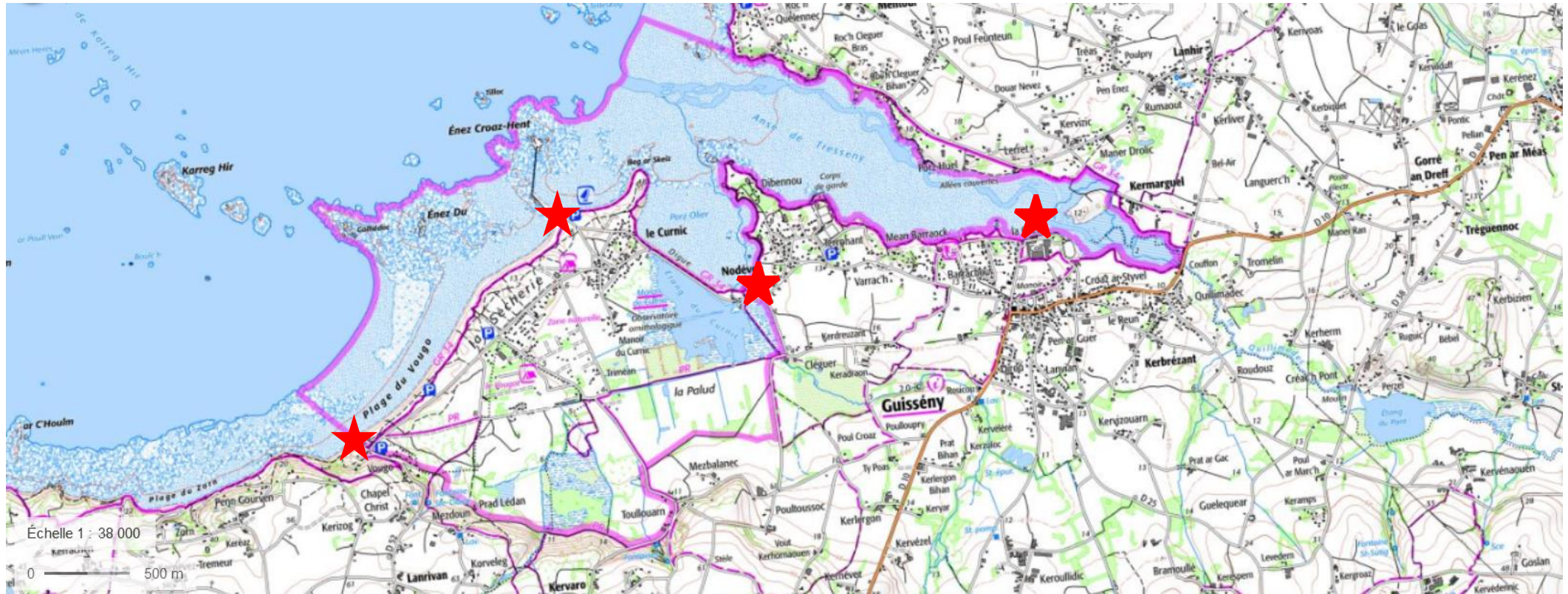
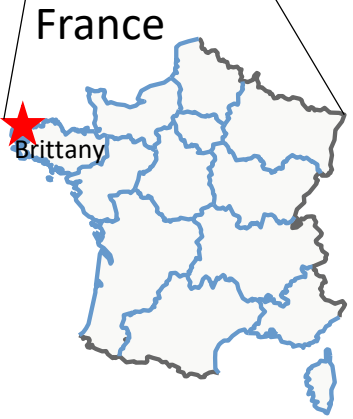
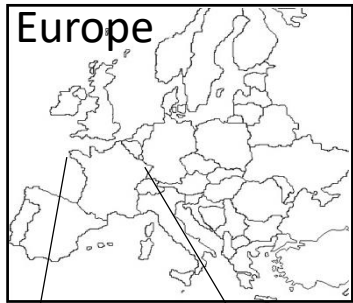
ISblue training project within the OSIRISC observatory

3-year project with students and a company to create an app on coastal hazards monitoring

3 user profiles:

- Beginner (no skills in coastal environment and measurements) – B
- Regular user (some skills in coastal environment and measurements) – R
- Coastal manager (professional) - P

Introduction



Vougo beach (exposed to erosion)



Nodéven beach (exposed to erosion and coastal flooding)

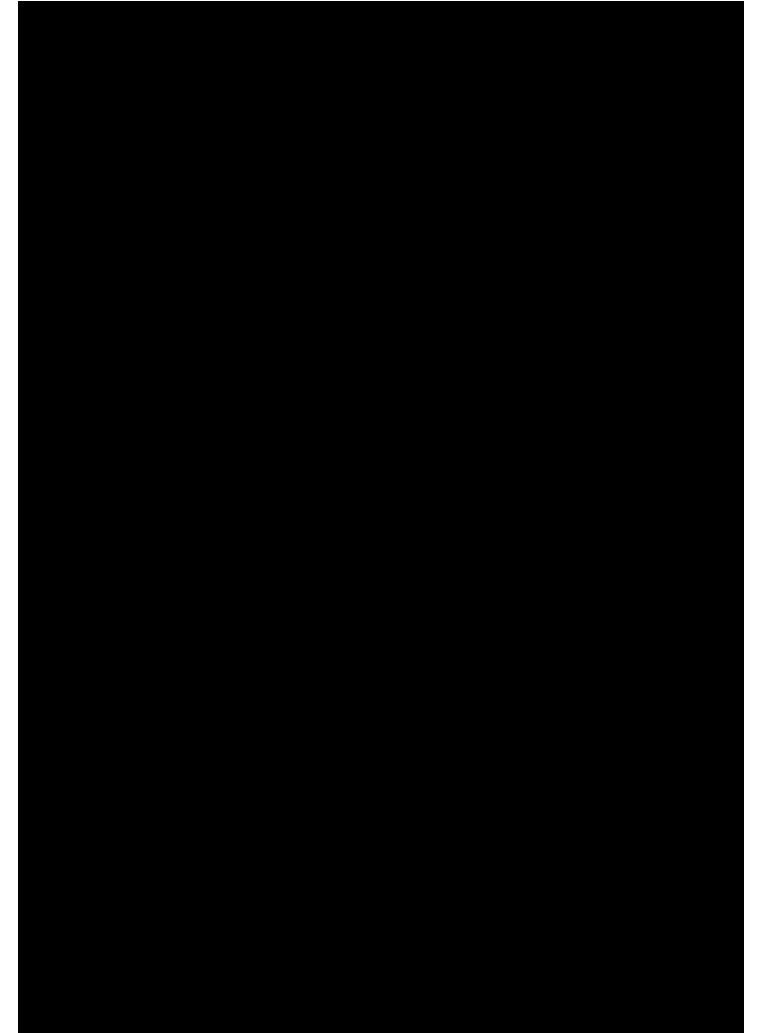


La Croix beach (exposed to erosion and coastal flooding)

1) Measurement tools and protocols available in CoastAppli

Site	Erosion protocol / user profile	Coastal flooding protocol
Croix beach	Photograph monitoring / B, R, P	Water height by vertical measurement / B, R, P
	Vertical measurement on the upper part of the nearshore / B, R, P	Water height by photograph / B, R, P
	Vertical measurement on the lower part of the nearshore / B, R, P	
	Distance between a reference point and the shoreline / R, P	
	Beach slope/ P	
Nodéven beach	Photograph monitoring / B, R, P	Water height by vertical measurement / B, R, P
	Vertical measurement on the upper part of the nearshore / B, R, P	Water height by photograph / B, R, P
	Distance between a reference point and the shoreline / R, P	
Curnic beach	Photograph monitoring / B, R, P	
Vougo beach	Photograph monitoring / B, R, P	

■ Qualitative data
■ Quantitative data

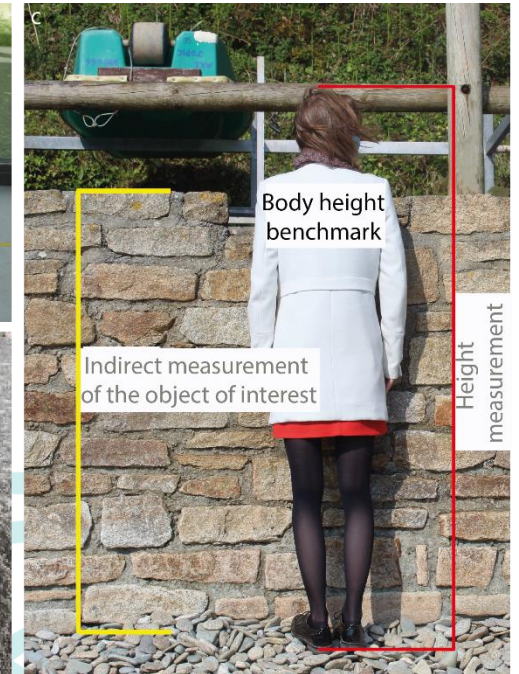


1) Measurement tools and protocols available in CoastAppli

For quantitative data

I. Simple measurement tools (for beginners and regular users)

- Pace benchmark (keyboarding by repetition)
- Body height benchmark (keyboarding by comparison)
- Index finger benchmark (keyboarding by repetition)



II. Professional tools (for professionals)

- Decameter (direct keyboarding)
- Laser distance meter (direct keyboarding)
- Inclinator (direct keyboarding)



Decameter



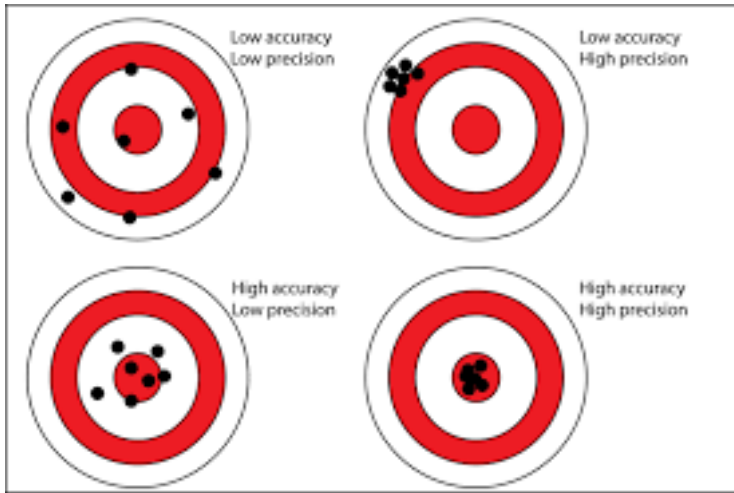
Laser distance meter



Inclinometer

2) Results

Assessment of accuracy and precision



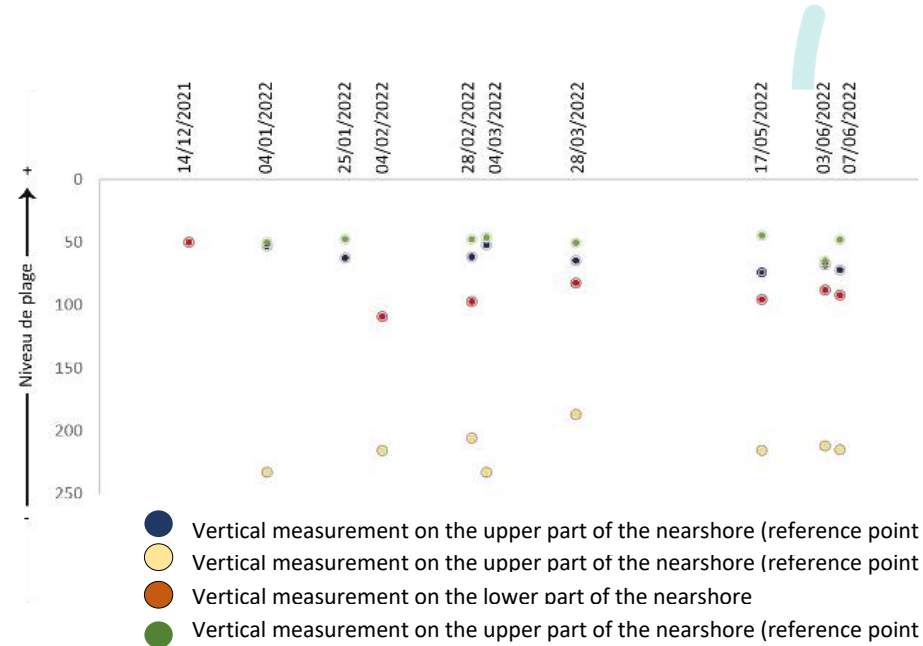
Ground truth data with UAV data (28/03/2022)

	Method of keyboarding data	Beginner or regular user
Accuracy, calculated by the average distance (cm)	Directly	3
	By repetition	7
	By comparison	10
Precision, calculated by the standard deviation (cm)	Directly	10
	By repetition	15
	By comparison	25

2) Results

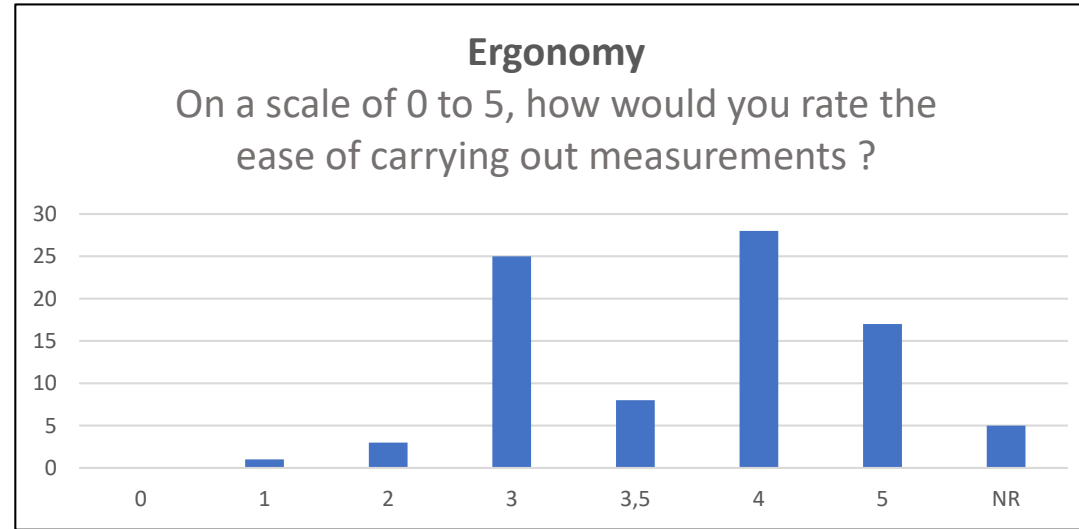


Evolution Croix beach from 12/12/2021 to 07/06/2022 with CoastAppli data (qualitative and quantitative monitoring)

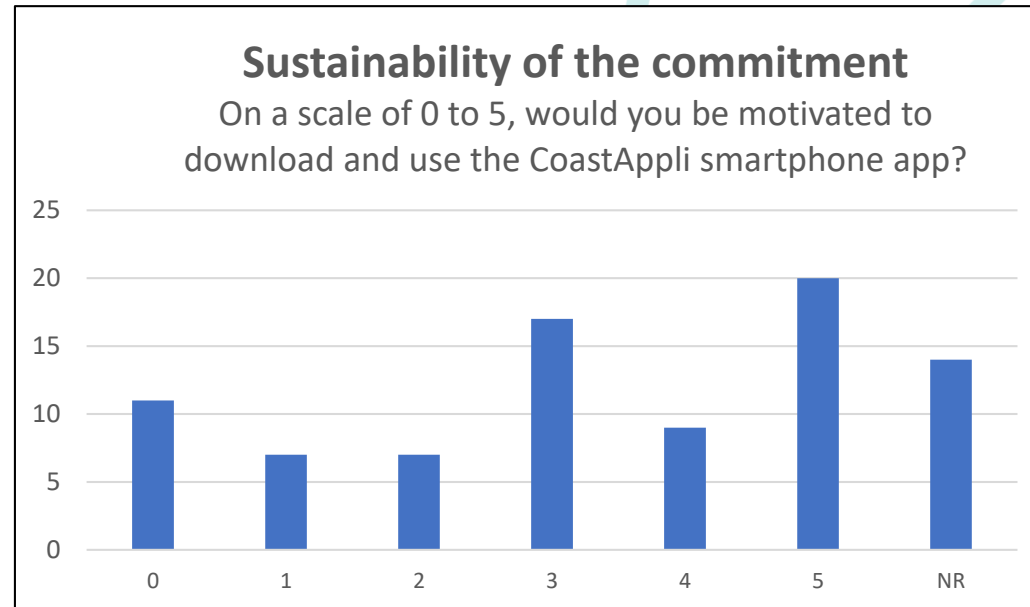
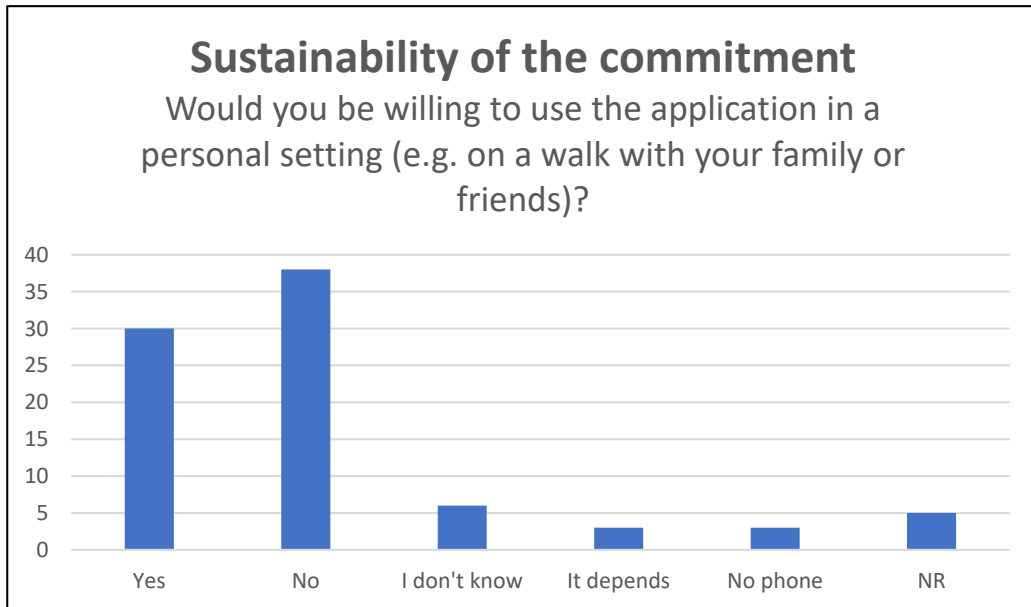


2) Results

87 questionnaires
(secondary school students,
citizens, coastal manager)



0: very difficult
1: difficult
2: relatively difficult
3: relatively easy
4: easy
5: very easy



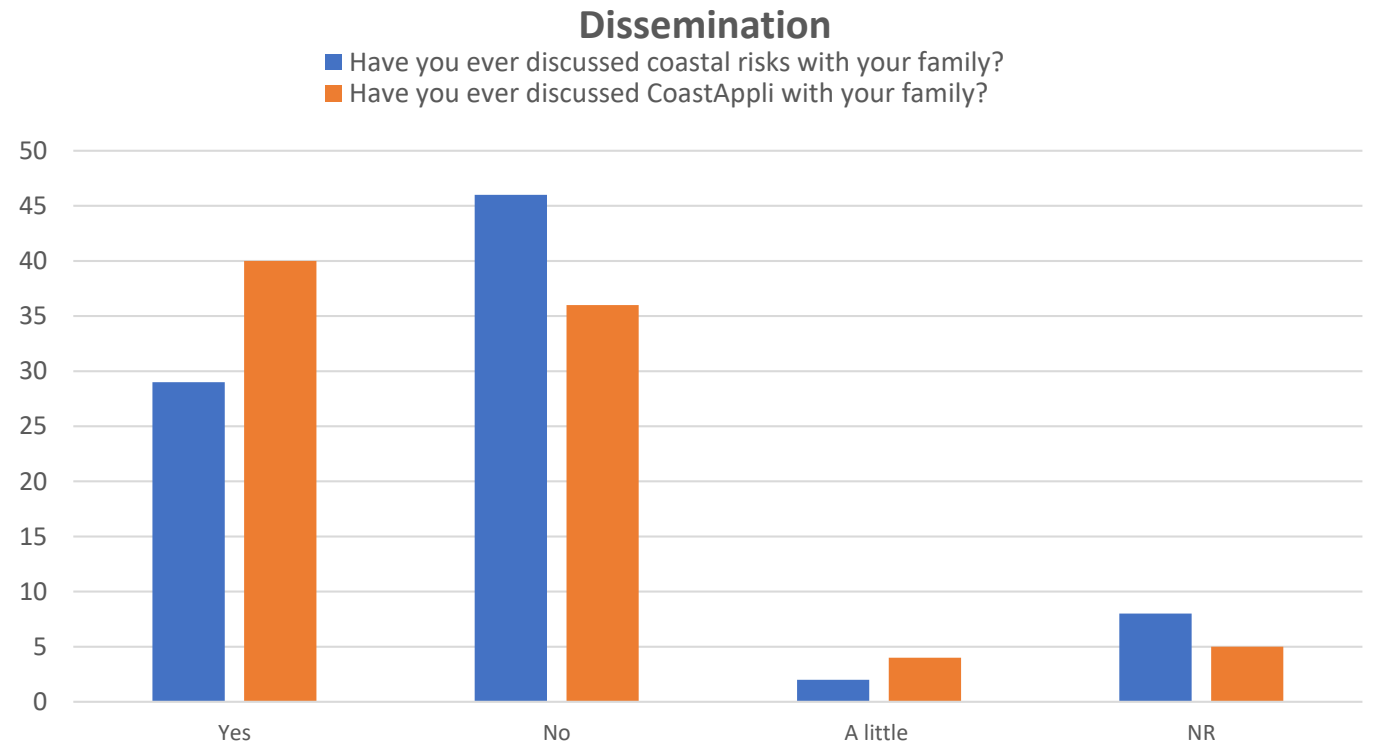
0: Not at all
1: A little
2: relatively motivated
3: motivated
4: very motivated
5: absolutely

Conclusion and perspectives

During its first test phase (2021-2022) we have already seen that CoastAppli can improve the monitoring and understanding of coastal risks for different audiences.

CoastAppli has a strong interest for the 3 target audiences :

- For all audiences, the interest can only be maintained by expanding the number of sites and updating the app. For school students, it is necessary to combine it with fun activities.
- Elected officials and managers: strong interest in taking regular monitoring (quantitative and qualitative database) and create discussions about coastal risks.



Conclusion and perspectives

At the request of school students and teachers, the test with schoolchildren will continue for another year (2022-2023).

--> The test of the sustainability of the commitment over one and a half years for CoastAppli will therefore be interesting

- How to integrate the different audiences in the analysis and valorisation of data in a short time (6 months)?
- What economic model should be put in place?

Thank you for your attention !

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