

# Cruises as a vector of spatial inequality between large and small ports in the Mediterranean Sea ?

Ronan Kerbiriou - Université Le Havre Normandie & CNAM-Paris  
Mariantonia Lo Prete – Université du Littoral Côte d'Opale  
Arnaud Serry – Université Le Havre Normandie  
Catherine Roche - Université du Littoral Côte d'Opale  
Julia Mermin – Université Le Havre Normandie (student)

Session : C.41: Transport and Geography: Medium-sized, small, peripheral ports and territorial developmen

# Introduction

4.4 million passengers in 2023, an increase of 19% since 2019 (before the COVID-19 crisis).

Denunciation of the cruise industry in many cities by civil society and associations for its societal, environmental and health impacts.

Restrictive measures introduced by municipalities in major cities.

Cruising spreading to new, smaller ports?

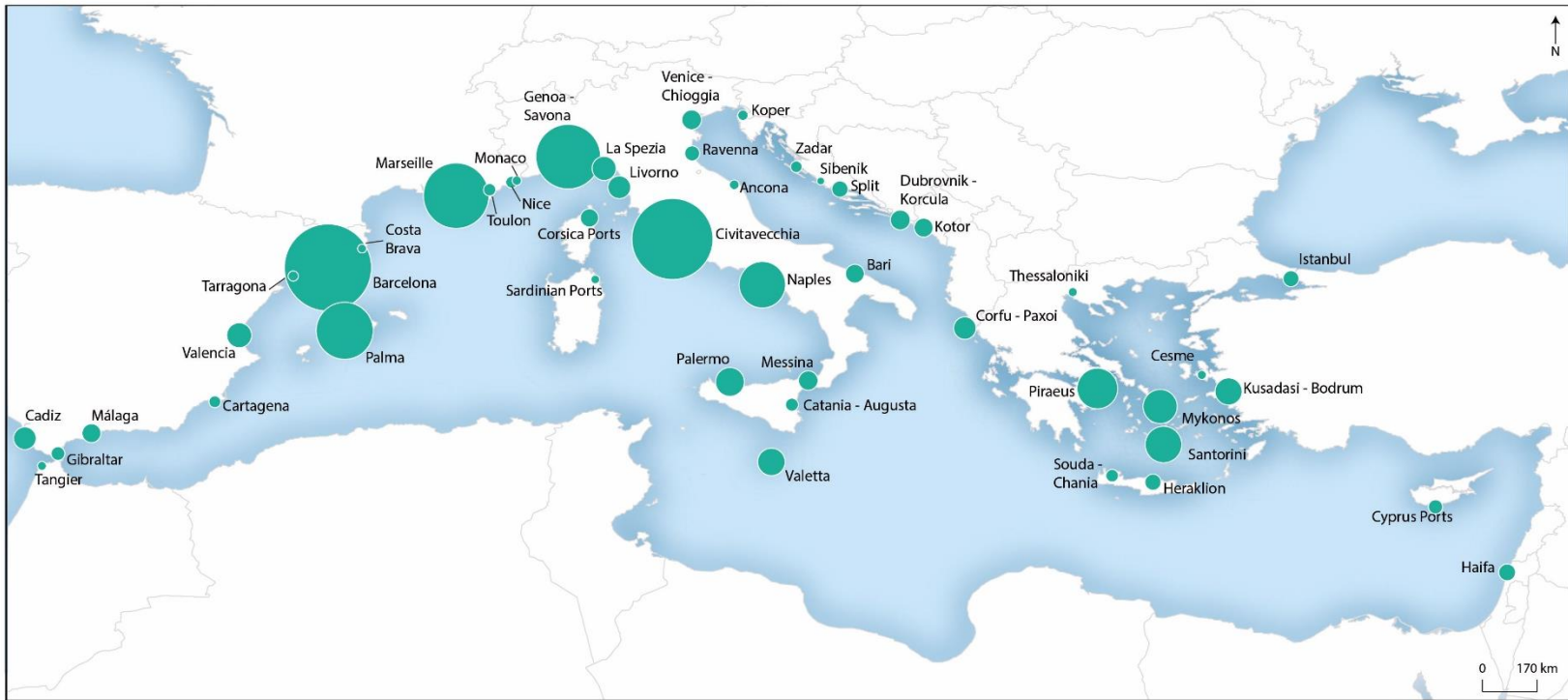
## **Objectives :**

Study the evolution of the cruise industry in the Mediterranean Sea between 2013 and 2023.

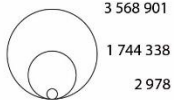
## **Frame :**

ANR CROISIPOLI project headed by Mariantonia Lo Prete (declined). Continuation of the project in another form?

# Study framework



Number of passenger  
per port with more than  
50 calls in 2023

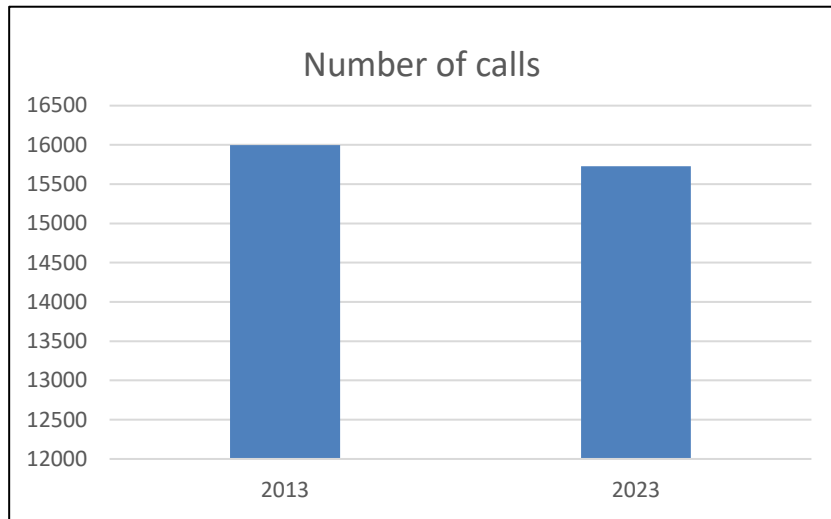


 Cruise ports studied  
 Hydrography  
 Country

## Plan :

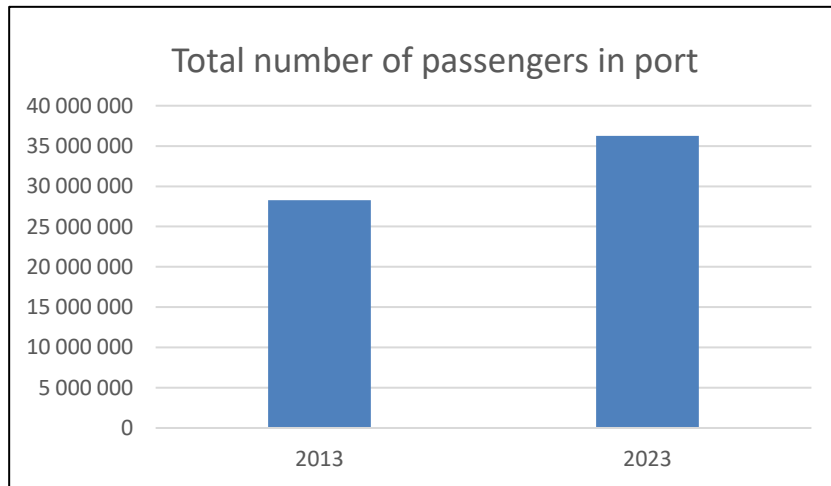
1. Analysis of cruise market trends in the Mediterranean Sea between 2013 and 2023
2. Port approach
3. Modelling of pollutant and atmospheric emissions from cruise ships calling in 2023.

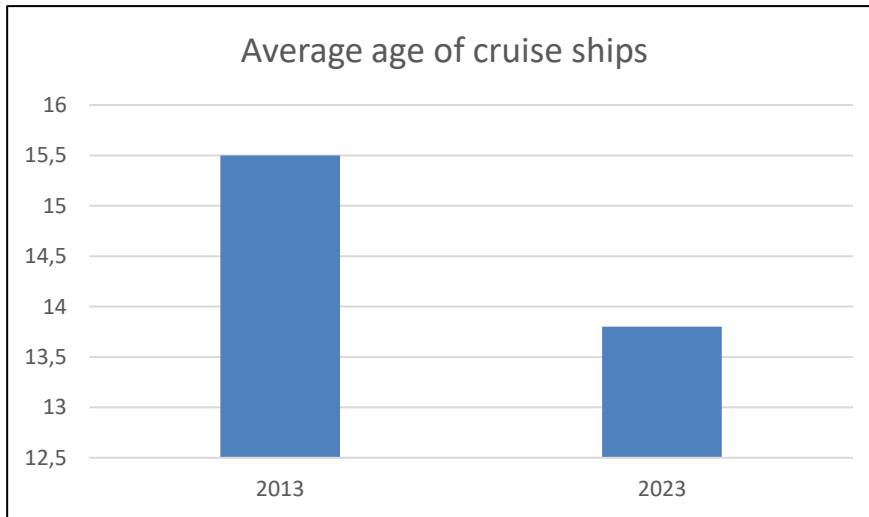
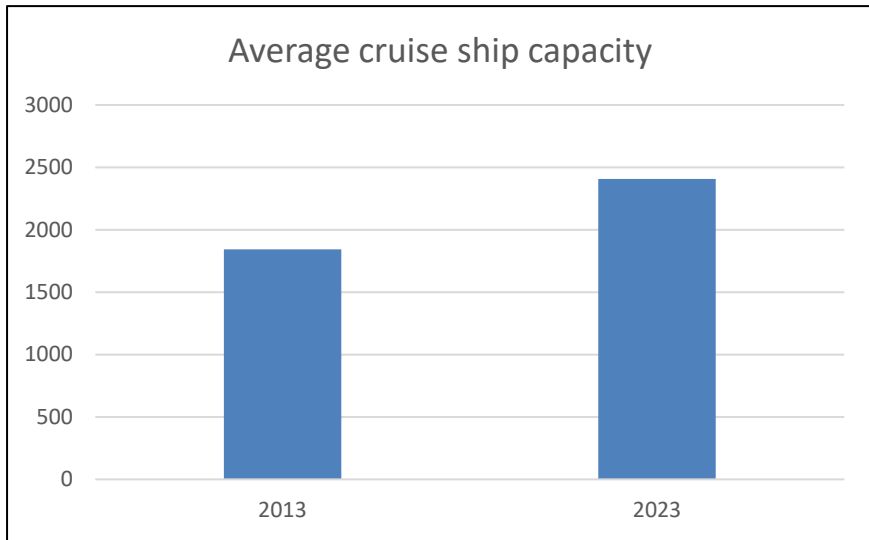
# Cruising in the Mediterranean



Stability in the total number of cruise calls between 2013 and 2023 : - 2% .

But increase in the number of cruise passengers calling: +22%. (+8 million in 10 years)





Number of vessels commissioned over the past 10 years and average capacity

Year of commissioning	Number of vessels commissioned	Average passenger capacity
2013	4	2761
2014	4	4658
2015	6	1891
2016	4	1345
2017	3	1072
2018	8	4464
2019	14	4479
2020	11	2081
2021	15	4315
2022	13	3231
2023	14	1375

Increase in average vessel capacity: +23%.

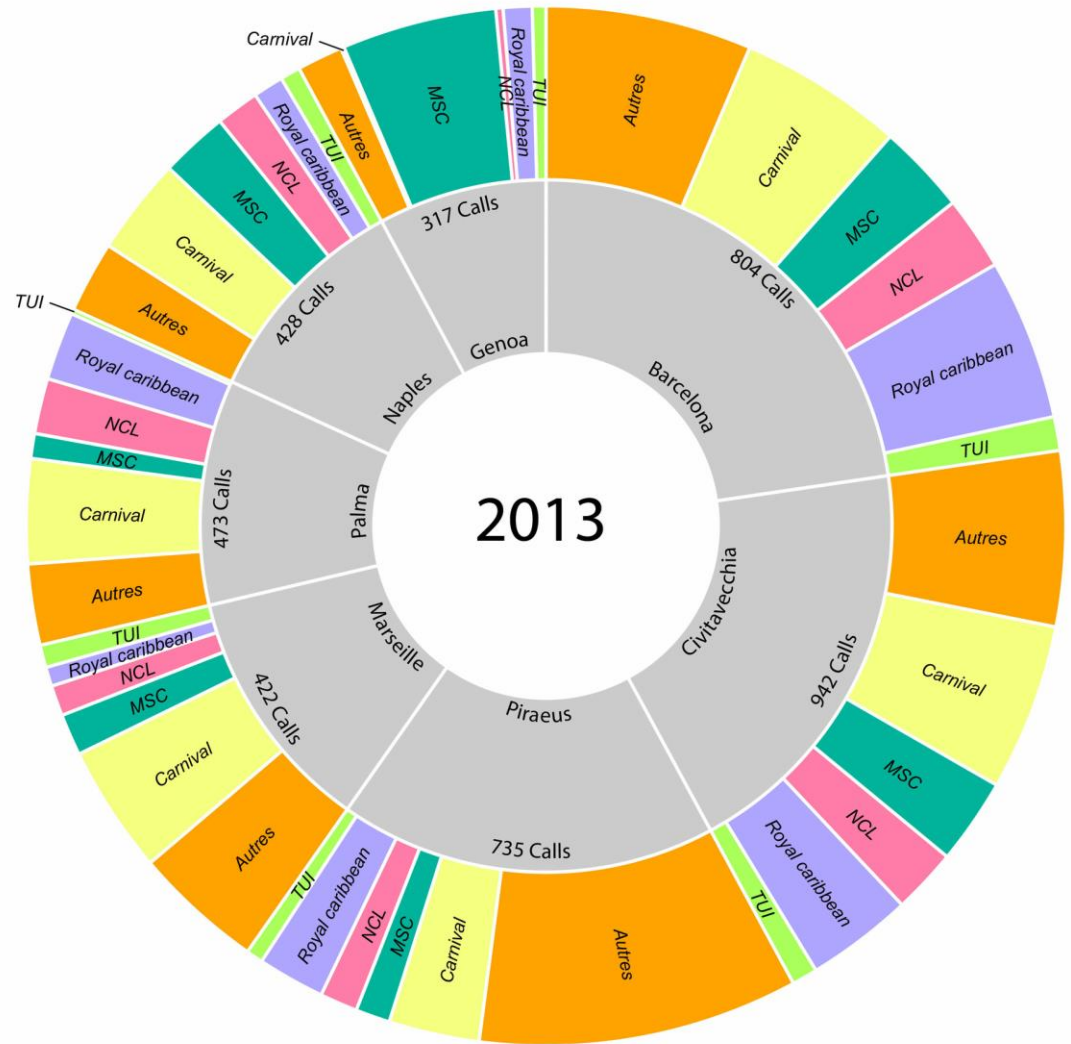
Over the past 5 years, a large number of vessels with very high capacities have been commissioned.

➔ Development of the MEDSEA cruise industry

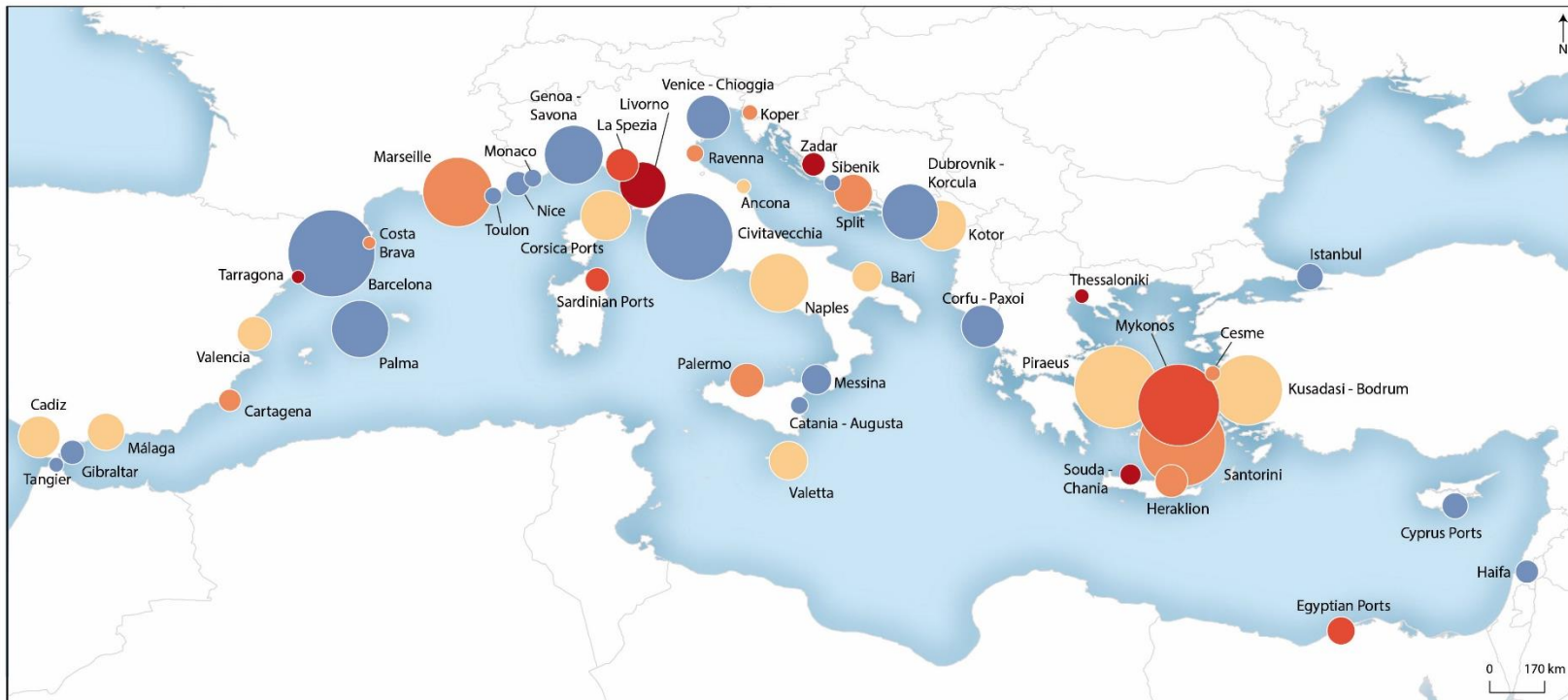
## Number of calls by group in 2013 and 2023 for the 7 main ports

Development of Carnival and MSC cruise lines in major ports.

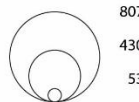
➔ Duopolization of the Medsea cruise market?



# Port approach

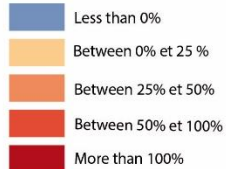


Number of calls in 2023 by cruise ships in ports with more than 50 calls



807  
430  
53

Passenger trends between 2013 and 2023

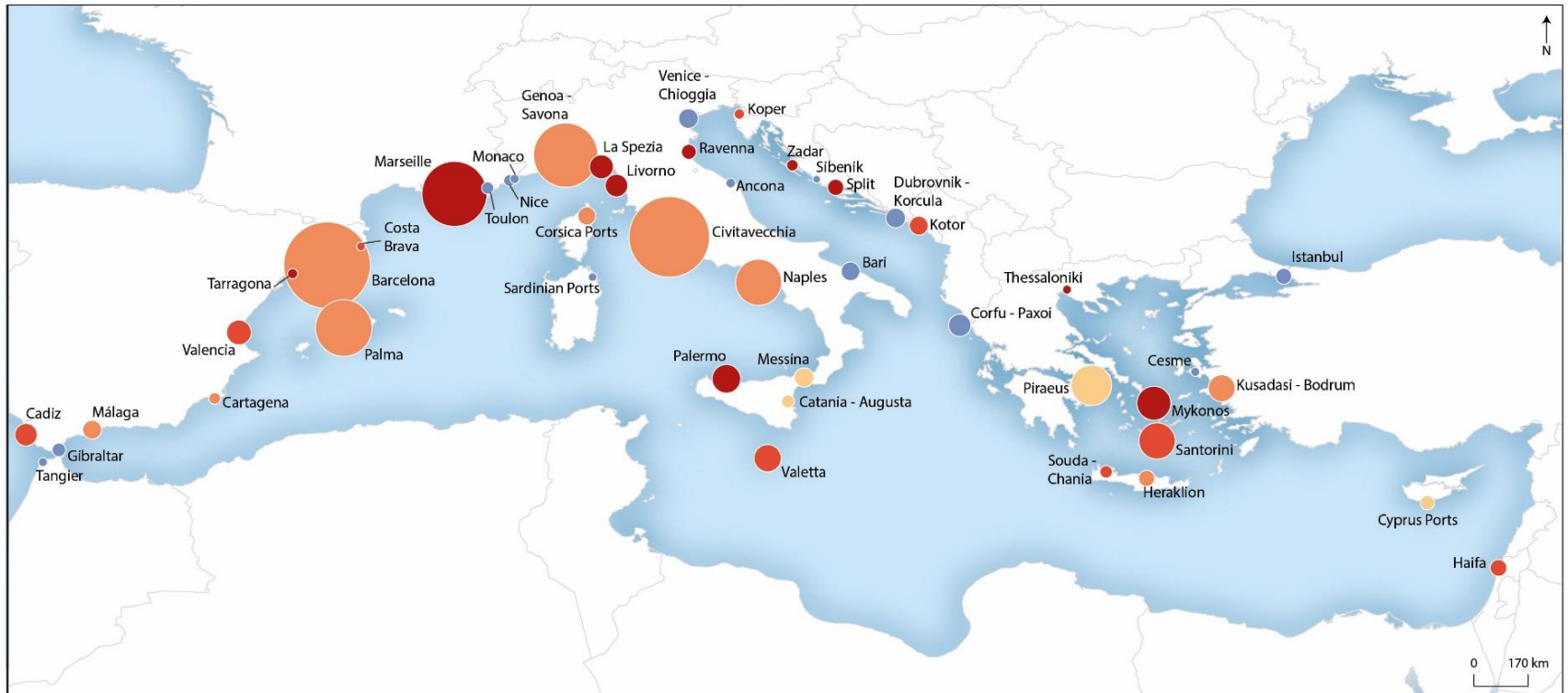


Hydrography  
Country

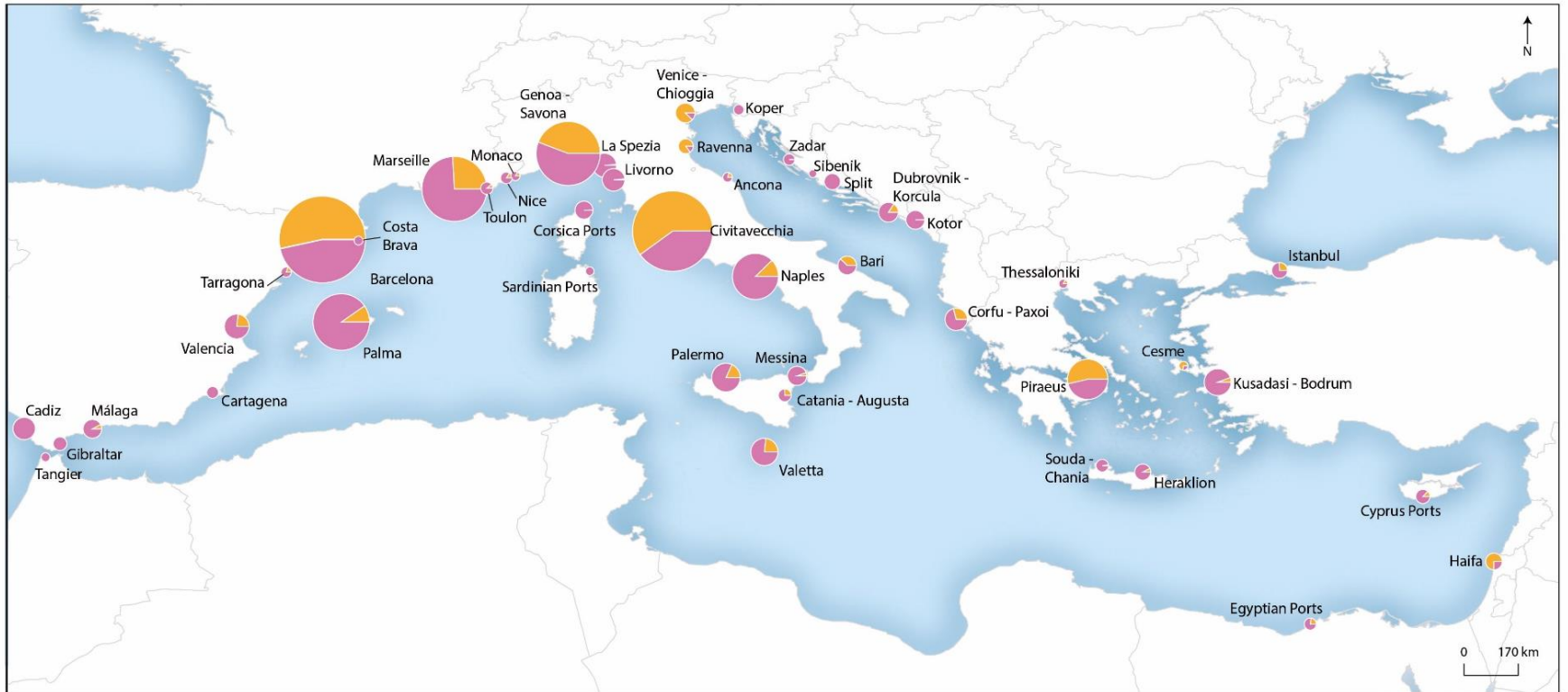
\* Data missing for the port of Rhodes in 2023 and for Egyptian ports in 2013

	2013	2023
CIVITAVECCHIA	6,10%	5,18%
BARCELONA	5,28%	5,28%
PIRAEUS	4,92%	4,92%
VENICE	3,33%	1,60%
MARSEILLE	2,71%	4,03%
DUBROVNIK	3,28%	2,50%
PALMA	3,10%	3,21%

	2013	2023
Top 5 ports	22,60%	23,70%
Top 10 ports	36,50%	35,60%







Number of passenger per port with more than 50 calls in 2023



3 568 901  
1 744 338  
2 978

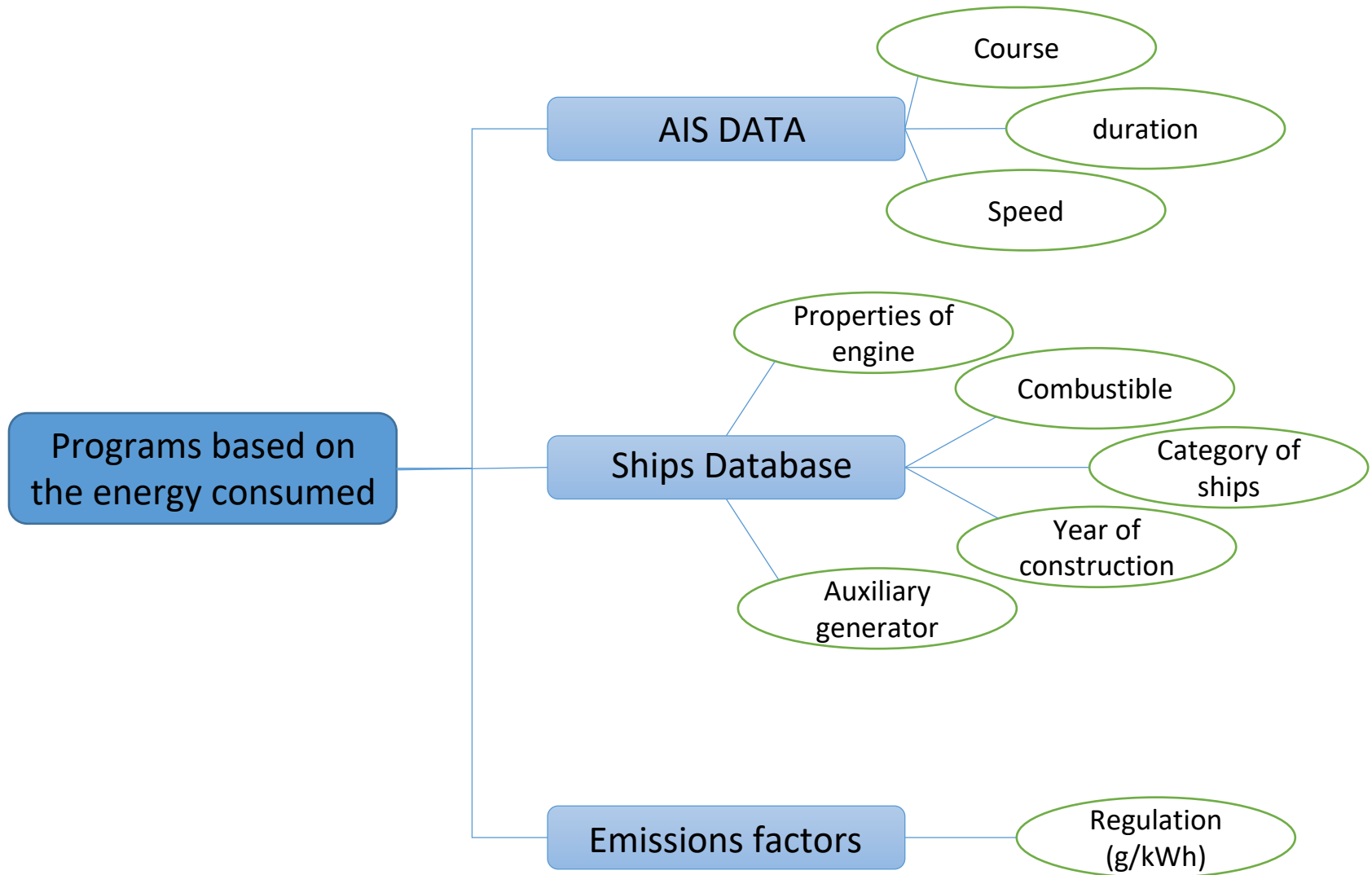
Distribution of cruise ship passengers in 2023

Home Port Passenger  
Transit Passenger

Hydrography  
Country

\* Data missing for the port of Rhodes in 2023 and for Egyptian ports in 2013

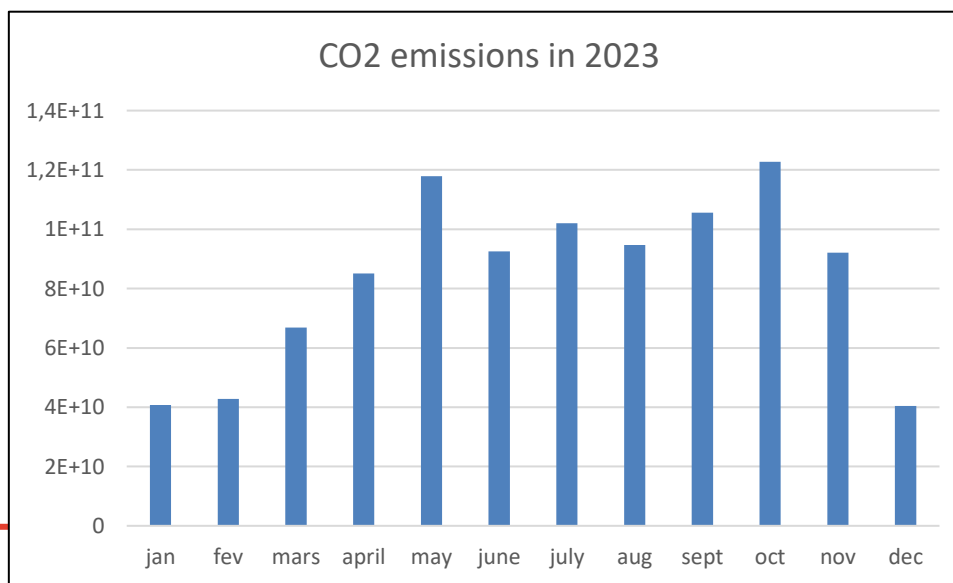
# Pollutant and atmospheric emissions

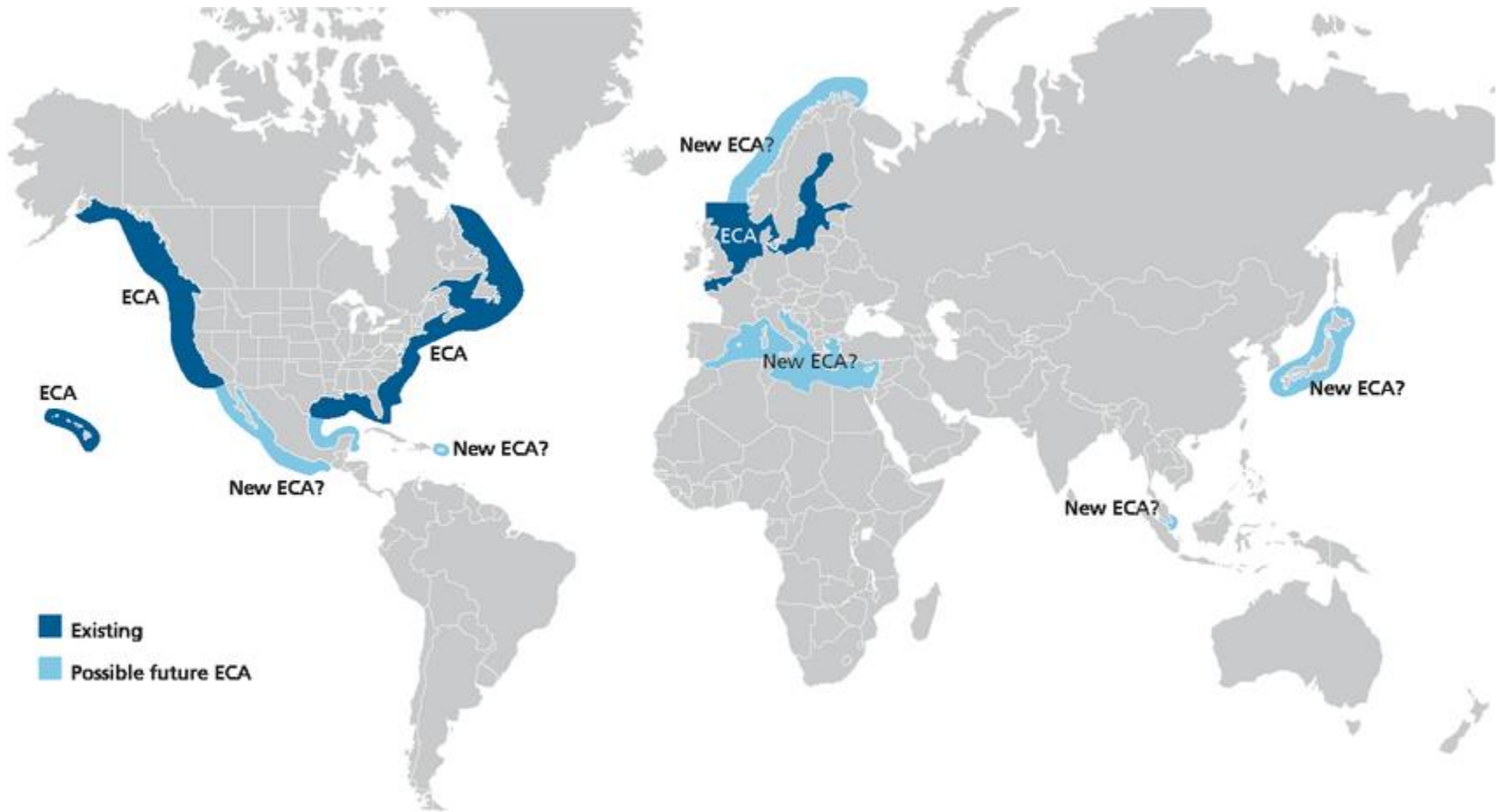


- 3 sources of energy consumption (and therefore 3 sources of emissions): the propulsion engine, the auxiliary generator (to supply energy for on-board needs) and the boiler,
- Estimation of call emissions → calculation of auxiliary generator emissions.

PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Particles with a diameter between 2.5 and 10 micrometers	Particles with a diameter of less than 2.5 micrometers	Diesel particulates	Nitrogen oxides	Sulfur oxides	Carbon monoxide	Unburned hydrocarbons	Carbon dioxide	Nitrous oxide	Methane

en tonnes	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Moteur auxiliaire en escale	546,418103	506,252824	546,418103	11991,5103	3230,53737	1561,19458	567,70712	1003422,33	41,3574637	11,3541424





	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Auxiliary engine on call	546,418103	506,2528241	546,418103	11991,5103	3230,53737	1561,19458	567,7071198	1003422,334	41,3574637	11,3541424
ECA simulation	268,241614	71,61625317	67,0604035	11238,0908	114,336214	1561,19458	567,7071198	987810,3885	38,6892402	11,3541424
Impact on the area	-51%	-86%	-88%	-6%	-96%	0%	0%	-2%	-6%	0%

## To continue ?

- Develop analyses for individual years,
- Cross-reference these quantitative results with qualitative information,
- Analyze cruise industry networks and routes,
- Develop analyses of pollutant and atmospheric emissions during cruising, and consider the impact in relation to the size of cities in terms of population.
- ...

# Thank you Merci

[Mariantonia.Lo-Prete@univ-littoral.fr](mailto:Mariantonia.Lo-Prete@univ-littoral.fr)  
[ronan.kerbiriou@univ-lehavre.fr](mailto:ronan.kerbiriou@univ-lehavre.fr)  
[Catherine.Roche@univ-littoral.fr](mailto:Catherine.Roche@univ-littoral.fr)  
[Arnaud.serry@univ-lehavre.fr](mailto:Arnaud.serry@univ-lehavre.fr)  
[Julia.mermin@etu.univ-lehavre.fr](mailto:Julia.mermin@etu.univ-lehavre.fr)



## UMR IDEES CNRS

Université du Havre / 25, rue Philippe Lebon / Le Havre

Tél. : 02 32 74 42 06 / E-mail : [projet.devport@univ-lehavre.fr](mailto:projet.devport@univ-lehavre.fr)