

# TOWARDS TRANSPARENT AIR QUALITY MONITORING IN PORTS OF THE SOUTHERN REGION

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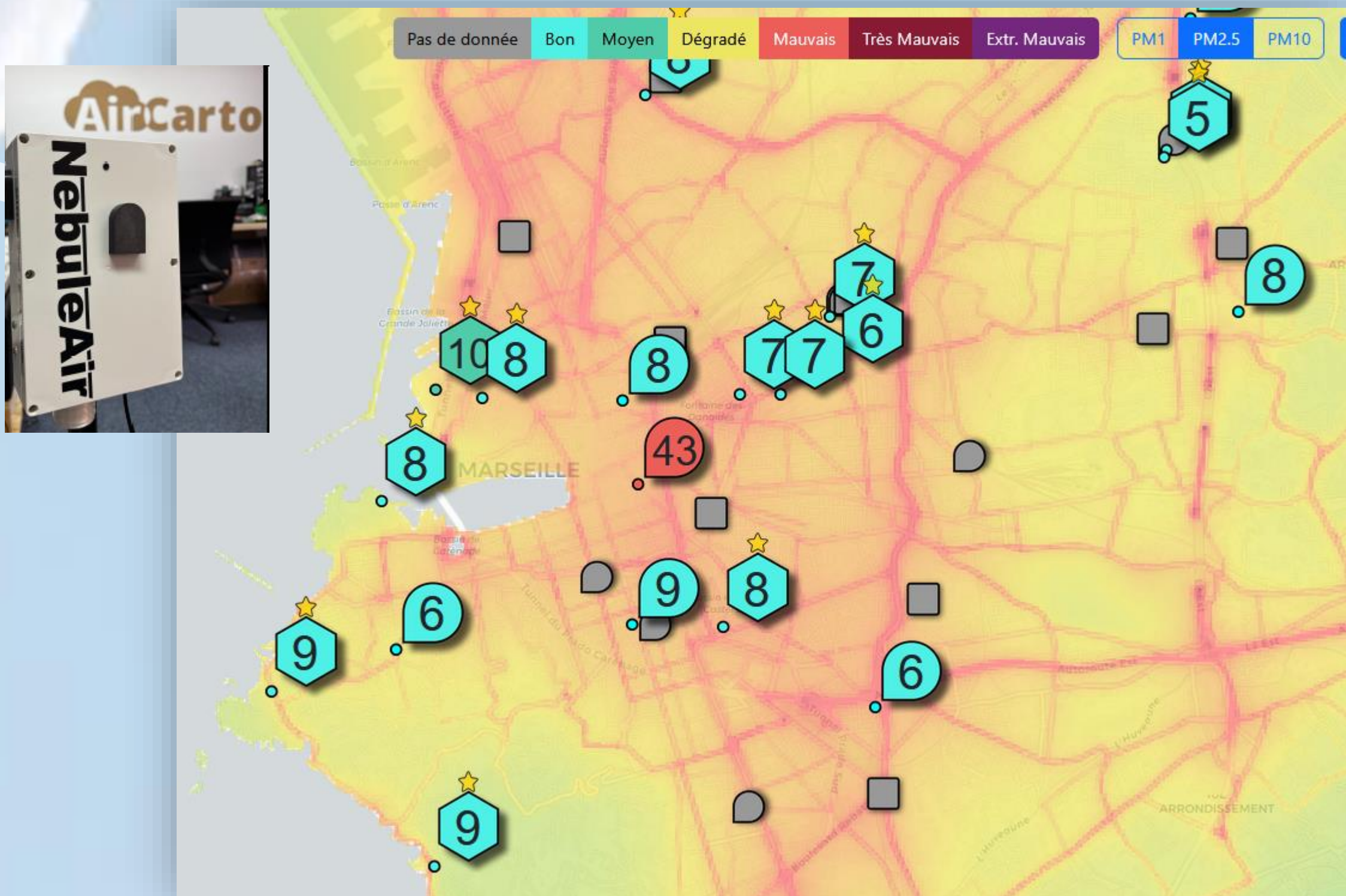


## Reference Air Quality Monitoring Stations



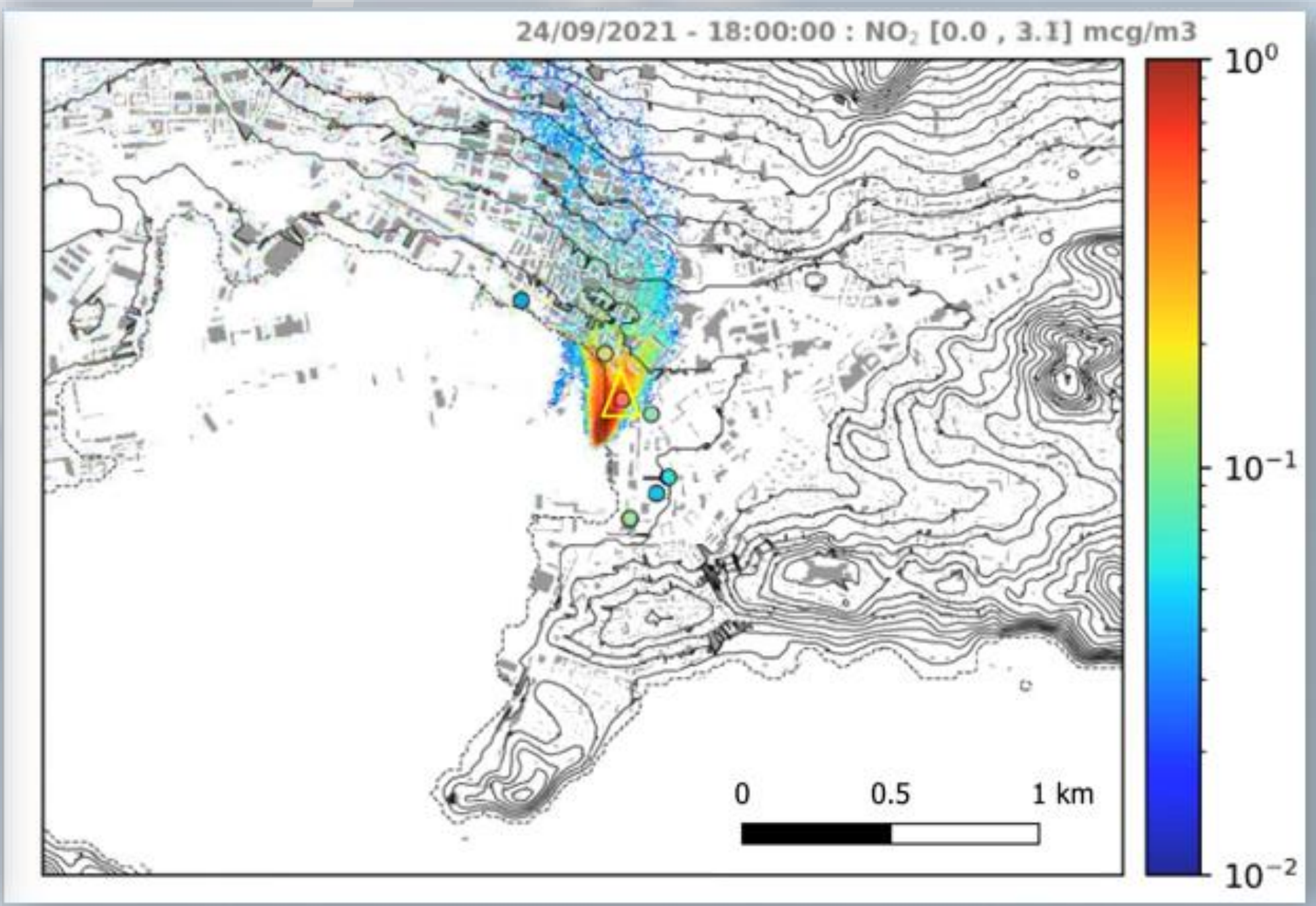
SO2, NOx, PM1, PM.25, PM10  
CO2, Ultrafine particules

## Micro-sensors : Enhancing Maritime Monitoring

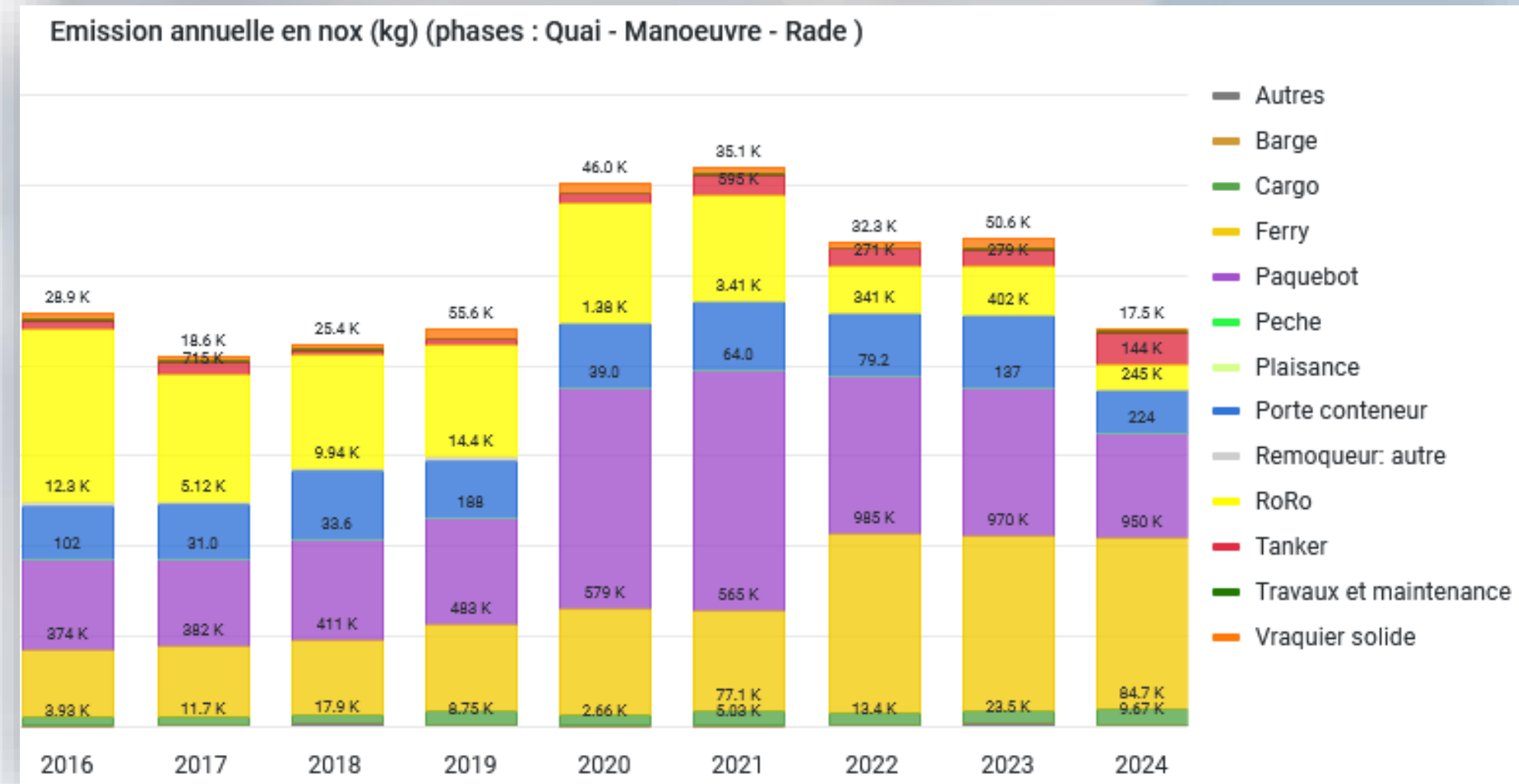


[openairmap.atmosud.org](http://openairmap.atmosud.org)

**High résolution ship  
plume modeling :**  
Geographical and sectoral  
impact of plume dispersion:  
guiding stakeholders' mitigation  
actions



**Emissions inventory :**  
Tracking emissions to improve the  
effectiveness of measures

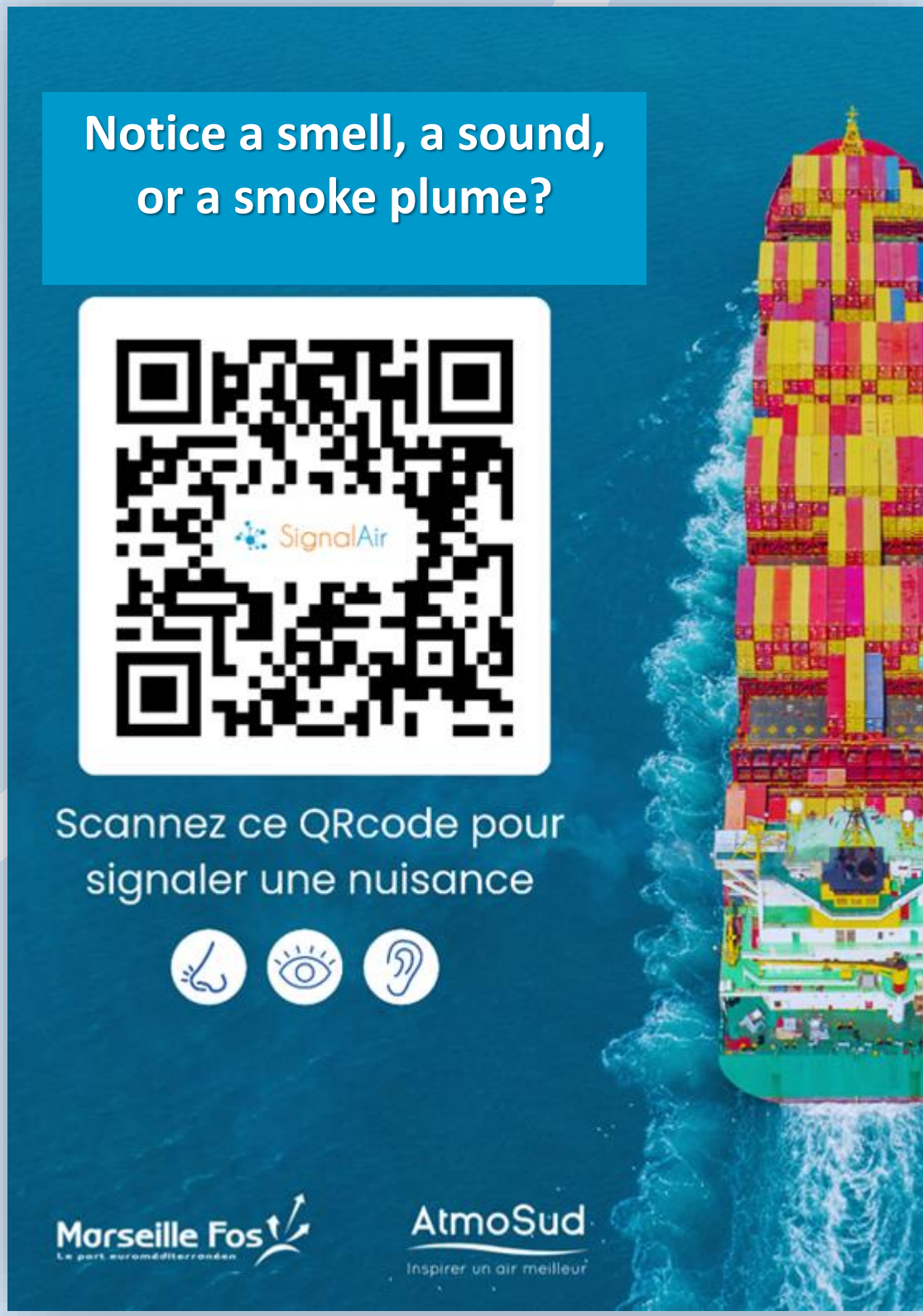


# Toward Next-Generation Maritime Monitoring

- Recently, numerous projects have highlighted the contribution of plumes to local air quality. Within these plumes, observations have shown that **ultrafine particle** concentrations can exceed **700,000 particles/cm<sup>3</sup>** and **nitrogen oxide** concentrations can reach **1,000 µg/m<sup>3</sup>** **instantaneously** [1] to [7].
- Fugacity** : the impacts of emissions from the ship maneuvering phase are brief, lasting only about a minute. Those from the berthing phase can be longer, with a dispersion width ranging from tens to hundreds of meters.
- Regarding chronic exposure, their contribution to pollution adds to existing urban sources such as road traffic, residential emissions, and industrial activities. Depending on the environment, this pollution can significantly contribute to long-term exposure, especially in areas located near port terminals.

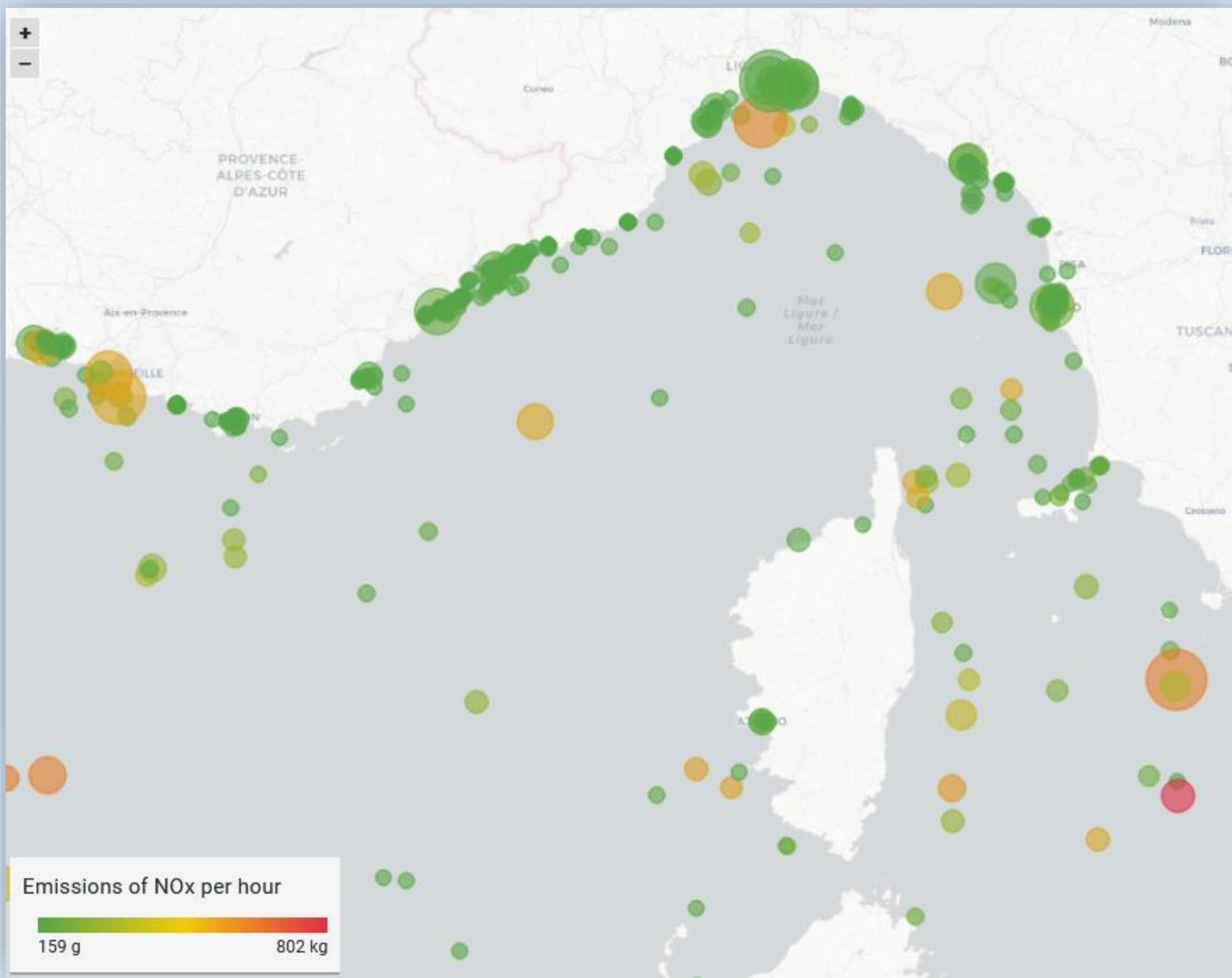
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Bridging authorities,  
stakeholders, and citizens  
[www.atmosud.org](http://www.atmosud.org)

**SIGNAL’AIR : an application  
to support citizen engagement**



## Live Emissions Data: A Step Forward in Port Environmental Management

A new methodology enables real-time estimation of ship emissions by combining fuel consumption data and vessel activity. Using ship characteristics and AIS movement data, emissions are calculated per ship, per phase, and per port, offering detailed insights for hourly to annual maritime pollution assessments.



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## References

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[2] SCIPPER booklet, 2024.  
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[4] Le Berre et al., (2024). Measurement report: In-depth characterization of ship emissions during operations in a Mediterranean port. 10.5194/egusphere-2024-2903.  
[5] SCIPPER, New set of emission factors and activity information, 2021.  
[6] AerNostrum, Rapport sur les résultats des simulations du modèle, 2023. French.  
[7] ARCADIA Project, in progress. WaltR, AtmoSud. French.