



Exposure of West Indies ecosystems to maritime traffic

E. Foulquier , I. Le Berre (UMR LETG), D. Le Guyader (Geo4Seas), P.-J. Lopez (UMR BOREA)

BIP Session: interdisciplinary working groups



International Symposium of LabEx DRIIHM
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

September 6th-8th, 2021 – Toulouse (France)

The problem: evaluate the transfer from the vector to the environment.

Context

- A globalized industry observed in a very aggregated mode.
- A particularly atomized business structure
- A highly supervised activity with very limited monitoring

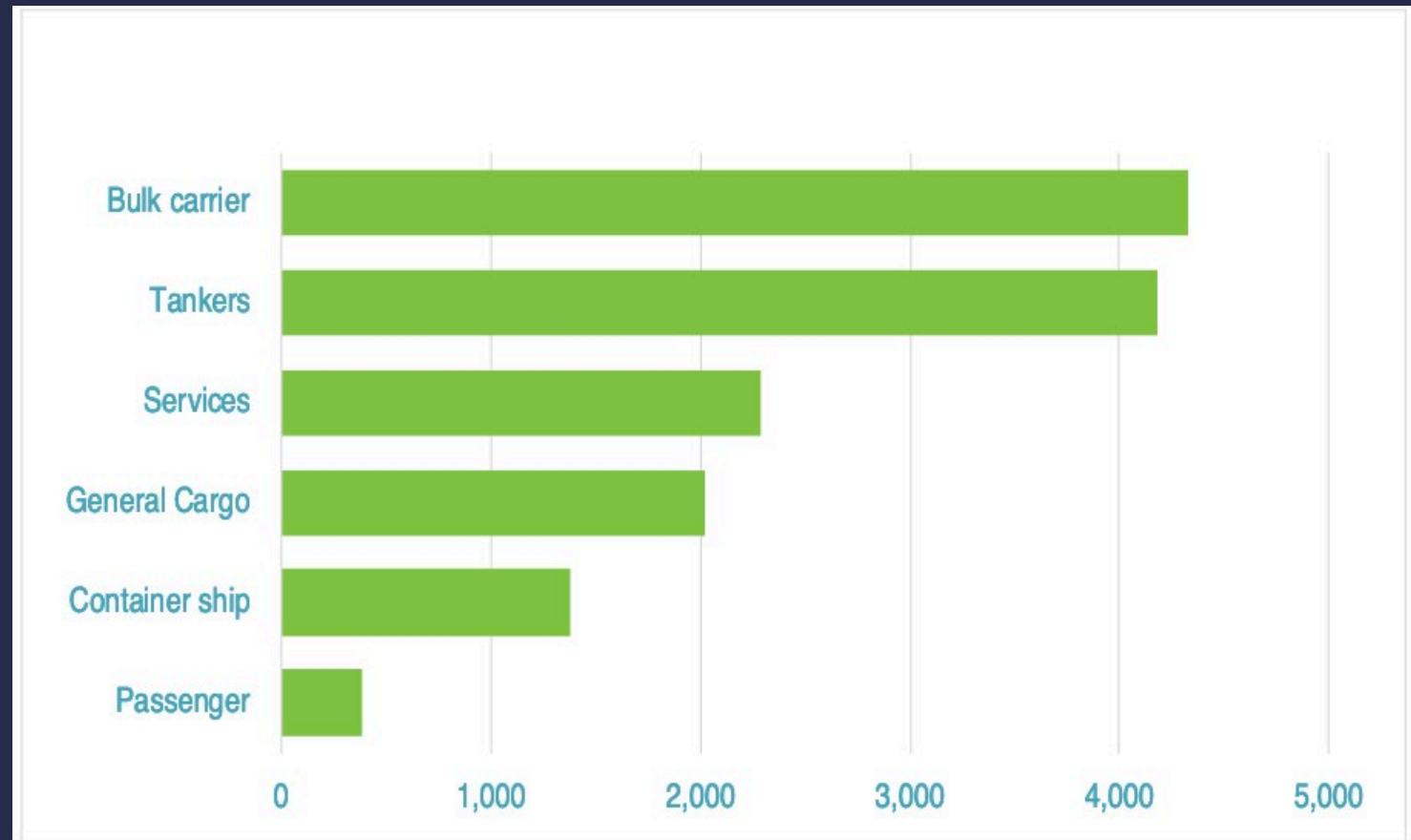
Problem

Very problematic data : non-existent, incomplete, multi-scale

Solutions

What exists : AIS (Automatic Identification System)
Which calls for modelization.

The ship, a vector

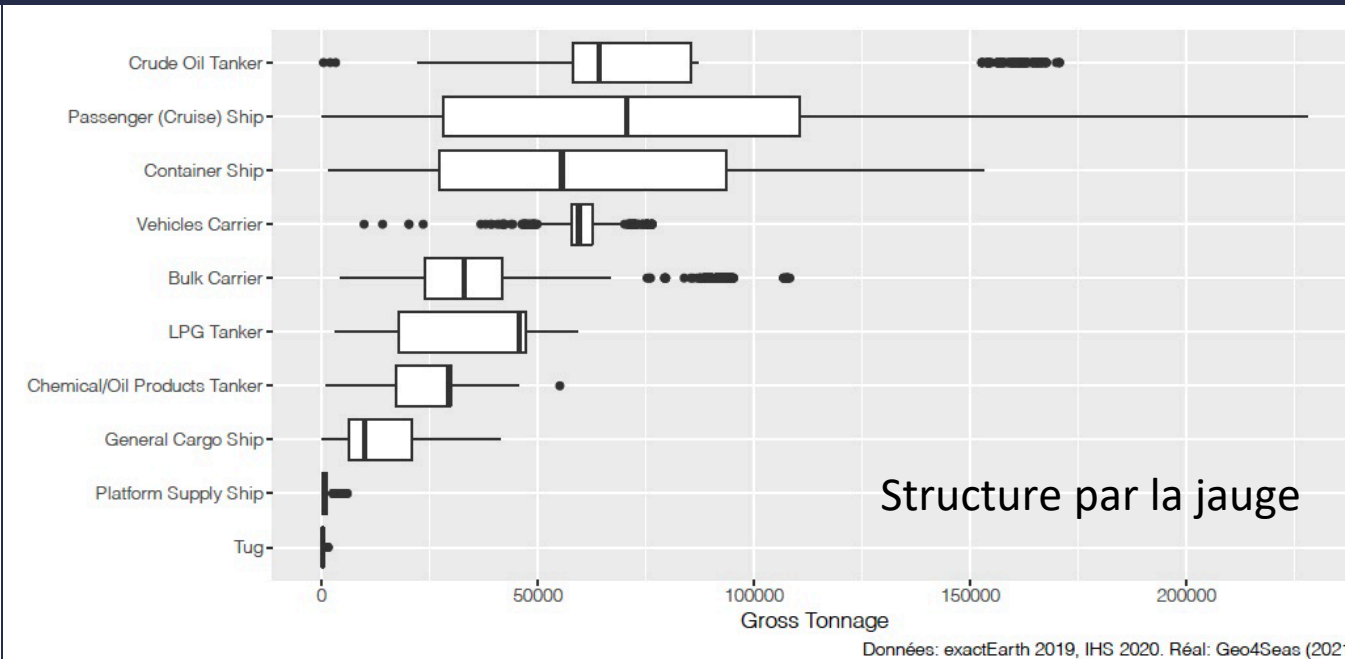
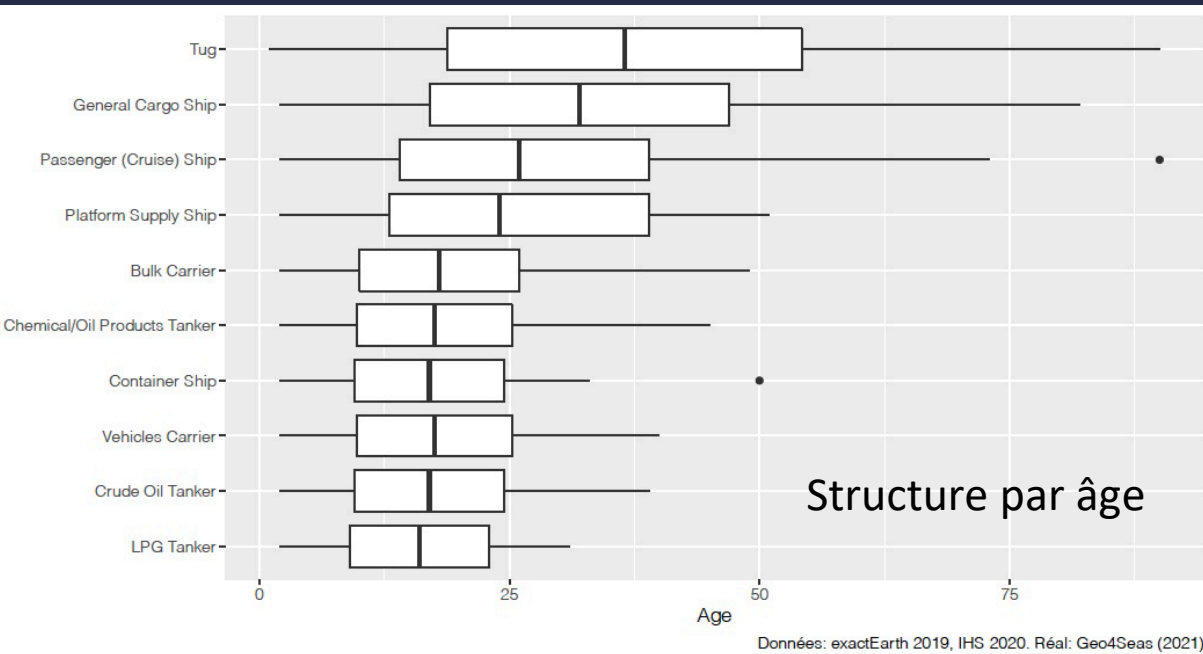


55 000 ships in the world

14 500 ships in Caribbean area

BIP Session: interdisciplinary working groups

But it is also a multifaceted object



BIP Session: interdisciplinary working groups

Shipping: a plural industry with multiple holdings

BIP Session: interdisciplinary working groups



International Symposium of LabEx DRIIHM
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

September 6th-8th, 2021 – Toulouse (France)

The problem of contamination by maritime transport

Static approach

The concept of environmental pressure

Dynamic approach

Evaluation of dissemination processes

Evaluation of interactions processes

Evaluation of the temporal evolution

Interannual
Seasonal
Daily

BIP Session: interdisciplinary working groups

The concept of environmental pressure

BIP Session: interdisciplinary working groups

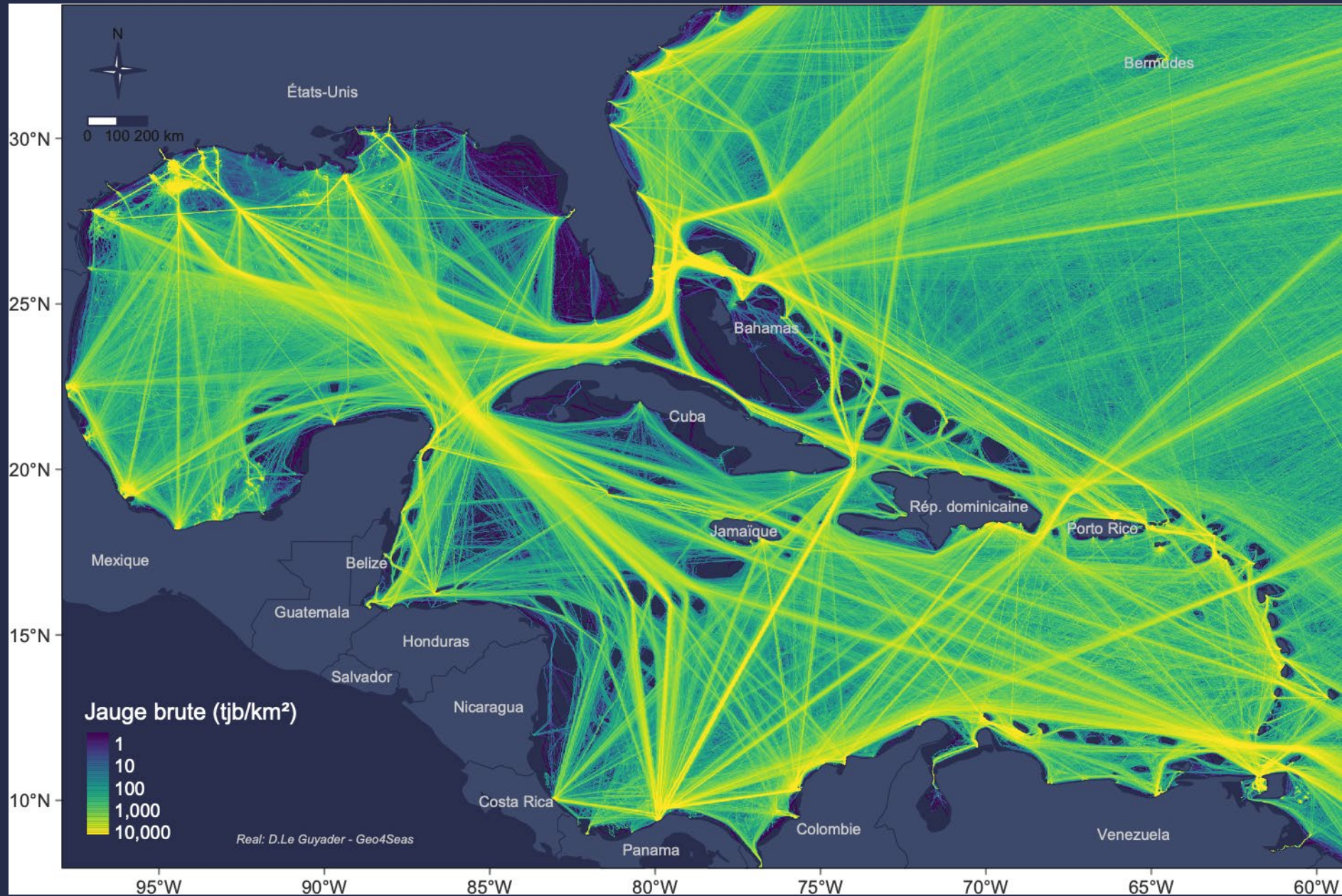


International Symposium of LabEx DRIIHM
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

September 6th-8th, 2021 – Toulouse (France)

Cumulated Shipping Traffic

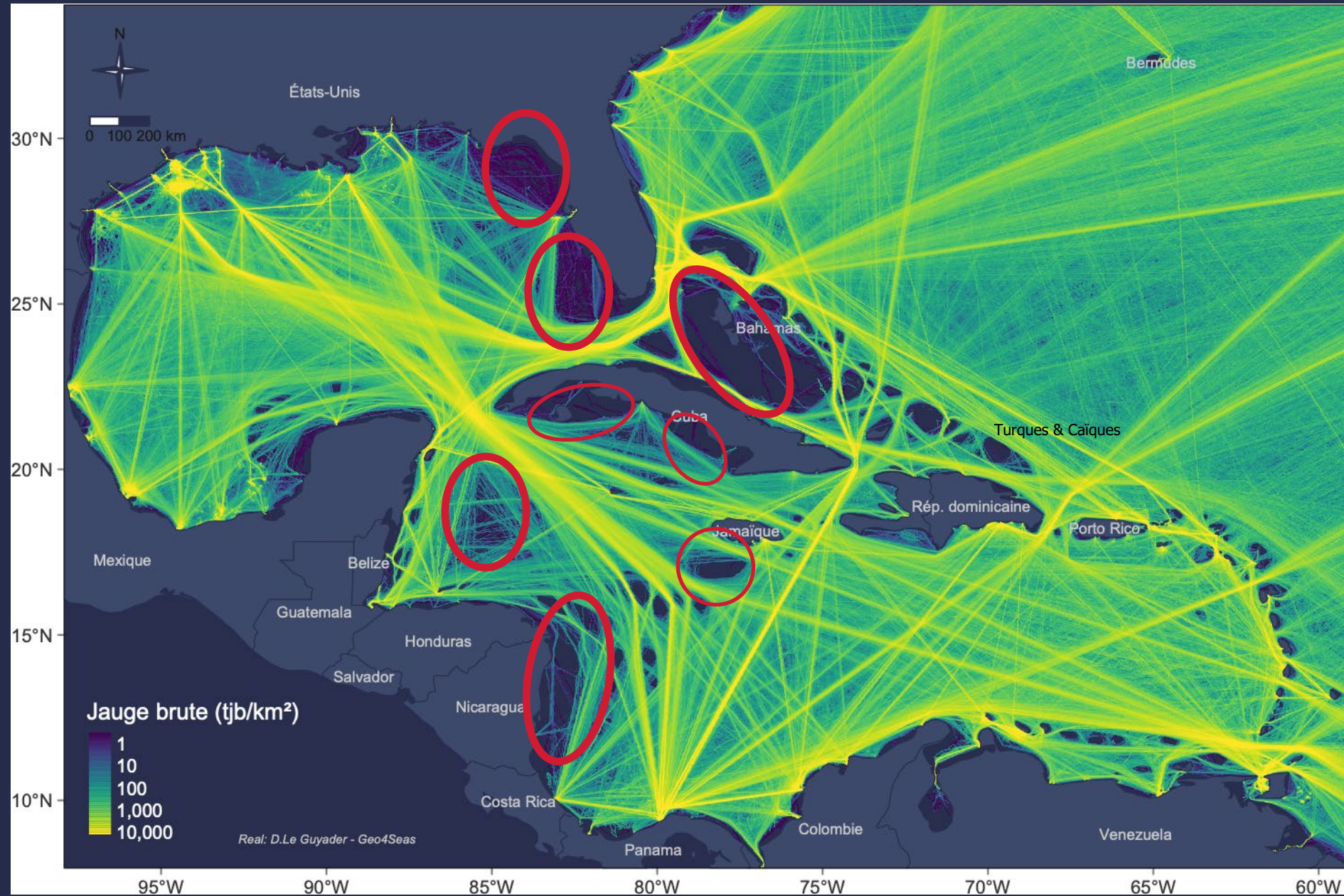
2019



BIP Session: interdisciplinary working groups

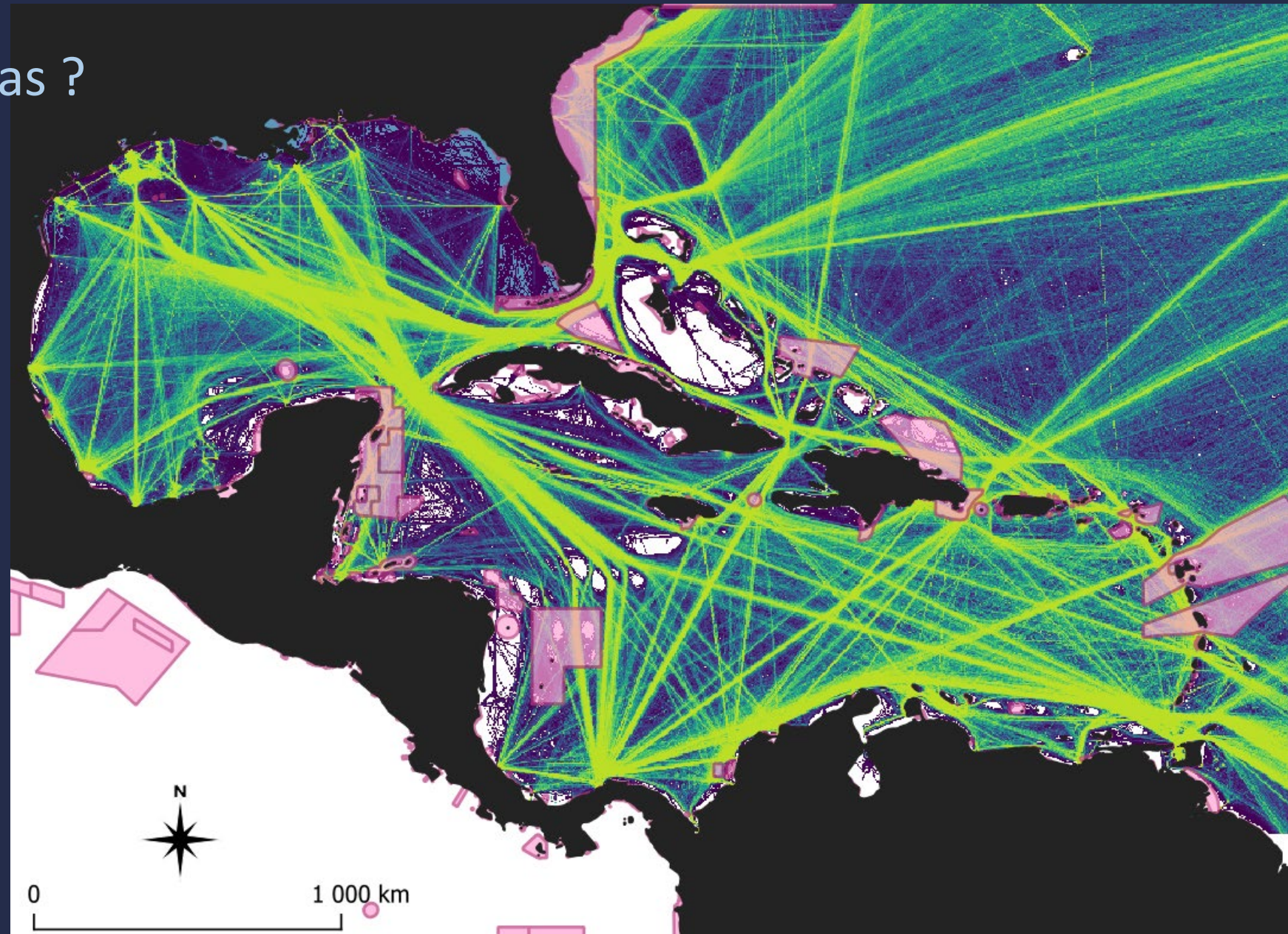
Some Abandoned Areas

2019



BIP Session: interdisciplinary working groups

Marine Protected Areas ?



BIP Session: interdisciplinary working groups

A massive occupation of the maritime environments

Multiple
Potential
Contaminations

Landscapes
Physical and chemical
Sound
Biological

Marine Environments

Terrestrial Environments

Atmospheric



Port State Control
Environmental Inequalities

BIP Session: interdisciplinary working groups

A necessary disaggregated approach

BIP Session: interdisciplinary working groups

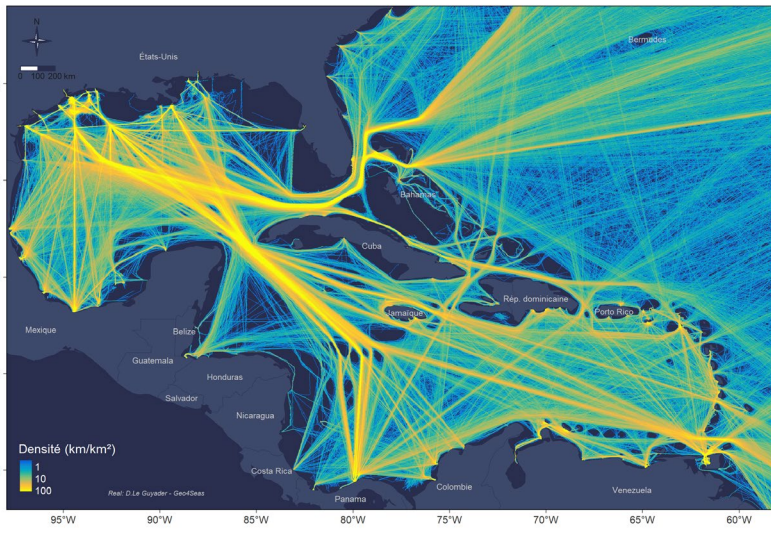
International Symposium of LabEx DRIIHM

Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

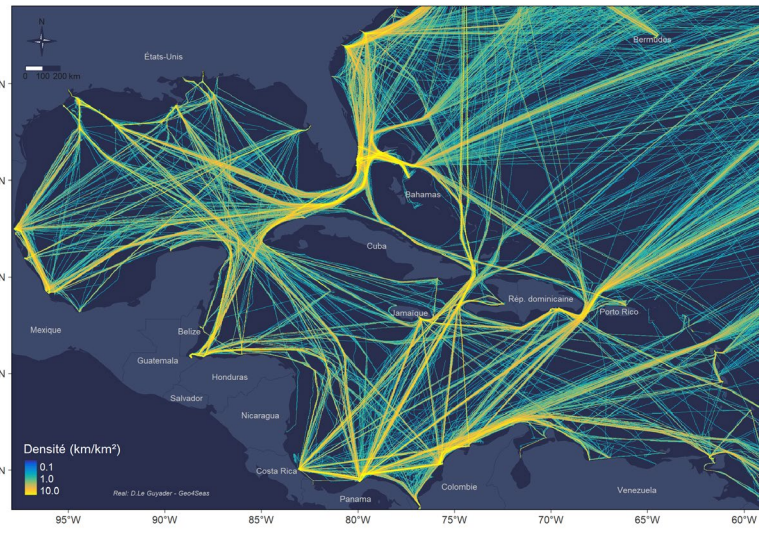
September 6th-8th, 2021 – Toulouse (France)



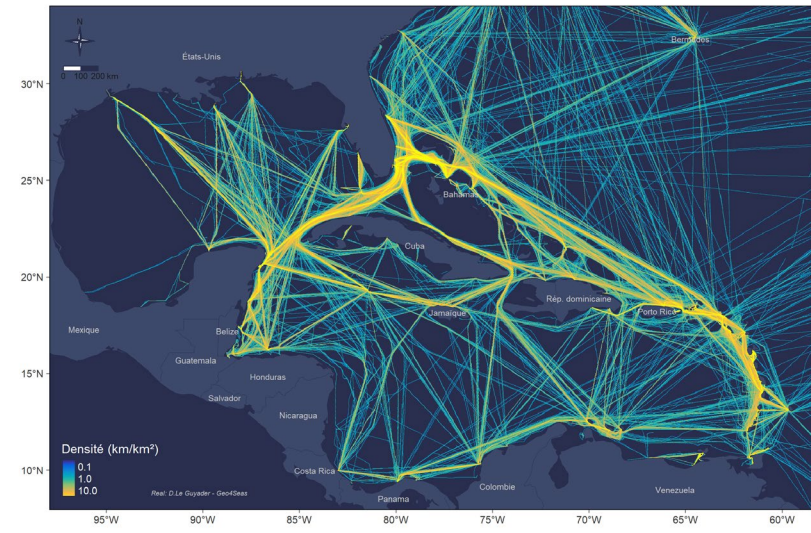
Tankers



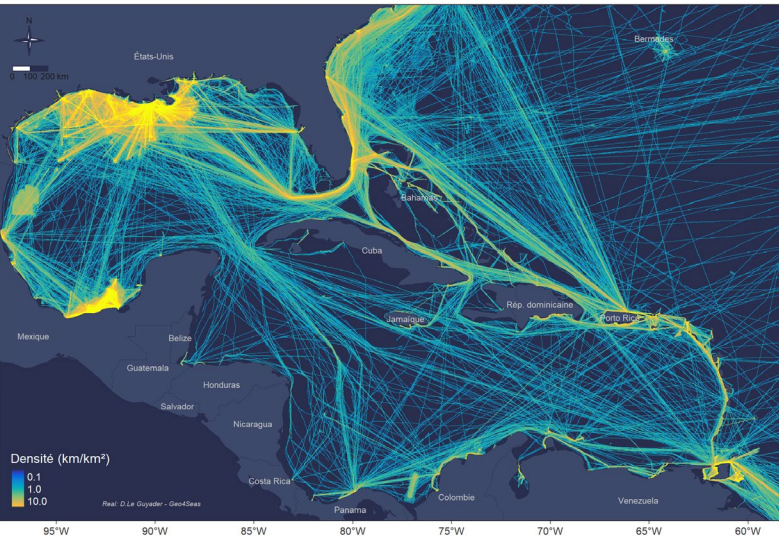
Container ship



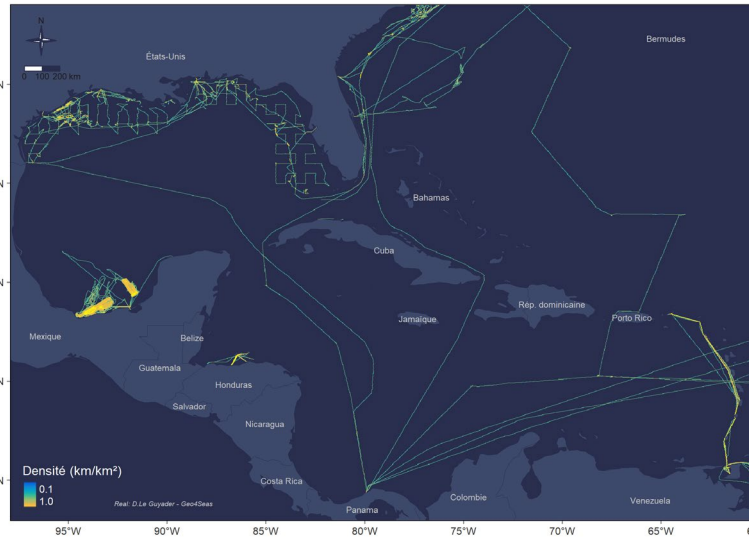
Passengers ship



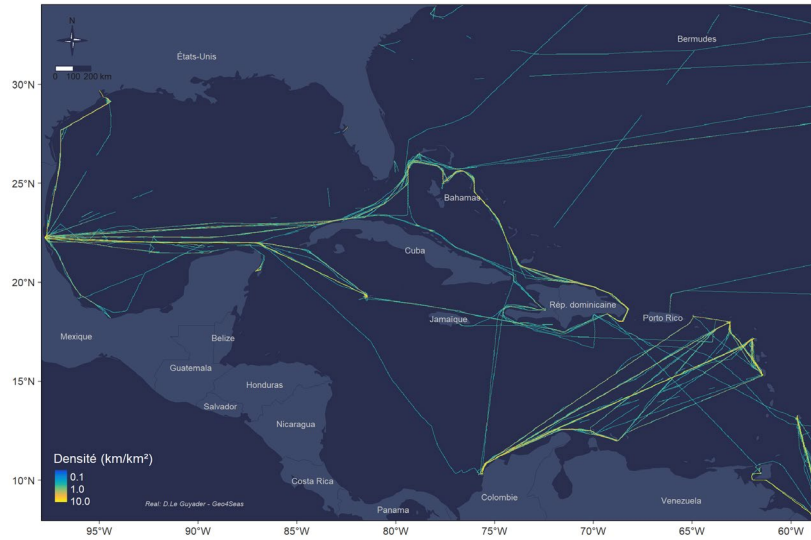
Service ship



Fishing ship



Cement carrier



BIP Session: interdisciplinary working groups

Evaluation of dissemination processes

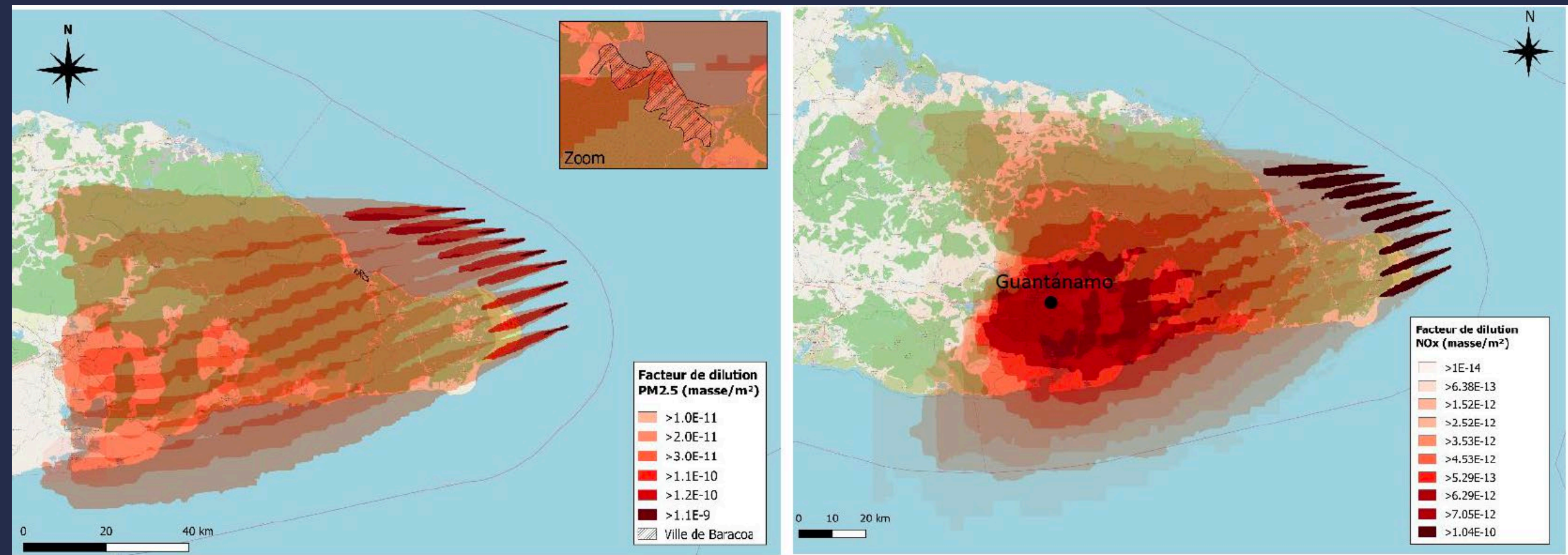
BIP Session: interdisciplinary working groups

International Symposium of LabEx DRIIHM

Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

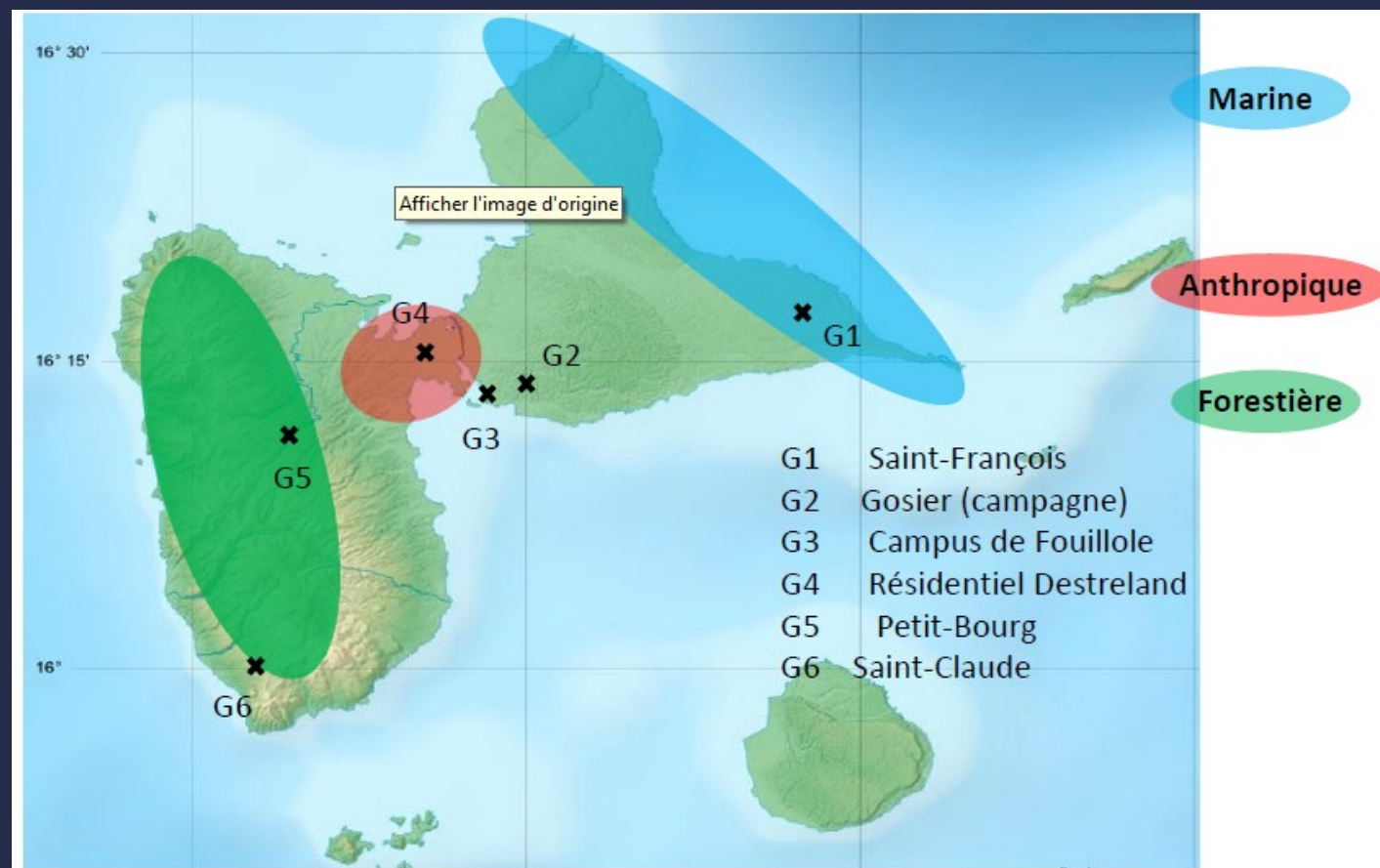
September 6th-8th, 2021 – Toulouse (France)





respectivement la représentation de l'impact des dépositions en PM2.5 et en NOx via un facteur de dilution en masse/m³ à la suite d'un pas

BIP Session: interdisciplinary working groups



A Etienne (2021), sous la responsabilité de Mickael Vaitilingom (UA)

BIP Session: interdisciplinary working groups



BIP Session: interdisciplinary working groups



BIP Session: interdisciplinary working groups



BIP Session: interdisciplinary working groups



BIP Session: interdisciplinary working groups



BIP Session: interdisciplinary working groups



BIP Session: interdisciplinary working groups







BIP Session: interdisciplinary working groups

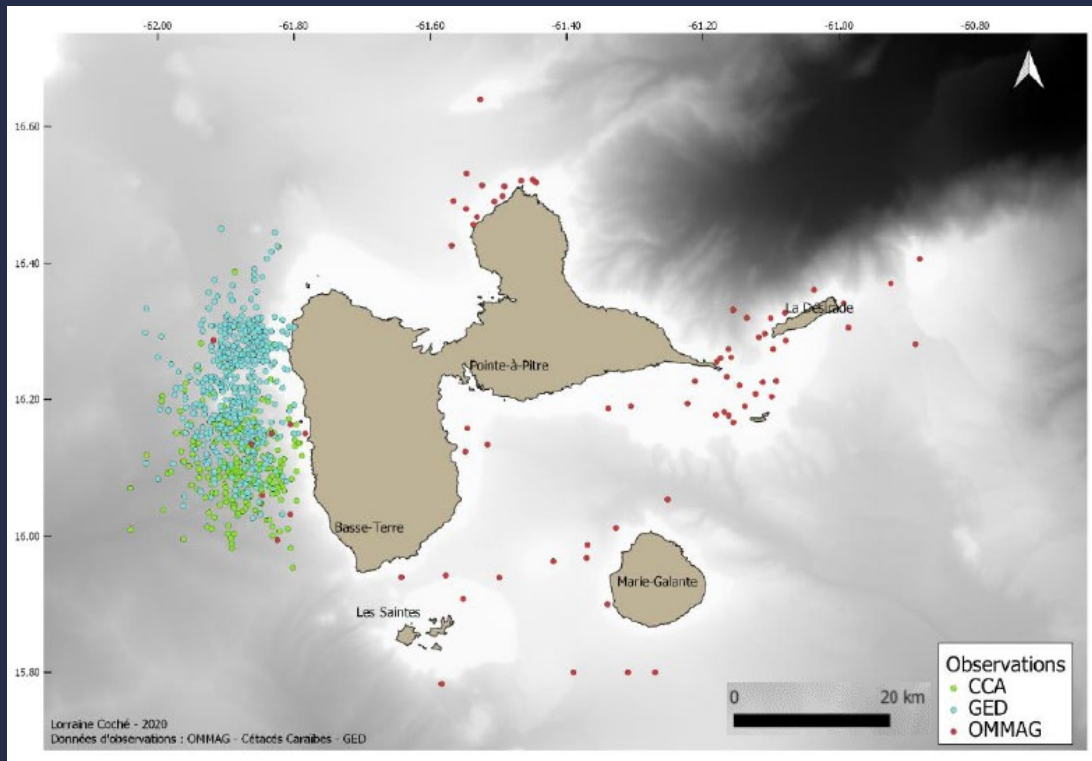
Evaluation of interactions processes

BIP Session: interdisciplinary working groups

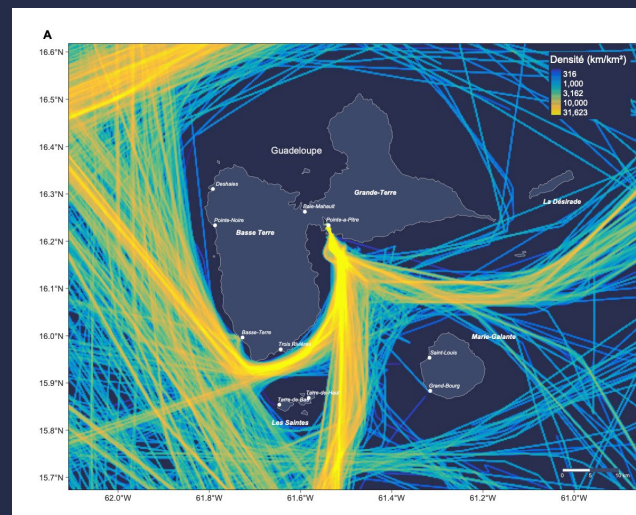


International Symposium of LabEx DRIIHM
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

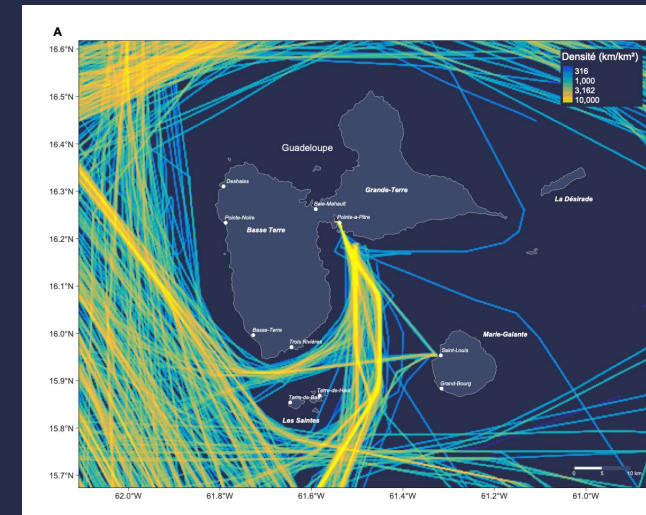
September 6th-8th, 2021 – Toulouse (France)



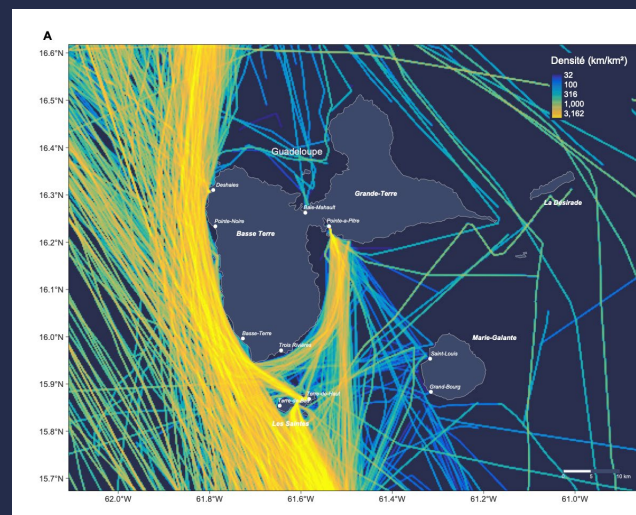
Distribution des observations de mammifères marins (Kakila)



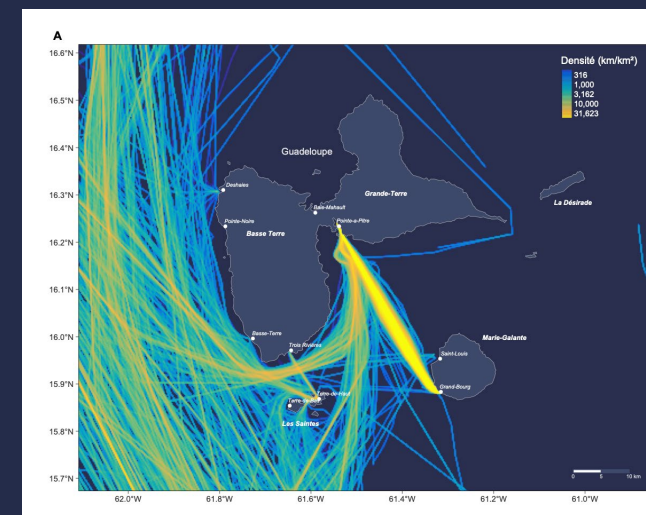
General cargo



Tankers



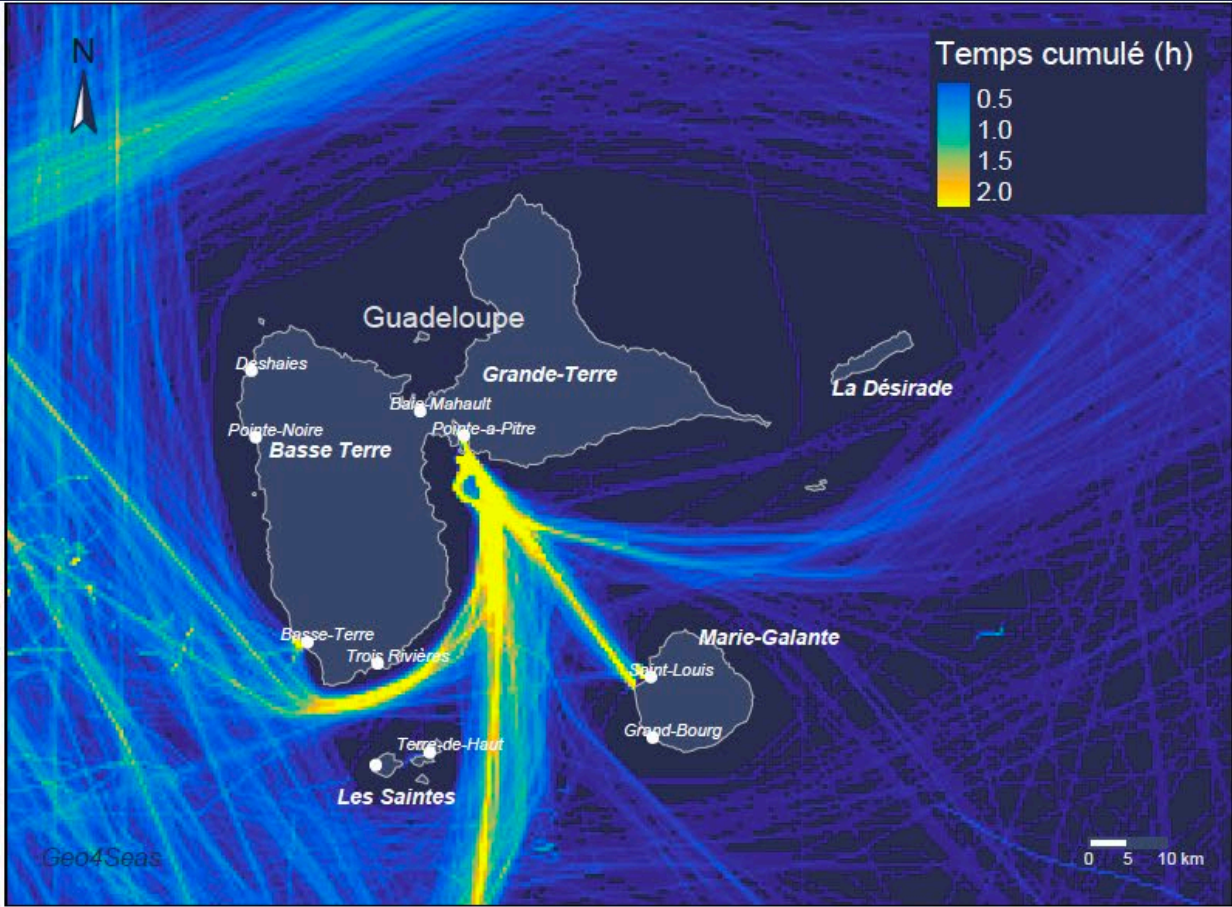
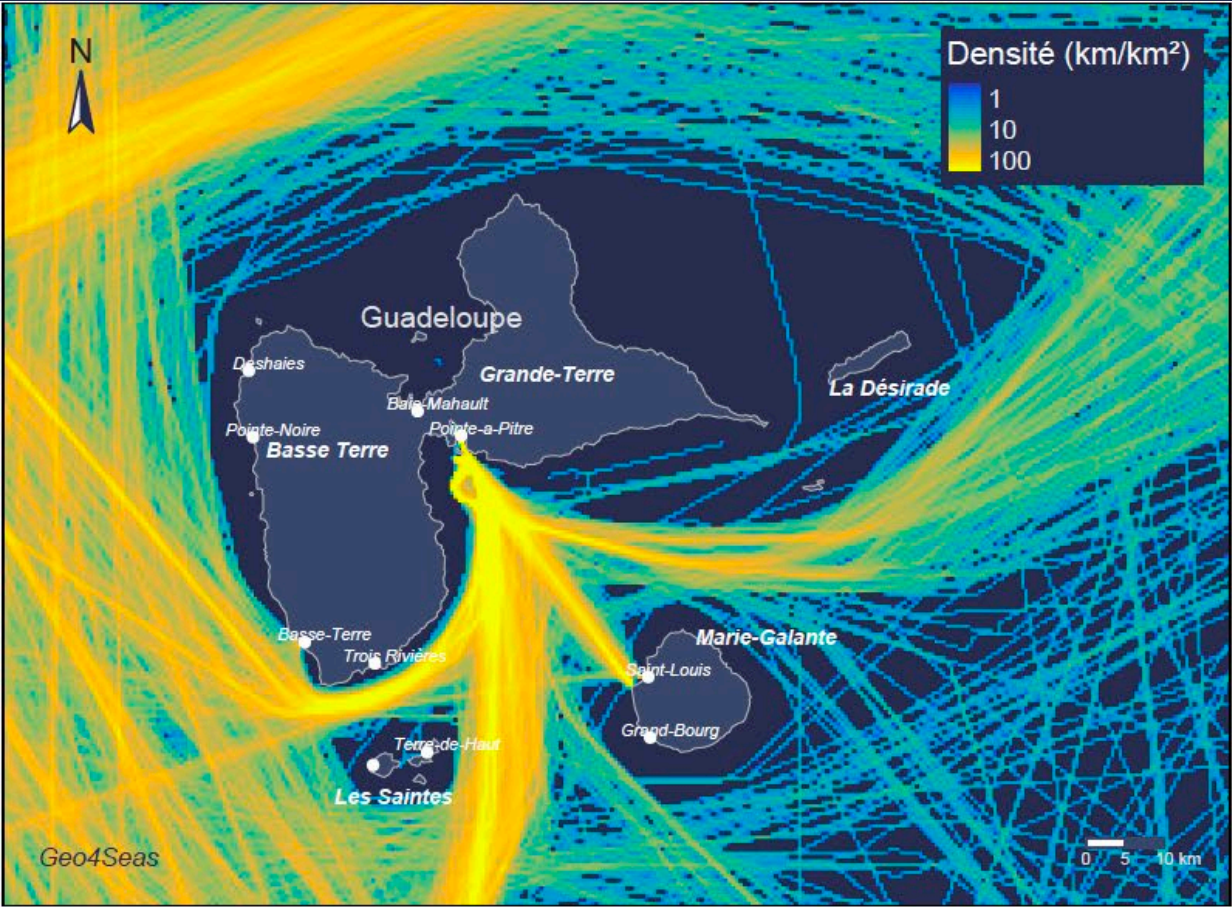
Leisure ships



Passengers

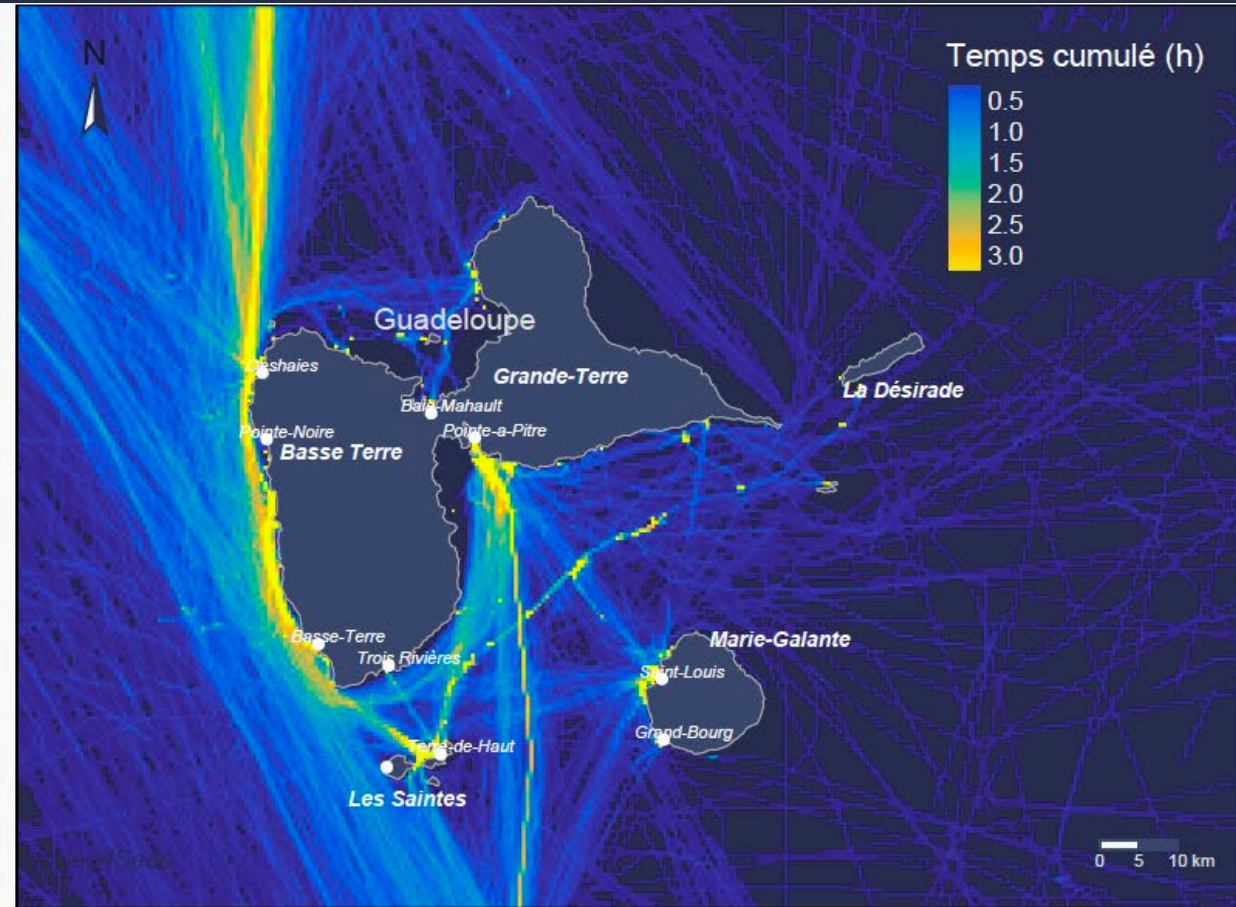
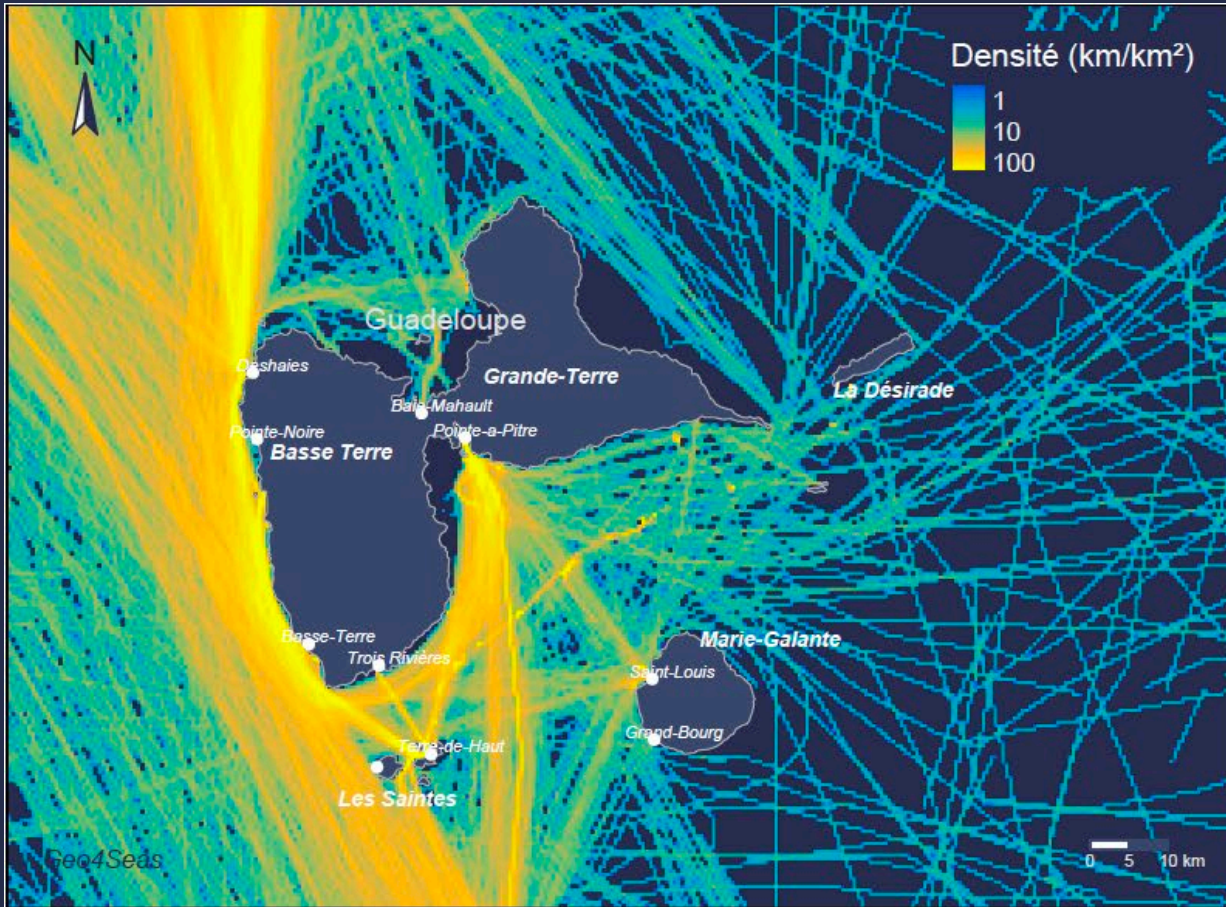
BIP Session: interdisciplinary working groups

Merchant fleet



BIP Session: interdisciplinary working groups

Other ship



BIP Session: interdisciplinary working groups

Evaluation of the temporal evolution

BIP Session: interdisciplinary working groups

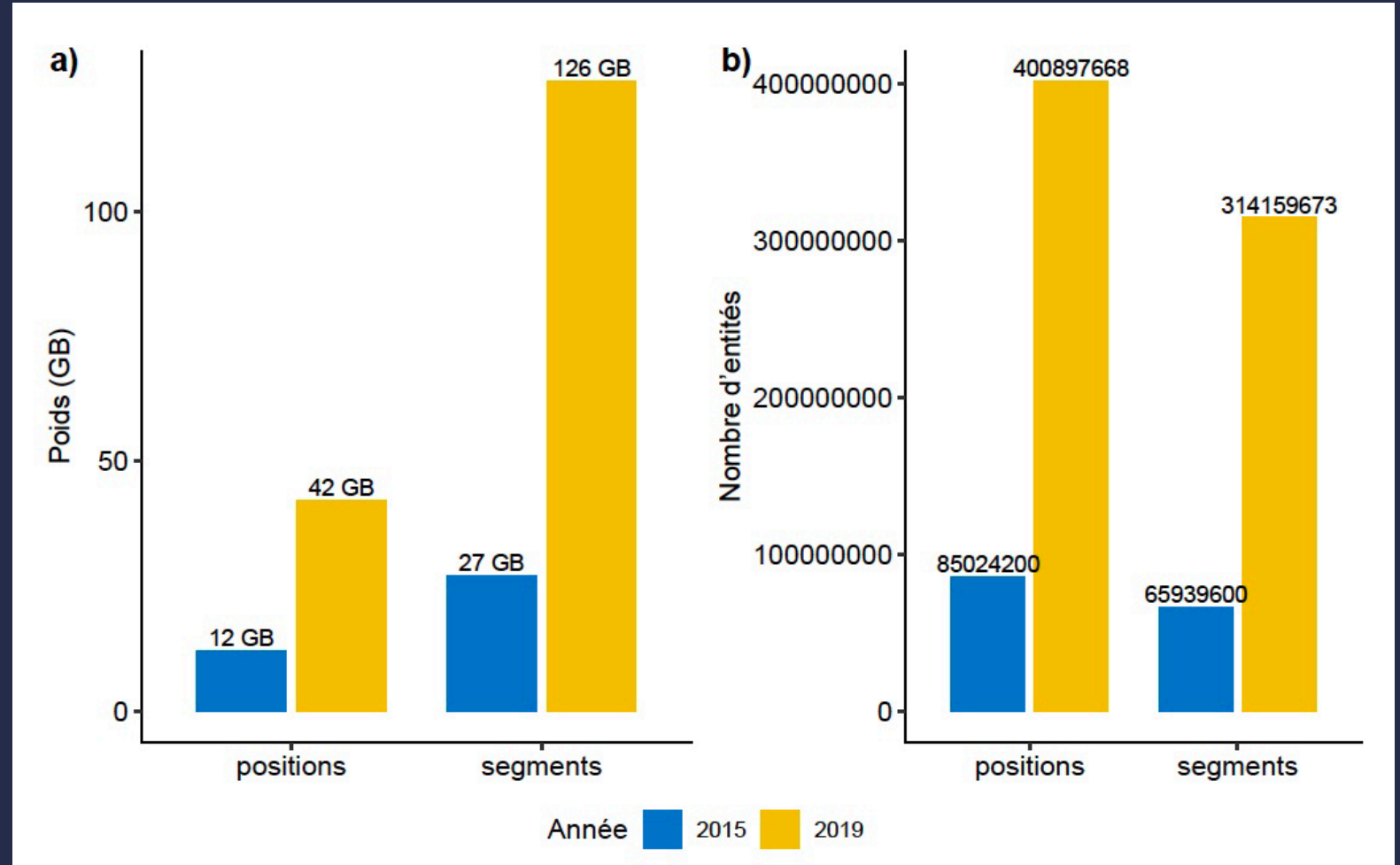


International Symposium of LabEx DRIIHM
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

September 6th-8th, 2021 – Toulouse (France)

2015
80 M positions

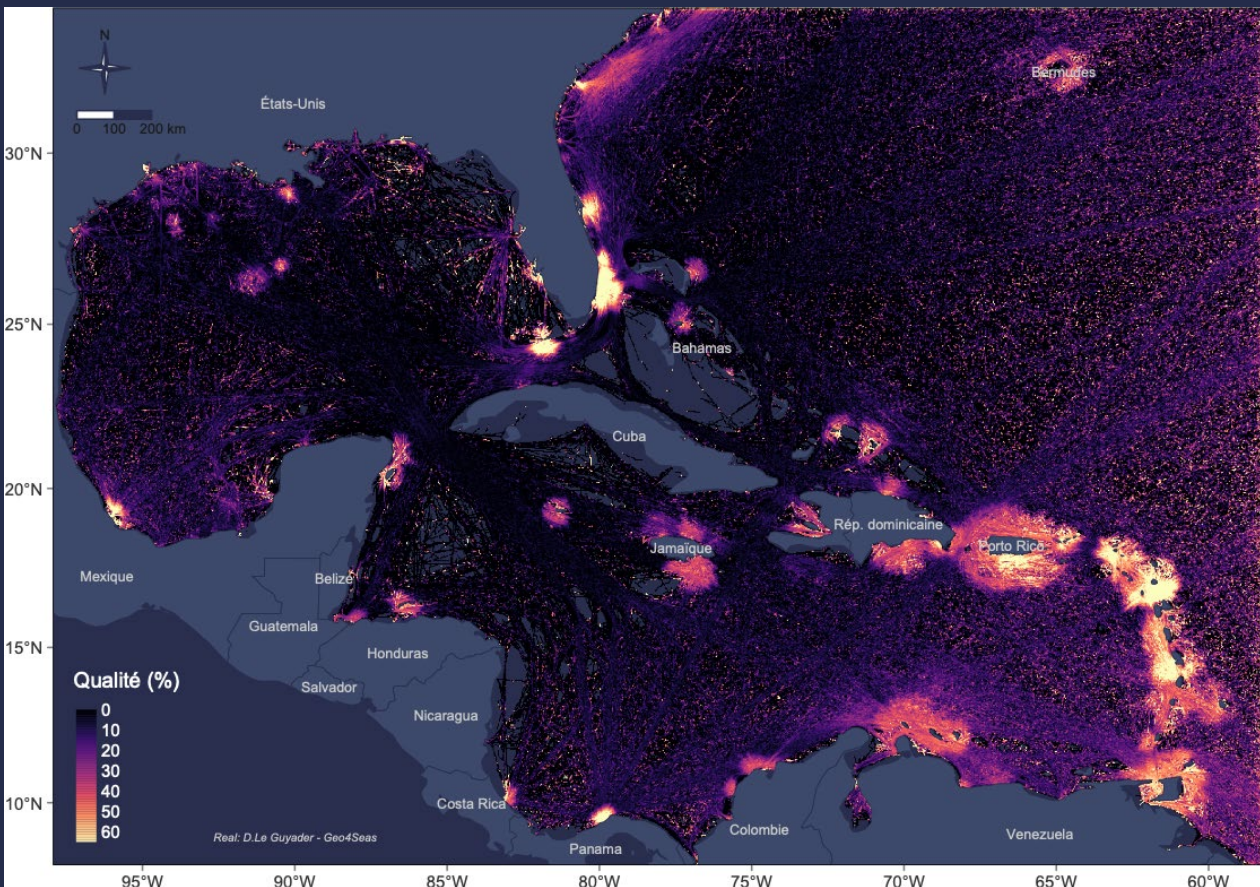
2019
400 M positions



BIP Session: interdisciplinary working groups

2015

2019

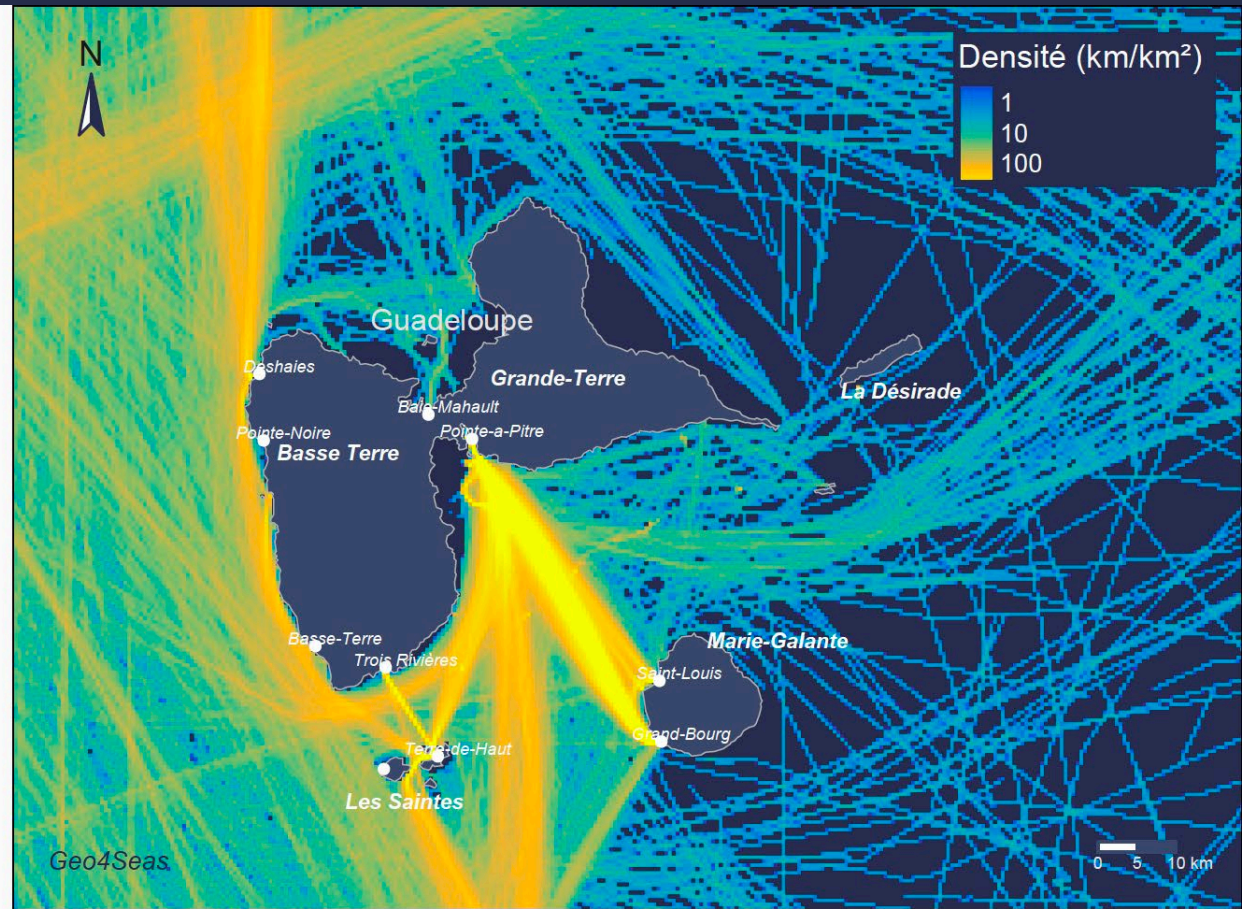
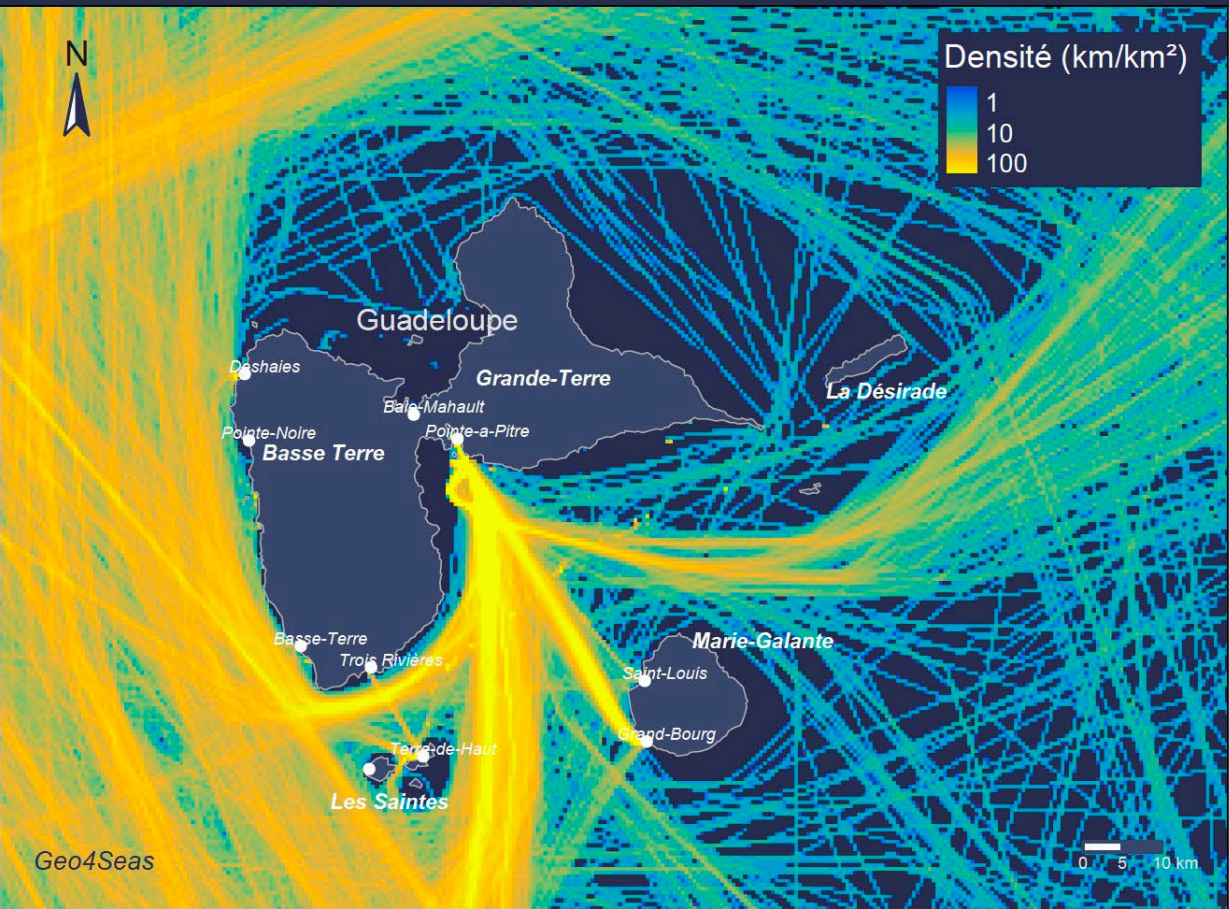


Indice de qualité % de segments <15 mn. dans une maille

BIP Session: interdisciplinary working groups

Night

Day

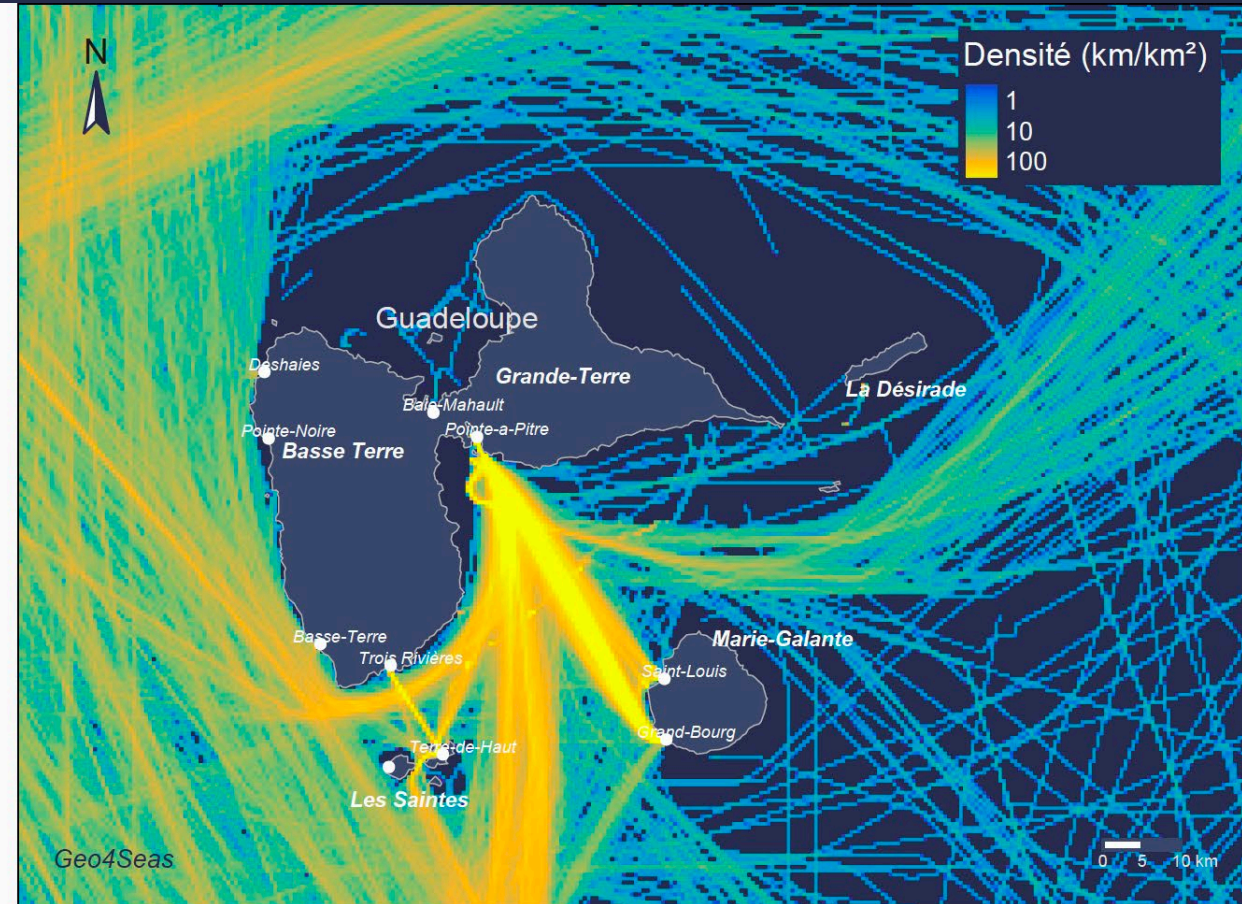
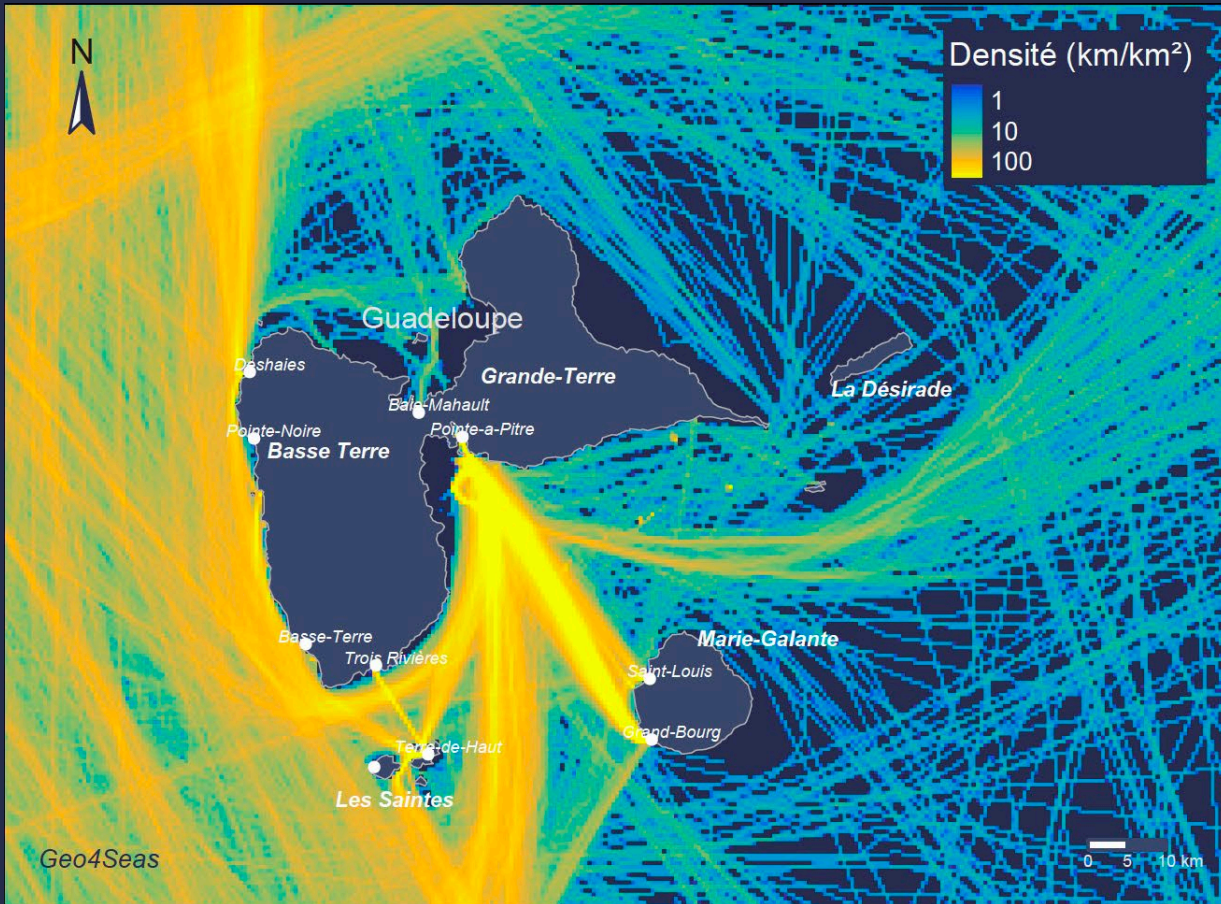


BIP Session: interdisciplinary working groups



Saison sèche

Saison humide



BIP Session: interdisciplinary working groups

Transport maritime et Contaminations

1. Contaminations protéiformes
2. Disparités spatiales des expositions
3. Evaluation des dynamiques de diffusion
4. Echelles et temporalités des expositions

BIP Session: interdisciplinary working groups



International Symposium of LabEx DRIIHM
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

September 6th-8th, 2021 – Toulouse (France)