



# State of play of non-organic litter from the aquaculture sector

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Berlin 9 October 2019*



*Preventive measures for averting the discarding of litter in the marine environment from the aquaculture industry*





## STATE OF PLAY



*Literature  
research*

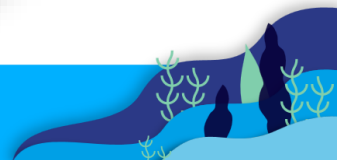


*Aquaculture  
players*



*Existing tools*

More specifically, **AQUA-LIT** was born out of a **desire for action on two major factors**: the staggering rapid increase of **marine litter in the Ocean**, and **the boost of the aquaculture** sector both at an EU level and worldwide. With the exponential expansion of the aquaculture sector we don't want an increase of marine debris.





# General items

Used by multiple offshore sectors

## MARINE LITTER INVENTORY

### [PLASTIC]

The item inventory is a solid knowledge base on marine litter from aquaculture activities which is divided into general [A], specific [B] and other potential [C] items.

Each item is characterized by an identification



AQUA-LIT

#### Gloves<sup>[A18]</sup>

Item type  
Clothing

Material  
Plastic, rubber



##### Description:

Industrial/professional gloves (e.g gut gloves)

Source: OSPAR beach litter guidelines nr 113



Item type  
Clothing

Material  
Plastic

#### Hard hats<sup>[A19]</sup>

##### Description:

Safety hats

Source: OSPAR beach litter guideline nr 42



#### Other clothing<sup>[A21]</sup>

Item type  
Clothing

Material  
Plastic



##### Description:

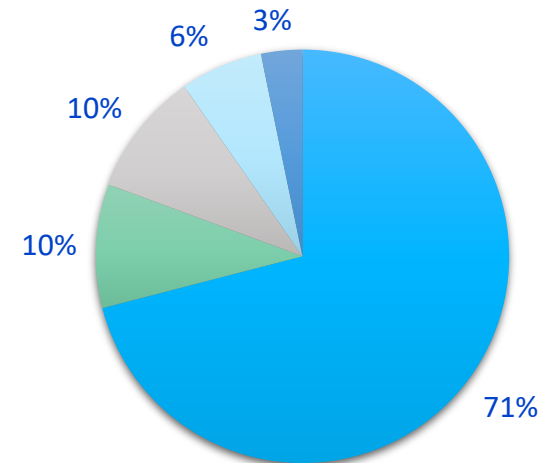
Safety jackets, reflective jackets, pants, sweater...

Source: OSPAR beach litter guideline nr 54



Total: 31

- Plastic: 22
- Wood: 3
- Metal: 3
- Textile: 2
- Rubber: 1



■ Plastic ■ Wood ■ Metal ■ Textile ■ Rubber





# Specific items

Uniquely linked to aquaculture activities

## MARINE LITTER INVENTORY

[PLASTIC]

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AQUA-LIT

### Tahitians<sup>[B11]</sup>

Item type  
**Structure**

Material  
**Plastic**



**Description:**  
Plastic structure from oyster cultures

**Aquaculture species:** Bivalves (mussel)  
**Aquaculture type:** Stake method / longline culture

*Source:* OSPAR beach litter guidelines nr 30



Item type  
**Structure**

Material  
**Plastic**

### Heavy-duty longlines<sup>[B12]</sup>

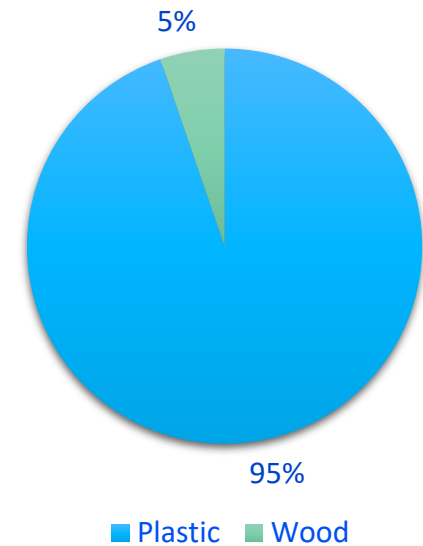
**Description:**  
Sub surface longlines who smaller growth ropes together

**Aquaculture species:** Bivalves (oyster), brown seaweed  
**Aquaculture type:** Longline culture

*Source:* Niaounakis, 2017

Total: 19

- Plastic: 18
- Wood: 1





# Other potential items

Aquaculture items that are not reported in literature or databases

## MARINE LITTER INVENTORY

### [PLASTIC]

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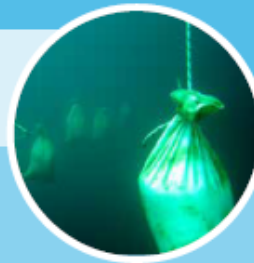


AQUA-LIT

### Mesh bags [C03]

Item type  
**Structure**

Material  
**Plastic**



**Description:**

Mesh bags filled with sand, gravel or small pebbles for use as sinker ballasts

**Aquaculture species:** Fish

**Aquaculture type:** Net cages

*Source:* Cardia and Lovatelli, 2015



Item type  
**Structure**

Material  
**Plastic**

### Polystyrene cylinders [C05]

**Description:**

Inserted into the pipes for extra flotation

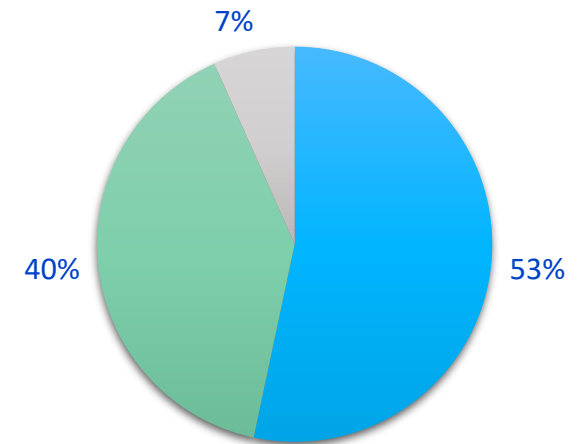
**Aquaculture species:** Fish

**Aquaculture type:** Net cages

*Source:* Cardia and Lovatelli, 2015

Total: 15

- Plastic: 8
- Metal: 6
- Concrete: 1



■ Plastic ■ Metal ■ Concrete



# Different materials

Wood, metal, concrete, textile, etc.

## MARINE LITTER INVENTORY

[WOOD]

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AQUA-LIT

### Wooden Pallets [A06]

Item type  
Pallets

Material  
Wood



Description:  
Wooden pallets

Source: OSPAR beach litter guidelines nr 69



Item type  
Collecting material

Material  
Wood

### Wooden fish boxes [A12]

Description:  
Fish boxes for seafood collection

Source: OSPAR beach litter guidelines nr 119



### Stakes [A24]

Item type  
Structure

Material  
Wood



Description:  
Stakes are used as growth medium

Source: Nicaounakis, 2017



Item type  
Structure

Material  
Wood

### Oyster sticks [B14]

Description:  
Wooden sticks for growth

Aquaculture species: Bivalves (oyster)  
Aquaculture type: Stake method

Source: Sherrington et al., 2016

## MARINE LITTER INVENTORY

[METAL]

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AQUA-LIT

### Thimble [A23]

Item type  
Structure

Material  
Metal



Description:  
Thimble for rope attachment

Source: Cardia and Lovatelli, 2015



Item type  
Other

Material  
Metal

### Industrial scrap [A25]

Description:  
Metal materials

Source: OSPAR beach litter guideline nr 83



### Metal drums [A30]

Item type  
Floats and buoys

Material  
Metal



Description:  
For flotation

Source: Ioakeimidis et al., 2014



Item type  
Structure

Material  
Metal

### Mussel cone laser marking [C01]

Description:  
To mark mussel cultures

Aquaculture species: Bivalves (mussels)  
Aquaculture type: Stake method?

Source: Frances Kerckhof (RBINS)



## STATE OF PLAY



*Literature  
research*



*Aquaculture  
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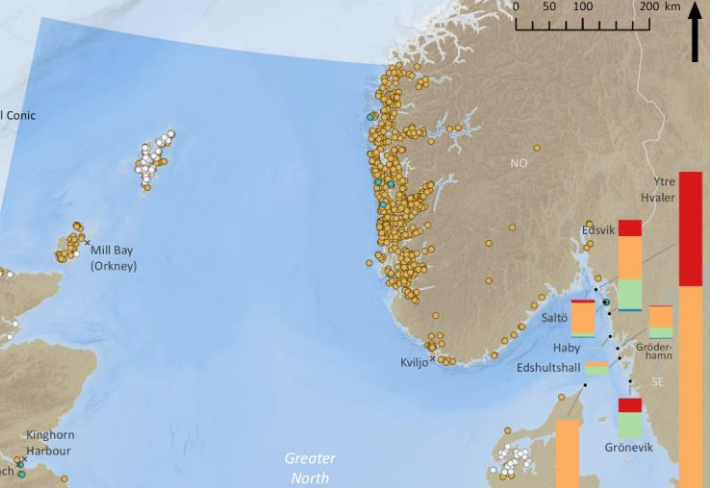


*Existing tools*

More specifically, **AQUA-LIT** was born out of a **desire for action on two major factors**: the staggering rapid increase of **marine litter in the Ocean**, and **the boost of the aquaculture** sector both at an EU level and worldwide. With the exponential expansion of the aquaculture sector we don't want an increase of marine debris.

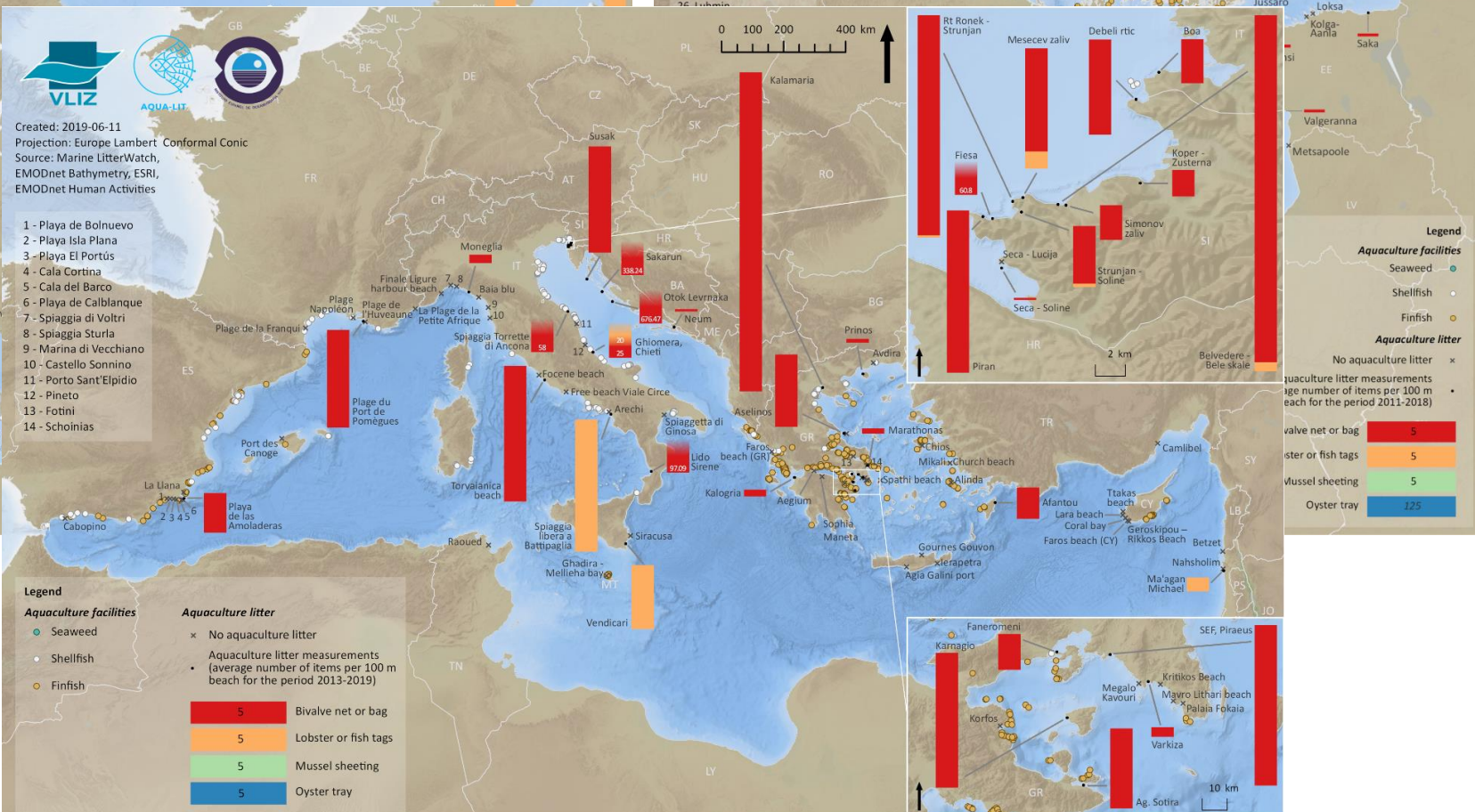






- 01 Pomlenakke, Falster
- 02 Fehmarn - Waldhide
- 03 Fehmarn - Krummsteert
- 04 Rosenhagen
- 05 Steinbeck
- 06 Tarnewitz
- 07 Wieschendorf
- 08 Poel
- 09 Boiensdorf
- 10 Darß - Müller
- 11 Zingst
- 12 Hiddensee - Gellen
- 13 Bug
- 14 Hiddensee - Enddorn
- 15 Varnkevitx
- 16 Nobbin
- 17 Glowe
- 18 Stubbenkammer
- 19 Mukran
- 20 Binz
- 21 Sellin
- 22 Göhren
- 23 Vilm
- 24 Klein Zicker
- 25 Greifwalder Oie

- 1 - Playa de Bolnuevo
- 2 - Playa Isla Plana
- 3 - Playa El Portús
- 4 - Cala Cortina
- 5 - Cala del Barco
- 6 - Playa de Calblanque
- 7 - Spiaggia di Voltri
- 8 - Spiaggia Sturla
- 9 - Marina di Vecchiano
- 10 - Castello Sonnino
- 11 - Porto Sant'Elpidio
- 12 - Pineto
- 13 - Fotinis
- 14 - Schoinias



**Legend**

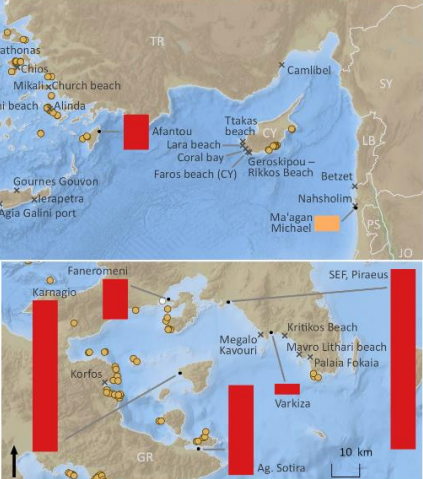
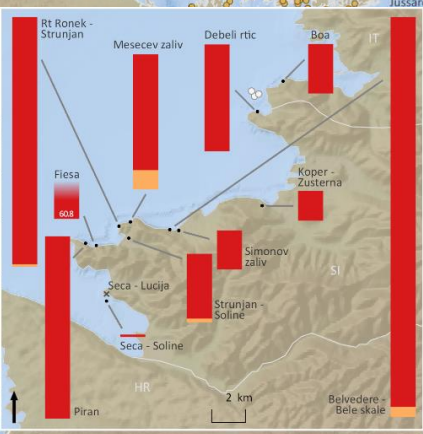
**Aquaculture facilities**

- Seaweed
- Shellfish
- Finfish

**Aquaculture litter**

- × No aquaculture litter
- Aquaculture litter measurements (average number of items per 100 m beach for the period 2013-2019)

5	Bivalve net or bag
5	Lobster or fish tags
5	Mussel sheeting
5	Oyster tray



**Legend**

**Aquaculture facilities**

- Seaweed
- Shellfish
- Finfish

**Aquaculture litter**

- × No aquaculture litter
- Aquaculture litter measurements (average number of items per 100 m beach for the period 2011-2018)

5	Bivalve net or bag
5	Lobster or fish tags
5	Mussel sheeting
125	Oyster tray



# Baltic Sea

## Aquaculture facilities

### ❖ Data lacking

- **Finfish:** Estonia, Latvia, Lithuania, Poland, Russia and Sweden
- **Shellfish:** Finland, Germany, Lithuania, Poland and Russia
- **Seaweed:** all but Denmark and Estonia

## Aquaculture related litter

### ❖ Data lacking

- Latvia and Russia

### ❖ Different classification methods

- Estonia, Finland, Germany and Sweden only 'Bivalve nets or bags' (red)

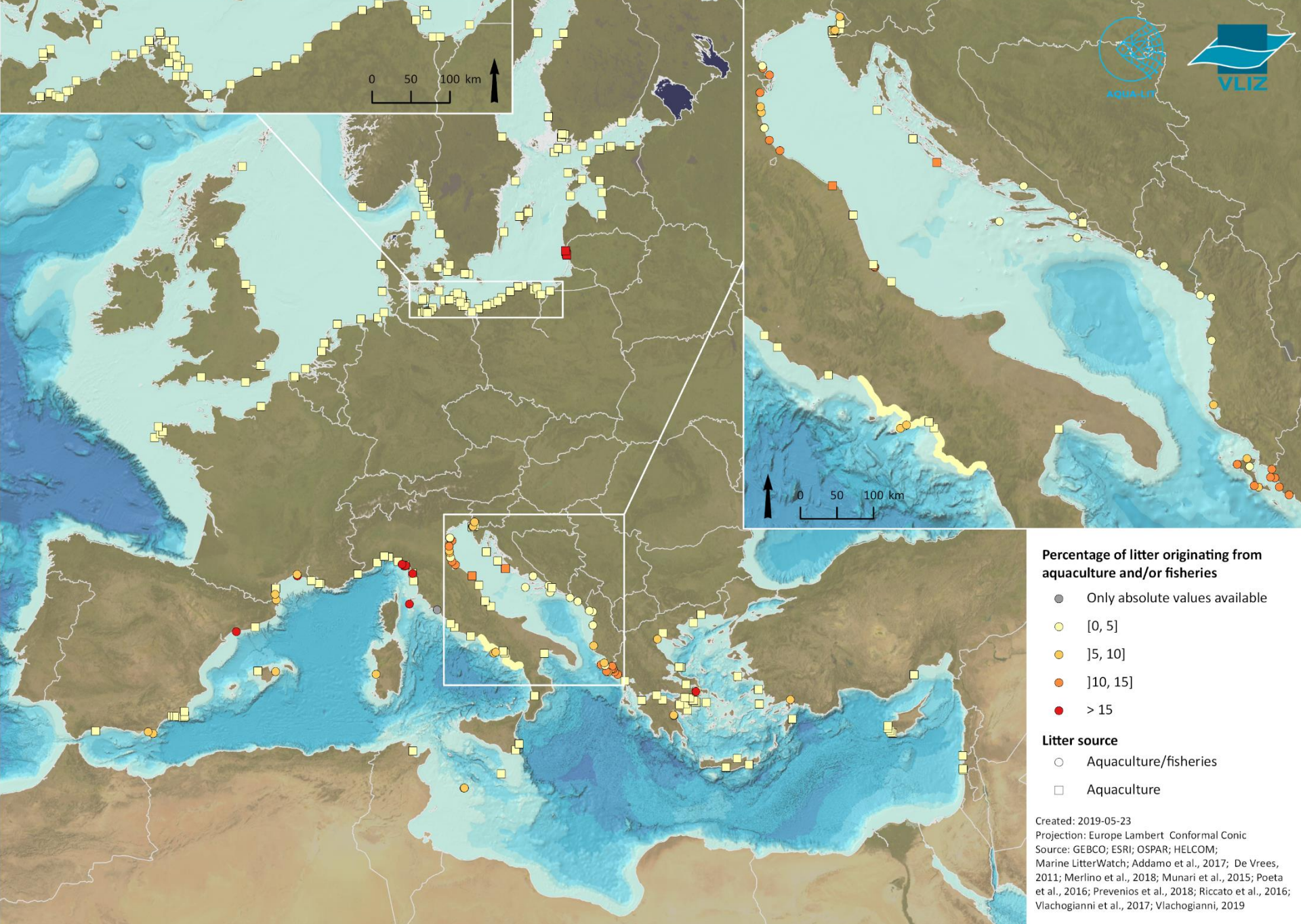
### ❖ Number of performed surveys is high, but distribution is low

### ➔ Aquaculture activities are lower in Baltic Sea than in North and Mediterranean Sea

- Environmental conditions (Low salinity, eutrophication, etc.)

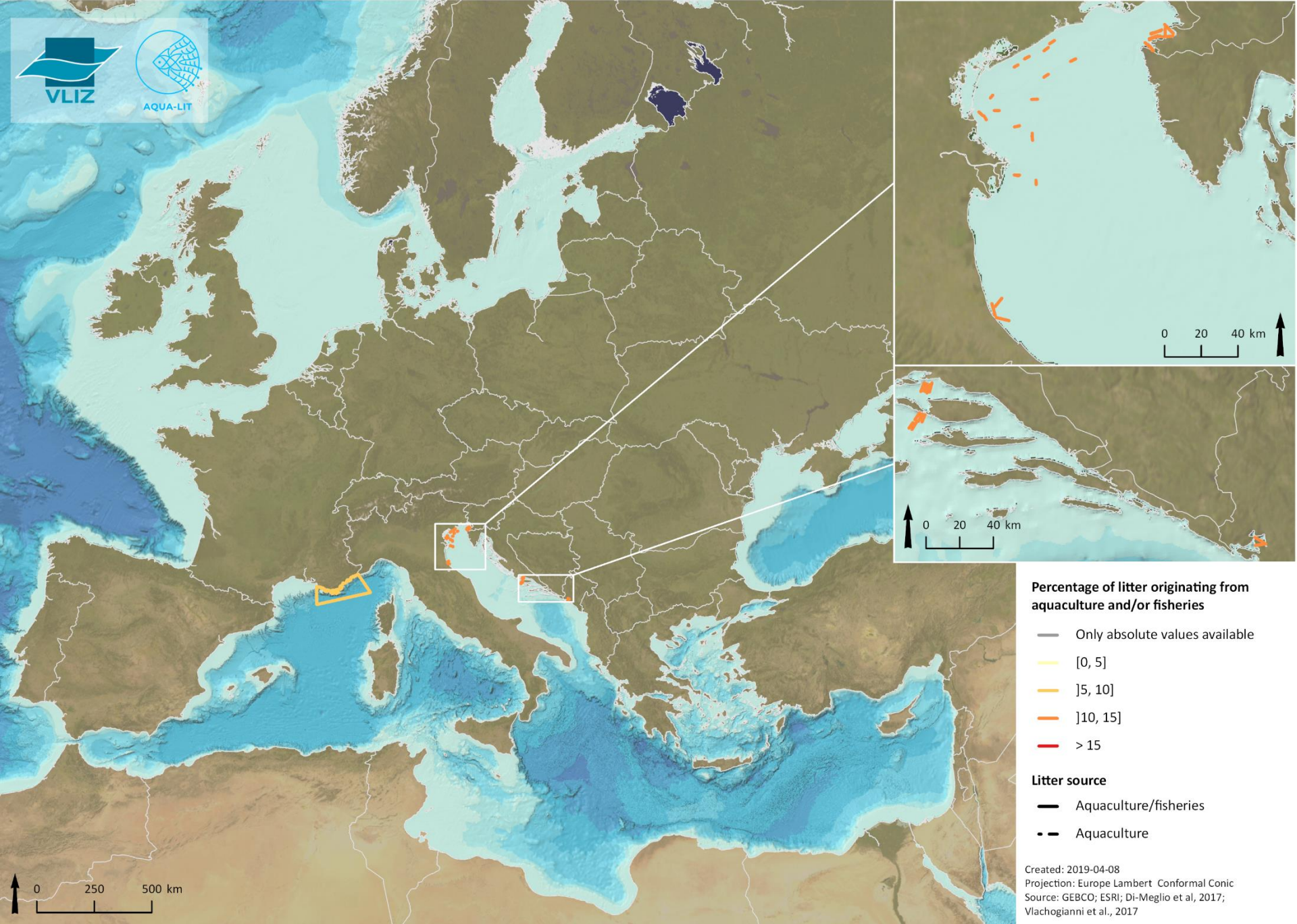






Beach litter ➔ 12.33%





**Percentage of litter originating from aquaculture and/or fisheries**

- Only absolute values available
- [0, 5]
- ]5, 10]
- ]10, 15]
- > 15

**Litter source**

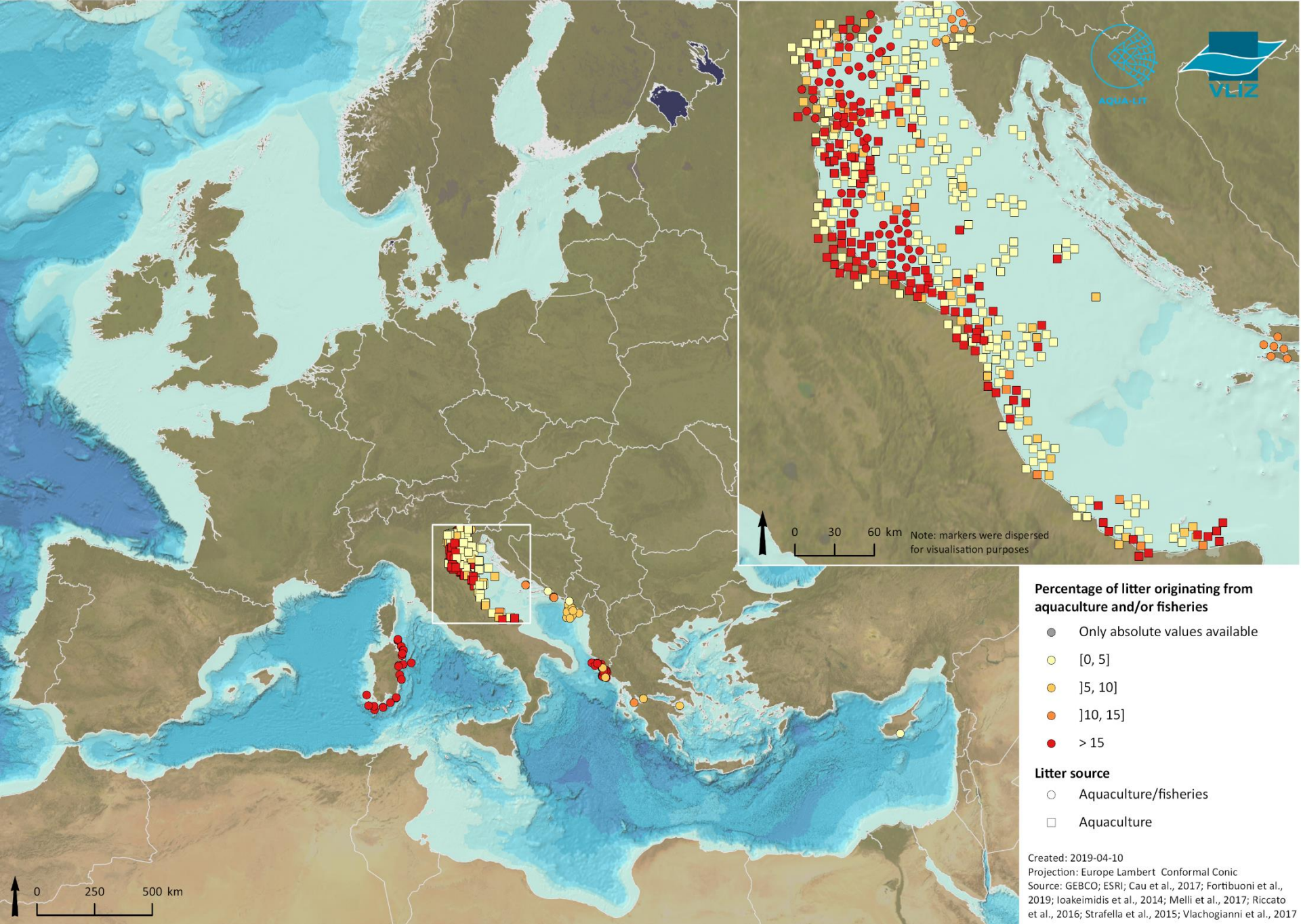
- Aquaculture/fisheries
- - Aquaculture

Created: 2019-04-08  
 Projection: Europe Lambert Conformal Conic  
 Source: GEBCO; ESRI; Di-Meglio et al, 2017;  
 Vlachogianni et al., 2017

Floating litter → 11.25%







Seafloor litter → 14.75%





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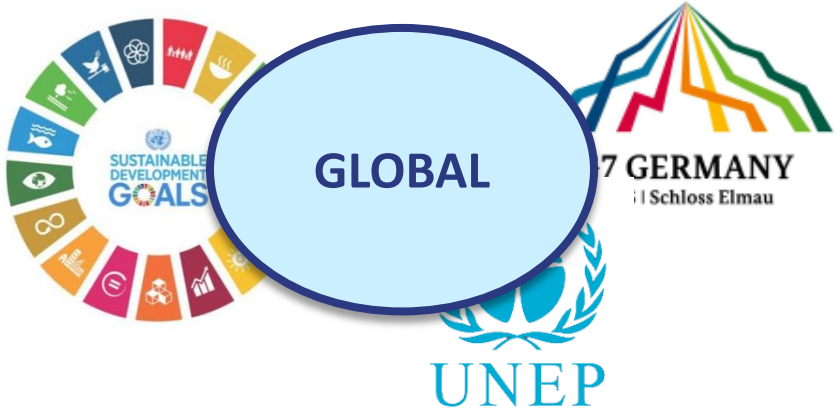
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# Available policy tools and measures



GLOBAL

Overview of the global, regional, European and national action plans and documents that contain measures to reduce or avoid marine litter from the aquaculture sector



REGIONAL



EUROPE



NATIONAL







# Examples



Prevention & reduction

## **CleanSea – Summary of Marine Litter Policy Options**

*Use of alternative materials in aquaculture (e.g. cotton mussel socks).*



Monitoring & quantification

## **OSPAR Commission – Marine Litter Regional Action Plan**

*Identify the options to address key waste items from the fishing industry and aquaculture, which could contribute to marine litter, including deposit schemes, voluntary agreements and extended producer responsibility.*



Removal & recycling

## **European Commission – DG Environment**

*Remove financial disincentives to bringing waste ashore including marine litter found at sea (litter retention). Port reception facilities play an important role and can be complemented with national recycling and disposal systems for items that require special processing such as nets and gear made from composite materials.*





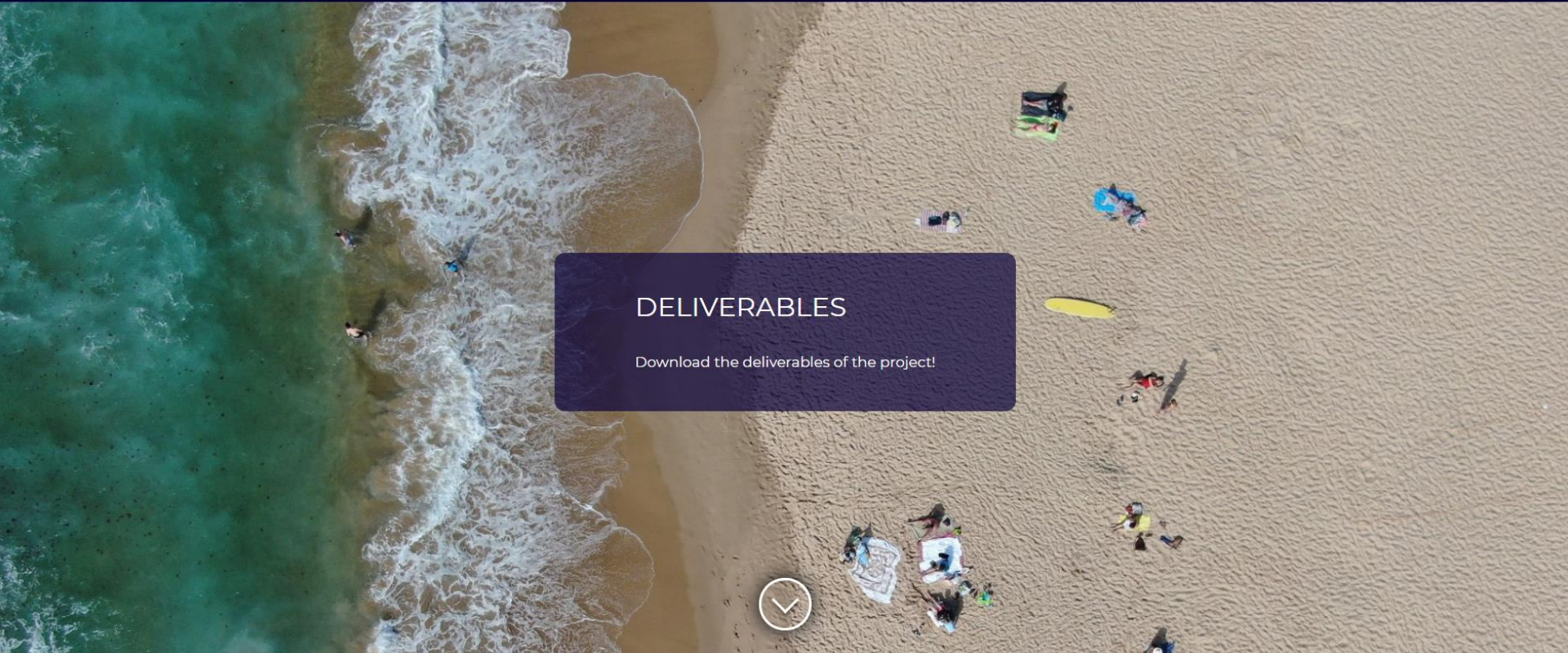
Deliverables available at [www.aqua-lit.eu](http://www.aqua-lit.eu)

D2.2 Knowledge Wave on Marine Litter from Aquaculture Sources

D2.3 Available Tools and Measures



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DELIVERABLES

Download the deliverables of the project!





# THANK YOU!

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<https://aqua-lit.eu>

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 **GEONARDO**  

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