

Plastic Busters MPAs Final Conference  
Athens, 12-13 April 2022



# The Plastic Busters MPAs marine litter monitoring results and findings at National Marine Park of Zakynthos (Greece)

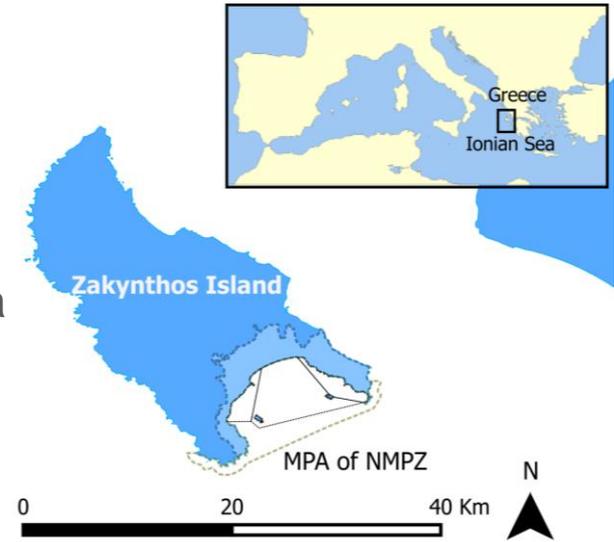
Catherine Tsangaris, Hellenic Centre for Marine Research



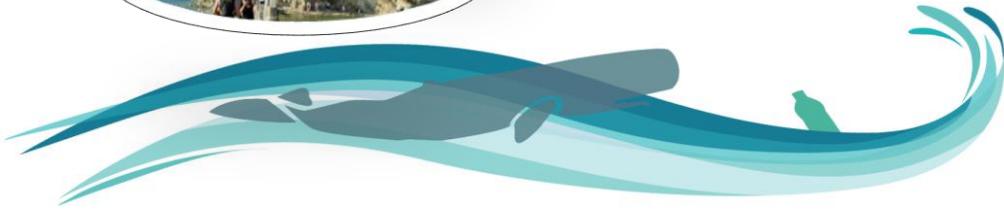
# National Marine Park of Zakynthos



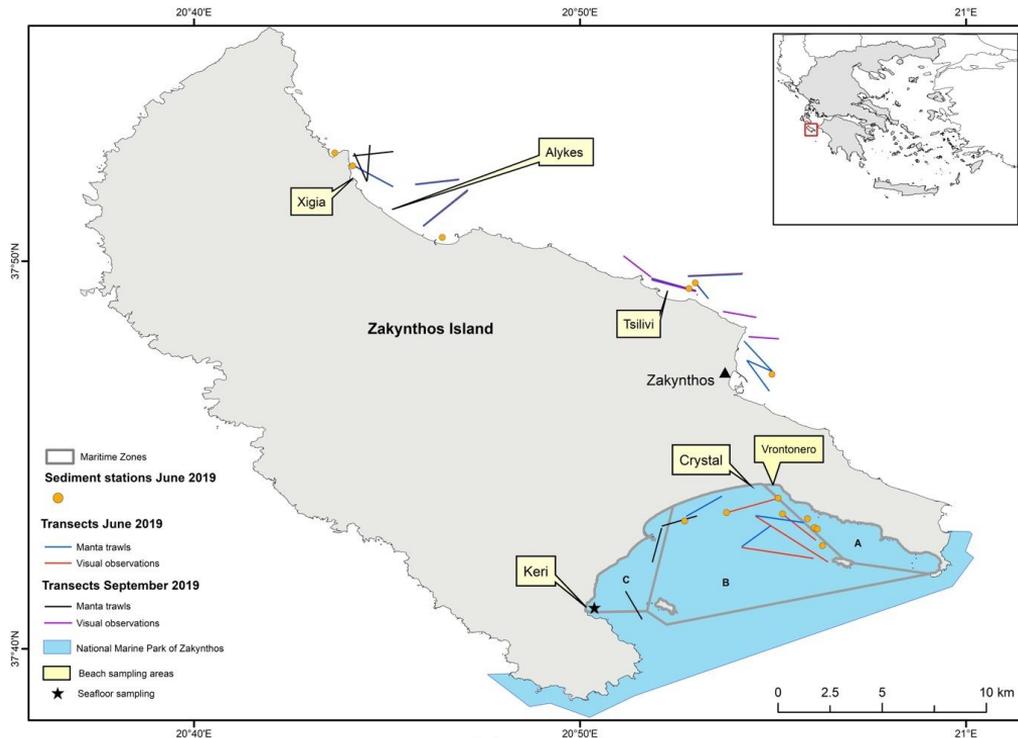
- Priority species and habitats  
92/43/EU: sea turtles, monk sea seabirds, cetaceans, Posidonia beds
- +15 Endangered or protected species / critical habitats for reproduction of endangered species at Mediterranean level
- High recreational and tourism pressure



**Marine area:** 89 km<sup>2</sup>  
**Terrestrial area:** 14.2 km<sup>2</sup>



# Implementation of Plastic Busters MPAs monitoring protocols



Beach macro- and micro- litter



Sea surface macro- and micro- litter



Sea floor macro- and micro- litter



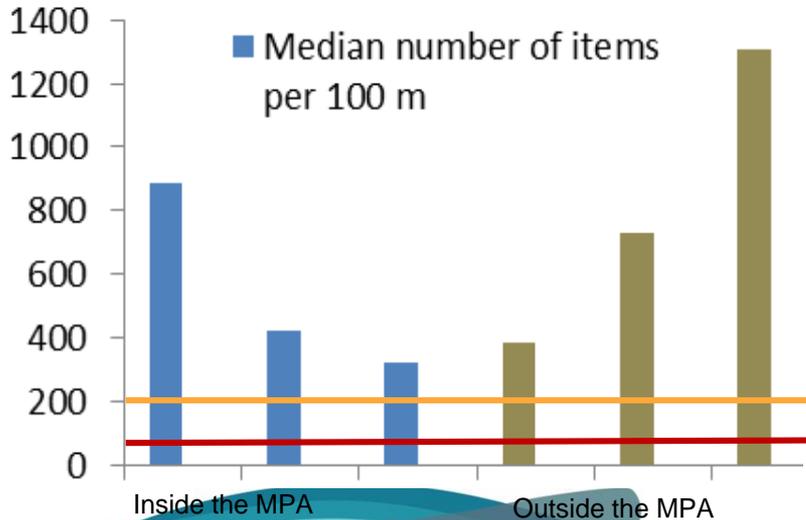
Micro- litter in commercial species



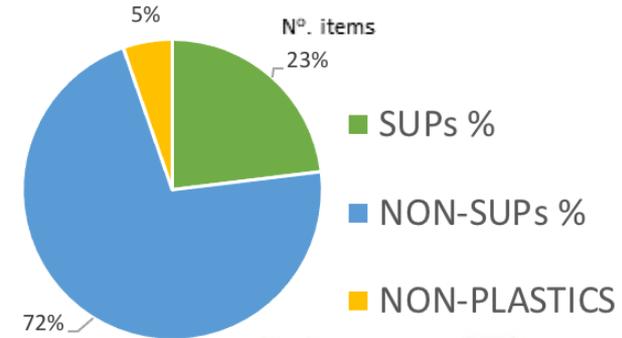
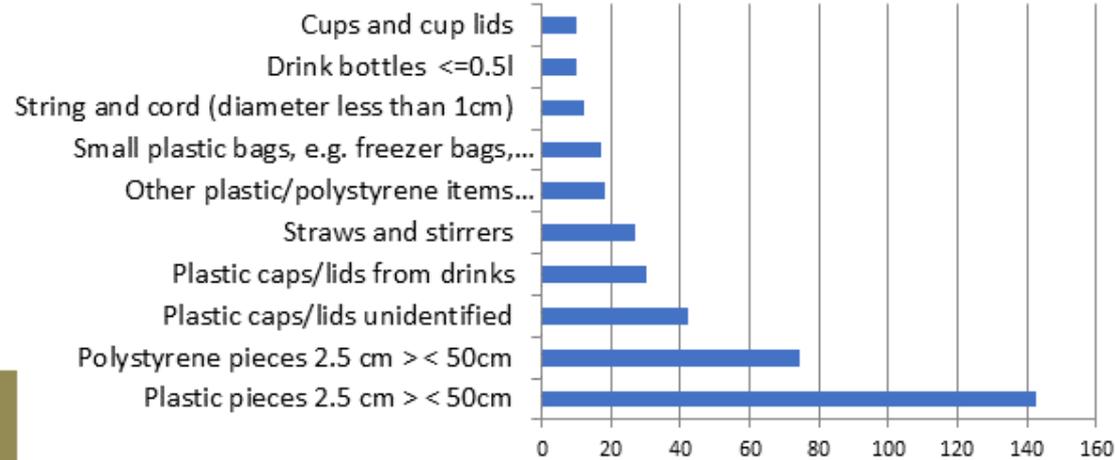
Macro- and micro- litter in endangered species

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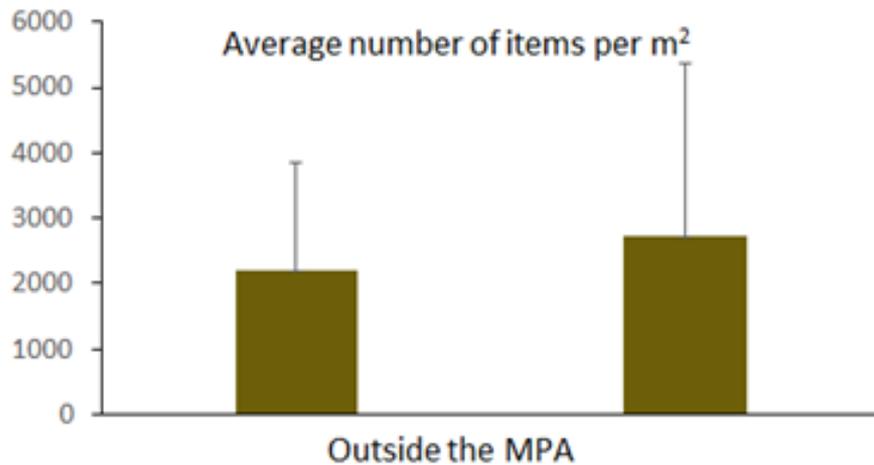
# Beach macrolitter



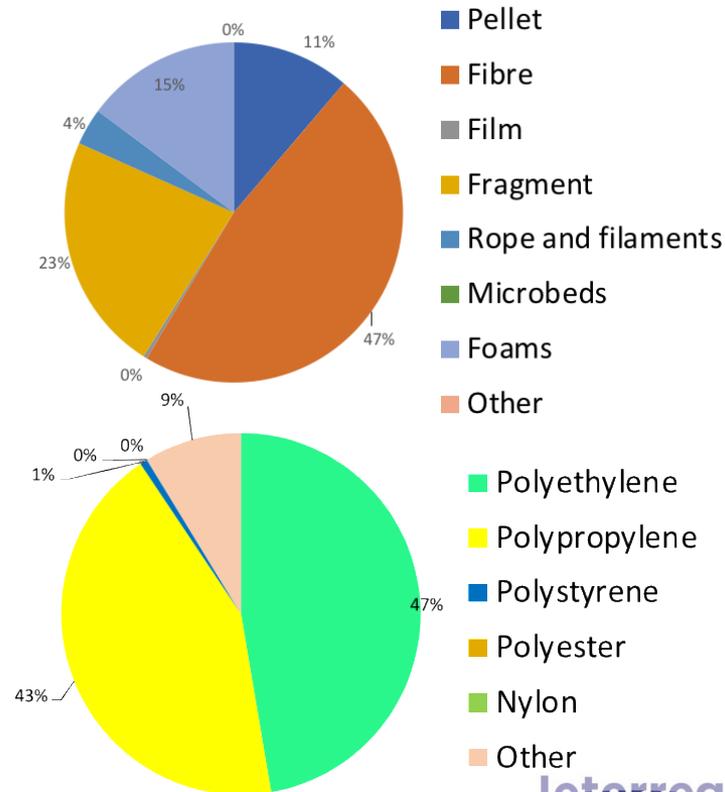
## MPA beach top ten items



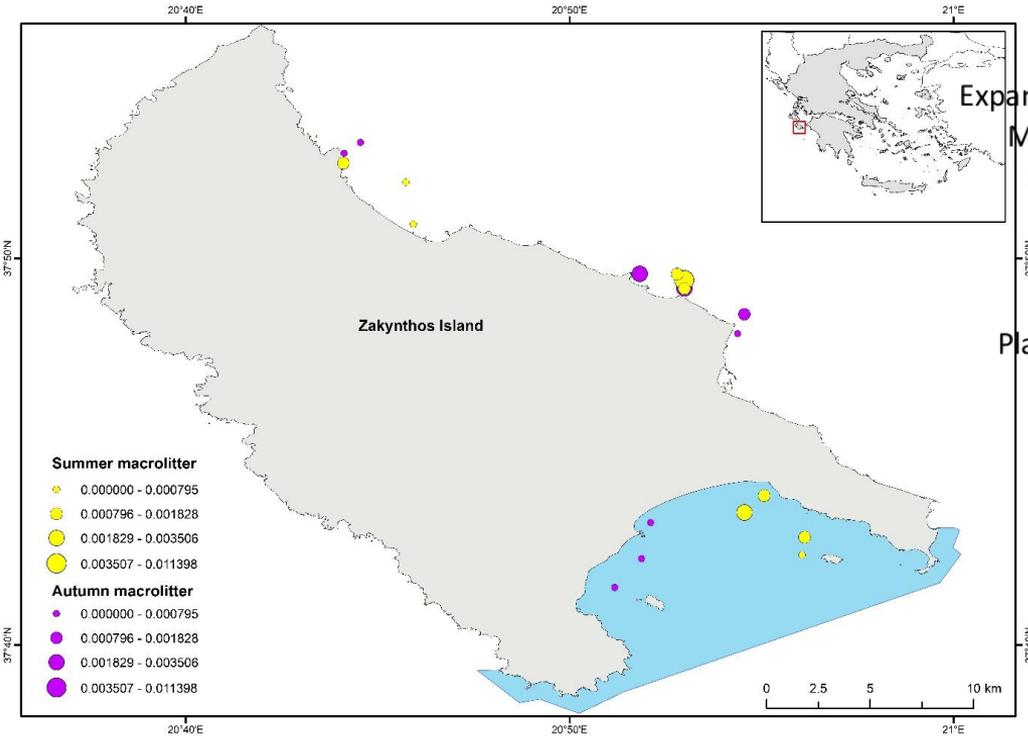
# Beach microlitter



## Microlitter types and polymers

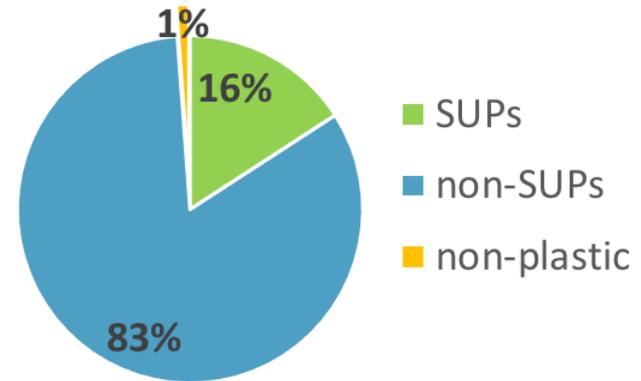
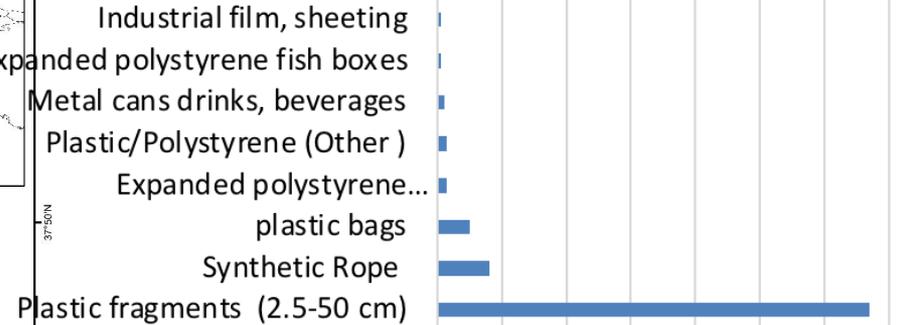


# Floating macrolitter

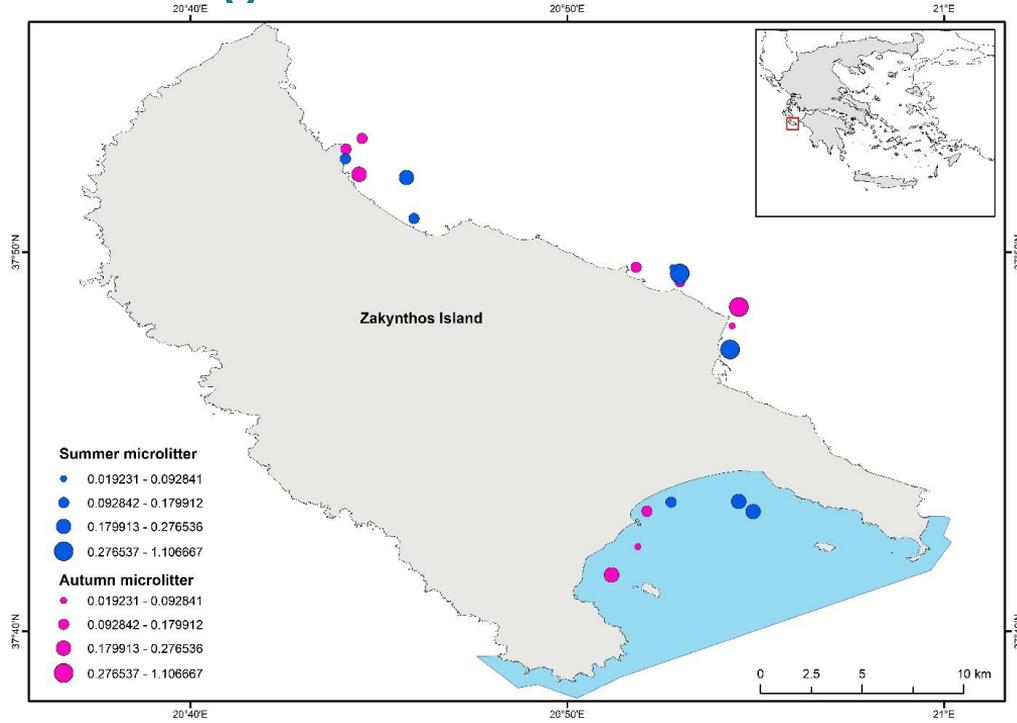


Range: 0-11398 items per km<sup>2</sup>

## MPA floating top ten items

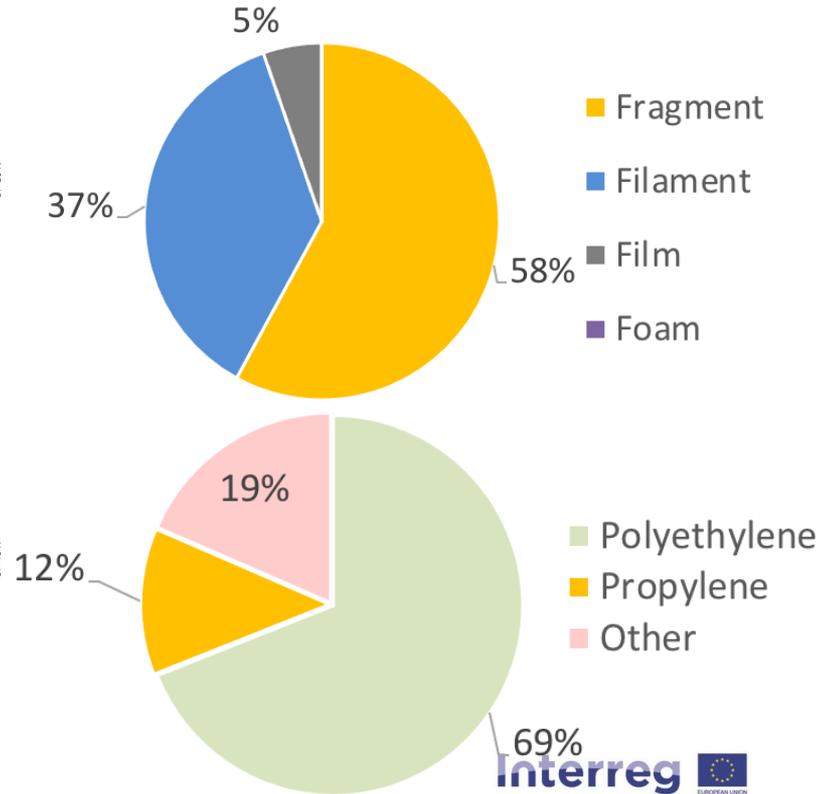


# Floating microlitter



Range: 0.02 to 1.11 items per m<sup>2</sup>

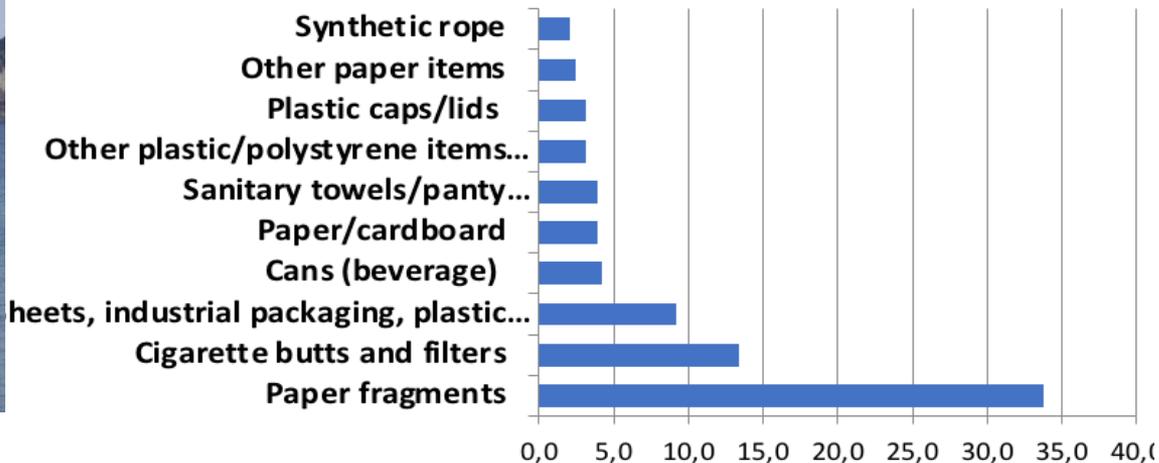
## MPA microlitter types and polymers



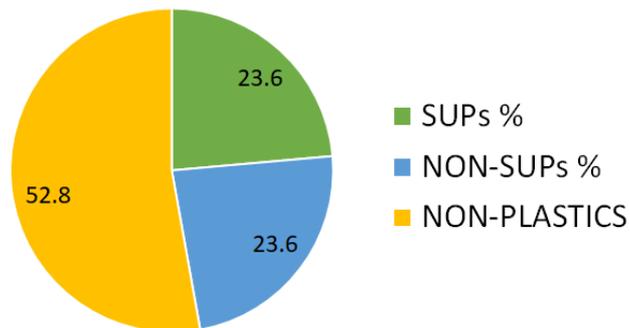
# Seafloor macrolitter



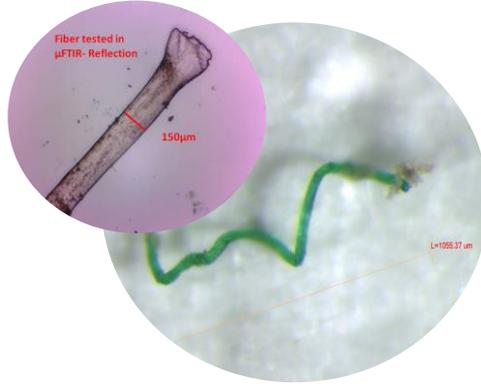
## MPA seafloor top ten items



Macro-litter density: 9466.67 items/km<sup>2</sup>

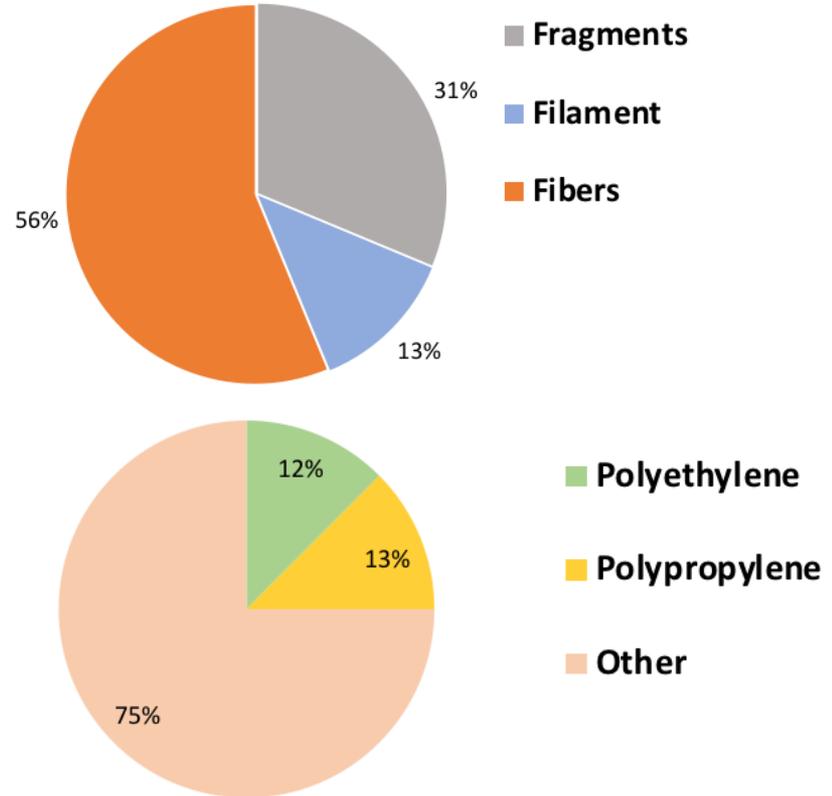


# Seafloor microlitter



Micro-litter abundance:  
1.56 to 78.81 items per kg of dry sediment

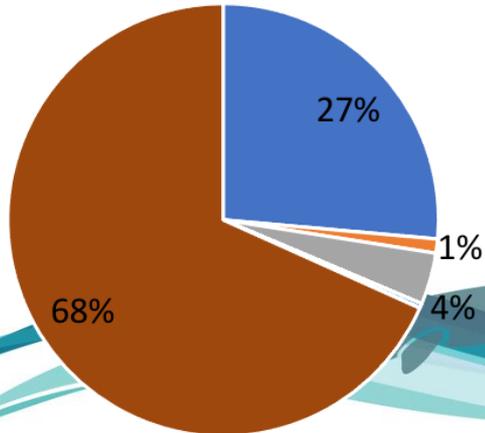
## MPA microlitter types and polymers



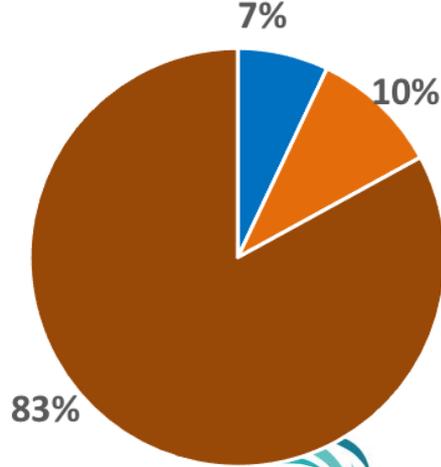
# Marine litter sources in the National Marine Park of Zakynthos

- SHORELINE, TOURISM AND RECREATIONAL ACTIVITIES
- FISHERIES & AQUACULTURE
- SANITARY & SEWAGE RELATED
- SHIPPING
- FLY-TIPPING
- MEDICAL RELATED
- AGRICULTURE
- NON-SOURCED

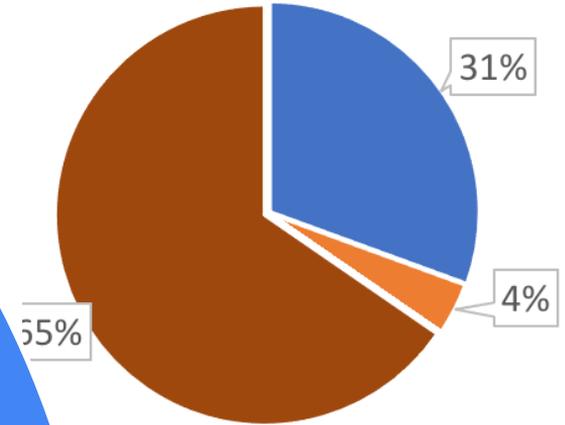
Sea floor macrolitter



Sea surface macrolitter



Beach macrolitter



Mitigation actions

# Recommendations on measures

Target mitigation actions towards

- Promoting best practices for tourism and recreation
- Promoting the replacement of single-use plastics
- Derelict fishing gear management schemes



# Microplastics and their effects in commercial species



## Microplastic ingestion

**0.40 ± 0.08** items per individual  
up to **2** items per individual



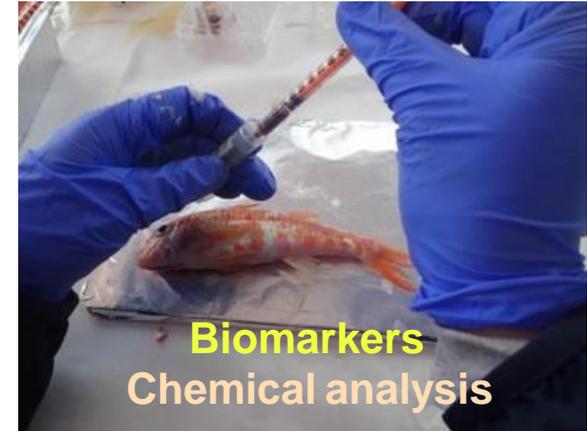
**0.18 ± 0.07** items per individual  
up to **1** item per individual



**0.44 ± 0.04** items per individual  
up to **3** items per individual



## Microplastic effects and plastic additives



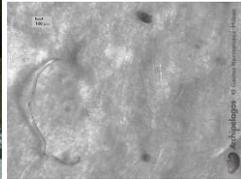
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# Marine litter in endangered species



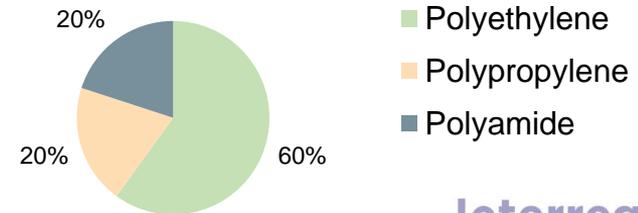
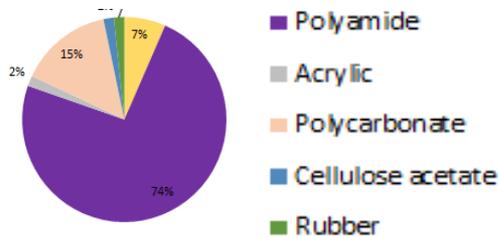
Micro litter



Macro litter



17% of sea turtles examined (N=6) found with ingested litter  
 Average number of items/individual: 0.17  
 Litter items size range: 5-25mm



# Overview of marine litter status in Zakynthos island

	<b>Macro litter density /micro litter abundance</b>
Beach macro-litter	<b>Exceeds EU threshold and baseline value</b> , comparable to reported values in Greek and Mediterranean waters
Beach micro-litter	Comparable to reported values in Greek and Mediterranean waters
Floating macro-litter	Higher than reported values in Mediterranean waters
Floating micro-litter	Comparable to reported values in Greek and Mediterranean waters
Seafloor macro-litter	Lower than reported values in Greek and Mediterranean waters
Micro-litter in commercial species	In the low range of reported values in Greek and Mediterranean waters
Marine litter in endangered species	In the low range of reported values in Greek and Mediterranean waters

# Lessons learned



- The implementation of the Plastic Busters MPAs monitoring protocol provided new knowledge on the amount, composition and sources of marine litter in the National Marine Park of Zakynthos and adjacent area, as well as, on the amount of litter and micro-litter ingested by resident marine animals, and enabled investigation of potential impacts on their health
- Collaboration between scientists and MPA managers was essential for pilot monitoring in the MPA
- Carrying capacity of the MPA management authority increased (know how, manpower, equipment use )
- Replicability is feasible through the joint efforts of MPA managers and scientists
- Outputs can be transferred to MPA management design and mitigation actions



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## Thank you!

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