

# Splash! Due anni tra ricerca e divulgazione

Franco Borgogno  
E.R.I.



La cooperazione al cuore del Mediterraneo  
La coopération au cœur de la Méditerranée

# SPlasH! Stop alle Plastiche in H2O!



## I PARTNER



**UNIVERSITÀ  
DEGLI STUDI  
DI GENOVA**



**UNIVERSITÉ  
DE TOULON**

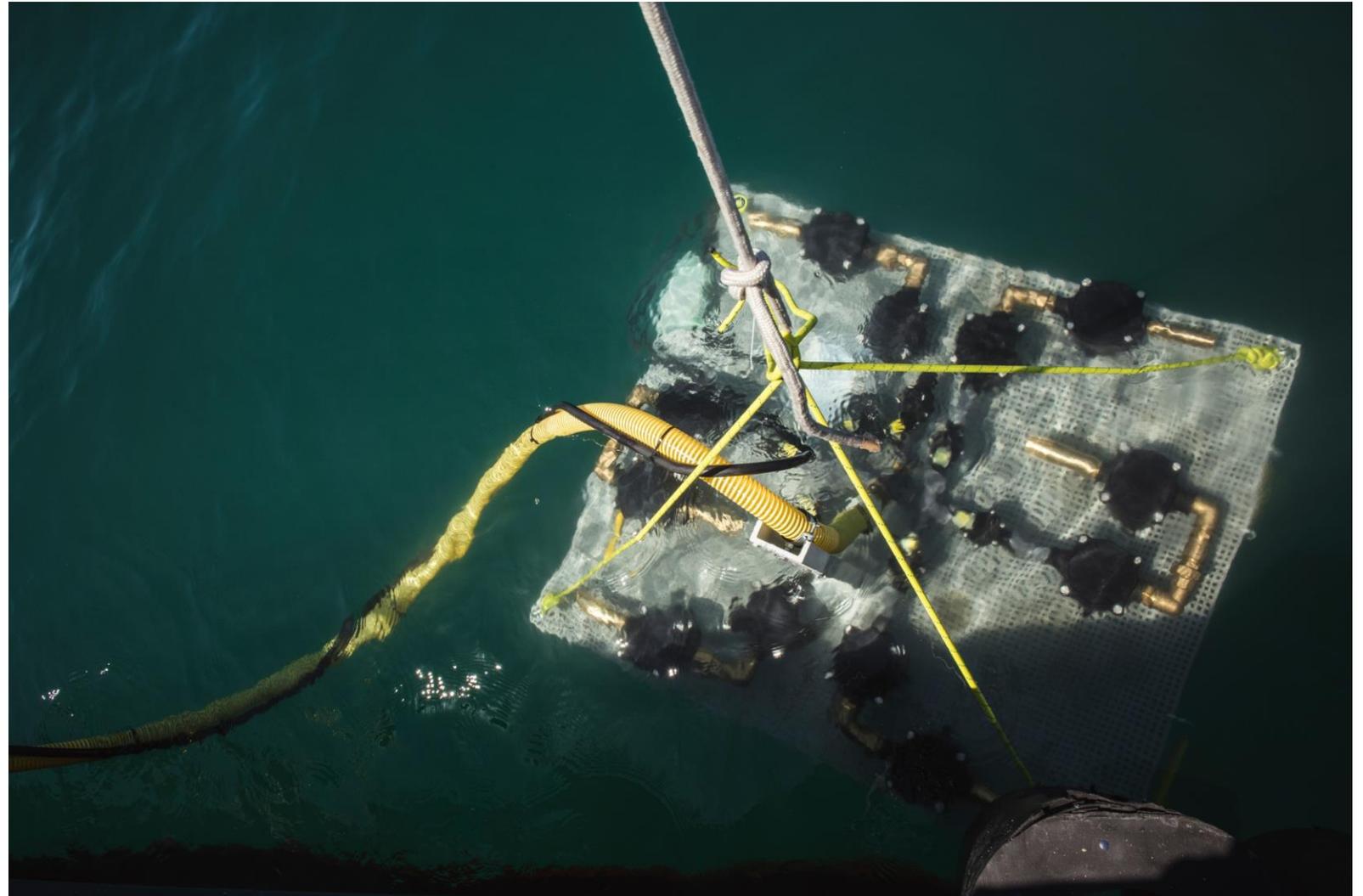


**EUROPEAN  
RESEARCH  
INSTITUTE**



## CAMPIONAMENTI

- 5 della plastica galleggiante
- 4 di acqua superficiale (1 m)
- 4 sedimento di fondo
- 2 di pesci



Un test prototipo per colonna d'acqua

## ATTIVITÀ DI LABORATORIO (DISTAV)

- 11 campioni di acqua superficiale
- 29 campioni di sedimento di fondo
- 40 pesci
- Più di 800 ore di laboratorio
- più di 440 ore di analisi al microscopio ottico
- più di 500 ore di analisi al Raman
- 105 filtri visionati al microscopio ottico
- 5582 particelle catalogate al microscopio
- 1116 particelle analizzate per la ricerca e il riconoscimento dei polimeri (tecnica micro-Raman)

Percentuale plastica  
(polimeri, coloranti, additivi)

- 42% nei pesci di Genova
- 22% nei pesci di Oristano
- 42% nell'acqua di Genova
- 17% nell'acqua di Tolone
- 41% nel sedimento di Genova
- 11% nel sedimento di Tolone

# LE ATTIVITÀ DI LABORATORIO (UNITOLONE)

- 12 campioni acque superficiali, 3 siti (Fra-Ita) e 2 stagioni (estate-inverno)
- circa 1000 particelle catalogate al microscopio
- più di 900 ore di laboratorio
- circa 200 ore di analisi per contaminazione metallica

## Percentuale di distribuzione plastica:

- 39% delle particelle di dimensione  $<2\text{mm}$  nel porto di Genova in inverno
- 41% delle particelle di dimensione  $<2\text{mm}$  nel porto di Genova in estate
- 55% delle particelle di dimensioni  $<2\text{ mm}$  nel porto di Tolone in inverno
- 66% delle particelle di dimensioni  $<2\text{ mm}$  nel porto di Tolone in inverno
- 85% delle particelle di dimensione  $<2\text{mm}$  nel porto di Olbia in inverno

## Simulazione (DICCA-UNIGE)

Identificazione scenari climatici caratteristici per i tre porti realizzazione delle simulazioni per analizzare la dispersione delle microplastiche lungo le coste adiacenti.

Tali coste spesso presentano infatti alto valore ambientale



29 Scuole  
96 classi  
1826 studenti

“Scienze in Piazza”  
(Sassari): circa 1000  
persone

40mila contatti social  
Articoli, servizi tv



# DIVULGAZIONE TECNICO SCIENTIFICA

3 articoli scientifici

1 poster scientifico EMSEA 2019

3 presentazioni orali in conferenze internazionali

2 tesi di laurea



## MARINE EDUCATION FOR ENVIRONMENTAL AWARENESS ON PLASTIC POLLUTION



Canuto, S.<sup>1</sup>; Borgogno, F.<sup>1</sup>; Forioso, I.<sup>1</sup>; Stocchino, A.<sup>2</sup>; Besio, G.<sup>2</sup>; Capello, M.<sup>2</sup>; Cutroneo, L.<sup>2</sup>; Mounier, S.<sup>3</sup>; Lenoble, V.<sup>3</sup>; Tesán, J.<sup>3</sup>

<sup>1</sup> European Research Institute, Italy; <sup>2</sup> University of Genoa, Italy; <sup>3</sup> University of Toulon, France

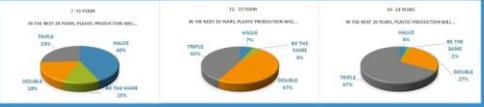
**INTRODUCTION**  
 Marine litter in the ocean is one of the biggest problems which affects human life. An estimated 6-12 million tonnes of plastic enters the oceans each year (Jambeck et al., 2015). Within the framework of INTERREG SPaSH PROJECT, which aims at studying the dynamics and characterization of microplastics in three ports of Mediterranean Sea (Genoa, Obis and Toulon), dissemination activities were carried out. Marine education is a key component in plastic pollution awareness and solution.

**MATERIAL AND METHODS**  
 Dissemination activities of SPaSH Project were carried out in schools (elementary, middle and high) of two Italian regions (Liguria and Sardinia) bordering the Mediterranean Sea, from February 2019 to May 2019. Activity consisted in a first interactive lesson in classroom and a second practical class on the seashore, several days later. Before starting the activities, a questionnaire titled "What do you know about plastic?" was submitted to all the students aged 7 and over (Coyer et al., 2017; The New Plastics Economy). Activity in classroom aimed to raise awareness about plastic pollution, understanding the influence of the Ocean on us and our influence on the Ocean, through videos, photos, slides, explanations and games. Practical activity on the beach was designed with the approach: "learn to look and look to learn" in order to become aware of the amount of plastic (not only macro, but also micro) in the environment. During practical sessions, with some groups of students sheets were filled out to list the macro litter recovered on the beach. At the end of the practical activity, in some circumstances it has been possible to submit the same questionnaire. To analyse questionnaire data, students were divided into 3 groups based on the school grades (7-11 years; 12-13 years; 14-18 years).

**RESULTS**  
 Dissemination activities involved 23 schools with a total of 95 classes and 2026 students. A total of 708 students participated to the questionnaire (Pre and post activity), 487 students from Liguria (69%) and 221 from Sardinia (31%), 362 were males and 346 females.



Region	Elementary Schools	Middle Schools	High Schools
Liguria	8	5	3
Sardinia	3	0	4



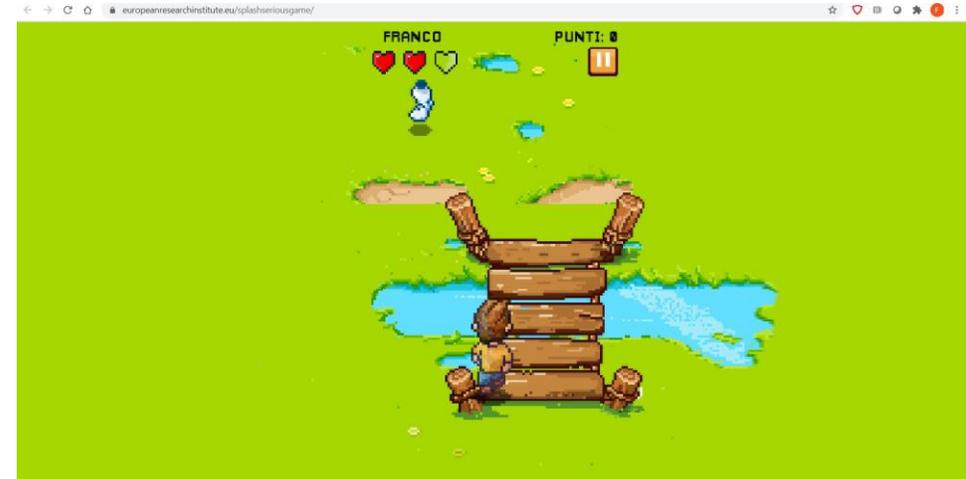
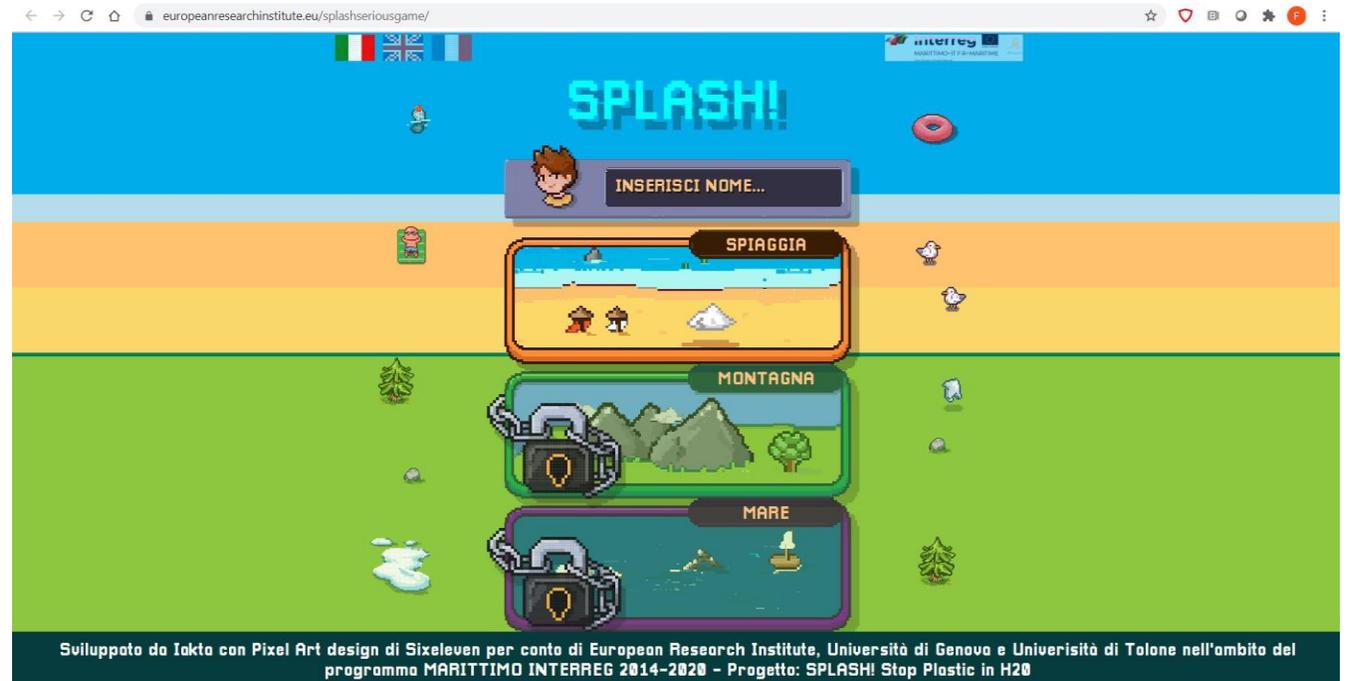
**DISCUSSION**  
 Comparison between previous and consequent questionnaires demonstrated a visible improvement of students' knowledge on plastic pollution issue and the effectiveness of dissemination activities. Younger students showed a more optimistic view than older students about plastic production projection in the next years, highlighting their naive trust in humans in being able to improve the situation in the short term. At the beginning of the practical activity the students gathered only the macroplastics, then after some time from the beginning of the activity they also began to pay attention to the microplastics.

**References**  
 Canuto, S., Forioso, I., B. Lenoble, V., et al. (2019). Plasticity, sea, and lots of plastic litter waste. *Science Advances*, 15(7), 1-8.  
 Jambeck, J.R., Girelli, G., Wilcox, C., Suter, T.R., Petersen, M., Atkeson, A., Narayana, L., et al. (2015). Plastic waste inputs from land into the ocean. *Science*, 347(6212), 769-774.  
 World Economic Forum. *Global Risks Report 2019*. Cambridge, 2019. See <http://www.weforum.org/reports/global-risks-2019>

**PRACTICAL SESSIONS**  
 Students participated to a Citizen Science experience, contributing to collecting some data on plastic amount on the seashore.

11/03/2019 - Marinella di Sarzana Beach (Liguria): 50 kg of plastic waste collected in 1h  
 27/03/2019 - Lenzi Beach (Liguria): 239 cigarette butts in 150 m<sup>2</sup> (30m x 5m)  
 29/04/2019 - Loana Beach (Liguria): 217 cigarette butts in 4.500 m<sup>2</sup> (300m x 15m)  
 16/05/2019 - Platamona Beach (Sardinia): 283 cotton buds in 1000m<sup>2</sup> (transect 16m long x 10 m wide) → 2,81 in 100 m<sup>2</sup>

# Il Serious Game



La cooperazione al cuore del Mediterraneo  
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**Grazie!**  
**Franco Borgogno**  
**[b.franco@eri.net.in](mailto:b.franco@eri.net.in)**