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**FOR THE EXCHANGE OF GOOD PRACTICES**

***LET'S ENJOY OUR HERITAGE***

**A17-DISCOVERY OF REGIONAL POTENTIAL**

***A JOURNEY THROUGH THE MEDITERRANEAN WATERS***

A.S. 2018/2019

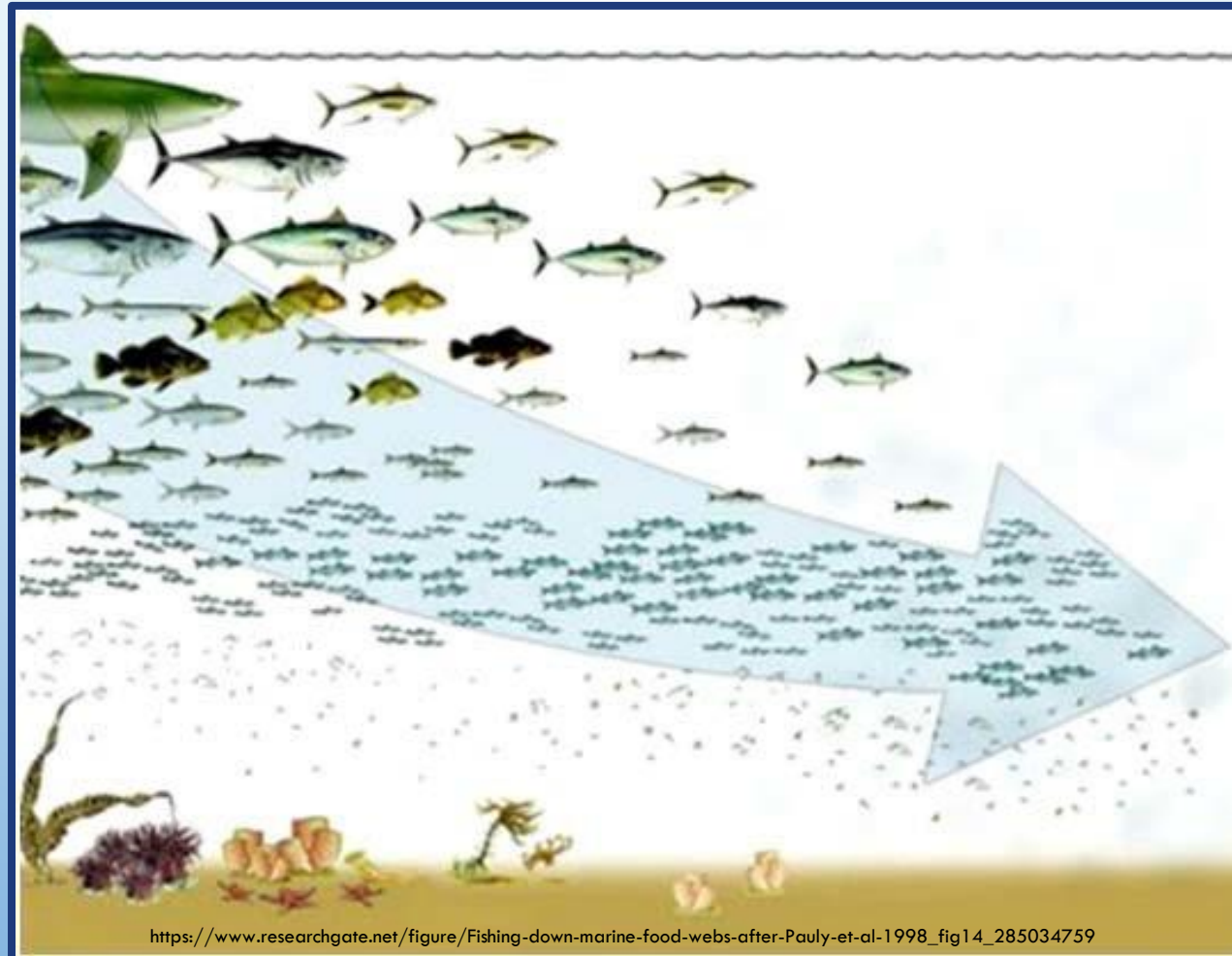
CLASSI 3<sup>^</sup>D, 3<sup>^</sup>E, SCUOLA MEDIA «ANDREA VELLETRANO»

VELLETRI



# THE MARINE BIOTIC COMMUNITY

IT IS THE COMPLEX SET OF ANIMAL AND PLANT POPULATIONS THAT LIVE AND INTERACT WITH EACH OTHER IN THE SAME MARINE ENVIRONMENT - *BIOTOPE* -, FORMING AN ECOSYSTEM.



# MARINE BIODIVERSITY IN ITALY

ITALY HAS 8,000 KILOMETRES OF COASTLINE, AND IT IS AMONG THE MOST BIODIVERSE EUROPEAN COUNTRIES. IN ITALY SEVERAL "HIGH DENSITY" POINTS OF BIODIVERSITY OF PLANETARY IMPORTANCE HAVE BEEN IDENTIFIED, CALLED *HOT SPOTS*. IT HOSTS ABOUT HALF OF THE PLANT SPECIES AND ABOUT ONE THIRD OF ALL ANIMAL SPECIES CURRENTLY PRESENT IN EUROPE. IN ITALY THERE ARE MORE THAN 9,000 SPECIES OF MARINE FAUNA AND, CONSIDERED ITS GEOGRAPHICAL POSITION, PROBABLY THEY REPRESENT MOST OF THE SPECIES OF THE MEDITERRANEAN SEA. (SOURCE I.S.P.R.A.)

IN ITS SEAS THERE ARE THE FOLLOWING SPECIES: BENTHOS, EPIFLORA, EPIFAUNA, NEKTON, PLANKTON, ZOO PLANKTON, PHITO PLANKTON, ASTEROIDEA, STARFISH, SPONGES, ALGAE, ECHINOIDEA, POLYCHAETES, CRUSTACEANS, MOLLUSCS, SHELLS, OPHIREIDEA, TUNICATA, OLOTUROID FISH.



[https://www.wikiwand.com/it/Mar\\_Tirreno](https://www.wikiwand.com/it/Mar_Tirreno)



<https://biopianeta.it/2018/07/scoperte-in-sicilia-foreste-di-rari-coralli-e-nuove-specie-sui-fondali/>

SOME SPECIES HAVE BIZARRE SHAPES AND BEAUTIFUL COLOURS, BUT EACH OF THEM HAS A SPECIFIC FUNCTION WITHIN THE ENTIRE ECOSYSTEM. THE BIO-DIVERSITY OF OUR SEAS IS LINKED TO THE PRINCIPLES OF ECO-SUSTAINABILITY, WHICH REGULATES THE BALANCE OF A SYSTEM THAT INCLUDES ALL LIVING BEINGS, INCLUDING HUMAN BEINGS.

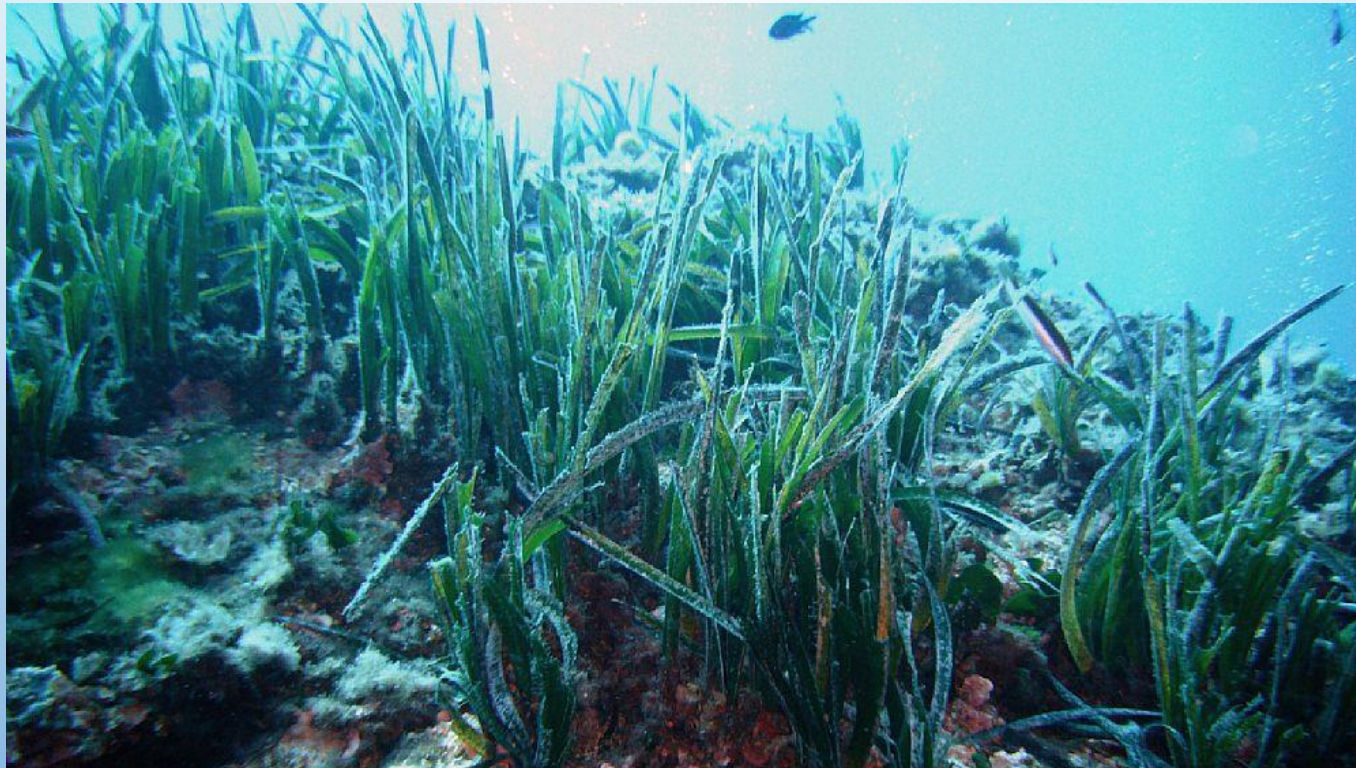


<http://www.strettoweb.com/2016/01/la-biodiversita-del-mare-di-sicilia-e-una-ricchezza-da-tutelare/363940/>



[https://d24qi7hscckwe9l.cloudfront.net/img/original/gorgonie\\_2.jpg](https://d24qi7hscckwe9l.cloudfront.net/img/original/gorgonie_2.jpg)

A MARINE PLANT LIVING ON THE SEABED IS THE *POSIDONIA OCEANICA*, WHICH IS VERY IMPORTANT FOR THE LIFE OF THE SEA, BECAUSE WITHOUT IT THERE WOULD NO LONGER EXIST THE BEACH: IN FACT, IT SLOWS DOWN THE MOVEMENT OF SEA WAVES, PREVENTING THE EROSION OF THE COASTS .



# POLLUTION IN ITALY

THE DAMAGES CAUSED BY HUMAN BEING, WHO ALTERS THE BALANCE OF THE ENVIRONMENTAL ECO-SYSTEM, ARE SEVERAL. AMONG THEM:

- DEPLETION OF RESOURCES;
- BIO ACCUMULATION;
- DEATH OF SEA CREATURES;
- TOXIC WATER POLLUTION



<https://www.ecoo.it/articolo/inquinamento-del-mare-il-dossier-mare-monstrum-2012-di-legambiente/4811/>



EVERY MATERIAL ENDS UP IN RIVERS AND URBAN SEWER SYSTEMS. WITH THE CURRENTS THE WASTE CIRCULATES IN THE SEA.

# THE EFFECTS OF POLLUTION ON MARINE ANIMALS - PLASTICS -

EVERY YEAR ABOUT 115 SPECIES ARE AT RISK OF EXTINCTION, BECAUSE MANY OF THEM DIE BECAUSE OF POLLUTION.

IN FISH, ON THE OTHER HAND, THE PHENOMENON OF BIO ACCUMULATION HAPPENS VERY FREQUENTLY.

FOR EXAMPLE, FISH MISTAKE PLASTIC STOPPERS OR OTHER PLASTIC ANIMAL MANUFACTURES. THEY EAT THEM AND AUTOMATICALLY FEEL FULL. SATIETY MAKES THEM STOP EATING AND CONSEQUENTLY THEY DIE OF HUNGER AND MALNUTRITION.

IN THE CASE OF TURTLES, THE *CARETA CARETA* SPECIE IN ITALIAN SEA, THE BIGGEST RISK FACTOR FOR THEM IS PLASTIC BAGS, THE SPECIMENS MISTAKE THEM FOR JELLYFISH AND DIE BY SUFFOCATION.



<https://www.wwf.it/?40200%2FMediterraneo-in-trappola>



<http://sustainablesmartbusiness.com/2017/07/how-closely-is-human-health-linked-to-the-oceans/>

# THE EFFECTS OF POLLUTION ON MARINE ANIMALS - PLASTICS -



WORLDWIDE, OVER 90% OF THE DAMAGE CAUSED BY OUR WASTE TO MARINE WILDLIFE IS DUE TO PLASTIC. MANY SPECIES ARE FOUND TRAPPED IN PLASTIC. IT OFTEN HAPPENS WITH FISHING NETS, RING LACES AND PLASTIC PACKAGING THAT CAN CAUSE INJURY, DEFORMITY AND ARE OFTEN LETHAL TO ANIMALS.

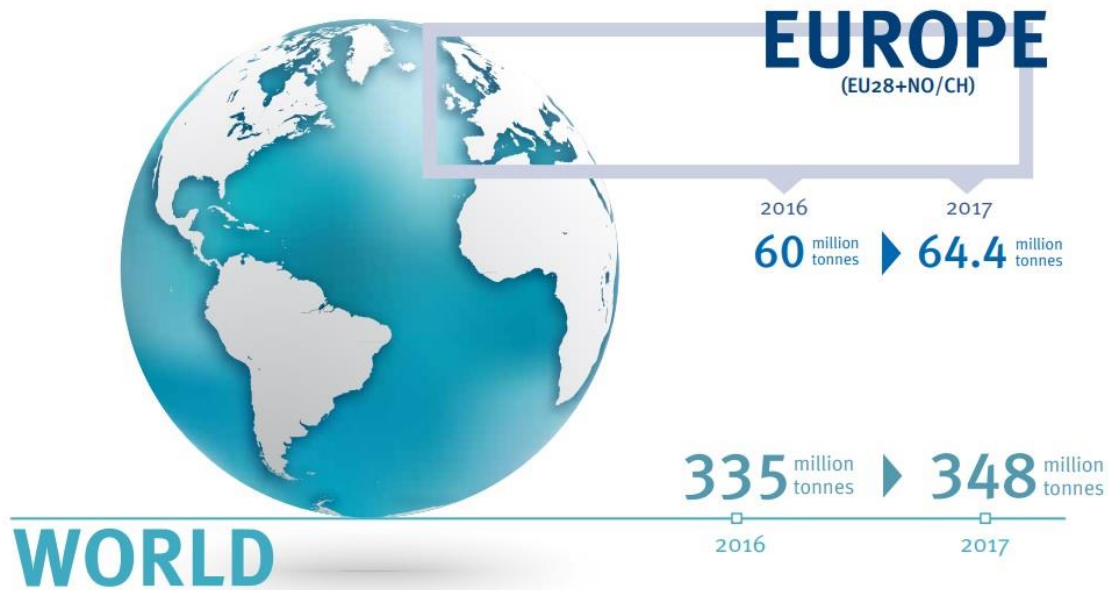
<https://www.google.it/url?sa=i&source=images&cd=&ved=2ahUKEwixrZ3C0tXkAhVPI1AKHbspCPMQjRx6BAgBEAQ&url=http%3A%2F%2Fwww.cassinogreen.it%2Fmediterraneo-plastic-free-leuropa-si-muove%2F&psig=AOvVaw1vnjDBxj8tJT4OsXyi2vt5&ust=1568733475915646>



## World and EU plastics production data

The world plastic\* production almost reached 350 million tonnes in 2017.

Source: PlasticsEurope Market Research Group (PEMRG) / Conversio Market & Strategy GmbH



Includes thermoplastics, polyurethanes, thermosets, elastomers, adhesives, coatings and sealants and PP-fibers.  
Not included PET-, PA- and polyacryl-fibers.

<https://valori.it/plastica-in-mare-un-danno-da-25-miliardi-lanno/>

- THE ACCUMULATION OF FLOATING GARBAGE LOCATED IN THE PACIFIC OCEAN FORMS REAL PLASTIC ISLANDS, EXTENDING FROM 700,000 KM<sup>2</sup> TO OVER 10 MILLION KM<sup>2</sup>.

- FROM THE MARIANA TRENCH TO THE POLES, PLASTIC RESIDUES HAVE BEEN FOUND ALMOST EVERYWHERE IN THE SEAS AND OCEANS.
- BOTTLES, PACKAGING, FISHING NETS, BAGS, BUTTS AND ANY OTHER PLASTIC OBJECT, ONCE THEY HAVE FINISHED IN WATER, THEY BREAK INTO SMALLER FRAGMENTS
- THESE FRAGMENTS CONSTITUTE ONE OF THE MAIN CAUSES OF DEATH DUE TO THE SUFFOCATION OF MANY FISH AND SEA BIRDS.



[https://it.businessinsider.com/ce-unisola-di-plastica-anche-nel-mediterraneo-tra-elba-e-corsica-lunga-decine-di-km-e-densa-il-doppio-di-quella-del-pacifico/?refresh\\_ce](https://it.businessinsider.com/ce-unisola-di-plastica-anche-nel-mediterraneo-tra-elba-e-corsica-lunga-decine-di-km-e-densa-il-doppio-di-quella-del-pacifico/?refresh_ce)

# THE EFFECTS OF POLLUTION ON MARINE ANIMALS

## - OIL-



THE OIL PENETRATES INTO THE PLUMAGE OF THE BIRDS, REDUCING THE CAPACITY OF THERMAL INSULATION AND MAKING THE FEATHERS UNSUITABLE FOR SWIMMING AND FLYING, SO THE BIRDS DO NOT HAVE THE POSSIBILITY TO GET FOOD AND ESCAPE FROM PREDATORS.

THEIR INSTINCT LEADS THEM TO CLEAN THE PLUMAGE WITH THE USE OF THE BEAK, BUT IN THIS WAY THEY INGEST THE OIL, WITH THE IMAGINABLE HARMFUL EFFECTS.

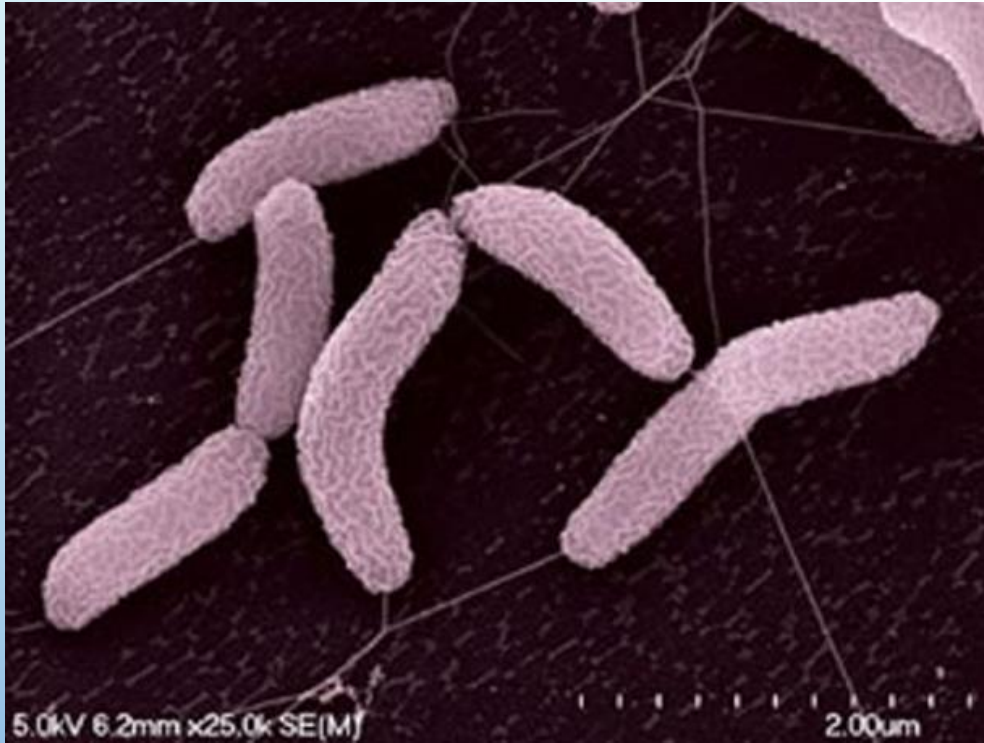
# POLLUTION FIGHT

EACH POLLUTANT HAS ITS OWN SCAVENGER BACTERIA. NATURE ALSO AMAZES AS FOLLOWS: HAVING IN ITSELF A METHOD OF SELF-CLEANING WHICH IS CALLED BIODEGRADATION.

THE CHEMICAL PROCESS IN QUESTION JUST DOES THAT: IT REDUCES COMPLEX ORGANIC MOLECULES INTO SIMPLER, AND SIMPLER CONSTITUENTS, UNTIL IT IS "DISMEMBERED".

IN RECENT YEARS, DUE TO THE SOARING POLLUTANTS IN THE SEA, THIS MECHANISM HAS BEEN IN CRISIS AND IT IS UP TO US TO BRING OUR PLANET BACK INTO BALANCE.

# POLLUTION CONTROL SYSTEMS



“BIOREMEDIATION” IS A TECHNIQUE THAT USES BIOLOGICAL SYSTEMS WITH THE AIM OF REDUCING AIR, WATER AND SOIL POLLUTION IN A NATURAL WAY AND WITH A LOW ENVIRONMENTAL IMPACT, OFFERING A VALID ALTERNATIVE TO TRADITIONAL METHODS.



The images on this page have been kindly provided by Dr. M. Flavia Gravina, from the Department of Marine Biology, University of Torvergata, Rome.

# POSSIBLE ECO-SUSTAINABLE SOLUTIONS

SOME MARINE SPECIES SUPPORT US IN THE FIGHT AGAINST POLLUTION. SPONGES, POLYCHAETES, ALGAE AND ASCIDIANS ARE NATURAL FILTERS ABLE TO ABSORB SEA WATER AND RELEASE IT CLEAN.



**Polychaetes**



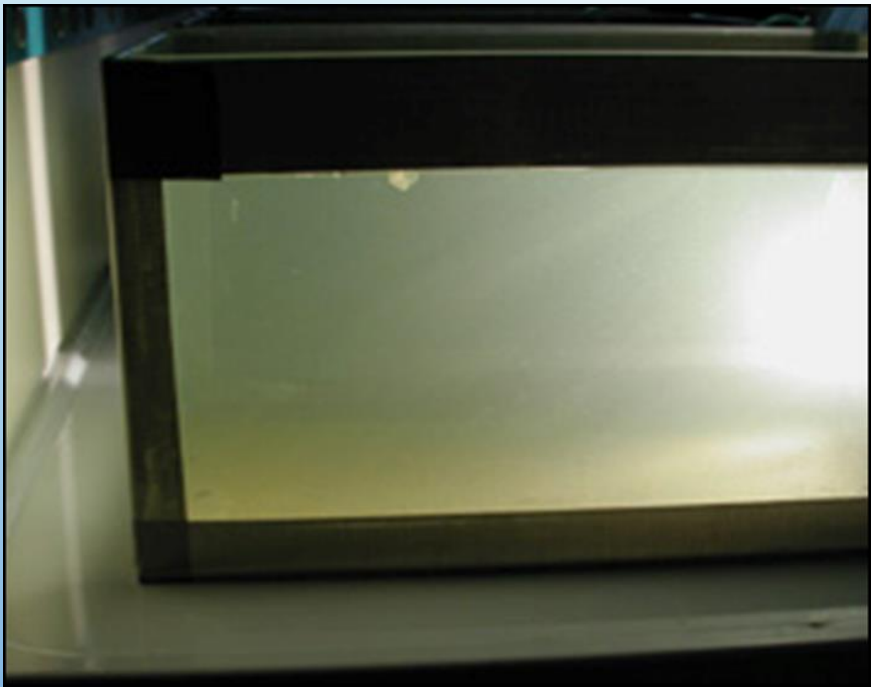
**Ascidians**



**Algae**

Images of ascidians and algae were kindly provided by Dr. M. Flavia Gravina, from the Department of Marine Biology, University of Torvergata, Rome.

# EXPERIMENT WITH POLYCHAETES, MADE IN THE LABORATORY



← **Before**



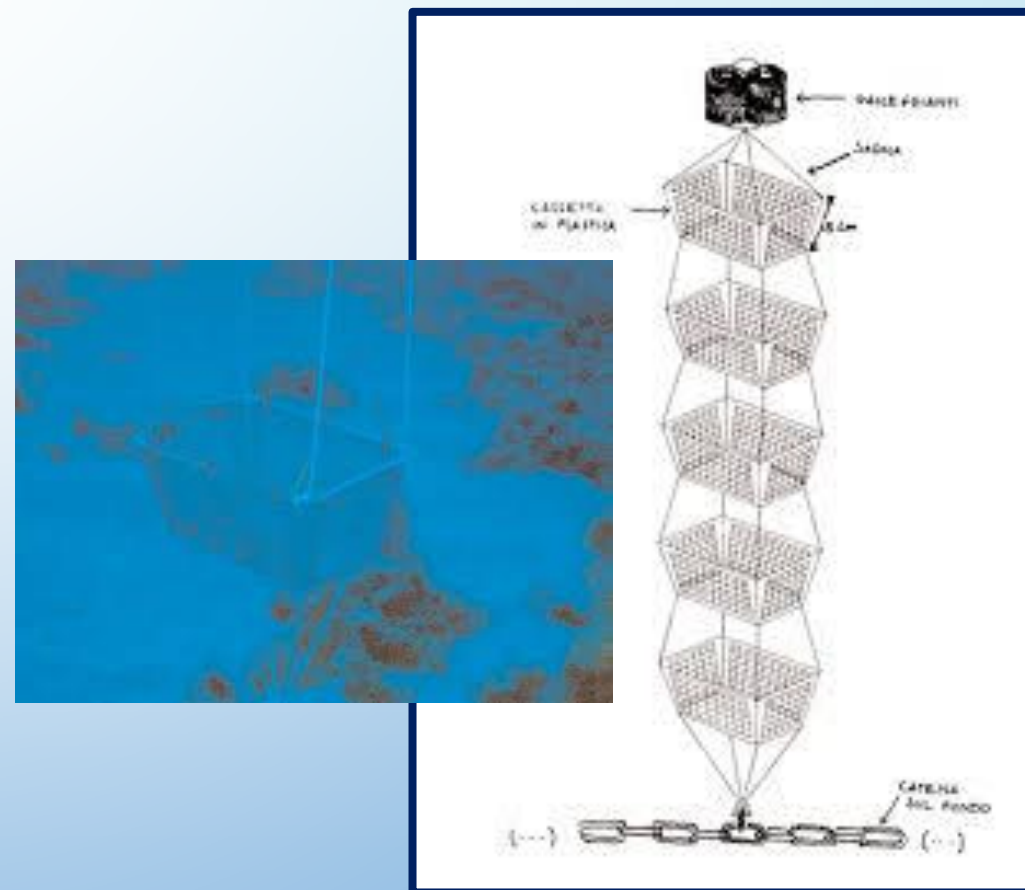
**After** →

The images of the experiment on polychaetes were kindly granted by Dr. M. Flavia Gravina, from the Department of Marine Biology, University of Torvergata, Rome.

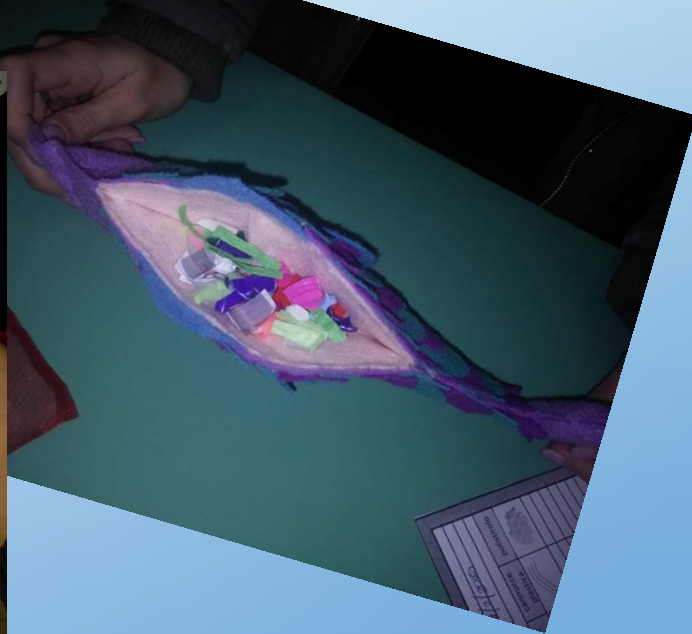
SOME MARINE SPECIES THEMSELVES SUPPORT US IN THE FIGHT AGAINST POLLUTION. THANKS TO THEIR BACTERIUM, MARINE SPONGES, IN FACT, ABSORB ALMOST 90% OF THE POLLUTANTS PRESENT IN THE WATER, GIVING US A DEEP CLEANING. INDEED, MARINE BIOLOGISTS HAVE CREATED SPONGE MARINE FARMS IN ORDER TO PRODUCE MORE SPONGES TO REDUCE POLLUTION. RESEARCH IS GOING ON BUT THE RESULTS ARE AT THEIR VERY BEGINNING TO BE SEEN.



[https://images.wired.it/wp-content/uploads/2018/10/15173416/1539610456\\_spugne.jpg](https://images.wired.it/wp-content/uploads/2018/10/15173416/1539610456_spugne.jpg)



Images taken from the article «Le spugne di Ustica» by G. Corriero, in the magazine «Lettera» of the Centro Studi e Documentazione «Isola di Ustica», Year XX, n.53, June 2018.





These results have been obtained after a series of workshop lessons held by professor Maria Flavia Gravina, from the "Institute of Marine Biology", University of Torvergata, Rome, and experts from I.S.P.R.A..



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