

On land or sea, **YUK!** plastic roams free



OCEAN OR PLASTIC SOUP?

Home to a multitude of plant and animal species, the Ocean is in recent years having to contend with an increasing population of... plastic! Man-made pollution is a big problem. Plastic waste now contaminates every sea in the world, indeed, the Tara even found some in the Arctic and the Antarctic! Since 2011 the Tara has been studying this type of pollution, in particular during the expedition Tara Mediterranean.



Find the answers!

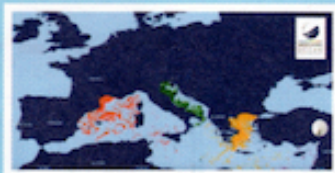
- A) For how many days did the Tara drift with the Arctic ice pack in 2006–2008?
- B) Who directs land operations for the Tara?

a) 507 days, b) the managing director

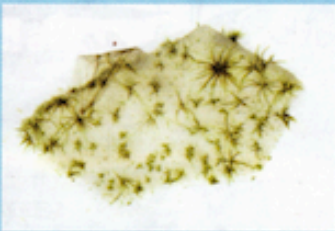
Did you know?

The media often talks about a 'plastic island' in the Ocean but that doesn't mean you could actually walk on it! No, it is simply an engaging way of describing sea areas where marine currents concentrate enormous quantities of tiny pieces of plastic waste like the ingredients of a vast inedible soup.

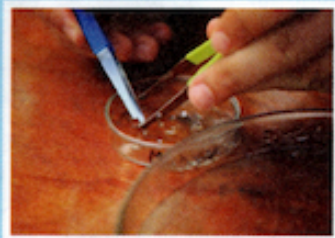
Xavier, education officer



SIMULATION OF HOW PLASTICS COULD SPREAD
© Mercator



ORGANISMS ATTACHED TO PLASTIC
© N.Sardet / Tara Expeditions Foundation



COUNTING PLASTIC IN A SAMPLE
© Y.Chavance / Tara Expeditions Foundation



PLASTIC WASTE IN A HARBOUR
© N.Pansiot / Tara Expeditions Foundation

Plastic in the sea: the risks

RISK No. 1: Turtles, dolphins, whales, birds and other marine animals can mistake plastic waste for food and swallow it. Once in the stomach, items such as bags, lighters and cotton buds may cause serious health problems and even death.

RISK No. 2: As plastic drifts around the Ocean it absorbs pollutants like a sponge sucks in water. Plankton swallow these tiny fragments of plastic and, of course, any toxic compounds they might have picked up. When fish eat the plankton they too become contaminated. And who eats fish? We do!

RISK No. 3: Certain bacteria use plastic waste like miniature rafts and float away from where they originated. If they are carrying disease, they have the potential to contaminate marine species throughout the world.

A question for oceanographer **Jean-François Ghiglione**.

COULD MARINE BACTERIA HELP US COMBAT PLASTIC POLLUTION?



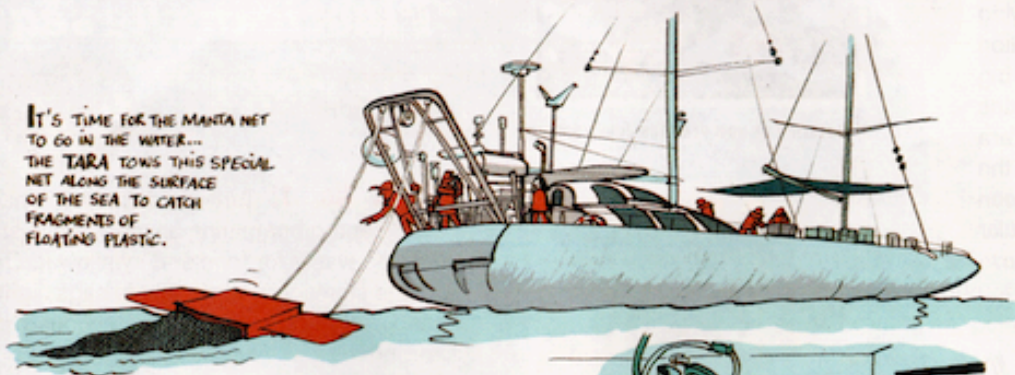
Scientists have discovered that marine bacteria break down plastic. By eating the bacteria they turn the plastic into something else and, therefore, partially destroy it. However digesting, for example, a plastic bag takes bacteria 100 to 400 years. That's much too slow!

Trawling for plastic

HAPPY FISHING!

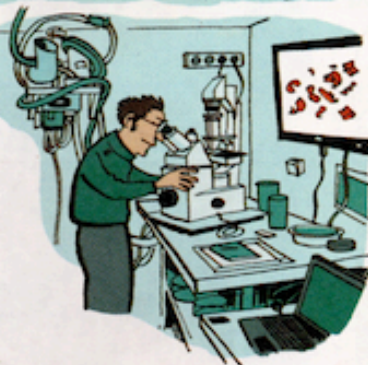
> AFTER COLLECTING WATER FROM EVERY PART OF THE MEDITERRANEAN SEA
THE TARA CAN CONFIRM THAT ALL HER 200 SAMPLES CONTAINED PLASTIC!

IT'S TIME FOR THE MANTA NET TO GO IN THE WATER... THE TARA TOWS THIS SPECIAL NET ALONG THE SURFACE OF THE SEA TO CATCH FRAGMENTS OF FLOATING PLASTIC.



BACK ON BOARD, SCIENTISTS TIP THE CATCH INTO A CONTAINER. NEXT, THEY TURN IT INTO SAMPLES OF A SIZE THAT IS SUITABLE FOR IMAGING IN THE DRY LABORATORY.

IN THE DRY LABORATORY, A SCIENTIST PHOTOGRAPHS THE DAY'S CATCH.



ONCE THE SAMPLES HAVE BEEN MARKED WITH THE DATE AND PLACE OF CAPTURE, THE SCIENTISTS ADD A PRESERVATIVE AND STORE THE DAY'S CATCH IN ONE OF THE FRIDGES ABOARD THE TARA.

THESE SAMPLES WILL BE STUDIED TO SEE WHAT ORGANISMS ARE ATTACHED TO THE PLASTIC.



Chris, biologist

Did you know?

To collect samples correctly, you must always follow the same procedure. It's essential if you want to compare the results. That's why scientists write down precise instructions. They call it a 'protocol'.



3 - EACH CATCH IS PHOTOGRAPHED. THE RESULTING IMAGES CAN BE ANALYSED BY MACHINE.

© F.Aurat / Tara Expeditions Foundation



1 - THE MANTA NET IS TOWED BEHIND THE BOAT AT SLOW SPEED AND THEN HOISTED ABOARD AFTER ONE HOUR.

© A.Deniaud / Tara Expeditions Foundation



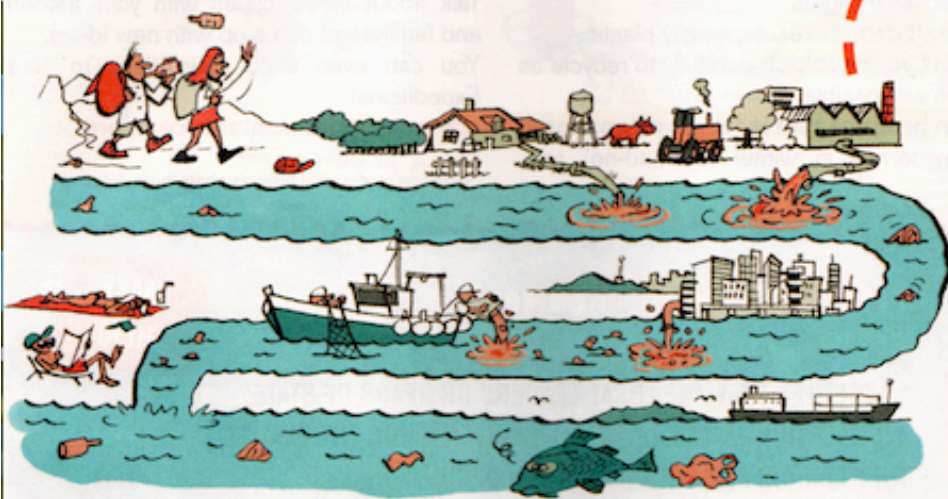
2 - SCIENTISTS CAREFULLY PROCESS THE CATCH BY HAND.

© Y.Chavance / Tara Expeditions Foundation

Plastic at sea, the solutions are on land

YUP!

PLASTIC TRAVELS



Plastic at sea: Why take action on land?

Because the wind carries plastic litter scattered in nature to the river

Because river water loaded with rubbish and pollutants flows into the sea

Because plastic thrown into the sea spreads out into the oceans

Because bad habits repeated millions of times have serious consequences

Because cleaning up the ocean is an impossible task: most pieces of plastic are smaller than a grain of rice!

Time to stop plastic pollution!

>> YOU CAN MAKE A DIFFERENCE! SIX WAYS TO HELP REDUCE PLASTIC IN THE OCEAN



Avoid buying water in plastic bottles and recycle as much as possible and reduce your reliance on plastic packaging by, for example, using a flask or a water jug!



Tell smokers not to drop their cigarette butts on the ground at the beach or even in town because they contain plastic filters and the rain can wash them into the Ocean. There are some really smart pocket ashtrays available!



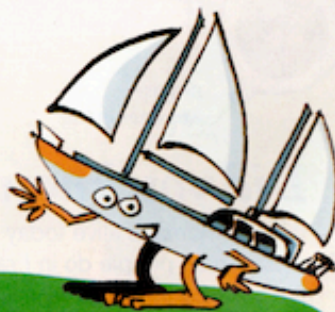
Don't flush plastic down the toilet because that route leads straight to the Ocean. There are lots of little plastic sticks floating in the sea which were once cotton buds that people dropped into the loo!



Clean up plastic from the beach. Not only is plastic dangerous for sea mammals, once it gets broken down into small pieces it can enter the food chain when fish eat it... and who eats the fish? We do!



Take part in group activities such as big beach-cleaning operations. Give it a try, you'll see it's really good fun working all together!



Find the answers!

A) What do we call the special plastic-catching net?

B) How many samples collected during the expedition Tara Mediterranean contained no plastic?

a) manta net, b) none.