Coastal tourism

« At the beach, I am allowed to pick up any type of shellfish. »

TRUE or FALSE?

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Coastal tourism

FALSE. There are minimum sizes depending on the species and different rules to follow.

Recreational fishing has developed strongly and is one of the most popular activities on the coast: there are more than 1.8 million seafood hand gatherers in France!

To preserve resources of shellfish, shrimps and crustaceans, there are several rules to follow: find out on the internet or from businesses about the minimum sizes (size rules are available) and authorized tools. Put the rocks back in place as you found them: they serve as habitats for many species.

Coastal tourism

I like going to the beach but does the beach appreciate my visit?

Name one impact and its solution.

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Coastal tourism

A trip to the beach can induce various impacts, mostly linked to behaviours we can change.

Sunscreen washed away in the waves, cigarette butts thrown to the ground, and waste left on the beach will all find their way to the ocean. Jet Ski and motor boats create (amongst other things) noise which especially impacts birds and marine mammals.

All these impacts can be reduced: we can choose a mineral sunscreen less harmful for the environment, pick up our waste and sort it into the adapted bins, respect speed regulations for navigation... Small gestures like this can reduce our impact and enable us to benefit from the sea-side in a durable fashion.

Coastal tourism

What is « sustainable tourism »?

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Coastal tourism

Sustainable tourism is tourism that respects the environment, heritage and local cultures.

It can use natural resources that are key for tourism development without degrading biodiversity: it must find the right balance. It must also respect local culture as well as traditional values (not build skyscrapers in the middle of a fishing village ..). Finally, it must ensure sustainable economic activity for all actors.

It is necessary to progress in terms of sustainable tourism to be able to keep the assets of tourist destinations in good condition. Tourism accounts for 10 % of global GDP making it a very important sector in the world.

Coastal tourism

Name one impact of coastal tourism and its solution.

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Coastal tourism

The development of hotels, housing, services and leisure activities leads to a loss of biodiversity through ecosystem habitat destruction.

With tourism developing on the coasts, significant changes are taking place.

Buildings built too close to the seaside impede the natural movements of sand and are exposed to floods. It also leads to loss of landscape quality in areas with highly urbanized coastlines.

In addition, the littoral zones are very rich in biodiversity but sensitive to tourism overcrowding.

By promoting sustainable tourism or eco-tourism, the environmental footprint can be limited while enjoying the seaside.

Coastal tourism

Why shouldn't one build too close to the sea-shore?

a. tourists attract mosquitoes, that then transmit diseases

b. you could fall in if you bend over too far

c. it destroys fragile habitats and provokes coastal erosion

Coastal tourism

ANSWER c.

Fragile habitats are destroyed and shoreline erosion is caused.

Under the action of swell and waves, tides and storms, the shoreline changes in time and space. Houses built too close to the shore can be threatened and even destroyed by the sea.

Since 1986, the Coastal Law provides a regulatory framework for the development of the coastal zone. It tries to reconcile preservation and development of the coastline. In its principles, it tries to find the balance between preservation of natural spaces and development of human activities.

What is a green tide?

a. a leak of green chemicals?

b. a massive deposit of algae on the foreshore?

c. when a tourist spills his glass of water and mint

ANSWER b.

A green tide is a massive deposit of algae on the foreshore.

Green tides, as those seen sometimes in Brittany, have several impacts. On beaches affected by these strandings of algae, swimming is no longer possible given the volume that these algae deposit take. Seaside recreation in general becomes impossible in these areas. It can also affect fishing, especially the laying of nets.

Once these algae begin to dry and rot in the sun, a toxic gas develops (hydrogen sulphide). This gas is dangerous for humans and animals: in high doses it can even be lethal.

Pollution

« Eutrophication is when algae grow in excess in an aquatic environment and stifle any other form of life. »

TRUE or FALSE?

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Pollution

TRUE. Eutrophication is when algae grow excessively in an aquatic environment and stifle any other form of life.

Eutrophication is a biological phenomenon that occurs in aquatic environments.

It takes place in a number of stages with as first step the supply in the environment of nutrients for aquatic plants. These substances can be varied but the excess supply is usually human. They lead to a strong development of plants that eventually die because of too high numbers.

Bacteria then degrade these plants and also develop in excess and consume all the oxygen in the area. The area becomes anoxic (no oxygen) and dead. Without oxygen, fish leave the area or die.

Pollution

How long does waste take before it breaks down in sea water?

a. a few weeks

b. between 2 and 5 years

c. several hundred years

Pollution

ANSWERS a, b and c.
The lifespan of waste at sea is extremely variable depending on the type of waste and can go up to hundreds of years!

The fastest to break down are organic waste: such as toilet paper that breaks down in 2 weeks or newsprint in less than a year. Fabrics need more time, from the order of a year for a sock up to a few years for pants. It takes several years for a cigarette butt.

Rubber or metal cans last longer: from a few years to several hundred years depending on the metal or the thickness! These times vary greatly depending on depth, sea conditions, and so on.

Pollution

What are ERIKA and AMOCO CADIZ?

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Pollution

Amoco Cadiz and Erika are two oil tankers that were shipwrecked close to the Britanny coasts in 1978 and 1999, leading to dramatic oil spills.

More than 220 000 tons (Amoco Cadiz) and 10 000 tons (Erika) of oil were spilled into the sea.

The consequences to the environment were dire: marine birds died covered in heavy and sticky petrol. The oil, upon reaching the shore, sticks to rocks and destroys the species living there.

Reglementation on oil tankers has strengthened since these shipwrecks: Among other things, the use of double hulls lowers the risk of oil spills.

Sustainable fisheries and aquaculture

« I absorb heavy metals when I eat fish. »

TRUE or FALSE?

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Sustainable fisheries and aquaculture

TRUE. Toxic substances are found in fish as in many other foods. The doses are low compared to the nutritional benefits and it is enough to vary the seafood species consumed.

Fish, like all animals, sometimes ingest toxic substances that can accumulate along the food chain, every time one species eats another.

However, eating different types of fish makes it possible to enjoy the nutritional benefits of fish while limiting the risks associated with the ingestion of heavy metals. It is advisable to eat fish at least twice a week.

On the Internet, ANSES provides information on the most contaminated fish and restrictions for pregnant women or children under 3 years old.

Sustainable fisheries and aquaculture

« Sustainable fishing is fishing practices that leave the fish enough time to reproduce and the marine ecosystems enough time to regenerate. »

TRUE or FALSE?

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RESPONSEABLE

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Sustainable fisheries and aquaculture

TRUE. Sustainable fishing is a fishery that gives fish time to reproduce and marine ecosystems to regenerate.

Fisheries have to fish in limited numbers without targeting the most endangered species, not use overly aggressive methods that can damage the environment and has to take into account the ecosystems as a whole.

The fish caught must be valued at best so that fishermen get enough profit.

States and stakeholders must continue to work on sustainable fisheries management for all.

This sustainable fishery can be enhanced through recognized labels and consumers can find out from associations about the most sustainable choices.

Sustainable fisheries and aquaculture

Ghost-net?

a. a net that fishes dead fish

b. a net lost at sea that keeps fishing (without the fisherman)

c. a net that, like a scarecrow, scares marine animals away from certain areas.

Sustainable fisheries and aquaculture

Answer B. Ghost-nets are fishing nets lost during storms or in strong currents that continue to capture fish and marine animals that no-one benefits from.

An estimated 640 000 tons of fishing equipment are lost or abandoned at sea each year. Not only do these nets present a danger to marine fauna, they are also mainly composed of plastic that degrades in the ocean.

If we were to align all the nets lost in the North East Atlantic in one year (more than 33 000 nets covering 1450 km), we could connect Brest (France) to Prague (Czech Republic).

In February 2018, a treaty on fishing equipment was signed. This should promote cleaner and safer seas.

Was plastic that we find in the ocean directly thrown into the sea?

NO. 80 % of the plastic at sea was first thrown on land.

Most plastics found in the ocean come from land-based activities, and are carried to the ocean by rivers.

Only about 10 % of the plastic in the ocean was abandonned at sea, and 10 % thrown on the beach.

Even far from the sea throw any waste, even the smallest, in the trash.

Plastics

« One day, I could live on the 7th continent of plastic. »

TRUE or FALSE?

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FALSE. Despite its name, the 7th continent is not solid. The pollution it describes however is very real.

The « 7th continent » is made of plastic and other debris. It is located in the middle of the North Pacific Ocean vrotex, where the oceanic currents meet, and its surface could cover one third of the United States of America.

The name « continent » gives the impression that we could walk on it, but in reality it is more of a plastic « soup », reaching 30 m in depth, and is mainly composed of microplastics.

Plastics

Name a way to remove plastic from the ocean.

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Beach cleanups, « plogging », sea-plastic hoover…

Removing plastic from the ocean is a difficult task: the material fragments into small pieces that are difficult to collect. There are several methods to remove plastic from the ocean, and new ocean-cleaning hoover-boats are currently being developed.

Beach-cleans organised by associations are very efficient: they help limit the amount of litter going into the ocean, but also to collect plastic that was in sea, namely after storms or big tides.

« Plogging » is when you pick up litter while on a jog.

Plastics

Is the ocean floor polluted by plastic?

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Plastics

YES. Plastic is found in every ocean, at all depths.

94 % of all of the plastic that enters the ocean ends up on the sea floor.

On average, there is an estimated 70 kg of plastic on every square kilometre of sea floor.

In 2016, the French goverment banned single use plastic bags. Other European countries, like Ireland, the United Kingdom, or Norway have installed a tax on single-use plastic bags. Since then, scientists have observed a 30 % reduction in the number of plastic bags reaching the sea floor in between these countries.

What size is a microplastic?

a. less than 5 mm

b. between 5 mm and 1 cm

c. between 1 cm and 5 cm

Plastics

Answer a.

A small piece of plastic is called a ‘microplastic’ when it is less than 5 millimeters in diameter.

Some plastics are directly produced at this size. They are called primary microplastics. They are found in cosmetics (as in scrubs or toothpastes), or used in industry.

But about 70 % of microplastics come from the degradation of larger plastics. They are called secondary microplastics.

Microplastics account for 92 % of plastic waste in the world’s oceans.

Name 2 political decisions taken to combat plastic pollution in the ocean.

Governments throughout the world are committing to ban single-use plastics.

- In France, single-use plastic bags were banned at check out (July 1st 2016) and in supermarkets (January 1st 2017);
- The British government plans to ban plastic straws, stirrers and Q-tips by the end of 2018;
- New York City banned styrofoam and China outlawed plastic cutlery;
- In May 2018, the European Commission proposed several measures to prohibit single-use plastics (plates and cutlery, Q-tips, ...). These products will have to be replaced by more sustainable and less harmful materials.

Are all marine species known to humans?

a. yes, we know all the species that live in the ocean

b. no, but we know almost half

c. no, we only know a small portion

Biodiversity

Answser c. We only know a small percentage, no more than 10% of marine species are thought to be known.

Scientists estimate that at least 90 % of marine species are still unknown (approximately 250 000 species have been identified).

There are several reasons for this: the oceans are very big and deep, so humans have not yet fully explored them. A majority of these unknown species are likely very small and hard to spot.

Even though the number of species living in the ocean is big, they are already starting to dissapear due to human actions on the planet.

Biodiversity

Are there more humans than fish on the planet?

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Biodiversity

YES. There are many more fish than humans!

The number of fish in the ocean is estimated at about 3 500 billion while there are « only » 7.5 billion humans on Earth!

The fish are therefore much more numerous, but this figure is only an estimate, it is not possible to count all the fish one by one and we have not yet discovered all the species.

And it's not because there are so many that you should not take care of them.

What is biodiversity?

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Biodiversity

Biodiversity is all living things: animals, plants and fungi.

But it's not just that, it's all the relationships they have between them and the environment in which they live.

It is the diversity of the living world at all levels: from genes to species to different ecosystems.

Humans are part of this biodiversity and benefit from it, it is important to ensure its preservation!

Biodiversity

Pelagic, demersal and benthic species?

What's that all about?

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Biodiversity

Pelagic, demersal and benthic species are marine species living at different depths.

Pelagic species live near the surface or between the surface and the bottom of the sea. Tuna, sardines and anchovies are among the best-known pelagic species.

The benthic species live on the bottom and do not usually go in the open waters. Most benthic fish have a flattened form such as sole or ray.

Finally, the demersal species are those that live above the bottom but can move in open waters unlike the benthic species. These species include gurnard or cod.

Invasive species

« Commercial ships: exotic species' favourite means of transportation! »

TRUE or FALSE?

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Invasive species

TRUE. Globally, shipping accounts for almost 60 % of all alien species introductions.

The organisms travel in the ballast tanks, huge tanks that fill with seawater to ensure shipd stability. Each year, more than 22 million m3 of seawater of all origins are deballasted in French ports.

In 1983, several thousand cases of intoxication following the consumption of mussels in southern Brittany were attributed to a toxic phytoplankton, Dinophysis, which arrived in France through ballast waters.

An international convention, which came into force on September 8, 2017, requires ships to equip themselves to eliminate or render harmless harmful aquatic organisms present in their ballast water.

Invasive species

Name one characteristic of an invasive species.

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Invasive species

Current knowledge is not sufficient to predict whether a species is potentially invasive but several common traits stand out.

- high adaptive capacity linked to high genetic variability;
- an absence of predators;
- a certain ability to rapidly increase its population;
- high dispersion capacities;
- an abundance in its area of origin associated with a wide spatial distribution;
- proximity to human activities favoring the transport of this species.

Invasive species

I am a species introduced by Man on a territory where I did not exist before, and I proliferate.

I am:

a. an exotic species

b. an pervasive species

c. an invasive species

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Invasive species

Answer C. An invasive species is a species – plant or animal – that was introduced voluntarily or not by humans in a territory where it did not exist before, and which proliferates.

A species that has been introduced outside of its natural range of distribution but does not proliferate is considered as an Exotic species. Since the 1950s, an introduction is reported approximately every 6 weeks on average in the Mediterranean Sea. They are considered "invasive" if they settle and proliferate at the expense of local species.

Regarding the species that are called "pervasive", they can be native or local but proliferate punctually following atypical environmental changes. The Pelagic Jellyfish for example, is pervasive in the Mediterranean Sea where it can be a real problem because of its stings.

Invasive species

Name one way for marine invasive species to reach a new territory.

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Invasive species

Maritime transport, aquaculture, trade of marine products and professional and recreational activities (fishkeeping, recreational boating, fishing), ...

The generalisation of maritime transport since the 19th century is considered as the main cause of introduction of species between different continents.

In aquaculture, oyster farmers have voluntarily introduced oyster species with invasive characteristics following production collapses. But this has unintentionally introduced species like the American Crepidule which deteriorates the seabeds in a sometimes irreversible way.

Fishkeeping also promotes the introduction of exotic species. In the Mediterranean, the so-called «killer seaweed» (Caulerpa taxifolia) has spread so rapidly that it has reduced biodiversity, especially in the Posidonia meadows.

Marine Renewable Energy

Is there enough energy in the oceans to provide electricity to the entire planet?

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Marine Renewable Energy

In theory, YES. The exploitable energy potential of the oceans would be 12 000 terawatt-hour per year, more than ten times the consumption of the entire planet.

The energy that has the greatest potential is the thermal energy of the seas, that is to say the exploitation of temperature differences in the sea. Its energy potential is 100 000 terawatt hours! However this type of energy is still only in the state of tests and projects.

Offshore wind has a potential of 18 000 terawatt-hour which is significant and also has the advantage of being well developed and already connected to the electricity network in a number of countries.

Marine Renewable Energy

Is it possible to implement marine renewable energies anywhere at sea?

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Marine Renewable Energy

NO. MRE sites are chosen according to several precise parametres.

Marine windfarm sites depend largely on physical conditions: there must be enough wind, fairly shallow water to facilitate the installation, and it must be close enough to land to connect the windfarm to the electric grid, etc.

Other parametres are also important, such as marine protected areas, the impacts on flora and fauna, or even military radar coverage that could be disrupted by the wind turbines. The choice of the site is determined by adding up all these constraints.

The same is true for other MREs, whose installation must respect physical, environmental and legal constraints.

Marine Renewable Energy

Cite one kind of marine renewable energy.

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Marine Renewable Energy

Wind, swell, tides, currents, thermal energy, osmosis.

MREs are technologies that exploit the different energies available from the ocean or its surface. The wind is used by offshore wind turbines, tidal power plants such as the Rance in Brittany use the force of the tides. The currents energy can be used by tidal turbines fixed on the seabed. Some mechanical systems are able to recover wave energy while others are working to recover energy from seawater temperature differences. Exploitation of salinity difference (osmosis) is at the research stage.