

Ocean Pollution Management



Who is Boyan Slat?

What did he do at your age?



Syllabus Link

Strengths and weaknesses of initiatives to manage ocean pollution, including local and global strategies for radioactive materials, oil and plastic waste

Ocean Pollution Management Notes

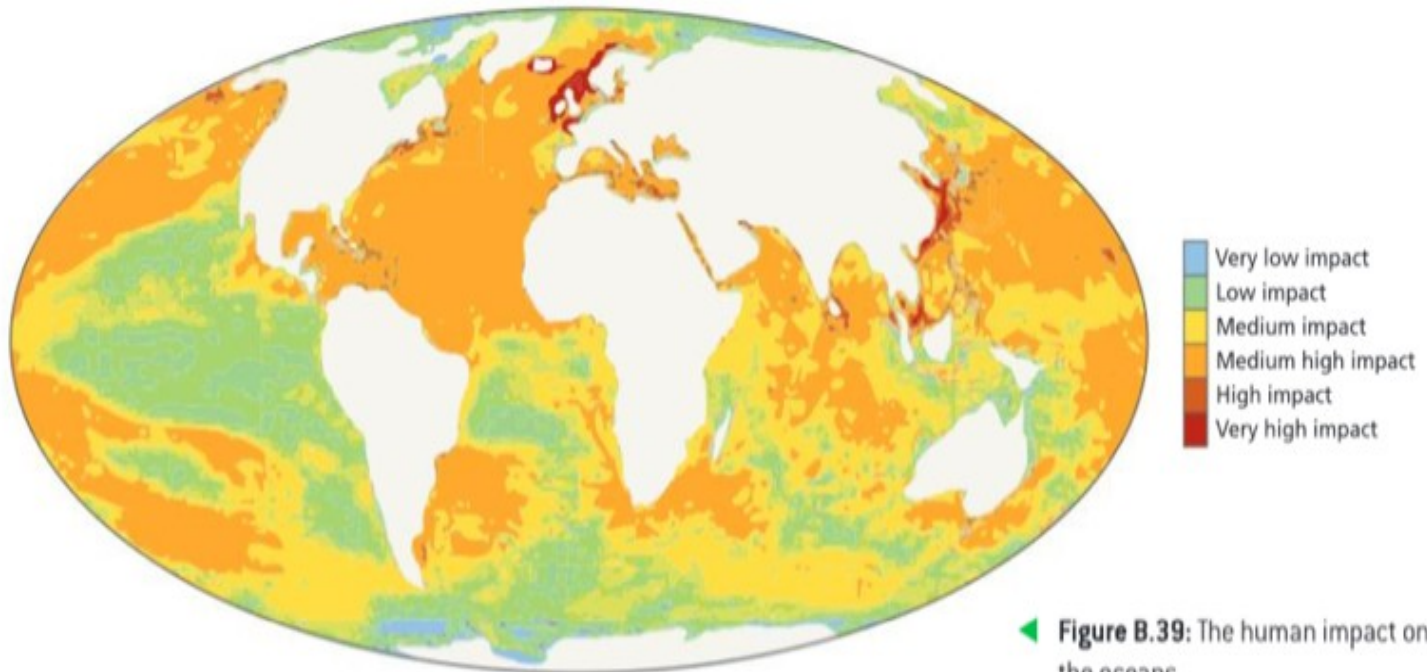
Syllabus Link

Strengths and weaknesses of initiatives to manage ocean pollution, including local and global strategies for radioactive materials, oil and plastic waste

Task: You need to use the handout and video/ reading resources on [adorngeo http://www.adorngeo.com/4-ocean-management-futures.html](http://www.adorngeo.com/4-ocean-management-futures.html) and your text book from pages 99-102 to take notes on the impacts of and management possibilities of three significant types of ocean pollution.

Global Extent

Using the map below describe the global distribution of human impacts on marine ecosystems



POLLUTION

Starter: Look at the following images and identify the type of waste, the cause and consequence.



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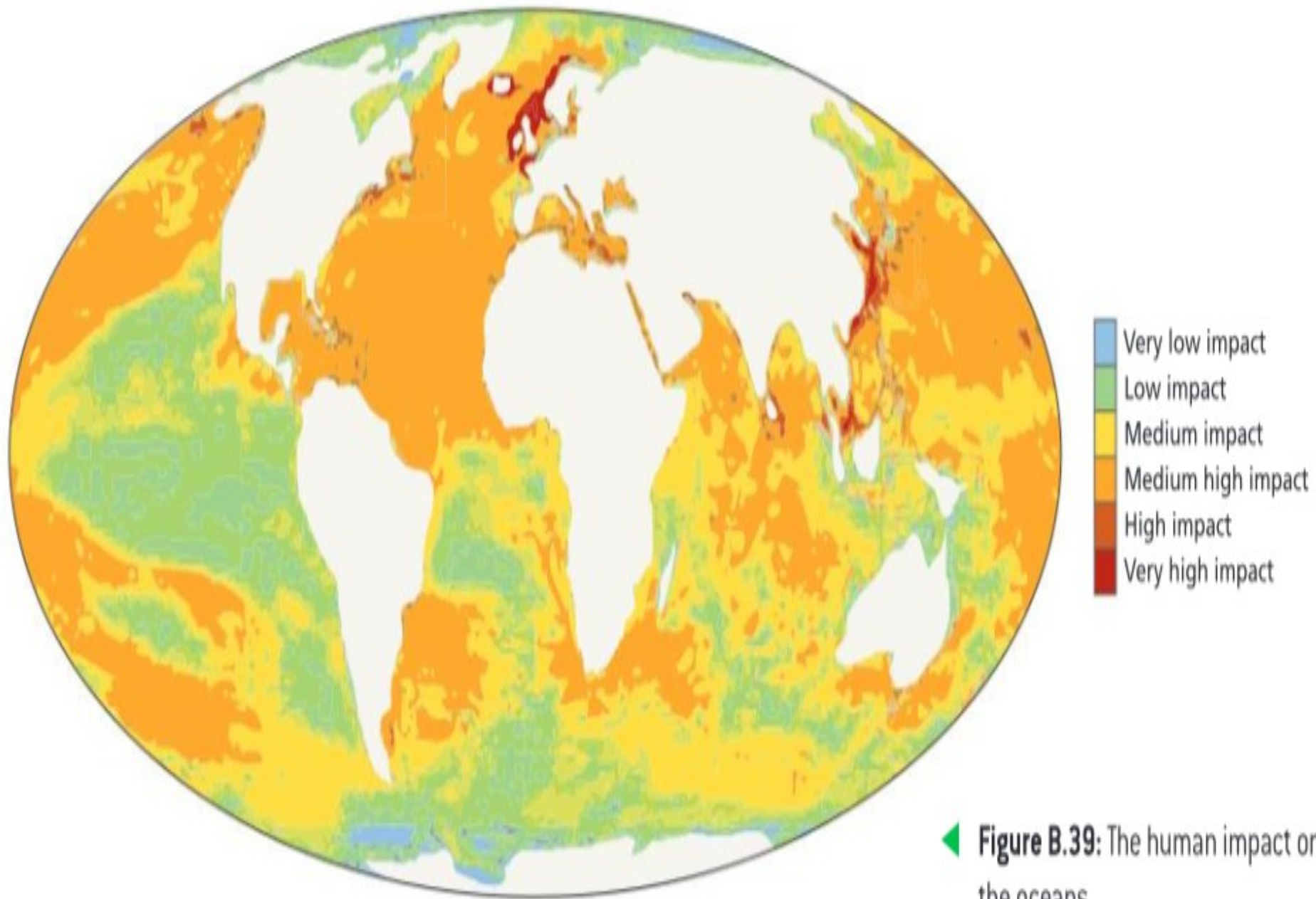
Starter: Look at the following images and identify the type of waste, the cause and consequence.



giant **GARBAGE** patches

#OurOcean2014





◀ **Figure B.39:** The human impact on the oceans

Understand & Beat Marine Pollution





Where does the waste in the oceans come from?



Where does the waste in the oceans come from?

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graph TD; A[Where does the waste in the oceans come from?] --> B[Fishing industries]; A --> C[Shipping industries]; A --> D[Toxic waste dumping (poisonous materials dumped into the oceans)]; A --> E[Agricultural waste, e.g. Chemicals, pesticides, fertilisers]; A --> F[Inorganic waste, e.g. Radioactive or chemical waste]; A --> G[Human waste, e.g. Household garbage, factory wastes, sewage, waste water from bathing, plastics etc.]; A --> H[Flooding and overflowing storm drains]; A --> I[Oil and gas industries];
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Fishing industries

Inorganic waste,
e.g. Radioactive or
chemical waste

Oil and gas industries

Shipping
industries

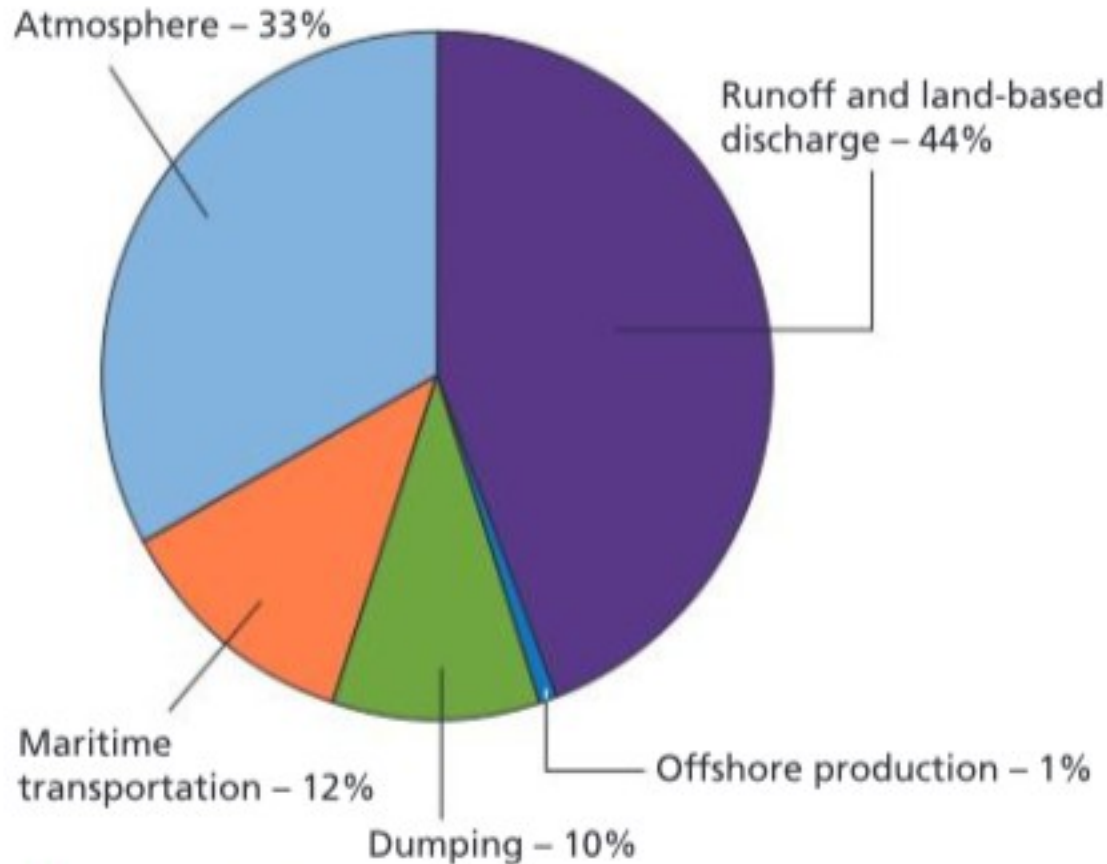
Flooding
and
overflowing
storm
drains

Toxic waste
dumping (poisonous
materials dumped
into the oceans)

Agricultural waste,
e.g. Chemicals,
pesticides,
fertilisers

Human waste, e.g.
Household garbage,
factory wastes, sewage,
waste water from bathing,
plastics etc.

Sources of pollutants from human activities entering the sea (Source: UNEP)



▲ **Figure B.38:** Sources of waste entering the sea

Approximately 80% of all ocean pollution comes from land based activities.

Radioactive material		
Identify why it is a problem & give some examples.	State a local initiative and evaluate it's effectiveness to manage ocean pollution	State a global initiative and evaluate it's effectiveness to manage ocean pollution

Oil		
Identify why it is a problem & give some examples.	State a local initiative and evaluate it's effectiveness to manage ocean pollution	State a global initiative and evaluate it's effectiveness to manage ocean pollution

Plastic Waste		
Identify why it is a problem & give some examples.	State a local initiative and evaluate it's effectiveness to manage ocean pollution	State a global initiative and evaluate it's effectiveness to manage ocean pollution

Managing Radioactive Waste

1. Initially walls of frozen soil were used to contain the contaminated water at the Fukushima nuclear power plant in Japan when it exploded in 2011.

Advantages	Disadvantages
Cheap	Temporary
Quick	Water eventually goes into the groundwater supply and could contaminate more areas.
Effective in short term	



2. Filtering out the radioactive material from the water. This can be done through several methods:

- Activated carbon filter-contains gaseous radioactive material which comes out of water vapour.
- Ion exchange filter-removes ionizing radioactive elements.
- Reverse osmosis- using a semi-permeable membrane and application of pressure.

Advantages	Disadvantages
Effective at removing most of the radioactive material.	Cannot remove all radioactive material.
https://youtu.be/r7NsDZRNhOM	Radioactive sludge is left behind on the filters which then is stored in big containers which are quickly filling up with no plan of where to put them.
Advances science and research.	All clothing that is worn by workers is disposed of at the end of their shift. These also have to be stored.

Managing Plastic Waste

1. 4Oceans-small businesses working towards cleaning up plastic. https://www.youtube.com/watch?v=U0P6P2_iVOM

Advantages	Disadvantages
Raises awareness on social media and amongst the younger generation to think about their plastic usage.	Small scale. Unlikely to have a huge impact.
Local communities can get involved in clean ups.	Branding shows that they are more about making a profit than cleaning up the oceans.
Expanding globally but mostly working on a local scale so far.	

2. Floating barrier: Ocean Clean Up

Advantages	Disadvantages
Very successful and effective method at cleaning up large areas.	Cannot clean up micro-plastics (less than 4mm).
Doesn't affect wildlife.	Ships are needed to go and collect the plastic-increases CO2 emissions.
https://www.youtube.com/	Sea bins
Uses clean energy (solar and tidal) to operate.	Hasn't quite got all the funding required yet.

3. Ban on micro-plastics: UK Government

<http://www.independent.co.uk/environment/microbeads-ban-bill-uk-cosmetic-products-government-outlaws-microplastics-a7852346.html>

Advantages	Disadvantages
Forces companies to rethink their products.	Only in the UK so far. Might not have a large impact.
Makes other countries consider following in the same path.	
Stops billions of microbeads entering our seas annually.	

Exam Question

- Explain three consequences of oil pollution in oceans. (2+2+2)

Mark Scheme

Explain *three* consequences of oil pollution in oceans.

[2+2+2 marks]

Possible consequences include:

- reduction in biodiversity
- declining ecological and/or economic productivity
- costs of clean-up operations
- social costs such as loss of livelihoods (short- and long-term unemployment)
- political costs such as after Deepwater Horizon.

Credit other valid consequences.

Award *[1 mark]* for the description or example of each consequence and *[1 mark]* for each explanation.