



*ITAC Conference – 26<sup>th</sup> – 28<sup>th</sup> September 2017*

# Maritime industry needs Ocean Literate citizens

Fiona Crouch – Marine Biological Association  
Sea Change Project Manager



# Outline

- What is Ocean Literacy
- Ocean literacy in context of EU and global initiatives
- Sea Change Project
- Resources



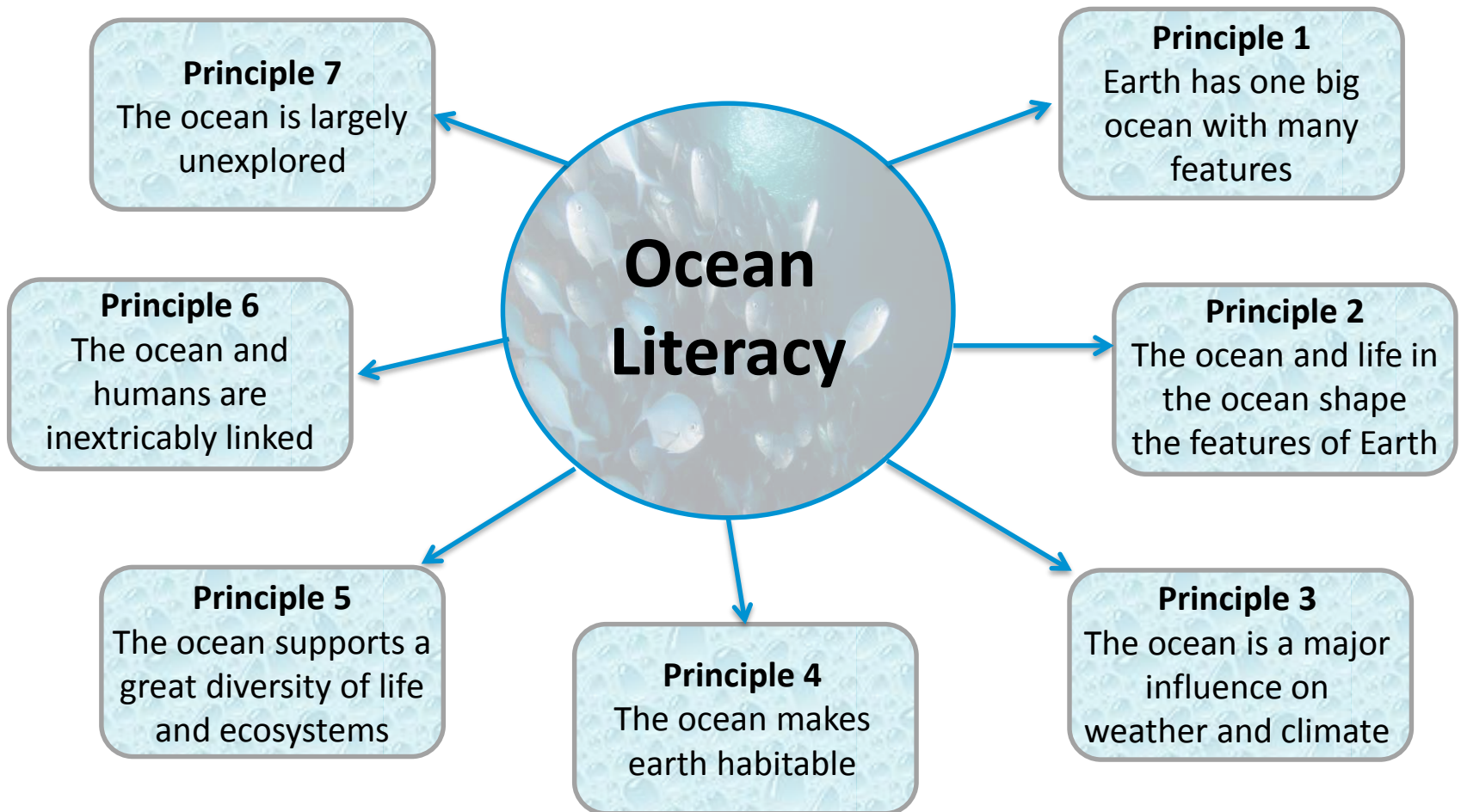
# What is Ocean Literacy?

**AN UNDERSTANDING OF THE OCEAN'S INFLUENCE ON  
YOU – AND YOUR INFLUENCE ON THE OCEAN**

**OR**

**AN UNDERSTANDING OF THE OCEAN'S INFLUENCE ON  
US – AND OUR INFLUENCE ON THE OCEAN**

# Ocean Literacy Fundamental Principles



## **Galway Statement on Atlantic Ocean Cooperation:**

“We further intend to promote our citizens’ understanding of the value of the Atlantic by promoting ocean literacy. We intend to show how results of ocean science and observation address pressing issues facing our citizens, the environment and the world and to foster public understanding of the Atlantic Ocean.”

## **Atlantic Ocean Research Alliance (AORA)**

- Atlantic Seabed Mapping and Characterization
- Aquaculture
- Ocean Literacy and Outreach
- Ocean Health and Stressors
- Ocean Observation and Prediction

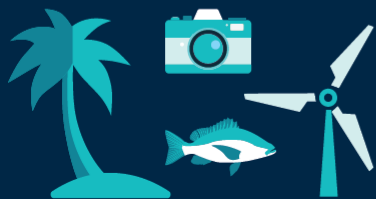
# The Blue Economy

## INVESTING IN THE BLUE ECONOMY

Unlocking the potential of the ocean to create jobs and boost the economy

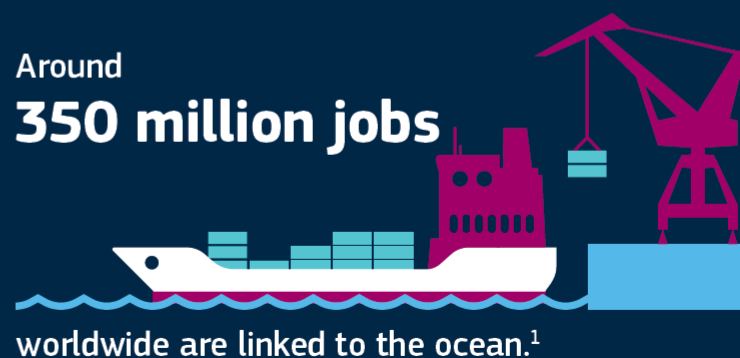
If the ocean were a country, it would be the world's **SEVENTH LARGEST ECONOMY**.

### The situation



The output of the ocean is an estimated **€1.3 trillion**, forecast to double by 2030.

Around **350 million jobs**



worldwide are linked to the ocean.<sup>1</sup>

# Community engagement

## To flourish, the blue economy needs



More **strategic investment** in blue growth.



Improved **maritime skills & qualifications**.



Better **access to finance** for the maritime sector.



Better **maritime spatial planning** and more **data sharing**.



More **cooperation** between public authorities, communities, researchers and private investors to ensure sustainable development.

Be part of the drive to unlock the potential of the blue economy in a smart, sustainable and inclusive way.

# Ocean Literacy and H2020 Programme

## Two Ocean Literacy funded projects

Sea Change (3/15 – 2/18) – 17 partners in 9 countries plus an International Advisory group – fund €3.5 million.

ResponSEAbLe (4/15 – 3/19) – 15 partners in 10 countries – fund €3.9 million.

[www.responseable.eu](http://www.responseable.eu)





# Sea Change and Ocean Literacy

## Aims

- Trigger the ability to make informed and responsible decisions on ocean issues.
- Move European citizens closer to an accountable position of acting responsibly and in protection of marine resources.
- An ocean-literate citizen
  - translates ocean knowledge into action;
  - is capable of communicating about the interdependencies between humans and the ocean in a meaningful way and
  - can make informed and responsible decisions.

# Three pillars of mobilisation

## Education and Lifelong Learning

- Marine education review
- Barriers to ocean education
- Blue schools
- Online seminars
- Harmful algal bloom ebook
- Coderdojo gaming competition.

## Sea Action – where society and science meets

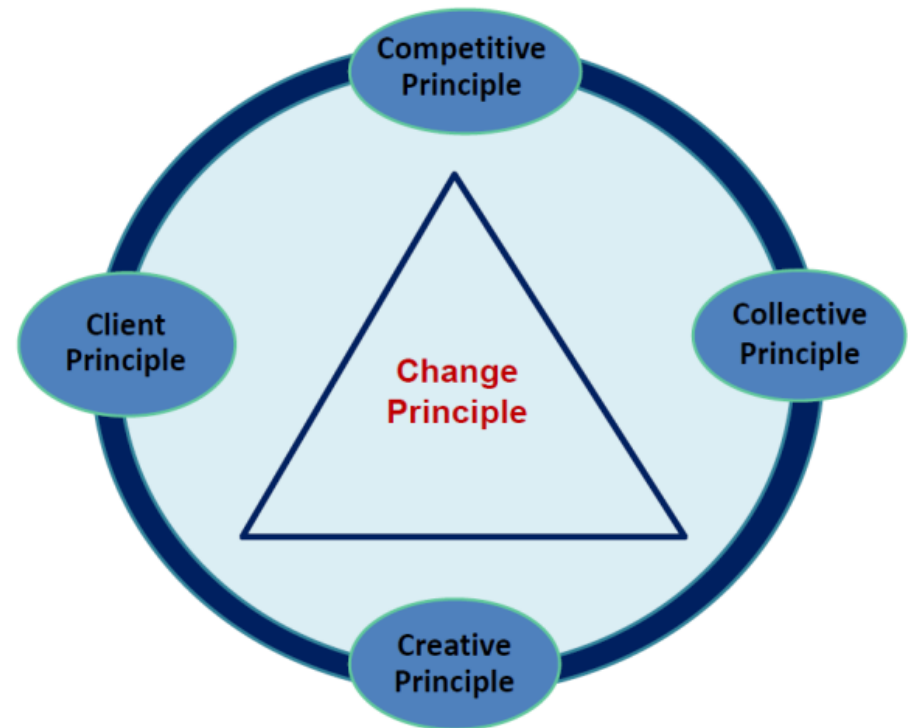
- Review on routes of engagement
- Ocean SIPP Events
- Database on ‘Dangers of the Sea’
- Citizen Science – Crab Watch
- Public engagement through innovation

## Marine Governance

- Review of marine governance system
- Consultation with marine governance actors
- Tools and mechanism for enhancing science-policy interface.

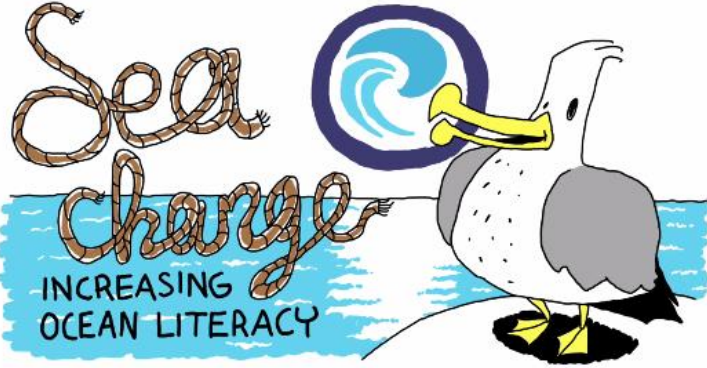
# Social Innovation Participation Processes

- Allows us to investigate societal problems
- Looks for community and collective initiatives that bring about positive social change
- Seeks to understand interaction





# Resources



Sea Change: Increasing Ocean Literacy from Sea Change Project on Vimeo.

WATCH: Human Health and the Ocean

03:55

SEA CHANGE

Human Health and the Ocean

Human Health and the Ocean  
what's the connection?

vimeo

## UNDERSTANDING OUR OCEAN

Phytoplankton in the ocean produce oxygen that we breathe

The sea connects people, goods and ideas around the world

### The Ocean - A Treasure Trove for Human Medicine

The ocean is home to a vast variety of organisms, diverse in their adaptations to the marine environment. Marine organisms produce an abundance of natural products to defend themselves against predators, to locate mates, to communicate and to compete for space and food. Many of these compounds have no terrestrial equivalents and are unique in terms of chemical structure and biological activity. Studying the physiology of marine organisms (the study of how an organism and its body parts function) and their natural products has increased knowledge of how our own bodies function and uncovered new medicines to treat disease. There are compelling reasons why we need to protect marine biodiversity into the future. There is much more to discover.

THE OCEAN REGULATES OUR CLIMATE BY TRANSFERRING HEAT ACROSS THE GLOBE

#### THERE ARE 7 MARINE-DERIVED MEDICINES IN CLINICAL USE

Compound	Ocean Area	Marine Source	Species
Proteinase	Cancer	Seaurchin	Actinopterozoa radiata
Edulis	Cancer	Sponge	Haliclona okadae
Halysartine	Cancer	Sponge	Cyathophylax sp.
Breastcancer	Cancer	Mollusk	Dolabella auricularia
Marimastat	Cancer pain	Sea shell	Conus magus
Valiexone	Arthritis	Sponge	Cyathophylax sp.
Obenoxime	Eye drops	Sea slug	Aplysia
Obenoxime	Eye drops	Sea slug	Aplysia

Many more compounds are currently going through clinical trials to treat conditions such as schizophrenia, Alzheimer's, chronic pain and cancer. Medicines that compounds isolated from marine animals, algae, fungi and bacteria have been shown to have anticancer, antifungal, anti-infective, anti-inflammatory, anti-obesity, anti-inflammatory and analgesic activities.

#### MARINE ORGANISMS TELL US A LOT ABOUT OURSELVES

As well as being a source of medicines, studying marine organisms increases our knowledge of human physiology and disease. It is the specific adaptations of organisms to the marine environment that makes them so valuable to us.

- **Sharks and the immune system:** Sharks have an immune system with the same fundamental components found in humans. This makes them a great comparative model for studying features of the immune system including autoimmunity (the immune response of an organism against its own cells and tissues), which is the underlying cause of several human diseases such as lupus and rheumatoid arthritis. Sharks also have some extraordinary immune mechanisms which manage to kill, often by eating, one possibility for immunotherapies using the immune system to fight disease.
- **Sea urchins and the cell cycle:** Sea urchins produce huge quantities of large, clear eggs that lack external coating, making them ideal for studying the cell cycle, the sequence of events to which a cell responds to genetic material and these diseases. The discovery of cyclin by group of scientists that regulate the cell cycle in sea urchin eggs in 1982 revolutionised the study of the mammalian cell cycle and paved the way for new research into the diagnosis and treatment of cancer.
- **Lipid and the nervous system:** The usual diet eaten in some fish that toxicology have implications for 1000-fold higher than vertebrate species. Its discovery opened up new avenues for researching the nervous system. The concepts that emerged from this research formed the basis for diagnosis and treatment of disorders of conduction in nerves and other tissues such as heart and skeletal muscle.

#### HELP PROTECT MARINE BIODIVERSITY

An estimated 95% of marine species still have disappeared. Six out of seven species could be heading for the same bleak future.

Learn why habitats. When diving or snorkeling, don't touch coral reefs or marine life. Take no souvenirs.

Before you're finally seaworthy, don't buy jewelry and cosmetics made from marine shells, coral and other shells.

Choose eco-friendly cleaning products and low-alkalinity detergents. Products that go down the drain can eventually end up in the ocean and harm aquatic life. Many household items can be done with simple household items like vinegar, baking soda or lemon juice.

## PLASTICS IN THE MARINE ENVIRONMENT

**DID YOU KNOW?**  
More than 8 million tonnes of plastic waste enters the ocean every year.

80% of marine plastic waste comes from land-based sources.

Plastic is very slow to break down in the ocean. It breaks down into smaller and smaller pieces. Pieces of plastic less than 5 mm wide are called "MICROPLASTICS".

Larger plastic can affect fish and wildlife through choking, ingestion or entanglement.

Dissolved contaminants from the water can adhere to the surface of microplastics.

Microplastics can be ingested and retained by filter feeders, such as shellfish.

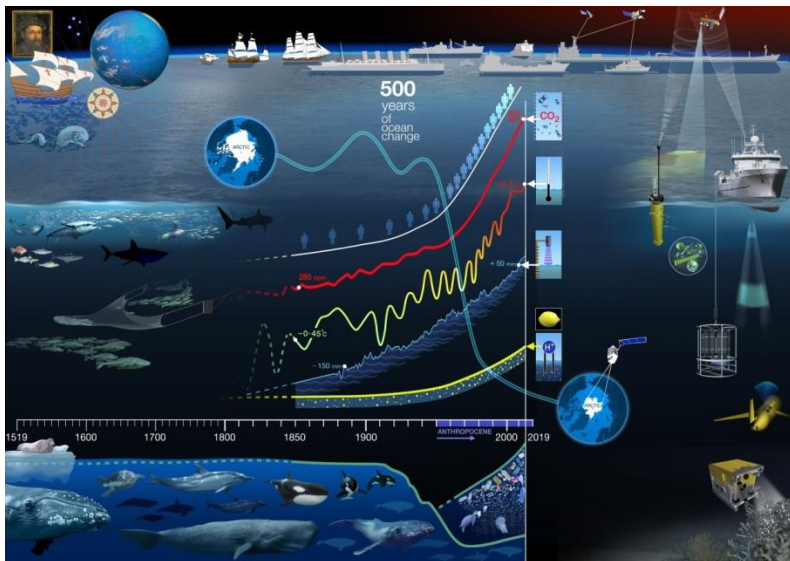
Although some research suggests that microplastics don't currently pose a significant health risk for humans, more research is needed.

### YOU CAN MAKE A DIFFERENCE WITH THESE EASY STEPS . . .

- USE REUSABLE SHOPPING BAGS
- CHOOSE REUSABLE PLATES AND METAL CUTLERY
- NEVER FLUSH PLASTIC DOWN THE TOILET
- CHOOSE PACKAGE-FREE FOODS OR THOSE IN BIODEGRADABLE PACKAGING
- MAKING A SEA CHANGE TO PROTECT OUR OCEAN: [HTTP://SEACHANGEPROJECT.EU/takeaction](http://seachangeproject.eu/takeaction)
- JOIN THE CONVERSATION ON TWITTER: @OURCEANOURHEALTH
- AVOID PRODUCTS WITH MICROBEADS
- AVOID PLASTIC STRAWS
- DO A #2MINUTESEACHCLEAN [HTTPS://SEACHCLEAN.NET/](https://seachclean.net/)
- NEVER FLUSH PLASTIC DOWN THE TOILET
- RECYCLE PLASTIC WASTE
- CARRY YOUR OWN REUSABLE WATER BOTTLE AND COFFEE CUP

For sources, see: <http://seachangeproject.eu/MarinePlastics>

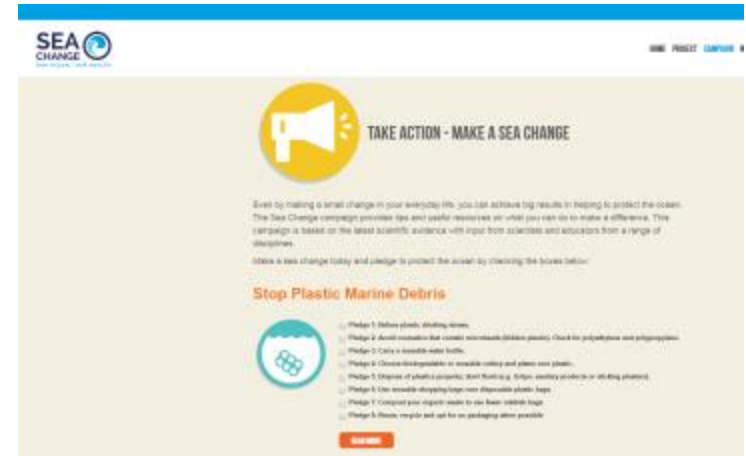
SEA CHANGE



MAKE A SEA CHANGE	<b>ON THE COMMUTE</b>	WITH THESE EASY STEPS
MAKE A SEA CHANGE	<b>IN THE BATHROOM</b>	WITH THESE EASY STEPS
RETURN	AVOID products that	NEVER FLUSH
Save water and		
MAKE A SEA CHANGE	<b>EATING ON THE GO</b>	WITH THESE EASY STEPS
BRING YOUR OWN MUG to take away hot drinks. Plastic liners in	Choose establishments that USE BIODEGRADABLE OR	CARRY A REUSABLE WATER BOTTLE to refill
REFUSE UTENSILS YOU DON'T NEED for example	DISPOSE OF WASTE CORRECTLY so that it can	
MAKE A SEA CHANGE	<b>IN THE KITCHEN</b>	WITH THESE EASY STEPS
Choose REUSABLE	Minimise	Use ECO-FRIENDLY
Dispose of fat, oil or grease		
MAKE A SEA CHANGE	<b>IN THE SUPERMARKET</b>	WITH THESE EASY STEPS
BRING YOUR OWN BAG to save money and reduce the amount of plastic used in the world	AVOID EXCESS PACKAGING. Most of the plastic debris in the ocean is thought to come from packaging	CHOOSE SUSTAINABLY-CAUGHT SEAFOOD. Look for certificates of sustainability on the packaging or menus
BUY ONLY AS MUCH AS YOU NEED to reduce the amount of fossil fuels needed to produce and	BUY LOCALLY PRODUCED FOOD to reduce the amount of fuel needed to transport it	
MAKE A SEA CHANGE	<b>IN THE OFFICE</b>	WITH THESE EASY STEPS
CHANGE YOUR COMPUTER TO "SLEEP" MODE when not in use and turn off electrical equipment when not needed	AVOID PAPER. Make notes electronically, scan documents instead of copying them, send emails instead of letters	BRING A PACKED LUNCH to the office in a reusable container, along with reusable cutlery
REUSE STATIONERY supplies and choose sustainable options where possible		
<b>HOW THIS HELPS</b>		
Carbon dioxide emissions released during energy production contribute to global warming and ocean acidification	Cutting down on paper consumption ultimately reduces air, water and land pollution from the paper production process	As well as contributing to the litter problem, many fast-food wrappers contain a chemical coating which can be harmful to wildlife and human health
Choosing reusable materials such as folders, paperclips and scrap paper helps to reduce waste that might end up in the ocean		
MAKE A SMALL CHANGE FOR SEA CHANGE by taking the #OurOceanOurHealth pledge at <a href="http://www.seachangeproject.eu/likeaction">www.seachangeproject.eu/likeaction</a>		
<a href="https://twitter.com/Seachange_EU">@Seachange_EU</a> <a href="http://www.seachangeproject.eu">www.seachangeproject.eu</a>		



# Campaign



## Watch the Latest Sea Change Videos

Make a Small Change for Sea Change: [www.vimeo.com/album/4588555](http://www.vimeo.com/album/4588555)

Make a Sea Change in the Bathroom: [www.vimeo.com/217645296](http://www.vimeo.com/217645296)

Make a Sea Change in the Kitchen: [www.vimeo.com/220452556](http://www.vimeo.com/220452556)

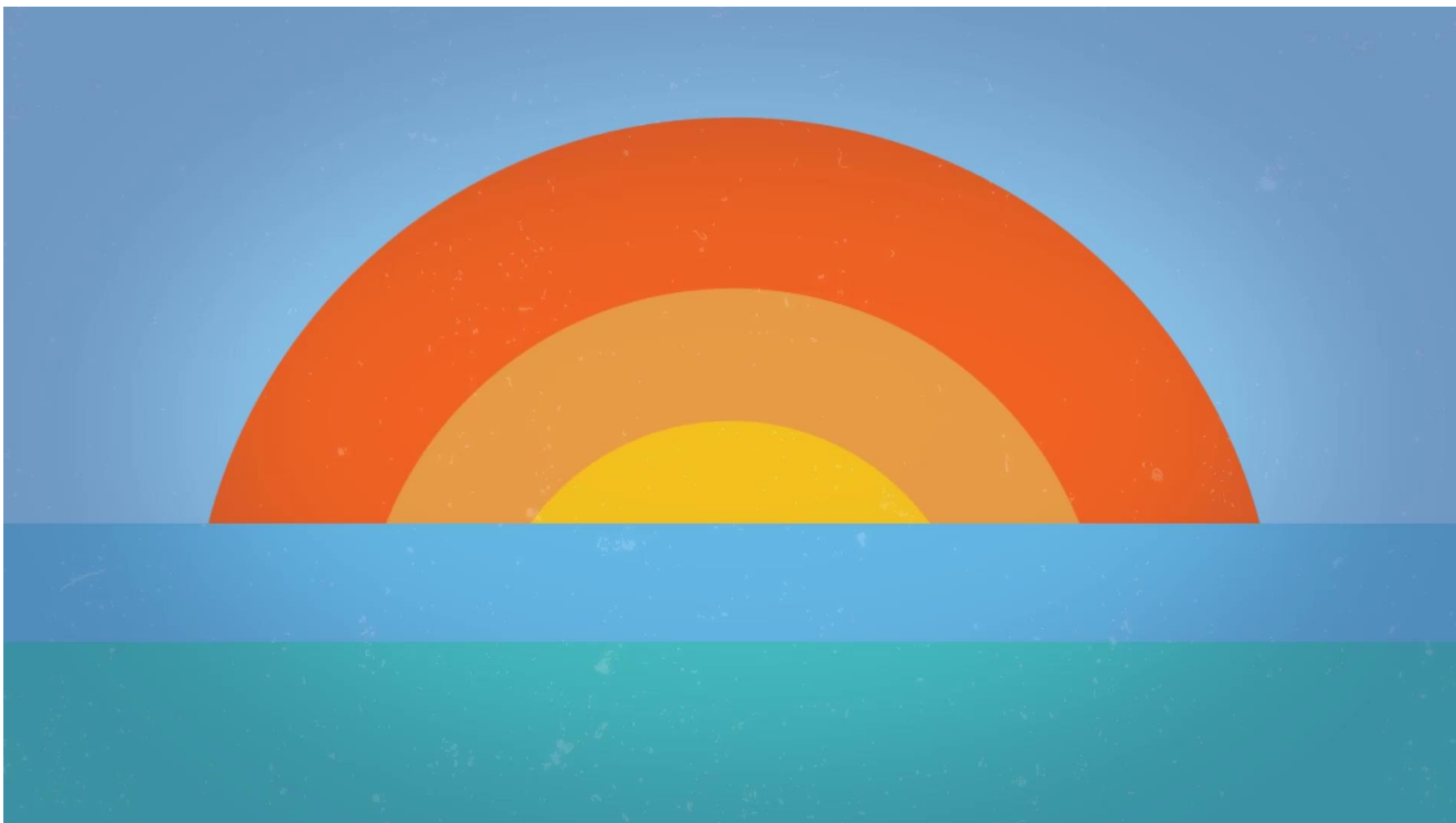
Make a Sea Change in the Supermarket: [www.vimeo.com/226125637](http://www.vimeo.com/226125637)

Make a Sea Change on the Commute: [www.vimeo.com/228353179](http://www.vimeo.com/228353179)

Make a Sea Change at Work: COMING SOON

Make a Sea Change Eating Out: COMING SOON







---

# Thank You

---



Fiona Crouch  
ficr@mba.ac.uk

