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# Special Issue Ocean Literacy



The Blue Survey: Validation of an instrument to measure ocean literacy among adults

EVELYN PAREDES-CORAL, TIM DEPREZ, MELITA MOKOS, ANN VANREUSEL, HENK ROOSE

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Contribution to the Special Issue: "Ocean Literacy across the Mediterranean Sea region"

# The Blue Survey: Validation of an instrument to measure ocean literacy among adults

# Evelyn PAREDES-CORAL, Tim DEPREZ, Melita MOKOS, Ann VANREUSEL and Henk ROOSE

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**Table S1.** Items from Section I and the specific essential principle that is addressed by each item. The letters next to the essential principles represent the specific fundamental concepts of Ocean Literacy.

Items	Essential Principles & Fun- damental Concepts		
The ocean affects your life because it	6 a	*	
Approximately how much of the earth is covered by ocean?	1 a		
The ocean dynamics (the motion of water within the ocean) is powered by	1 c	*	
The ocean is large and finite. Its resources are	1 h		
What is causing sea level rise?	1 d	*	
The ocean helps to global warming by absorbing human-produced CO2 from the atmosphere	2 d /3 e,f	*	
Which of the following are transported by rivers to the ocean?	1 g	*	
Beaches and coastlines are particularly vulnerable to pollution caused by	6 d		
What produces most of the earth's oxygen?	4 a/3 e	*	
There are several economic activities collectively taking place in the ocean (e.g., fisheries, shipping, offshore energy, etc). Effective management of the maritime space across borders and sectors should lead to	6 g		
Look at the image. If both cities are at the same elevation, it is likely that:	3 b	*	
In the ocean, living spaces and habitats are found	5 e	*	
Which of the following options provide habitat for one-third of all marine species?	5 e		
The ocean is the last and largest unexplored place on earth. How much of the ocean remains unexplored?	7 a		
How is the climate change impacting the Arctic?	6 e	*	
Oil spills affect the marine environment by	6 d		
Most of the antifouling paints that are used to keep ship hulls and floating structures free of marine organisms are	6 d	*	
Marine renewable energy industries (e.g., offshore wind, tidal and wave energy) may affect the ocean in a variety of ways, such as	6 d	*	
What are the most frequent effects derived from the concentration of industrial activities near the seashore?	6 d		
Most of the marine invasive species are introduced and dispersed to new habitats by	6 d		

\*Items retained after validation.

Table S2. List of validated questions from The Blue Survey. Items with (\*) represent the correct answers.

### Knowledge about ocean-related topics

The ocean affects your life because it

- □ provides food and medicine\*
- □ provides mineral and energy resources\*

□ regulates the temperature\*

□ provides recreation and jobs\*

# The ocean dynamics (the motion of water within the ocean) is powered by

 $\Box$  tides\*

 $\Box$  winds\*

- $\square$  earth's rotation\*
- $\Box$  tsunamis

What is causing sea level rise?

 $\Box$  warming of the ocean\*

 $\hfill\square$  ocean acidification

- □ increasing melting of glaciers and ice sheets\*
- $\Box$  heavy rainfall in the tropics

The ocean helps to \_\_\_\_\_\_ global warming by absorbing human-produced CO2 from the atmo-

sphere

- O accelerate
- O stop
- O slow\*
- O none of these

Which of the following are transported by rivers to the ocean?

- $\Box$  nutrients\*
- □ (micro)plastics\*
- □ sediments\*
- $\Box$  pollutants\*

What produces most of the earth's oxygen?

O forests

- O algae in the ocean\*
- O both equally
- O none of these

#### Look at the image. If both cities are at the same elevation, it is likely that:



O City A will have warmer summers and cooler winters than city B O City A will have warmer summers and warmer winters than city B O City A will have cooler summers and warmer winters than city B\* O City A will have similar temperatures as city B in each season O none of these

In the ocean, living spaces and habitats are found

- $\hfill\square$  at the surface\*
- $\hfill\square$  in the water column\*
- $\square$  on the seafloor\*
- $\hfill\square$  none of these

How is the climate change impacting the Arctic?

O The impact on the Arctic is the same as on the rest on the planet

O The Arctic is warming faster than the rest of the planet\*

O Ice is melting in some parts of the Arctic and growing in other parts

- O Tropical fish are migrating to the Arctic
- O none of these

Most of the antifouling paints that are used to keep ship hulls and floating structures free of marine organisms are

- $\square$  harmless
- $\hfill\square$  persistent and accumulative in organisms\*
- $\Box$  toxic\*
- $\hfill\square$  none of these

Marine renewable energy industries (e.g., offshore wind, tidal and wave energy) may affect the ocean in a variety of ways, such as

- □ visual pollution\*
- □ collision with seabirds\*
- □ underwater noise\*
- $\square$  harmful algal blooms

### Personal interest in ocean-related aspects

To what extent do the following aspects of the ocean interest you?	not at all	a little bit	neutral	quite a bit	a lot
I am interested in marine energy	0	0	0	0	0
I am interested in ocean science	0	0	0	0	Ο
I am interested in maritime jobs	0	0	0	0	Ο
I am interested in the recreational aspects	0	0	0	0	Ο
I am interested in the aesthetic aspects	0	Ο	Ο	0	0

# **Ocean-friendly behaviour**

Considering a period of one year prior to this survey. How often do you undertake the following actions in your day-to-day life?	never	rarely	some- times	often	always
I avoid products with ingredients that are toxic for the marine envi- ronment or that are derived from endangered marine organisms	0	Ο	0	0	0
I reduce my energy consumption at home	0	Ο	0	0	0
I take short showers	0	0	0	Ο	0
I opt for plastic-free alternatives	0	0	0	0	0

### Ocean stewardship

To what extent do you agree/disagree with the following statements regarding ocean sustainability? *Ocean sustainability focuses on managing our ocean and its services without compromising them for future generations	strongly disagree	disagree	neutral	agree	strongly agree
I understand the issues facing the global ocean	0	0	0	0	О
My actions can have a significant effect on the health of oceans and coastal areas	0	0	0	0	0
I have a personal responsibility to work for the health of oceans and coastal areas	0	0	0	0	0
The health of the ocean is important to human survival	0	0	0	Ο	Ο
Business and industry should be responsible for ocean sustainability	0	0	0	0	О
Individual citizens should be responsible for ocean sustainability	0	0	0	Ο	Ο
Ocean sustainability is more important than economic growth	0	0	0	0	Ο

# Ocean as economic resource

To what extent do you agree/disagree with the following statements regarding human utilization of the ocean?	strongly disagree	disagree	neutral	agree	strongly agree
It is all right for humans to use the ocean as a resource for economic	0	Ο	Ο	Ο	0
purposes					
We should no longer use the ocean as a resource for economic pur-	0	0	0	0	0
poses					
Maritime economic activities are compatible with ocean sustainabil-	0	0	0	0	0
ity					

# Willingness to act

How often would you be willing to undertake the following responsi- ble actions towards the ocean in your day-to-day life?	never	rarely	some- times	often	always
I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms	0	0	0	0	0
I would be willing to reduce my energy consumption at home	Ο	Ο	Ο	Ο	0
I would be willing to take short showers	Ο	Ο	Ο	Ο	Ο
I would be willing to opt for plastic-free alternatives	0	0	0	0	0

The six sub-dimensions obtained by Exploratory Factor Analyses are in bold. Questions with checkboxes  $\Box$  have more than one correct option, participants were asked to check all that applied. The Blue Survey re-used existing items from validated surveys (Cudaback, 2006; Greely, 2008; Chen *et al.*, 2020).