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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

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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 & Fundamental 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		

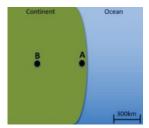
<sup>\*</sup>Items retained after validation.

# 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
□ tides*
□ winds*
□ earth's rotation*
□ tsunamis
What is causing sea level rise?
□ warming of the ocean*
□ ocean acidification
□ increasing melting of glaciers and ice sheets*
□ heavy rainfall in the tropics
The ocean helps to global warming by absorbing human-produced $\mathrm{CO}_2$ from the atmosphere
O accelerate
O stop
O slow*
O none of these
Which of the following are transported by rivers to the ocean?  □ nutrients*
□ (micro)plastics*
□ sediments*
□ 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
□ at the surface*
□ in the water column*
□ on the seafloor*
$\Box$ 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 kee	p ship hulls	and floating structure	s free of marin	ne
organisms are				

П	harml	ess

- □ persistent and accumulative in organisms\*
- □ toxic\*
- □ 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\*
- $\ \square$  underwater noise\*
- $\hfill\Box$ 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	O	O	O	O	O
I am interested in ocean science	O	O	O	O	O
I am interested in maritime jobs	O	O	O	O	O
I am interested in the recreational aspects	O	O	O	O	O
I am interested in the aesthetic aspects	O	O	O	O	O

Ocean-	friendly	beha	viour

Considering a period of one year prior to this survey. How offen do you undertake the following actions in your day-to-day life?  I avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms. I reduce my energy consumption at home  O O O O O O O O O O O O O O O O O O O	Ocean-iriendly denaviour					
Ireduce my energy consumption at home		never	rarely		often	always
Itake short showers I opt for plastic-free alternatives  Oo O	•	O	O	O	O	О
Ocean stewardship         Strongly disagree or mentral regarding ocean sustainability? "Ocean sustainability? focuses on managing our ocean and its services without compromising them for future generations         strongly disagree or mentral disagree or mentral disagree or mentral strongly agree or mentral disagree or ment	I reduce my energy consumption at home	O	O	O	O	O
Ocean stewardship To what extent do you agree/disagree with the following statements regarding ocean sustainability? *Cocan sustainability focuses on managing our ocean and its services without compromising them for future generations  I understand the issues facing the global ocean  I understand the issues facing the global ocean  I understand the issues facing the global ocean  O O O O O O O O O O O O O O O O O O	I take short showers	O	O	O	O	O
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  I understand the issues facing the global ocean  I understand the issues facing the global ocean  O O O O O O O O O O O O O O O O O O O	I opt for plastic-free alternatives	O	O	О	О	0
regarding ocean sustainability? **Ocean sustainability focuses on managing our ocean and its services without compromising them for future generations  I understand the issues facing the global ocean  I understand the issues facing the global ocean  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	Ocean stewardship					
My actions can have a significant effect on the health of oceans and coastal areas  I have a personal responsibility to work for the health of oceans and coastal areas  I have a personal responsibility to work for the health of oceans and coastal areas  I have a personal responsibility to work for the health of oceans and coastal areas  The health of the ocean is important to human survival  O O O O O O  Business and industry should be responsible for ocean sustainability O O O O O O  Individual citizens should be responsible for ocean sustainability O O O O O O O  Ocean sustainability is more important than economic growth Ocean as economic resource  To what extent do you agree/disagree with the following statements regarding human utilization of the ocean?  We should no longer use the ocean as a resource for economic purposes  We should no longer use the ocean as a resource for economic purposes  Maritime economic activities are compatible with ocean sustainability  Willingness to act  How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms  I would be willing to take short showers  O O O O O O O O O O O O O O O O O O O	regarding ocean sustainability? *Ocean sustainability focuses on managing our ocean and its services without compromising them	$\mathcal{C}$	disagree	neutral	agree	0,5
Coastal areas  I have a personal responsibility to work for the health of oceans and coastal areas  The health of the ocean is important to human survival  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	I understand the issues facing the global ocean	O	O	O	O	O
Coastal areas  The health of the ocean is important to human survival  O O O O O O O O O O O O O O O O O O	•	О	О	О	О	Ο
Business and industry should be responsible for ocean sustainability		O	O	O	О	О
Individual citizens should be responsible for ocean sustainability  O O O O O O O O O O O O O O O O O O	The health of the ocean is important to human survival	O	O	O	O	O
Ocean as economic resource       O       O       O       O       O         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 purposes       O       O       O       O       O         We should no longer use the ocean as a resource for economic purposes       O       O       O       O       O         Maritime economic activities are compatible with ocean sustainability       O       O       O       O       O         Willingness to act       How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?       never       rarely times       sometimes       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       O       O       O       O       O       O         I would be willing to reduce my energy consumption at home       O       O       O       O       O       O         I would be willing to take short showers       O       O       O       O       O       O	Business and industry should be responsible for ocean sustainability	O	O	O	O	O
Ocean as economic resource  To what extent do you agree/disagree with the following statements regarding human utilization of the ocean?  It is all right for humans to use the ocean as a resource for economic purposes  We should no longer use the ocean as a resource for economic purposes  Maritime economic activities are compatible with ocean sustainability  Willingness to act  How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms  I would be willing to reduce my energy consumption at home  I would be willing to take short showers  Strongly disagree neutral agree neutral agree strongly disagree neutral agree strongly agree agree strongly agree with strongly agree agree strongly disagree neutral agree strongly agree agree agree strongly agree agree strong	Individual citizens should be responsible for ocean sustainability	O	O	O	O	O
To what extent do you agree/disagree with the following statements regarding human utilization of the ocean?  It is all right for humans to use the ocean as a resource for economic purposes  We should no longer use the ocean as a resource for economic purposes  Maritime economic activities are compatible with ocean sustainability  Willingness to act  How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms  I would be willing to take short showers  Strongly disagree neutral agree strongly agree  O O O O O O O O  O O O O O  O O O O	Ocean sustainability is more important than economic growth	O	O	О	О	0
It is all right for humans to use the ocean as a resource for economic purposes  We should no longer use the ocean as a resource for economic purposes  Maritime economic activities are compatible with ocean sustainability  Willingness to act  How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms  I would be willing to reduce my energy consumption at home  O O O O O O O O O O O O O O O O O O O	Ocean as economic resource					
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Willingness to act  How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms  I would be willing to reduce my energy consumption at home  O O O O O O O O O O O O O O O O O O		O	O	O	O	О
How often would you be willing to undertake the following responsible actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic for the marine environment or that are derived from endangered marine organisms  I would be willing to reduce my energy consumption at home OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO		0	0	О	Ο	О
ble actions towards the ocean in your day-to-day life?  I would be willing to avoid products with ingredients that are toxic of the marine environment or that are derived from endangered marine organisms  I would be willing to reduce my energy consumption at home OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	Willingness to act					
for the marine environment or that are derived from endangered marine organisms  I would be willing to reduce my energy consumption at home OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO		never	rarely	_	often	always
I would be willing to take short showers OOOOO	for the marine environment or that are derived from endangered	О	O	О	О	0
	I would be willing to reduce my energy consumption at home	O	O	O	O	O
I would be willing to opt for plastic-free alternatives O O O O	I would be willing to take short showers	O	O	O	O	O
	I would be willing to opt for plastic-free alternatives	О	0	О	О	<u>O</u>

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).